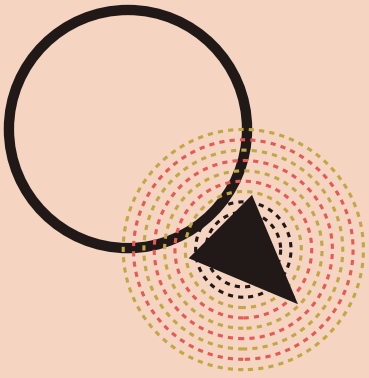
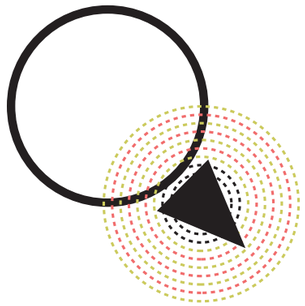


Reterritorializing Zuidoost

towards sustainable, liveable and just assemblages in Amsterdam Zuidoost



Colophon

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Thank you all.

Abstract

If we denounce neoliberal ideology and the capitalist order of today's cities as value generating machines, what would the new order be? An integral part of Amsterdam's emergence as a just city was the interaction between radical resident movements and national housing policy that was designed to solve the housing shortage through massive investments in social housing in the 70s and 80s.

However, since the early 90s, rising neoliberalism, changing national economic and housing policies have created segregation and segmentation of the housing stock and people. Existing short-sighted trends in urban development processes that are fragmented pose a threat towards a just city, as seen evidently in Amsterdam Zuidoost district which consistently ranks poorly in social, economic and spatial dimensions of well being. The city is currently in the process of building a large stock of new housing within the existing city(densification), while also transitioning to a different socio-technical regime in terms of energy, economic logic (circular economy) and climate adaptation.

Therefore, it is crucial to adopt an integrated approach towards urban development at this juncture taking into consideration the socio-economic and ecological urgencies of Amsterdam Zuidoost. One that enables vulnerable populations to be a part of the process leading to a just distribution of its resultant benefits and burdens.

The aim of this research project is three fold. First is to understand the historicity of urban development processes that led to the current socio-economic, ecological and spatial realities of Amsterdam Zuidoost from a complex systems perspective.

Second is to evolve a set of patterns that lead to livable communities and sustainable neighborhoods that are spatially just. Third is to evolve an integrated approach towards urban development by operationalising the patterns amongst the complex interrelations between socio-economic, ecological and spatial dimensions of Amsterdam Zuidoost that is co produced by local stakeholders.

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1

Notions

Before we get into the ‘body’ of the thesis, I would like to reflect on certain notions that I started this thesis with. My understanding of sustinable development and neoliberalism developed in the first year of my masters, that heavily influenced the direction of this thesis project.

1.1 Personal Motivation
1.2 On Sustainable Development
1.3 On Neoliberalism

1.1 Personal Motivation

If you are someone who reads the news daily, chances are that you stopped being an optimst long ago. Though Hans Rosling wouldn't want us to think that way, and would argue that the world is becoming a better place in the long term, the nature of human memory tends to favour the short term with a recency bias and it seems like a downward spiral for quite a while.

As someone who was trained as an architect, the act of building is one of optimism for me. By the mere fact that there is a hope for the building to last a lifetime. Of course, we build in contingencies to prevent the building from crumbling in an earth quake or accidental fires, but the hope is that it will be there forever.

The same could be said of urbanism. By the mere act of looking into the future, and trying to create a better reality, it's an exercise in optimistic thinking. However, in recent decades the imaginatory zeal of the profession is missing in my opinion, speculative value chasing for global capital is the driving factor behind the act of city building nowadays.

In my thesis, I want to break away from this in pursuit of an utopia. Not in a naive sense, but from a value system that is just and moral for humans and is sustainable for the planet.

We need to build cities that are sustainable from a social, economic and environmental sense. We need to build cities that are livable for a diverse population. We need to build cities where we can speak and we can be heard for our reasons and values and not just our purchasing power. We need to build cities that reflect humane values of justice.



Fig 1.1: The Garden of Earthly Delights by Hieronymus Bosch.

Source: Wikimedia commons

1.2 On sustainable development

From developed nations to developing nations

The 17 Sustainable Development Goals (SDGs) set by the UN General Assembly in 2015, provides a framework for sustainable development that is intended to be achieved by 2030.

To track the progress of individual countries with respect to the SDGs, the SDG Index was created. Not surprisingly, 'developed countries' of the global north rank high on the Index, with the Netherlands ranking at 9 out of the 166 countries currently ranked as of 2020.

If we look at the nature of the development in the Netherlands, through the safe and just space framework (Raworth, 2012), it is obvious that the country has overshot the ecological ceiling and is using more than its fair share of natural resources (O'Neill et al, 2018). This is the case with most 'developed countries'.

If we go a step further and think about the historical emissions, as a measure of use of natural resources in the past, the EU-28(Pre-Brexit) is responsible for 22% of global cumulative emissions since 1751 through 2017 (Ritchie & Roser, 2020). Not surprising considering the extractive colonial past of European nations.

Hickel (2019) argues that the sustainable development goals are contradictory and incoherent with ecological values. He also states that the SDG Index has a weighting problem with more indicators focusing on social and infrastructure development over indicators measuring ecological impact.

From an ethical perspective, countries on the top of the SDG index including the Netherlands need to do more than achieving net zero emissions, and move towards climate positive conditions - creating environmental benefits by removing additional carbon dioxide from the atmosphere.

If cities of developing countries were to achieve the same kind of development as cities in developed nations based on the existing development models, it would release 350 Gt of carbon dioxide by 2050, four times the amount used to build the existing developed-world infrastructure (Bai et al, 2018).

Sustainable development and sustainability transitions alon the way through a critical perspective involves power struggles in terms of how the benefits and burdens are shared in the process as well.

A more integrated and sustainable development model that is finetuned in the low-conflict conditions of Dutch cities could be a torch bearer for developing nations in the coming years. This is imperative if we aim to achieve the SDGs without overshooting the planetary boundaries.

Does the developed nations of the global north offer a model of development that could be replicated in countries that are further down along the SDG index?

Table 1.1: Comparing sustainable development indicators of the Netherlands and India

Data: O'Neill et al, 2018

	Indicators	The Netherlands	India	Per Capita Boundary	Unit
Biophysical indicators	CO2 Emissions	13.3	1.7	1.6	tonnes CO2 per year
	Phosphorus	4	0.6	0.9	kilograms P per year
	Nitrogen	53.2	6.9	8.9	kilograms N per year
	Blue Water	339	520	574	cubic metres H2O per year
	eHANPP	2.8	1	2.6	tonnes C per year
	Ecological Footprint	4.5	0.9	1.7	global hectares (gha) per year
	Material Footprint	26	3.6	7.2	tonnes per year
Social Indicators	Life Satisfaction	7.6	4.6	6.5	[0-10] Cantril scale
	Healthy Life Expect.	71.2	57	65	years of healthy life
	Nutrition	3147	2459	2700	kilocalories per capita per day
	Sanitation	100	35.1	95	% with access to improved sanitation
	Income	100	78.8	95	% who earn above $1.90 per day
	Access to Energy	100	78.7	95	% with access to electricity
	Education	129.1	66.4	95	% enrolment in secondary school
	Social Support	93.8	55.3	90	% with friends or family they can depend on
	Democratic Quality	1.3	0.5	0.8	Democratic Quality Index
	Equality	73.4	50.1	70	[0-100] Scale -> (1 - Gini Index) * 100
	Employment	95.6	96.5	94	% of labour force employed

1.2.1 On Transitions

Urban planners and designers are traditionally concerned with development and design of land use and the built environment. However, the profession is currently evolving to accomodate the demands of various transitions towards sustainability and their impacts on the built evironment if my education in TU Delft the past year is to be considered an indicator.

Socio-technical transitions towards sustainability are characterised by systems change. To break away from existing lock-ins and path dependencies of an exctractive economy towards a more sustainable reality is a difficult task. This requires whole supply chains from production to consumption and the motivations to behaviours of various stakeholders need to change over a period of time.

As with any change in an existing socio-technical regime, there are going to be burdens and benefits and this needs to be shared in a fair manner. However socio-technical transitions towards sustainability focus largely on the environmental sustainability and miss out on social sustainability achieved through equity and democratic processes (Campbell, 2013).

While it is important that we focus on ensuring a transition towards sustainable systems that protect our environment, it is important that we make sure vulnerable populations embedded in the existing systems are not left behind in the process.

The Dutch economy is still embedded heavily in the global fossil fuels market housing two of the largest petroleum and coal harbours in Europe at Amsterdam and Rotterdam. This contributes significantly to the GDP and employment generation in the country. While alternative clean energy generation creates jobs, they aren't always in the same skill-space and require additional training which could be expensive and not preferred by employers who could hire skilled people in the open market.

Regulations towards a sustainable transition also play out in complex ways and have large second order effects. The regulations on nitrogen emissions meant that new construction came to a standstill, which also contributed to the housing shortage in the Netherlands, decreasing the affordability of existing housing stock due to high demand.

Thus, it is important to keep in mind that socio-technical transitions towards sustainability need to keep the three distinct components of sustainability as part of the process - social, environmental, and economic and the complex ways in which they interact.



Fig 1.2: Code Rood action at the port of Amsterdam - Mass blockade of the OBA Bulk Terminal coal port of Amsterdam, June 24, 2017.

Source: ejatlas.org

1.3 On Neoliberalism

Dissolving Keynesian institutions for a Hayekian world

The Neoliberal agenda, a favourite term for critics than the actual proponents of the policies and practices, has two foundational components according to Ostry, Loungani & Furceri (2016).

- The first one is increased competition, which is on paper accomplished through deregulation and the opening up of domestic commodity and financial markets to not just national but global competition.
- The second one is a reduced role for the state as a supplier and regulator of services, which is accomplished through privatization of government services and austerity measures that limits the ability of governments to run fiscal deficits and accumulate debt towards infrastructural development (Ostry, Loungani & Furceri, 2016).

The proponents claim that these practices help increase investment, reduce global poverty, help in the transfer of technology across borders and improve efficiency in distribution of services in a market. Reality couldn't be farther away from this presumption.

The rise in the neoliberal agenda since the 1980s as a predominant way in which we organise our societies with the price system at it's core, assuming that almost all human activity is a form of economic calculation as bought forth by Hayek is a problematic worldview and has created negative externalities that threatens sustainable and equitable living for all.

With the state being re-designed to support the free market in neoliberalism as opposed to classical liberlaism where states are expected to leave markets alone has created instances such as the favourable tax policies implemented in the Netherlands, which in turn has made it into a tax haven. The country which ranked 119th in the world in 2008 in terms of wealth inequality measured through Gini coefficients is the world's most unequal nation in terms wealth distribution by 2019. This creates bizzare situations such as the world's biggest furniture manufacturer, IKEA, being legally constructed as a Dutch charity.

Metcalf (2017) in his Guardian article argues that the Neoliberal world view increasingly equates these practices as natural law and a natural way of organising societies through the concepts of wealth, value, exchange, cost and price. Pricing as a means of allocating scarce resources efficiently to fulfil need and achieve maximum utility, as governed by the forces of supply and demand.

"We must face the fact that the preservation of individual freedom is incompatible with a full satisfaction of our views of distributive justice."

Friedrich August von Hayek

With the assumption that the price system functions efficiently with free and unregulated markets, which are competitive. Within this society, people are expected to express only their self-interest and compete for scarce rewards.

Neoliberal policies has led to an inequal distribution of burden and benefits in a society. While society as a whole is increasingly exposed to burdens of financial crises, extreme inequality is on the rise with a select few benefiting from the increasing wealth. In the Netherlands, the richest 0.1% own a sixth of the nation's wealth and the wealthiest 1% of Dutch households own one third of the Netherlands' private assets (Source: CBS).

People as social beings by nature are turned against one another through competition and individualism in a neoliberal world. A third of the Dutch population feel lonely and over a million people feel extremely lonely in the Netherlands. Loneliness is twice as deadly as obesity and is as potent a cause of early death as smoking 15 cigarettes a day (Holt et al., 2015).

Neoliberal policies and their relentless pursuit of growth has led to the destruction of our natural world and collapse of critical ecosystems around the world as discussed in chapter 1.1.

Growing economic instability bought forth by deregulation, digitization, financialization, globalization as part of the neoliberal agenda has led to crises again and again resulting in a damaged reputation of democracy and increasing polarisation(Diamond, 2020). Over three quarters of the Dutch population believe that polarization on social issues like climate change and refugees is increasing as "everyone has started to think only of themselves".

1.3.1 On Values of a City

If we denounce neo-liberal ideology and the capitalist order of today's cities as value generating machines, what would the new order be?

We've been conditioned to act in our self interests and when everyone acts in their self interests, Adam smith's individual hand would magically take us to a better place. Not all of us have equal opportunities to act on our self-interests, and even if we do, we live in a finite planet with finite resources, and acting on self-interests alone create negative externalities that others are left to deal with.

Hayek's idea of the price system expanded to include every aspect of life as determined by the market has reduced our individual capacity to reason. Our actions and beliefs are not evaluated through reason anymore.

Without deliberation on the morality of actions, the market decides for us. We see this extended in our online social worlds as well. Driven by algorithms of personal preference we create social bubbles that echo our own thoughts. Authority and expertise of institutions are replaced by the derivative logic of big data aggregated at scale and composite metrics.

Metcalf (2017) reminds us of a humanist tradition, which was dominant for centuries, had always distinguished between our tastes and preferences – the desires that find expression in the market – and our capacity for reflection on those preferences, which allows us to form and express values.

We need to be critical about the way in which we build our cities. Building our cities around the seemingly objective truth as affirmed by the market. With increasing polarisation, fall in the trust on democratically elected governments, rise of strongmen around the world, it is important we protect the fabric of society before it is completely lost forever.

We need to build cities that are sustainable from a social, economic and environmental sense. We need to build cities that are livable for a diverse population. We need to build cities where we can speak and we can be heard for our reasons and values and not just our purchasing power. We need to build cities that reflect humane values of justice.



Fig 1.3: Vankrijk at Spuistraat.

Source: Google street view.

2

Problem Field

The problem field for this thesis focuses on two major crises of our times in the Netherlands – housing crisis, and the climate crisis. While one is very local, the other is a global problem as well.

In this chapter, I'll breifly introduce the crises and explain current momentum towards engaging with these. The initial concern that is introduced is that of 'spatial and social justice' of the proposed solutions and the processes leading to it.

2.1 Urbanisation in the Netherlands
2.2 Housing Crisis
2.3 Climate Crisis
2.4 Amsterdam Just - City | Context Essay

2.1 Urbanisation in the Netherlands

Observed trends

In the Netherlands, by 2019, 91.88 percent of the population lived in cities and most people work in cities as well. Almost half the country's population lives in the Randstad metropolitan region in the west of the country, which also lies predominantly below sea level, kept dry by a robust network of dikes, canals and pumping stations..

Thus, **climate adaptation** during an age of climate change and rising sea levels becomes an urgency. Governments at various scales from the national to the municipal level, are working on managing a transition that helps towards **decarbonising the economy and energy production**, and this has a huge impact on cities, which are the power houses of economic activity. **Climate adaptation and mitigation requires space**, which is difficult to find in the Netherlands. It is already one of the **most densely populated countries** in the world with a population density of around 460 people per km2.

There are no Dutch cities with a million plus population. They are connected to each other in a **polycentric structure** held together by an efficient public transportation and extensive motorway network. However an **increasing metropolisation** could be seen in larger cities such as Amsterdam, where neighboring municipalities behave as suburbs of the city, falling under the daily urban system of the larger central city. This is due to the agglomeration effects and the economic pull of a larger city. This demands a focus on planning and designing at the metropolitan scale.

Dutch cities, especially Amsterdam, is experiencing what is colloquially called the third golden age, with a tremendous **increase in job growth**, especially in the service sector (atleast until the COVID-19 pandemic hit). This is causing an influx of expats and high skilled labour to the city. Housing construction, which came to a halt during the financial crisis, has risen up again, however the demand far outweighs the supply leading to a **drop in the affordability** of housing. The changing social composition of the cities is also creating a sense of unease amongst vulnerable groups as they question their **right to the city.**

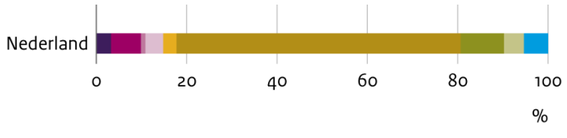




Fig 2.1: Built area in the Netherlands (right).

Fig 2.2: Land use distribution in the Netherlands (bottom).

Source: pbl.nl



2.2 Housing Crisis

building the next million houses

There is a growing housing shortage in the Netherlands. In most of the major cities, finding a house to live (buy/rent) has become an expensive and difficult affair. A mix of envionmental regulations (leading to reduced supply), neo-liberal policies (affecting the kind of housing being produced), and population growth (migration, natural growth and increasing life expectancy leading to increasing demand) has left the country with way less housing than is needed.

Minister for Home Affairs Kasja Ollongren said that 845,000 homes need to be built by 2030, when she presented the 2020 report on the state of the housing market to the national parliament in June 2020.

This pressure is increasingly felt in the national capital of Amsterdam, which is experiencing what is colloquially known as the third golden age (Disclaimer: I personally reject the idea of framing economic prosperity through extractive colonisation in the past as Golden age, but that is beyond the scope of this discussion) just before the pandemic hit the city. The city has been growing at an average pace of 11,000 people every year, an unprecedented growth in the past few decades. However, housing hasn't expanded to accomodate the growing population. The construction freeze post the credit crisis of 2007-08 contributed to an increasing shortage.

Amsterdam attracted over 19 million tourists in 2019, who also compete for housing in the city through modern temporary rental systems such as AirBnB. All these have contributed to housing in Amsterdam being unaffordable for a large section of lower and middle income groups. The waiting period for social housing in Amsterdam is an astonishing 13 years and 10 months.

The Municipality of Amsterdam recognising this increasing demand had released the Course 2025 policy document (Gemeente Amsterdam, 2016) which identifies existing housing projects that could be sped up and potential housing projects that could be accelerated towards completion in the coming years to meet the demand.

The realisation of these projects would be a challenge of its own as the city hasn't seen the expansion of housing stock at this scale in a long time, without expanding the city.

The compact city aspiration as outlined in the Stuctural vision for Amsterdam 2040 and reiterated in the draft environmental vision 2050 would mean that a large portion of this densification is to be achieved through densification of existing neighborhoods through uraban renewal processes. The trends observed in urban renewal since the 1990s are a bit worrying from a just city perspective as it tends to change the proportion of housing stock to more owner occupied and expensive segments of the market reducing the accessibility and affordability of housing. We will expand on these concerns in the further chapters.

"The Netherlands currently has a shortage of 331 thousand homes, 4.2 percent of the hous

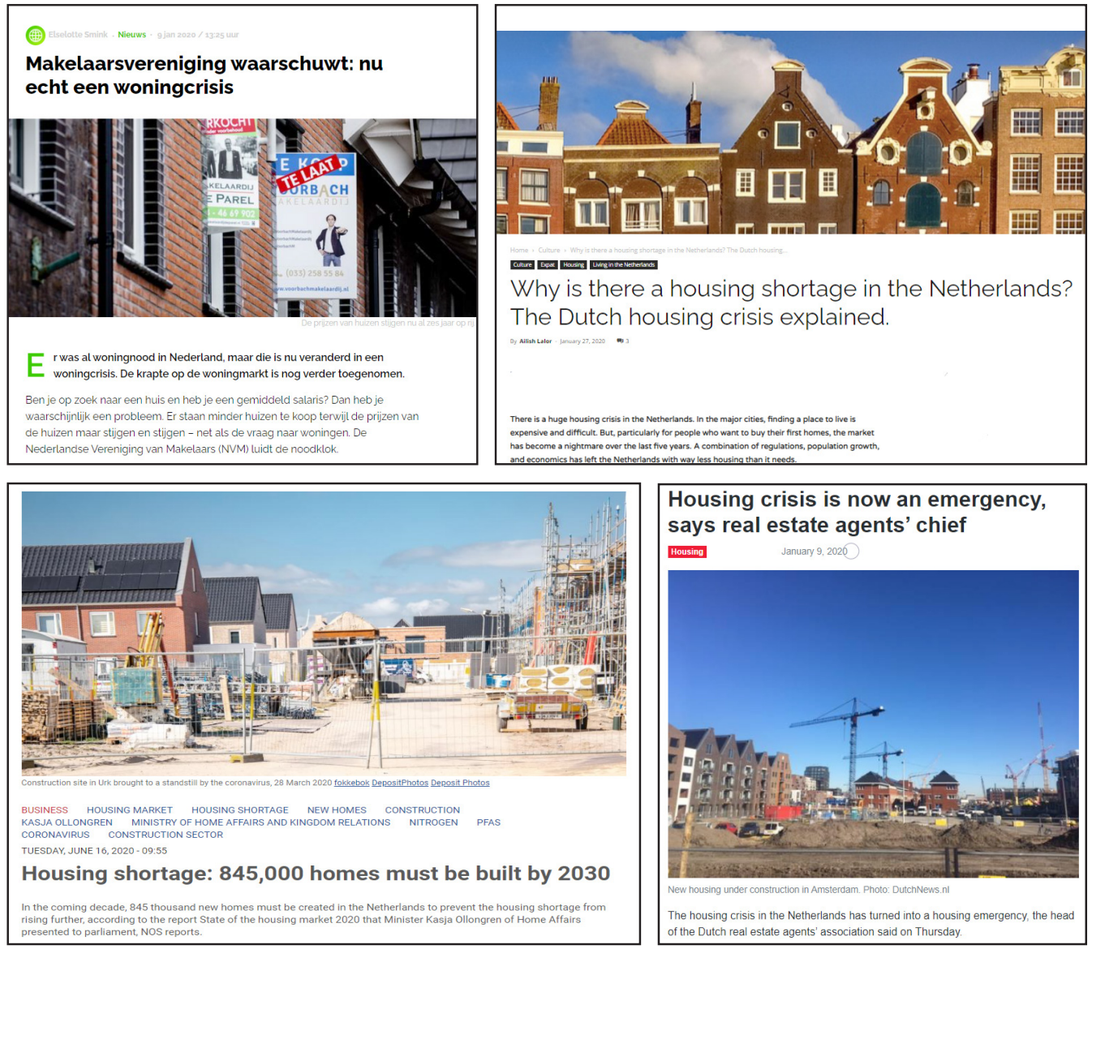


Fig 2.3: Collage of newspaper clippings.

Source: nltimes.nl, dutchnews.nl, dutchreview.com and metronieuws.nl in clockwise order.

2.2.1 Housing Production

in Amsterdam for the next decade

To tackle the housing demand in Amsterdam, the municipality released the *Course 2025 document* (Gemeente Amsterdam, 2016), to streamline the construction of atleast 5.000 -7.500 homes every year.

Data retrieved from the housing monitor in December 2020 shows that scheduled homes for construction rises significantly after 2020. Amsterdam currently has a 40:40:20 regulation for social housing, middle income and expensive housing within any development. This doesn't reflect ground reality, where the highest demand is for the middle income segment. Sako Musterd argues that the city is gentrifying rapidly and is becoming a place for the rich (Couzy, 2019).

As it stands, the demand for housing grossly outweighs the supply, driving up prices of existing housing in Amsterdam. If newer constructions also focus on expensive segments of the market, Amsterdam would soon become unaffordable for the majority.

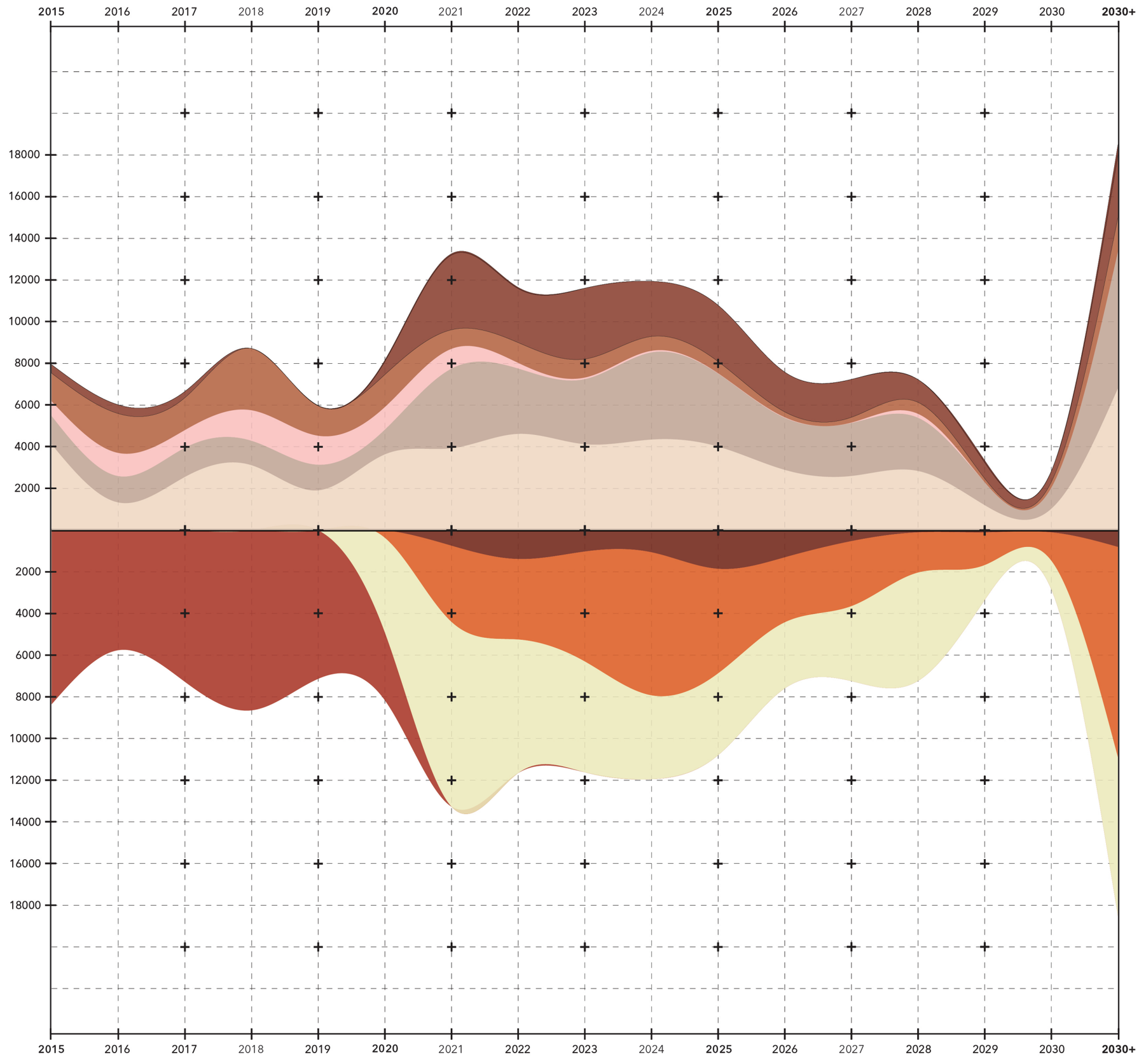


Fig 2.4: Projected housing construction till 2030

Source: Author
Data Source: Monitor Housing plans (1-7-2020) retrieved from https://maps.amsterdam.nl/woningbouw-plannen_monitor/

2.3 Climate Crisis

Socio-technical transitions towards adaptation and mitigation

The urgency of a changing climate and the need to mitigate the causes and adapt to its effects has made it to the policy tables around Europe. The Netherlands aims to reduce its greenhouse gas emissions by 49% by 2030 compared to 1990 levels and a 95% reduction by 2050. The European Union wants to the continent to be the first carbon neutral continent by 2050. These are lofty goals that need to be operationalised in the way in which our cities function.

Amsterdam as a city has ambitious goals for itself. The city aims to be emissions free by 2030 with only emission-free transport on road and water by 2050. The city wants to halve the use of new raw materials by 2030 and achieve a fully circular city by 2050 and has launched an ambitious Amsterdam circular strategy for 2020-25. The document proclaims ambitiously that all 50% of all renovations and building maintenance activities in Amsterdam will be done in a circular fashion from 2025.

However, the construction of the next 50,000 homes in the city as outlined in the Course 2025 document presents an interesting challenge. This could be an opportunity to operationalise the aspirations as outlined in the various policy documents in a world that is changing right under us.

The document mentions that the social costs of these transitions are not very clear, but claims that it would be understood through cost-benefit analyses within existing financial frameworks instead of rethinking how the social costs would be evaluated. This value extraction perspective of looking at our cities is one of the drivers behind housing speculation and gentrification and could result in unjust negative externalities as a result of this.

The Netherlands has been uncharacteristicly slow for a country below sea level in evolving towards a changing world as it is deeply embedded in lock-ins and path dependencies created by a socio-technical regimes established by a fossil fuel based extractive global economy.

This presents a difficult challenge of dealing with the densification of the built environment to tackle the housing crisis in the backdrop of a looming climate crisis. Thus densification needs to be paired with climate adaptation and emission mitigation efforts to make the city future proof in a shorter span of time. If we resort to existing market driven practices of organising the built environment in this process, we might be left with an unjust city. A city can potentially be environmentally sustainable and be socially unjust.

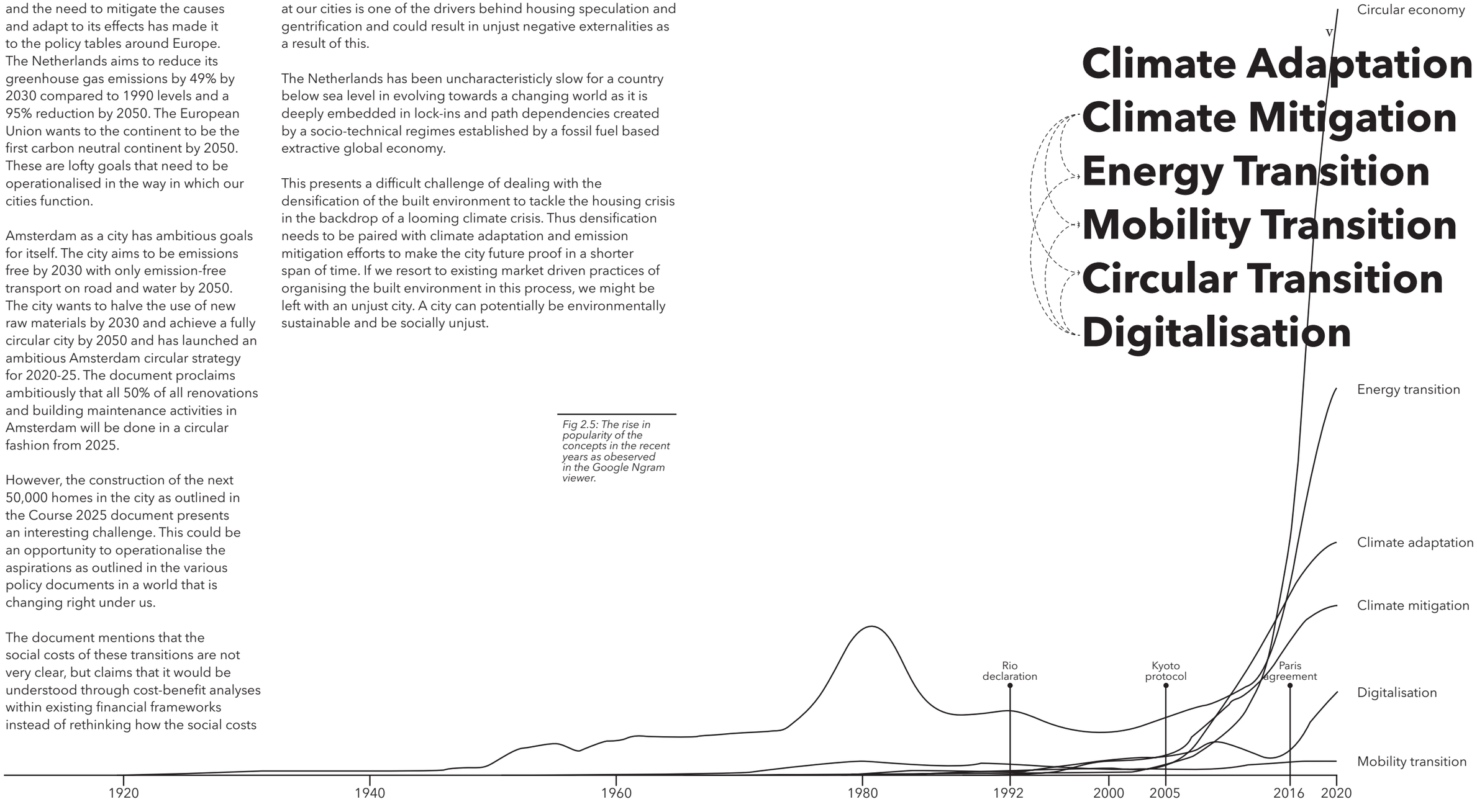


Fig 2.5: The rise in popularity of the concepts in the recent years as obeserved in the Google Ngram viewer.

2.3.1 Ambitions across scale

projection for the next decade

CO_2 emissions, Renewable energy and Circular economy are some of the key domains of policy and strategy forming at various governmental scales towards creating a world in accordance with the Paris climate accords and prevent the world from warming beyond the tipping point.

The European union has set up some of the most ambitious goals of anywhere in the world, especially as it pertains to a large portion of the world's most powerful economies, thus setting a good precedence for others countries to follow.

The Netherlands is particularly vulnerable to climate change owing to a large portion of the country below sea level, held dry by an intricate network of infrastructures which are increasingly under stress. The country is lagging behind in comparison to its European counterparts in terms of existing progress in renewable energy generation and CO_2 emissions reduction. However, the country has also set ambitious targets in alignment with the EU level goals.

The city of Amsterdam is one of the most proactive within the Netherlands in working towards climate change and mitigation, and has set goals and developed policies which are beyond what is being done at the municipal scale in other cities of the Netherlands or even gloabally.

This presents an incredible opportunity for Amsterdam to create a positive precedence of working models that could be replicated in other similar contexts around the world.

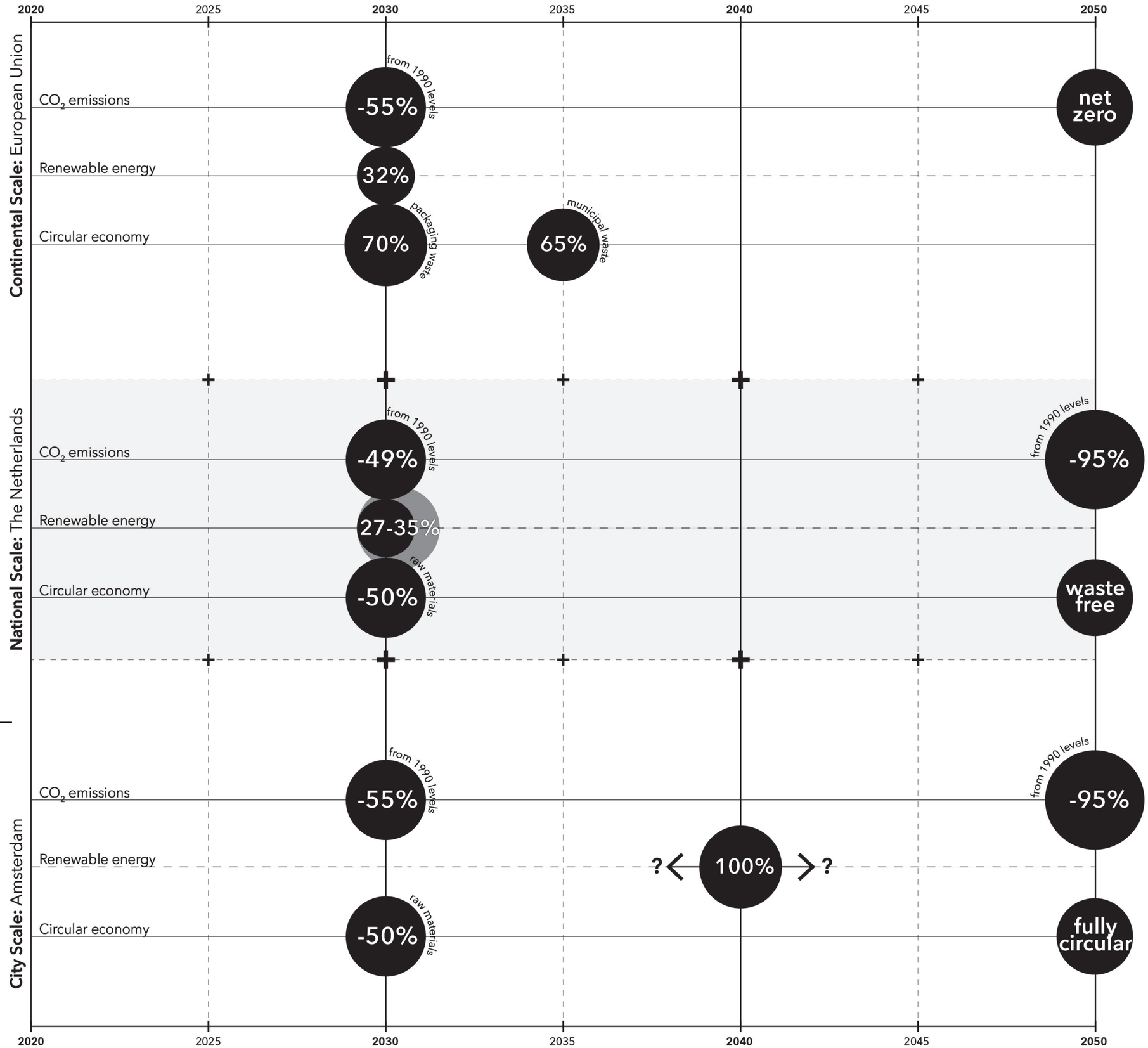


Fig 2.6: The sustainability ambitions of the European Union, the Netherlands and Amsterdam mapped for the next three decades.

2.3.1 Amsterdam's Ambitions

projection for the next decade

To expand on the ambitions of Amsterdam, the city in accordance with the Paris climate accords has set a lot of ambitious goals. The city has aims to decrease the its CO_2 emissions by 55% in 2030 and by 95% in 2050, compared to 1990, which is used as a reference year. This has multiple components such as carbon capture, reducing natural gas usage for heating requirements and also reducing vehicular emissions by limiting the sale and use of automobiles that use fossil fuels.

The city also has set strong goals in terms of renewable energy generation. Amsterdam wants to move over to 100% sustainably generated energy and by 2040, Amsterdam wants to elimate the use of natural gas for heating throught the city. The municipal organisation aims to be climate neutral by as early as 2030 to set good precedence for other institutions operating within the city.

The Amsterdam circular strategy aims to significantly reduce the use of new raw materials as well, thus contributing to a sustainable city that is not resource intensive. In the coming years, the City aims to map out various material flows, from entry to processing, in order to preserve valuable raw materials. The aim is to halve the use of new raw materials by 2030 and to achieve a fully circular city by 2050.

All these present very interesting opportunities for neighborhood scale transformation in terms of not only infrastructural upgradation but also ownership and management regimes of the said infrastructures if we approach it from a distributional justice perspective.

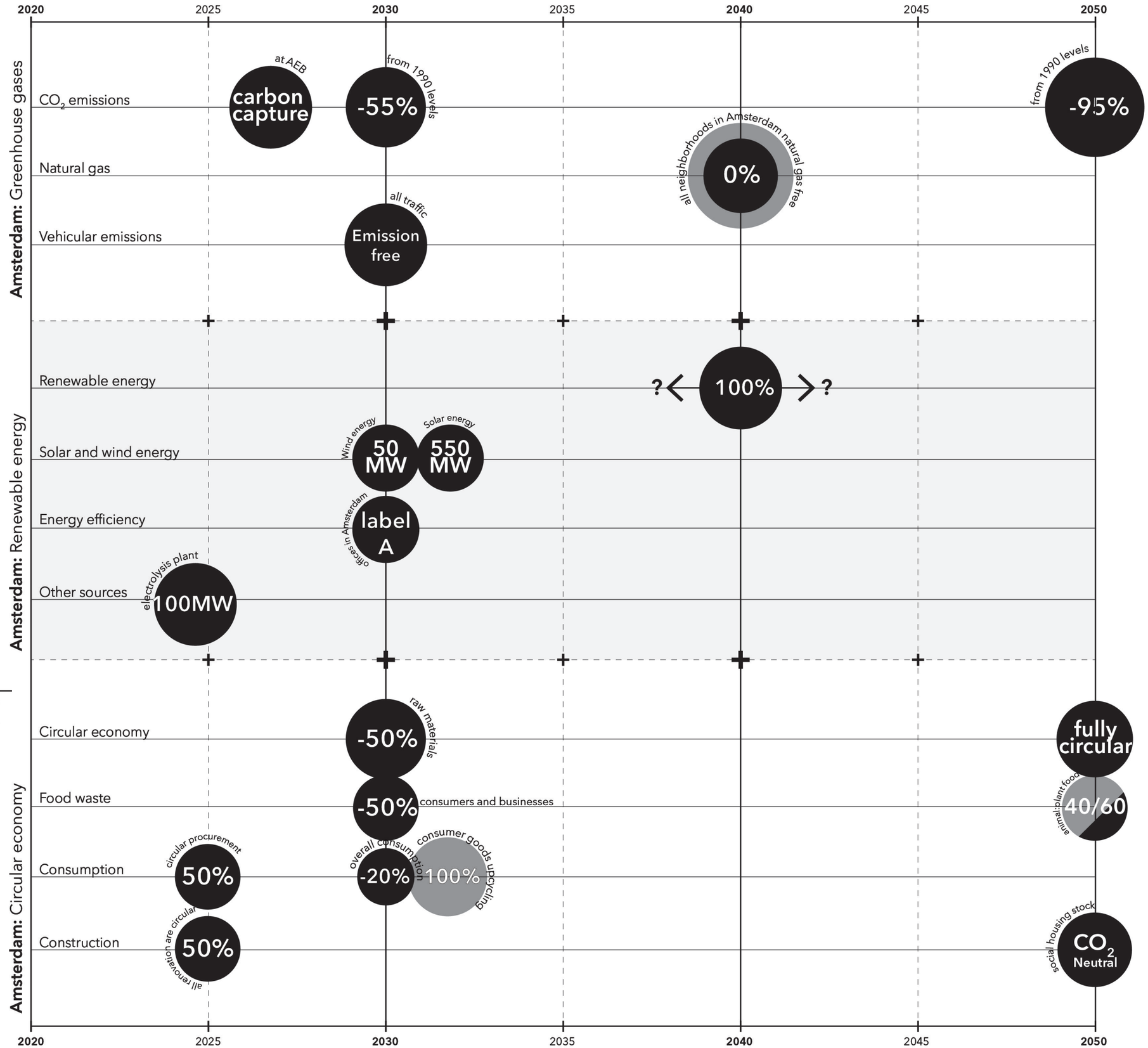


Fig 2.7: Amsterdam's sustainability ambitions mapped for the next three decades.

2.4 Amsterdam: Just City

a city of all, by all, and for all

I raised speculative concerns about existing trends in Amsterdam and how it could potentially make the city unjust. I think it is important to visit some long-term processes in the city to explain my position.

Ed Soja wrote of Amsterdam as a city that fosters a culture of tolerance and civic engagement (Soja, 1992). Fainstein (2014) in her book titled 'just city' praised Amsterdam as a city that approached her ideal of a just city.

Fainstein defined her idea of a just city as as a result of equitable and democratic practices and recognition of diversity. The presence of a large amount of social housing stock that was affordable and accessible, contributed to this immensely.

The city has some of the most tolerant, happy, and healthy citizens compared to other major cities in the world. A comprehensive welfare state, coupled with progressive policies and a tolerant population contributed to this.

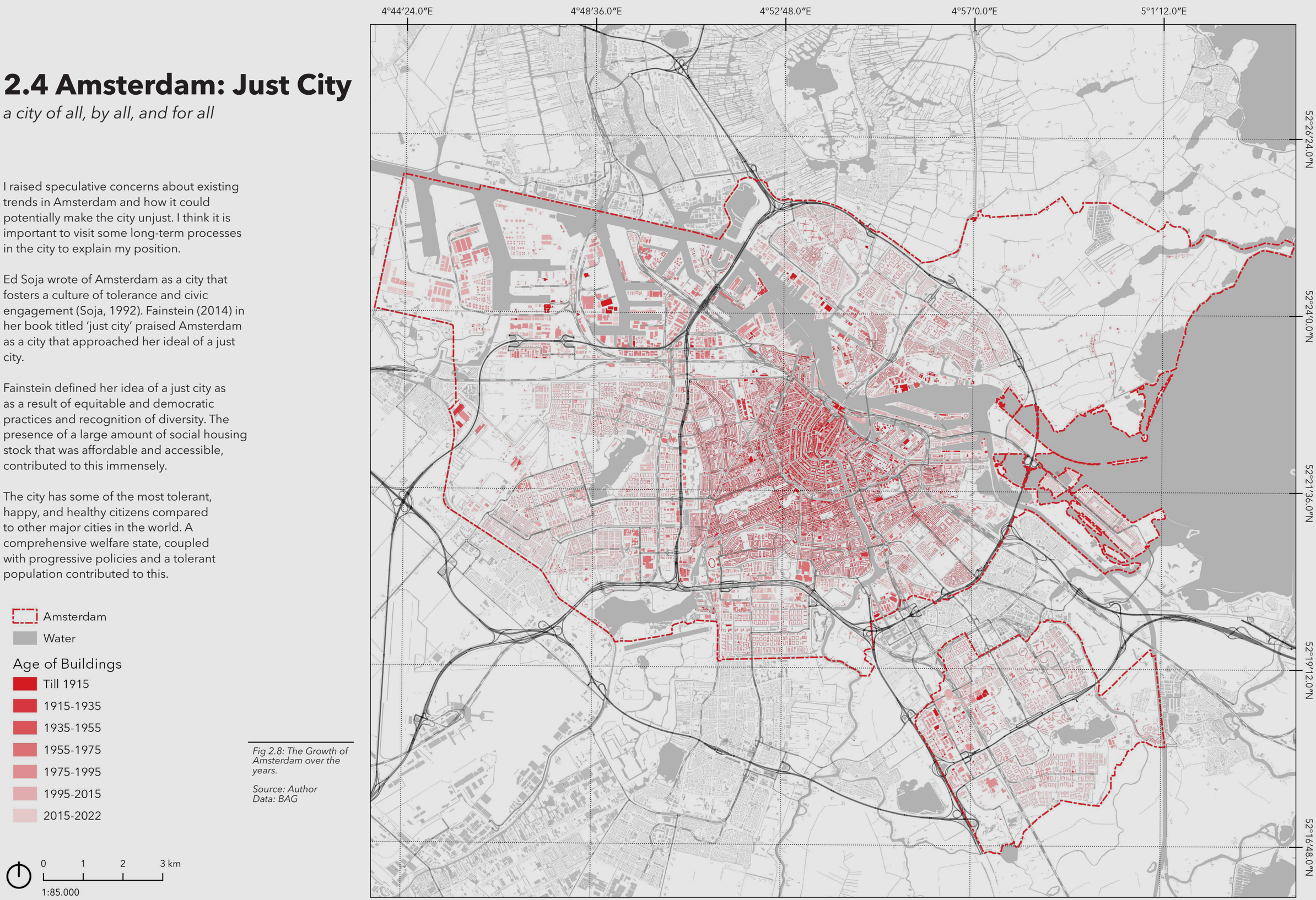


Fig 2.8: The Growth of Amsterdam over the years.

Source: Author
Data: BAG

2.4.1 Just City!

decommodification of the housing stock

Urban social movements in Amsterdam led to the city's rise as a just city, however various scholars have observed that policy changes at the national and municipal level could be undoing a lot of progress made in the past.

It is important to take a critical look at how Amsterdam came to be called as the just city. A large part of this historical review is based on the works of Justus Uitermark.

Around 1960s, investments towards the improvement of inner cities came to a grinding halt. The chaos and mess of the city was to be fundamentally restructured to reflect the values of the time as defined by modernist urban planning.

Criticisim of this view of governments and urban planners, and a democratized imagination of an alternate reality led to resistance among residents of cities throughout Western Europe (Castells, 1983).

In Amsterdam, the flourishing squatters movement contributed to the radicalization of resident protests. Large numbers of squatters moved into vacant housing to prevent demolition. The resident movement propagated an alternative view of the city advocating for new construction, updating the existing stock, and the democratization of planning (Uitermark, 2009).

Jan Schaeffer personified the new urban vision. As the Junior Minister of Public Housing in the national government he helped create the institutional preconditions for a further deepening and broadening of the residents' movement. He helped to popularize and institutionalize the slogan "building for the neighborhood" and the concept of the "compact city" as against the restructuring of cities from the ground up through demolition and reconstruction (Uitermark, 2009).

As a result of the resident's movements, three general trends towards the decommodification of the housing stock was seen.

1. Standardisation of rent: The ability of owners to determining rent levels arbitrarily and speculatively was replaced with a comprehensive points based system aiming towards a fair rent (puntensysteem). (Huisman and Kelk, 2008).

As these regulations applied to all types of rental housing (Amsterdam has had low percentages of owner occupied housing, 13% in 1997, but 30% by 2019), the Amsterdam housing stock had in effect become decommodified (Huisman, 2009, p. 9). Thus residentship rather than ownership defined access to scarce resources.

2. Standardisation and centralisation of distribution: The ability of owners to determine the use of their properties were replaced by centralization and standardization of allocation.

Standardization was achieved through the formulation of an universal criteria of eligibility. Waiting time and seniority was by far the most important criterion, but urgent needs also played a role.

Centralization was achieved through a city-level distribution system in which landlords registered their property. The municipality and the landlord alternately allocated the available accommodation. The separate waiting lists of housing associations were also eventually merged.

3. Universal accessibility: Housing supply was gradually universalized. In the beginning, only married couples qualified for housing through the municipality. The changing societal setup in the 1960s meant that single-person households and unmarried couples were also bought under the fold. By 1980s, the age limit was bought down to 18 from 26.

The housing associations opened up to general public and not just specific groups like members of professional associations. We tend to forget in the contemporary discourse that the housing associations were never catering only to the needs of the poorest segments of the population but made conscious efforts in the 80s to provide affordable housing to all income groups. Household composition rather than household income determined what was appropriate and affordable (Uitermark, 2009).

A strong state post depillarisation of the Dutch society was critical to this transformation, however this was done in tandem with the residents. A strong institutional setup was formed in the 1970s and 1980s to ensure residents' right to the city. (Uitermark, 2009). Social workers allied with residents in their struggles against the state and could afford to take this position as they were not dependent on municipal governments or housing associations, but were funded by the central state.

The ability to translate abstract intuitions and aspirations into formal designs was crucial in shaping a just urban space that met the needs of diverse collective and individual residents as part of them. A large network of actors operating under state subsidies and voluntary support made this a reality. From community workers who provided logistical and professional support to residents, sympathizing professionals, architects, academics, and planners.

The birth of a just city

The 1975 Nieuwmarkt riots against the demolition of the neighborhood for a metro development, spearheaded by residents and squatters alike began the transition of Amsterdam to a just city.

By 1982, the city built more than 9,000 housing units to reduce the waiting time for a two-room apartment in the city to an all-time low of just two years (currently it stands at almost fourteen years). These revolutionary developments gave the city to its people and helped generate a vibrant creativity in spaces that had been freed from both the state and the market.

The housing market was under state control, and a grassroots movement brought the state under democratic control.

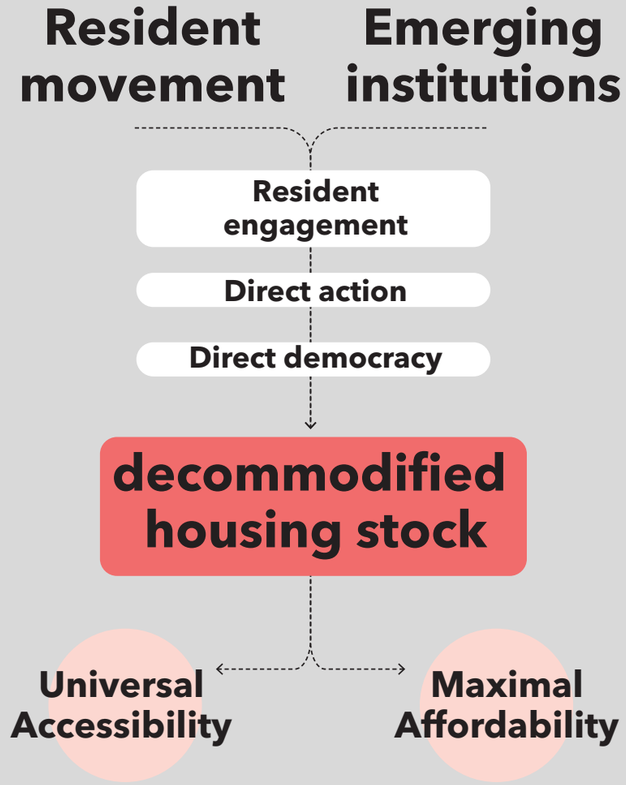


Fig 2.9: The process of decommodification of the housing stock in Amsterdam

2.4.2 Just City?

commodification of the housing stock

The emergence of a just city was the outcome of the interaction between a radical resident movement and a national housing policy that was designed to solve the housing shortage through massive investments in social housing.

In the early 90s national economic and housing policies were changing reflecting a global trend towards austerity in government spending. Affordable housing moved from being considered as an important investment in a Keynesian welfare state to more of a cost.

A transition towards a residual welfare state in which the government should only take responsibility for those who are not able to take care of themselves as opposed to an universal welfare state. Social housing was seen from this perspective and was turned into a residual social provision for people who could not afford to buy (Malpass, 1990; Priemus, 1995).

As neoliberal ideologies (as discussed in 1.3) pervaded the government, subsidies for social housing and housing construction were increasingly questioned. A shift was made towards tax incentives for owner-occupied homes and reducing public expenditures on social housing.

A shift was made in the framing of the subject of housing shortage from a quantitative perspective towards a qualitative perspective, claiming that there was enough housing for all, but the quality of existing stock was bad and needs to be upgraded This was to be promoted through the privatization of the housing market facilitated by selling of large portions of social housing, which would generate the required funds for maintaining the remaining stock.

This created segregation and segmentation of the housing stock along income lines, with each segment having their own segment of housing in the housing market. Social housing was considered to be housing for the lower classes sustained by rent subsidies. While the middle and higher classes should own their houses which also received government subsidies in the form of tax rebates on mortgage interests.

This wasn't an inadvertent mistake but a deliberate objective to extract more value from the city. Housing was to be considered in a different commodified plane from that of education or healthcare, where it would still be considered immoral to segregate people based on their purchasing power.

Today it is normative to consider that middle and high income households should have the 'freedom' as defined in neoliberal policies to buy their way into conveniently seggregated attractive segments of the housing stock.

The national policies of the 1990s slowly dismantled the universal provisions that were achieved just a mere 10 years before that. The idea of a housing market under state control, and a state under democratic control was turned upside down. Housing associations which were integral towards improving the accessibility and affordability were formally privatized and transformed into housing corporations.

Now they had specific directives prescribed by the central government. The prominent of them being to sell houses. From housing associations being controlled by tenants, they escaped the control of both the state and tenants. Tenants were reduced to categories of consumers.

The most important of the consumer being the one in the middle class. Now, the middle class was expected to buy the newly privatized social housing and to invest the capital necessary to improve the quality of their properties.

Segregation and fragmentation extended beyond the housing stock to residents in the form of new tenure types, such as anti-squatters and temporary tenants, who are extremely unlikely to protest against property owners and also someone called a crooked inhabitant (scheefwoner).

Even in Amsterdam, the tide turned eventually with the large stock of social housing being considered an obstacle to an efficient housing market.

The main target group for current policies are the scheefwoner who are tenants with high incomes in a segment where they do not 'belong'. Through policies they are to be attracted to leave their smaller and affordable social housing to purchase or rent larger houses on the market.

The current policy position of Amsterdam is that there is a surplus of poor quality affordable housing in Amsterdam and that the housing market should become more "balanced" through a reduction of housing stock under housing corporations to a minimum of 35%. (Gemeente Amsterdam, 2008, p. 27). The municipality makes use of a constellation of tools to achieve this. Owners of houses in the rent regulated sector, including housing associations are encouraged to sell it.

A key strategy has been to utilise urban renewal policies to change tenure compositions in neighborhoods. Since the government considers social housing is for low income groups, in the guise of "social mixing" low-income households are to be replaced with high-income households. This is being pursued instead of constructing universally accessible housing for the cross-section of the society (Uitermark et al., 2007).

The idea of "building for the neighborhood" is being replaced by "building livable neighborhoods" through the alteration of social composition in neighborhoods (Aalbers, 2010).

Livability has been a central concept in Dutch urban policies since the late 1970s. The idea used by resident groups for subtle interventions has now been subverted to through the operationalization of the idea in the

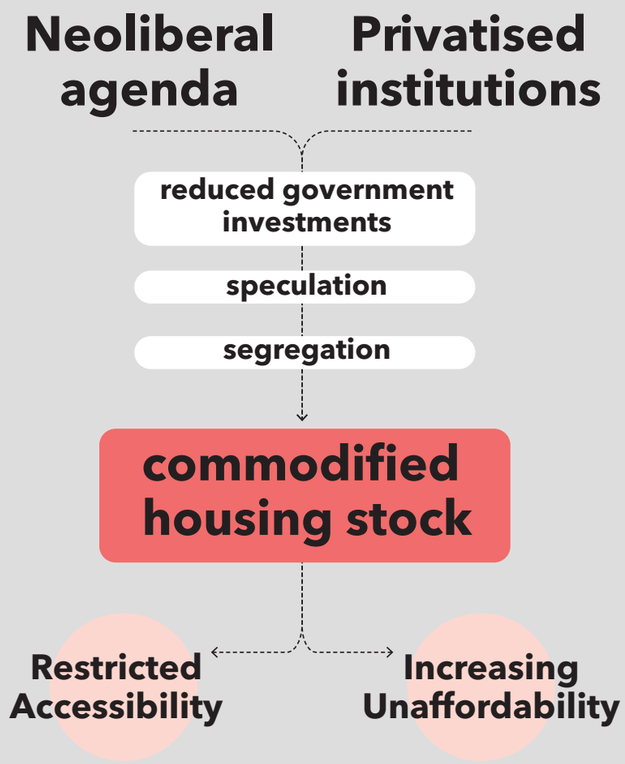


Fig 2.10: The process of commodification of the housing stock in Amsterdam

calculation of leefbarometer (Uitermark, 2009).

Though qualitative perceptions of residents are included in the calculation, the score is based on supposedly "objective" criteria. High share of ethnic minorities, low-income households, and affordable housing lead to a low livability score. It seems like the livability score is measuring the value extraction potential in a neighborhood rather than how pleasant and affordable it is for residents in neighborhoods. Through urban renewal of neighborhoods with low liveability scores, policies disperse migrants and low-income groups instead of empowering deprived communities to promote gentrification and displacement.

Urban renewal operations are used to transform the tenure composition of neighborhoods, but it is questionable whether they reduce overall levels of segregation (Bolt et al., 2008). Moreover, there is no evidence that the mixing of different tenure types and income groups produces a cohesive community (Uitermark et al., 2007).

The just urbanism processes that created the just city of Amsterdam through equal access to housing has moved away from that. Social-mixing was a by product of that approach. Segregated housing stock maneuvered through the purchasing power of individuals has become the dominant form of Urbanism we see today. We see citizen disengagement at the neighborhood and city levels as current urban renewal processes orient towards people from outside of the neighborhood rather than those already in it.

Urban renewal, which was instrumental towards improving the physical quality of a neighborhood and a sense of community among the residents, is now used to disperse tenants across the city and transform the neighborhood from above. We are left with an increasingly commodifying housing stock that is not affordable and thus not universally accessible.

With another housing shortage, the government relies on the market and private players to play an important role in dealing with the shortage. This is not a call to return to a centralised model of housing provision as seen in the post world war II era. This is a call to balance the forces at play at the metropolitan scale, by improve the agency of neighborhood scale players including residents and tenants who are not property owners to have a say in how their neighborhoods could change towards demands of the city including densifaction and climate adaptation.



Fig 2.11: New market riots, Amsterdam, 1975

Source: Photographer Vincent Mentzel

3

Problem Analysis

In the previous chapter, the problem field was introduced to establish current urgencies in urban development in the Netherlands – housing and climate crisis and concerns about proposals and processes from a spatial and social justice perspective based on a historic reading.

In this chapter, we'll expand on these urgencies and underlying processes to understand the problem field better.

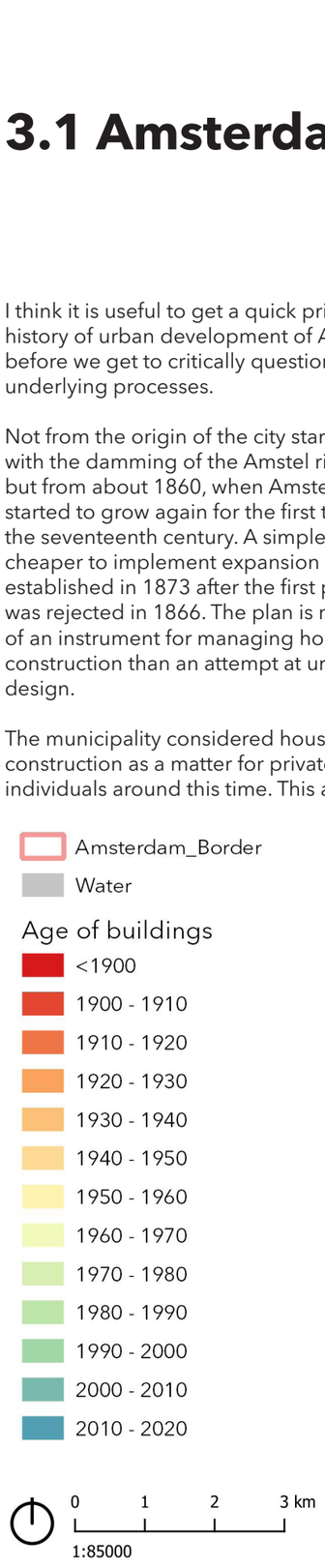
3.1 Amsterdam: History
3.2 Segregation
3.3 Densification and Transformation
3.4 Sustainable Transition
3.5 Site Focus
3.6 Problem Statement

3.1 Amsterdam: History

I think it is useful to get a quick primer of the history of urban development of Amsterdam before we get to critically questioning the underlying processes.

Not from the origin of the city starting with the damming of the Amstel river, but from about 1860, when Amsterdam started to grow again for the first time since the seventeenth century. A simpler and cheaper to implement expansion plan was established in 1873 after the first proposal was rejected in 1866. The plan is more of an instrument for managing housing construction than an attempt at urban design.

The municipality considered housing construction as a matter for private individuals around this time. This also



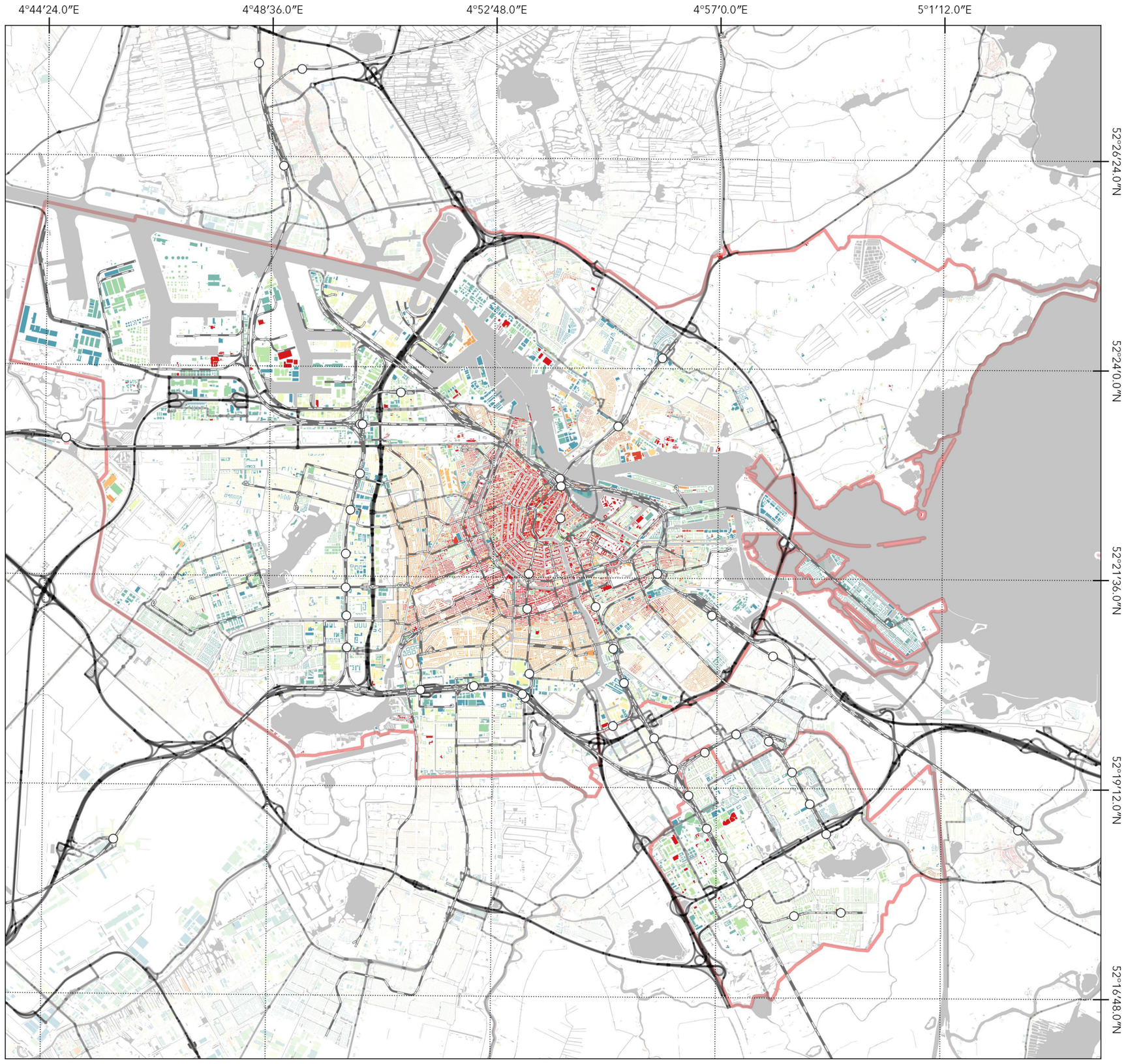


Fig 3.1: The Growth of Amsterdam over the years.

Source: Author
Data: BAG

applied to urban facilities. Rich citizens of the city take the initiative for the Concertgebouw and the Vondelpark introducing some of the most belowed urban amenities that continue to exist today.

Private builders were allowed to develop the homes in the new neighborhoods around the old city center. They were mostly inspired by the architecture of the old town, eventhough the quality varied. Facades in the concertgebouw area were richly decorated and interiors were beautiful with high ceilings and lots of wood carvings. In working-class neighborhoods like De Pijp, the houses were soberly designed and often small and noisy. The streets were long and straight. Because there were hardly any trees in the past, they looked monotonous.

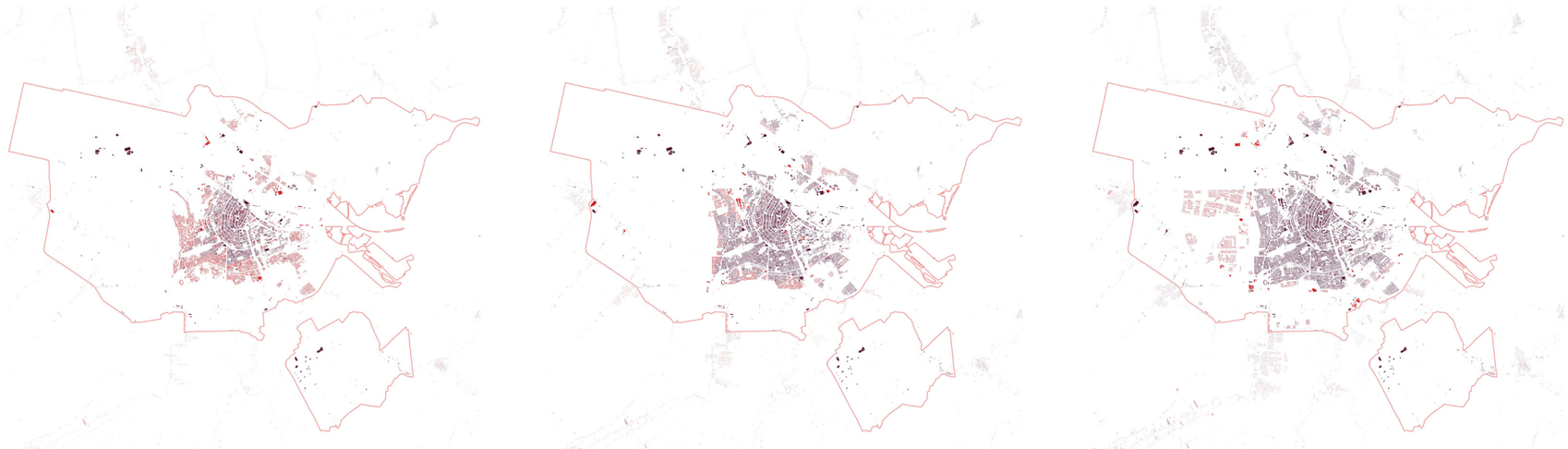
The 19th century sprawl was criticized during the times. Nevertheless, the old working-class neighborhoods around the city center were now a popular place to live. The architecture of the houses were appreciated. In addition, the neighborhoods were lively because, in addition to housing, there was also plenty of room for working, shopping and hanging out.

Around 1900 there was much dissatisfaction with the new city districts. A lot of attention was paid to the influence of polluting industries in the city and the poor living conditions in many old neighborhoods. Amsterdam therefore wanted a real urban design as a basis for the further growth of the city. The well-known architect Berlage was commissioned to make a plan for the southern urban expansion. It was completed in 1914 and was established in 1917. Public housing then became an important political issue. Government money was also made available for housing associations to build decent housing for workers. Many of these housing associations built specifically for a particular profession or for people with the same religious denomination, as characterised by the pillarisation of the Dutch society of the times.

In Berlage's Plan Zuid, more expensive neighborhoods and working-class neighborhoods are connected by wide avenues. Leafy banks and squares and a slew of parks on the south side also made it a green plan. The municipality considered good architecture as an important asset and set up a Beauty Committee. Architects from the Amsterdam School had the say in that committee. They had developed their own style, with richly detailed brick facades. Most of the buildings built in Amsterdam between 1915 and 1940 were designed by them. Entire neighborhoods such as the Baarsjes, the Hoofddorppleinbuurt and Berlages Plan Zuid are showrooms of the brick expressionism of the Amsterdam School. Even Bridges and street furniture were designed in the same style. Amsterdam

Fig 3.2: The Growth of Amsterdam over the years.

Source: Author
Data: BAG



thus became an example of a city as a coherent work of art.

The municipality of Amsterdam introduced a ground lease in 1896. This means that the municipality is actively purchasing land around the existing city. During development, that land is not sold to builders, but rented out for a long time. The idea behind it was that the increase in land value over a longer period of time also benefits the city and not only the owner of the buildings. Ground lease also offers the opportunity to work with lower land prices and thus enable the construction of affordable homes.

Berlage's expansion plans for South and West were sub-plans. There wass no expansion plan for the entire city and no idea about how the development of the city was related to that of the region. The need for such a general expansion plan was increasingly felt and Amsterdam was given a special department, called the Department of Urban Development, to draw it up. The first General Extension Plan (AUP) for Amsterdam was completed in 1934.

The mastermind behind the plan, the architect Cornelis van Eesteren, made a radical break with the way in which the city was built at that time. According to him, Amsterdam should no longer grow outward like an expanding oil slick, but like a hand with fingers. The landscape penetrates deep into the city between those fingers. This way, all residents have quick access to greenery and open space. The neighborhoods are designed according to new ideas about the ideal city. Living, working and recreation are strictly separated and there was plenty of space for neighborhood greenery. Each residential area is built around amenities such as schools, community centers and shops.

Part of the AUP is also a major modernization of the existing city. The old neighborhoods in the city center and in the 19th century belt no longer met the needs of the time, according to the designers. Space must be created for work, for traffic and more green space. Business activity must move to the new port areas. The implementation of the AUP started cautiously in the Rivierenbuurt and Bos en Lommer, but was interrupted by the Second World War.

After the liberation, from 1951, the implementation of the 1934 General Expansion Plan continued. In the garden city of Slotermeer, housing associations were building sober and serial homes. A mix of porch flats and terraced houses was created. The new district was to be raised with sand from the Slotermeerpolder. The resulting pool formed the center of a large green lung in the middle of the western urban expansion.

After Slotermeer, the garden cities of Geuzenveld, Overtoomse Veld, Slotervaart and Osdorp quickly followed. Buitenveldert emerged as an extension of South. This district was intended as a place to live for the upper middle class. Good living was central to the new neighborhoods. Architects were experimenting with new floor plans. Efficiency was paramount. Minimum requirements had been set for almost everything, from the height and length of the countertop to the size of children's rooms and balconies.

In the old city center, the planning means of the reconstruction plan was used to renew neighborhoods. Initially, this was to mainly happen on the east side of the center. The Holocaust claimed the lives of tens of thousands of Jewish citizens and the deportation of residents of the Jewish quarter around Waterlooplein and the demolition of buildings for firewood in the hungry winter had left this part of the city abandoned and neglected. Restoration was not seriously considered. City planners saw opportunities for radical renewal. Weesperstraat and Valkenburgerstraat were to be widened into arterial roads. Space was being made for metropolitan facilities, including the university and municipal offices.

The renewal plans for the existing city became increasingly large-scale in the 1960s. Amsterdam was growing fast and there was a great need for space for offices and facilities. This space was thought to be found in the neglected working-class neighborhoods in and around the city center. There was desire to model the city center after the American example. This also included a modern transport system. Cars were given a free rein and in 1968 the city council adopted an ambitious metro plan as well.

The first metro line was the Oostlijn. This runs from Central Station via Nieuwmarkt, Waterlooplein and Amstel Station to a large urban expansion in the Bijlmermeer.

This new district was not part of the General Expansion Plan, but nevertheless forms an extreme elaboration of it in many respects. The Bijlmer is built up from a colossal, almost identical gallery flats with parking garages in a green, car-free park landscape. Traffic is handled over higher lanes. The metro provides a fast connection to employment opportunities in the center.

The 'better form of housing' attempted at the Bijlmermeer did not appear to be attractive to many Amsterdammers. The vacancy rate in the flats were high. In the years before Suriname became independent, many residents choose to move to the Netherlands. In 1975 no fewer than 40,000 Surinamese came this way. Many of them found shelter in the Bijlmermeer as they were denied residency in the city centre. It is the starting point of Southeast as a district with its own Caribbean-African culture. What followed was a struggle for years to make the Bijlmermeer a fully-fledged part of Amsterdam.

Both the Bijlmermeer and the metro were tipping points in post-war urban development. While the new flats in the Bijlmer were designed with the middle class as the intended occupants, it didn't materialise as such, the construction of the metro was met with resistance from the city residents because a lot had to be demolished in the city center. Young people who had come to live in the demolished neighborhoods had very different ideas about good living and the good city than the engineers of urban development. The question of how Amsterdam should develop was becoming the subject of fierce debate and struggle.

Between 1960 and 1985, Amsterdam lost more than 200,000 inhabitants. People and businesses were moving to the suburbs and other cities in the region. Industry was disappearing to countries with lower wages. The city remained empty and neglected. But amid neglect and exodus, a counterculture of critical youngsters flourished. Cultural stages and workshops opened in squats throughout the city. The city was also increasingly offering accommodation to newcomers from abroad, who gave new color and dynamism to city life.

From the late 1970s onwards, spatial policy focused on restoring the city. urban renewal was well underway in the 1980s. Existing homes in old neighborhoods were being renovated. Sometimes they were demolished and replaced by new buildings. At the same time, young people were illegally moving into vacant homes. Squatting was booming in Amsterdam. In some neighborhoods the squatters' movement was more or less in control. Government attempts to regain control lead to violent confrontation.

The East line of the metro was completed in 1980. But Amsterdam was fed up with big plans. Moreover, the limited growth of the city in those years gave no reason to implement the large-scale plans from the 1960s. Social rental housing was being built all over the city in relatively small complexes. This was called building for the neighborhood. Project groups of the municipality gave substance to this together with local residents.

From the late 1980s, with rising neoliberalism around the world, the national government was increasingly withdrawing from public housing. The idea that the market could play a much more central role was gaining popularity. Municipalities were looking to collaborate with market parties to develop parts of the city. The demand for owner-occupied homes boosted by interest subsides also offered opportunities for Amsterdam. At the same time, the economy was also picking up strongly, resulting in a new demand for offices. Space was no longer being sought for this in the city center. They are built in easily accessible places on the outskirts of the city. Schiphol Airport was becoming increasingly important as an economic center.

Amsterdam earned a lot of money from the construction of offices on leasehold land. This made it possible to invest in the quality of the city. Amsterdam was given the financial strength to transform the old port areas along the IJ into new residential areas and to renovate highly neglected public space.

The city started to grow again and considerable investments were being made in the accessibility of new work areas. With the Ring Line, Amsterdam got its second fully-fledged metro connection that connects office locations in Southeast, South and West.

1996 sees the birth of three major development projects. With the laying of the first pile for the new head office of ABN-AMRO, Zuidas became a reality and the city council has decided to construct the North / South line and the new IJburg district. On the IJ and on the Zuidas, the municipality works closely with market parties, including the independent housing associations. This marks the era of public-private partnership in Amsterdam.

Amsterdam was setting up an efficient project organization to enable collaboration with market parties. Municipal services were working together in a new way. A time of internationally leading projects was dawning. New homes and cultural institutions were being built along the IJ. The Zuidas was growing into an international business center. A cluster of leisure facilities was being created at the Amsterdam Arena in Southeast.

Existing neighborhoods were also changing. In neighborhoods in and around the city center, more and more young people and people working in the rapidly growing business services were settling. Amsterdam was developing into an internationally leading metropolis. The city had been divided into boroughs since 1992. They are closely involved in urban renewal in the post-war neighborhoods and are responsible for improvement of the quality of public space. The city was greening and was becoming increasingly car-free.

During the economic crisis, it became clear how attractive cities like Amsterdam are in today's knowledge economy. While housing construction almost came to a standstill and offices across the city were vacant, the number of residents continued to grow rapidly. Unemployment also remained relatively low. Market parties turned their backs on the city in the crisis years. But citizens still saw opportunities and the municipality was making room in various places in the city for experiments with (collective) self-construction.

From 2014 onwards, the economy improved rapidly. Tech companies found Amsterdam to be an interesting location. At the same time, tourism was also developing rapidly. The positive mood about the city's growth was turning into concern. Housing prices were starting to rise, while the hundreds of thousands of extra residents, workers and tourists were causing a lot of buzz.

Amsterdam got ready for another construction spree since 2016. But this time around projects were smaller and increasingly involved the transformation of industrial estates into mixed living and working. This means less land income for the municipality, while the costs for the energy transition, affordable housing, new infrastructure and city management are actually higher.

The need to get a grip on the development of the city is felt throughout the city. Spatial issues have quickly become central to the social debate. How to keep living in the city affordable? How to maintain sufficient space for arts and other cultural activities? How do we ensure that the car-free city remains accessible? How do we shape the energy transition and the circular economy? How does Amsterdam maintain its green quality while densifying? How do we deal with a changing climate? How does the city of the 21st century look like?

These are concerns of today's urban development. This brief overview of historic processes show the changing drivers and lead stakeholders over time and how it shaped the city as it stands today.

Let us take a closer look at some of these questions and how they could be spatially engaged.



Fig 3.3: Aerial image of Amsterdam

Source: Wikimedia commons

3.2 Densification and Transformation

In order to relieve the pressure on housing demand in Amsterdam, the city plans to add 5000 to 7,500 new homes are to be added every year atleast until 2025 (Gemeente Amsterdam, 2016).

This map shows the various projects under construction and slated for construction in various parts of the city as of January 1, 2020. As mentioned previously most new construction is of a much smaller scale, especially within the ring where it is predominantly infill construction, outside it larger projects are in the works in industrial and monofunctional office areas.

Amsterdam Zuidoost is expected to get a huge chunk of new housing with more than 30,000 new homes expected to be constructed in the coming years. New construction brings in a different mixture of people into these neighborhoods, potentially gentrifying them, as seen in the example of Noord in the past decade.



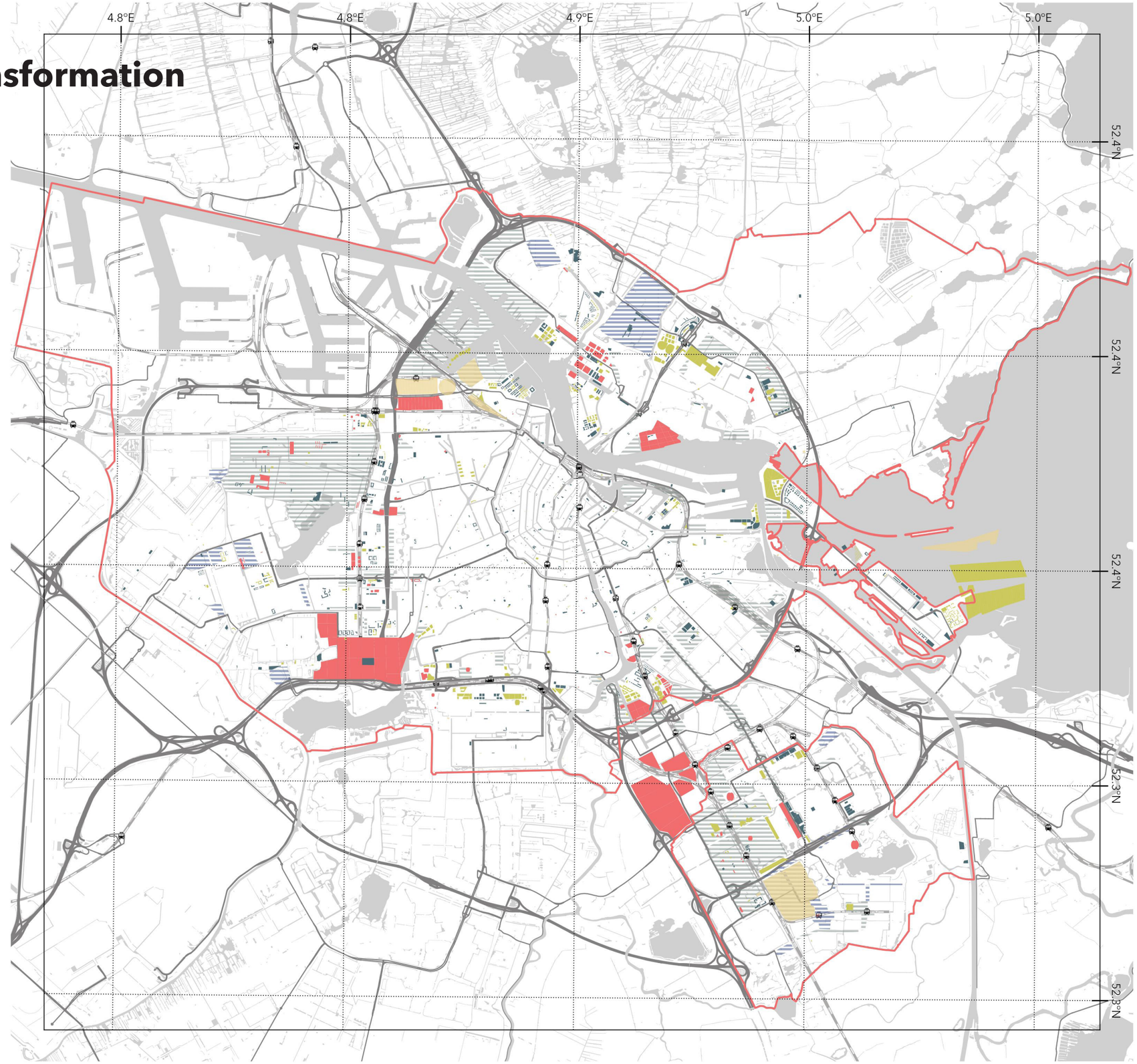


Fig 3.4: Map showing current and future housing proposals in the city of Amsterdam.

Source Data: City of Amsterdam

3.2.1 Status quo of housing stock

The concern for gentrification through new construction is not misplaced. It is based on existing trends that I'll expand in the following chapters.

As the city is facing a construction boom in the coming years, a majority of the housing stock is more than 50 years old and require upgradation to meet the changing energy regulations amongst other things as well. While for some housing it makes sense to upgrade them, other parcels might be demolished and redeveloped to reflect today's demands.

As discussed in chapter 2.4.2, we see an increasing transformation of housing from housing corporations to owner occupied housing and houses in the unregulated rental market. Fig 3.11 shows the changing proportion of house ownership in the city of Amsterdam.

While housing through housing corporations have the lowest vacancy rates and offers the most efficient means of housing distribution, they are not actively promoted.

Another observation is that the average size of single family housing has been consistently rising, while multi-family housing has been shrinking, reflecting the changing demands of residents who have increasing purchasing power thanks to low-interest mortgages on house purchases.

As mentioned before, the city aims to bring the total percentage of social housing to 35%, as it is currently viewed as a form of residual housing provision for the poor. However, this 35% is not evenly distributed as some neighborhoods in the city have the bulk of the social housing, concentrating poverty in those neighborhoods. This is mapped in the next chapter.

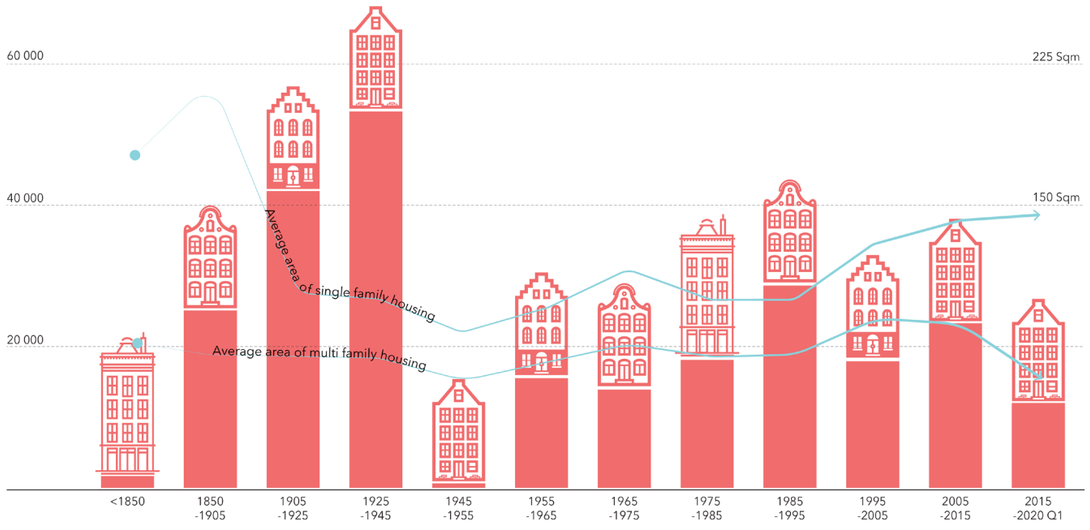


Fig 3.5: Number of buildings constructed during different time periods.

Source: CBS



Fig 3.6: The change in proportion of social housing and owner occupied housing from 2013 (above) to 2019 (below)

Source: CBS

3.2.2 Social Housing

Since the 1990s a large portion of affordable housing stock with the housing corporations have been sold of. What was once over 60% of the housing stock, stands at 40% by 2019, with the official policy goal of reducing it to 35%. The change between 2009 and 2019 is mapped to the right.

Observing recent trends, we can see that social housing within the ring is being sold off due to high demands. Still, large stocks of housing under housing corporations are available in the post war neighborhoods in Nieuw west, Zuid oost and Noord.

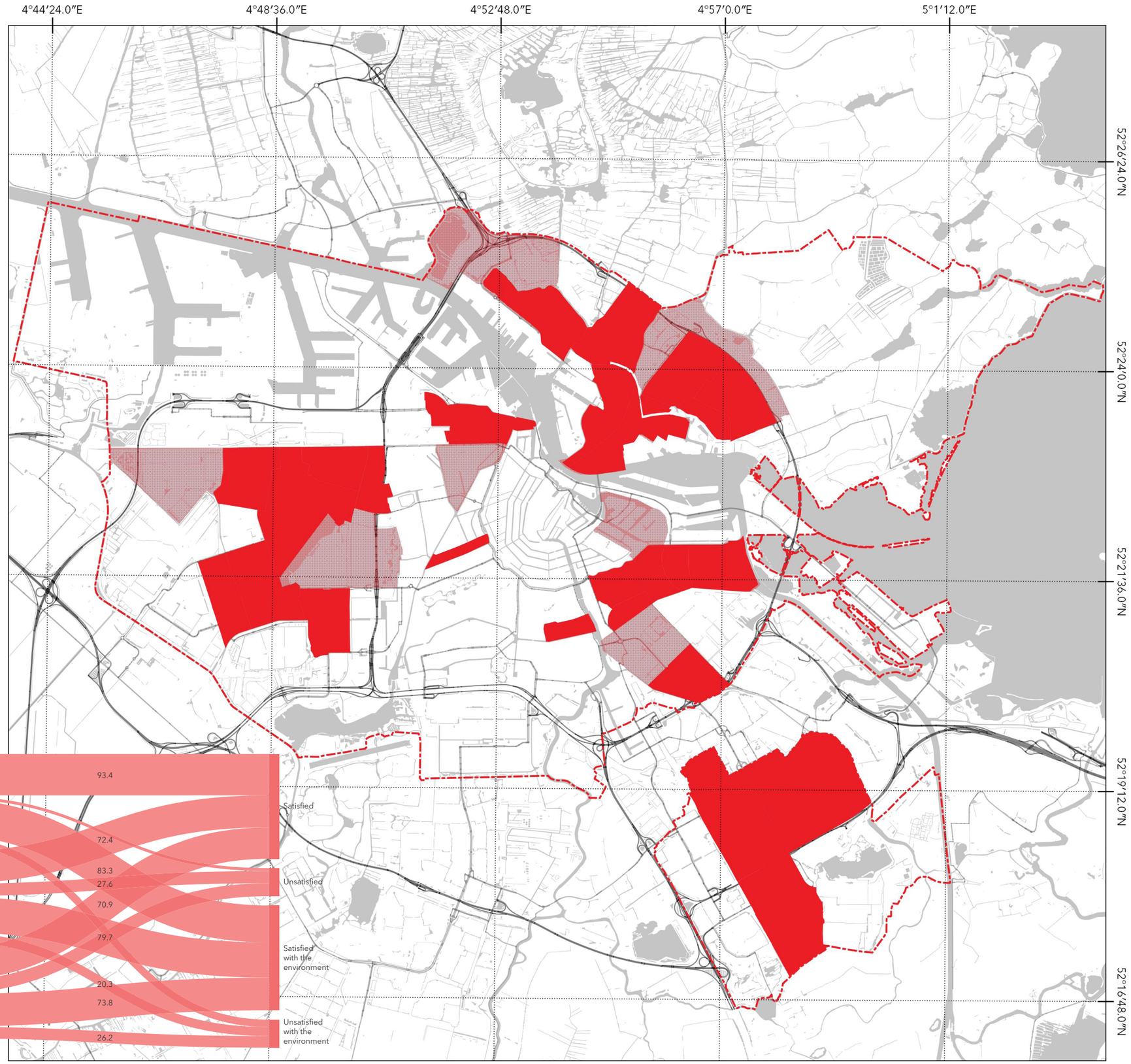
The major driving factor behind urban renewal projects in these neighborhoods with a high percentage of social housing is the liveability as perceived by inhabitants. The satisfaction of tenants with their home and living environment is less than that of people who own their houses.

Even within those who rent their houses, people renting from social landlords have lower satisfaction with their homes and living environment, below the national average. One possible reason could be the lack of agency for tenants to improve their homes and their living environment since the housing corporations are legally responsible for maintaining the quality of the living environment.

Fig 3.7: Map showing the neighborhoods of Amsterdam with more than 50% social housing.

Fig 3.8: Sankey showing the resident satisfaction per tenure type

Source: CBS



3.2.3 Renewal and Gentrification

The reduction of social housing in neighborhoods need to be read along with the value of housing in specific neighborhoods. CBS measures the average value of residential real estate objects based on the Valuation of Immovable Property Act (WOZ value). For the determination of the average value, only those described as real-property for main stay and houses with practice space with a value greater than zero Euro are included.
It closely tracks the market value of real estate in any neighborhood.

Each individual bubble on the graphic represents a neighborhood of amsterdam, with their size representing the percentage of non-western migrants. The X axis represents the WOZ value and the Y axis represents the % of housing under housing corporations.

We can observe that the phenomena of a lower percentage of housing run by housing corporation correlates with an increase in WOZ value and observing the changes since 2013 to 2019 shows that the trendlines seem to move in the direction for all neighborhoods with the exception of the ones in Zuid-oost.

This is not surprising as larger the portion of housing stock in the free market, more consumer activity on real estate, leading to speculation and price rise.

What is also interesting to observe is that a majority of non-western migrants still live in neighborhoods with large social housing estates as seen in the size of the individual bubbles.

A majority of neighborhoods in the centre and zuid have risen in value in the recent past and the main reason attributed to their sudden growth is the increasing interest for house owners to live in an urban setting, which is readily available in the inner ring neighborhoods of Amsterdam.

While there aren't any current proposal to redevelop large social housing estates, they are marked as strategic spaces for potential densification in the future.

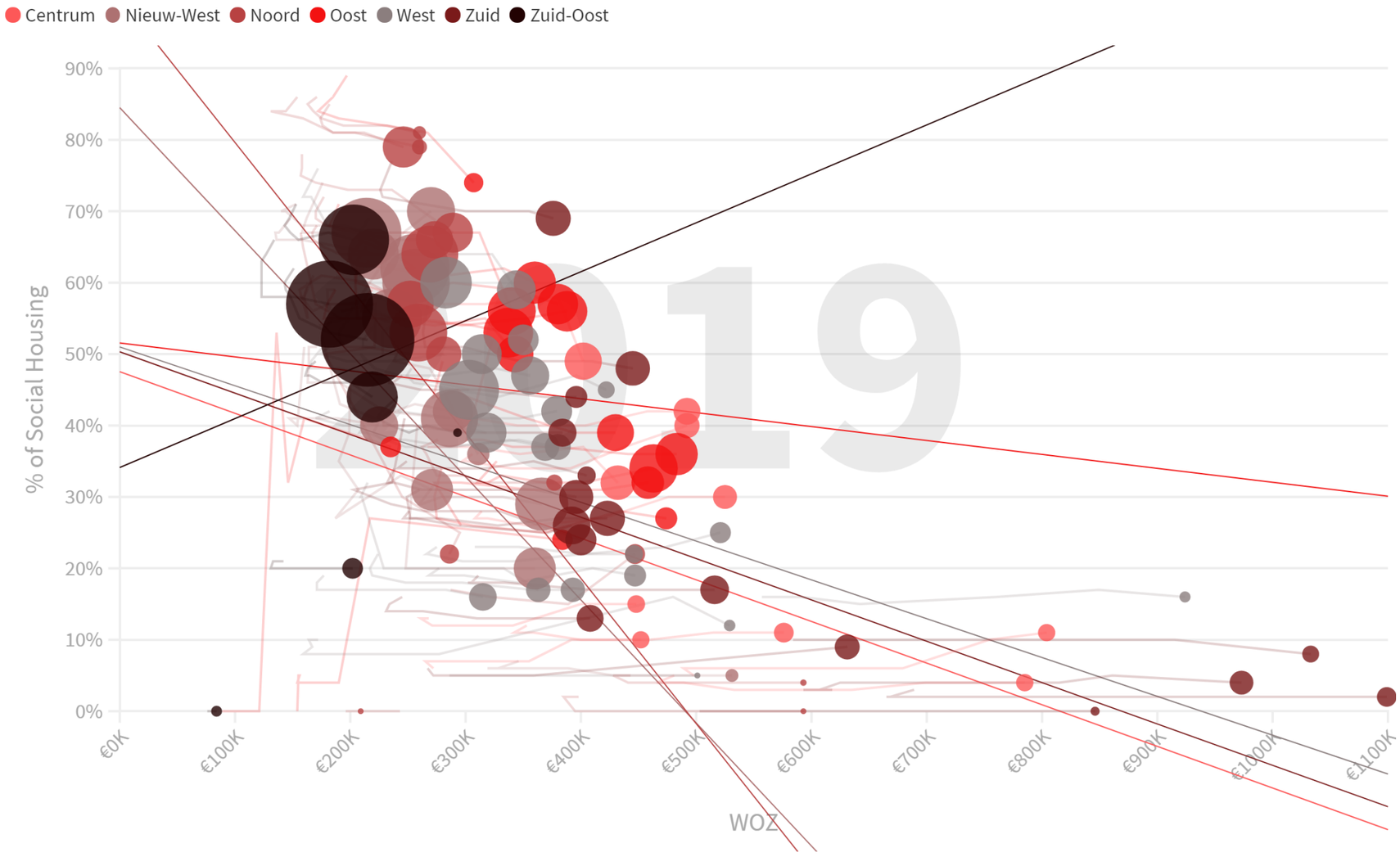


Fig 3.9: Rosling chart showing the relation between % of social housing in a neighborhood and WOZ values.

Data Source: CBS

3.2.4 Densification potential

Beyond the officially proposed plan for densification, infill development and urban regeneration proposals discussed at the beginning of chapter 3.2, there is more potential for densification outside the ring. This map shows the existing FSI in city blocks within 400 metres from a train and metro station.

As could be seen, most of the city blocks in the city centre have a density of FSI 2 and above, while outside the ring and beyond the Ij, there is still a lot more potential for densification, as the existing stock is less dense. From a sustainable densification perspective, there are many more city blocks that could be densified close to the metro stations. Zuidoost district stands out with two separate tracks connecting it to the city centre and a lot of low dense development within a walkable distance from the metro stations.

However, these neighborhoods also house some of the most vulnerable populations. We'll discuss their vulnerabilities in detail in chapter 3.4. While there is potential for densification, its benefits and burdens need to be distributed in a just way.

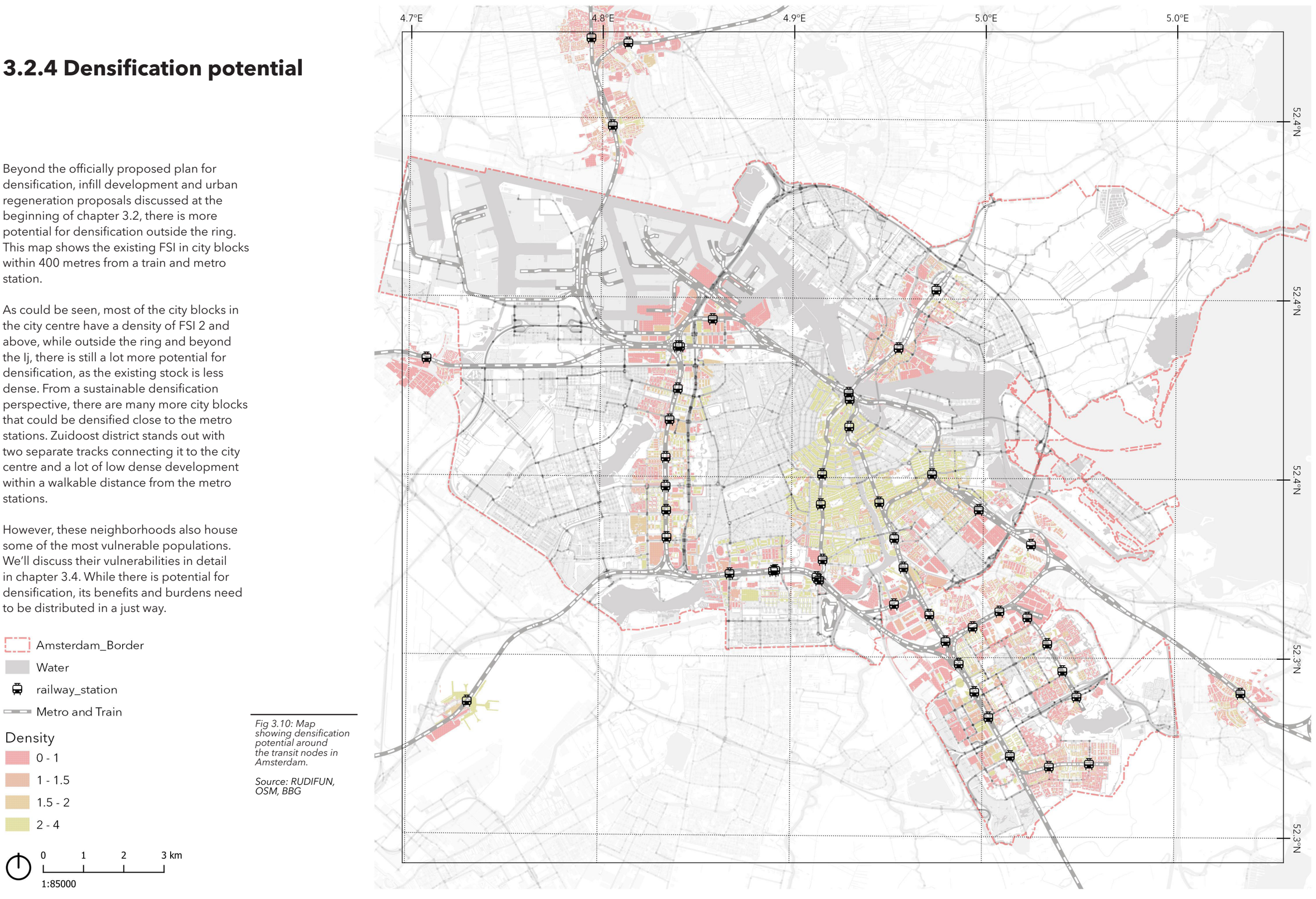


Fig 3.10: Map showing densification potential around the transit nodes in Amsterdam.

Source: RUDIFUN, OSM, BBG

3.3 Sustainable Transition

As mentioned before in Chapter 3.1, the need to get a grip on the development of the city is felt throughout the city. Spatial issues have quickly become central to the social debate. How do we ensure that the car-free city remains accessible? How do we shape the energy transition and the circular economy? How does Amsterdam maintain its green quality? How do we deal with a changing climate?

A well functioning blue and green network provides ecosystem services that are irreplaceable and extremely vital to the healthy functioning of other inter dependent human systems.

Amsterdam aims to be climate proof by 2050, and green and blue spaces have an important role to play in that ambition.

While green and blue networks add immense value in improving the environmental sustainability of a region, their spatial manifestation have the potential to fragment neighborhoods into isolated islands of their own, decreasing the spontaneous encounters that are possible only in urban areas. These green areas are currently under pressure as the city looks to densify without expanding its borders

The garden cities of the west and the Zuidoost city district stand out distinctively due to their strong blue-green networks.

In terms of land use, green spaces per neighborhood is higher in neighborhoods outside the ring and above the IJ since they were constructed during the era of garden cities and modernism when a lot more importance was given to open green spaces.

This provides a lot of opportunity in terms of infrastructural upgradation towards energy transition and climate adaptation.

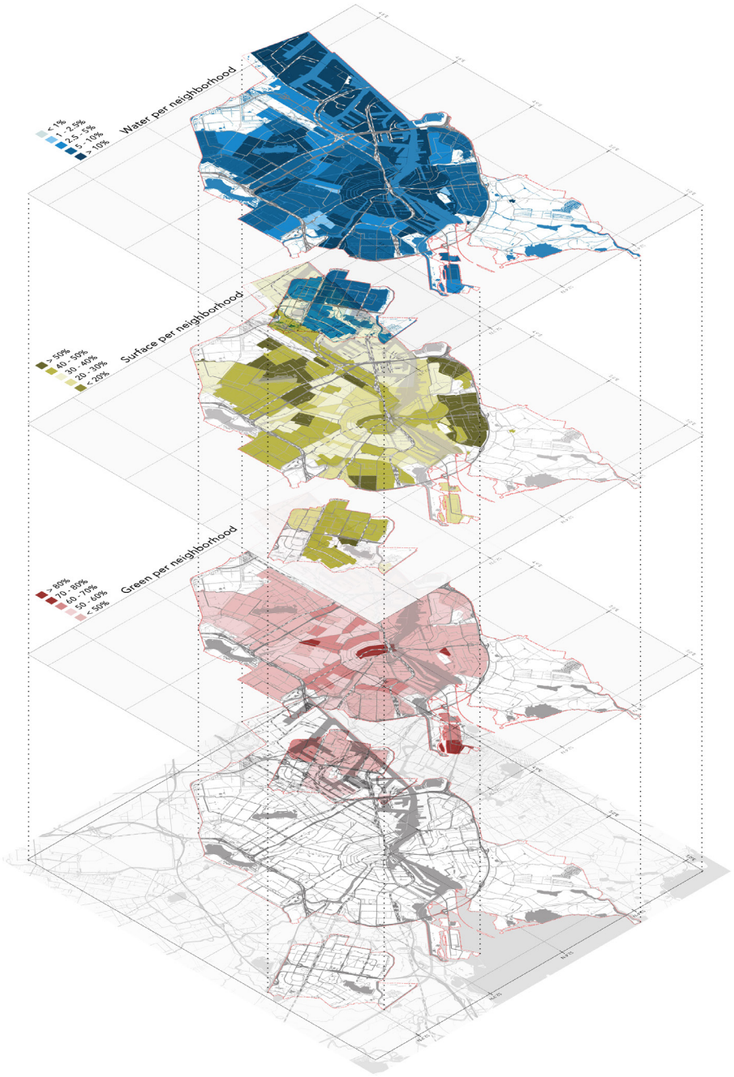


Fig 3.11: Maps showing % of land use of green, blue and paved areas per neighborhood in Amsterdam

Source: RIVM



Fig 3.12: Map showing green and blue networks of Amsterdam and surrounding areas.

Source: BBG

However the same neighborhoods also have a significantly large portion of paved area due to low density sprawl urban form. With further densification and de-paving this could also be reversed, preventing flooding during cloudburst events.

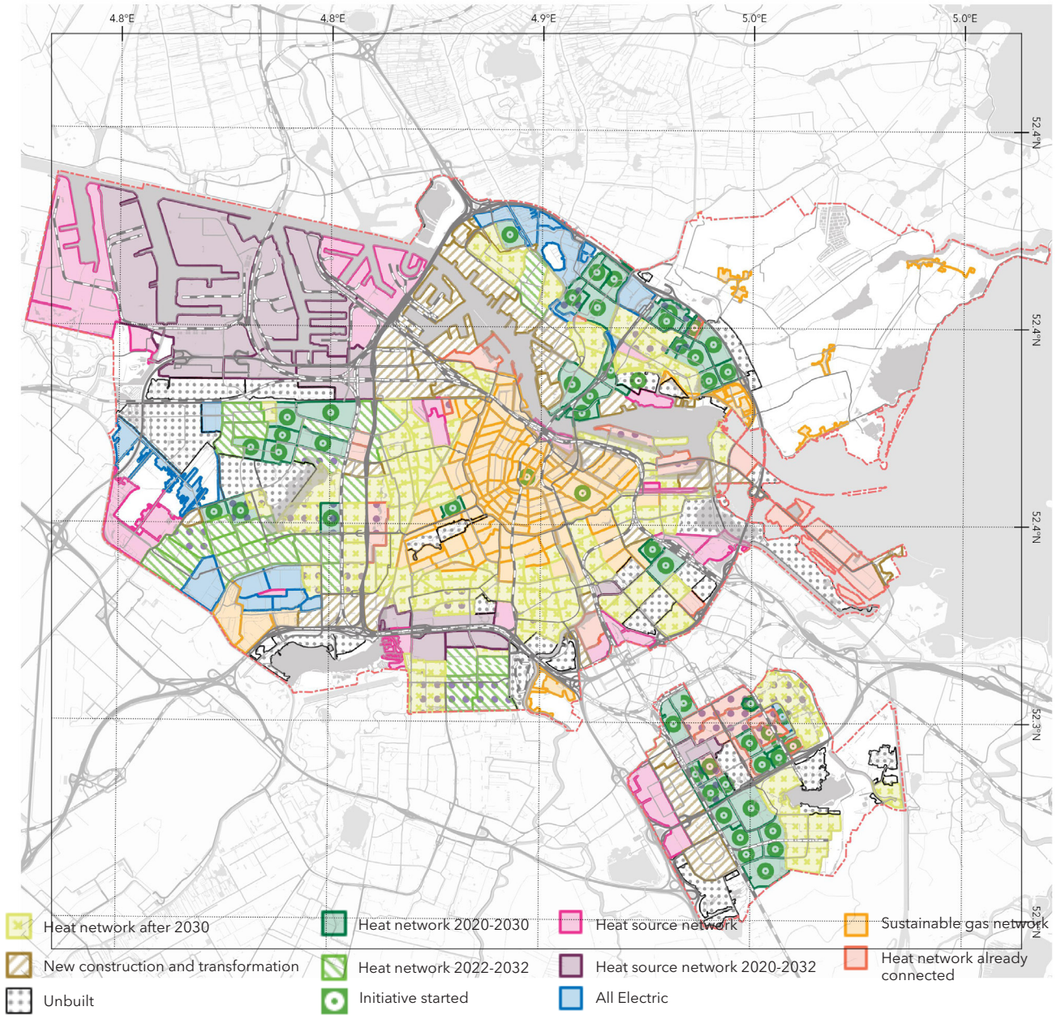
In terms of water per neighborhood, the Amsterdam city centre has a lot of water which is also used for transportation and not just drainage like in other neighborhoods of the city.

This comparison reveals the potential of the peripheral neighborhoods in Amsterdam's ambition in moving towards a climate neutral and resilient city by 2050. The availability of space in these neighborhoods can contribute positively to the overall dynamics between these neighborhoods in Amsterdam.

3.3.1 Plans for Natural gas free neighborhoods

Fig 3.13: Map showing natural gas free transformation plans for neighborhoods in Amsterdam

Source: City of Amsterdam



Natural gas is a major source of CO_2 emissions and in Amsterdam, around 90% of homes and businesses are heated using Natural gas. Switching to sustainable sources can reduce Amsterdam's carbon emissions.

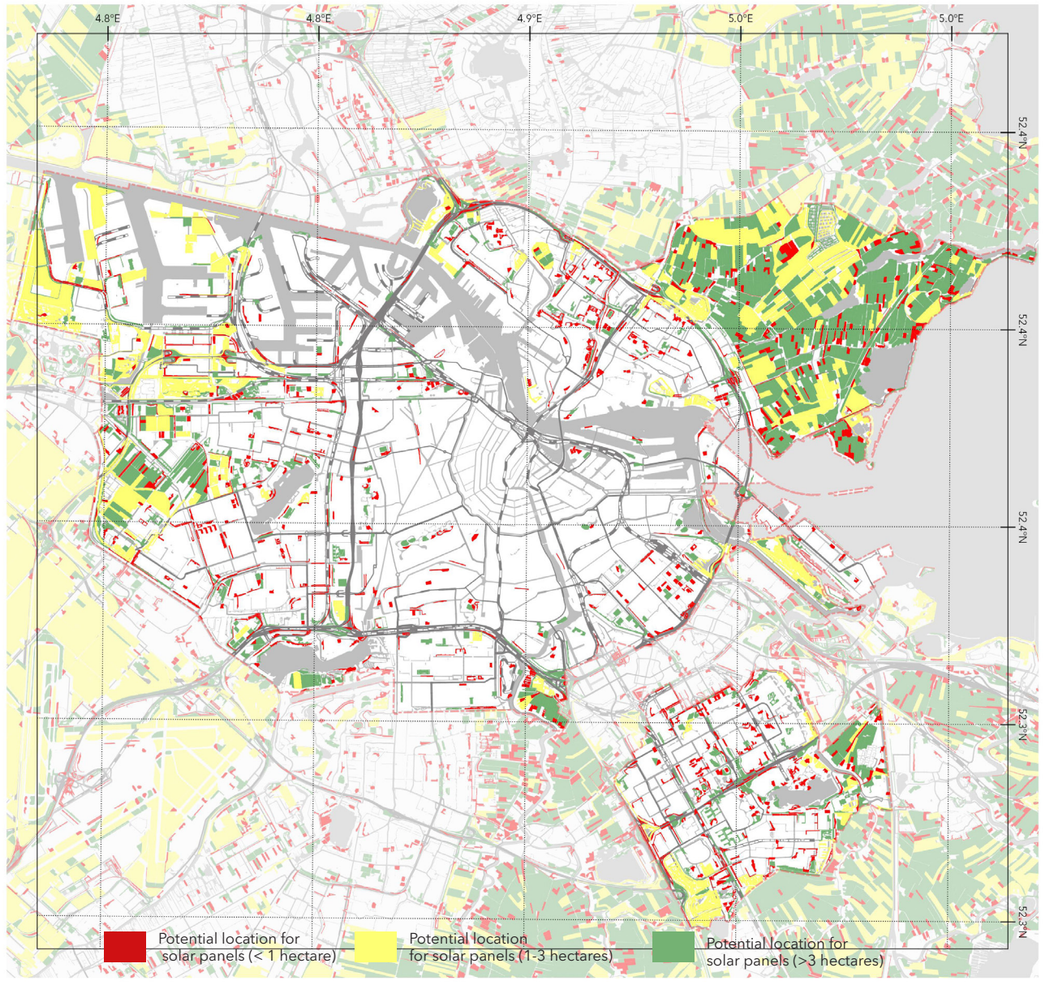
Amsterdam aims to be natural gas free by 2040. The developing neighborhoods listed previously are the first to be considered for upgradation to a district heating system, potentially reducing energy costs.

This also presents an interesting opportunity to build new forms of collectives and managements in these neighborhoods to promote a more sustainable lifestyle, while also enabling disadvantaged populations to gain from the investments made by the government.

Fig 3.14: Map of potential locations for wind and solar energy

Data source: RIVM and City of Amsterdam

3.3.2 Energy generation potential



Solar energy production currently makes a relatively modest contribution to the production of sustainable energy in the Netherlands. Decreasing initial investments and enormous potential mean that this changing rapidly.

In the Netherlands, the main applications of solar energy is on the roofs and facades. Further upscaling of the technology and the energy transition require more space on and around buildings. The function of generating solar energy can coexist with existing or other spatial functions such as water storage basins, slopes of (rail and river) dikes, noise barriers along roads, roofs for parking lots, landfills, roundabouts.

There is very less potential for large energy parks. However, flat roofs and open spaces outside the ring have a higher potential for energy generation.

3.4 Segregation

In chapters 3.2 and 3.3 we spatialised the densification and sustainable transition processes within the city of Amsterdam and how neighborhoods outside the ring were well suited to absorb these processes. In this chapter, we will see how these neighborhoods are different from the city centre and how that difference could potentially affect these neighborhoods in different ways.

Urban living is popular again and the share of high incomes in cities is growing. With this change, concerns are growing about the creation of a 'division' and segregation. It is visible in neighborhoods where previously lower and middle incomes lived, which are now being renovated and emerging into better neighborhoods (gentrification).

An average apartment in the Amsterdam Pijp now costs half a million euros. More affordable to an established investment banker than that of a teacher, while fifty years ago De Pijp was a neighborhood where mainly young labor migrants and students rented a flat. Not all pre-war neighborhoods such as the Pijp have become expensive - a house in Rotterdam South or The Hague Spoorwijk is relatively affordable - but a shift from certain groups of residents to specific neighborhoods is visible in all Dutch cities.

The new urban geography is being driven by higher incomes. However, living preferences are limited and shaped by what is available to choose. In other words, spatial sorting is strongly shaped by the structure and accessibility of the housing market. The high prices in the center of Amsterdam are known, but prices have also risen in other cities. House prices are not only driven by new demand, but also by relaxation of loan rules and low interest rates. Individuals can borrow more and offer more, but the low interest rate also makes owner-occupied homes an interesting investment for (holiday) rental and speculation.

The unaffordability of owner-occupied and rental homes excludes lower and middle-income groups. At the same time, the supply of regulated rental is under pressure. The 2015 Housing Act limits access to social housing by means of income criteria. Housing corporations can build less and have to increase rents due to government taxes. The result of this housing policy is that social rent is increasingly becoming the domain of the poorest households.

The increasing inaccessibility of urban living has consequences not only for emerging urban neighborhoods but also for the urban region. In Amsterdam, households with low incomes move more to the region (nearby municipalities such as Almere, Haarlemmermeer and Zaandam) than other income groups. This so-called 'suburbanisation of poverty' also applies to new migrants with low incomes. Where they once could go to the Pijp, they now settle more often in the region.

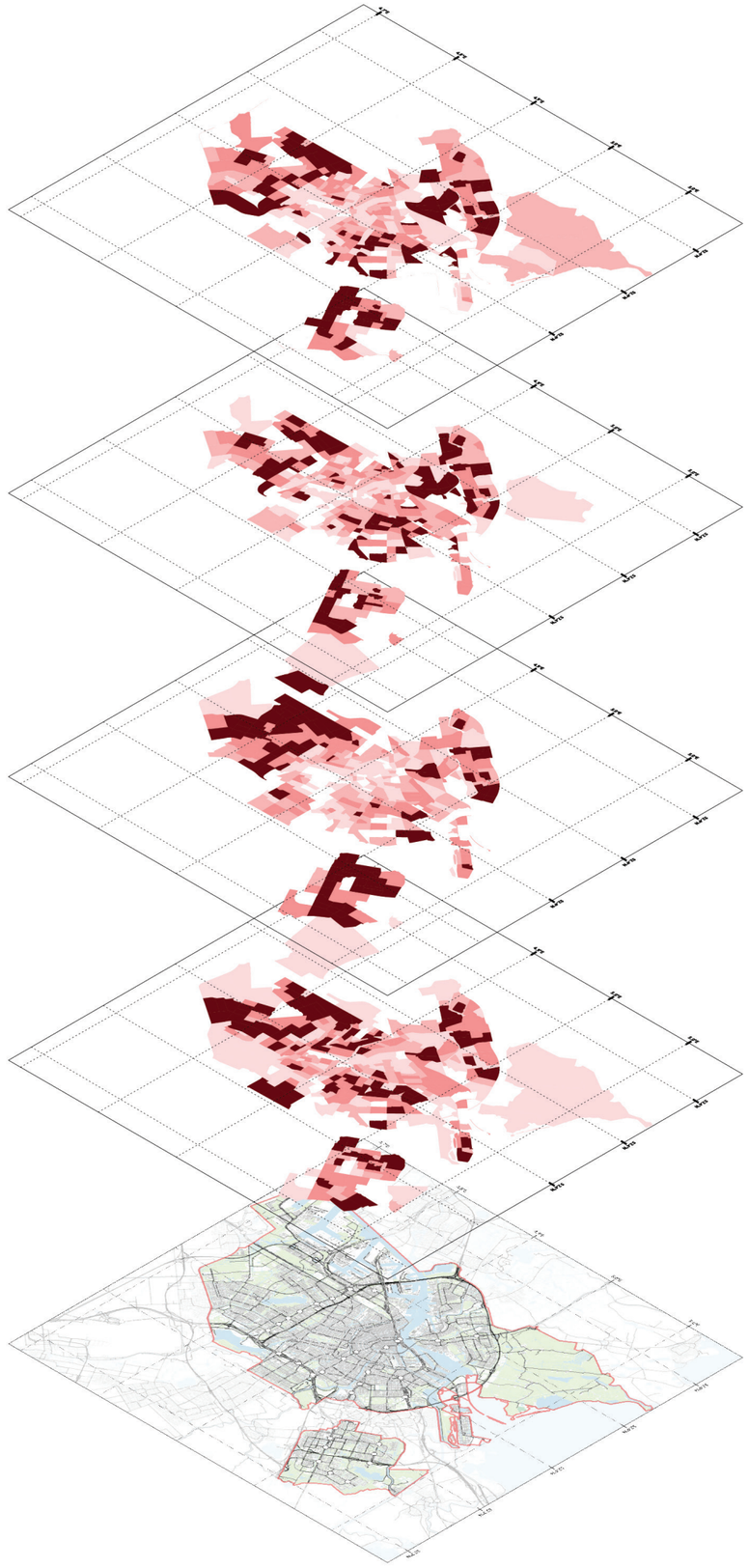


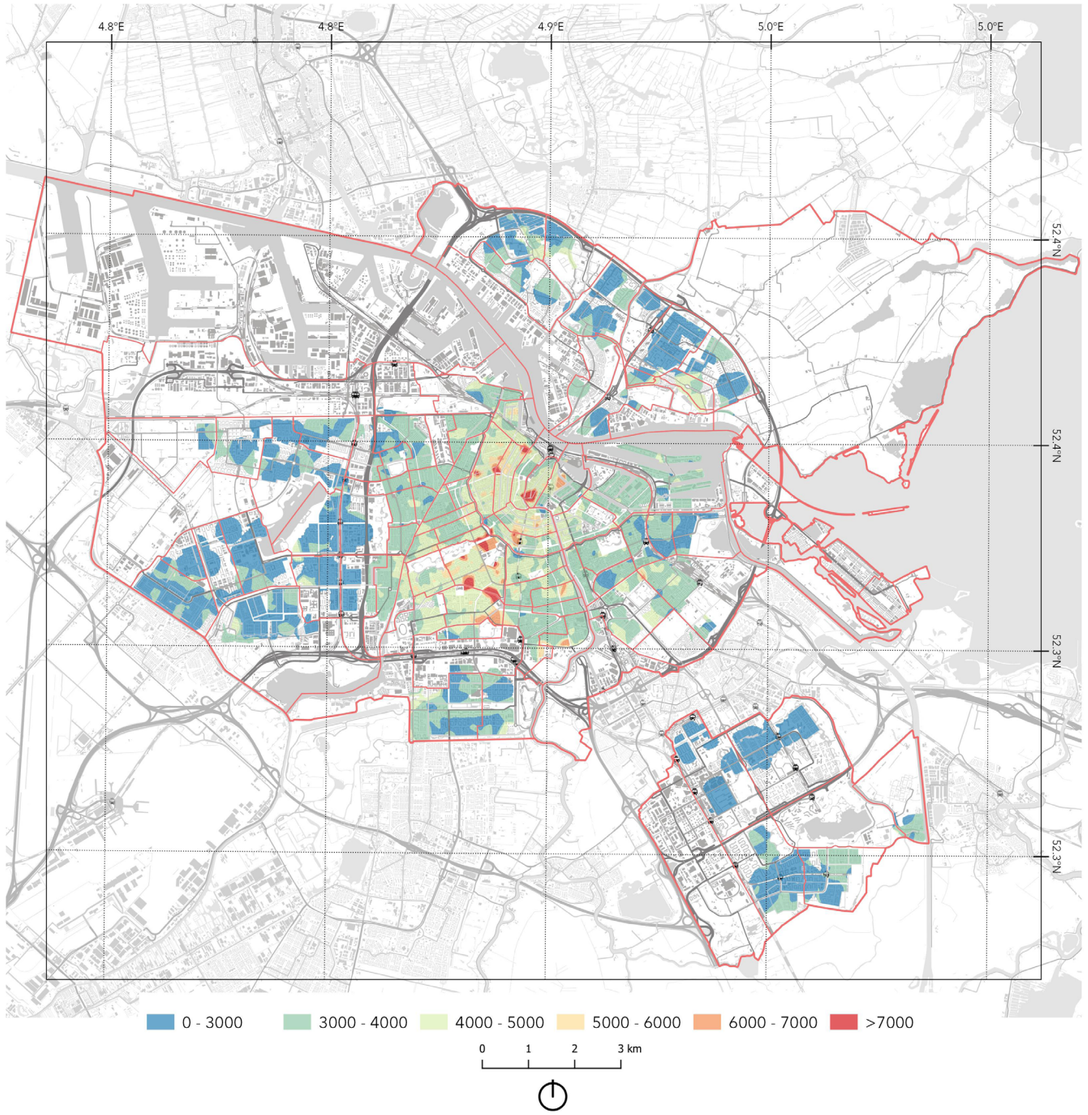
Fig 3.15: Layers of population, percentage of social housing, income distribution and distribution of people of various migratory backgrounds in Amsterdam. Darkest being the highest.

Source: Author Data: CBS

3.4.1 Home Value

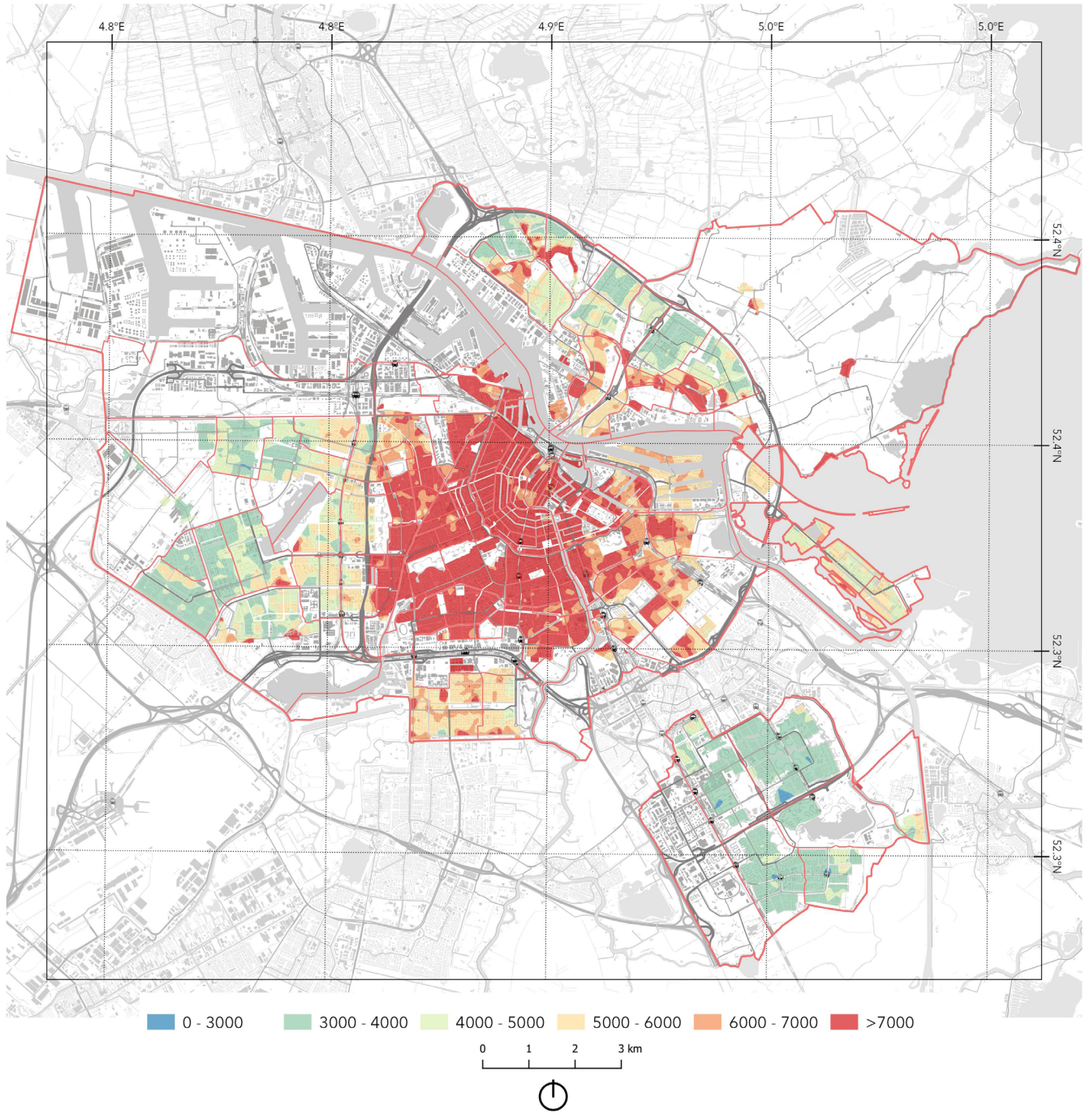
Fig 3.16: The comparison of home value in the city between 2002 and 2019

Source: Author Data: City of Amsterdam



Circa 2002

The city was a lot more affordable around 2002, even when adjusted for inflation to current prices. While the city centre was relatively more expensive, it was not completely inaccessible.



Circa 2019

The financialisation and commodification of the housing market, leading to speculative buying has pushed the cost of housing in Amsterdam through the roof, making the city centre some of the most expensive real estate in Western Europe, unaffordable to a large portion of the population and expanding outwards.

3.4.2 Ethnic and income divides

The concept of segregation is usually used with the assumption that it is a form of inequality. However, not all forms are perceived to be a problem: segregation by age or household is usually not a topic of discussion. Segregation is seen as problematic when it is linked to social hierarchies, or when inequalities by class, education or income, or by ethnicity, nationality or religion also manifest themselves spatially. It often concerns groups that are low in the hierarchy and their overrepresentation in certain neighborhoods. Concentrations of groups at 'the top' are less problematized in public debate, policy and science. For example, predominantly rich neighborhoods are never a problem that is to be solved.

Concerns about concentrations of poverty or of cultural groups are related to possible negative consequences for residents. One-sided neighborhoods could hinder social and cultural integration and economic success.

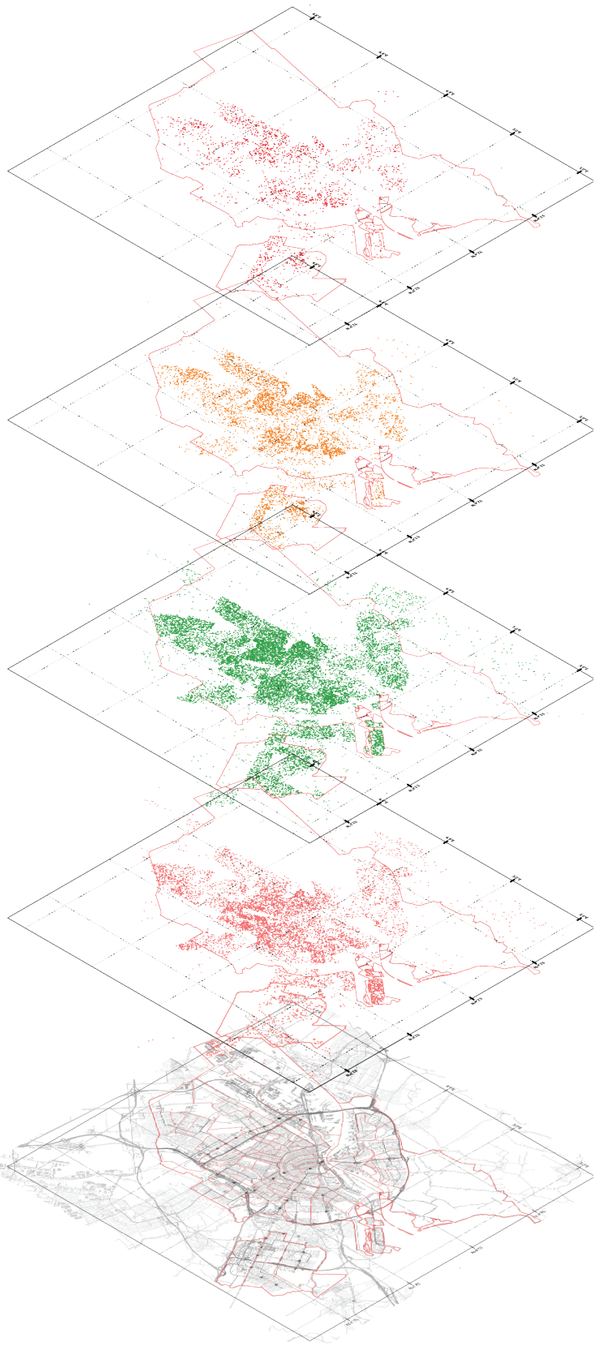
Segregation can clarify and even reinforce inequality, but it is not the case that inequality by definition leads to segregation. In Sweden, for example, the differences in income are relatively low, but the degree of social and ethnic segregation is considerably higher than in the Netherlands. The reverse also exists. Southern European cities have a lot of inequality but have relatively mixed inner cities. In Athens there is even vertical segregation, with wealthier residents living on higher floors to get more light and air. The richest have a spacious roof terrace.

In addition to inequality, spatial separation of population groups can also undermine social and political solidarity. There is a connection between having different contacts and understanding different points of view and interests, whereby the question is which comes first: a diverse social network or the concept. Spatial separation can play a political role in the Netherlands as the suburbanised (lower) middle class seems more inclined to vote for right-wing radical parties than elsewhere in the country (Van Gent et al, 2014).

Amsterdam is currently one of the most inequal cities in the Netherlands in terms of wealth. With a total private household wealth of 85.7 billion euros, and an average private household wealth at 187,700 euros, it is the richest among the G4, however the median private household wealth is at an abysmal 8400 euros revealing the vast wealth disparity between people.

As seen in the maps, most non-western migrants live outside the ring. The average citizen is also poorer outside the ring. While segregation in Dutch cities is not as bad as in some North American cities, it is still spatially visible. These neighborhoods are also some of the least livable neighborhoods based on the national livability index.

The populations in these neighborhoods are vulnerable to large scale transformations driven by densification and sustainability agendas. Thus concerns of how the benefits and burdens of these urban development processes are to be shared is again bought to the fore.



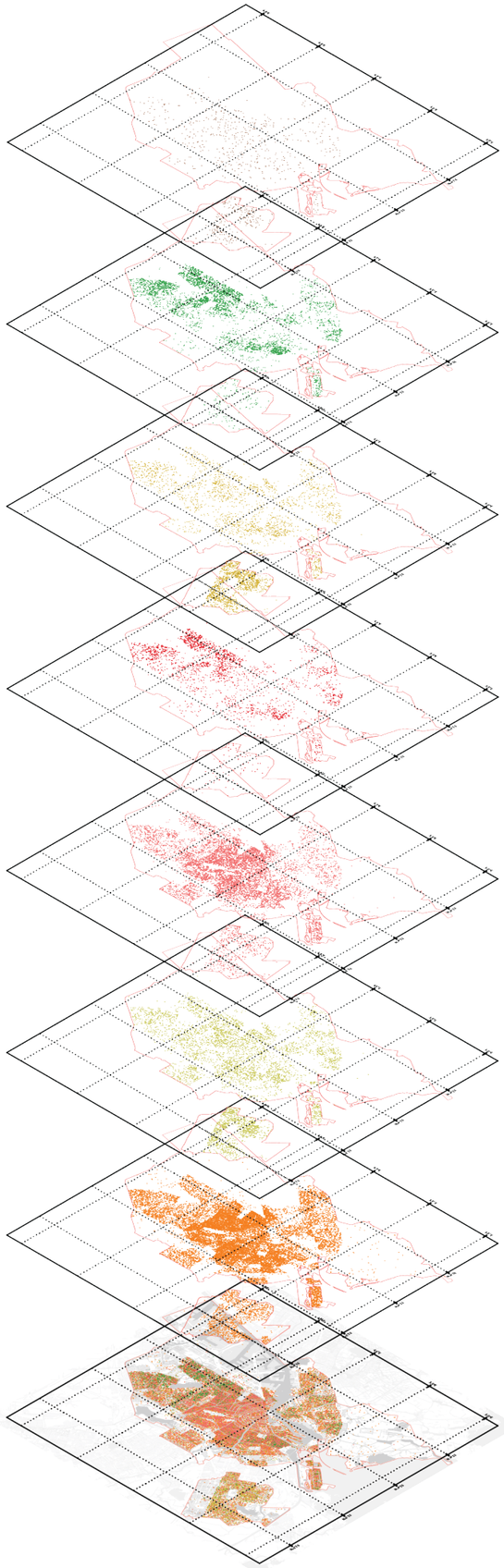


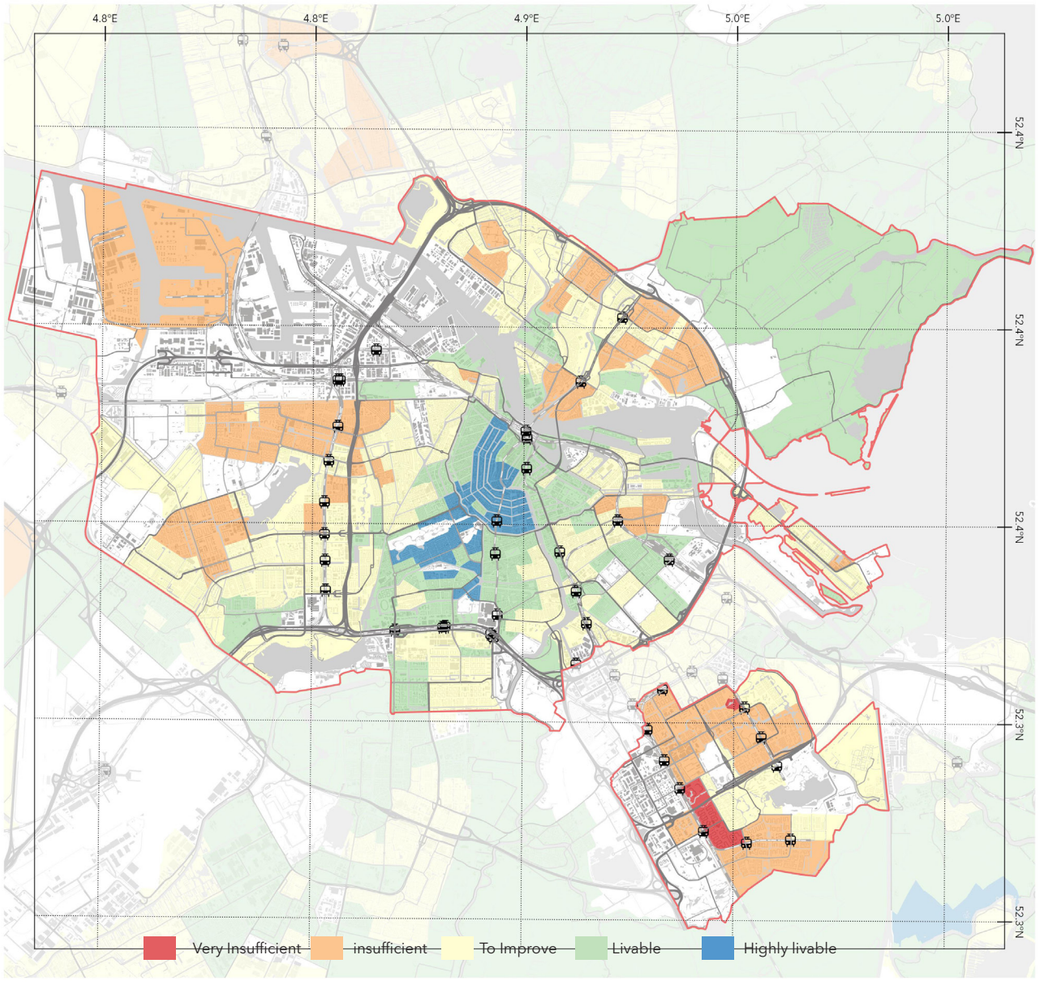
Fig 3.17: Layers of income distribution and distribution of people of various migratory backgrounds.

Source: Author Data: CBS

3.4.3 Livability

Fig 3.18: Map showing neighborhoods classified based on the livability index

Source Data: Leefbarometer



The Liveability Meter is used to monitor the quality of life in all inhabited districts, neighborhoods and streets in the Netherlands.

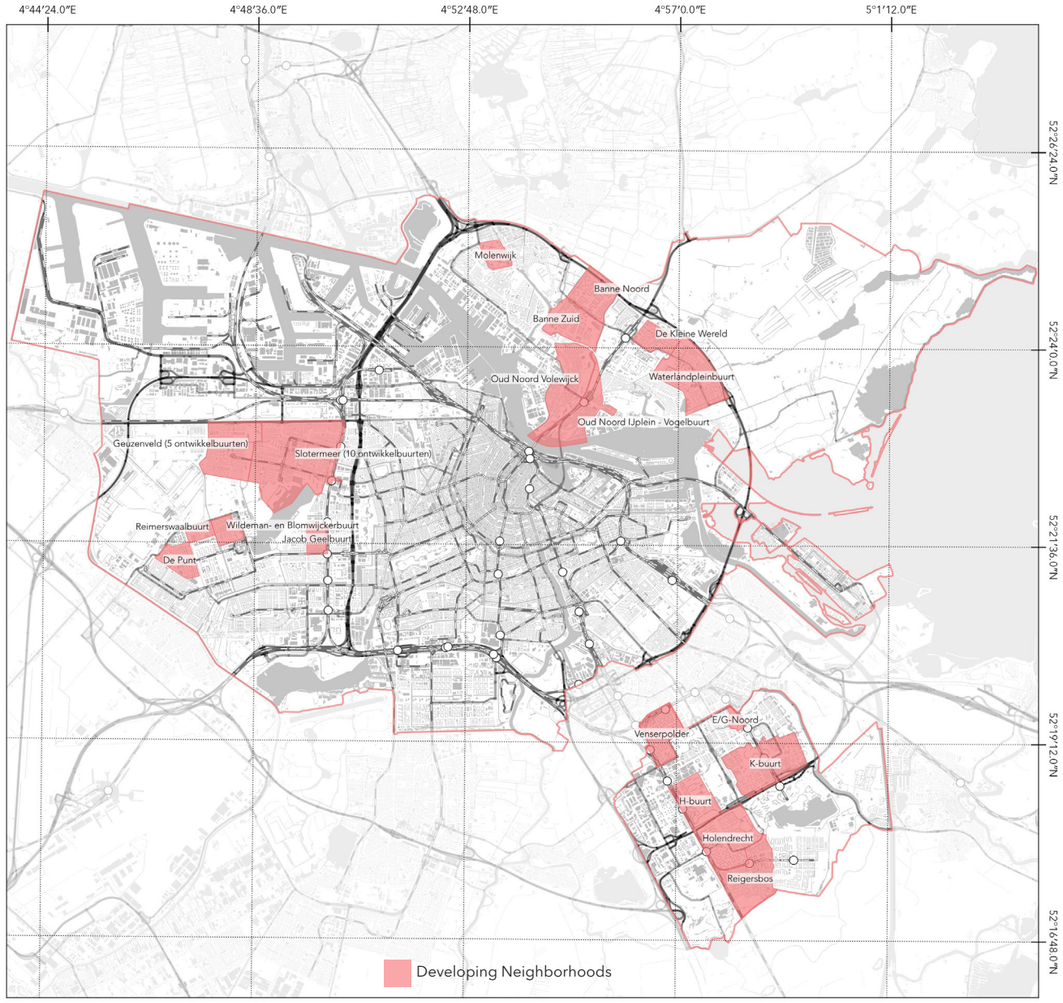
The Liveability Meter shows what the quality of life situation is and how it has developed in recent years. In this way, the Liveability Meter provides basic justification for policy preparation, adjustment and evaluation for various parties.

The neighborhoods outside the ring, and above the Ij have some of the lowest livability scores in the country according to this composite metric. Some of these neighborhoods are also identified as developing neighborhoods and are paid special attention.

Fig 3.19: Map showing neighborhoods classified as developing neighborhoods that requires renewal and transformation.

Source Data: City of Amsterdam

3.4.4 Developing Neighborhoods



The municipality claims that social problems are greater in Amsterdam's 32 development areas than in the rest of the city as marked in the map above. These are places were equality of opportunity is at the lowest.

However, to achieve lasting progress in these neighborhoods, interventions from the spatial and social domain must be brought together. Not incidentally, but long-term and structural.

All efforts neeed to be aimed at blurring the sharp contrasts between existing and new, so that residents of every area of the city can benefit from the economic development of Amsterdam.

There are also Amsterdam neighborhoods that, despite the economic prosperity of recent years and all previous investments and efforts, do not benefit from economic growth and other opportunities. Where things are not going any better. Where many residents have difficulty making ends meet, find and keep a job, and are less healthy than the average Amsterdammer.

3.5 Site Focus

In the previous chapters, we took a brief look into the history of Amsterdam, the current plans for densification and transformation, the possibilities bought forth by ambitious plans of socio-technical transitions towards sustainablity and the nature of segregation in the city and the potential gentrification effects it might have on neighborhoods.

Based on this brief initial problem analysis, neighborhoods outside the ring are strategically well suited to absorb the bulk of densification and transformation, but they are also segregated and vulnerable to change potentially gentrifying them and pushing the populations further into the region. Amsterdam Zuidoost stands out to be one of the most vulnerable amongst these neighborhoods and has as a potential site can be further studied to understand the opportunities offered under the scope of the research project.

Amsterdam-Zuidoost is a district of the municipality of Amsterdam in the Dutch province of North Holland. From a governance perspective, Zuidoost district with its own parliament (first a district council, since 2018 a district advisory committee) was established in 1987. The oldest and best-known district in the district is the Bijlmermeer, or Bijlmer for short . That name is often used for the entire city district.

Amsterdam-Zuidoost has an area of 22.08 km² and had 89,841 inhabitants on January 1, 2020. It is not contiguous to the rest of the municipality of Amsterdam, but is separated from it by the municipalities of Ouder-Amstel (in particular the village of Duivendrecht) and Diemen . Originally, the area was part of the agricultural municipality of Weesperkarspel . When it was decided in the 1960s to build a new city here, Weesperkarspel was assisted by the municipality of Amsterdam. On August 1, 1966 it was annexed by Amsterdam.

Prior to the annexation it was agreed that after 12 years (in 1978) this area would be merged with the municipality of Ouder-Amstel. This plan was rejected, and it continued to belong to the municipality of Amsterdam. This makes it the only district that does not share any borders with the rest of Amsterdam.

Since March 2007, the Bijlmermeer was designated as a *vogelaarwijk*, or developing neighborhoods (Chapter 3.4.4) that would receive extra attention and money from the national government.



Fig 3.20: Site focus. From Netherlands to Amsterdam met-ropolitan region to Amsterdam, Zuidoost district.

Source: Author

3.6 Problem Statement

Motivation

If we denounce neoliberal ideology and the capitalist order of today's cities as value generating machines, what would the new order be?

We've been conditioned to act in our self interests and when everyone acts in their self interests, Adam smith's individual hand would magically take us to a better place. Not all of us have equal opportunities to act on our self-interests, and even if we do, we live in a finite planet with finite resources, and acting on self-interests alone create negative externalities that others are left to deal with.

Hayek's idea of the price system expanded to include every aspect of life as determined by the market has reduced our individual capacity to reason. Without deliberation on the morality of actions, the market decides for us.

We need to be critical about the way in which we build our cities. Building our cities around the seemingly objective truth as affirmed by the market. With increasing polarisation, fall in the trust on democratically elected governments, rise of strongmen around the world, it is important we protect the fabric of society before it is completely lost forever.

We need to build cities that are sustainable from a social, economic and environmental sense. We need to build cities that are livable for a diverse population. We need to build cities where we can speak and we can be heard for our reasons and values and not just our purchasing power. We need to build cities that reflect humane values of justice.

Problem Statement

Amsterdam's emergence as a just city was the outcome of the interaction between radical resident movements and national housing policy that was designed to solve the housing shortage through massive investments in social housing in the 70s and 80s.

However, since the early 90s, rising neoliberalism, changing national economic and housing policies have created segregation and segmentation of the housing stock and people. Existing short-sighted trends in urban development processes that are fragmented pose a threat towards a just city, as seen evidently in Amsterdam Zuidoost district which consistently ranks poorly in social, economic and spatial dimensions of well being. The city is currently in the process of building a large stock of new housing within the existing city(densification), while also transitioning to a different socio-technical regime in terms of energy, economic logic (circular economy) and climate adaptation.

Therefore, it is crucial to adopt an integrated approach towards urban development at this juncture taking into consideration the socio-economic and ecological demands of Amsterdam Zuidoost. One that enables vulnerable populations to be a part of the process leading to a just distribution of its resultant benefits and burdens.

Research Aim

The aims of this research project are three fold.

First is to understand the historicity of urban development processes that led to the current socio-economic, ecological and spatial realities of Amsterdam Zuidoost from a complex systems perspective. Second is to evolve a set of patterns that lead to livable communities and sustainable neighborhoods that are spatially just. Third is to evolve an integrated approach towards urban development by operationalising the patterns amongst the complex interrelations between socio-economic, ecological and spatial dimensions of Amsterdam Zuidoost.

How can the fragmented and vulnerable neighborhoods of Amsterdam Zuidoost, become more liveable, sustainable, and just, through an integrated urban development process?

4

Methodology

In this chapter, we'll expand on the methodology of this thesis project, focusing on the research questions, conceptual frameworks, methods and planned outcomes.

4.1 Introduction
4.2 Problem Statement
4.3 Research Framework
4.4 Conceptual Framework
4.5 Analytical and Design Framework
4.6 Methods
4.7 Intended Outcomes

4.1 Introduction

The research aims to develop an integrated approach towards urban development in the context of western liberal democracies, who through their colonising past and in their current high standards of living propped up by extractive capitalist economies have contributed more than their fair share of environmental degradation. Thus they owe it to the rest of the world to devise a more sustainable form of urbanisation that is not only climate neutral, but is climate positive.

In the Netherlands, since the early 90s, rising neoliberalism, changing national economic and housing policies have created segregation and segmentation of the housing stock and people.

Urban development processes that are driven by market forces and driven by profit pose a threat towards a just city. In Amsterdam, the neighborhoods in the Amsterdam Zuidoost district are criticial examples, which consistently ranks poorly in social, economic and spatial dimensions of well being.

Instead of the resident's perception of livability, the nature and composition of the resident population became the defining factor. Unemployed, single-parent families, ethnic minorities were undesired and negatively affected the livability of neighborhoods. State sponsored gentrification was a tool to reconfigure the population mix of neighborhoods by changing the housing mix through the selling off of social housing stock (Kaal, 2011; Uitermark, 2009; Uitermark, Hochstenbach, & van Gent, 2017).

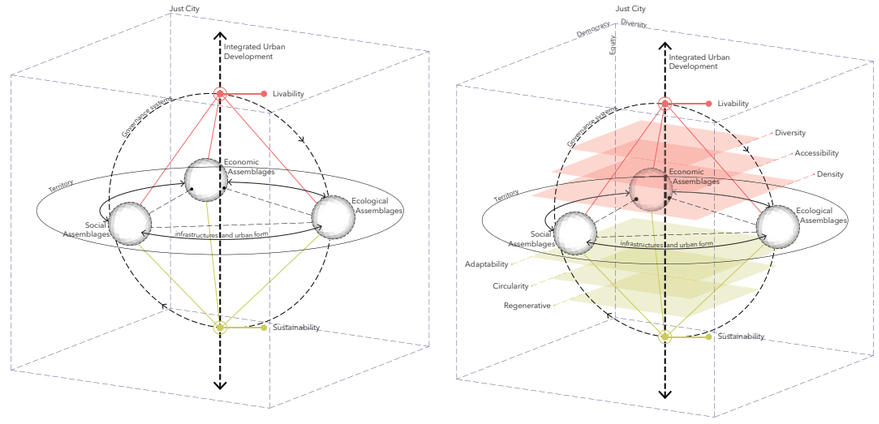
As the city is currently in the process of building a large stock of new housing at a rapid pace to address an exceptional housing shortage, while also transitioning to a different socio-technical regime in terms of energy, economic logic (circular economy) and climate adaptation, it is looking at certain easy fixes, which have the potential of causing serious harm to vulnerable neighborhoods in Amsterdam Zuidoost, which within Amsterdam has some of the last bastions of affordable housing.

Thus, the thesis aims towards understanding the urban development process with an emphasis on processes, interdependencies, uncertainties, and feedback loops in the production of specific spatial formations and not rely on linear and lazy storylines of gentrification and decline in neighborhoods.

For this purpose, a deductive and inductive approaches are used together to learn from the lastest theoretical research on the concepts of sustainability, livability and spatial justice, while also considering the context specificities of what it means for Amsterdam and Amsterdam Zuidoost.

The historicity of the context is coupled with the generation of a pattern language that focuses on outcomes that are geared towards livability, sustainability and spatial justice.

Through a research by design approach, the patterns identified and generated from theory, observation and analysis are validated in site specific conditions of opportunities and challenges.

Problem Field	Sustainable development, Neoliberalisation, Residualisation of social housing
Key Words	Sustainability, Livability, Spatial Justice, Integrated Urban Development, Complex Systems
Location	Amsterdam Metropolitan Area → City of Amsterdam → Zuidoost District
Problem Statement	Since the early 90s, rising neoliberalism, changing national economic and housing policies have created segregation and segmentation of the housing stock and people. Existing short-sighted trends in urban development processes that are fragmented pose a threat towards a just city, as seen evidently in Amsterdam Zuidoost district which consistently ranks poorly in social, economic and spatial dimensions of well being. The city is currently in the process of building a large stock of new housing within the existing city(densification), while also transitioning to a different socio-technical regime in terms of energy, economic logic (circular economy) and climate adaptation. Therefore, it is crucial to adopt an integrated approach towards urban development at this juncture taking into consider-ation the socio-economic and ecological demands of Amsterdam Zuidoost. One that enables vulnerable populations to be a part of the process leading to a just distribution of its resultant benefits and burdens.
Research Question	How can the fragmented and vulnerable neighborhoods of Amsterdam Zuidoost, become more liveable, sustainable, and just, through an integrated urban development process?
Research Approach	Inductive and deductive approach
Conceptual Framework & Analytical Framework	
Methods	Literature review, documents and policy review, fieldwork, interviews, statistical analysis, transcalar mapping, stakeholder analysis, scenario construction, explanatory case study, research through design
Outcomes	Assemblage drawings on the current conditions, Pattern language for livability, sustainability and spatial justice, Strategic Framework, Operational Framework, Scenarios

4.2 Problem Statement

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Hayek's idea of the price system expanded to include every aspect of life as determined by the market has reduced our individual capacity to reason. Without deliberation on the morality of actions, the market decides for us.

We need to be critical about the way in which we build our cities. Building our cities around the seemingly objective truth as affirmed by the market. With increasing polarisation, fall in the trust on democratically elected governments, rise of strongmen around the world, it is important we protect the fabric of society before it is completely lost forever.

We need to build cities that are sustainable from a social, economic and environmental sense. We need to build cities that are livable for a diverse population. We need to build cities where we can speak and we can be heard for our reasons and values and not just our purchasing power. We need to build cities that reflect humane values of justice.

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Therefore, it is crucial to adopt an integrated approach towards urban development at this juncture taking into consideration the socio-economic and ecological demands of Amsterdam Zuidoost. One that enables vulnerable populations to be a part of the process leading to a just distribution of its resultant benefits and burdens.

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Second is to evolve a set of patterns that lead to livable communities and sustainable neighborhoods that are spatially just.

Third is to evolve an integrated approach towards urban development by operationalising the patterns amongst the complex interrelations between socio-economic, ecological and spatial dimensions of Amsterdam Zuidoost.

How can the fragmented and vulnerable neighborhoods of **Amsterdam Zuidoost,** become more **liveable**, **sustainable,** and **just**, through an **integrated urban development** process?

4.3 Research Framework

Main Research Question	Sub-Research Questions	Methods	Expected Outcomes
How can the fragmented and vulnerable neighborhoods of **Amsterdam Zuidoost,** *SRQ 2,3* become more **livable**, **sustainable,** and **just**, *SRQ 1,4* through an **integrated urban development** process? *SRQ 4,5,6*	**SRQ1 What is the relationship between livability, sustainability and spatial justice in an urban development context?**	Literature review, Documents and policy review	Theory paper and a strategic framework at the macro scale towards livable, sustainable and just assemblages in Amsterdam Zuidoost.
	SRQ2 How did the urban development process of Amsterdam Zuidoost influence its social, spatial, economic and environmental realities?	Literature review, Documents and policy review Fieldwork, Stakeholder Analysis, and case study Multiscalar Mapping and Statistical Analysis	An understanding of the actual condition of Zuidoost set against the ideal from the theoretical frameworks as a base for research.
	SRQ3 What are the threats and potentials regarding densification and socio-technical transition towards sustainability in Amsterdam Zuidoost?	Multiscalar Mapping and Statiscal Analysis Scenario Construction and Research by Design	An understanding of the actual condition of Zuidoost set against the ideal from the theoretical frameworks as a base for design development.
	SRQ4 What are the patterns of liveable, sustainable and just settlements?	Scenario Construction and Research by Design Literature review, Documents and policy review	A set of patterns geared towards improving livability, sustainability and Spatial justice in Amsterdam Zuidoost derived from both theoretical (deductive) and contextual (inductive) approaches of engaging with the site.
	SRQ5 How to improve the affordance of urban form in Zuidoost towards socio-technical transitions?	Literature review, Scenario Construction, and Research by Design	Operationalising the patterns at specific neighborhoods in Amsterdam Zuidoost.
	SRQ6 How to improve the agency of low-power stakeholders in the procedural aspects of an integrated urban development process?	Literature review, Documents and policy review, Stakeholder Analysis, Literature review, Documents and policy review Scenario Construction and Research by Design	An operational framework on how patterns of livability, sustainability and spatial justice could be used on specific neighborhoods in Amsterdam Zuidoost.

4.4 Conceptual Framework

topological map of key concepts

The conceptual framework presents a topological map of relations between the key concepts towards the realisation of the research aim of an integrated urban development process. As a topological map it is relational and doesn't correspond to scale, distance, and hierarchy and shouldn't be read as such.

Liveability and Sustainability

Here, livability and sustainability as two important goals of urban development are conceptualised as emerging from the interactions between economic, social, and ecological assemblages. While livability and sustainability are compatible goals, they are represented on the opposite ends to signify the fact that livability deals with the 'here' and 'now' in space-time, thus focusing on the local scale and a shorter time span for implementation and impacts. While sustainability focuses on the global and long term impacts of our actions.

Infrastructures and Urban Form

The economic, social, and ecological assemblages are embedded in space through the specificities of the urban form and technological regimes as bought forth by the infrastrucures of urban systems.

Assemblages

The assemblage in a deleuzoguattarian sense provides an ontological framework to represent the complex interrelations amongst a plethora of different actors, institutions, documents, spatial units and events that constitute a certain dimension in its entirety without having to categorise reality into ahistoric, deterministic structural categories.

Just City

The just city represents an ideological imperative of a normative spatial justice ideal. It conceptually encompasses everything else mentioned in the conceptual framework and is the beacon to orient oneself in the quest for sustainable and liveable cities, so as not to be led astray in a blind rush towards growth and development.

Governance Systems

Governance systems are conceptualised to encompass the entire operational field and are envisioned to be self-organising structures in the context of the project.

Integrated Urban Development

The aim of the research is to develop an integrated urban development process that leads to livable, sustainable and just outcomes. The conceptual framework establishes the key relationships between the desired outcomes and establishes the operational field. The conceptual framework is further grounded in the reality of Amsterdam Zuidoost to be analysed and operationalised through the process of this research.

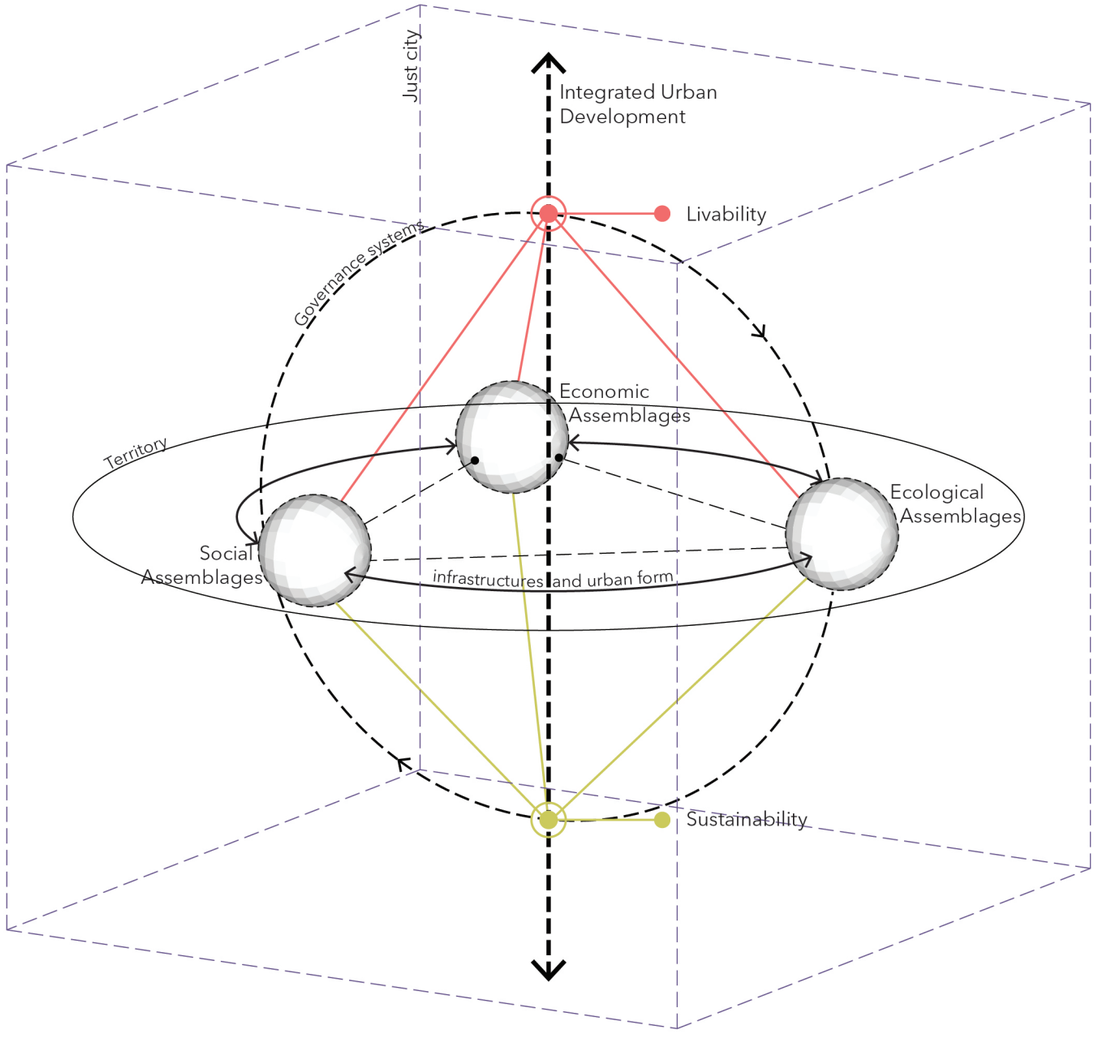


Fig 4.1: Conceptual Framework
Source: Author

4.5 Analytical and Design Framework

planes and attributes of analysis and design

The analytical framework is built on top of the topological map of relations between the key concepts towards the realisation of the research aim of an integrated urban development process established in the conceptual framework. As a topological map it is relational and doesn't correspond to scale, distance, and hierarchy and shouldn't be read as such.

Infrastructures and Urban Form

Analysis of the Urban form and infrastructure of Amsterdam Zuidoost is carried out to understand the spatial logic of its constituent neighborhoods and spatialise the economic, social and ecological assemblages. This feeds into the analysis of the existing livability and sustainability conditions.

Liveability

Livability of Amsterdam Zuidoost as emerging out of the social, ecological and economic assemblages is analysed through the planes of diversity, accessibility and density of constituent entities. It is derived from the framework of "spatial capital," as evolved by Marcus (2010) as an integration of space syntax and spatial morphology studies. Here distance, density, and diversity are understood as measures of three fundamental variables of spatial form with distinct relations to generic aspects of human use of urban space. The parameter of distance is adapted as accessibility in the network and the parameters of density and diversity are understood as accessible density and accessible diversity to establish their relative position in the complex network of a city as lived and not just as built.

Sustainability

Sustainability of Amsterdam Zuidoost as emerging out of the social, ecological and economic assemblages is analysed through the planes of adaptability, circularity and regenerative potential of constituent entities. Since these properties are abstract to study on their own, this is looked at from the perspective of metabolic flows such as energy, waste, food and green/blue networks.

Just City

The just city represents an ideological imperative of a normative spatial justice ideal. It conceptually encompasses everything else mentioned in the conceptual framework and is expanded into its constituent components of democracy, diversity and equity as argued by Fainstein (2010). It provides the analytical framework to evaluate existing policies and governance structures towards urban development in Amsterdam Zuidoost and design just systems based on that.

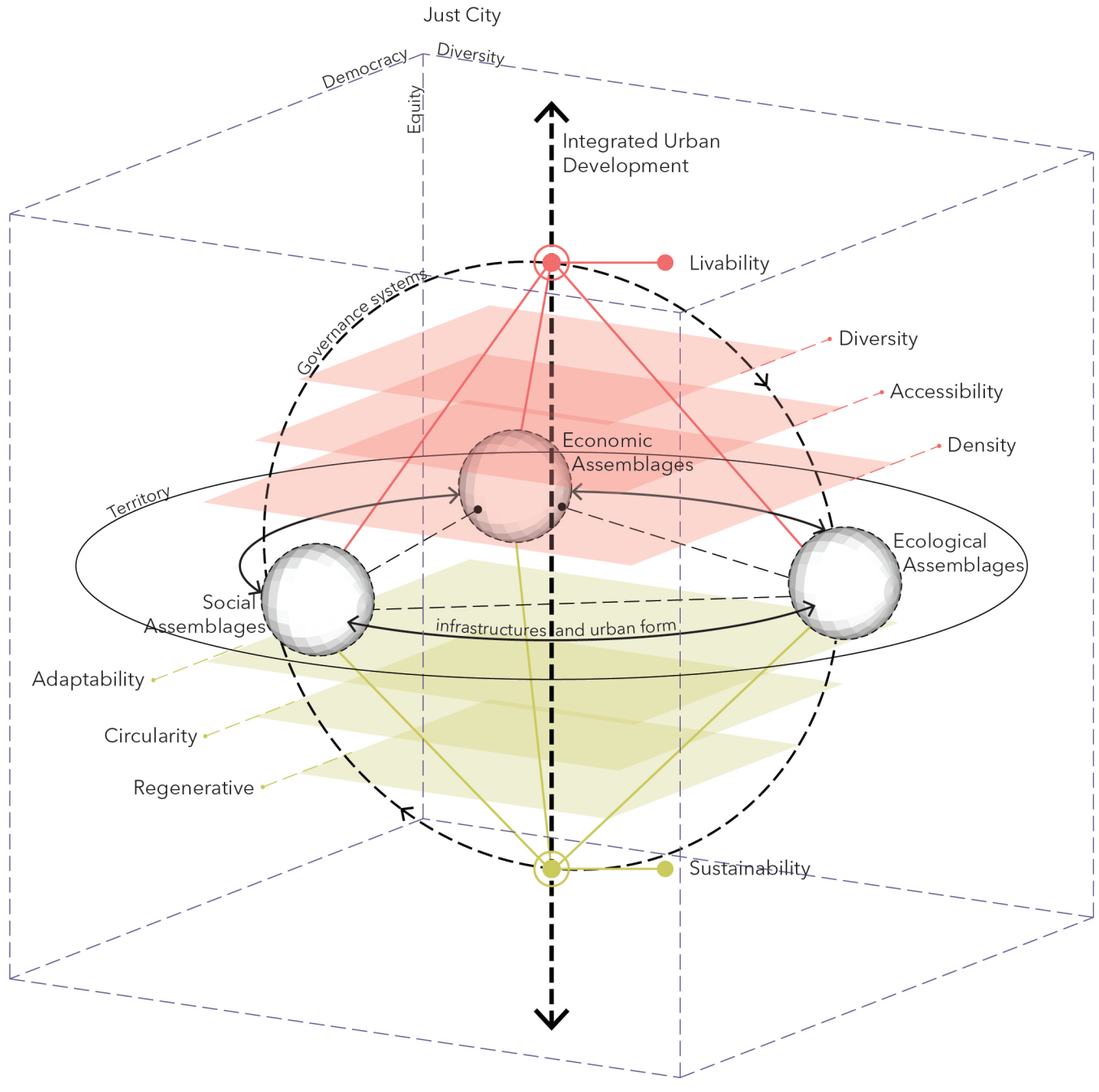


Fig 4.2: Analytical and design Framework
Source: Author

4.6 Methods

Literature Review

Literature review involves a critical survey of scholarly articles, documents, books, and reports to develop a theoretical (deductive) and contextual (inductive) understanding of the key aspects of the research. It helps to explore and understand what has already been researched, to gather opinions, findings and information. This informs the problem statement, supports the formulation of the knowledge gap and defines the course of the research.

Since the research relies on complex systems theories such as complex adaptive systems and assemblage theory, towards understanding cities; socio-material phenomena are explained through interrelationships and emergent properties. Thus, it becomes important to draw interrelations of ideas of relevant and related bodies of literature from social sciences, urban metabolism studies, spatial morphology studies and applied research in urban planning and urban design.

Documents and policy review

Documents and policy review is used to critically review the main spatial planning instruments at the metropolitan and municipal scales.

Government organisations at multiple levels have created various strategic frameworks, structure plans, environmental visions, area plans and policy documents that establish the ambitions of various actors towards sustainability and livability as stated in them. These are critically reviewed to understand the current direction of urban development and their existing limitations, restrictions and conflicts.

Fieldwork

Fieldwork helps towards contextualising the theoretical and documentary reading of the concepts and context and develop first impressions and potential for interventions. Field work enables a more intuitive and subjective reading of interactions, and atmosphere of a place.

Photo documentation, observed patterns, and sketches are to be made during the fieldwork to record the experience, characteristics and the main urban issues of the place.

Statistical Analysis

Statistical Analysis in the context of the project deals with the critical inquiry of statistical data sourced from multiple government institutions at the national and municipal scales such as *Centraal Bureau voor de Statistiek, Planbureau voor de Leefomgeving, Centraal Planbureau, Sociaal en Cultureel Planbureau* and *Afdeling Onderzoek, Informatie en Statistiek (OIS)*

In the Netherlands, a wide array of statistical information is available in relation to the project that provides insights into social, economic, and ecological domains. A critical approach is taken towards statistical analysis, since in multiple cases composite indices tend to blackbox the underlying assumptions as discussed in the Theoretical Framework.

Multiscalar Mapping

Multiscalar mapping helps towards the understanding of the relationship of phenomena in the context across multiple scales. In the scope of the thesis, the scales are identified as the Municipality of Amsterdam at the city scale, Amsterdam Zuidoost at the district scale and specific neighborhoods and blocks at the neighborhood and block scale (Venserpolder, H-Buurt, Holendrecht, Reigersbos and K-buurt Midden).

The method helps towards the understanding of livability and sustainability as emergent phenomena operating at multiple scales and reveal their interdependence and relation to each other.

Stakeholder Analysis

Stakeholder mapping involves the identification of key stakeholders operating at various scales and stages of the urban development process and understanding their roles, intentions, interests, and power relations in the context of the development process.

The process has two components. First to identify the stakeholders and their interrelationships in terms of power and interest. The second component involves spatialising their power and interest to identify synergies and conflicts.

Scenario Construction

Scenario construction involves the elaboration of observed trends as future scenarios, to understand the possible and probable futures to inform the strategies and design of the outcomes.

Speculative exploration of desirable scenarios helps us to identify probable realities within them. Scenarios help make explicit the interrelationships between different drivers and their influence on the system, while also helping us discover the potentials and threats in a given development condition.

Scenarios are an inherent part of research by design,
generating hypothetical solutions for comparative analysis in
order to gain insights into possibilities and scale of the task.
Such research helps to recognise limits and crucial decision
points.

Explanatory case study

An explanatory case study is intended to explore a specific phenomenon in a contextual location. In this case, the urban renewal process of the modernist Bijlmermeer area is to be undertaken. The urban renewal of the area has received mixed reviews since its completion and offers an wonderful contextual case to evaluate the processes and the outcomes to learn from it.

Research through/by design

Research through/by design uses design thinking to explore potentials in a context by exploring solutions to problems. This systematic exploration helps towards an understanding of underlying problems. It is a practical and goal oriented method, focusing on the workability of methods. In this thesis, the method is used to test out patterns in the context derived from thoeretical, spatial, and statistical analysis.

4.7 Intended Outcomes

The aims of this research project as stated before are three fold.

First is to understand the historicity of urban development processes that led to the current socio-economic, ecological and spatial realities of Amsterdam Zuidoost from a complex systems perspective. Second is to evolve a set of patterns that lead to livable communities and sustainable neighborhoods that are spatially just. Third is to evolve an integrated approach towards urban development by operationalising the patterns amongst the complex interrelations between socio-economic, ecological and spatial dimensions of Amsterdam Zuidoost.

The outcomes of the project are aligned with the research aim.

A. Pattern language for livability, sustainability and spatial justice.

A set of patterns geared towards livability, sustainability and spatial justice in Amsterdam Zuidoost derived from both theoretical (deductive) and contextual (inductive) approaches of engaging with the site are to be created.

"The idea of a diagram, or pattern, is very simple. It is an abstract pattern of physical relationships which resolves a small system of interacting and conflicting forces, and is independent of all other forces, and of all other possible diagrams. The idea that it is possible to create such abstract relationships one at a time, and to create designs which are whole by fusing these relationships-this amazingly simple idea is, for me, the most important discovery of the book. I have discovered, since, that these abstract diagrams not only allow you to create a single whole from them, by fusion, but also have other even more important powers. Because the diagrams are independent of one another, you can study them and improve them one at a time, so that their evolution can be gradual and cumulative. More important still, because they are abstract and independent, you can use them to create not just one design, but an infinite variety of designs, all of them free combinations of the same set of patterns."
(Alexander, 1964, p. 6).

Patterns, when composed as a pattern language, are a relational tool and are well suited to engage with the understanding of the city as a complex system, while also making the complexity comprehensible for stakeholders of different proficiency in the processes of urban development.

The communication potential of pattern language helps towards operationalising generic solutions in the context through engagement with stakeholders.

B. Strategic Framework

A strategic framework for integrated urban development for Amsterdam Zuidoost that addresses the housing shortage through strategic densification and the sustainability ambitions of the municipality through strategic projects staggered in space and time.

The strategic framework helps operationalise the pattern language at the scale of the city district to respond to site specific challenges and opportunities towards creating livable, sustainable and just assemblages.

C. Operational Framework

An operational framework is envisioned as a part of the integrated development process and it outlines the role of different stakeholders and proposes different possibilities of organisation to empower vulnerable populations and provide them with agency to engage with the development process.

D. Potentialities

As part of the potential study, set of maps that highlight the potential of specific neighborhoods with respect to the studied layers of accessibility, diversity, density, blue/green networks, energy, waste, and food systems are highlighted.

5

Theoretical Framework

Theoretical Framework

Introduction

Cities are the dominant form of human settlement on the face of the planet. Urbanisation trends projected by the UN show that it is not going to change anytime soon and by 2050, over 70% of the global population will live in an urban area (UN, 2019).

Over 11,000 scientists from different countries declared clearly and unilaterally that our planet is facing a climate emergency based on years of scientific research (Ripple et al. 2019). Natural Ecosystems around the world provide ecosystem services for all human life in the form of provisioning, regulating, supporting and cultural services (MEA, 2001). Urban development as it has happened since the industrial revolution and the resource intensive contemporary way of life poses an existential threat to life on the planet.

While creating liveable environments has been a key pursuit of urban development in the past, sustainability and livability both need to be the defining characteristics of an integrated urban development going forward. Contemporary literature in urbanism is filled with both the notions, addressing specific challenges within urban development. While the relevance of sustainable cities and livable communities are a given, the notions of sustainability and livability are not always compatible in practice.

Density can help explain the discrepancy between the concepts. While high density and a compact city form is considered economically and environmentally sustainable, crowding as a result of high densities leads to a poor living quality (Boyko & Cooper, 2011). In this case, how do we reconcile the differences between sustainability and livability? The ability to evaluate the impacts becomes crucial to operationalize abstract notions of sustainability and livability towards an integrated urban development in practice.

In the following sections, I would look at the ways in which sustainability and livability are conceptualised and how they are related. I would also critically look at how they are operationalized in urban development today and position them against an expanded reading of the just city as developed by Fainstein (2010) to provide a basis for an integrated urban development. The context of evaluation is liberal democracies within the global North, and as such a strong institutional setup catering towards the wellbeing of its citizens is assumed.

While approaching cities as complex systems has been gaining widespread attention in academia, in practice, cities are still broken down into departmental and sectoral silos, and approached from a fragmented and simplistic worldview. An integrated urban development approach, that is built on the understanding of cities as complex adaptive systems is required if we set out to solve some of the biggest challenges ever facing urban planners in the history of the profession.

Sustainability

There are a wide variety of definitions for what entails sustainable development. The Millennium ecosystem assessment defines sustainability as “A characteristic or state whereby the needs of the present and local population can be met without compromising the ability of future generations or populations in other locations to meet their needs” (MEA, 2001). This establishes the systemic nature of the concept connecting cause and effect across space and time.

Sustainable development aims to resolve the inherent conflicts between economic development, intergenerational equity, and ecological preservation but the definition lacks the specificity required to operationalize it in practice. However, the urgency of climate change and the enormous coordinated global effort required to reduce global emissions and bring economic development within planetary boundaries led to the development of 17 interlinked sustainable development goals in 2015, and eventually a set of indicators were created per SDG with the intent to objectively measure progress made under each of the SDGs.

Another challenge for urban planners, designers and other professionals of the built environment is that, in a paradigm of globalisation and planetary urbanization with a vast interconnected network of material and financial flows and accumulation at the global level, sustainability is difficult to be operationalized effectively at the scale of the neighborhood and efforts might feel too little to make any reasonable impact.

Operationalising sustainable development in practice has led to a plethora of rating systems that aim to quantify the level of sustainability at the neighborhood scale (Planners, 2014). BREEAM Communities, LEED for Neighborhood Development (LEED ND) etc., are some of the more common ones being used to measure neighborhood sustainability.

However, even if an architect builds a net zero building that meets all the environmental sustainability criteria, if it is bought to engage in real estate speculation and not actual housing demand or if it houses a supermarket selling coffee from the Kodagu hills in India, it is rendered pointless. While one could argue that sustainability as a paradigm needs to be a part of the ethos of every walk of life, there is another major driver for how we design our cities that could pave the way for a better understanding of the processes at play - Livability.

Livability

Livability is a lot more difficult to define and there isn't a single globally accepted definition. The Merriam Webster dictionary defines it as 'suitability for human living'. Veenhoven (2000) defines livability as the quality of life, welfare, 'level of living,' or habitability of the environment. A place based definition from an environmental quality perspective is "the physical characteristics of a community, the way it is planned, designed, developed, and maintained" (Burton, 2014, p. 5312, as cited in Okulicz-Kozaryn & Valente, 2019)

In contrast to sustainability, livability looks at the "now" and "here", localised in space and time. For Urban planners, designers and other professionals of the built environment, livability is a lot more achievable as creating livable neighborhoods, instead of sustainable neighborhoods is within the traditional agency of urban local bodies, planners, architects, policy makers and developers, who are engaged in the city building process (Ruth & Franklin, 2014).

Livability has been operationalized rather indirectly in terms of rules and regulations to ensure building safety, provision of utilities such as clean water, heat, electricity and waste disposal, promoting education and job growth, and maintaining public health in most cities in the western world. As a result of this legacy, livability is a powerful vehicle for institutions and individuals for action and accountability.

The quest for improving livability has been a key driving force behind a large number of urban regeneration and renewal processes in western liberal democracies since the 1960s.

Conceptualisation of livability has shaped infrastructural investment decisions and public policy discourses within cities, while also facilitating competition among cities across the world to attract investment opportunities, and skilled human capital (Ruth & Franklin, 2014).

A brief look at the history of architecture and urban planning will give us a multitude of utopian plans that envision livable places. From garden cities to modernist plans for cities as machines, many have envisioned the ideal of a livable city. These visions have changed over time, reflecting what is perceived in each point of time to be the ideals and needs in their contexts. Many conceptualizations of livability, though well intended, were rendered obsolete too soon as these grand plans with their grand narratives often simplified urban form and didn't engage meaningfully with the complex reality of life in a city. For example, during the post world war II boom in construction in Europe and North America, the ideal livable place for families with the agency to choose where they could live was conceived to be the low dense suburban housing developments propped by the automobile, which is now replete with problems of long commuter times, inability to sustain diverse amenities and most of all the inherent unsustainability as an urban form to facilitate further urbanisation.

Richard Sennett distinguishes between the two aspects of cities, the ville and the cité. While the ville refers to the built urban environment or the built city, the cité deals with the way of life, the lived city (Sennett, 2018). This is an important distinction to be made in the livability discourse as top-down envisioning of livability is disconnected from what people want and need in their everyday lives. It is not to say that engaging with people to understand their perceptions is the only solution as what people want and need changes over time as well. It would help to illustrate this with a specific example.

Livability in the Dutch Context

In the Dutch context, livability has played a predominant role in the city building process, however the conceptual boundary of what is referred to as livability has changed multiple times since the beginning of its usage in the late 50s.

1950s

Initially liveability was positioned to contrast life in Dutch countryside to that of Dutch cities. As the villages couldn't sustain diverse amenities, they were viewed as less liveable in relation to cities. Here livability meant an access to opportunities and choices in living, working and entertainment.

1960s-1970s

The urban social movements of the 60s and 70s bought new meaning to the concept of liveability and politicised it. Here livability was conceptualised as a post-materialist critique of the excesses centered around economic growth in urban policy making and the modernist logic of production of space. Since in the Dutch welfare state healthcare and employment were guaranteed as a given, agency over the quality of the environment became a concern for Dutch citizens. Kaal (2011) argues that livability represented citizen rights that had to be safeguarded by a new approach to urban democracy.

1970s-1980s

The urban renewal and restructuring efforts of the 70s and 80s, focused on active citizenship. A livable environment was not only a 'right' of a citizen, but also their duty for which they are to be made responsible along with the government. This marked livability as a social concept that now looked at the role of people in creating livable environments (Kaal, 2011). Uitermark (2009) argues that this could be viewed as a way in which urban social movements from the era were co-opted into government systems .

1990s

In the 90s, with neoliberalisation, the role of national governments in municipal affairs started reducing. Housing corporations(*woningcorporatie*) were privatised and became a key actor in neighborhood management. Around this time, livability was defined at the scale of a neighborhood with sufficient amenities and a balanced composition of the population (Kaal, 2011; Uitermark, 2009). Instead of the resident's perception of livability, the nature and composition of the resident population became the defining factor. Unemployed, single-parent families, ethnic minorities were undesired and negatively affected the livability of neighborhoods. State sponsored gentrification was a tool to reconfigure the population mix of neighborhoods by changing the housing mix through the selling off of social housing stock (Kaal, 2011; Uitermark, 2009; Uitermark, Hochstenbach, & van Gent, 2017).

2000s

The *leefbaarometer* or the livability Index that emerged in the 00s as a popular policy tool that helps locate complex social problems at neighborhood scale and reduce it to a single universal measure across the nation, helping authorities to rank neighborhoods and prioritize their policies and evaluate their eventual degree of success based on the metric (Uitermark, Hochstenbach, & van Gent, 2017).

The liveability index is used to identify deprived neighborhoods for state sponsored gentrification and also in the operationalisation of targeted acts for deprived neighborhoods such as the Rotterdam act, which prohibits poor households with limited residential history in Rotterdam from moving into certain deprived neighborhoods.

Scholars have questioned the efficacy of such methods as Uitermark, Hochstenbach, & van Gent (2017) argues that this helps feed inherent biases towards populations perceived to be undesired through the statistical politics of exceptional territories and doesn't improve ground reality substantially.

"Statistics—selectively mobilized and interpreted to justify decisions that would otherwise remain infeasible—open up greater space for political decision-making. In such cases, statistics become ammunition to show that policies must now go beyond what was once thought possible and acceptable, with administrators retaining the discretion to ignore or relativize guidelines and metrics when the numbers do not support their policy goals. Far from dictating policy or annulling politics, statistics can inform, justify and normalize previously unacceptable policy practices."
(Uitermark, Hochstenbach, & van Gent, 2017)

Since the livability index focuses on high homeownership rates, high house prices, low unemployment rates, high income levels, and a low presence of ethnic minorities as leading indicators of livability, neighborhoods that went through urban renewal showed an increase in the livability index, while other indicators of safety, satisfaction and social cohesion didn't show marked improvements (Permentier, Kullberg, & Van Noije, 2013, p. 16 as cited in Uitermark, Hochstenbach, & van Gent, 2017).

Sustainability and Livability–Relation and operationalisation

With sustainability and livability as concepts in urban development being established, let us look at how they are related and how they are operationalized in practice. Firstly, sustainability and livability are interconnected concepts. Ruth and Franklin (2014) state that "it is conceivable that high levels of livability can be experienced temporarily while undermining ecosystem structure and function, over the long haul livability is intricately tied to environmental sustainability". The biophysical environment defines the boundaries that dictate the ability of cities and its people to live and thrive, however the resilience of those boundaries are influenced in complex ways by cities and its people (Ruth & Coelho, 2007; Raworth, 2017).

Since livability focuses on the 'here' and 'now', it is easy for planners and policy makers to solve solutions in the short-term. However, without considering the long term sustainability of solutions, they risk turning obsolete or create negative externalities elsewhere.

The sustainability/livability prism as conceptualised by Godschalk (2004) offers a way to perceive the potential synergies and conflicts between sustainability and livability. Another model is offered by Raworth (2017) in the form of the doughnut economy model which conceives livable communities balanced on social foundations, existing within the planetary boundaries, thus sustainable in the long run. These models help us see the interconnectedness between them, but don't establish a hierarchy amongst the measures to improve livability and sustainability and don't provide a way to solve conflicts between the two.

Secondly, the way in which abstract concepts of livability and sustainability are operationalized today is through indicators as discussed above. The utility of indicators lies in the process of converting complex systems and processes into simpler and measurable metrics through reduction. This process involves a loss of information. Often, contextual and qualitative information which are difficult to quantify are discarded because it is considered to be unimportant at the scale and institutional setup within which they are conceptualised (Porter, 1995). Indicators typically tend to be developed without an explicit consideration of an ethical premise or the underlying moral assumptions and sometimes biases embedded in their conceptualisation as seen in the example of the leefbaarometer or the livability index in the Dutch context. Fredericks (2014, p. 6, as cited in Mair et al., 2018) argues that "there is a widespread assumption in modern Western society that technical and ethical assessments are, and should be, completely separable". This needs to change since formulation of indices and indicators without an explicit attention to ethics runs the risk of ineffective indexes, or even counterproductive ones that drive people away from their vision of sustainability and livability.

Through the interpretation of multiple Indicators one could construct new information or communicate information about a system. This works best in a well understood and conceptually well defined system. Indicators are ill suited for fuzzy concepts with multiple, and sometimes conflicting conceptualisations of a system as a set of indicators would only communicate information about a partial understanding of a system (Mair et al., 2018). Therefore, one should be careful while using indicators built on partial understanding of a system, so as to not consider them as objective truth, but as a reflection on how an individual or group conceptualises that system, with potential for biases.

A third perspective towards integrated urban development could help us here in evaluating and reconciling the differences between livability and sustainability–Spatial justice. "Spatial justice as such is not a substitute or alternative to social, economic, or other forms of justice but rather a way of looking at justice from a critical spatial perspective' (Soja, 2013, p. 60). Spatial Justice provides an evaluative framework that also enables action to make liveable communities and sustainable cities a reality.

Just City

Fainstein (2010) evaluates justice in its spatial form in the city as the dilemma between the process of development and the redistribution of the resultant boons and burdens, in which the benefits for the collective should override the benefits of individuals or groups in power. She also makes the distinction from other marxist scholars such Lefebvre, Harvey, Castells and Marcuse as well as communicative planning theorists in that positive social change is evolved simultaneously from urban social movements as well as public policy in western liberal democracies (Fainstein, 2010).

Fainstein conceptualises justice in a city as the interplay between the recognition and nourishment of diversity, equity and democratic deliberation embedded in the city building process.

The conceptualisation of democracy in Fainstein's just city is an extension of the practice of communicative rationality within the profession of urban planning, which approaches planning as an argumentative practice, where urban processes and their problematization are socially constructed and their resolution is the result of the deliberation between different stakeholders including citizens. This would help us in addressing the problem of indicators representing a partial understanding of the system through a democratic deliberation paving way for an understanding of local reality.

However, Fainstein argues that just and inclusive processes do not always equate to just outcomes as it is still subject to parochialism and corruption. Existing social hierarchies and political capital are not easily overcome through democratic deliberation alone, however it can be an important source of local knowledge for policy makers and practitioners. The sustainable development targets and livability metrics assigned nationally, need to be contextualised at the neighbourhood level. Institutionalised democratic deliberation as part of the planning process provides active citizens of social movements and grassroots organisations an avenue and agency to be a part of an integrated urban development process that is transparent and accountable.

The second pillar of a just city according to Fainstein is Diversity. In her usage diversity indicates the physical environment as well as social relations, and refers to policy ambitions that go beyond encouraging acceptance of others to include the social composition of places.

Diversity needs to be understood in relation to identity. Fainstein says In the context of Western liberal democracies, "Liberal democratic theory, by treating individuals atomistically, ignores the rootedness of people in class, gender, cultural, and familial relationships. In doing so and by placing liberty at the top of its pantheon of values, it fails to recognize the ties of obligation that necessarily bind people to each other and also the structurally based antagonisms that separate them." (Fainstein, 2010, p.44).

This is exacerbated by the recent trends in the context of the welfare states of the west, where the nation-states are based on race identities. Interdependent solidarity through the welfare state is conditional to citizenship which is built on race identity to a large degree and is challenged by an increasing immigration and ethnic diversity in the last few decades (Putnam, 2007). To deal with this diversity, nation-states are assuming an increasingly assimilationist agenda over a multicultural one, projecting the majority culture as the normative value system (Brubaker, 2001).

"Group differentiation is both an inevitable and a desirable aspect of modern social processes. Social justice … requires not the melting away of differences, but institutions that promote reproduction of and respect for group differences without oppression" (Young, 2011, p. 47, as quoted in Fainstein, 2010, p. 43). Under this conception, the argument for spatial justice in cities focuses on social differentiation without exclusion' (Fainstein, 2010, p. 43).

Thus she conceptualises the just city as one with diversity where different groups of people have the ability to find common ground supported by state institutions, and are able to live alongside each other in harmony, without their identity being diluted or it being trampled by market interests. I would expand on this conceptualization to include biodiversity as well. While flora and fauna traditionally don't have the agency to represent their interests, expert groups and academia could act on their behalf. While diversity in the traditional sense contributes to a liveable community, the expanded conceptualization to include biodiversity can ensure the recognition and nourishment of natural ecosystems that provide ecosystem services to sustain human life longer in cities.

Fainstein's third pillar of a just city is equity. She chooses equity over equality as the latter according to her is 'too complex, demanding, and unrealistic to be an objective in the context of capitalist cities' (Fainstein, 2010, p. 36).

Fainstein adopts a version of distributional equity which aims for fairness in policy objectives specifically catering towards the betterment of those who would struggle under deprivation if not for state support. This is against the usual basis for policy analysis, which is the utilitarian perspective based on liberal political theory in which public policy is expected to provide the greatest benefit for the greatest number while not focusing on those who are left behind. This is a crucial criteria in the livability discourse as we see time and time again, under the guise of improving the livability of neighborhoods, further segregation and marginalisation of vulnerable populations through processes of gentrification continue unabated (Musterd, 2005; Kaal, 2011; Uitermark, 2009; Uitermark, Hochstenbach, & van Gent, 2017).

Democracy, diversity and equity are not always aligned and might lead to conflict, but in such a case equity should be preferred, as she argues public policy should give priority to actions that would benefit the less privileged as a matter of distributive justice.

The conceptualisation of spatial justice as constituting democratic deliberation, equity and diversity, provides an analytical framework that helps understand and evaluate the performance of policies and planning practices towards an integrated urban development resulting in livable communities and sustainable cities.

City as a Complex System

Complexity theories are interdisciplinary theories that are increasingly acknowledged in the social sciences; Urry (2005) even speaks of a complexity"turn"in social theory. There are a wide array of complex systems theory and there isn't a single globally adopted complexity theory. However, there are a family of theories with similar ontological stances have been developed in an interdisciplinary manner focused on opposing reductionism and linear causal thinking. Complex adaptive systems, actor network theory and assemblage theory are some examples. These theories operate on very different levels and are what Beauregard (2012) calls as grand theories, establishing "formal arguments using precisely defined concepts and highly specified relationships . . . set out to capture the underlying logic of thereality under investigation"(Beauregard, 2012, p. 477).

Social change in this perspective is the non-reductible outcome of multiscalar interdependencies and interactions, rather than established narratives of powerful single drivers or linear cause-effect chains producing similar outcomes in different contexts. Rather, context and path dependencies are important frames that explain the different outcomes of similar trends.

Holling & Goldberg (1971) were the first to outline the similarities between urban systems and ecological systems, including their functioning as interdependent systems, their historicity, their spatial linkages, and their nonlinear structure, with both systems appearing to have considerable internal resilience within a certain domain of stability (Marcus & Colding, 2014). They viewed a city not as a homogenous structure, but rather as "a spatial mosaic of social, economic, and ecological variables that are connected by a variety of physical and social dispersal processes" (Holling & Goldberg, 1971, p. 227).

Marcus & Colding (2014) in their integrated theory of spatial morphology and resilient urban systems, argue how urban systems and their spatial form could be understood in terms of a resilience framework by building on the work of Holling & Goldberg (1971). By putting urban systems in the context of the adaptive renewal cycle, they evolved a way of analyzing urban systems by merging key notions and insights in spatial morphology and space syntax methods with that of resilience science.

The attributes that bring about resilience in complex adaptive systems have been spatialised into a generic network model for resilient urban systems by Marcus & Colding (2014), which by extension also brings in the possibility for informed intervention in urban systems by way of design.

However, when reading cities as complex adaptive systems, one shouldn't assume they constitute "the natural order" of things, but as they mature, self-organizing capacity tends to wane down in urban subsystems. An increased knowledge of the attributes that lead to resilience in urban systems can help urban planners and designers counteract undesirable development trajectories by building resilience in urban systems.

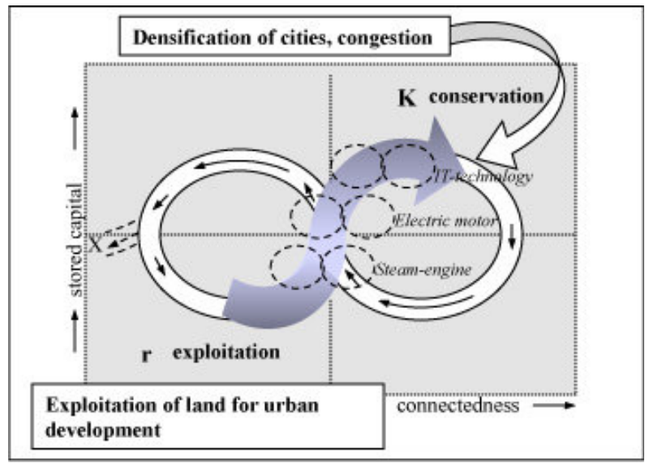


Fig 5.1: Urban growth in the context of the adaptive cycle. Source: Marcus & Colding (2014)

Assemblages

Deleuze and Guattari (1987) conceptualised what is understood today as the assemblage theory. It is a way of reasoning that splits away from causal, dichotomic thinking (relations as a rhizomatic structure rather than as a hierarchical tree) towards a multitude of interconnections that continuously shape and reshape the phenomena that social research aims to understand. DeLanda (2006) further developed this theory to inform understandings of societies, applying it to, among other things,cities and neighborhoods.

Assemblages are entities, assembled of component parts,"wholes whose properties emerge from the interaction between parts,"characterized by relations of exteriority and by historical processes (DeLanda, 2006, p. 5). To conceptualise a phenomena as assemblages is to consider them as constantly changing configurations of component entities, materialities, infrastructures, different actors and even policy documents, interrelated in a multitude of connections and relations.

Inspite of their differences, approaches of assemblage theories and complexity theories share a systemic perspective. They disregard direct cause–effect relationships and look at feedback loops, unexpected processes, and new, emerging characteristics.

A. Assemblages are fundamentally relational in their conceptualisation. They are composed of varied entities linked together to form an emergent whole. The entities themselves are further non-decomposable and thus assemblages consist of relations of exteriority. This implies a certain autonomy of the entities (people, objects, etc.) from the relations between them and, the properties of the individual entities cannot explain the properties of the resultant assemblage. (DeLanda 2006, 10).

B. Assemblages are heterogeneous. It is not categorical and thus there are neither rules on what could be related (humans, flora, fauna, policy documents and ideas) nor a heirarchy of importance within an assemblage. It transcends the nature–culture divide and are socio-material (Bennett 2010).

C. Assemblages are productive. They produce new territorial organisations, new behaviours, new expressions, new actors and new realities. This also means that they are not primarily mimetic; they are not a representation of the world (Müller, 2015).

D. Assemblages are in a dynamic of deterritorialisation and reterritorialisation. This dynamic forms the central axis of an assemblage, where 'reterritorialized sides, … stabilize it, and cutting edges of deterritorialization, … carry it away' (Deleuze & Guattari, 1987,p. 88). Assemblages establish territories as they emerge and hold together but also constantly mutate, transform and break up.

E. Assemblages are desired. 'Desire constantly couples continuous flows and partial objects that are by nature fragmentary and fragmented' (Deleuze and Guattari 1983, 6).3 Assemblages thus have a corporeal component.

Conclusion

Increased understanding of the interconnectedness of the global biophysical systems and the urgency of climate change has led to sustainability becoming a key driver in urban development along with a better operationalized but still contested concept of livability. While both the concepts are interconnected, they were conceptualised in different periods for different purposes and provide a worldview that is not always compatible.

Thus operationalizing sustainability and livability together at the scale of the neighborhood towards integrated urban development is a challenge for planners and policy makers. Though livability could be envisioned on its own, establishing it in relation to sustainability ensures long term viability of the urban development. Existing indicators as it is used today, do not provide a complete understanding of the desired goals of livable communities and sustainable cities, while leading to market and state driven processes that create antithetical realities as opposed to what they set out to achieve.

Here an expanded reading of Fainstein's (2010) conceptualisation of a just city as consisting of democratic deliberation that helps towards the grounding of indicators, nourishment of diversity that helps build common ground while preserving identity and distributive equity that ensures can help us in operationalizing both livability and sustainability towards an integrated urban development.

The fuzzy conceptual definition of livability and sustainability would continue to pose a challenge in the systemic understanding of the cause and effect as established. Revisiting the concepts from an alternate ontology as established in assemblage theory and complex adaptive systems could provide an expanded understanding of the relation between the concepts from a systemic perspective.

6

Analysis

In this chapter, we'll expand on the methodology of this thesis project, focusing on the research questions, conceptual frameworks, methods and planned outcomes.

6.1 Bijlmer: History
6.2 Infrastructures
6.3 Urban Form
6.4 Accessibility
6.5 Density
6.6 Diversity
6.7 Blue and Green Networks
6.8 Energy
6.9 Waste
6.10 Governance
6.11 Stakeholder Analysis

6.1 Bijlmer: History

how it came to be

The Bijlmermeer is a cause célèbre in the history of Dutch housing and urban planning (Mentzel, 1990). At the time of its conception, it was the most expensive housing development plan.

The construction of the Bijlmer started in 1966. The design for the neighborhood, made by a team from the Urban Development Department of the Amsterdam Public Works Department, led by architect and urban planner Siegfried Nassuth, was inspired by the functional city ideas of the CIAM and the Swiss architect Le Corbusier.

It was a progressive concept at the time that had a strict division between living, working and recreation. Part of the philosophy is also the separation of car, bicycle and pedestrian traffic, which was strictly worked out in the original planning of the Bijlmermeer. The idea behind the separation of the traffic flows was to prevent traffic accidents and prevent cluttering. Modern man – according to Le Corbusier – was entitled to a quiet green living environment without traffic.

In the 1970s the first metro line in Amsterdam was built from Central Station to Bijlmermeer. This line was opened on October 14, 1977, the (later) lines 53 (Gaasperplas line) and 54 (Gein line). Metro line 50 (Ringlijn) opened in 1997, almost 20 years later. This goes from Gein (in Gaasperdam) along the Bijlmer to Isolatorweg in the Western Docklands . Amsterdam Bijlmer ArenA station (originally opened in 1971/1976) was extensively replaced and expanded between 2000 and 2007.

The Bijlmermeer was supposed to be a 'model district', the district for modern people. However, the Bijlmermeer became nationally known within ten years of construction due to social problems.

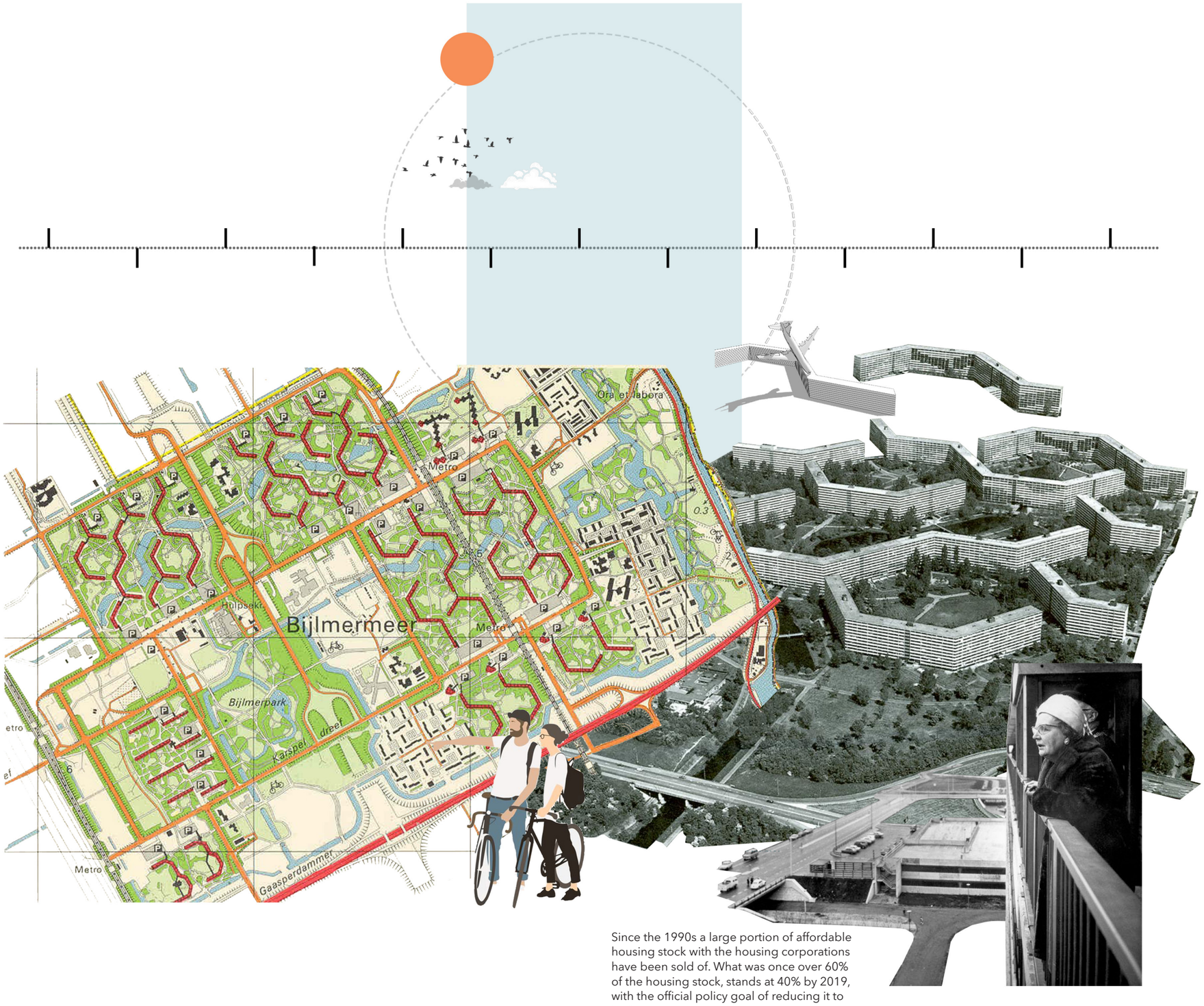
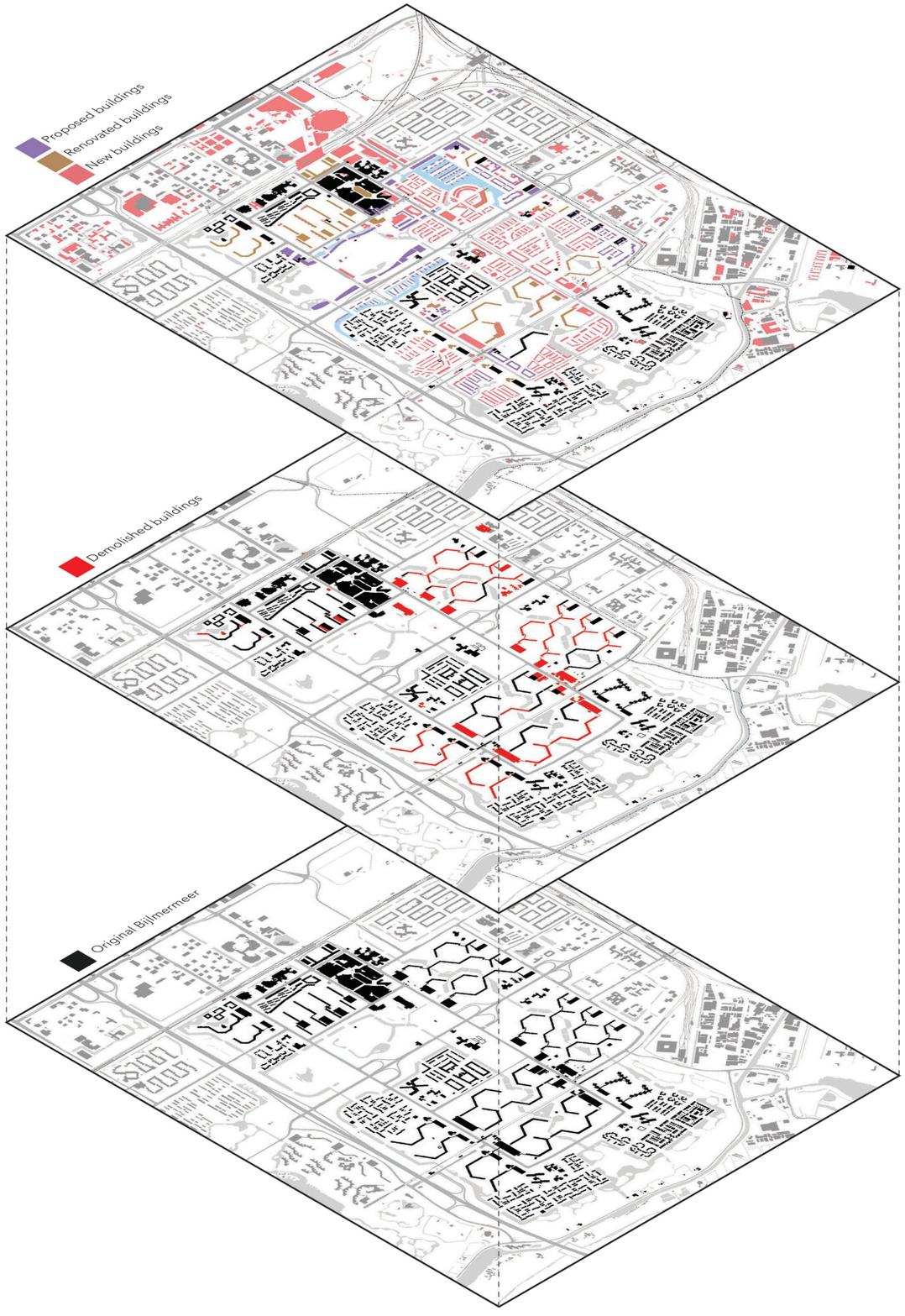


Fig 6.1: Collage showing original plan of Bijlmermeer

Since the 1990s a large portion of affordable housing stock with the housing corporations have been sold of. What was once over 60% of the housing stock, stands at 40% by 2019, with the official policy goal of reducing it to 35%.

Fig 6.2: The construction and transformation of Bijlmermeer.

Source: Projectbureau Vernieuwing Bijlmermeer



Because the level of facilities in the district lagged behind expectations at the time of construction and because the modern, spacious flats had to compete with new single-family homes in the region such as Almere and Purmerend, the middle class Amsterdam families for whom the district was built stayed away. The design for the Bijlmer lacked diversity in the housing supply, making it sensitive to developments in the Amsterdam housing market.

In the early 1970s, Surinamese (before the independence of Suriname still Dutch citizens) moved in large numbers to the Netherlands. Most of them moved to the big cities. However, they were kept out of old neighborhoods by landlords and city authorities. Part of the Bijlmer plagued by vacant land, in particular the Gliphoeve I flat, was initially opened to habitation by Surinamese. When they started to come to the Bijlmer, this policy was revoked by the housing corporations and in 1974, with the support of the Amsterdam squatters' movement, homeless Surinamese began to use the empty apartments. Their situation was legalized after pressure on the city council.

In time, however, deterioration occurred. Certain places in the Bijlmermeer were plagued by unemployment, crime and drug issues. Moreover, at the time of the design, the modern idea of the functional city turned out to be less effective than expected. The strict separation between living, working and recreation meant that some parts of the Bijlmer turned into deserted ghost towns during different time periods. The separation of traffic types led to a lack of social control and to unsafe pedestrian routes through lush greenery.

At the time, the area south of the current A9, now known as Gaasperdam, was referred to as the Zuid Bijlmer. High-rise buildings were originally planned as well: ten floors in the plan part of Holendrecht and a slightly lower six-storey high-rise in the plan parts Reigersbos and Gein. This high-rise proposal was scrapped and instead, neighborhoods with mid-rise and low-rise were realized.

While small scale renewal attempts were being made in these neighborhoods, the crash of a Boeing 747 cargo aircraft into the Groeneveen and Klein-Kruitberg flats on October 1992 was a turning point. Since then large-scale renewal operations were set in motion. A large part of the high-rise has been demolished and replaced by smaller-scale homes, including many housing in the owner-occupied sector. The remaining flats were to be thoroughly renovated. In addition, some of the originally elevated roads (the 'dreven') have been replaced by roads at ground level, by excavating the dikes and demolishing the viaducts. Most of the parking garages from the original layout were also demolished.

The stated aim of the renewal was to create a less one-sided population composition and a more pleasant living environment. The Amsterdamse Poort shopping center, dating from the 1980s, was also completely renovated in 2000. In 2006, the district office moved into a new office at Anton de Komplein. In 2009, the new Bijlmersportcentrum and the Bijlmer Parktheater were completed.

In recent years, more and more apartments and houses have been added. In the period between 2005 to 2008, the flat 'Grubrequeve' was renovated and many homes were built around the area around the Grubrequeve, including single-family homes and apartments. Grub NEO also had a purchase project called (Vereniging) KJEB, Koop Je Eigen Bijlmer, a cooperation agreement for the repositioning of 90 homes in Grub NEV, where buyers could buy a flat cheaply at the start of the renovation. A similar project was done at Kleiburg for the repositioning of 500 homes. In 2003, the Cultural Educational Center Ganzenhoef and De Kandelaar, a striking residential building with a number of church halls, were built in addition to Grubvooreve.

The intention was to keep the six flats in the G and K neighborhood around the metro track (in addition to Gruboneeve also Gooioord, Groeneveen, Kruitberg, Kikkenstein

and Kleiburg) with the surrounding public space as Bijlmer Museum.
The ideas of the designers of the Bijlmermeer are best worked out here. This area was designated a municipal Protected Cityscape in May 2019 as the ' Bijlmermuseum '.

The green courts have now been redesigned in the English landscape style and the Kleiburg flat, where an athletics track, tennis courts and a large playground were realized under the metro viaducts in 2001. Gravestein was renovated on the outside in 2013.

The stadium of AFC Ajax , the Johan Cruijff ArenA , is an important centrality in Amsterdam-Zuidoost. In addition to football matches, pop concerts are also regularly held here. The entertainment centers AFAS Live, Ziggo Dome, Pathé ArenA, a building with large-scale shops such as the Media Markt and the Villa ArenA furniture boulevard are also located along the ArenA Boulevard. Pepsi Stage was demolished in 2007 to make way for a large new entertainment and shopping center, the GETZ Entertainment Center. In 2010, the plan was shelved due to the credit crisis.

Amsterdam Bijlmer ArenA station was rebuilt on the same site and reopened in October 2007. Since then the station has been an important hub for train, bus and metro.

Discussion

We saw a brief overview of some of the important moments in the development of the Bijlmermeer. The urban development which was supposed to be a flag-bearer of modern Dutch living was anything but that. What do we learn from this whole experience?
The development was driven by a top down technocratic process which was built on modernist ideology and grand-narratives of life. It was unable to respond to the changing conditions on ground. Between the proposal and completion, local and global changes within the Amsterdam context and the global Dutch colonial kingdom's context. For example, cheaper owner occupied housing that was made available in the region at Lelystad and Almere proved more attractive to the Dutch middle class that Bijlmermeer was targeted at. A large exodus of Surinamese to the Netherlands, who were discriminated from the old neighborhoods, occupied housing in the Bijlmermeer, separated from the rest of the city. Since a large number of new residents didn't have social networks that overlapped with people in the rest of the city, where jobs were available, they were deprived of potential job opportunities, paving way for a history of concentrated poverty.

While the physical design addressed most of the problems of the era and proposed innovative solutions for them, the design 'worked' as a whole and not in parts, thus the years leading to its completion was filled with a lot of problems, due to a lack of amenities and proper access. This was due to budget cuts and design changes during the process, such as reducing the number of lifts in an apartment to the metro connection to the city, delays and changes to some of the infrastructural preconditions made Bijlmermeer less than habitable.

Some of the proposed solutions to existing problems were problematic. Modernist mono-functional zoning deprived Bijlmermeer's potential to develop into a bustling urban centre. The transport design put cars central with grade separation amd a garage to garage design. Most of the garages were largely empty. Since they were static spaces they also became perfect breeding ground for crime and anti-social activities. The grade separation led to a creation of a vast expanse of walking and cycling network in the ground plane. But they passed through large unarticulated green spaces with less social control and were less than ideal at the end.

The second order, third order effects of initial mistakes was too difficult to rein back. Eventually the renewal of the Bijlmermeer continued to do the same mistakes from a procedural perspective. Opting for top-down demolition and reconstruction of a large part of the urban fabric. Aspects of landmark driven urban renewal was attempted through the construction of Johan Cruyff arena and the upgradation of Amsterdamse Poort. However, they were framed to serve the larger context of Amsterdam both physically and mentally through branding and association and not the local Bijlmer context.

Conclusion

This historical reading of urban development of Bijlmermeer leads to some general conclusions that criticise Modernism. Questioning notions of monofunctionality, car-centric design and grand-narratives of human life. Since then, a lot has changed as to how urban development in Amsterdam happens. The city wants to be mixed-use, active transportation friendly and so on.

However, the challenge of adapting these urban fabrics that followed a different social and developmental logic is still there. While we shortly discussed the shortcomings in the original design and the renewal process, there is still potential for redemption. The urban fabric of Bijlmermeer has large buffers built into it, which are adaptive to future use. Not only that, in the recent years, there has been an increasing politicization onf organising at the grass root levels in Bijlmermeer leading to strong community associations that can lead redevelopment from a community friendly perspective.

However, decisions on what is fixed and what's flexible needs to be made, in terms of existing stocks. In the further chapters, we'll look closely into the infrastructure and urban form of Bijlmermeer to understand its current state and how conducive it is to change.

A detailed timeline of the construction and renewal process is in the annexure.

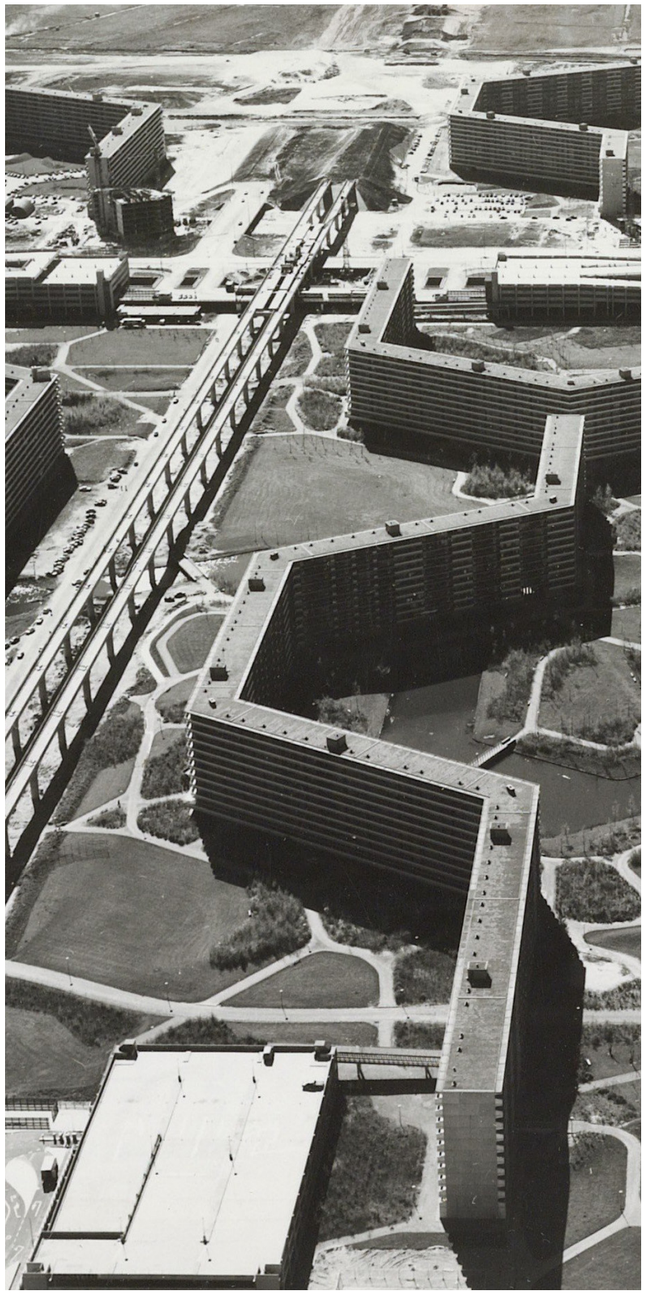


Fig 6.3: Archival photo from the construction of Bijlmermeer and the metro.

Source: Amsterdam City Archives

6.2 Infrastructures

Amsterdam Zuidoost has a lot of infrastrucural space owing to its origin story. It was a progressive concept at the time of its construction to have a strict division between living, working and recreation. Part of the philosophy is also the separation of car, bicycle and pedestrian traffic, which was strictly worked out in the original planning of the Bijlmermeer. The idea behind the separation of the traffic flows was to prevent traffic accidents and prevent cluttering; modern man - according to Le Corbusier - was entitled to a quiet green living environment without traffic.

This led to a lot of footpaths and cycletracks that are not along motorways, but with their own logic of movement, creating a lot of wasted infrastructural space.

Along with the elevated motorways, the city district also has three metro lines in two metro tracks running through the neighborhoods, slicing it into pieces.

With the recent impetus towards climate adaptation, emission control and intelligent waste processing in relation to circular economy, a lot of new onground, streetlevel infrastructural objects have started to occupy space on the streets.

Infrastructural space could be conceived as trans-scalar. For example, the national highway network operates at the national scale, however, it interfaces with urban fabrics at the neighborhood scale it passes through as well. A study of energy related infrastructural space could take us from wind farms in the north sea and sub-stations in Diemen to the transformer at the street corner and the reading metre under the staircase of the house. However, within the scope of this thesis, we will look at infrastructural space through the spatializing of infrastructural systems such as road and electricity networks at the scale of the Zuidoost city district. In eventual detailing of specific systems such as energy and waste, I'll expand on this trans-scalar nature in chapters 6.7, 6.8 and 6.9.

Based on the conceptual and analytical frameworks detailed in Chapters 4.4 and 4.3, the nature and logic of Infrastructure and Urban form embeddded the territory leads to the emergence of the specific properties of livability and sustainability and in this chapter we focus on understanding the infrastructural space in Zuidoost.

6.2.1 Road and Rail Network
To understand the basic structuring logic behind the transport network and how it guided urban development.

6.2.2 Energy Network
To understand the nature of energy network at the scale of the city district.

6.2.3 Observations
Smaller observations made during site-visit are bought together to capture the nature of infrastructural space at eye-level.

6.2.4 Management
To understand the temporal aspect of management of infrastructural systems and how it interfaces with the urban development process.

Finally, the opportunities and urgencies identified on the basis of this analysis are synthesised.



Fig 6.4: An archival photo of the space under the metro tracks through the Bijlmer Oost neighborhoods.

Source: Bijlmermuseum

6.2.1 Road/Rail Network

A large portion of the land surface in Zuidoost is dedicated to extensive transportation infrastrcure split across motorways, cycletracks, footpaths and train networks.

Add to the fact that these are not along consolidated street sections, take up a lot of space including buffer spaces. Most of these surfaces are not permeable and thus contribute immensely to high surface runoff.

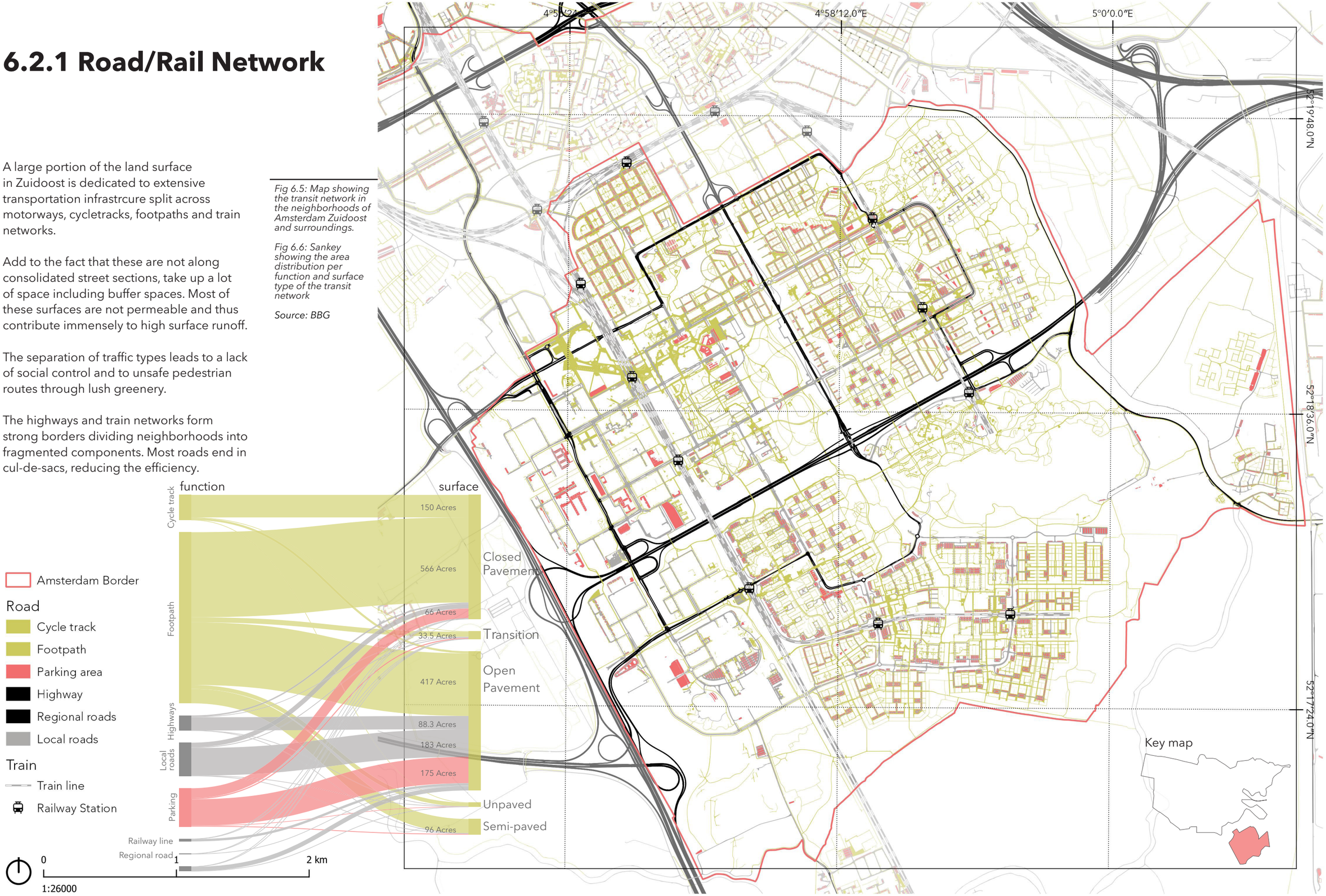
The separation of traffic types leads to a lack of social control and to unsafe pedestrian routes through lush greenery.

The highways and train networks form strong borders dividing neighborhoods into fragmented components. Most roads end in cul-de-sacs, reducing the efficiency.

Fig 6.5: Map showing the transit network in the neighborhoods of Amsterdam Zuidoost and surroundings.

Fig 6.6: Sankey showing the area distribution per function and surface type of the transit network

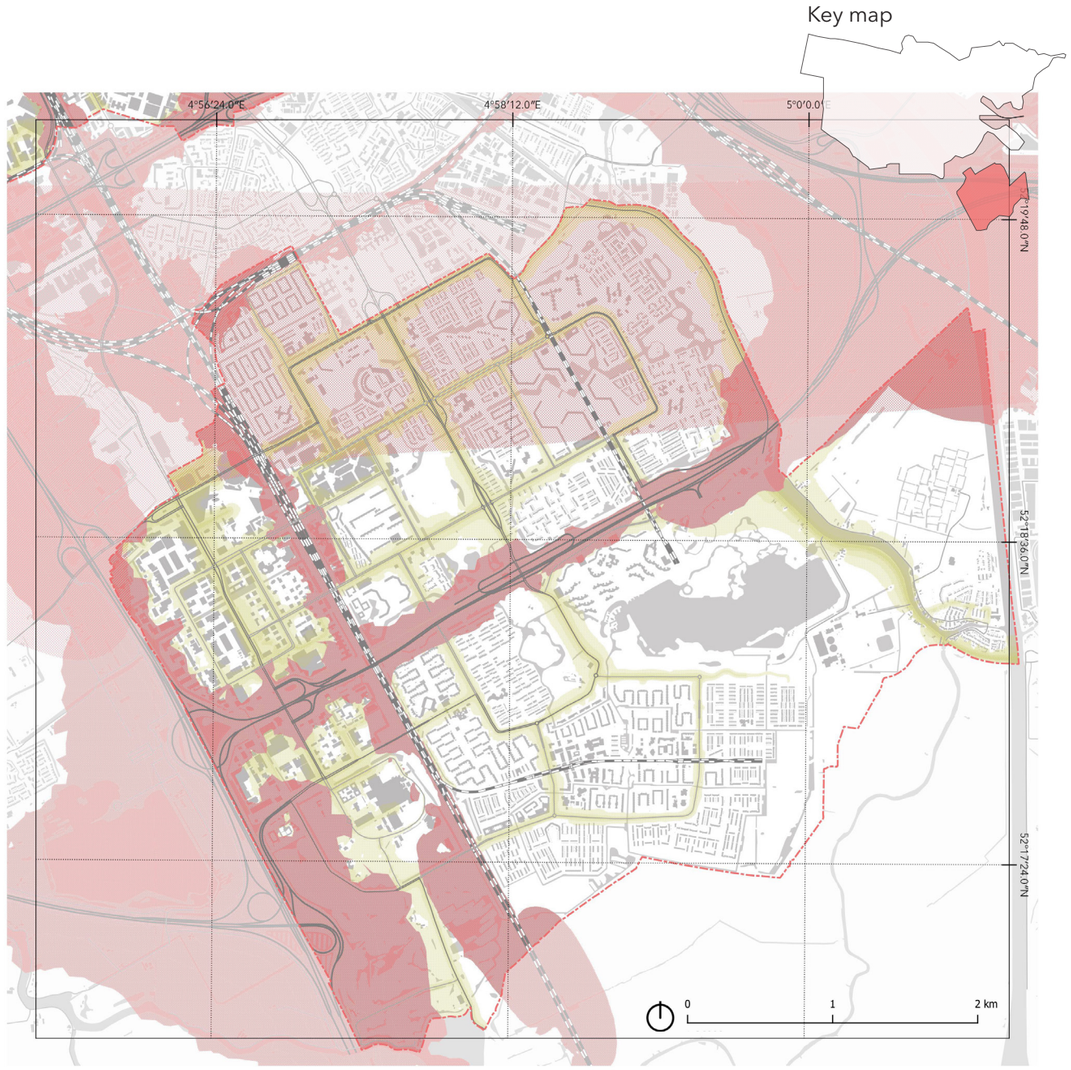
Source: BBG



6.2.1.1 Noise Contours

Fig 6.7: Map showing noise contours along the transit network in Zuidoost.

The map doesn't factor in Gaasperdammertunnel



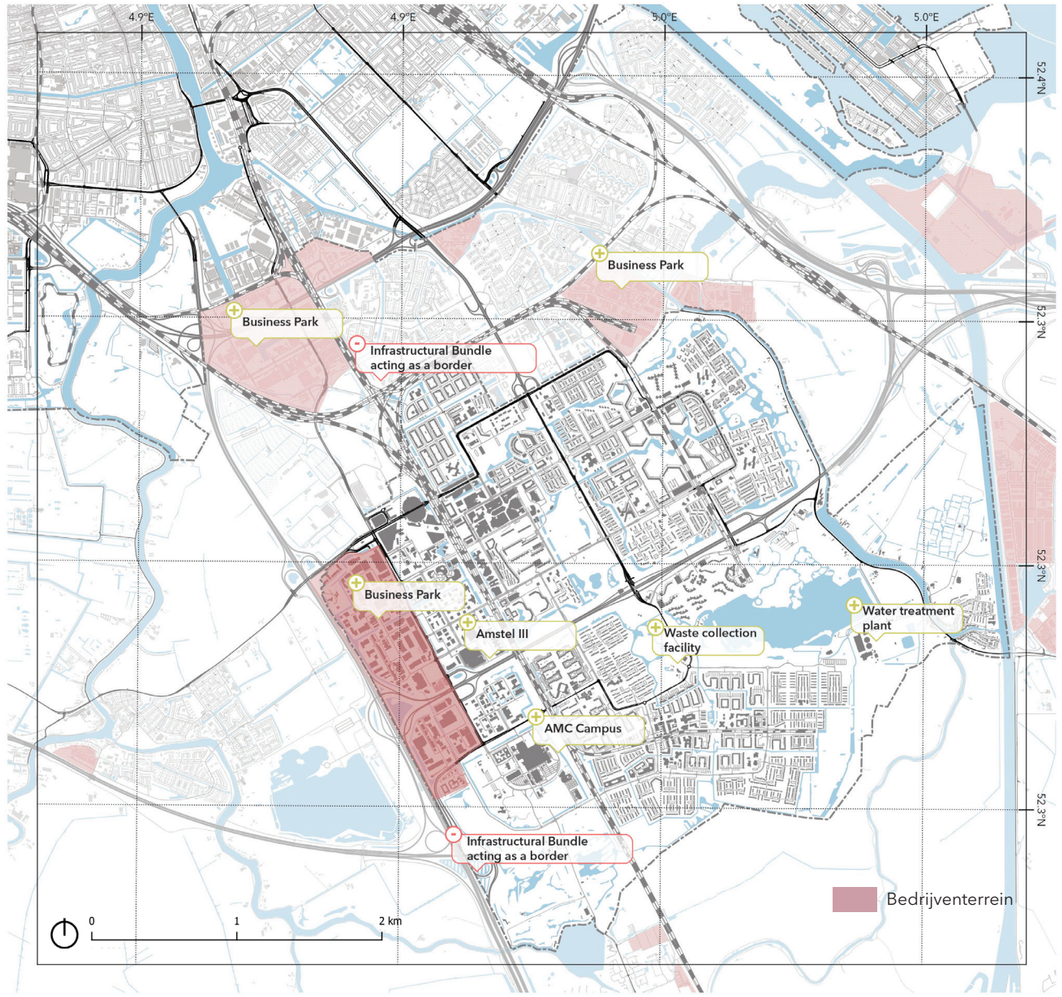
Since the city district has a relatively large number of highways and train tracks running through it, the residents are exposed to considerable noise pollution.

The noise contours also pose considerable restrictions in terms what spaces could be occupied for housing and other productive functions. The elevated roads and setback of buildings allow noise to be heard at longer distances than a comparable at grade road with buildings along the edge with similar traffic conditions.

The Gaasperdammertunnel along the A9 reduces this nuisance to a large degree. However, the elevated metro tracks and other arterial roads continue to cause nuisance to the residents.

Fig 6.8: Map showing major infrastructural corridors at the Metropolitan scale in relation to Amsterdam.

6.2.1.2 Metropolitan scale



At the metropolitan scale, the A2 forms a border on the western edge of the city district.

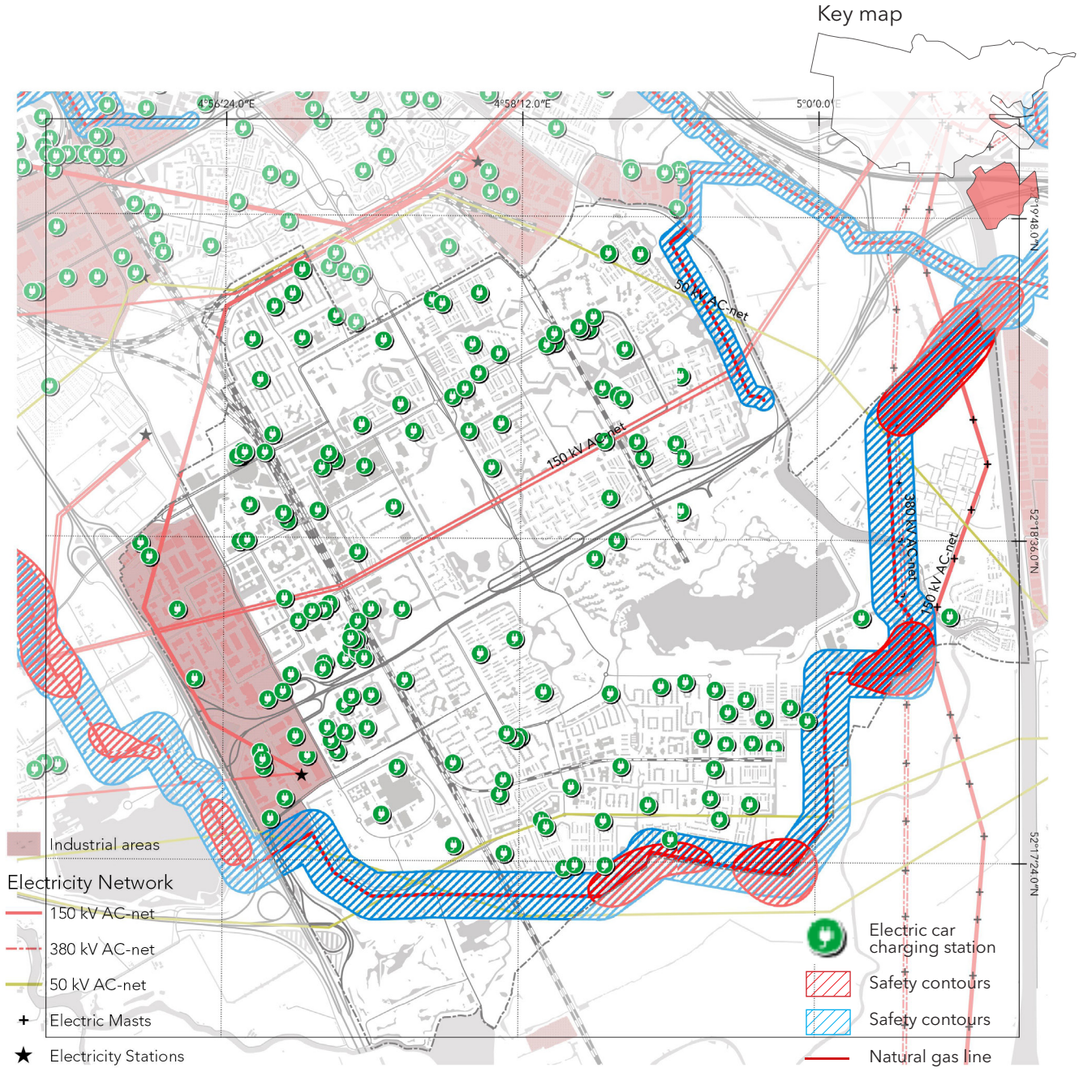
To the North, even when not considering the administrative boundaries, railway and metro tracks and eventually the A10, form significant metropolitan scale borders that separate Zuidoost from the rest of Amsterdam.

To the east and south of the city district, pastoral lands, canals and rivers form the border. These natural and manmade features are productive spaces and infrastructures in their own right.

Though theoretically greenfield developments are possible beyond the current boundaries spatially, the city district saddles the administrative border of the province of North Holland along its southern edge, and any further expansion to the south woruld be in Utrecht, which leads to a lot of complexities from an administrative perspective.

6.2.2 Energy Network

Fig 6.9: Map showing the energy networks in the neighborhoods of Amsterdam Zuidoost and surroundings.



Another important infrastructural component making life possible is the energy network. Most of the high voltage lines running across the city district are underground, however the lines to the east are aboveground, and thus require a considetable amount of buffer space around them for safety. These could be moved underground for optimal utilisation of the eastern borders of the Amstelland area. The gas network running along the southern border would be obsolete in the next few decades, with the transition to district heat networks.

Compared to rest of Amsterdam, Zuidoost has less number of electric car charging facilities at the moment. Eventhough a large portion of people in Zuidoost use cars for their personal transportation needs, only a small sub segment use electric cars at the moment, which might change over time.

Fig 6.10: Collage showing observations on the infrastructural systems in Zuidoost.

Images from Google earth, Google Maps and Author

6.2.3 Observations

Antithetical to the urban form of Amsterdam Centre, Zuidoost's infrastructure and urban form promotes the use of car to a large degree. With the housing shortage and the cry about lack of space for climate adaptation, large off-street surface parking is a relic of the past that requires rethinking.

In the past decade, a lot of investments on segregated waste collection has happened. However, there is lot of scope towards improving this infrastructure and social processes surrounding itsince

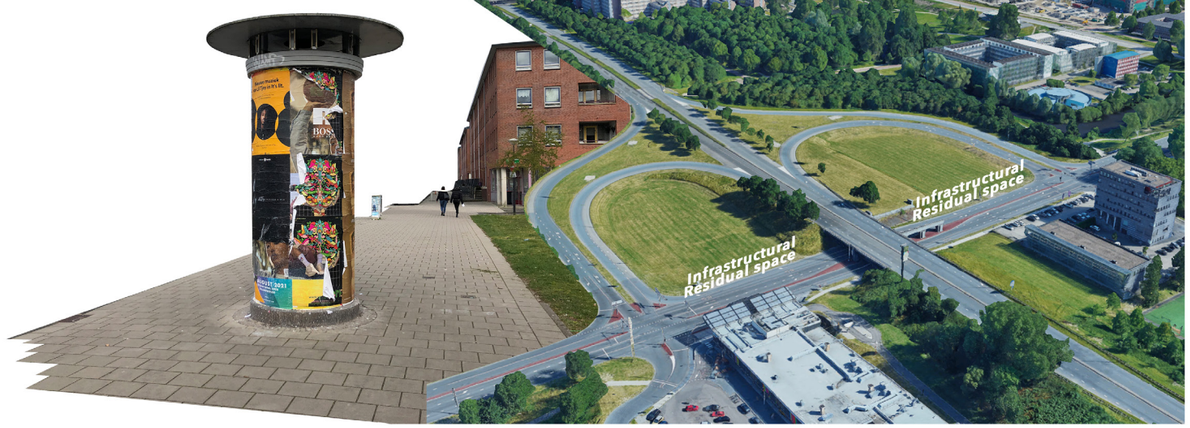








The wide variety of infrastructural objects that occupy street space currently and are scheduled to occupy street space require considerable design thinking to integrate them effectively in the public realm. Currently they stand as sore thumbs that are appropriated randomly



Since environmental nuisance and protection laws operate in a different paradigm compared to urban development rules and regulations, a large amount of buffer spaces next to infrastructure is seen around Zuidoost. An integrated approach could put these spaces to better use.

6.2.4 Management

Infrastrucutural objects in the public realm have been occuping an increasing amount of space over the years. Both at the surface and the sub-surface levels.

Each infrastructural entity overground and underground from street furniture and waste containers to railway tunnels and sewer systems is the responsibility of a wide range of actors and entities that own and maintain these over time.

This creates a complex system of spatial claims on the street surface and sub-surface, most of which is difficult to map and co-ordinate due to the inherent complexity in existing operational systems. has its own life span and maintenance period. Mapping the life span of the various entities in public space on a time line sheds light on when exactly which entity needs to be tackled.

Determining the transition points within the lifecycle of a certain street or square can help to define ideal synergetic times, when construction processes, tendering and operational procedures could be combined to reduce nuisance for citizens while also reducing cost for the municipality and other stakeholders. Alternatively, Rethinking infrastrucutral objects as commons under community control could be a way to streamline maintenance.

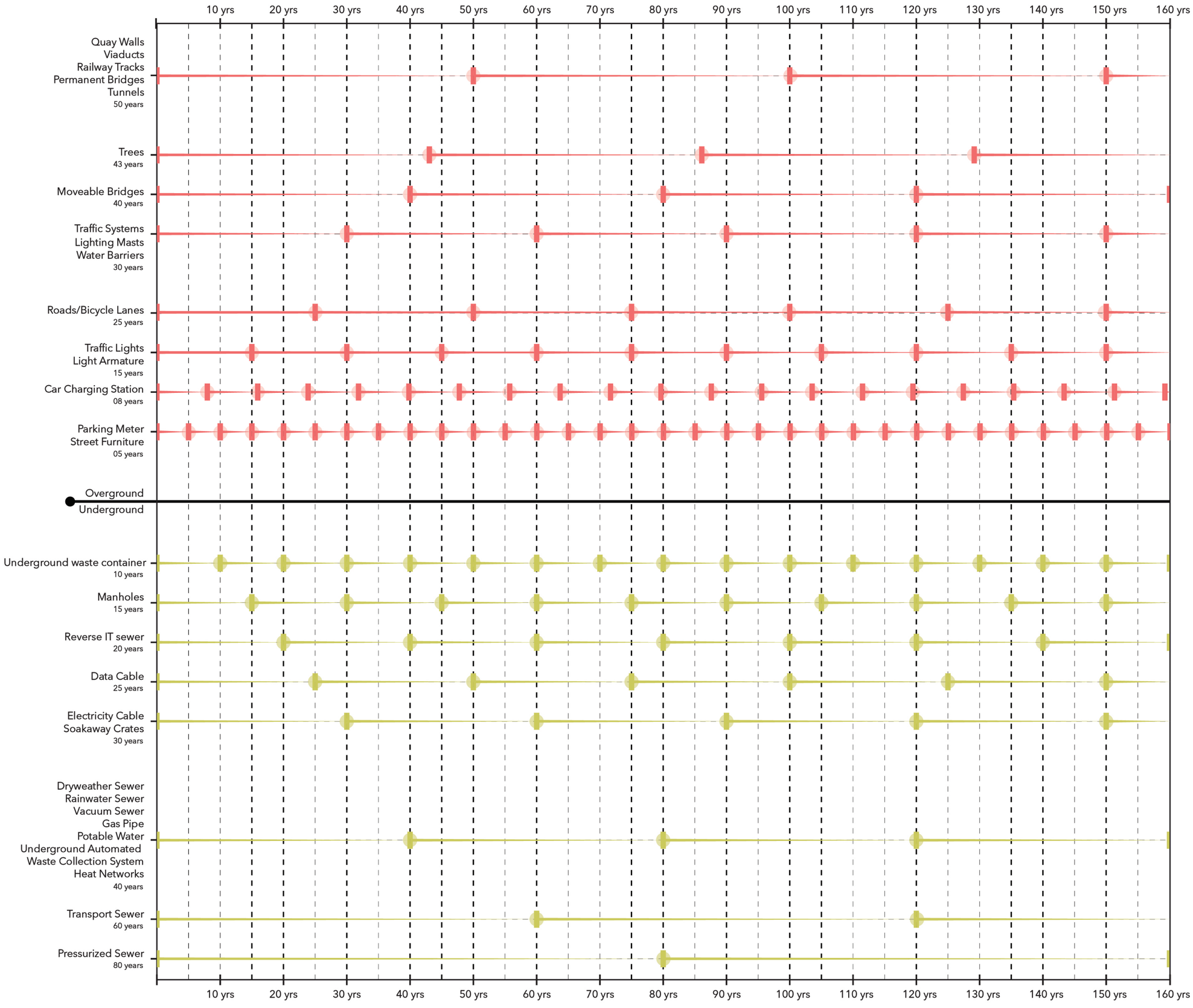


Fig 6.11: The lifecycle of infrastructural entities overground and underground

Data source: Integrale Ontwerpmethode Openbare Ruimte, City of Amsterdam

6.2.5 Opportunities and Urgencies

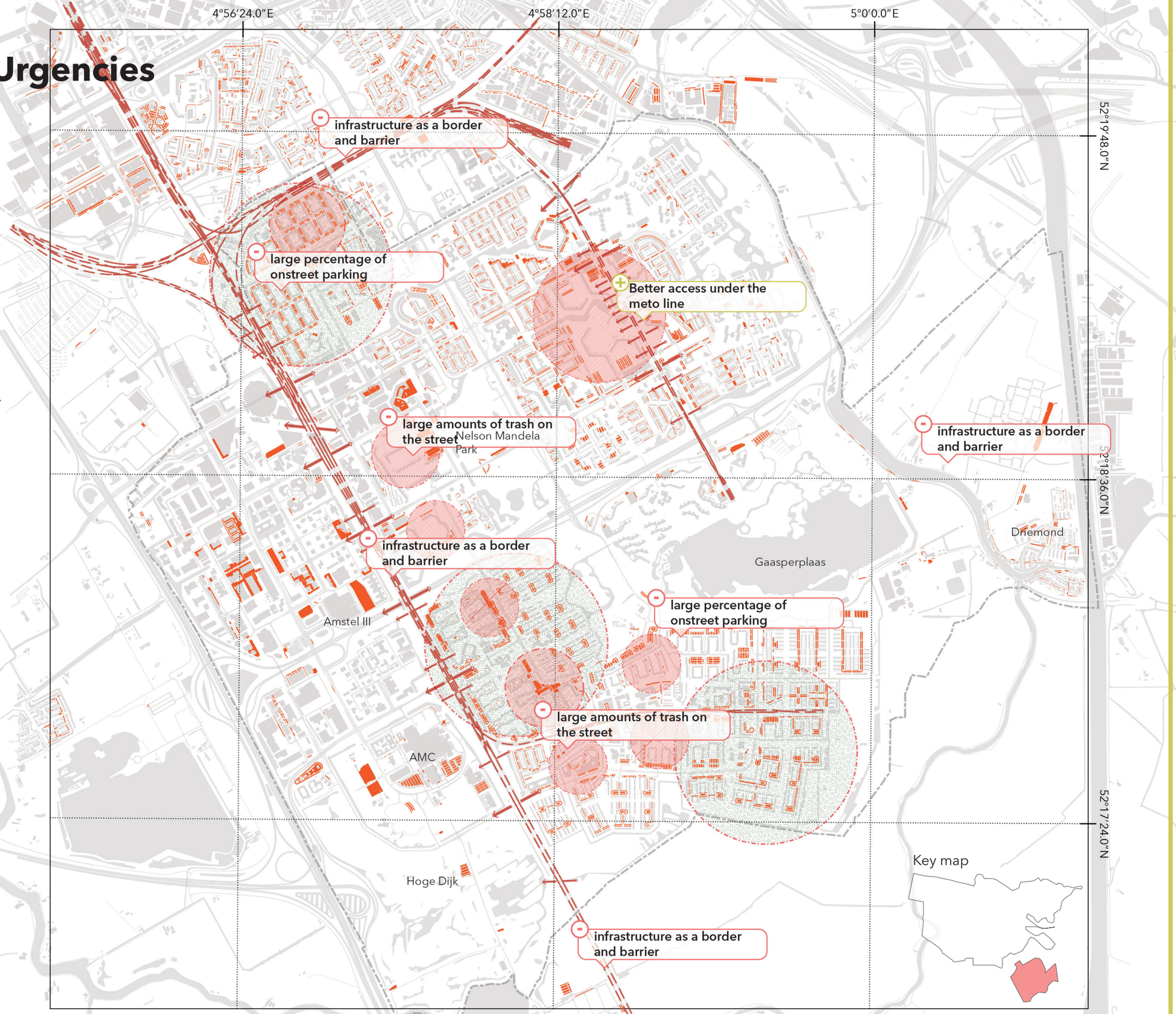
The separation of traffic types leads to a lack of social control and to unsafe pedestrian routes through lush greenery, this could be redesinged to be consolidated along a super grid.

The highways and train networks also form strong borders dividing neighborhoods into fragmented components, though there are underpasses through the elevated roads and tracks, these underpasses feel unsafe as they are not surrounded by any street activity. By strategic densification and relocation of these underpasses, the quality of these networks could be improved.

A lot of new infrastructural entities need to be added to the public space from ICTs to energy infrastructure and beyond in the coming years. By strategically planning the construction activity, the cost of it can be reduced by using same equipment and preventing nuisance for users of the space as well.

Decentralised waste processing can generate new employment opportunities while also improving the quality of public space by preventing overflow of trash cans in various neighborhoods. Specific opportunities and urgenices in relation to accessibility will be further explored in chapter 6.4.

Fig 6.12: Map showing opportunities and urgencies in the infrastructure networks in the neighborhoods of Amsterdam Zuidoost and surroundings.



6.3 Urban Form

As we saw before, the Bijlmermeer development was initially designed as high rise towers in a honeycomb pattern on an open and wide greenfield. Much of these high-rise construction has been demolished now and replaced with low-rise fine grain construction in Bijlmer Oost and centrum.

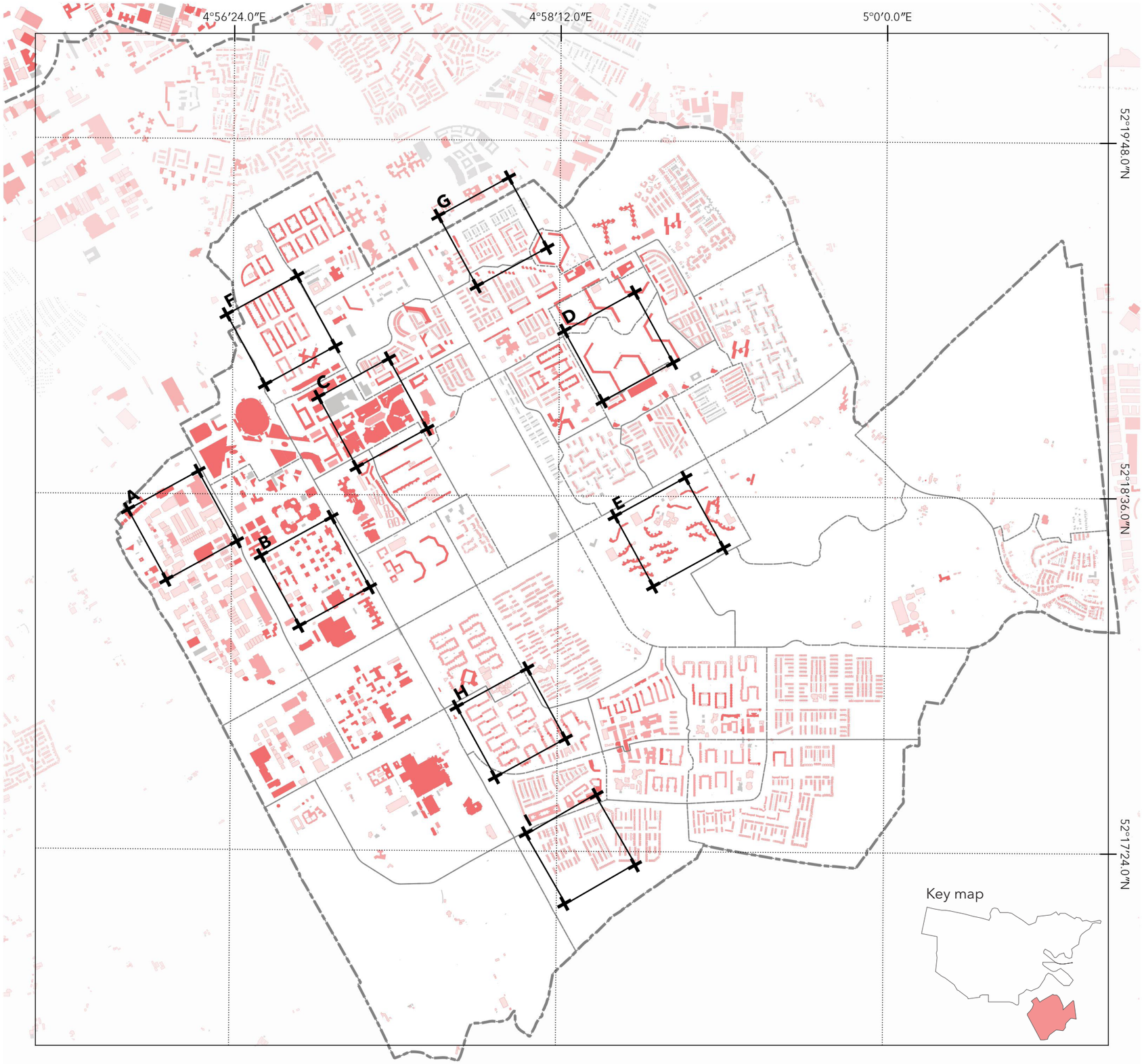
Towards the south of the A9, the initial proposals for high-rise development was scraped and replaced with mid-rise towers and low-rise houses, which continue to stand now.

To the west of metro lines 50 and 54, the Amstel III business district houses high-rise office towers and large grain warehouses for industrial purposes.

Some of the distinct components of the urban form of Amsterdam Zuidoost has been highlighted in the map and expanded in the next chapter. Accessibility, diversity and density as characteristics of the urban form are explored in further chapters, however the nature of new constructions in Zuidoost is explored in chapter 6.3.2.

Fig 6.13: Map showing the heights of buildings in the neighborhoods of Amsterdam Zuidoost and surroundings.

Source: BBG



6.3.1 Types of Urban Fabric

1. The western edge of Zuidoost is mostly occupied by large warehouses and car dealerships. This industrial area is made for flexible industrial use and movement of trucks and not human scaled.

2. The Amstel III business area has mid to high rise generic glass buildings with parking moats around them. This generic business district is also not human scaled and is designed with the car user in mind.

3. The ArenaPoort is a shopping centrum with large indoor shopping areas with pedestrian spaces at the ground level.

4. The preserved portion of the original honeycomb flats balance density and green space masterfully. With semi-enclosed green spaces nestled in-between high-rise towers, it was an unfortunately failed utopian vision failed.

5. L Buurt has mid rise apartments stacked along the gentle slope towards the lake to the south. This car free neighborhood again has large open areas disconnected from rest of the urban fabric.

6. Venserpolder has the classic perimeter block with a semi-public courtyard. However the standardised mono-functional blocks situated in a corner of Zuidoost doesn't reflect the magic of Amsterdam centre.

7. The mid-rise open courtyard blocks of Holendrecht straddle parking and green areas alternatively.

8. The urban-renewal neighborhoods have low-rise rowhouses reflecting Vinex developments in a regular grid.

9. The older low-rise developments in the south are prototypical car free suburbs with clustered off-street parking.

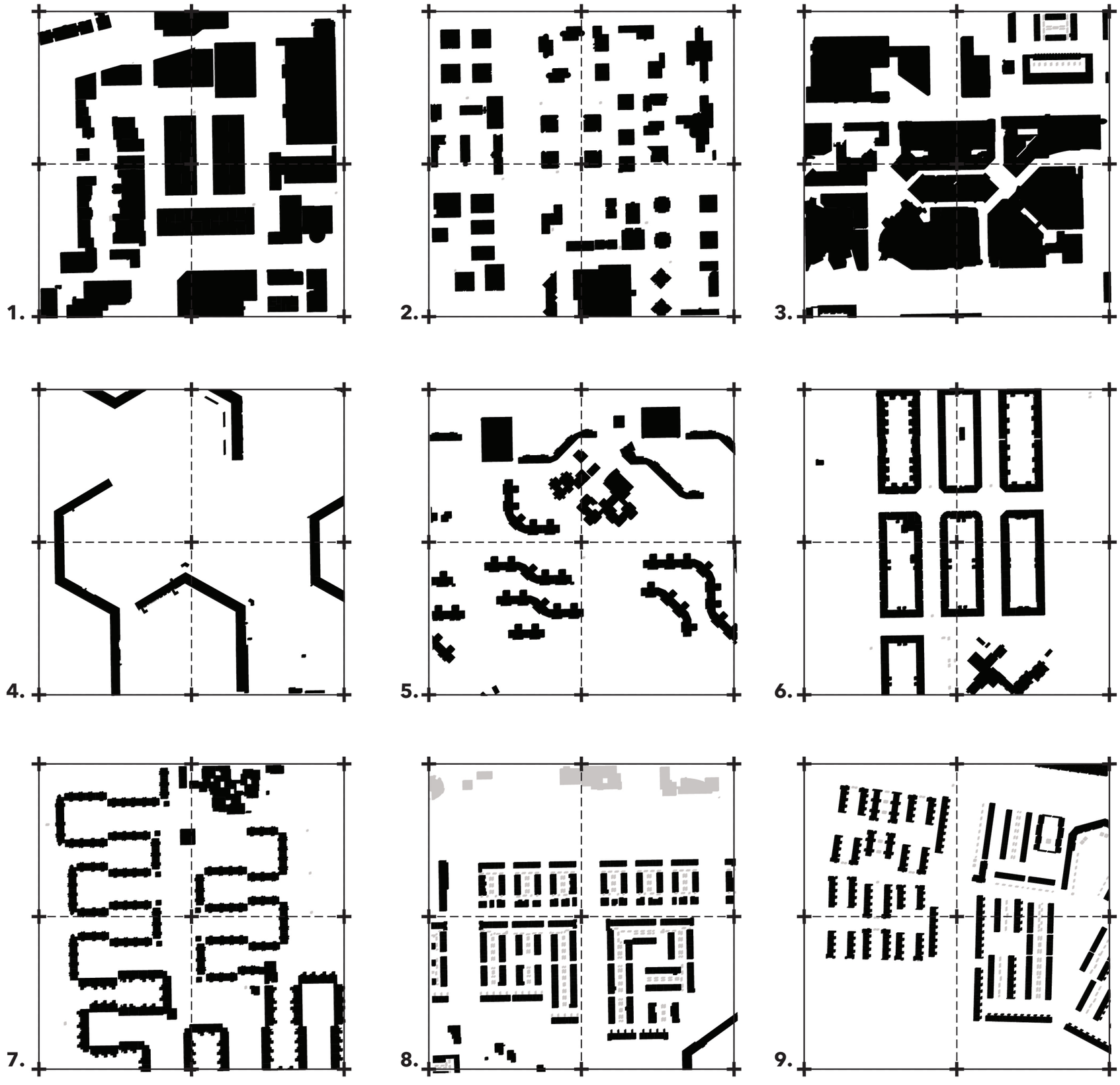


Fig 6.14: Snippets from the urban fabric of Amsterdam Zuidoost reflecting years of experimentations and explorations.

Source: BAG

6.3.2 Housing Plans

In Zuidoost, more than 30,000 new homes are expected to be constructed in the coming years. New construction brings a mixture of people into these neighborhoods, potentially gentrifying them, as seen in the example of Noord in the recent years. Managing this gentrification is crucial towards ensuring an inclusive development.

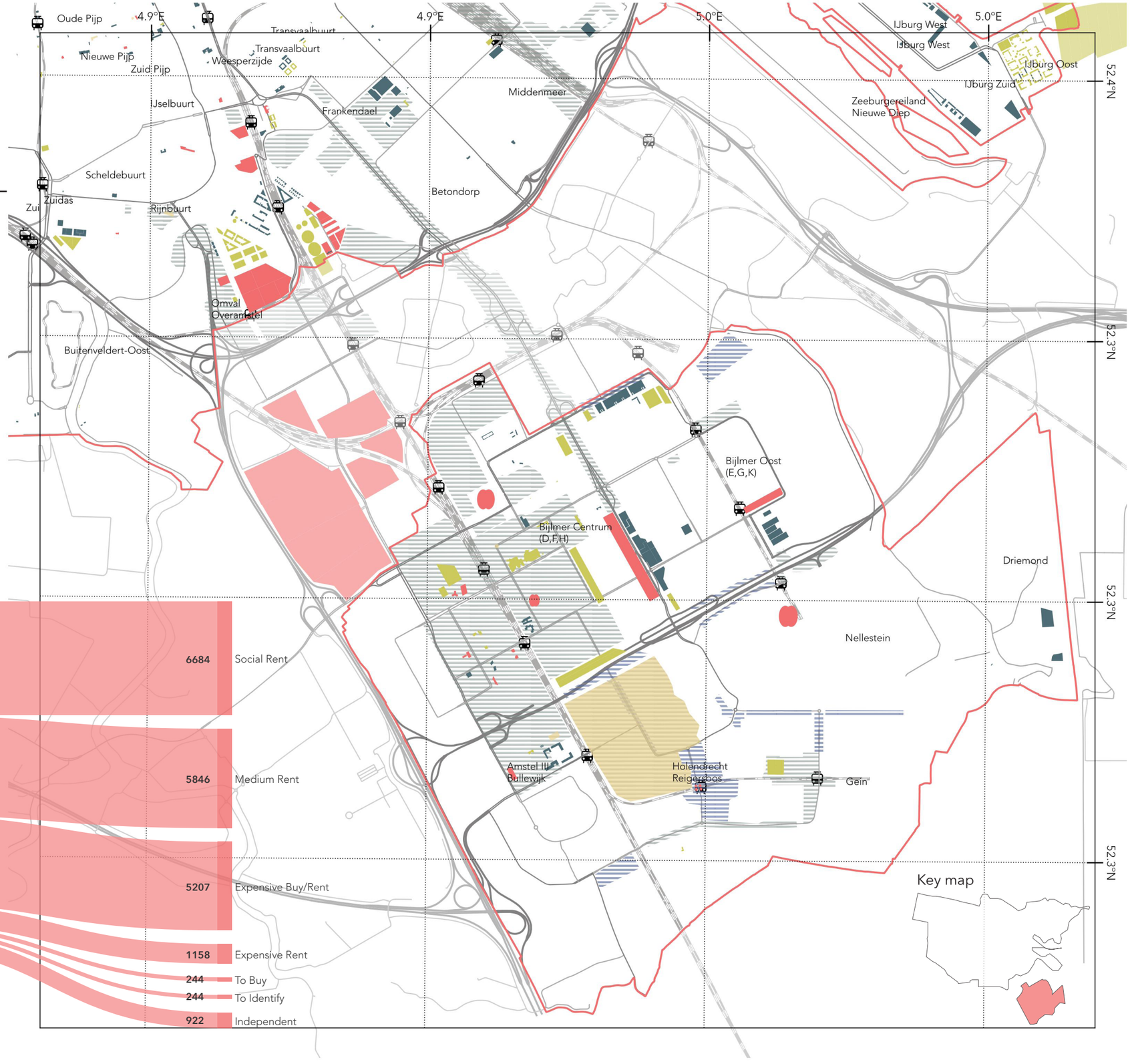
However, our focus here is on some of the highly publicised renewal of office spaces in Amstel III and developments such as SPOT, KARSP, Our Domain and Hondrugspark. which aim to bring in high rise, high end developments to the city-district.

Since the plane crash in Bijlmer, majority of new construction in Zuidoost has been low-rise until now. The proposed developments are much more denser and functionally diverse than rest of Zuidoost as well, bringing in a higher degree of urbanity.

Fig 6.15: Map showing current and future plans for housing construction.

Fig 6.16: Sankey showing number of units under each category.

Data source: City of Amsterdam (2020)



6.3.2.1 Observations

Amsterdam earned a lot of money from the construction of offices on leased land. After the economic crisis of 2008, a lot of office spaces were left vacant in the business parks. Amstel III was heavily affected and since then various plans for transformation of office buildings to residential units to ease the housing pressure were developed. Currently, the Amstel III redevelopment is one of the flagship projects of the municipality.

Most of the buildings from their initial renderings seem to be replicas of each other creating a simulacrum of a global metropolis with characterless towers. There is very little formal exploration and the buildings aim to bring more affluent residents to the neighborhood maybe potentially gentrifying it.

The proposed diversity of functions and higher density can bring in a higher degree of urbanity which is expected to have a ripple effect on other neighborhoods.

However, currently the plans are site specific, and don't engage with the neighboring context. A new neighborhood park aims to turn the focus of the development inward, missing out on potential opportunity to engage with the rest of Bijlmer beyond the railway tracks.



Fig 6.17: Collage showing observed trends in the new developments in Amsterdam Zuidoost

Images from Google earth, Gemeente Amsterdam, Hondrugspark.nl and Felixx Landscape Architects & Planners.

6.4 Accessibility

Urbanity as opposed to rurality, could be understood as a social condition of relatively random encounters between strangers in the public realm. These seemingly random encounters are structured and mediated through the street networks and the nature of urban form.

A well functioning city is one whose structure and form facilitates random social encounters. This is the mechanism through which urban economies and ecologies work.

It is not the flow of vehicles, but the flow of people and with them, ideas, narratives, and products that makes cities successful.

From an administrative borders perspective, Zuidoost is an exclave of Amsterdam, disconnected from the rest of contiguous Amsterdam. Morphologically, it is also fragmented from the rest of Amsterdam by infrastructural and industrial spaces as well. This was not an accident as the settlement was initially envisioned as a satellite residential town, connected to the city centre through strong metro and road networks.

As Amsterdam continues to grow, this dynamic is being questioned. A secondary metropolitan centre around ArenaPoort is a necessity that is being investigated in the draft environmental vision plan.

With a point of view of how urban structures facilitiate random encounters, city streets play a crucial role. City streets (also known as main streets, high streets or fore streets) are a special type of public space. Here, instead of looking at streets as just conduits for traffic, a street is understood as a combination of traffic and the functions that attract audiences. In these public spaces there is therefore a great diversity of people, which means that city streets have a strong economic and nurturing function for both the city and the neighborhood.

Looking at the current and potential city streets as identified by the municipality in the Onderzoeksrapport Stadsstraten (Gemeente Amsterdam, 2017), the fragmented and segregated nature of Zuidoost becomes evident. Even though, Zuidoost has a strong transport network within the city district and to the rest of Amsterdam, these networks act as transit conduits only and not as bearers of public life.

In the accessibility analysis, the intent is to understand the nature of transportation networks and how they structure movement at the scale of the city and at the scale of the district.

6.4.1 Time sheds
To understand how far one can reach from Zuidoost using different modes of transportation to understand Zuidoost's position at the regional scale.

6.4.2 Motor transit network and 6.4.3 Active transit network
Evaluating the physical transit network at the scale of the city to understand how it connects Zuidoost with the rest of the city.

6.4.4 Public transit network
Evaluating the existing public transit network at the regional scale to understand choice and feasibility.

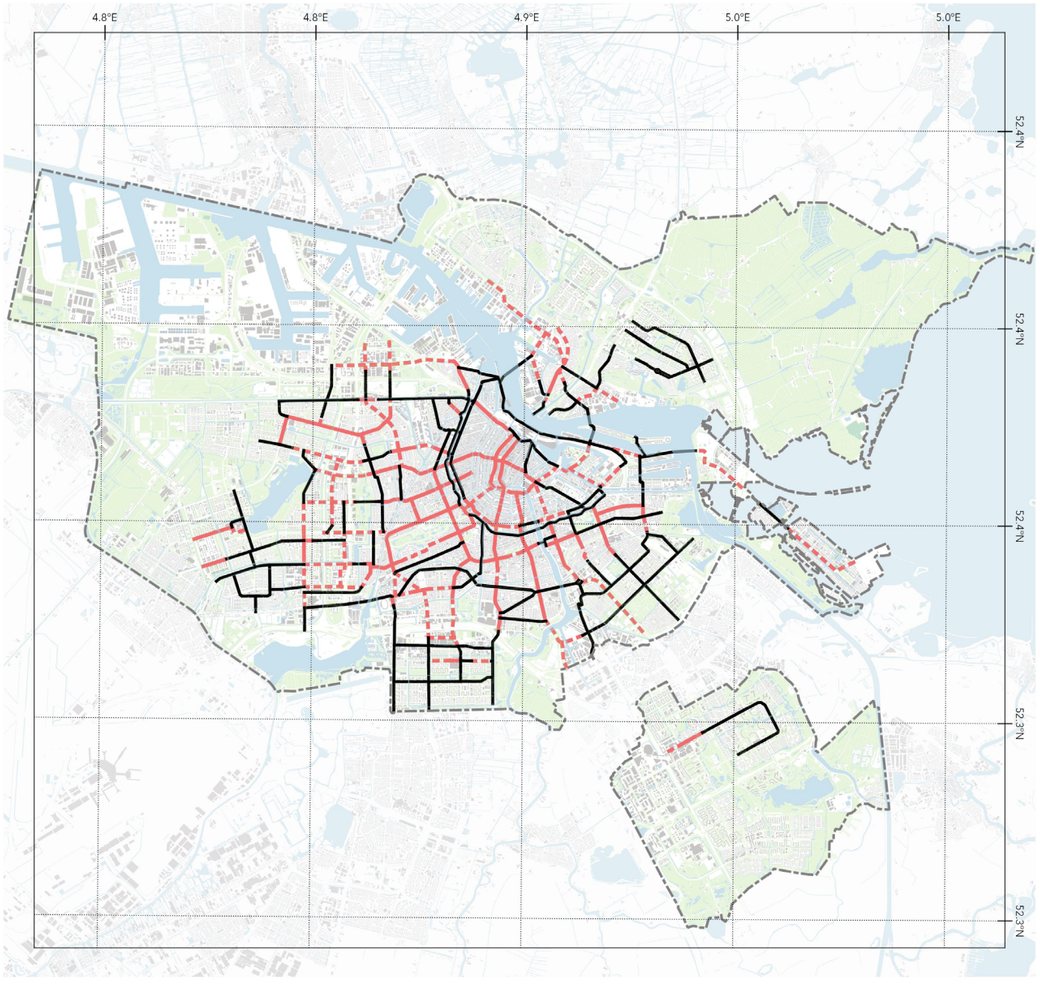
6.4.5 and 6.4.6 Space Syntax analysis
Space syntax analysis of the motor transit and active transit network shows the integration and betweeness of the network.

6.4.7 Amenity analysis
An amenity analysis is done at the scale of the neighborhood to see how easy it is to access specific amenities from each neighborhood.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

Fig 6.18: Map showing city streets in Amsterdam.

Data source: Gemeente Amsterdam and BBG.



6.4.1 Time Sheds

regional work and transportation dynamics

Marchetti's constant is the average time spent by a person for commuting each day and its value is approximately one hour, or half an hour for a one-way trip. Marchetti posits that although forms of urban planning and transport may change, people gradually adjust their lives to their conditions (including location of their homes relative to their workplace) such that the average travel time stays approximately constant.

The map shows areas that could be potentially reached from Zuidoost using different modes of transportation and business parks in the MRA.

It becomes evident why there is a large number of car use in Amsterdam Zuidoost, as most business parks could only be reached through cars if we are to stick with Marchetti's constant.

Improving frequency and reach of public transportation at the regional scale, and bringing jobs closer to the city are two possible ways of responding to this dynamic.

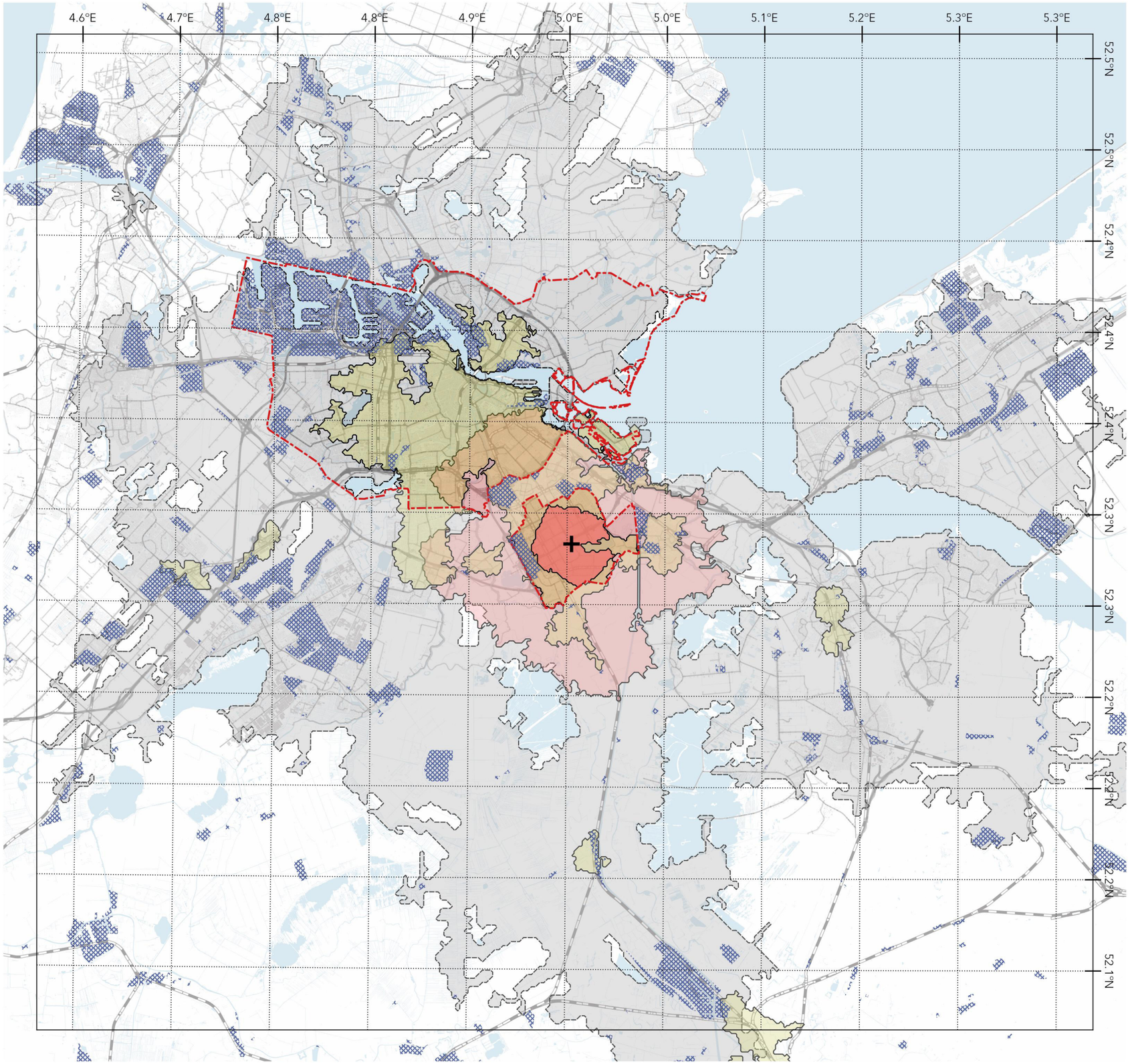


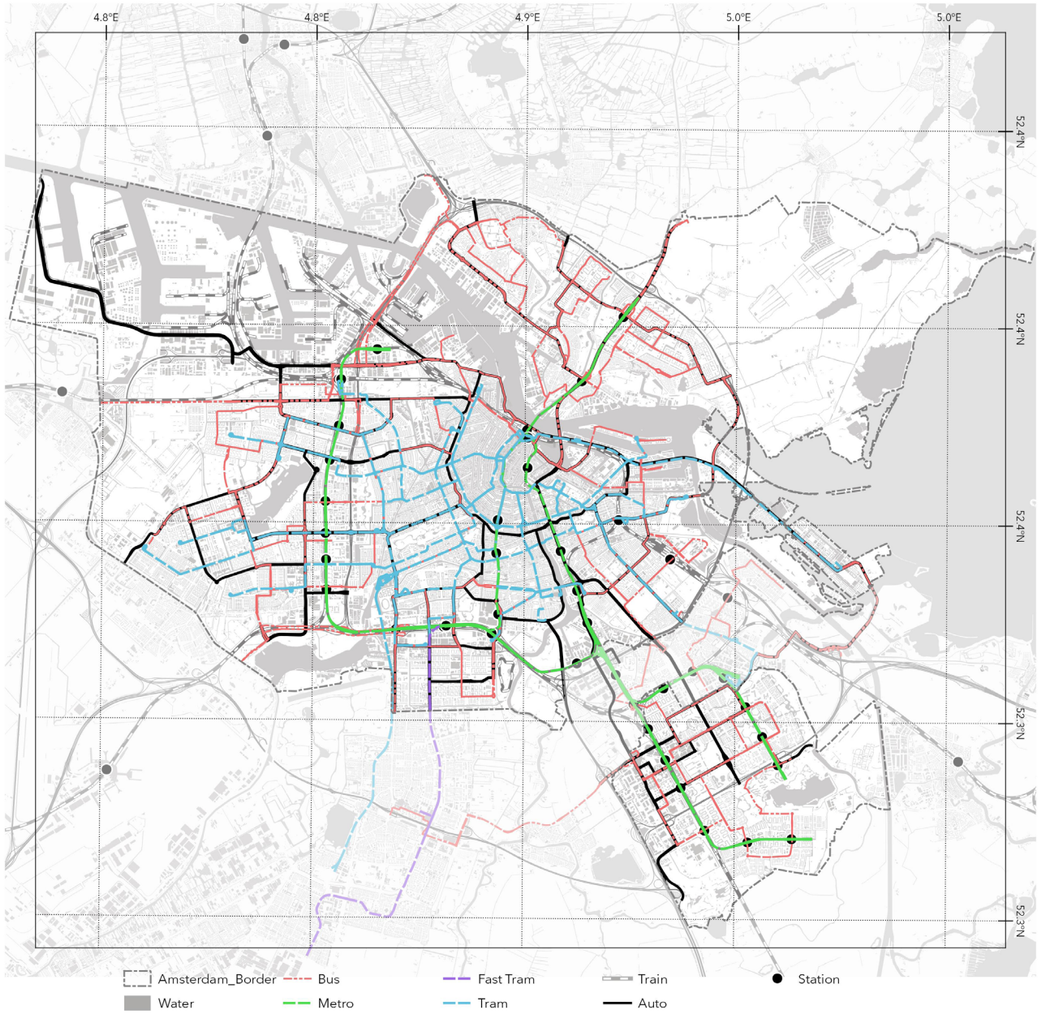
Fig 6.19: shows areas that could be potentially reached from Zuidoost using different modes of transportation and business parks in the MRA.

Source: Author, made using TravelTime plugin for QGIS. IBIS.

6.4.2 Motor Transit Network

Fig 6.20: Map showing the motor transit network of Amsterdam

Data source: Gemeente Amsterdam



As mentioned before, Zuidoost was conceived as a satellite town to Amsterdam dependent on metro and road connection to the city centre.

Amsterdam uses a system of plus and main network classification for its roads to assign priority for high volume traffic flows based on type of mobility.

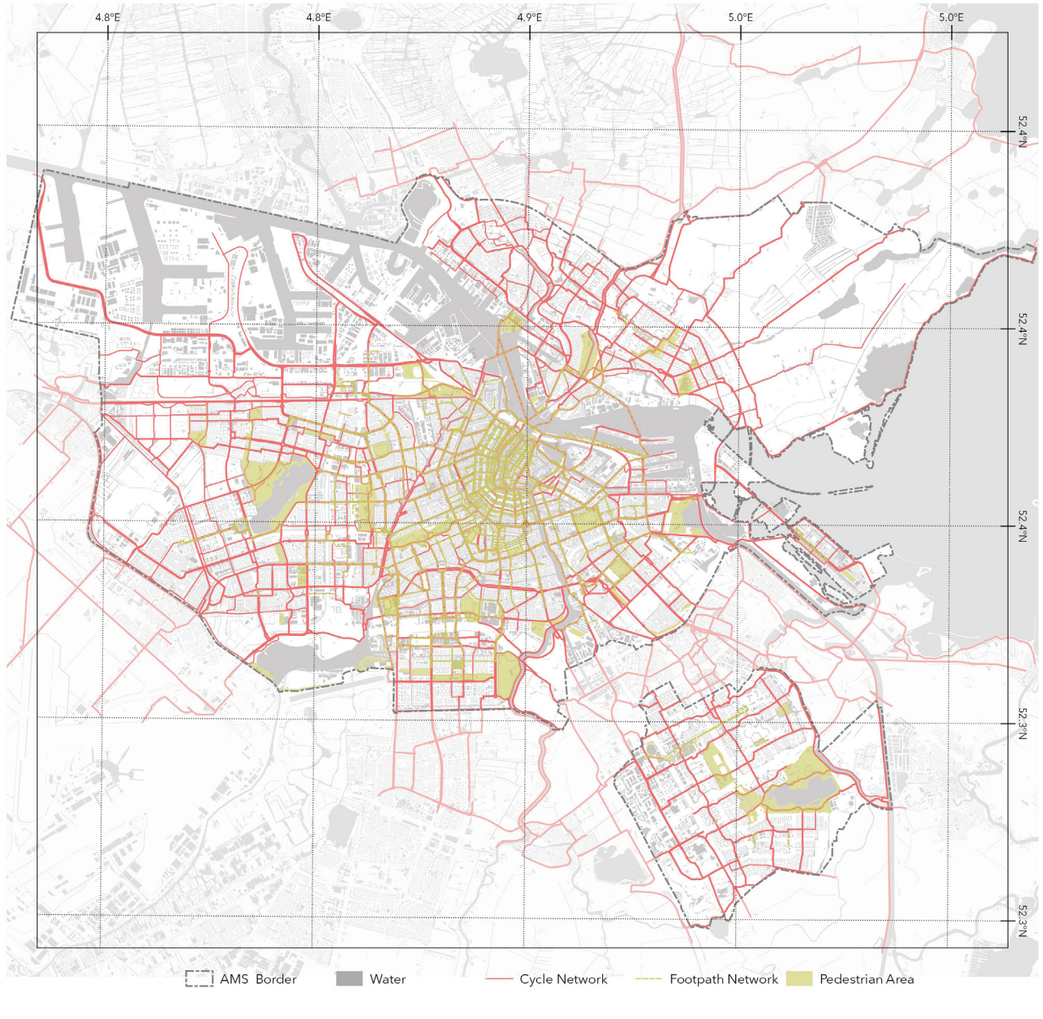
Amsterdam Zuidoost has a strong connection to Amsterdam city centre through Metro and road networks, however the nature of this network is problematic as they focus on moving large volumes of traffic and are not condusive for urban activity along their edges.

The A2, S112, A9 are motorways that split Zuidoost neighborhoods. Of these, the A9 has been moved underground and a rooftop park is to be developed atop it.

Fig 6.21: Map showing the active transit network of Amsterdam

Data source: Gemeente Amsterdam

Active Transit Network 6.4.3



Amsterdam's classification system of plus and main network of roads extends not only for auto and buses, but also for cycles. This is beneficial where there is scarcity of space, as roads could be classified for different modalities.

While in the rest of Amsterdam, it is the same network of roads which are classified for different modalities, Zuidoost has a different logic of road network, where the cycle network is almost completely disconnected from the rest of the road network.

Within the ring, space constraint, air and noise quality are often cited to nudge citizen usage towards public transport and active transport from car based mobility. However, those concerns are not the leading factors in Zuidoost.

6.4.4 Public Transport

local and regional bus and train networks

According to the municipality, Amsterdam's public transport system no longer fits the current requirements of the city leading to serious pressure on public transport networks, specifically during rush hours according to the municipality.

The focus of public transport journeys are slowly shifting from local journeys within the city to longer journeys outside the ring and beyond at the regional scale through train traffic as well. The tram network is is too slow and too expensive for this this type of traffic, and doesn't cater to Zuidoost.

Within Amsterdam, GVB runs all local public transport systems like bus, tram, and metro. The Zuidoost area has strong connectivity to the city centre via metro and bus networks. There are regional bus services connecting the business district of Amstel III with Utrecht, Haarlemmermeer, Velsen, Purmerend and Almere. The Amsterdam Bijlmer ArenA is a very important node along the public transit network, fueling growth around the node as well. While most houses are within 400 metres from a bus stop, the peripheries of the city district are still quite far from public transport nodes and are dependent on cars.

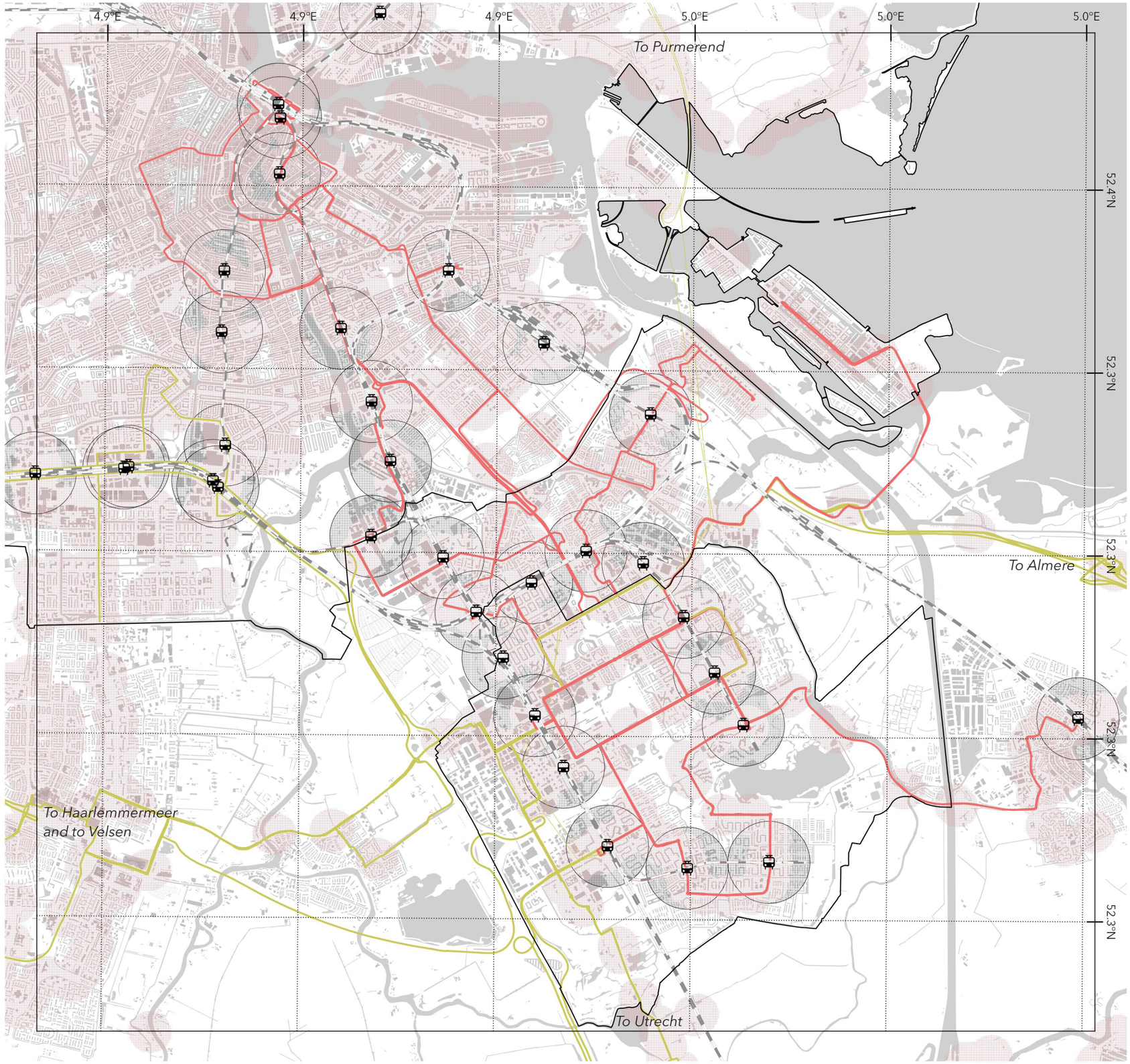


Fig 6.22: Public transport lines running from Zuidoost district

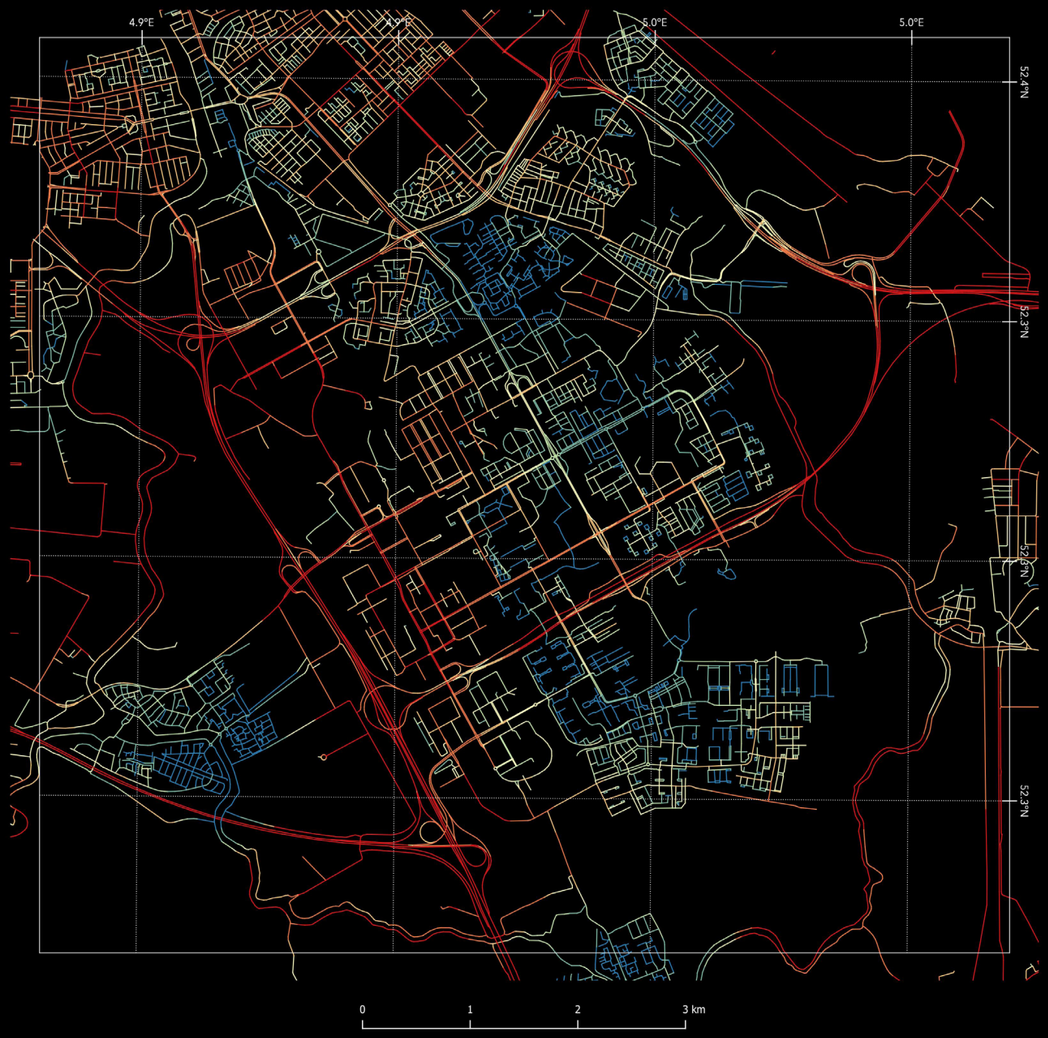
Data Source: Open-OV.nl

6.4.5 Motor Transit

space syntax analysis

Fig 6.23: Angular integration and Angular choice analysis of Zuidoost motor transit ntwork

Source Data: Berghauser Pont et al. (2019)



Angular Integration at District Scale

Angular integration calculates the angular distance between one line and every other line in the network, using shortest paths, basically revealing how easy a street is to reach. The angular integration analysis of the motor transit network reveals that the main highway network of A2 and A9 are well integrated with rest of Amsterdam along with the businesspark, and Amsterdam Bijlmer Arena to a certain extent, while the rest of the district is not well integrated.



Angular Choice at District Scale

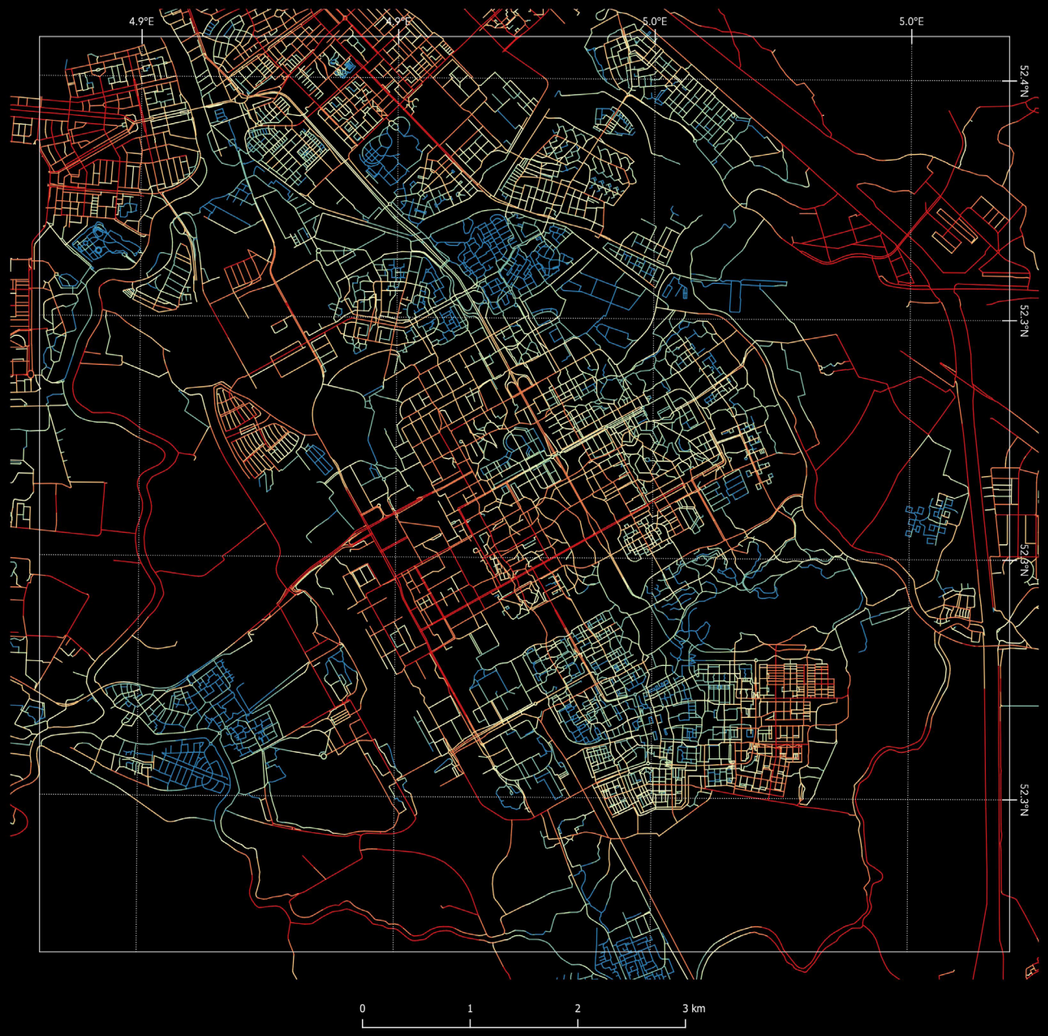
Angular choice reveals how often a line falls on the shortest path between all pairs of lines in a network, with the distance mode being Angular. It reveals how probable a street is chosen to move through. Angular choice analysis of the motor transit network reveals the prominence of the dreef roads, however due to a large number of cul de sacs with parking lots, the potential of the network is not fully utilised.

6.4.6 Active Transit

space syntax analysis

Fig 6.24: Angular integration and Angular choice analysis of Zuidoost active transit ntwork

Source Data: Berghauser Pont et al. (2019)



Angular Integration at District Scale

Angular integration calculates the angular distance between one line and every other line in the network, using shortest paths, basically revealing how easy a street is to reach. The angular integration analysis of the active transit network reveals that the network in Bijlmer Centrum is well integrated. If the impacts of the new developments in Amstel III and Bijlmer centrum is to be felt in other parts of the district, a better integration of the network is required.



Angular Choice at District Scale

Angular choice reveals how often a line falls on the shortest path between all pairs of lines in a network, with the distance mode being Angular. It reveals how probable a street is chosen to move through. Angular choice analysis of the active transit network such as footpaths and cycletracks reveal that there is a dense preexisting netwotk providing ample choice, however their potential is not fully utilised as the neighborhoods are monofunctional with only neighborhood centres.

6.4.7 Amenities

neighborhood accessibility to amenities

The idea of 15 minute cities has captured the imagination of urban planners and designers to build better cities post-COVID-19. The amenity accessibility analysis tries to capture a similar intent.

While there are robust road networks connecting Zuidoost with the rest of Amsterdam, it falls short from a 15-minute neighborhood perspective, since the city district is composed of predominantly mono-functional residential areas with very few amenities.

Urban renewal plans since the late 90s have introduced few amenities in the Bijlmer area, to fix this shortage. However, the peripheries are still largely lacking in terms of accessibility. The low densities of the peripheries also mean that they can't sustain a large variety of amenities as well.

Amenity accessibility is a crucial component that determines perceived livability in an area as it impacts everyday life of citizens. While in Amsterdam centre, almost all amenities are accessible within 15 minutes to and fro. That is not the case in Zuidoost, and thus in comparison it feels less livable than the rest of Amsterdam.

Providing amenities is not just a matter of zoning decision, but is dependent on other factors such as density and diversity as well.

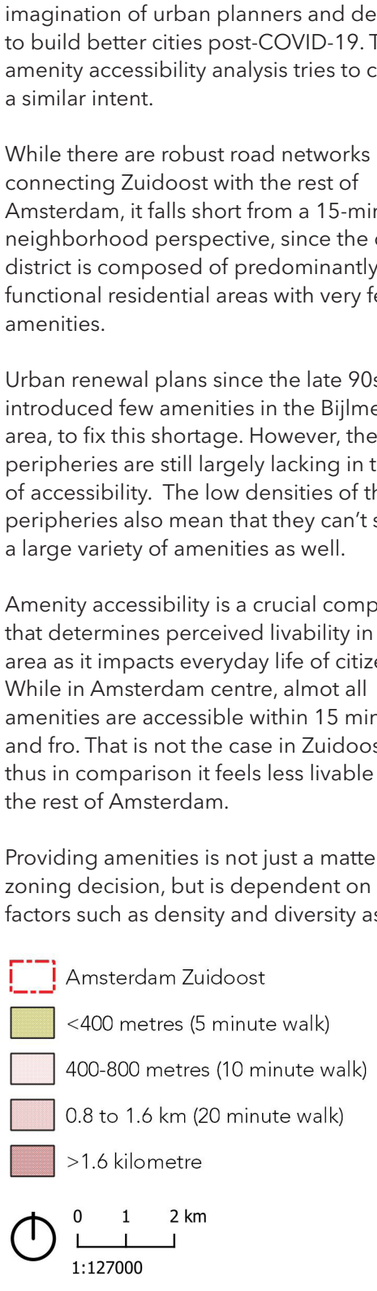




Fig 6.25: Maps showing accessibility of neighborhoods to different amenities.

Data source: CBS

6.4.8 Opportunities

Infrastructural and network assesment of Zuidoost at the municipal scale, shows very strong connectivity to the rest of the city. However, there are lot of issues at the district scale that prevents this from providing benefits to the citizens.

At the district scale, the main arterial dreef roads need to be downgraded to the ground level. This has been done in parts in Bijlmer oost. The improved accessibility and densification as a result of this stands as a working proof for this to happen.

The elevated dreef roads means all bus stops are at a higher level, and require long ramps to access. Downgrading them into urban roads would improve their accessibility as well.

In Zuidoost a large percentage of surface area is allocated for off-street parking. This presents an interesting opportunity for consolidation into multipurpose mobility hubs that promote alternate modes of transportation as well.

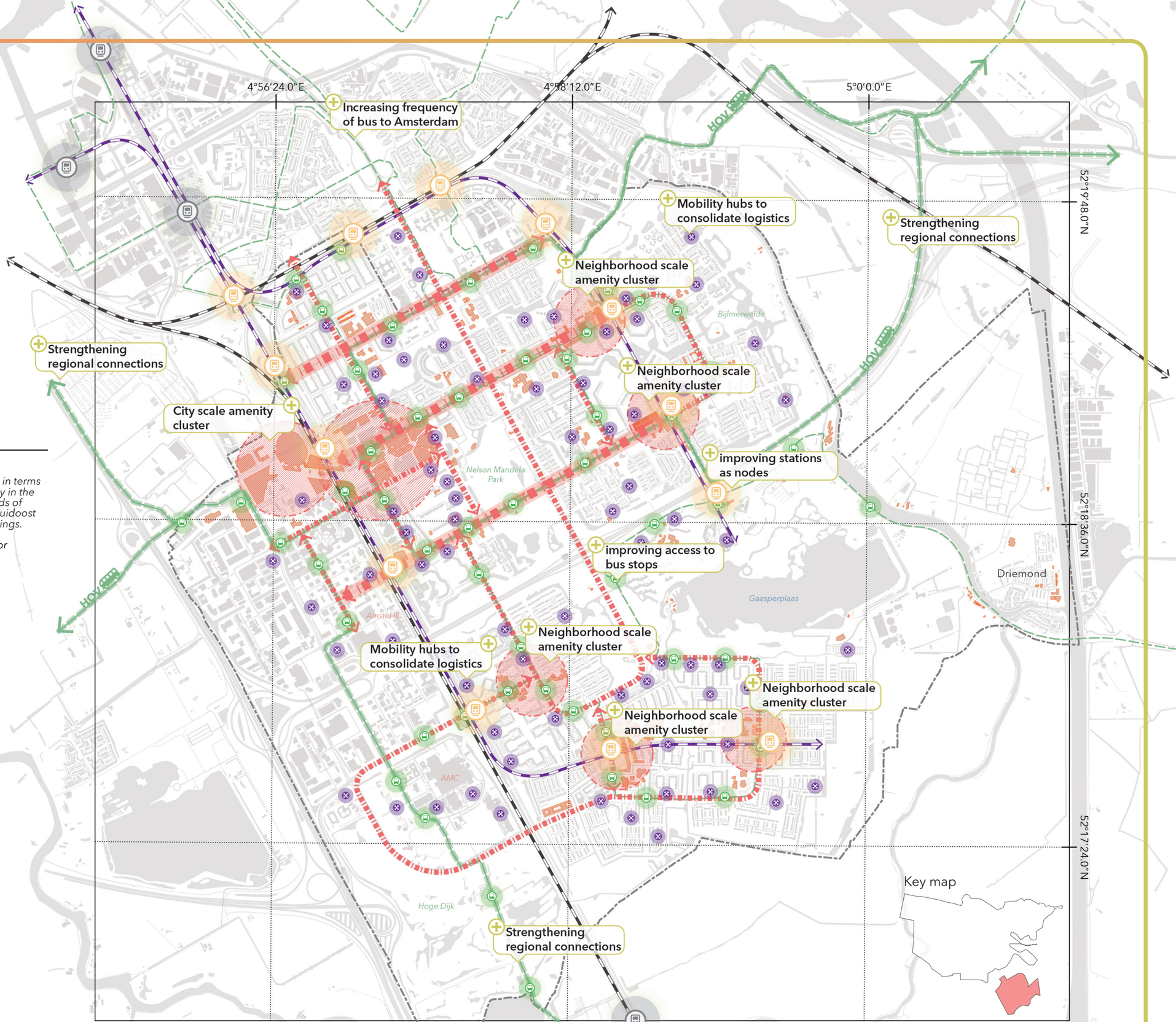


Fig 6.26: Map showing opportunities in terms of accessibility in the neighborhoods of Amsterdam Zuidoost and surroundings.

Source: Author

Primarty street network to be improved

Secondary street networks to be improved

New regional HOV

Improving train station areas

Improving access to bus stops

Potential Mobility hubs

Amenity clusters

0 1 2km

1:26000

6.4.9 Urgencies

There are quite a few urgencies that need to be addressed before they devolve into complex problems.

While the downgrding of the elevated dreef roads could have a potential multiplier effect, the tunnels that are created as a result of this two-level network presents a safety risk. Placemaking efforts towards improving their quality can help make them feel safer in the meantime.

While line 53 is elevated and doesn't fragment the urban fabric, lines 50 and 54 act as a barrier within the urban fabric.. The extension of the existing cycling network beyond the tracks in a cohesive way can help mitigate this.

As mentioned in the network analysis, the rationalisation of the cycling network along places of activities is important to ensure people use cycle for transit and not just recreational purposes.

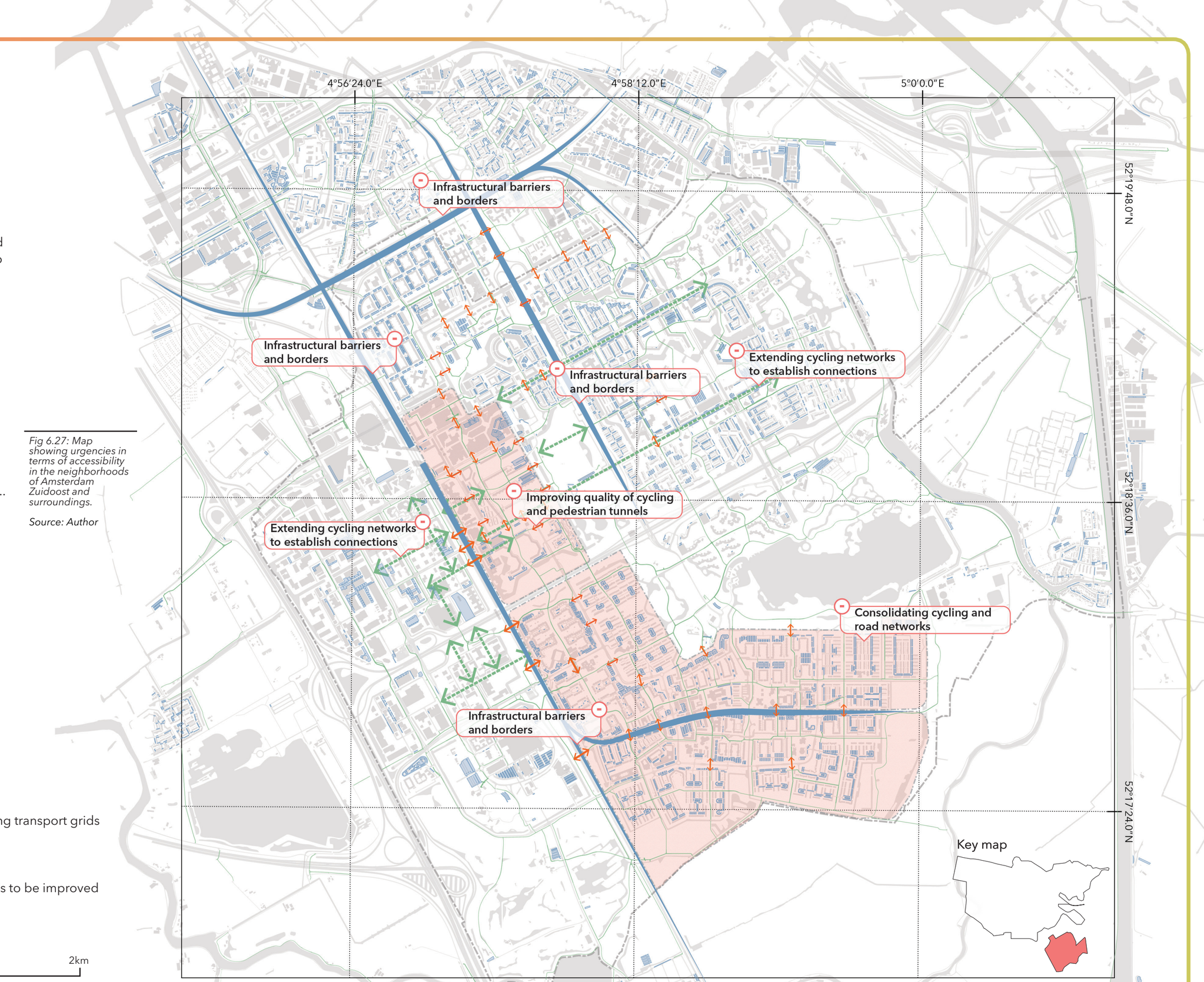


Fig 6.27: Map showing urgencies in terms of accessibility in the neighborhoods of Amsterdam Zuidoost and surroundings.

Source: Author

6.5 Density

Density is a concept used widely in Urban planning, and related fields to describe the intensity of people, households, jobs, businesses, total floor area of buildings, transit stops, parks or a myriad of different measures of human occupation in a defined unit of area. Urban density helps describe the degree of concentration or compaction of people and the nature of urban development in an urban area.

The density of urban areas is extremely relevant when dealing with issues related to the quality of urban life such as "environmental quality, transportation systems, physical infrastructure and urban form, social factors, and economic factors" (Churchman, 1999, p. 398). As such, urban planning and design when it aims to improve the livability of an area, it revolves a lot around density.

Zoning policies of the early twentieth century were particularly concerned with limiting congestion as a result of high densities and the resultant ill effects as cities grew. Promoting lower-densities as a precondition to establish healthier residential environments that facilitated light and air resulted in the creation of new suburban developments (Fischler, 1998).

However, in the recent decades, suburban sprawl, and low-density urban developments of urban peripheries are subject to intense criticism due to the extraordinary public costs associated with servicing them with roads, urban utilities, and other infrastructure. Another line of argument against low-density urban sprawl is that they are energy and material intensive and are unsustainable to house large populations under similar conditions. Thus, the need for urban regions to increase densities has become a central goal towards minimising land use change and improving urban sustainability, while reducing public costs of servicing (Ingram, Carbonnel, Hong, & Flint, 2009).

Amsterdam's Structural vision 2040 from 2011 and the current draft environmental vision 2050 reflects this need to create a compact city within existing city limits. This is of particular significance to industrial areas and low dense housing in the urban peripheries which might be subject to further densification in the near future to deal with the high demand for housing in the Amsterdam metropolitan area. Amsterdam Zuidoost district has both low dense residential neighbourhoods and monofunctional office areas. Current housing plans in Zuidoost focus more on transitioning the monofunctional office areas to a mixed-use high dense city district owing to investor interest and to repurpose the excess supply of high end office spaces and the resultant vacancy.

Beyond built density, it is important to also look into other measures of human occupation as well. The fear of congestion and resultant ill effects in terms of noise and health hazards are less now due to advancements in technology in the past century.

In the density analysis, the intent is to understand the density of human occupation and built form in Zuidoost.

6.5.1 Density of Businesses

To understand how much economic activity is concentrated within the city district and as a proxy indicator of its dependency on the city centre.

6.5.2 Density of Dwellings

To understand the relation of existing built forms and its ability to offer dweling units for occupation.

6.5.3 Built Density

To understand distribution of built density within the city district to identify potential areas that could be further densified.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

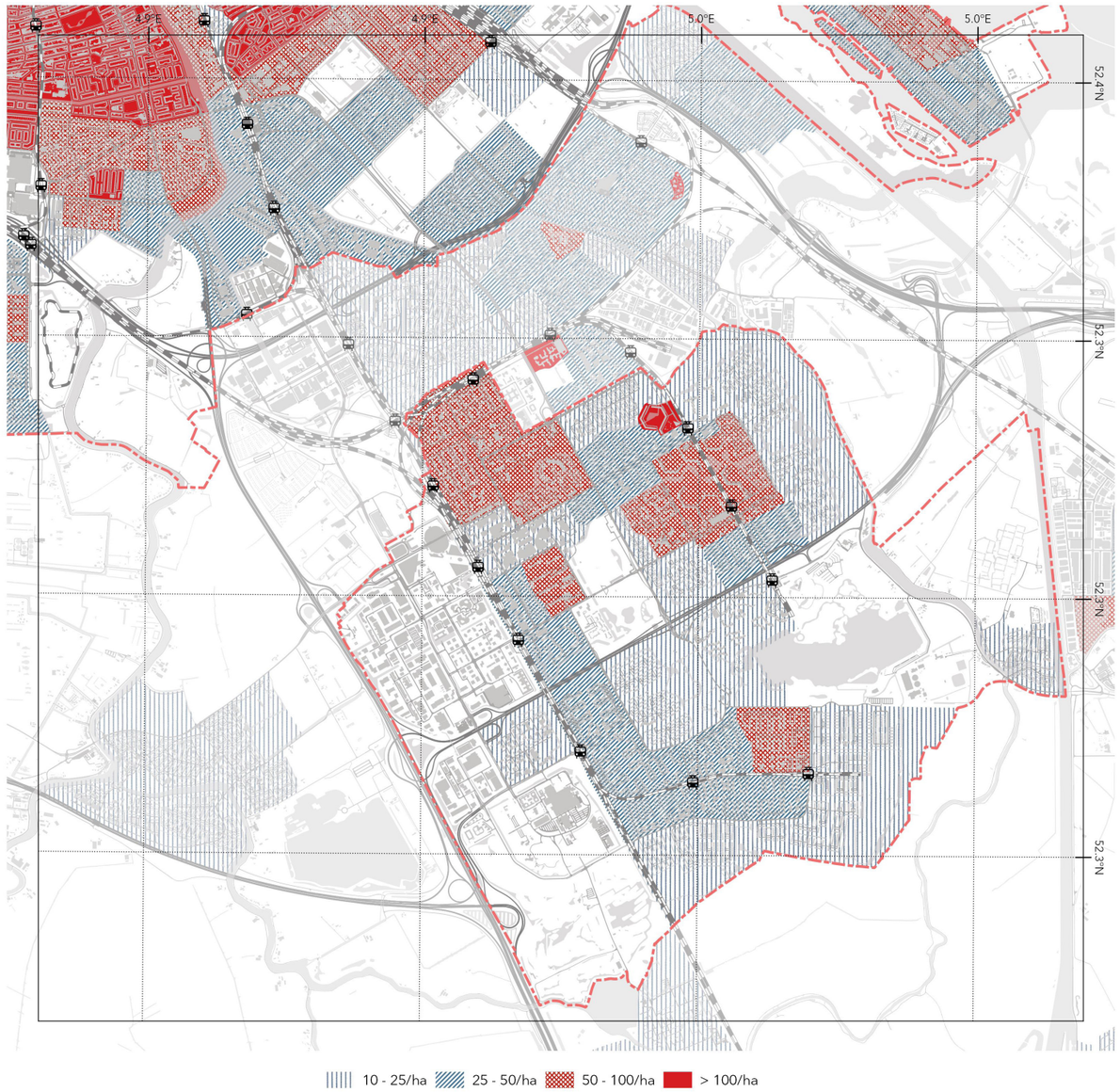


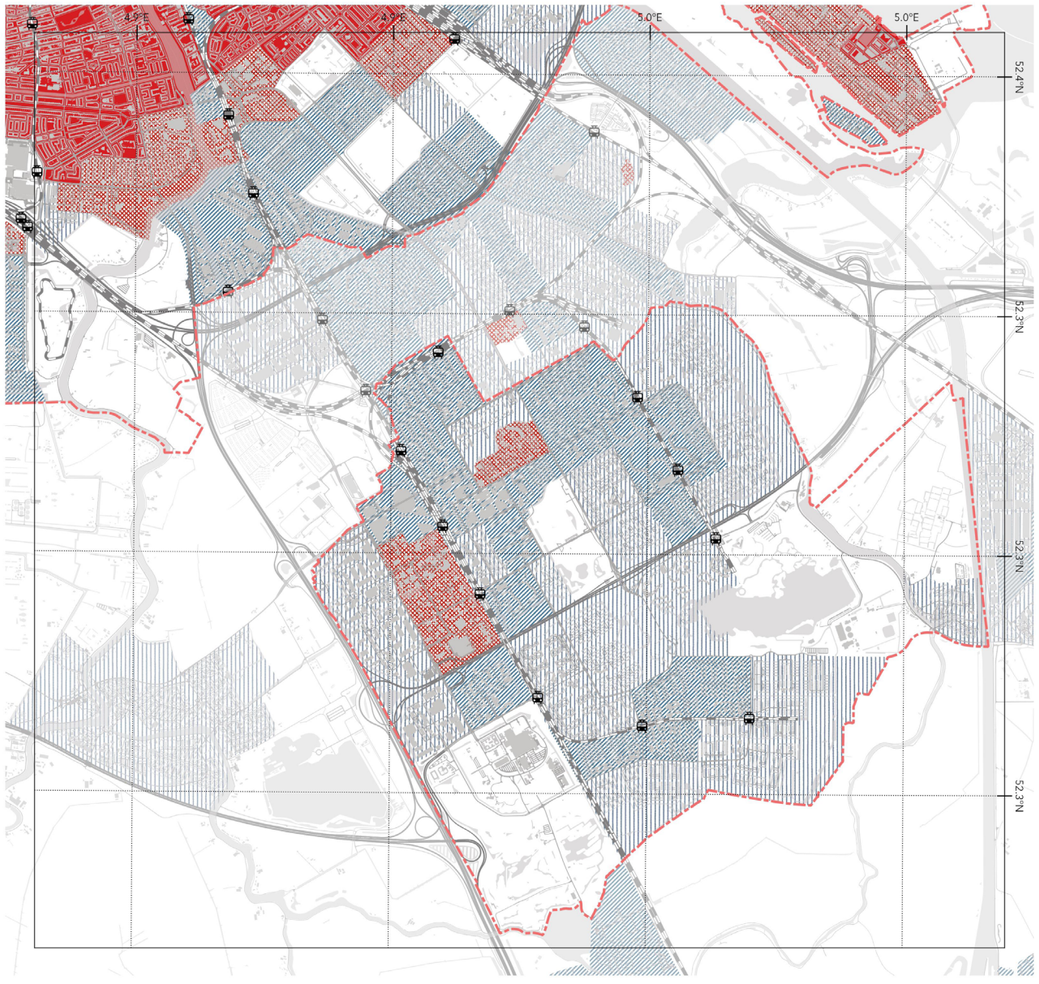
Fig 6.28: Map showing density of people per hectare per neighborhood.

Data source: CBS

6.5.1 Density of Businesses

Fig 6.29: Map showing the density of businesses per hectare.

Data source: CBS



Amsterdam Zuidoost has predominantly residential and monofunctional neighborhoods and thus the density of businesseses per hectare is quite less in these neighborhoods. The notable exceptions being the businesspark in Amstel III, ArenaPoort and adjacent neighborhoods.

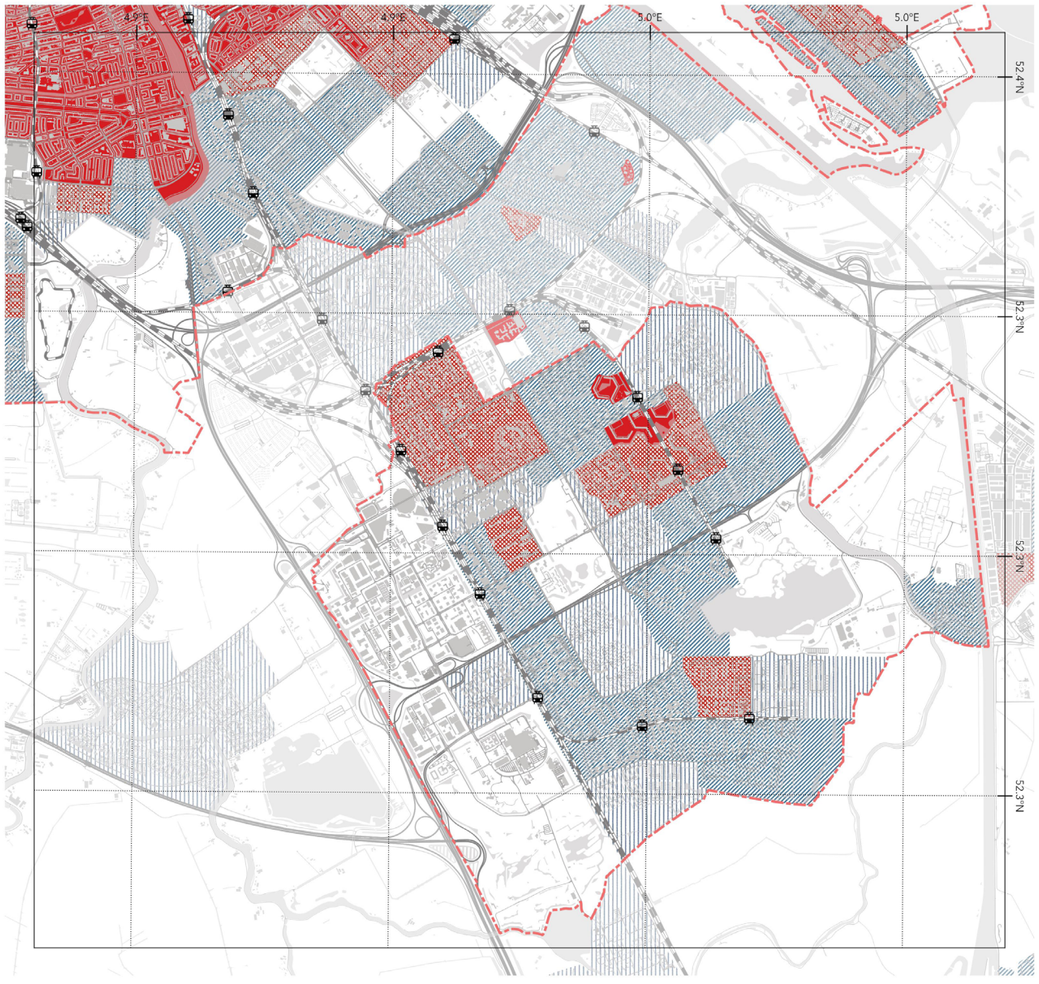
The neighborhoods in Bijlmer Oost that went through urban renewal in the recent years have paved way from small businesses to start in the local centralities.

However, as seen in the map, in comparison to Amsterdam centre, Zuidoost has less density of businesses. This means people will have to commute to either Amsterdam city centre or to other cities for their work.

Fig 6.30: Map showing the density of dwellings per hectare.

Data source: CBS

Density of Dwellings 6.5.2



There is a huge variety of urban fabrics in Amsterdam Zuidoost. Each of them provide very different levels of dwelling densities. The Amstel III businesspark doesn't have dwellings at the moment and thus is not reflected in this map.

The Bijlmermuseum neighborhood which has the original honey-comb design intact and its adjacent neighborhoods have the highest dwelling density. These neighborhoods mostly house high rise towers or slabs as in Rechte H-Buurt.

The VenserPolder neighborhood's mid-rise perimeter blocks also have a high density of dwellings, similar to the city centre. Beyond the A9 to the south and to the east, it is largely low rise developments with less dwellings per hectare. On average social housing with smaller unit sizes provide more dwellings.

6.5.3 Built Density

The map reflects the FSI at the block level in Amsterdam Zuidoost. Since Zuidoost doesn't have a strict grid similar to other parts of Amsterdam, it can be difficult to show this information. However, the available data is useful to understand where built density is currently high.

With the demolition and renewal of the old high-rise apartments, the bulk of Bijlmer oost is low to medium density developments. The current concentrations are in the ArenaPoort area with the shopping mall and the clustering of important metropolitan amenities such as the Amsterdam Arena, and other entertainment venues.

The Amstel III business district has a lot of high rises, but they also have low ground coverage since a lot of space at the ground level is used for parking and thus their FSI is relatively low.

In the south, neighborhood centralities around Reigersbos and Gein metro stations stand out Beyond that, it is predominantly low dense.

The 500m radius around metro stations is currently quite low dense. However it can support relatively high densities.

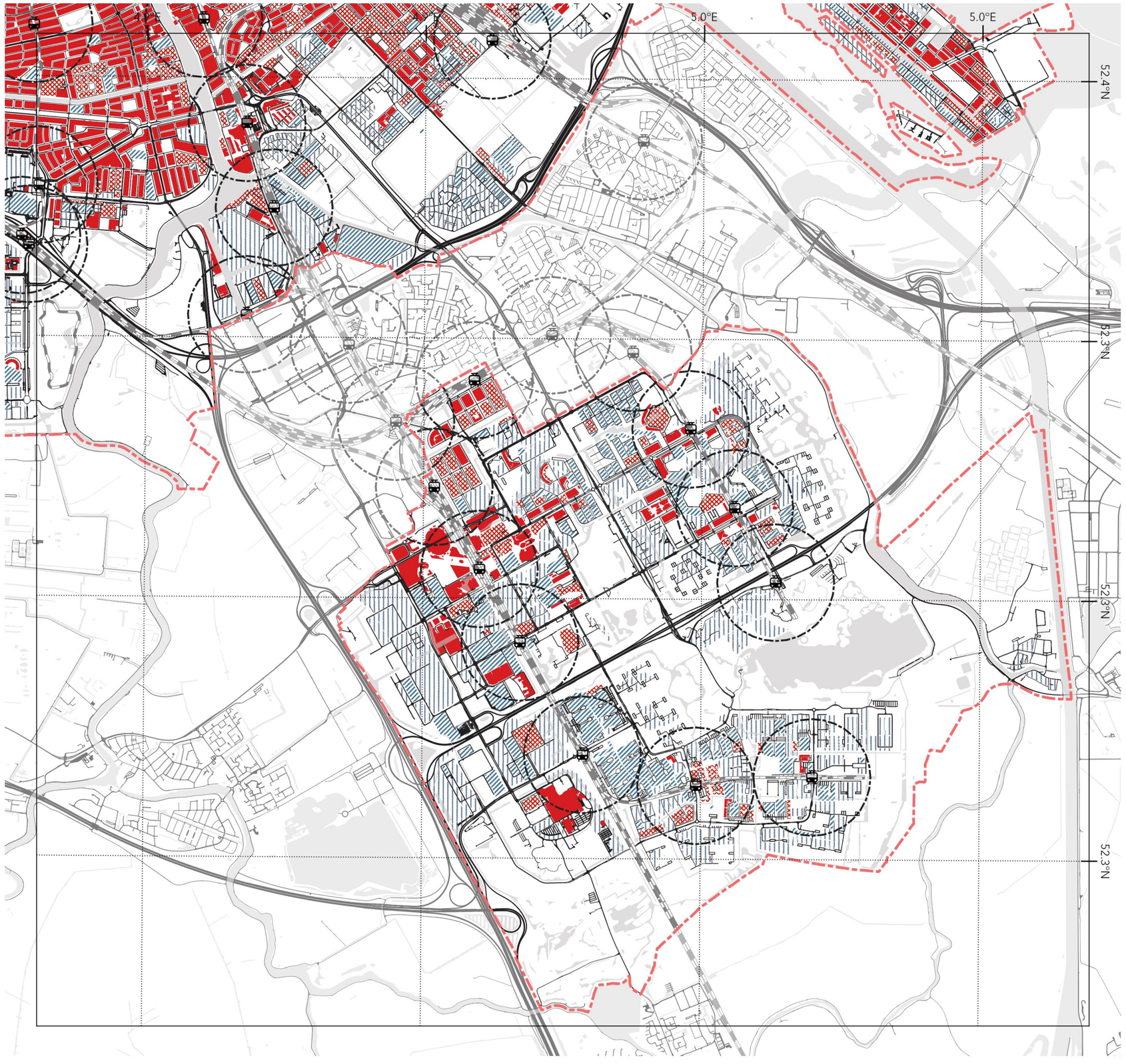


Fig 6.31: Map showing the FSI at block level in Amsterdam.

Data Source: PBL RUDIFUN

6.5.4 Opportunities and Urgencies

Zuidoost housed some of the first high-rise buildings in Amsterdam, paving way for a new kind of density, that tried to have it all. However, decades later, lot of that experimentation has been demolished for familiar low-rise housing.

With the housing crisis and the pressure for densification, Amsterdam is embracing high-rises but in a different form compared to the egalitarian model of the original Bijlmermeer.

There is a lot of potential for densification in Zuidoost, especially compared to the densities of city centre, which are still attractive. Smart densification of existing urban fabric, by focusing on well connected station areas, rethinking underutilised large swathes of off-street parking can help towards improving the density of Zuidoost without overwhelming the current residents.

The new Amstel III development is a renewal of an office district to a mixed-use district, and needs to be thought in conjunction with the rest of the context, to avoid excessive gentrification.

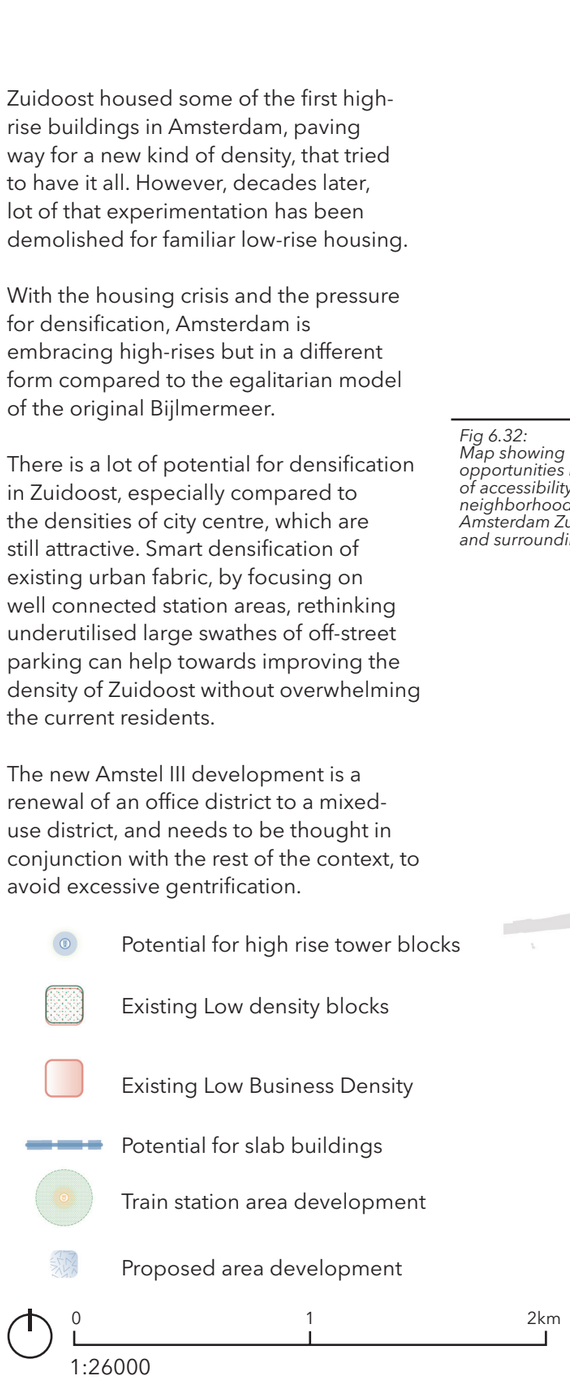
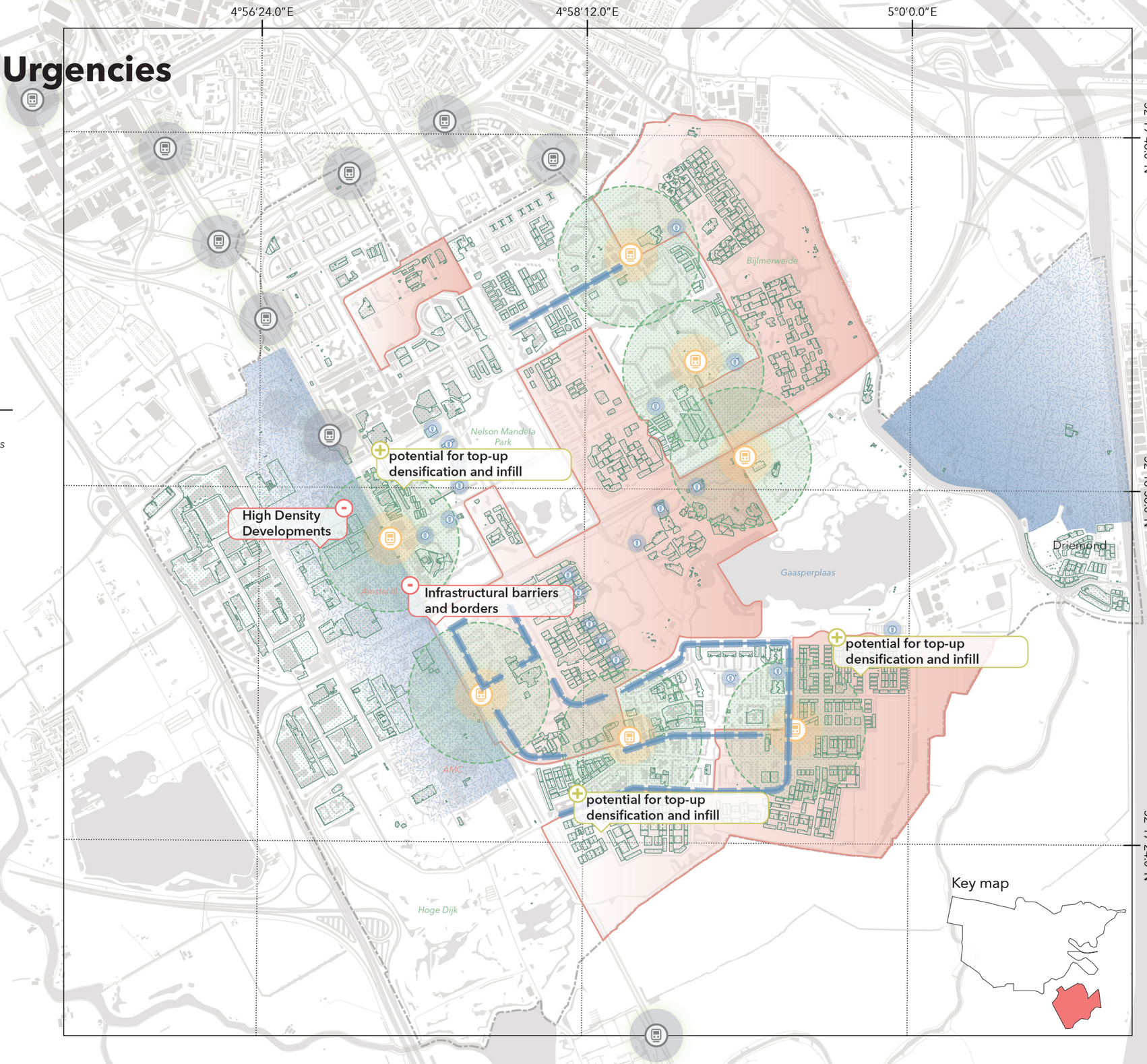


Fig 6.32: Map showing opportunities in terms of accessibility in the neighborhoods of Amsterdam Zuidoost and surroundings.



6.6 Diversity

While looking at accessibility, the question was ‘how do we get around the city?’ which was about the network of flows. Looking at diversity is the question of ‘what’s the attraction?’ since these flows are flows of desire.

Different groups of people in a city seek out specific activities and people are attracted to various kinds and scales of urban form. Ultimately diversity is looking at formal, functional, and social diversity.

Since cities work by bringing different kinds of activity, people and buildings into accessible proximity – they are ‘multiplicities’ rather than singularities (Dovey, 2016). This diversity is not about a collection of parts, but rather the parts are defined by their relations with other parts.

Urban diversity is about the relations between different functions, buildings types and people in a community – their interconnections, alliances, synergies and flows between them.

Jane Jacobs’ key insight to urban design was to understand the productive co-functioning of different activities and highlighting the damage caused by modernist urban zoning, which separates functions to specific areas. But it is not just functional diversity that makes a thriving city but also formal and social diversity that creates successful synergies for a thriving city.

In the diversity analysis, the intent is to understand the existing formal, functional and social diversity in Amsterdam Zuidoost.

6.6.1 Formal Diversity
6.6.1.1 Age of Buildings
To understand how and when neighborhoods developed within the city district and how they influence spatial character.

6.6.1.2 Building Typology
To understand why certain building forms are dominant in specific neighborhoods.

6.6.1.3 Social Housing
To understand the distribution of social housing within the city district and their importance in terms of future developments.

6.6.2 Functional Diversity
6.6.2.1 Amenities
To understand the distribution of choice in terms of specific daily dependencies.

6.6.3 Social Diversity
6.6.3.1 Migration histories
To understand existing ethnic clusters and the change in compositions in terms of recent developments.

6.6.3.2 Age of population
To understand existing trends in terms of demographic groups. This helps determine if there is a demand for age specific adaptations to the built environment.

6.6.3.3 Marital Status
To understand the nature of familial setups and what that would mean for social support systems within a neighborhood.

6.6.3.4 Household Income
To understand existing low-income and high-income clusters and the change in compositions in terms of recent developments.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

Fig 6.33: Heesterveld Creative Community

Image source: wethecity.nl



6.6.1 Formal Diversity

6.6.1.1 Age of Buildings

Fig 6.34: Map showing the age of buildings in Amsterdam Zuidoost

Data source: 3DBAG



Amsterdam Zuidoost is relatively new compared to the rest of the city. The city district was built during the post-war era and following widespread deterioration, a large-scale renewal operation was set in motion in the 90s, which has now come full circle. A large part of the high-rise has been demolished and replaced by smaller-scale homes, including many housing in the owner-occupied sector.

Since most neighborhoods are built at one go, there is little variation within the neighborhoods, however across the city district, Zuidoost has one of the most unique composition of housing in the Netherlands. Infill development in the recent years have bought much needed variety around Krainnest. However, there is a lot of potential for similar developments around the city district.

Fig 6.35: Map showing building typology in Zuidoost.

Data source: Esri Nederland, Kadaster NL.

6.6.1.2 Building Typology



The original plans for the Bijlmermeer proposed 90% of the over 40,000 dwellings to be high-rise apartments. During construction, the plans were changed and further demolition and renewal meant that the city district currently has a sizeable proportion of terraced houses as well along with mid-rise and high-rise apartments.

The nature of urban development that happens in the Netherlands means that whole neighborhoods are built at one go, and thus have very little variance in the type of building they contain. Except for a few exceptions such as Hoptile and Kortvort, which underwent urban transformation, most neighborhoods are of a single typology. The map shows housing units classified into apartments, corner houses, freestanding houses, terraced house or row houses, and semi-detached houses.

6.6.1.3 Social Housing

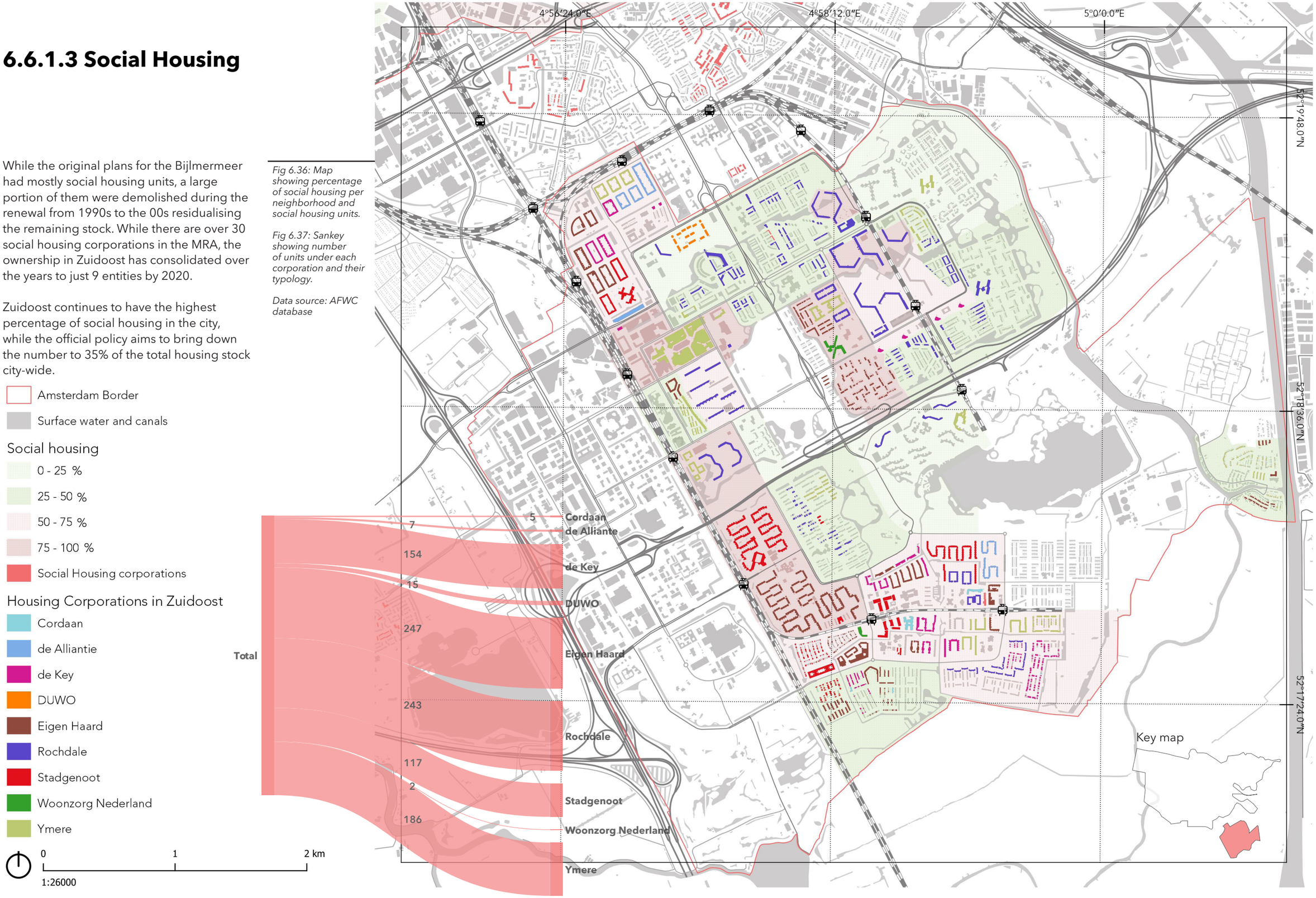
While the original plans for the Bijlmermeer had mostly social housing units, a large portion of them were demolished during the renewal from 1990s to the 00s residualising the remaining stock. While there are over 30 social housing corporations in the MRA, the ownership in Zuidoost has consolidated over the years to just 9 entities by 2020.

Zuidoost continues to have the highest percentage of social housing in the city, while the official policy aims to bring down the number to 35% of the total housing stock city-wide.

Fig 6.36: Map showing percentage of social housing per neighborhood and social housing units.

Fig 6.37: Sankey showing number of units under each corporation and their typology.

Data source: AFWC database



6.6.2 Functional Diversity

The Zuidoost was built in an era when it was a progressive concept to have a strict division between living, working and recreation. Part of the philosophy is also the separation of car, bicycle and pedestrian traffic, which was strictly worked out in the original planning of the Bijlmermeer. The idea behind the separation of the traffic flows was to prevent traffic accidents and prevent cluttering; modern man - according to Le Corbusier - was entitled to a quiet green living environment without traffic.

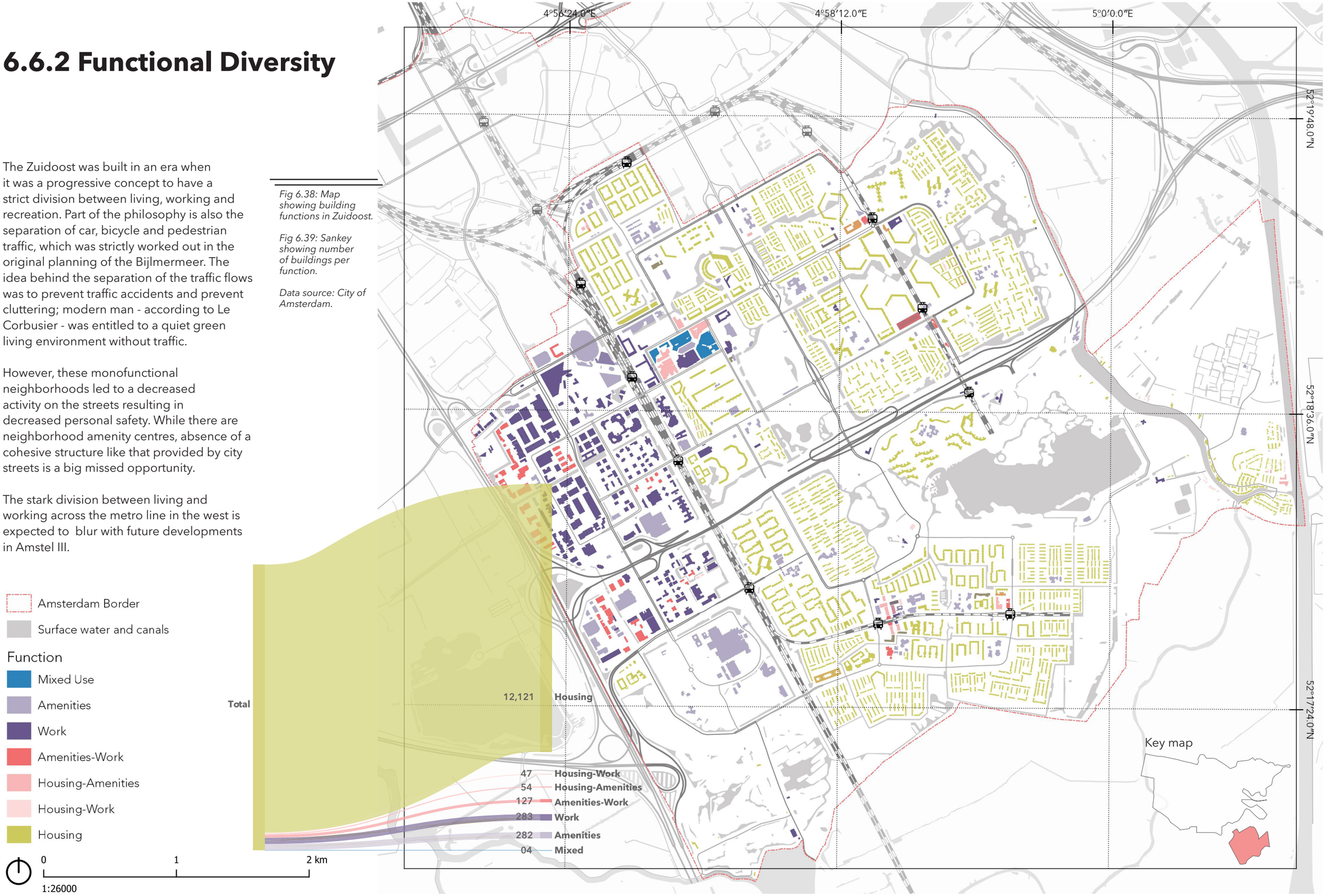
However, these monofunctional neighborhoods led to a decreased activity on the streets resulting in decreased personal safety. While there are neighborhood amenity centres, absence of a cohesive structure like that provided by city streets is a big missed opportunity.

The stark division between living and working across the metro line in the west is expected to blur with future developments in Amstel III.

Fig 6.38: Map showing building functions in Zuidoost.

Fig 6.39: Sankey showing number of buildings per function.

Data source: City of Amsterdam.



6.6.2.1 Amenities

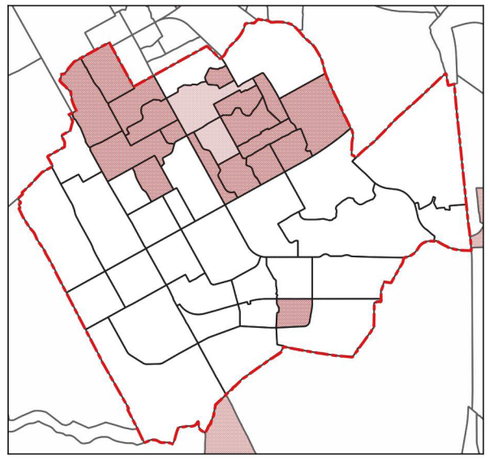
Diversity of neighborhood amenities

The diversity analysis of amentities complements the accessibility analysis to see options available to citizens within a reasonable distance from their neighborhoods.

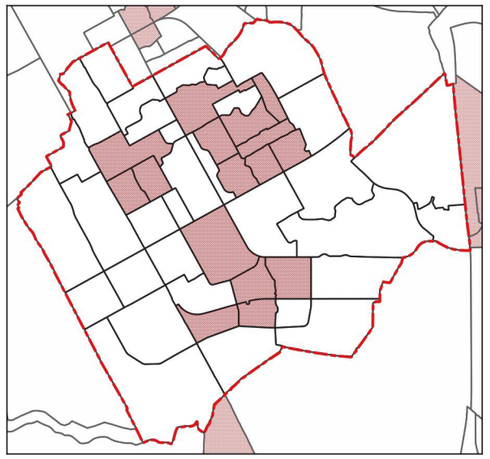
While a supermarket might be available within a 15 minute walk from a neighborhood, if it is only one that is shared by multiple neighborhoods, then the neighborhoods are too dependent on it and they don't have alternatives or choice when it comes to buying daily needs.

As we see in this analysis, most neighborhoods have only one or less supermarket within 1km of every resident, and some neighborhoods have a maximum of 2-3 within 1km of every resident. In contrast, neighborhoods in Amsterdam centre easily have more than 15 within 1km of every resident.

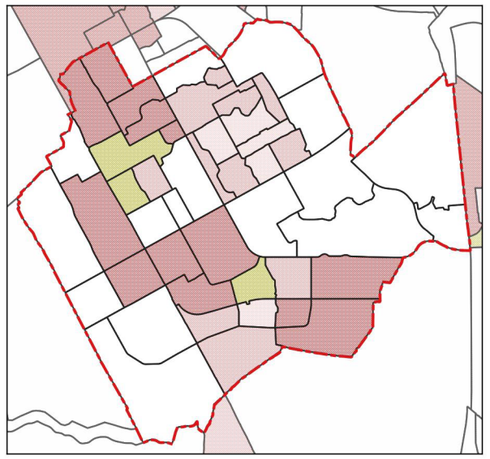
This contributes largely towards perceived livability as well in terms of options a citizen has in her locality t.

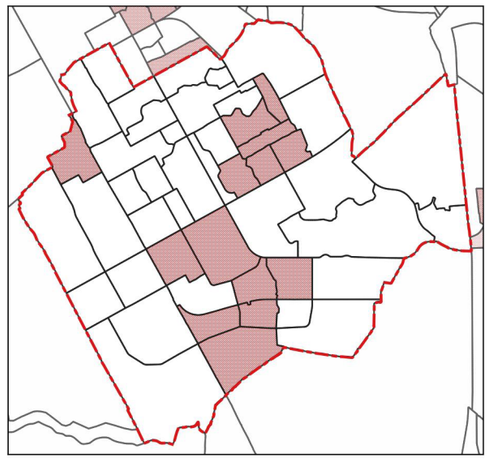


Diversity of Supermarket within 1km

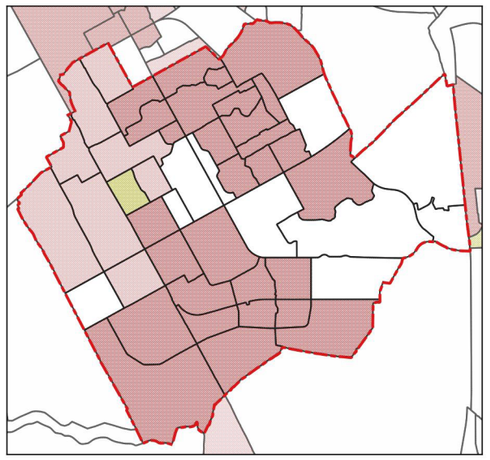


Diversity of Daily Food Options within 1km

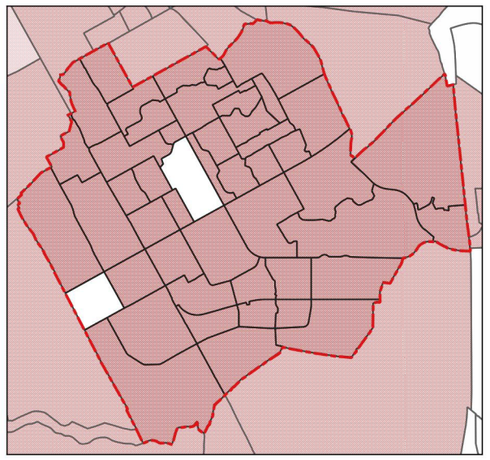


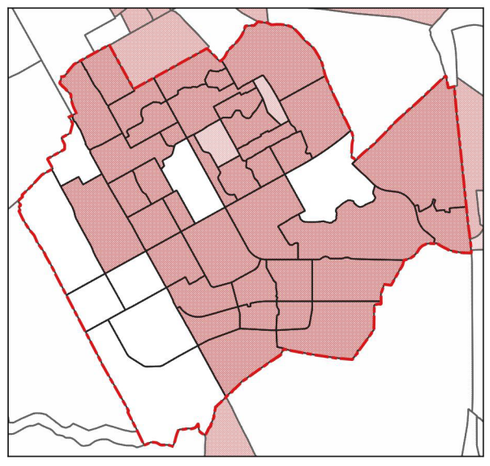


Diversity of Restaurants within 1km

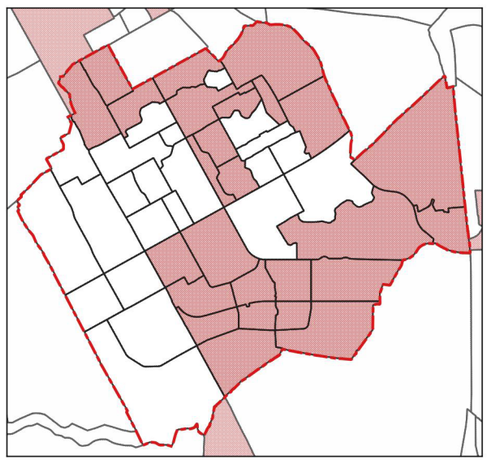


Diversity of Hotels within 5km

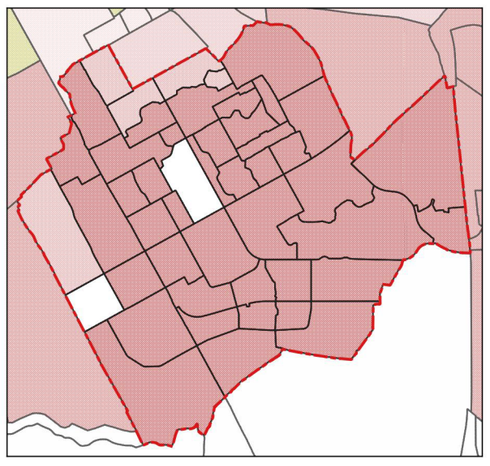




Diversity of Schools within 1km



Diversity of Secondary Schools within 3km



Amsterdam Zuidoost

Diversity Attraction 10km

- 1 or less Options
- 1 - 5 Options
- 5 - 10 Options
- 10 - 15 Options
- 15 or More Options

0 1 2 km

1:85000

Fig 6.40: Maps showing diversity of amenities in different neighborhoods in Amsterdam Zuidoost.

Data source: CBS

6.6.3 Social Diversity

The heatmap provides a snapshot overview of the social composition of the neighborhoods in Amsterdam Zuidoost. The data is classified into equal quantiles in terms of distribution to show the relative status of different neighborhoods. Since Amstel III/Bullewijk business park and the neighborhoods with the Nelson mandelapark and Gaasperpark and Gaasperplas are mostly non-residential at this point, and ranks low in almost all parameters.

The observed parameters are the age distribution, marital status, migration history, income per household, social benefits obtained from the government, household composition and the housing tenure composition.

The concept of segregation is usually used with the assumption that it is a form of inequality. However, not all forms are perceived to be a problem: sorting by age or household is usually not a topic of discussion, however one might make an argument for high percentage of 15-24 year olds in student housing in a neighborhood creating nuisance for others.

Segregation is seen as problematic when it is linked to social hierarchies, or when inequalities by class, education or income, or by ethnicity, nationality or religion also manifest themselves spatially. It often concerns groups that are low in the hierarchy and their overrepresentation in certain neighborhoods. Concentrations of groups at 'the top' are less problematized in public debate, policy and science.

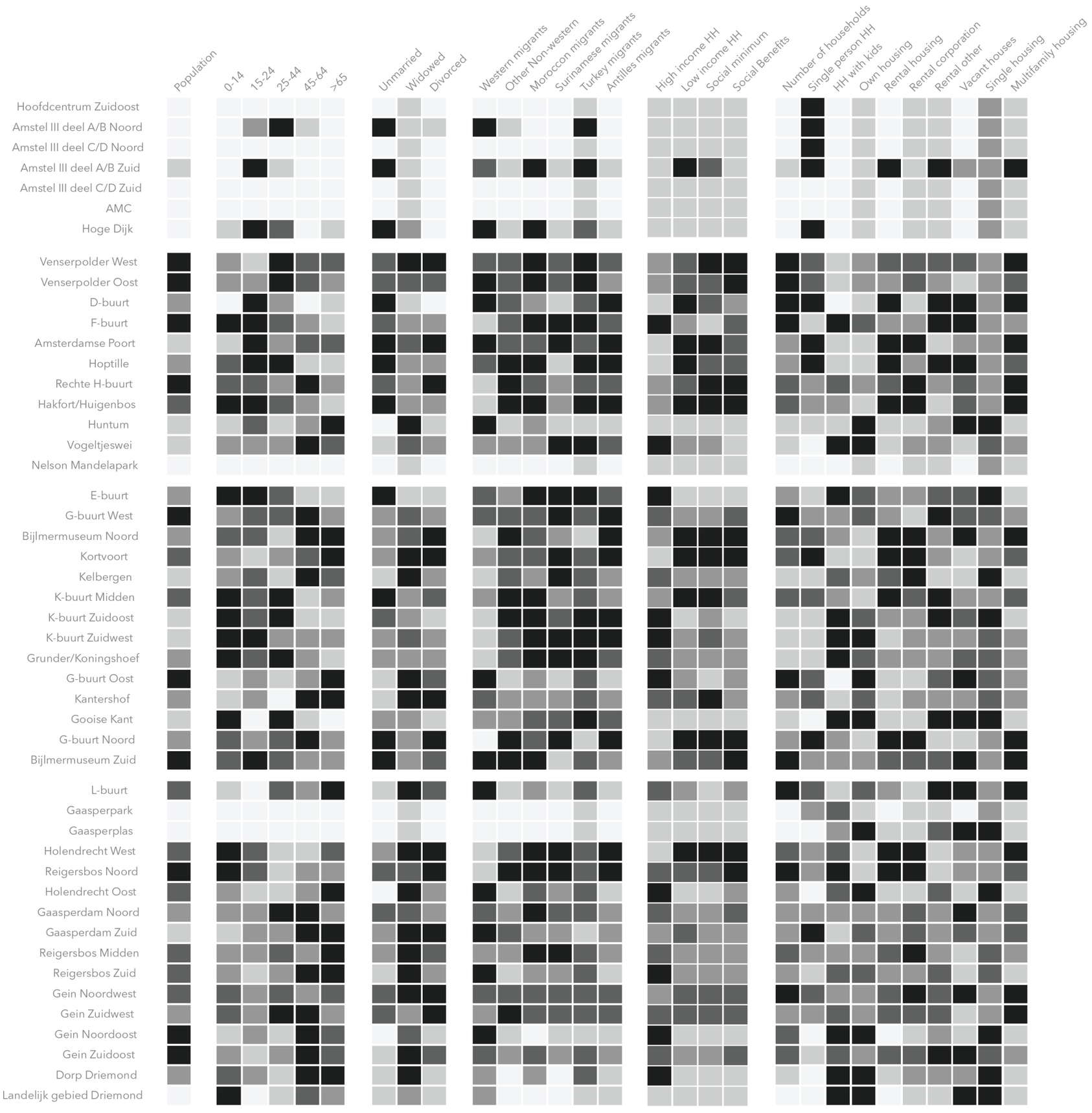


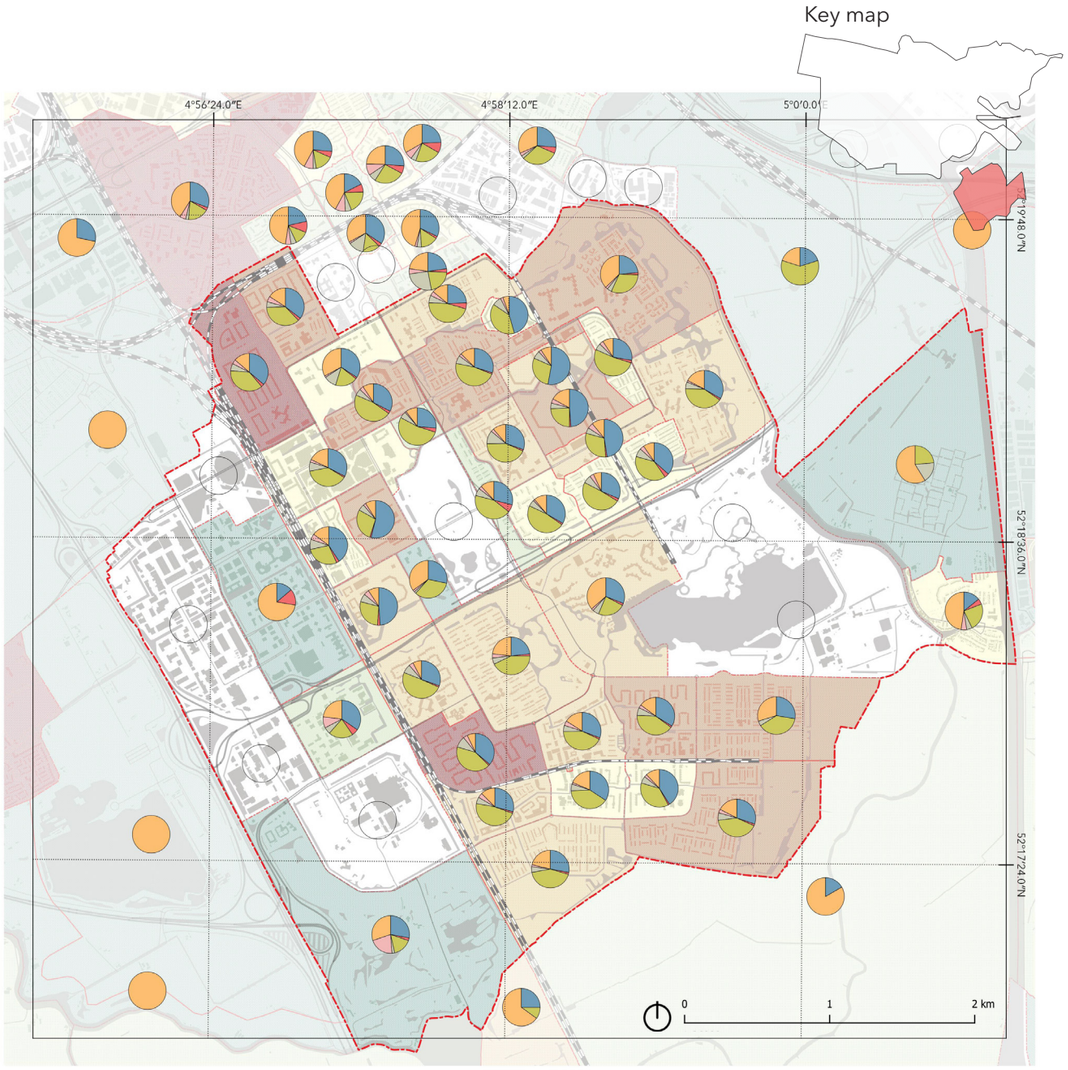
Fig 6.41: Heatmap showing the different social statistics per neighborhood

Source: Author Data: CBS

Fig 6.42: Map showing the migration history of inhabitants in Amsterdam Zuidoost.

Source: Author Data: CBS

6.6.3.1 Migration histories



Currently the city district has a huge proportion of surinamese anywhere in the country and also a large portion of non-western migrants. Moroccans and Turks, while they form a significant proportion of Amsterdam's population, they are less in number in zuidoost.

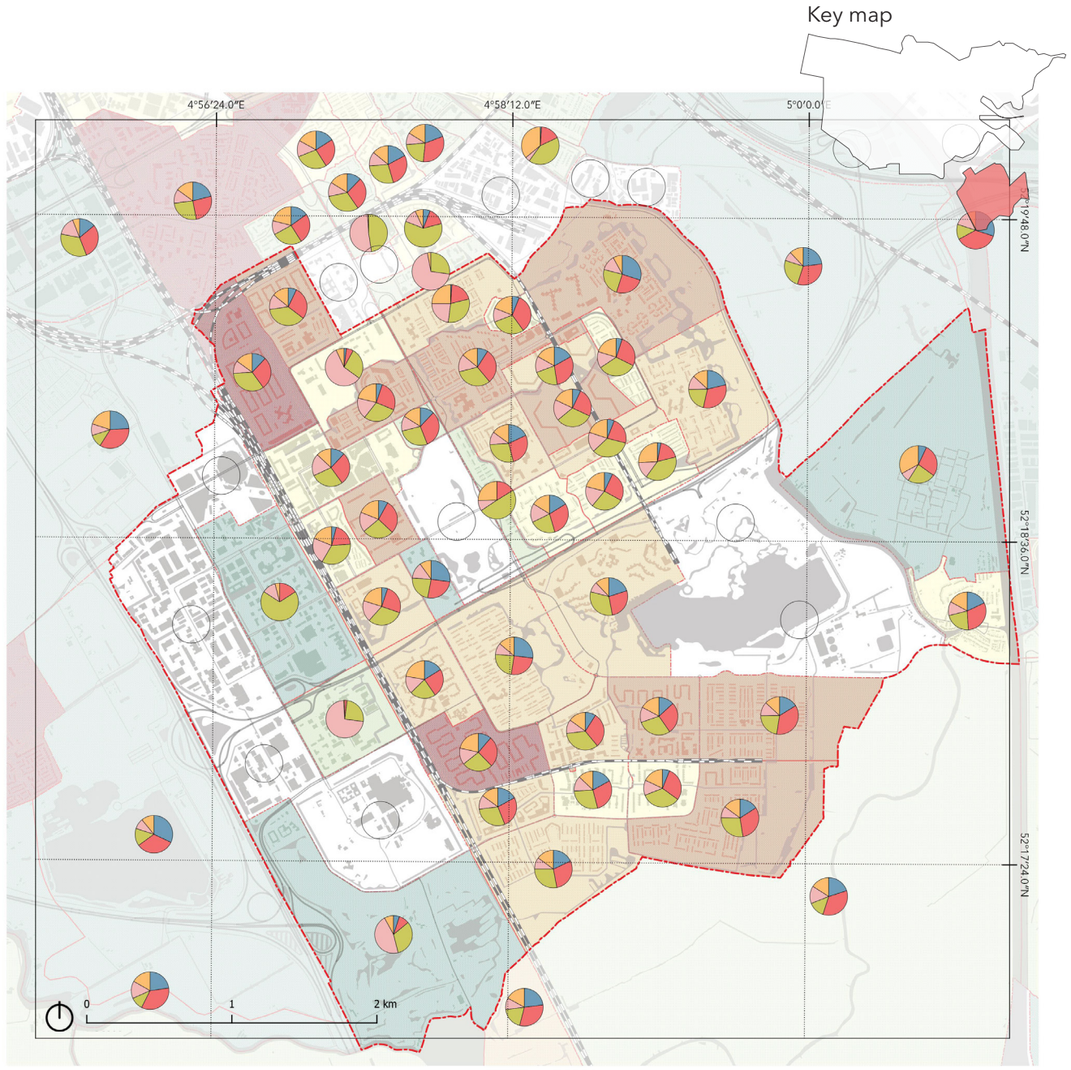
Relatively new neighborhoods with owner occupied homes are preferred by western migrants and native Dutch population.

Different social networks in a city require strong overlaps to ensure ideas and opportunities reach different communities. Segregated ethnic enclaves, while providing a familiar environment for new immigrants hinder these overlaps.

Fig 6.43: Map showing the age of inhabitants in Amsterdam Zuidoost.

Source: Author Data: CBS

6.6.3.2 Age of population



The population distribution according to age in Zuidoost is relatively even. With a few anomalies in neighborhoods with a lot of student housing and neighborhoods with retirement homes.

The concept of segregation is usually used with the assumption that it is a form of inequality. However, not all forms are perceived to be a problem: sorting by age or household is usually not a topic of discussion, however one might make an argument for high percentage of 15-24 year olds in a neighborhood in student housing creating nuisance for others.

Student housing is currently used as a strategy to provide temporary housing in sites that are readied for further developments in the future based on investment availability.

Fig 6.44: Map showing the marital status of inhabitants in Amsterdam Zuidoost.

Source: Author Data: CBS

6.6.3.3 Marital Status



While marriage as a familial institution is declining in the larger Dutch context, kids from single family households fall back in education and economic mobility later in life.

Thus a high proportion of households with separated individuals might be reflective of a larger social problem, which might have negative impacts far into the future.

Care networks of day care and other ancillary social infrastructure to support single parents is required to ensure inclusive growth for all families.

Majority of the registered households are single person households in Amsterdam Zuidoost with the exception of low rise peripheries where more families tend to settle.

Fig 6.45: Map showing the household income of inhabitants in Amsterdam Zuidoost.

Source: Author Data: CBS

6.6.3.4 Household Income



Low income households refer to the share of private households with the lowest 40% of household income in the country.

High income households refer to the share of private households with the highest 20% of household income in the country. Social minimum households reflect the households that fall below the social minimum in the Netherlands.

Due to the residualisation of social housing, most of the neighborhoods do not have high income households and they are only in neighborhoods with privately owned homes.

This is problematic as a lack of social diversity can hinder upward social and economic mobility for people from a disadvantaged background due to neighborhood effects.

6.6.4 Opportunities and Urgencies

Zuidoost is culturally one of the most diverse places in the city, however it requires some mix in terms of form and function as well, which could potentially lead to some social mix that can be beneficial for the city district.

Amstel III and rest of Zuidoost require strong physical connecions that bring the city-district together. Right now, they are essentially two different worlds.

Through the diversification of predominantly residential neighborhoods and bringing in a mix of functions, the local economy could be revived, which can potentially benefit the local residents in improving their financial situations.

Formal and tenure mix within neighborhoods can bring in new dynamics to the neighborhoods and could help improve the vicious cycle some of the neighborhoods are stuck in.

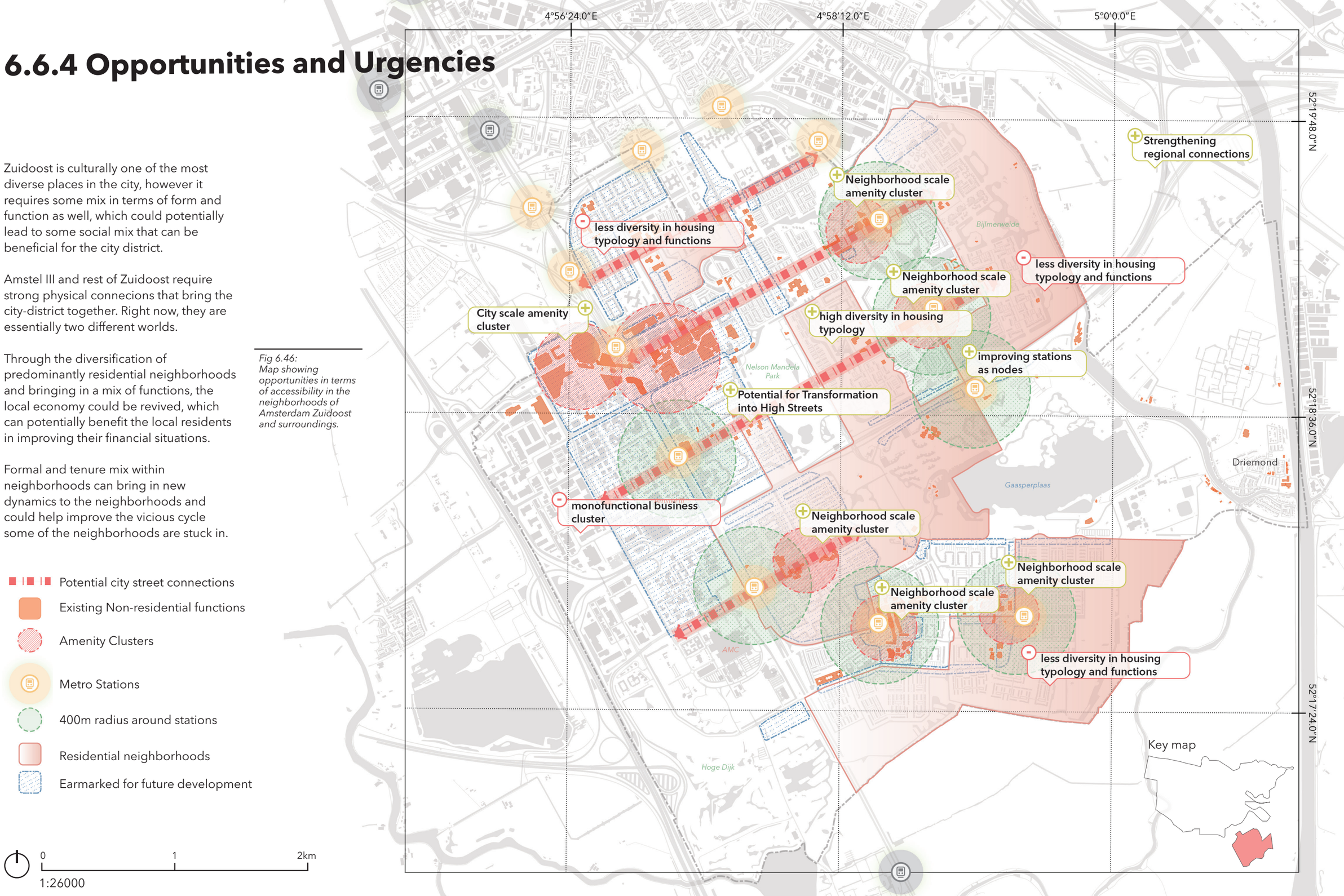


Fig 6.46: Map showing opportunities in terms of accessibility in the neighborhoods of Amsterdam Zuidoost and surroundings.

6.7 Blue and Green Networks

A well functioning blue and green network provides ecosystem services that are irreplaceable and extremely vital to the healthy functioning of other inter dependent human systems (MEA, 2001).

Amsterdam Zuidoost has a high percentage of green spaces and less amount of blue networks as compared to the city centre, however, a lot of the existing potential is not fully utilised. A lot of what is considered as green space is still under utilised spaces in open courtyards or residual and inbetween buffer spaces around infrastructure.

There is a huge potential for the large areas of existing green space in Amsterdam zuidoost in terms of adopting new programs for leisure, work, socialising, sports, play, celebration, food production and more productive activities as well.

Amsterdam aims to be climate proof by 2050, and green spaces in the city has an important role to play.

Not just at the urban scale, but even at the building scale, green roofs can help absorb rainfall and slow down the run-off into the street, buffering the capacity of storm water drains in the city to cope with the increase in runoff during cloudburst events, which are becomign increasingly common.

In addition, when temperatures are high during increasingly warmer summer months, green space provide a cooling effect due to evaporation, however this needs to be distributed across different neighborhoods and not just concentrated in one part for it to minimise the urban heat island effect.

In contrast, from a biodiversity perspective, larger and interconnected patches of different greeen and blue areas can sustain more species than fragmented and smaller patches of green and blue.

While green and blue networks add immense value in improving the environmental sustainability of a region, their spatial manifestation have the potential to fragment neighborhoods into isolated islands of their own, decreasing the spontaneous encounters that are possible only in urban areas.

In this analysis, the intent is to understand the nature of blue and green networks in Amsterdam Zuidoost.

6.7.1 Soil and Subsidence
To understand the underlying soil composition in Amsterdam Zuidoost and surrounding areas, and the opportunities/ challenges it presents.

6.7.2 Blue Network
To understand the blue network as an interconnected system in relation to the built environment in Amsterdam Zuidoost, its spatial implications and some observations along the way.

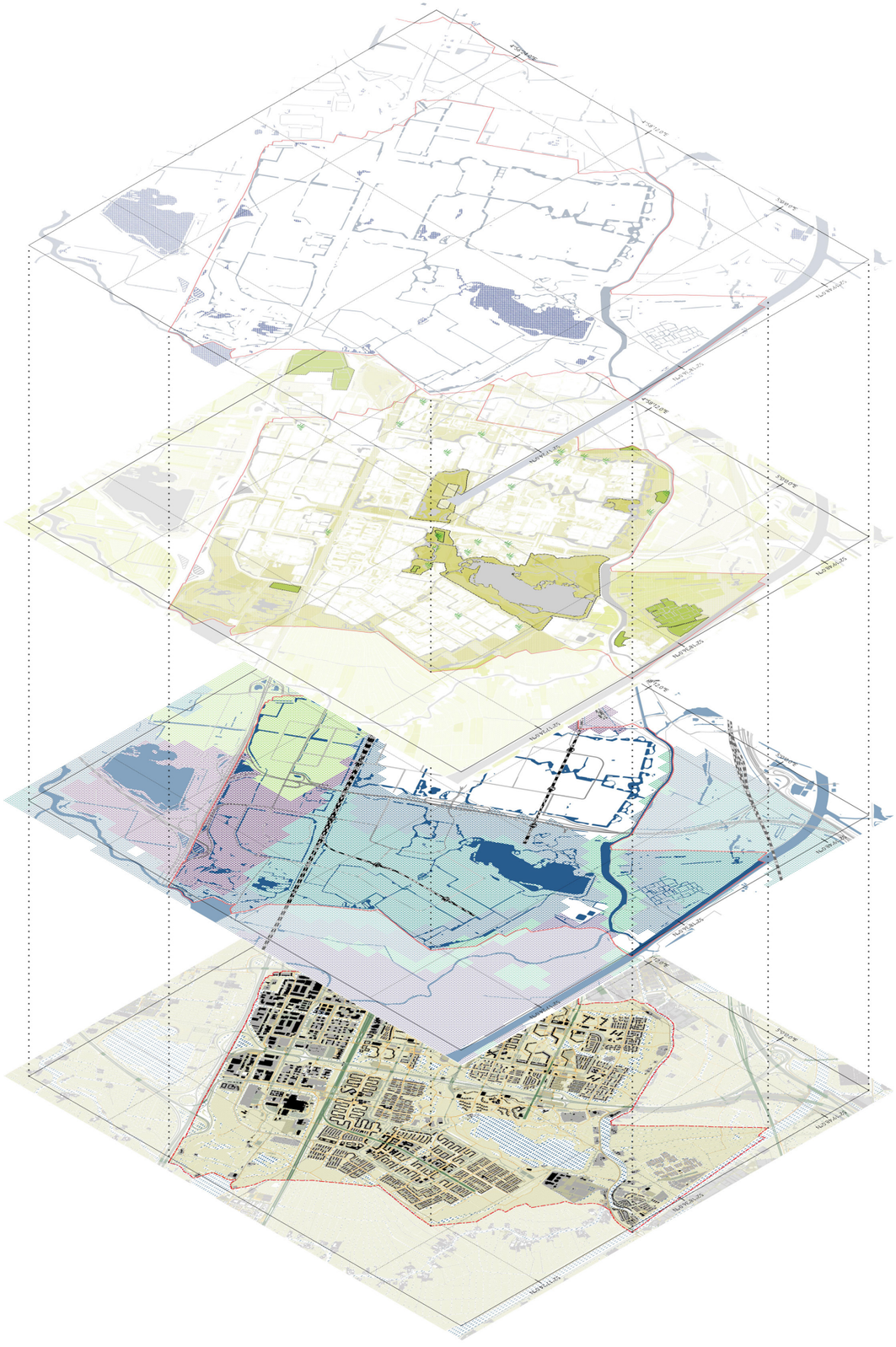
6.7.3 Green Network
To understand the green network as an interconnected system in relation to the built environment in Amsterdam Zuidoost, its spatial implications and some observations along the way.

6.7.4 Climate Change
Climate adaptation is the need of the hour when it comes to dealing with the climate crisis and its impacts on urban life. In this section, the immediate threats posed by climate change in Amsterdam zuidoost is analysed.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

Fig 6.47: layers of blue-green networks and soil conditions in the city district of Amsterdam Zuidoost and its surroundings.

Source: Author



6.7.1 Soil and Subsidence

All of the Bijlmermeer development is built on fertile agricultural land, a part of which was reclaimed from the Bijlmermeer lake around 1850. Since the soil type here is different types of peat, it is highly prone to subsidence due to peat oxidation when the water levels are low.

This is especially of concern in the Amstel III business areas, Reigersbos, Gein and Gaasperdam. In the residential neighborhoods of Reigersbos and Gein, ground water levels could go beyond 2m during droughts, potentially causing faster subsidence.

As of now, projections show subsidence upto 60cm in these neighborhoods before 2050. It is important to ensure that the surface runoff are stored longer and allowed to seep slowly into the groundwater table to prevent this in the long run.

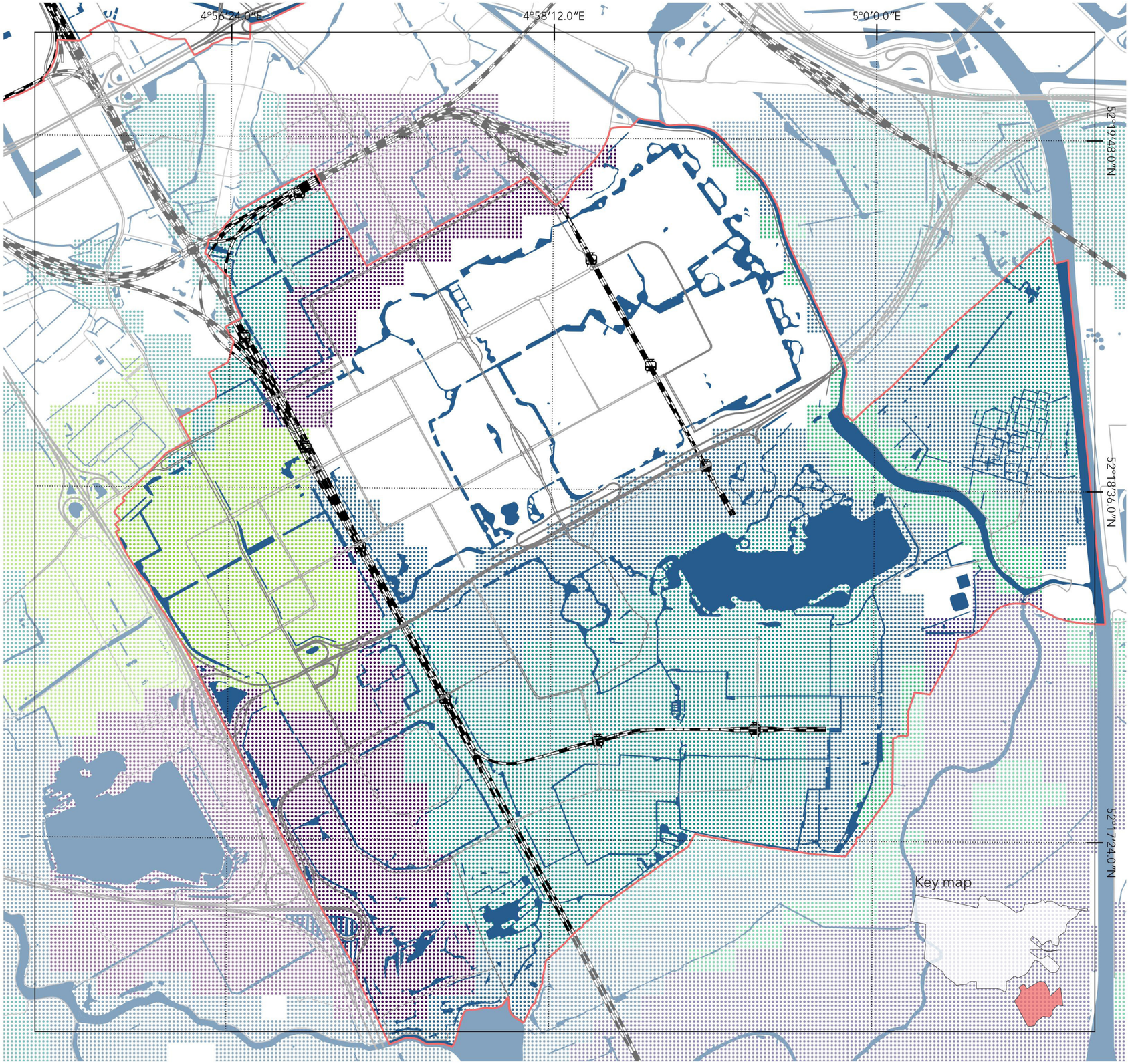


Fig 6.48: Map showing soil types in the neighborhoods of Amsterdam Zuidoost and surroundings.

Source: PDOK

6.7.2 Blue network

If we look past the primary dikes and the water defence systems that keep the north sea at bay, there are three other distinct water systems and related infrastrucure in Amsterdam.

There are a series of infrastructural systems that keeps the land dry from rainfall and water coming along the rivers upstream. This includes storm water drainage systems to move water from the city along the underground infrastructure on to the canals and from there, it is pumped out into larger canal systems via the pumping stations. Within the city centre the stormwater system and the sewer system are one and the same and in recent years gets overburdened during cloudburst events leading to sewage water running in the canals. However, the more recently developed Zuidoost has indpendent systems for storm water transportation and sewer water transportation.

The second system is the system that brings drinking water to households. The centralised water supply system is highly regulated and it features a series of both natural and man made systems to extract and filter water, which are then transported to households. Since there is no distinction of use, drinking quality water is used for all purposes from drinking/cooking to showering and flushing. According to Waternet, the average Amsterdammer uses 22% more drinking water than the average Dutch person. This system is not very resilient as it faced difficulties in maintaining pressure when more people staying home due to pandemic lockdowns used more than average water to deal with the warmer summers.

The third system is the one that deals with waste water from buildings, the sewer network. Here again, there isn't a distinction between black water and grey water systems. They are collectively treated at a water treatment facility before they are allowed to enter the surface water in the canals.

This predominantly grey infrastructure based, centralised water system in Amsterdam has potential to be decentralised to expand its capacity and build resiliency in to the system with increasing climate anomalies.

The govenance of Amsterdam's water system is heavily integrated with the Municipality of Amsterdam and the Waterschap Amstel, Gooi en Vecht forming Waternet as the intregrated company that manages all the cycles of water mentioned before in Amsterdam and the surrounding areas.

The current system is an extremely efficient and integrated system that might not be open to decentralisation since it brings in risks of potential failures as well. However, with advancements in ICTs, and the need to adapt to the climate crisis, means we are looking at decentralisation of some of water infrastructure through measures such as water storage, sponge infiltration and phytoremediation wherever feasible.

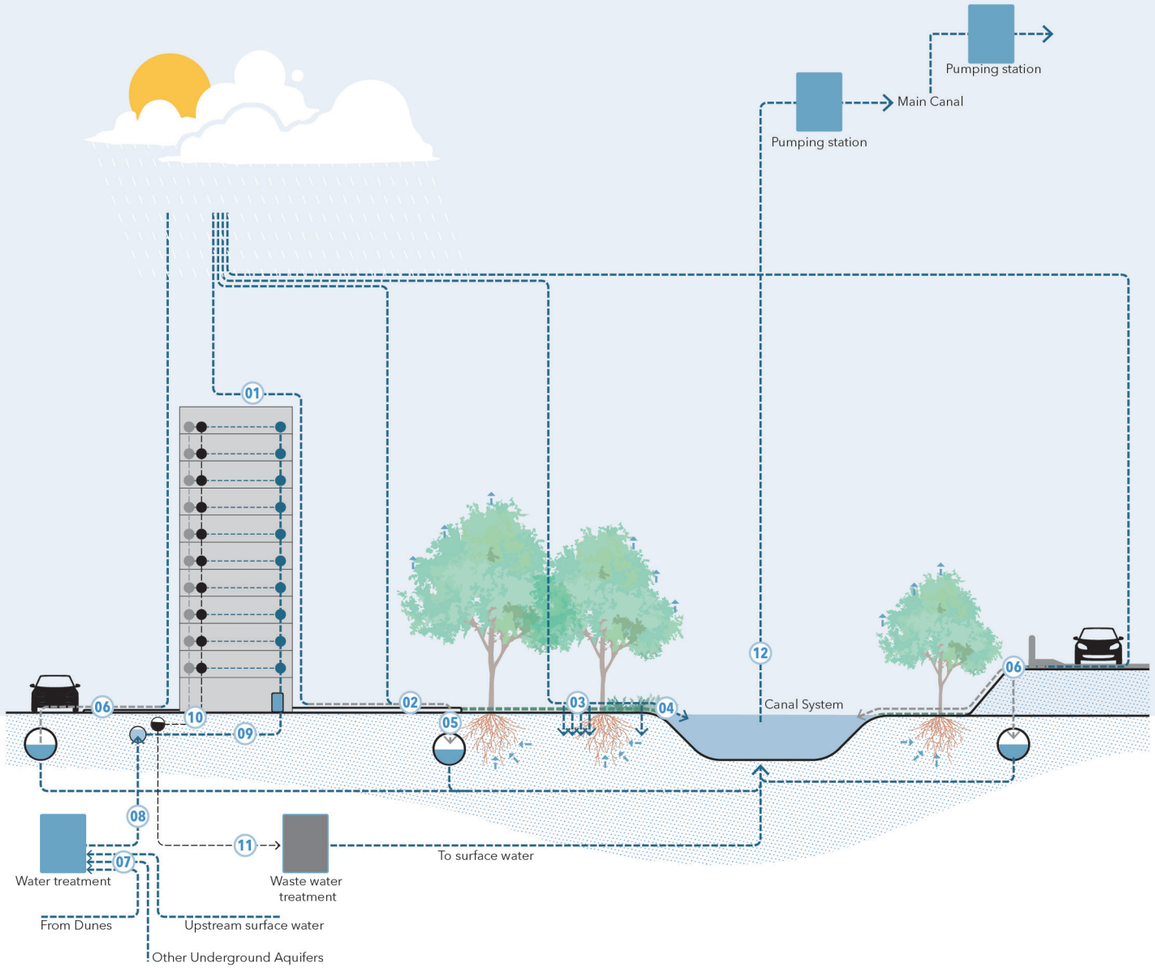


Fig 6.49: The cocep-tual systemic section shows the flow of water in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 The roof of buildings add rainwater to surface runoff, which could be stored and used.

02 Paved surfaces such as parking lots and roads prevent infiltration of rainwater. With higher density, paved surface increases.

03 The unpaved surfaces lead to infiltration of the runoff water. If water table is high, this infiltration will be slow.

04 The surface runoff also drains in the canals when there is heavy rainfalls, which is expected to rise with climate change.

05 Stormwater runoff is collected in a separate underground stormwater drainage system Amsterdam Zuidoost.

06 Surface runoff from roads and parking lots are polluted by vehicle exhausts and they pollute surface water.

07 Water from multiple sources are purified by both natural and artifical processes by the water company waternet.

08 Purified water is delivered to households via pipelines. An average Amsterdammer uses 133 litres of water per day.

09 Purified water from main network is used for all purposes in the household from drinking and shower to washing and flushing.

10 The wastewater from the household is not segregated, but drained to the municipal sewerage system.

11 The waste water is pumped to the treatment facility where it is treated and drained into natural water system.

12 The interconnected canal systems are drained through a network of pumping stations to keep areas from flooding.

6.7.2.1 Spatiality of Blue Network

Compared to Amsterdam centre, the neighborhoods in Zuidoost have less surface area covered in water.

The Zuidoost district is divided into several hydrological units and are drained by the various unnamed water canals. Unlike the city centre, the canals here are mostly used for drainage and rarely for recreation and never for transportation.

They are not all linked at the surface level and form self contained hydrological units that drain out at the pumping station into the Amsterdam-Rhine canal on the east and the Amstel river on the west.

The Gaasperplas is a large manmade lake, constructed during Floriade 1982 and has since been made into a recreational lake used by all residents of Amsterdam and its surroundings.

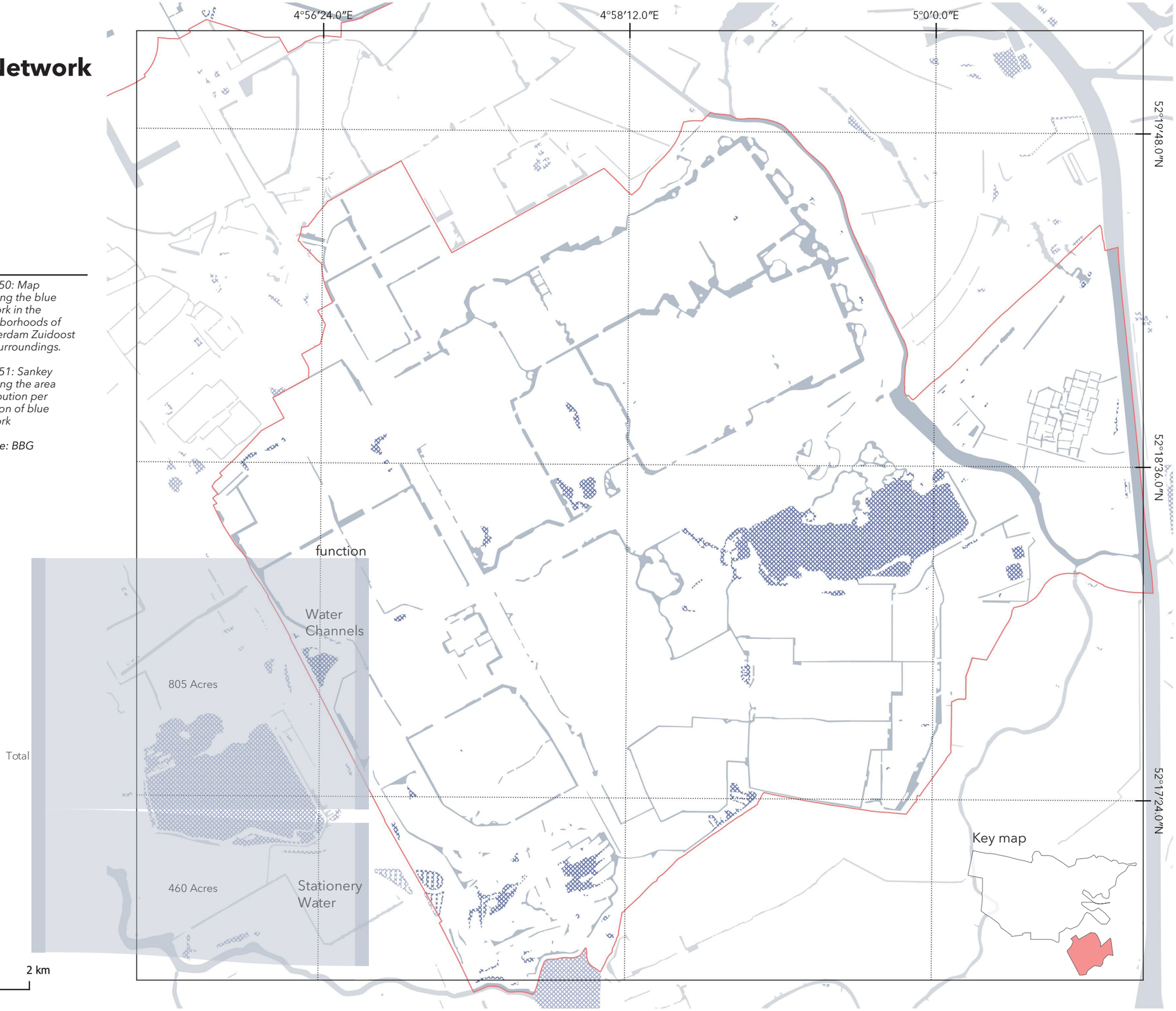
The Neighborhoods of the Bijlmermeer form the lowest point, while the neighborhoods of Reigersbos, Amstel III business park and Gein form relatively higher ground.

The canal edges have incredible potential for both biodiversity and recreational use, which are currently vastly underutilised as spaces next to the canals are zoned for service functions such as parking.

Fig 6.50: Map showing the blue network in the neighborhoods of Amsterdam Zuidoost and surroundings.

Fig 6.51: Sankey showing the area distribution per function of blue network

Source: BBG



6.7.2.2 Observations

The blue networks of Zuidoost are predominantly used for the drainage of water and keeping the land dry and very little for other purposes. Spatially, they act as border around different neighborhoods, fragmenting them since there is very little placemaking along their edges. Increasing access points and improving activity along the canals can improve this a lot. Biodiversity along the canals could also be improved through dedicated interventions.

The Gaasperplas recreational area of 166 ha is part of the Amstelland Green Area . A part of the northern adjoining Gaasperpark with its intricate pattern of cycling and walking paths reflective of the Floriade at that location in 1982. After the Floriade, almost all additions were removed, so that a simpler city park remains.

On the Gaasperplas there is a marina for a sailing club, a canoe rental, a windsurfing club, an indoor playground and several sunbathing areas and beaches on both the north and south banks.

There is currently a proposal for the Gaasperplas to be renovated, which focuses on increasing recreational activities at the lake and the park around it.

In the Bijlmermuseum neighborhood, during the renewal, green open spaces were reduced through the expansion of water storage since it was not manageble. Canals in this part of the district feature viewing decks and pedestrian and cyclist bridges over the waterbodies along with artworks on the canal. This is an example that could be extended in the upgradation of waterbodies all around Zuidoost as well.



Fig 6.52: Collage showing observed trends in the blue spaces of Amsterdam Zuidoost

Images from Google earth, Google Maps and Author

6.7.3 Green networks

Of the 71 European cities ranked in the Husqvarna green city index, Amsterdam ranked 66th. It claims that an average Amsterdammer has 69.9 m² green space per person. This is probably inflated by waterland to the north. While the presence of green spaces within Amsterdam city centre is less, Zuidoost and garden cities to the west have a large percentage of their surface area dedicated to green spaces.

Zuidoost features the Gaasperpark, the Nelson Mandela Park in its geographic centre, the Bijlmerweide, Gasperzoom and the De Hoge Dijk as large green areas mostly around the periphery except for the Nelson Mandela park and the small neighborhood parks in the southern suburbs.

Most other green spaces are part of open and closed courtyards of the cityblocks and in the case of townhouses, private front and backyards.

The management of the public and semi-public green spaces in Zuidoost is contested due to its large expanse and relative lack of intensity of use due to low articulated programming in these spaces.

The new renovation plans for the Gaasperpark aims to change that with programmatic thickening.

The Gaasperdammertunnel rooftop parks will bringforth the spatial integration of the nelson mandela park and the Gaasperpark. However, in order to connect the green network to the rural landscapes beyond the city fabric, an experiential green network with urban recreational facilities is required throught the city district.

The green areas and the canal banks are also home to a large number of species seen in Amsterdam. An integrated approach towards biodiversity management can look at the built environment as a part of the larger urban ecosystem where plants and animals can thrive alongside humans as well. In Amsterdam zuidoost there is huge potential in that front.

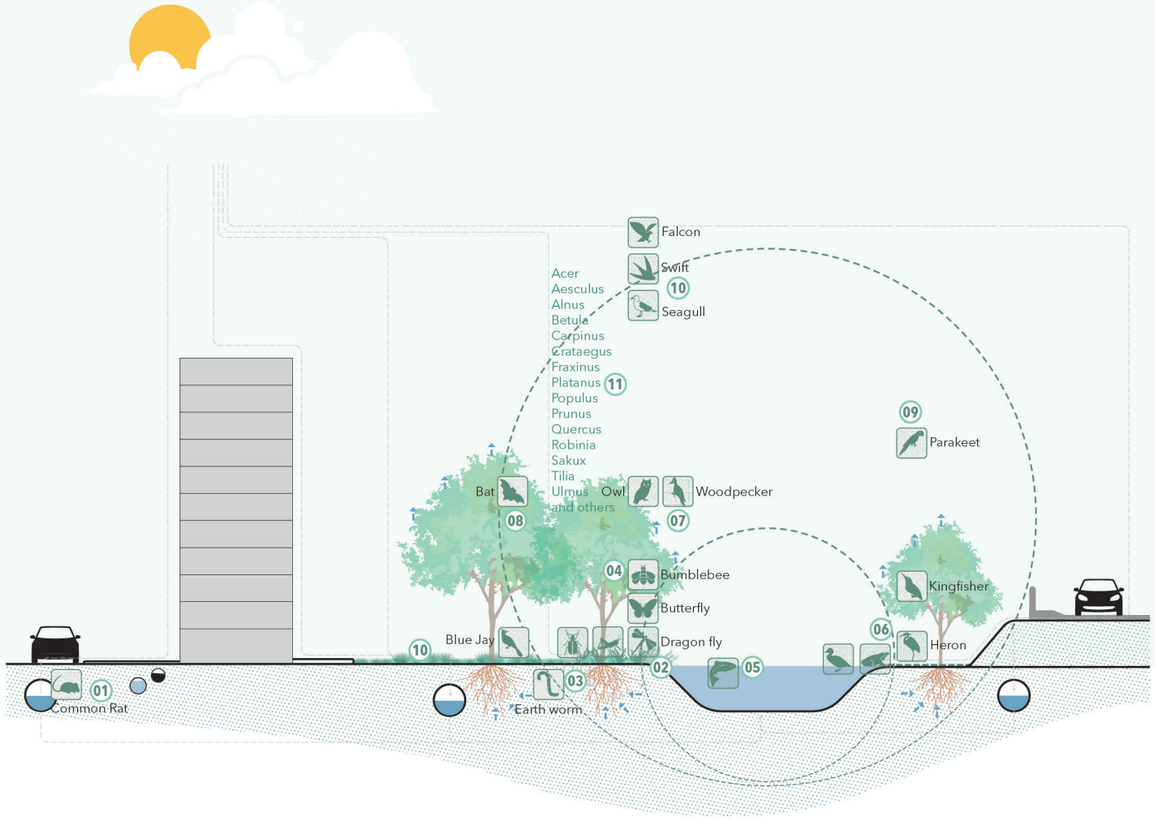


Fig 6.53: The coceptual systemic section shows the green network in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 The old sewer systems of Amsterdam house a lot of rats as pests.

02 Currently, Biota is confined to the green areas and canals. while built areas have less biodiversity

03 Large green areas in Amsterdam zuidoost are currently poorly maintained which could potentially be more biodiverse.

04 Insects and bees are an integral part of any ecosystem and are required to sustain a wide range of birds in the area.

05 The waters in Amsterdam zuidoost are currently polluted. They have the potential to house a large variety of aquatic species.

06 Canal edges are currently some of the most biodiverse areas able to sustain a wide variety of birds and amphibians.

07 The large number of trees in Amsterdam Zuidoost is home to a large variety of bird species as well.

08 Common noctule bats are one of the largest types of bats in Europe. They live in trees and hunt for bugs, moths and mosquitoes.

09 Amsterdam is home to a colony of rose-ringed parakeets, known to be living here since the 1980s.

10 Seagulls are also seen in Amsterdam Zuidoost especially around public spaces with outdoor restaurants.

11 While there are a large number of trees in Zuidoost, they are predominantly aesthetic focused easy maintenance species.

6.7.3.1 Spatiality of Green network

Amsterdam Zuidoost has a lot of green spaces as typical of neighborhoods outside the ring in Amsterdam. Some neighborhoods have more than 60% of their surface area that are green.

However, a vast portion of these green spaces are vastly underutilised. Due to a lack of cohesion and order in the urban form, the green spaces end up being perceived as leftover or inbetween spaces, leading to a lack of ownership resulting in poor maintenance and further deterioration of these spaces. As the least populated city district, the green space per person is higher than the rest of the city.

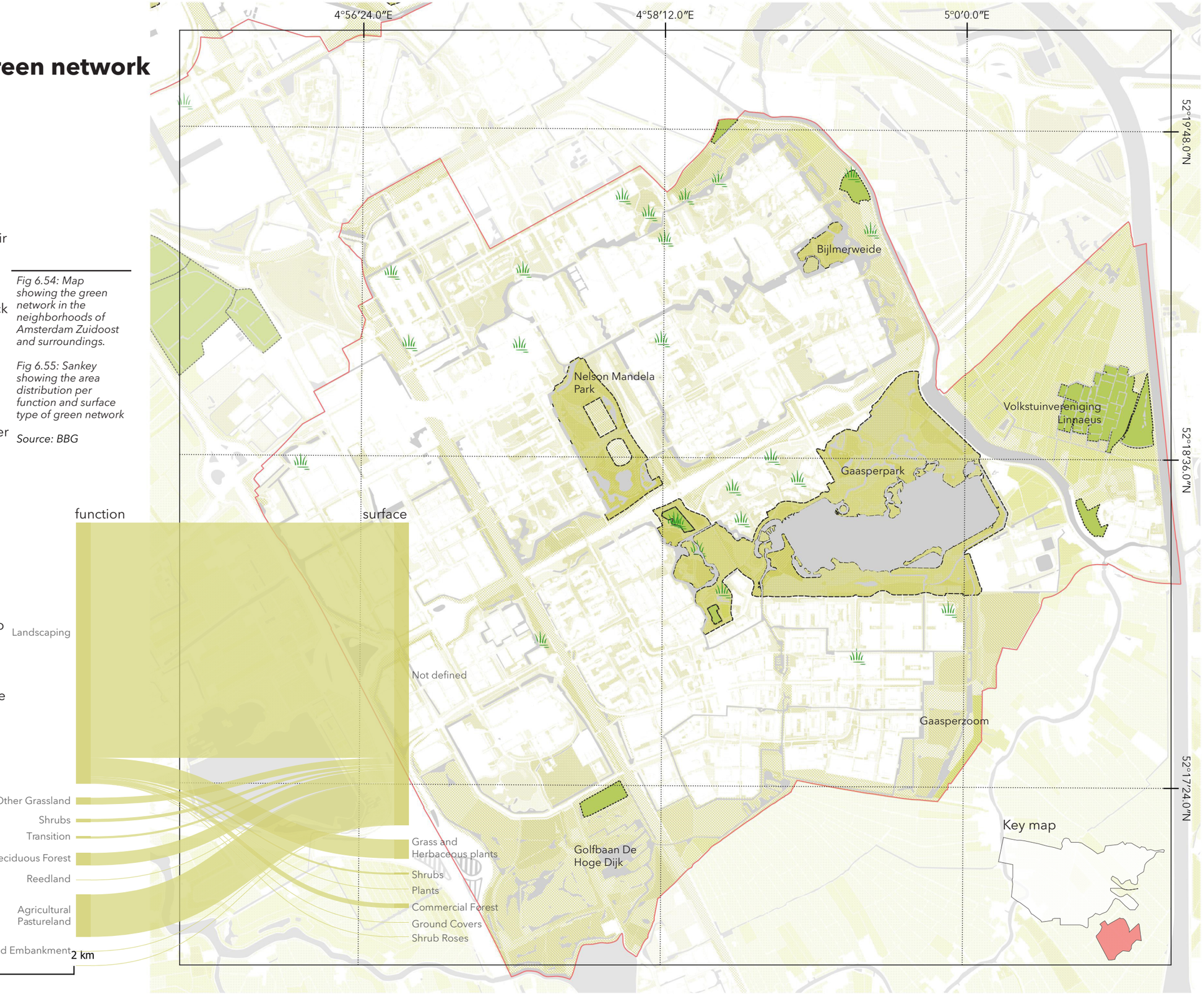
There are smaller initiatives in different neighborhoods towards the productive use of greenspace such as urban farming, which could be successfully scaled up to other parts of Zuidoost, provided they are integrated with the rhythm of life in the city district.

The construction of a new rooftop park atop the Gaasperdammertunnel, which is twice the size of Vondelpark would create a city level attraction in the geographic centre of the city-district, and an oppurtunity to create strong connections between Bijlmer in the north and Reigersbos/Gein in the south.

Fig 6.54: Map showing the green network in the neighborhoods of Amsterdam Zuidoost and surroundings.

Fig 6.55: Sankey showing the area distribution per function and surface type of green network

Source: BBG



6.7.3.2 Observations

It has long been established that the presence of greenery and the opportunity to enjoy the rural area contribute to health and well-being of citizens. For people living Amsterdam Zuidoost, this greenery is a lot more accessible. The green network around the Zuidoost district forms part of the larger Amstelland green area.

There is a lot of potential in establishing connections through the city district between the much older settlement of Ouderkerk aan de Amstel to the west and the municipality of Weesp to the east. The rooftop park atop the Gaasperdammertunnel is a step in that direction, but it's regional potential needs to be realised if it were to bring maximum benefits.

The rural landscape surrounding zuidoost also has poor biodivesity as it is predominantly pasture lands. These could be rethought to create more productive habitats for other species beyond livestock.

Since this crosses multiple administrative boundaries of municipalities and provinces, n integrated nature and agricultural management is required in these rural green areas similar to the Waterland alliance in Amsterdam Noord and beyond.

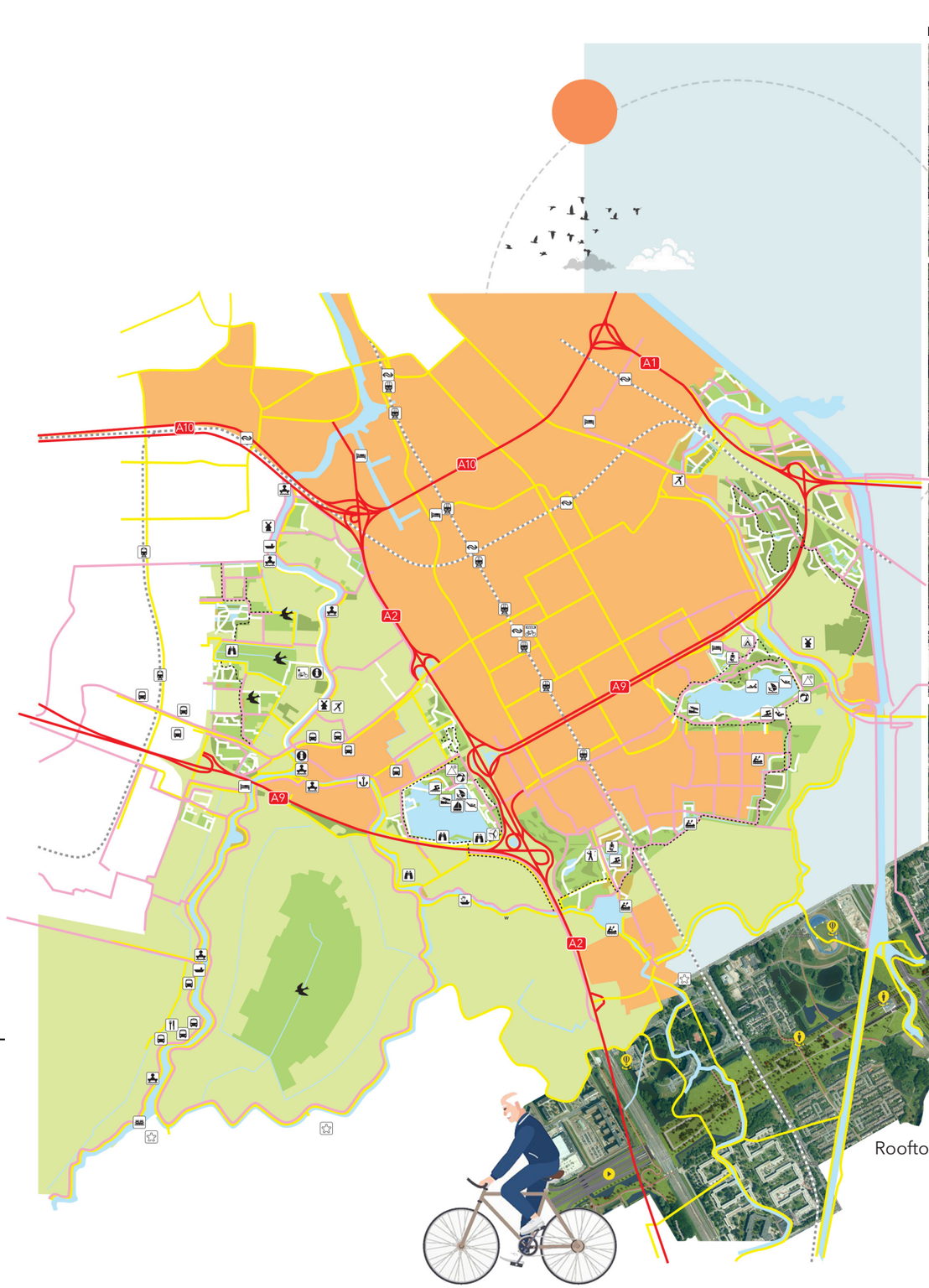
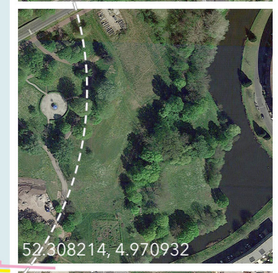


Fig 6.56: Collage showing observed trends in the green spaces of Amsterdam Zuidoost

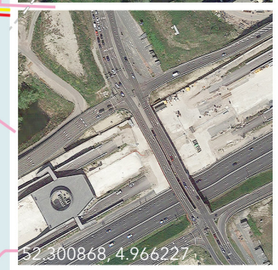
Images from Google earth, Google Maps, Groengebied Amstelland and Author



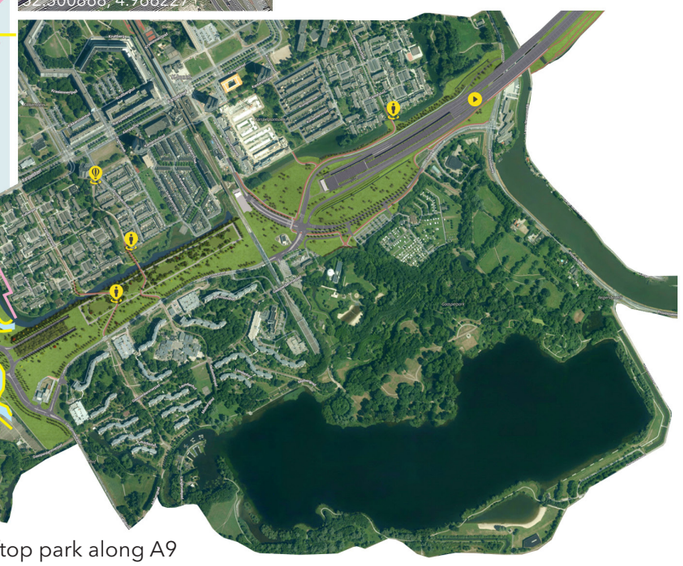
A large portion of the observed green areas in the neighborhood are residual green spaces along infrastructure which help in reducing noise, but do very little beyond that. The diversity of trees used for these purposes are also quite minimal.



The greenspaces between buildings are not well articulated and thus are underutilised. These fragmented patches don't accompany active streets and are perceived to be unsafe, eventhough they have immense potential for programmatic thickening.



The Gasperdammertunel was completed in 2020, thus paving way for the construction of a new rooftop park twice the size of Vondelpark. However the current designs do not add much functional value beyond improving connectivity across the fragmented north and south of Amsterdam Zuidoost district.



Rooftop park along A9

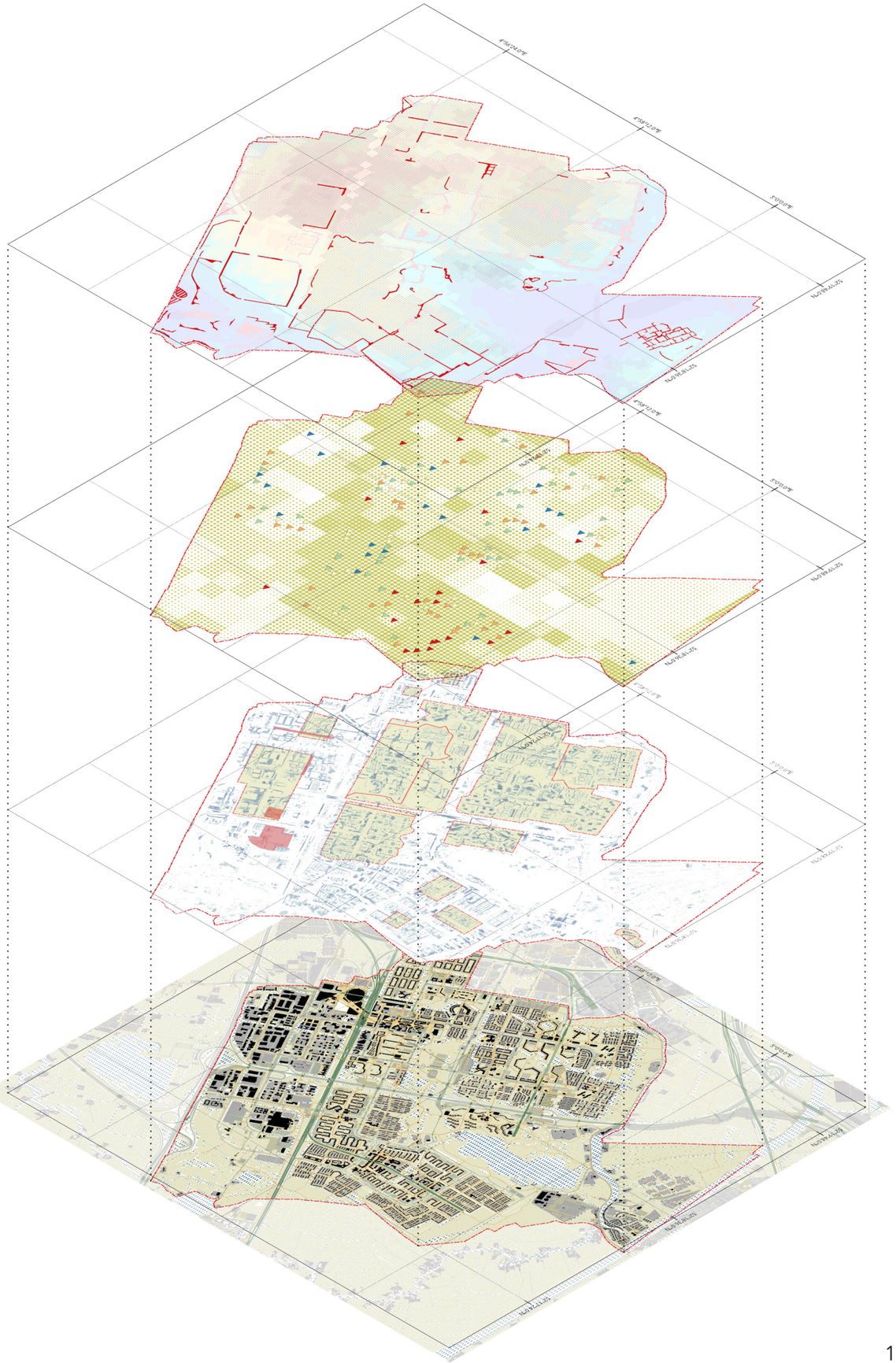
The construction of the new rooftop park atop the Gaasperdammertunnel, which is twice the size of Vondelpark would create a city level attraction in the geographic centre of the city-district

6.7.4 Climate change

mitigation and adaptation towards survival

Fig 6.57: layers of climate vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to climate change under the dimensions of heat, drought and flooding.

Source: Author



According to the KNMI`14 climate scenarios , in the future higher temperatures, faster rising sea levels, wetter winters, heavier showers and drier summers in the Netherlands should be taken into account while designing the built environment. Due to global warming, showers are getting heavier and more frequent. As a result of this, the stormwater system and sewer system in the city have to process much more water than before. The risk of extreme heat and prolonged drought is also increasing. While the risk of primary dike breaches and the complete flooding of western Netherlands is still there, in this section, the focus is on Zuidoost and the impact of climate crisis at the district scale.

In the Delta Plan on Spatial Adaptation, it has been agreed that all provincial and local governments will have to carry out climate stress tests on the themes of heat, drought, and flooding. The vulnerabilities for these themes in Amsterdam have been mapped out using stress tests. The results of these stress tests are used in drawing up a climate adaptation strategy for Amsterdam.

In the following maps, the climate related vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to climate change under the dimensions of heat, drought and flooding are analysed.

In the coming years, more than 30,000 homes are slated to be constructed within the city district of Amsterdam Zuidoost, which means there'll be over 50,000 residents at least, who would be moving in.

It becomes extremely important to create public infrastructures towards climate change mitigation and adaptation towards the impacts of climate change that we already see happening around us. The vast green and blue networks of Zuidoost provides opportunities for climate adaptation that could potentially play a role at the city scale and beyond as well.

While climate crisis is experienced at the city scale in different ways, many of the solutions towards mitigating it are embedded in the green/blue networks of the city. In this section the following aspects are analysed in detail to understand the potentials and urgencies.

6.7.4.1 Flooding

Potential vulnerabilities to cloudburst events and other extreme weather conditions leading to flooding of the streets and canals. This doesn't look into dike breaches at the metropolitan scale.

6.7.4.2 Drought

Potential vulnerabilities to drought conditions and how hidden water systems such as water tables would respond.

6.7.4.3 Heat

Potential heat stress related vulnerabilities and relation to the built environment and how it could change in the near future.

The conclusions of this analysis are combined in the urgencies chapter 6.7.6

6.7.4.1 Flooding

Due to climate change, Amsterdam is expected to receive more extreme rainfall. In combination with increasing buildings and paving, this makes the city district vulnerable, because rainwater can no longer drain away so quickly. This leads to more and more nuisance and damage after downpours, and risk of flooding during cloudburst events.

The map shows the places in Zuidoost where there is a high risk of flooding and damage when it rains extremely hard. A rainwater bottleneck is (part of) a street or neighborhood with a (strongly) increased risk of such nuisance and damage in the event of extreme rainfall. The bottlenecks vary in severity and size.

While city level infrastructures can help control runoff, design of building roofs or garden can also make a difference to a large degree.

A sponge network of green infrastructure can supplement the gray infrastructure of stormwater drainage to increase percolation, where ground water levels are not too high. In places with high ground water levels, more surface storage can be created to store and delay water runoff during cloudburst events.



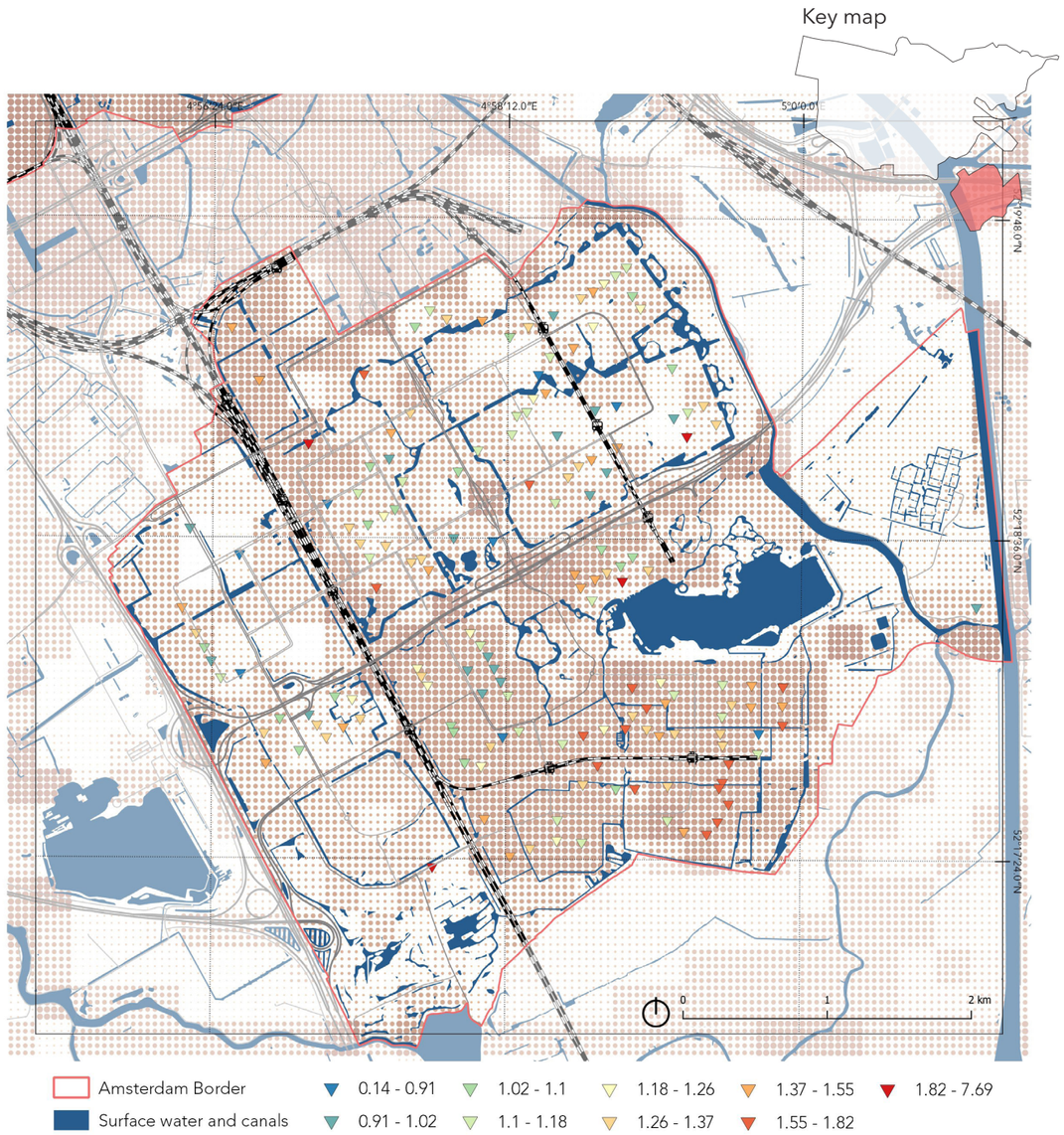
Fig 6.58: map showing the climate vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to flooding.

Source: Author

6.7.4.2 Drought

Fig 6.59: map showing the climate vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to drought.

Source: Author



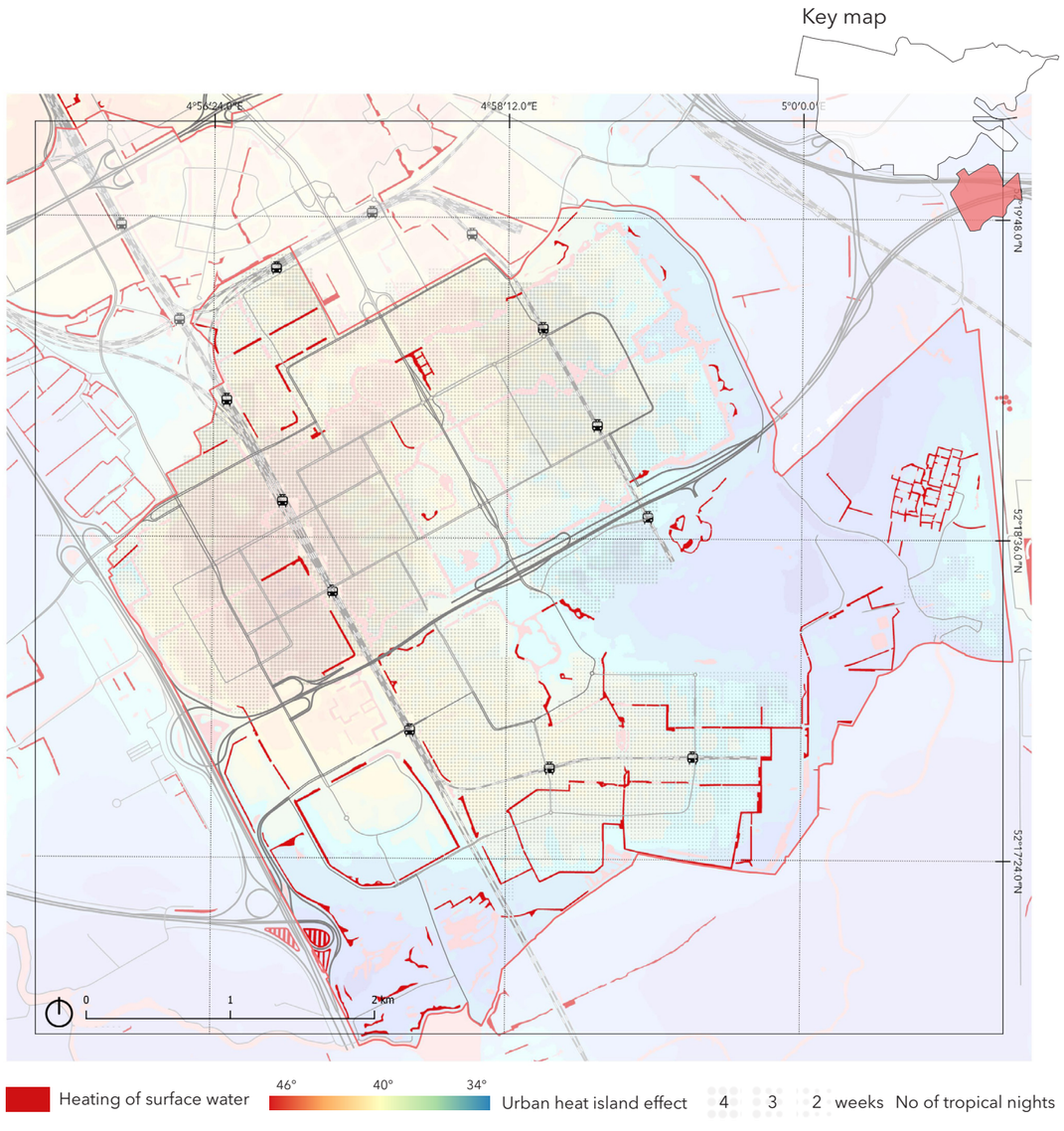
Amsterdam measures groundwater levels on public land in approximately 2500 level filters around the city. These measurements help calculate how deep the groundwater is below ground level (= ground surface) on average in summer. This map shows the average groundwater levels over the past 10 with the Average Lowest Groundwater Level (GLG) as the metric.
The groundwater level fluctuates and varies due to the weather, diversity of soil structure such as impermeable clay or well-drained sand, obstacles and / or drains.

Low groundwater levels can be a problem for areas such as greenery (trees, parks), subsidence and sensitive foundations. The areas where GLG is already low such as Reigersbos and Gein may be extra vulnerable to more extreme dry periods due to climate change.

6.7.4.3 Heat

Fig 6.60: map showing the climate vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to heat.

Source: Author



The underlying heat map shows the average wind chill (PET) for July 1, 2015 between 12 noon and 6 pm. This day has been selected by the RIVM as the starting point for conducting the stress tests for heat because this day is seen as the representative 1 in 1000 heat day for the summer period from April to September. This corresponds to a probability of 1 in 5.5 years for the current climate.

This gives a better picture of the degree of exposure to heat. The perceived temperature is used as an indicator of the influence of heat on human health. This is directly proportional to the amount of paved and concrete surfaces in the neighborhood and is expected to increase a lot with the slated construction of 30,000 more homes in the city-district.

It is thus extremely important that the surface are of green is maintained and improved and not further reduced with new developments as it can lead to stronger urban heat island effects with increasing temperatures.

6.7.5 Opportunities

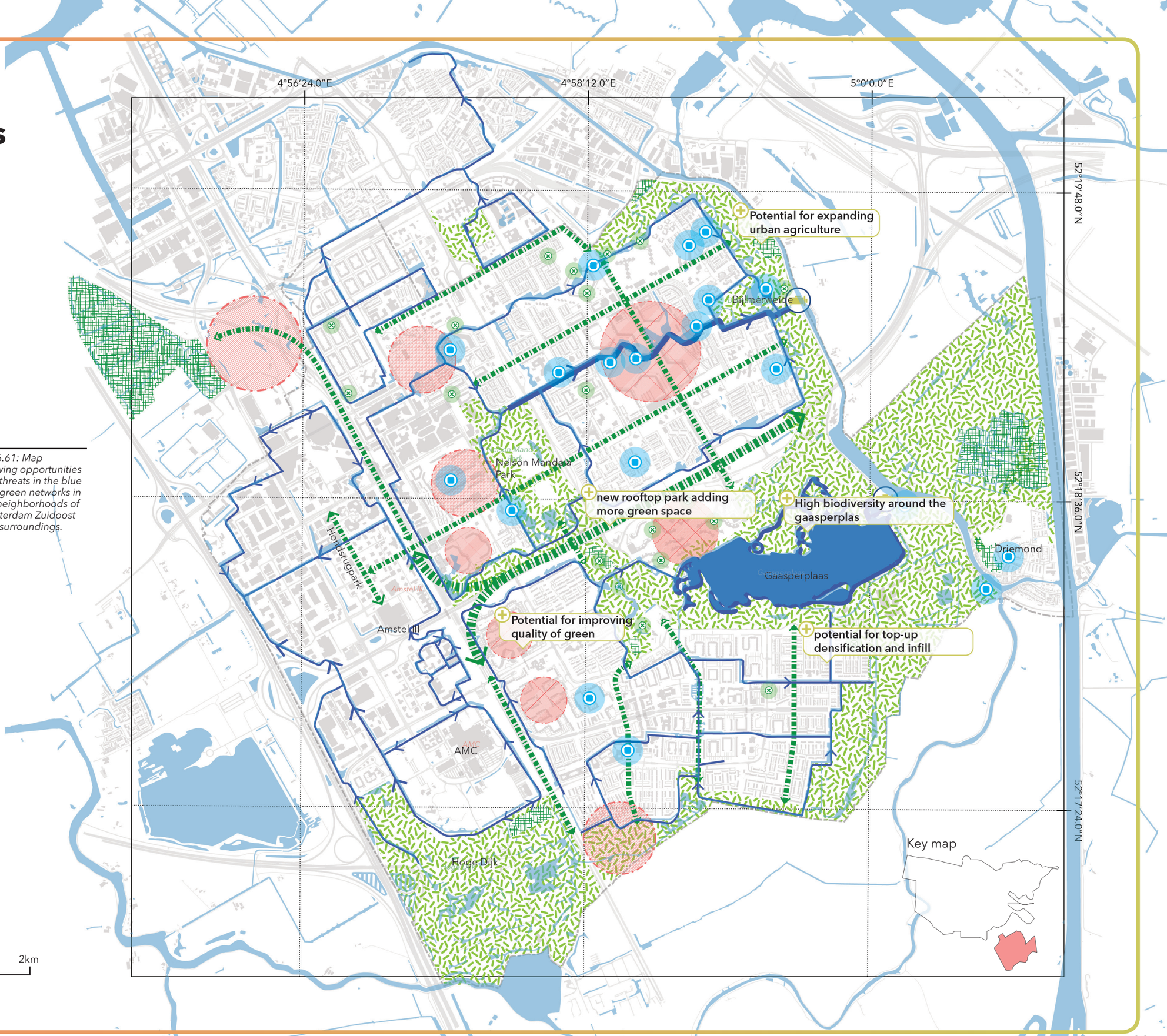
An integrated blue-green network for Zuidoost beyond greens along highways and drainage canals that is lively and productive can add a lot of value to the residents of the neighborhoods.

The neighborhood has a lot of embedded potential and with only smaller upgradations along canal edges and better programming of green spaces, their full potential could be unleashed, which can benefit the residents immensely.

In conjunction with the emission targets of the city, adding productive biomass in underutilised public greens can help in carbon sequestration and carbon capture.

There is a lot of potential for expanding in the existing urban agriculture initiatives to play an integral role in the local food economy of the city as well, creating resilient and less carbon intensive supply chains.

Fig 6.61: Map showing opportunities and threats in the blue and green networks in the neighborhoods of Amsterdam Zuidoost and surroundings.



6.7.6 Urgencies

Analysing the climate vulnerabilites faced by the city district of Amsterdam Zuidoost as it pertains to climate change under the dimensions of heat, drought and flooding reveals a few urgencies.

The city district is not as vulnerable to cloudburst events, but could potentially be vulnerable to heat stress with the slated new construction projects. In order to adapt to this, adaptation at the scale of the street and in public spaces to reduce the collective risk due to flooding and energy demand for airconditioning during heat stress is required.

Zuidoost could potentially play a strategic role at the city scale in dealing with city level urgenices such as flooding.By utilising the existing green-blue infrastructure to the most optimal levels, Zuidoost can provide buffers for some climate anomalies at the city scale.

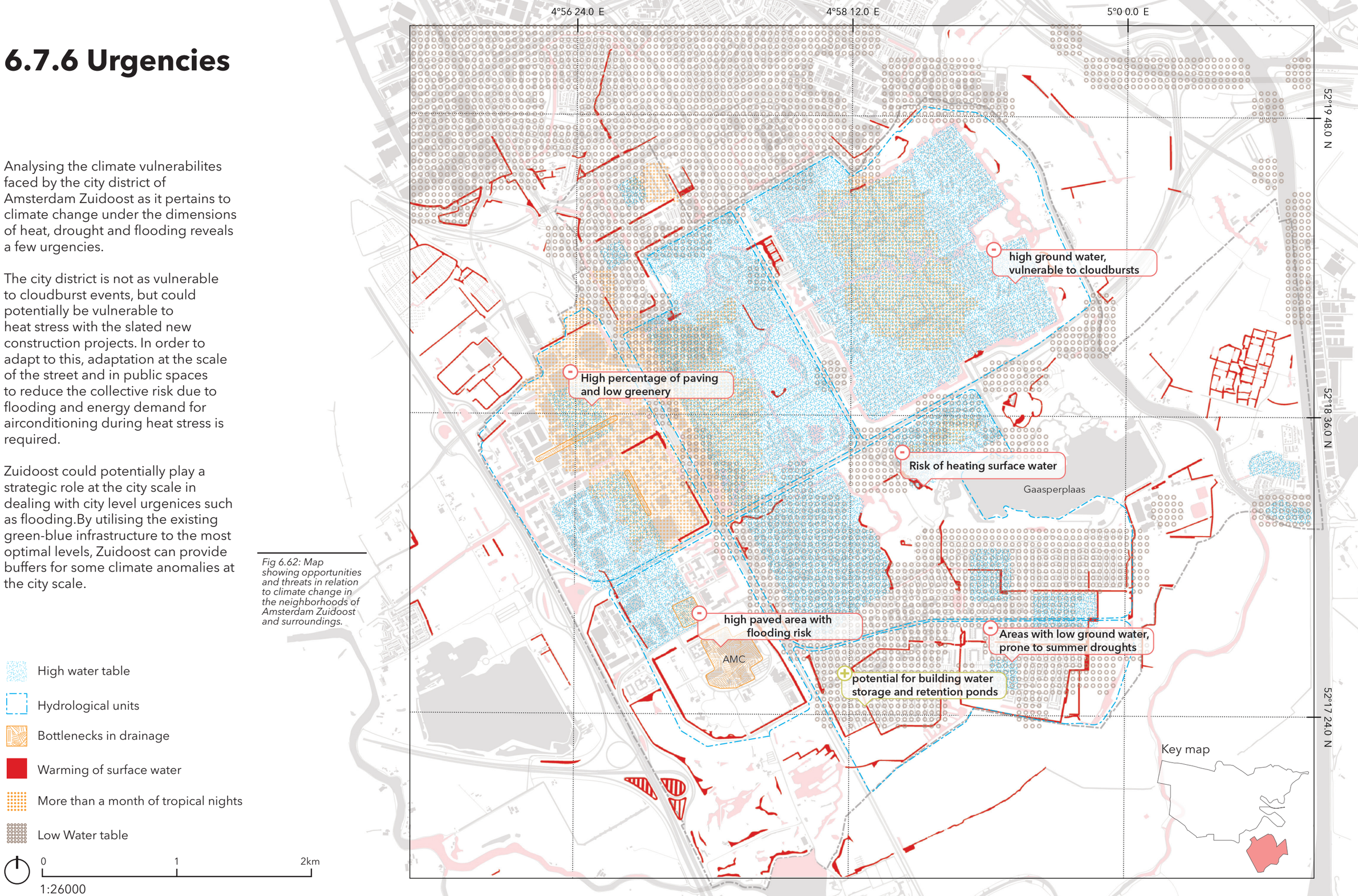


Fig 6.62: Map showing opportunities and threats in relation to climate change in the neighborhoods of Amsterdam Zuidoost and surroundings.

6.8 Energy

In Amsterdam Zuidoost district, green house gas emissions from buildings accounts for around 3442 kiloton CO_2 per year. This was from the consumption of over 1,700 GWh energy, which equals to a collective annual energy bill of over 108 million euros (Hermsen 2016).

Of this, 34% is from residential buildings, while the rest is from a combination of offices, educational institutions, hospitals and others. Of the overall energy consumption, the amount of energy spent on heating and cooling takes up a large part.

The current heating solutions used in Zuidoost consists of a combination of three systems:

1. Centralised district heating,

2. Decentralised gas-based systems in individual buildings (using gas boilers or gas heaters),

3. Electricity-based heating (Using heat pumps, heat and cold storage).

The current cooling solutions are conventional air conditioning units and district cooling systems.

The city of Amsterdam aims to be Natural gas free by 2040, while specific neighborhoods in Zuidoost such as Venserpolder are slated to be natural gas free as early as 2030. At the regional scale there are the RES strategies that outline how the energy transition needs to be approached. However at the scale of the neighborhoods, it is mostly decentralised with a large number of individuals and social organisations that are leading the effort.
The energy transition is closely linked to climate crisis as both a mitigation and an adaptation effort. While reducing fossil fuel based energy generation can help reduce carbon footprint, the fact that the summers are already getting wamer means that there will be an increased energy use to cool buildings in the future, which needs to be addressed as well.

In the energy analysis, the intent is to understand the current state of energy infrastructure, energy production and future potential in Zuidoost.

6.8.1 Existing Infrastrucutre
To understand the current state of energy infrastructure and energy being produced in Amsterdam Zuidoost.

6.8.2 Energy Potential
To understand where and how energy could be produced within Amsterdam Zuidoost.

6.8.3 Energy Labels
To understand the current state of the built stock preparedness in terms of insulation and energy production on site and how they are distributed in the city district.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

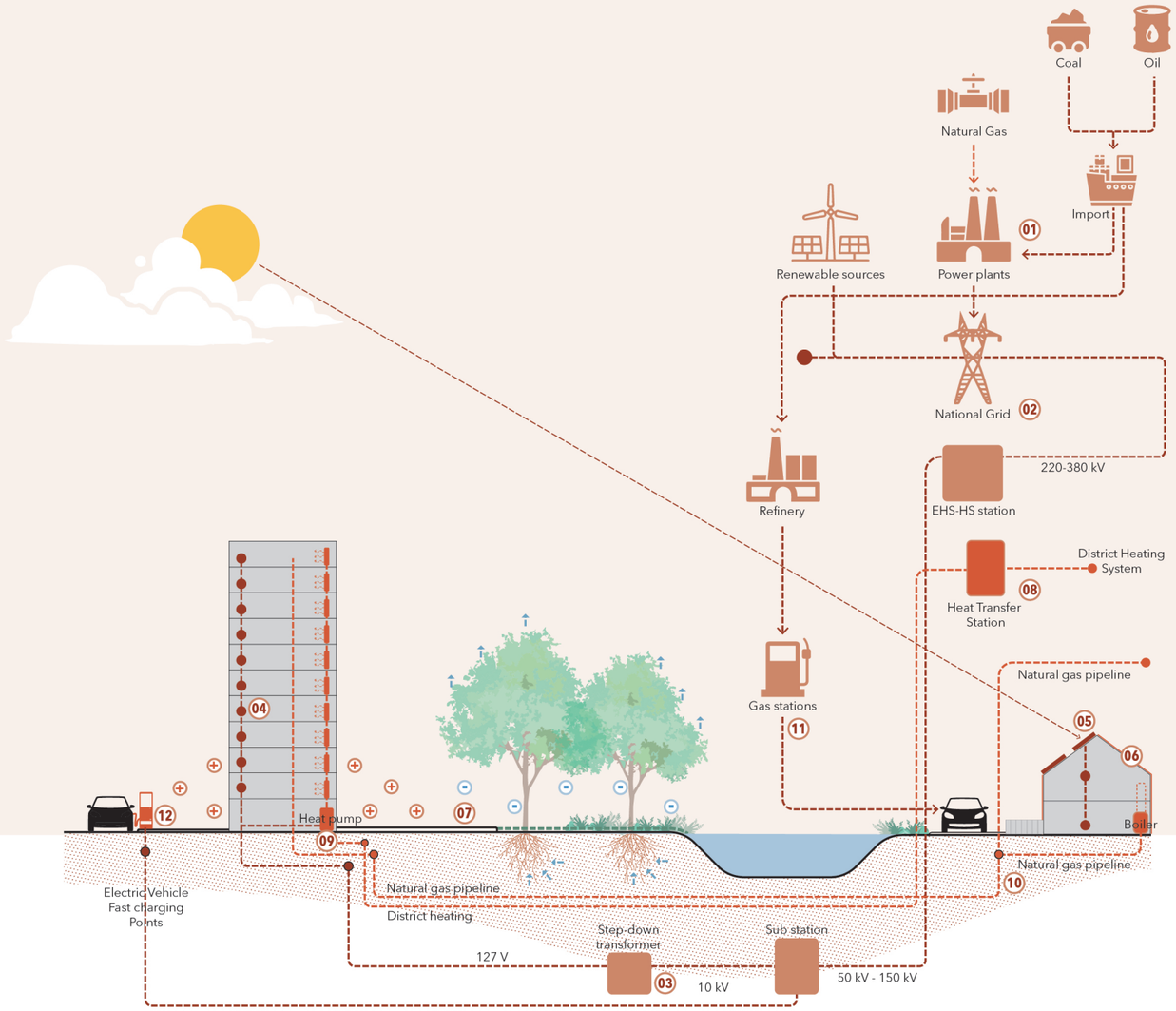


Fig 6.63: The cocep-tual systemic section shows the energy net-work in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 While energy produced from renewable sources is increasing, Netherlands generat-ed 73% of energy in 2020 from fossil fuels.

02 The national high voltage grid is operated by TenneT, while the regional grid is operated by Liander N.V.

03 The cylindrical step-down transformers in Amsterdam occupy prominent spots in the neighbourhoods but remain inconspicuous.

04 Appliance Energy efficiency is being heavily regulated in the EU with a new stricter directive coming into force in 2021.

05 Solar panels contribute to decentralised energy production. In Zuidoost it is mostly installed in private households.

06 Building energy labels help classify buildings based on energy use. Insulation and energy composition contribute to it

07 Urban heat island effect contributes significantly to energy usage. This is expected to increase with climate change.

08 District heating systems cover a fraction of Zuidoost. While various heat sources exist, infrastructure is yet to be built to use them.

09 Buildings connected to LT district heat network use a heat pump to warm water for heating using electricity.

10 Most buildings use a centralised natural gas grid for heating purposes. Which the municipality aims to phase out by 2040.

11 Another major energy usage is for cars. Netherlands is still heavily dependent on cars and majority of cars run on fossil fuels.

12 Electric car usage has been rising consider-ably, requiring new infrastructural additions such as fast charging points.

6.8.1 Existing Network

district heat network and renewable energy

Natural gas is a major source of CO_2 emissions and in Amsterdam, around 90% of homes and businesses are heated using Natural gas. Switching to sustainable sources can reduce Amsterdam's carbon emissions.

Electricity from fossil fuels and natural gas prices are expected to continue rising in the future, owing to higher carbon taxes, and declining natural gas production in the Netherlands. Sustainable systems such as 'district heating': An insulated network of pipes that distribute hot water to homes and businesses from a central facility are being developed. By 2020, it is estimated that 102,000 homes in Amsterdam will make use of the district heating system.

There is no one solution that fits all and in many cases, the choice will be between district heating and fully electric heating systems. Ensuring that residents' energy costs don't rise should be a priority.

At present, majority of solar panels are on top of private dwellings facilated through subsidies, while a large proportion of social housing is underutilised.

Fig 6.64: Map of existing district heat network

Fig 6.65: Existing KWP potential of installed photovoltaics in Zuidoost

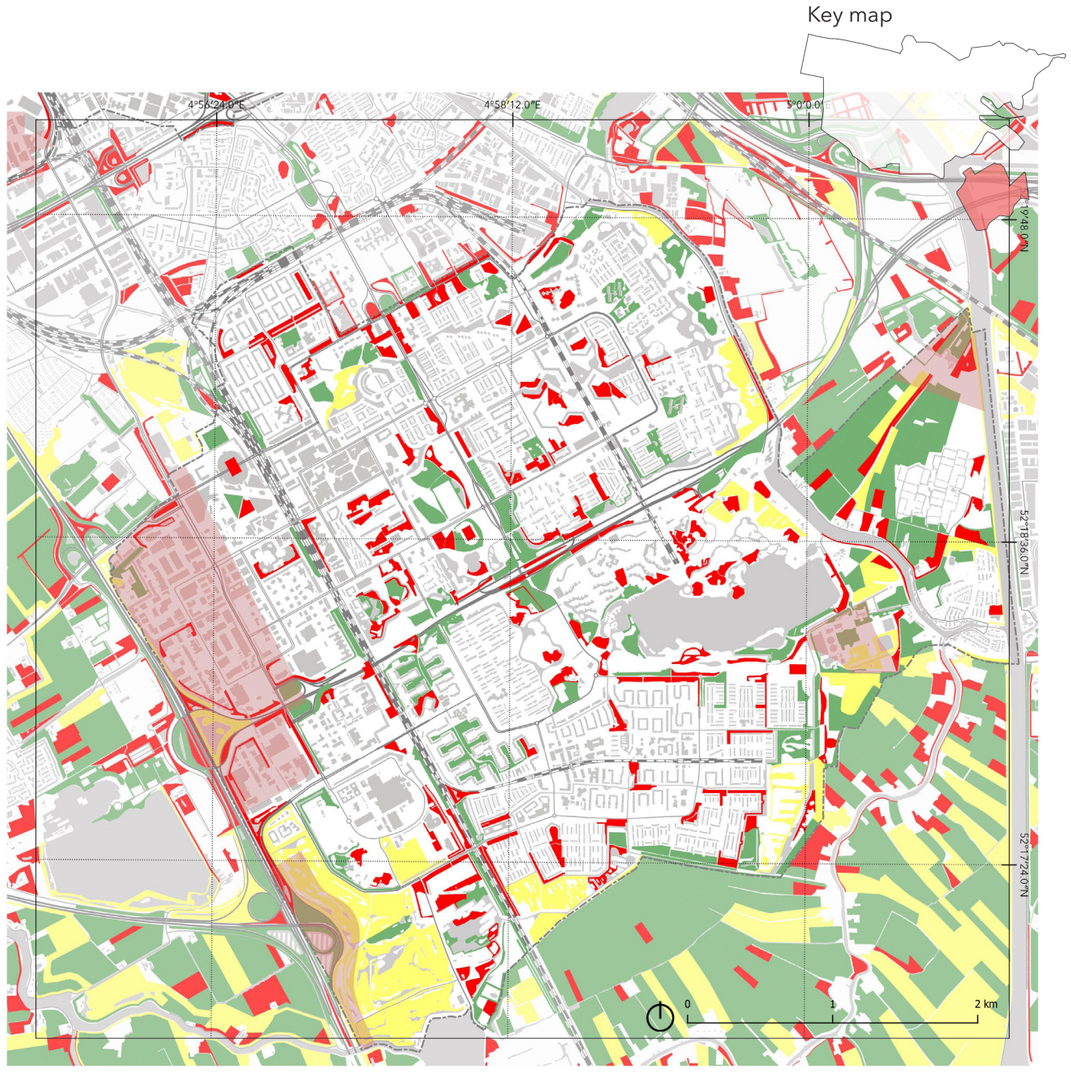
Data source: City of Amsterdam



Fig 6.66: Map showing energy generation potential in Amsterdam Zuidoost.

Data: PDOK

6.8.2 Energy Potential



Solar energy currently makes a sliver of sustainable energy production in the Netherlands. Decreasing capital costs and enormous potential mean that this changing rapidly.

In the Netherlands, the main applications of solar energy is on the roofs and facades. Further upscaling of the technology and the energy transition require more space on and around buildings.

The function of generating solar energy can coexist with existing or other spatial functions such as water storage basins, slopes of (rail and river) dikes, noise barriers along roads, roofs for parking lots, landfills, roundabouts. Ground-based solar energy generation is still relatively new to citizens in the Netherlands. In Zuidoost, potential is mostly along the urban-rural fringe, within urban areas, open couryards could be adapted for energy generation.

Currently residents show resistance towards large scale implementation of wind turbines and solar parks in Amsterdam. Mutually beneficial partnerships and social acceptance should be preconditions.

Fig 6.67: Map showing the existing energy labels of buildings in Amsterdam Zuidoost.

Data: PDOK

6.8.3 Energy Labels



The energy label, helps bring together the concepts of economics, standard of living and sustainability together. As opting for an efficient home means a lower energy bill, more living comfort and less CO2 emissions.

The energy label for homes runs from classes A ++++ (green, very efficient) to G (red, very inefficient) currently and is slated to be revised for easy comprehension.

How energy-efficient a house is in comparison with similar houses. An energy-efficient house has good insulation, triple or HR ++ glass, energy-efficient heating and solar panels. The energy label is a document in which these characteristics are described.

Since almost all of the housing in Zuidoost were built after 1965, they are relatively well insulated in relation to Amsterdam city centre. However, a majority of the housing are at energy label C, where improvements such as insulation, energy efficient heat pumps could be used. While owner-occupied homes are renovated through specific subsidies, housing corporation owned social housing are yet to be upgraded with better insulation.

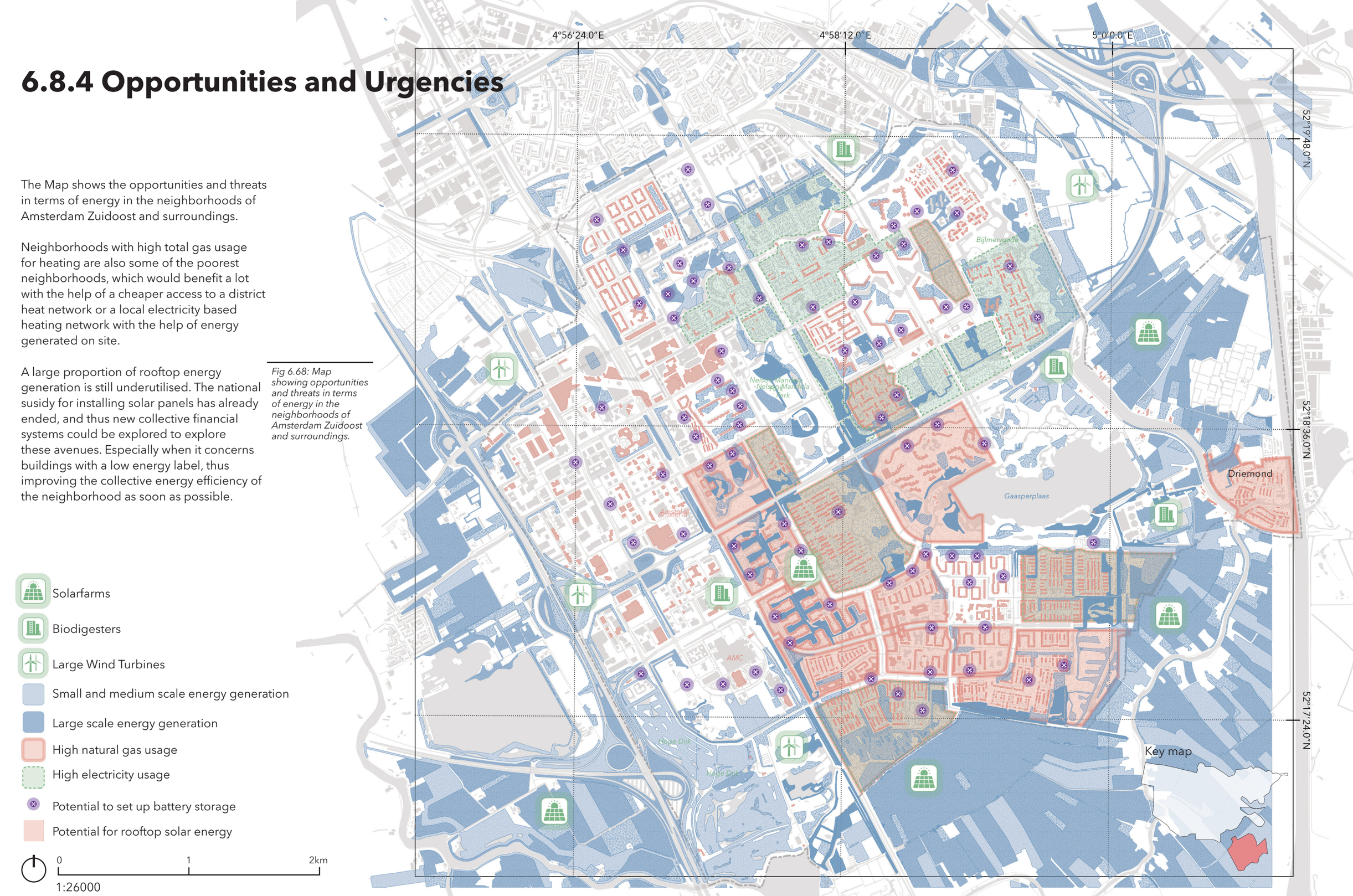
6.8.4 Opportunities and Urgencies

The Map shows the opportunities and threats in terms of energy in the neighborhoods of Amsterdam Zuidoost and surroundings.

Neighborhoods with high total gas usage for heating are also some of the poorest neighborhoods, which would benefit a lot with the help of a cheaper access to a district heat network or a local electricity based heating network with the help of energy generated on site.

A large proportion of rooftop energy generation is still underutilised. The national susidy for installing solar panels has already ended, and thus new collective financial systems could be explored to explore these avenues. Especially when it concerns buildings with a low energy label, thus improving the collective energy efficiency of the neighborhood as soon as possible.

Fig 6.68: Map showing opportunities and threats in terms of energy in the neighborhoods of Amsterdam Zuidoost and surroundings.



6.9 Waste

In Amsterdam Zuidoost there is a combination of two systems for waste management.

1. The underground segregated waste collection receptacles, which are kept at common points and collected by trucks periodically.

2. The segregated bins per household, which are again collected by trucks periodically.

The underground receptacle system is shared by many households and is used in denser neighborhoods.

While Amsterdam currently has provision for collecting plastic waste, paper waste, textile waste, organic waste, glass waste and residual waste separately. Not all waste collection points have all receptacles.

Residual waste collection points are more common, which collect mostly aggregated waste. Specialised segregated waste collection for organic waste, paper waste, plastic waste etc are yet to be rolled out uniformly throught the city-district.

When it comes to segregated bins per household, they are used in low-dense neighborhoods such as Huntum. The neighborhoods beyond the metro line to the west including Amstel III have no segregated waste collection units except around ArenaPoort.

Now, the biggest observed problem is the position of these receptacles within the urban fabric. Since they were introduced well after the initial construction of the Bijlmer, they are not exactly well integrated.

They are mostly situated in no-man's land next to parking areas or cycle tracks off housing units. This leads to a lack of maintenace of these units as they are off site-off mind for most residents.

There is also potential for expanding the existing collection points to collect waste in a disaggregated manner for better processing and recycling.

In the waste analysis, the intent is to understand the current state of waste infrastructure, and future potential in Zuidoost.

6.9.1 Existing Infrastrucutre
To understand the current state of waste collection infrastructure in Amsterdam Zuidoost.

6.9.2 Waste Potential
To understand where and how much waste is being produced within Amsterdam Zuidoost.

Finally, the opportunities and urgencies identified on the basis of this analysis is synthesised.

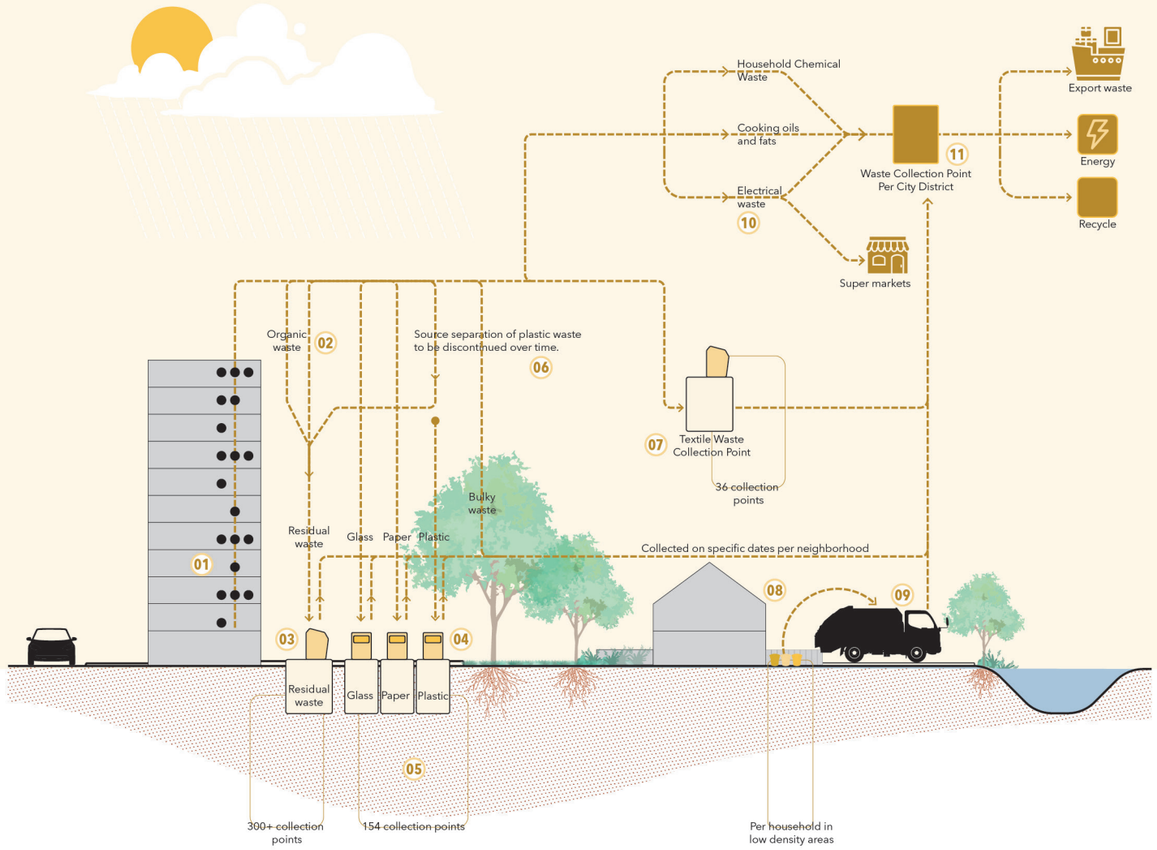


Fig 6.69: The coceptual systemic section shows the waste network in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 Currently not household waste is segregated in Amsterdam Zuidoost due to a multitude of reasons.

02 There is only one segregated organic waste collection bin in Zuidoost, everywhere else it goes in the residual waste bin.

03 The residual waste bin is used where there aren't segregated waste bins and usually contains all streams of household waste.

04 Glass, plastic and paper are more commonly segregated and stored in underground receptacles.

05 These segregated bins are not uniformly available everywhere throught the city district.

06 Plastic waste is planned to centrally segregated after collection in an industrial facility to improve recycling according to the municipality

07 Textile waste is also collected in large special purpose containers. However these are not as common as other bins.

08 Low dense neighborhoods in the city district have their own segregated waste bins in their front yards.

09 The waste is collected by garbage trucks that visit specific streets during specific days in a week.

10 Electrical waste currently could be deposited in some select super markets and also at the district waste collection facility.

11 The district waste collection facility also takes in other bulky waste, cooking fats and chemical waste for safe processing.

6.9.1 Existing Infrastructure

Fig 6.70: Map showing existing waste collection infrastructure in Amsterdam Zuidoost.

Data: data.amsterdam.nl



The map shows the positions of some of the different kinds of waste collection receptacles within the city district.

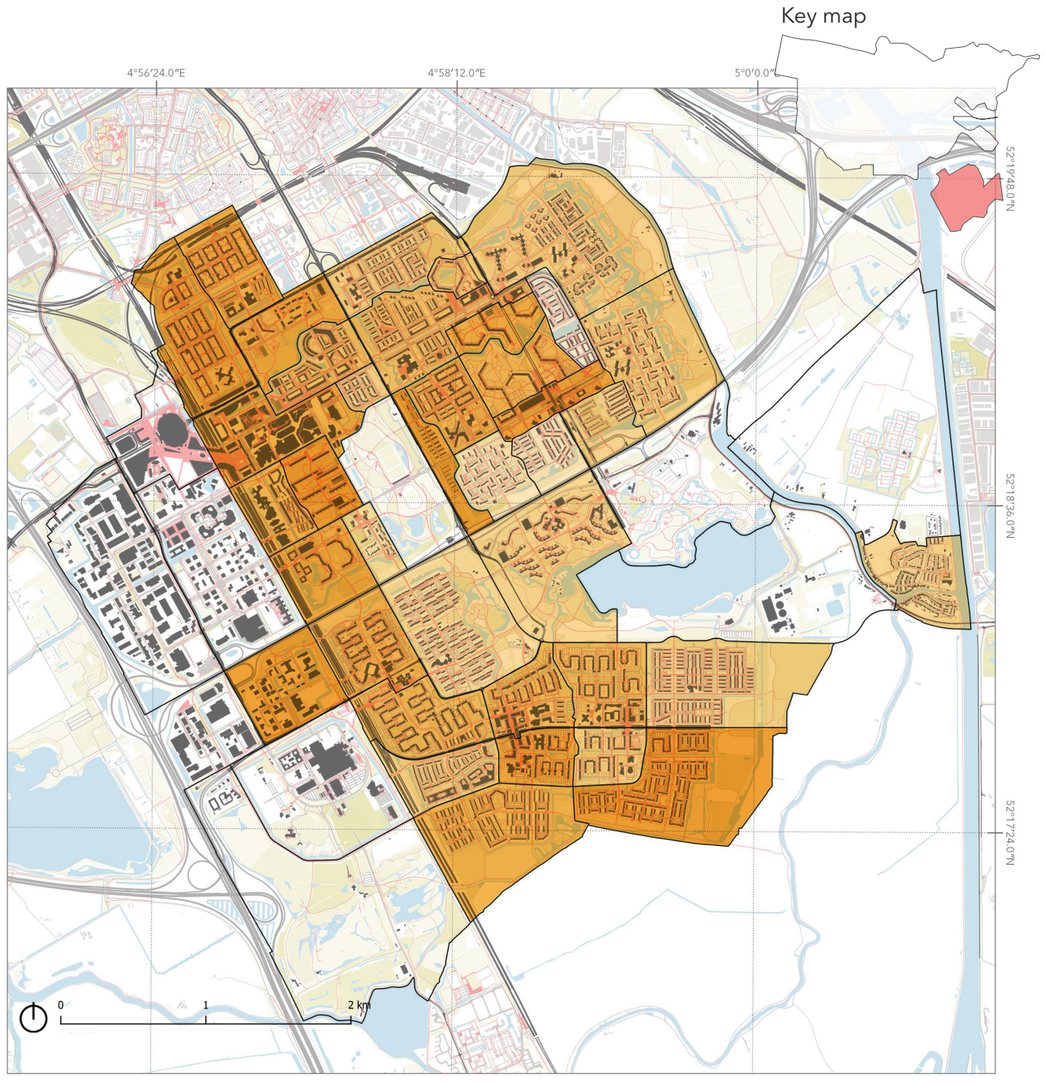
Like mentioned before, low dense neighborhoods such as kelbergen, holendrecht oost, K-buurt zuidwest etc, do not have common segregated waste collection.

Because these collection points are evenly distributed within the city district, they can be used as information points to convey residents about the material flows within these neighborhoods.

Transparently available information on waste generated, and waste processed could help towards behaviour change to reduce waste.

6.9.2 Waste Potential

Fig 6.71: Map showing the waste generation potential in Amsterdam Zuidoost.



Residual waste containers, Paper waste containers, Plastic waste containers, and Textile waste containers per thousand population per neighborhood are used to evaluate a neighborhood's waste production potential. A composite index of the four indicators with equal weight is calculated to understand the nature of waste produced in neighborhoods of Amsterdam Zuidoost district.

Since data on waste generated per neighborhood isn't available openly, the number of containers is used as a proxy assuming that their positions are already optimised for the amount of waste produced.

This indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone in terms of their waste production. The better performing neighborhoods in this analysis are not to be taken as normative as they require interventions of varying degrees to improve their quality.

6.10 Governance and Policies

Fig 6.73: Presentation by members of Hart voor de K-buurt near the Kraaiennest station.

Source: Michiel Wijbergh via Platform31.nl



In the previous chapters, we looked at the nature of some of the physical systems or hard systems that create Zuidoost and the opportunities and urgencies embedded in them based on current trends.

In this and the next chapter, the focus is on understanding some of the soft-systems that shape urban development.

The Netherlands is world renowned for being a planner's paradise. As the famous saying goes, "God created the world, but the Dutch made the Netherlands". I have some fundamental issues with those notions, but they are beyond the scope of this thesis and thus we'd take them as is at face value. There is a long history of understanding the landscape, introducing effective infrastructure systems to 'tame' it and eventually the 'Polder model' of consensus building where engaging multiple stakeholders and viewpoints are part of the process.

However, things have changed a lot in the recent decades, where new planning paradigms and governing practices specific to large Dutch cities find it difficult to balance centralising power at the municipal scale on one hand and a bottom-up citizen driven power structure on the other hand. Mostly, the market (free or not) is the middle-ground that tries to reflect priorities on either ends. The recent changes were extensively described in the first few chapters of the book.

While devolution of power from the national government to the municipalities has empowered municipal governments to devise locally informed plans and create targeted action, a lack of a central vision with the necessary large-scale economic power at the national scale has been seen as a problem for some time now. The calls for the re-establishment of the Ministry of Housing, Spatial Planning and the Environment from a decade ago are a reflection of this desire and was seen as an active talking point during the recent election cycle.

As mentioned before, as a planner's paradise there is an incredible amount of planning, policies and research that happens in the Netherlands. Sometimes they contradict each other and sometimes there is so much that, no action can take place. In order to streamline these, the government proposed the new National Environmental Vision, which aims to bring together a wide variety of existing policy regimes and unify them towards a cohesive vision for the future that is progressive and sustainable. This is an important step in the right direction, also reflective of the integrated development the thesis aims to achieve.

In Amsterdam, the city has been the forerunner in setting ambitious goals and developing innovative polices for achieving them. The recent Amsterdam city doughnut strategy (Gemeente Amsterdam, 2020) sets a progressive example of bringing economic developmental goals while maintaining planetary and social boundaries based on Kate Raworth's concept of Doughnut economy.

In this chapter, we will look at the current policy and governance landscape of Amsterdam.

6.10.1 Amsterdam Structural Vision 2040
This is the current spatial structuring document that governs the nature of spatial development in Amsterdam and the metropolitan region.

6.10.2 Draft Environmental Vision 2050
The proposed environmental vision required as part of the NOVI will replace the structural vision as the guiding document.

6.10.3 Existing Operational Framework
To understand the nature of current governance processes and systems of service delivery in Amsterdam.

6.10.3.1 Participation at the Neighborhood Scale
As a case, K-Buurt midden is studied to understand how participation works at the neighborhood scale.

6.10.1 Amsterdam Structural Vision 2040

The structural vision 2040 released in 2011 marked the transition towards a vision that looks at the city in relation to the region that it is a part of. As a marked change from city expansion masterplans, this looked at the city holistically.

As the vision came when the city was still feeling the impacts of the global financial crisis, larger emphasis was placed towards developing a more resilient city, underlining the need to respond to climate change, renewable energy production and the overall sustainability of the city.

The Structural vision identified four structural elements as planning imaginaries towards directing the future development:

1. Roll-out of the central area
2. The metropolitan landscape
3. Waterfront development
4. Southern Flank

Roll-out of the central area:

The mixed-use city core attracts a lot of businesses and people. The vision aimed to extend this character outwards from the city centre till the A10 and IJ. This sort of consolidating focus on the city core was reversed in the draft environmental vision released recently, shifting towards a multi core approach.

The metropolitan landscape:

The city has landscape features that penetrates far into the city via the green wedges. The vision recognizes that it increases the attractiveness of the city and give Amsterdam the opportunity to densify within an existing urban area while remaining liveable. The vision proposed programmatic thickening and improving of quality in these metropolitan landscape structures around the city.

Waterfront development:

The vision identifies waterfront development as a strong economic and activity generator, as a means to capture higher land value and exploit recreative potential along the Ij. Establishing stronger connections between Amsterdam Noord and centre is viewed through this perspective.

Southern Flank:

The planning imaginary of the southern flank looks to connect the strong economic engines of Schiphol and the A2 via Zuidas. A huge impetus is placed on Amsterdam Zuid towards making it a secondary centre in the region, with developing Amsterdam Zuid station as a major transport hub as well. The Amstel III district as part of the southern flank is expected to be transformed into a more mixed use neighborhood.

Conclusions:

The structural vision placed a lot of emphasis on economic resiliency and towards strengthening the competitive position of Amsterdam as a viable global city. The agglomeration effects seeked through specific planning imaginaries were based on these desires. While the vision stated ambitions towards a sustainable built environment through energy transition and improving the quality of landscape, the then national policy climate was not evolved to create an unifying perspective across complex domains.

The built environments and functional mix sought were primitive with a dichotomous understanding between work and live. The growth trajectories envisioned till 2040 were already overshot, with Amsterdam doing exceptionally well until the corona crisis. The city attracted saw a population and employment boom, however this was not matched by the ambitions set across other domains within the document in terms of climate adaptation and renewable energy production.

The population and employment boom has also significantly changed the demographic composition of the city with more wealthier expats moving to the city creating a new reality.

Fig 6.74: Amsterdam Structural Vision 2040

Source: Gemeente Amsterdam



6.10.2 Draft Environmental Vision 2050

The Environmental Act which is expected to enter into force in 2022, will completely revise the existing system of spatial regulations. The introduction of the law is linked to the introduction of a digital system for spatial plans and rules, and to a different way of working.

The environmental law obliges governments to draw up an environmental vision as opposed to a structural vision we saw being developed in the previous years. An environmental vision is binding for the government that draws it up, relates to the territory of that government and must be integral: all aspects of the physical living environment are viewed in conjunction (energy, green, water, flora and fauna, housing, economy, environment , health, air quality, soil, physical safety, cultural history, climate adaptation, mixed neighborhoods, space for social facilities and meeting).

Amsterdam's draft environmental vision brings in a wide variety of ambitions in to the picture. Economic growth within this is qualified towards promoting innovation and a circular economy and not growth for growth's sake. The five strategic choices the environmental vision makes towards this are:

Multi-core development:

The vision recognises that Amsterdam is out of balance with a city center where everything is aimed at. The vision aims towards developing multiple urban centers in the region.

Growing within limits (Compact City):

Sustainable and compact urban development with an intensive use of space are strategic choices made in the vision. Through such a densification, the city aims to build social cohesion and entrepreneurship, while limiting the ecological footprint of the city.

Sustainable and healthy:

In order to achieve a compact city, walking, cycling and public transport are given priority. Meeting places and public space for exercising are to be prioritised according to the vision. This means new spatial tasks build increasing pressure towards how they are resolved due to a scarcity of space, reallocation of space from cars towards other uses is an ambitious task, highly contingent on the political will over the coming years.

Rigorous greening:

Another intensifying use of space is to allocate more space towards new parks and more greenery in the public space and on and around buildings. This is towards ensuring a climate-proof and liveable city not only for peoplebut also for animals and plants.

Making the city together:

This is a very important strategic choice as the vision aims to provide more opportunities for social initiatives. The ambition as stated in the document is to create possibilities for experimentation and sharing responsibility and ownership with the residents of the city. Collaborative city making involves not only residents, corporation and private parties but also multi-scalar government bodies from neighboring municipalities to the provincial and national governments.

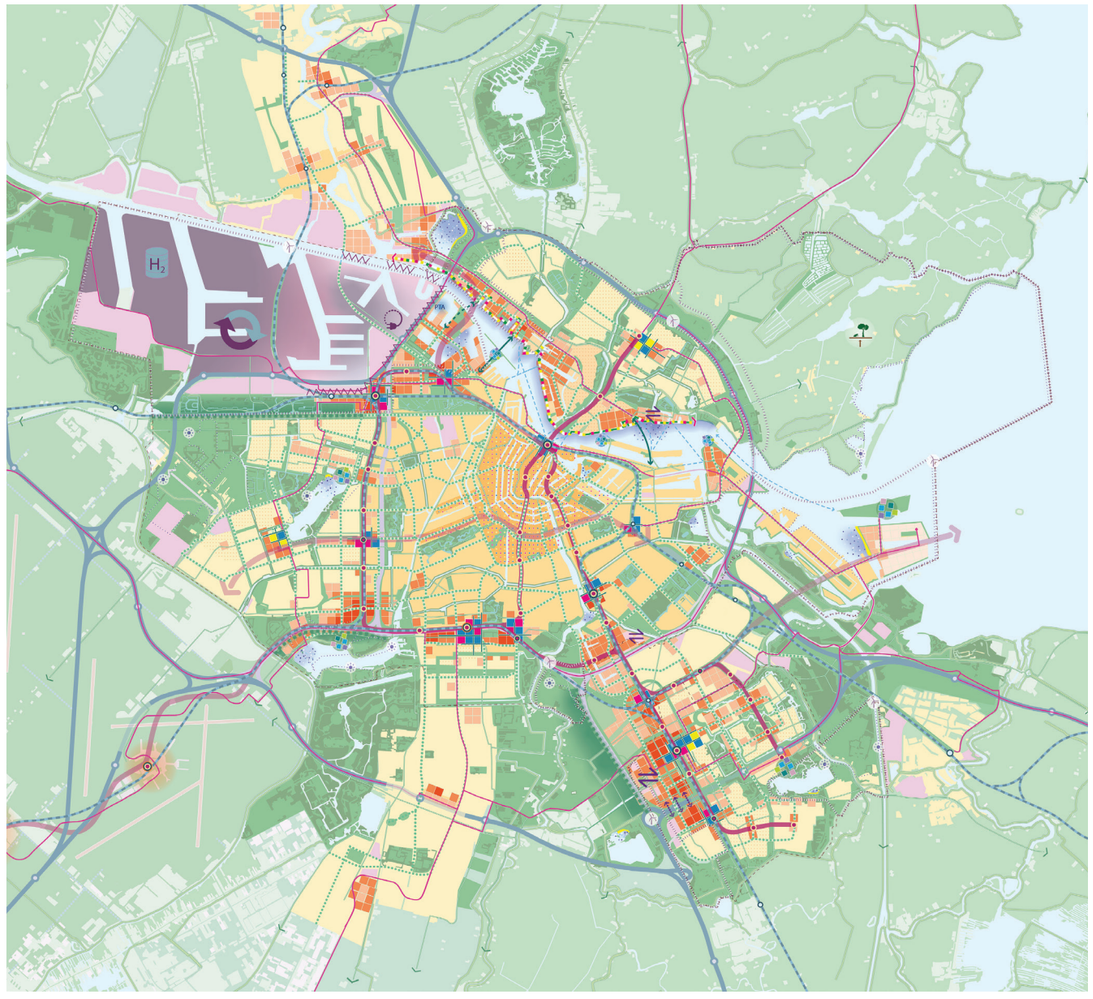
Conclusion:

The draft environmental vision reiterates the compact city model taken up in the structural vision 2040, and adds a more networked thinking to it. The language places increasing importance towards a transition to a circular economy and climate neutral development.

The biggest organisational takeaways from this draft document is the clear mandate for a more integrated approach in line with the national policies and a collaborative approach towards city building. These are powerful and progressive starting points on which a powerful and progressive operational model needs to be built.

Fig 6.75: Amsterdam Draft Environmental Vision 2050

Source: Gemeente Amsterdam



6.10.3 Existing Operational Framework

From municipality to the city districts to the people

Amsterdam used to have *deelgemeente* or sub-municipalities for a long time. In 1990 Amsterdam had 16 sub-municipalities, with their own district council and daily administration. Due to mergers, this number decreased again later. In 2014, when they were abolished due to the amendments to the municipal act, towards limiting the number of levels of government under central government to two. Now, Amsterdam has seven city districts including Zuidoost.

Even with this, the Municipality of Amsterdam has been making regular amendments to the way in which the city is being governed in the direction of devolution of power.

The city districts and the district committee are the link between different neighborhoods and the town hall. Each district has its own executive committee appointed by the town hall and a district committee consisting of representatives from the neighborhoods. With recent amendments, residents who are not part of existing political parties could also contest for the district committee.

The district organizations' main concerns are around the implementation of urban policy and not legislating policy. The maintenance of the public greenery, enforcement and collection of household waste and maintenance of public facilities are their operational objectives.

Beyond this, the municipality undertakes an area-oriented working approach at the scale of the Wijken.

This approach involves four stages of operation, which starts with Area Analysis, done every four years. This aims to evaluate the area to understand the pressing issues based on data from their working partners.

The area analysis is followed by the area agenda which again sets an agenda for four years, however there is provision for this to be adjusted anually based on developments in the area. Within the agenda, priorities for areas are set based on the analysis and also actors who are responsible for those priorities are identified as well.

Based on the priorities set within the area agenda, it is turned into an area plan every year with a maximum of six assignments. Some of those assignments are expanded within the plan, but they are also expanded along the way based on the participation with other stakeholders.

The progress made in the area plan is checked along the way with the help of an area monitor. The area monitor asseses progress made on the specific priority assignments. An annual report is published on the municipality website based on the progress of that particular years' area plan. The defined areas also have gebiedsmakelaars who are liasioning agents between different stakeholders.

This is a very convincing and structured operational framework, however, it focuses predominantly on social issues embedded within areas under concern that involve the municipality as an operational intermediary.

Zuidoost has four areas in this framework, Bijlmer Oost, Bijlemr West, Bilmer Centrum and Gaasperdam and Driemond. To give an example, some of the priorities set within the area agendas for Zuidoost include improving development opportunities for young people, increase security, improve the position of vulnerable residents, reduce poverty, Strengthen the arts and culture offering etc., Some of them are very specific in their definition, while some of them are quire broad in what they set to achieve. This framework operates on a different plane that is place specific and seems to not track the agenda set within the vision for the city set in the previously discussed policies. There is also criticism of transparency within the process and the degree of participation within these initiatives as well as they are embedded within the budget restricted, time bound government processes, that are not able to respond to local realities effectively. (Haart voor de K-Buurt, 2021)

"The system was devised by highly educated, probably often white men. This makes the 'participation system' particularly suitable for those who dare to open their mouths without any problem. But it doesn't work for Henk, Ingrid or Mo. Their complaint, which just as well has an equally appreciable living improvement wish or idea, does not fit the hole that a 'Memorandum' expects. Or a report via the website 'MORA-report', or ..... You just have to know, you just have to want it, you have to be able to do it. The barriers to participation are unevenly distributed. Often according to Color and Class." (Haart voor de K-Buurt, 2016)

Area-based development, which is employed in Amsterdam for majority of the housing developments is distinct from this and don't follow a similar way of working. It follows a process called Plaberum.

PLABERUM stands for PLAn- en BEsluitvormingsproces RUimtelijke Maatregelen. It specifies the process that spatial projects must go through in Amsterdam. In the Plaberum, the process is shaped and structured into four phases of plan and decision-making:

The exploratory or the reconnaissance phase is the first phase, which is concluded with a decision in principle in which a statement is made about the desirability of starting a project.

The feasibility phase is concluded with a project decision in which a statement is made about the feasibility and manageability of risks in a said project.

The design phase is concluded with an investment decision in which a statement is made about the design, the program and the means for implementation of a project.

The implementation phase is the fourth and final phase and has numerous administrative decisions, depending on the task. These can vary from a zoning plan to permits, development plans, a management plan and a closure plan.

The Plaberum was updated in 2017 towards streamlining spatial projects in the city and also improving the speed of obtaining construction permits and the overall process of development within the city. In line with that, Phase 1 and phase 2 can be skipped if it concerns a project of which the cost level is lower than € 5 million and there is no complexity.

While within the plaberum, there is a mention of citizen participation at all stages of the project, the nature of this participation is not clearly defined. Within projects, the municipality is still the client and the participating citizens share their views and perspectives along the way, but they do not call the shots in the project and thus participation is not within the DNA of this process and it focuses on streamlining existing permits and plans that are produced as part of a project development.

Participation in this would fall under placation, consultation and informing based on Arnstein's (1969) ladder of participation and thus it is a form of tokenism and not true citizen power, which would involve citizen control. delegated power and partnership.

6.10.3.1 Participation at the Neighborhood Scale

The case of K-midden Buurt in Bijlmermeer

While theoretically, the system seems to be set towards maximising participation, in practice, participation is mostly tokenism and doesn't involve the exercising of actual citizen power.

The main criticism is that existing bureaucratic systems optimise for doing no mistake. This extreme accountability due to potential legal problems has led to formulation of frameworks and policies with no room for ambiguity. Extreme precision leading to a lack of flexibility in terms of engaging with new potentialities as they arise (Hart Voor de K-Buurt, 2021).

The renewal plans for Bijlmer has been going on slowly over multiple decades as mentioned before. As part of those plans, designs were made for the K-midden buurt as well, around the Krainnest station. The eventual financial crisis of 2008 meant that the particular plan was dropped.

Eventually after many years, new urban plans were developed under the leadership of a consultancy and in consultation with a team of residents.

The residents of K-Midden had organised as Hart voor de K-buurt, which means the heart of the K-neighborhood in the Zuidoost district. The residents felt a strong need for a lively city square and a place to meet. In the course of the participation process, however, the collaboration stalled; residents felt that they had not been heard and felt that they were not given enough space for their ideas, especially when it came to the development of the dreamed-of lively K-plein.

The resistance from the residents was expressed in a very media-genic 'participation strike' in 2018, initiated by neighborhood organization Hart voor de K-neighborhood. The call not to vote showed the mobilization power of the organization: there was hardly any voting.

The participation strike was recently called-off and new talks are now beginning towards how things could be differently done.

Fig 6.76: Proposal for K-midden buurt from 2001
Source: bijlmerblog.com

Fig 6.77: Current condition at site
Source: Google Earth



6.11 Stakeholder Analysis

The stakeholder analysis is carried out based on literature and documentary review.

The information is analysed from two perspectives:

1. The power, interest and attitude towards change of each stakeholder in the current system,

2. The hierarchy of different stakeholders and the relationship between them.

Power, Interest and Attitude

To demonstrate the power, interest and attitude of stakeholders, the model developed by Murray-Webster and Simon (2006) is used. This is a three dimensional model as opposed to the more common two dimensional power-interest model and it also shows the attitude of specific stakeholders.

The concepts in this context are defined as follows:

Power: It is defined as the political, legal, economic, and/or social ability to influence the process of urban development. This is measured as high or low.

Interest: It is defined as the intrinsic interest of stakeholders to promote change. This is measured as high or low interest and thus an active or passive stakeholder.

Attitude: It is defined as the stakeholder's support towards certain change. If it is positive, they support change and if it is negative, they would obstruct change.

Here change refers to the integrated development in Amsterdam Zuidoost.

Within the model, based on the relative position of the stakeholders, eight categories are proposed by Murray-Webster and Simon (2006).

1. Saviour: High power, high interest stakeloders with positive attitude. They take an important role in coalition building and consensus seeking during participatory discussions.

2. Friend – Low power, high interest stakeholders with positive attitude can be allies and help strengthen the process.

3. Saboteur - High power, high interest stakeholders with negative attitude could potentially derail the project and process. It is important to engage with them to ensure they won't affect the project detrimentally.

4. Irritant – Low power, high interest stakeholders with a negative attitude don't have the institutional capacity to derail a project, but could lead arguments against the project. It is important to engage with them to minimise damage.

5. Sleeping Giant - High power, low interest stakeholders with a positive attitude needs to actively seeked out to ensure they support the project, since they could potentially transform it positively.

6. Acquaintance – Low power, low interest stakeholders with a positive attitude aren't a threat to the project, but they could be informed of what's happening over time.

7. Time Bomb - High power, low interest stakeholders with a negative attitude are potentially detrimental to the project if they choose to. It is important they are engaged initially to ensure they are aligned.

8. Trip Wire – Low power, low interest stakeholders with negative attitude can bring a lot of nuisance to a project and need to carefully maneuvered to avoid conflicts.

As with most things in reality, these categorisations are not exclusive and in some cases form hybridization. In addition, the level of power, attitude, and interest also can vary in relation to the position.

Relationship and hierarchy

To demonstrate the hierarchy of different stakeholders and the relationship between them in relation to a specific project or process, the onion diagram developed by Czischke Ljubetic (2018) has been adapted and used.

The diagram uses three concentric circles around a project/process in the center, which represents the relative importance of a specific stakeholder based on their position in relation to the centre. The closer they are to the centre, the more important to the process/project and vice versa.

The circles are further subdivided into three domains to which the different stakeholders belong: market, state, and civil society. This distinction helps to differentiate the motivations of each actor.

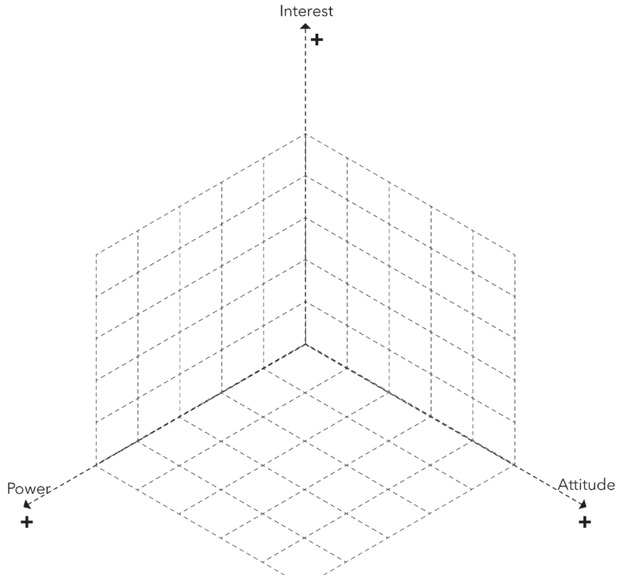
Threee forms of relationships between the stakeholders are identified.

1. Strong collaboration relationship: related to a high frequency, mutual influence or dependence.

2. Ad hoc collaboration relationship: limited to exchanges or mutual actions in technical, financing or service areas for a limited period.

3. Indirect relationship: related to the implicit and contextual relationships between stakeholders, as a gradient of influence.

The onion diagram is used to understand stakeholder relations in the design testing phase in chapter 10.



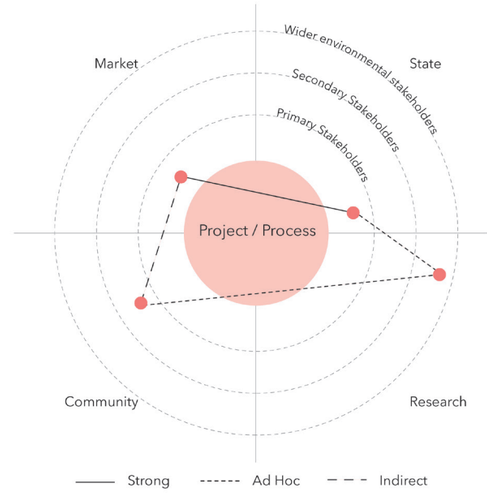


Fig 6.78: Amsterdam Draft Environmental Vision 2050

Source: Gemeente Amsterdam

There are an extremely large number of actors in the urban development process in the Netherlands and in Amsterdam as an extension. Simplication of these actors is carried out to reduce the complexity and multiple stakeholders are combined within the following categories

National government

The right of centre coalition government led by VVD has been the centre of national politics for over a decade now. They've carried out austerity measures in government spending and liberalisation and standardisation of the market to be in accordance with EU directives.

The VVD government also dimantled the separate Ministry of Housing, Spatial Planning and the Environment and merged it with the Ministry of Infrastructure and Water Management signifying the national government's distancing from concerns of housing.

While the state is a very powerful stakeholder with a positive attitude towards integrated development, currently it shows low interest.

Regional government and institutions

There are a wide variety of regional government and institutional setups. While the province of Nord-holland itself is a facilitating actor, there are other regional alliances that concern Zuidoost such as

1. Waterschap Amstel, Gooi en Vecht (Amstel Gooi en Vecht water board),
2. Vervoerregio Amsterdam (Amsterdam Transport Region),
3. Metropoolregio Amsterdam (Amsterdam Metropolitan Area)
4. Amsterdam Economic Board
5. Nord Hollandse Energie Regio Zuid (North Holland Zuid energy region)
6. Groengebied Amstelland (Amstelland green area)

These are mostly regional collaborations and partnerships made for specific tasks except for the waterboard, which is an elected government body to keep the region flood free.

These institutions focus on developing plans and strategies towards inter-municipal synergies and have far fewer executional authorities. These institutions also signify the general Dutch turn from government to governance. They are high interest and positive attitude stakeholders with low power.

Municipality

The municipality of Amsterdam is an extremely powerful stakeholder in the process of urban development. However, their powers are largely curtailed due to a limitation of financial abilities since the neo-liberal turn in Dutch governments.
The national government doesn't always align with what the Municipality wants and thus projects can stay on paper for extremely long durations Eg: Schiphol extension of the Noord-Zuid Lijn. This would have been extremely beneficial to people living in Zuidoost, a large percentage of whom work at Schiphol.

However, the municipality is progressive and takes initiatives and sets ambitions in line with EU and national targets in terms of curtailing carbon emissions, transitioning to a circular economy and so on. The municipality in general is a high power, high interest stakeholder with a positive attitude.

Public infrastructure companies

Public infrastructural companies in the Netherlands, concerning the area of study and themes outlined before include a wide range.

Afval Energie Bedrijf (AEB) focuses on waste management and Waternet focuses on water management

In terms of energy. following the Independent Network Management Act, informally referred to as the 'Unbundling Act', energy companies were separated. The national high-voltage electric network is operated by TenneT, the national gas network is operated by Nederlandse Gasunie. However, the regional energy network and suppliers are private players.
In terms of transportation, the public company prorail manages the tracks and NS operates trains. Within the city of Amsterdam, the operator GVB manages all metros and buses, while there are both private and public actors operating buses through Zuidoost. Road networks are built and managed by Governments at all three levels.

Public infrastrucutre companies in this context and high power, low interest and have a negative attitude.

Private infrastructure companies

Private infrastrucure companies would include the regional energy network manager Liander, and a wide variety of energy suppliers such as Vattenfall and Eneco. Public transport operators such as Connexxion and shared transport companies such as mobike, Felyx, Car2go etc.

Private infrastrucutre companies in this context are low power, low interest and have a negative attitude.

Housing corporations

Housing corporations are large institutional landlords providing social housing in the Netherlands as established within the Housing Act. These are not-for-profit organisations assigned the task of providing affordable housing to citizens.

In the case of Amsterdam, there are over 30 housing corporations that own and operate social housing units. They form the Amsterdamse Federatie van Woningcorporaties (AFWC). Not all of them have a presence in Zuidoost. The housing corporations active in Zuidoost are Cordaan, de Alliantie, de Key, DUWO, Eigen Hard, Rochdale, Stadgenoot, Woomzorg Nederland and Ymere. Of these, Eigen Hard and Rochdale are the biggest suppliers in Zuidoost.

While housing corporations are socially important organisation, they have been recently caught up in a number of money laundering scandals and has lost public trust as financially prudent organisations. Apart from that, tax policies such as the landlord levy, which were introduced as a temporary solution to strengthen Dutch coffers, are now a long-standing financial burden for Housing corporations. Some had to sell off properties to cover operating expenses and pay the landlord levy, since the rent is controlled by law.

Housing associations in this context are highly powerful stakeholders with high interest and a negative attitude.

Developers and real estate market

The Amstel III represents one of the most revenue generating business districts in the Netherlands. Slated for redevelopment in the coming years, it is a hotspot for real estate developers eager to be a part of the urban development of Amsterdam. While neo-liberal urbanism fuelled by speculation is not as rampant in Amsterdam as it is in New York or London, things are not completely alright as well.

They are highly powerful stakeholders with high interest and a negative attitude.

Special purpose partnerships

In Zuidoost there are a lot of special purpose partnerships that are established towards improving the quality of life. These are special purpose partnerships between different businesses and organisations, sometimes including the municipality with a stated aim of achieving a goal. Zuidoost Werkt, 1Zuidoost, Zocity! are examples of such special purpose partnerships made for improving job opportunities, improving quality of life etc.,

They are less powerful stakeholders with high interest and a positive attitude.

Community organisations

Community organisations are two-fold. There are neighborhood based community organisations such as Haart voor de K-Buurt,

Bewoners G-Buurt etc., and theme specific community organisations such as Coforce or Cocratos who focus on specific agendas such as energy transition or inclusivity.

While most owner-occupied apartments are legally required to form a VVE, they are not socially active with a few exceptions.

There are also quite a few artist collectives and business incubators operating out of buildings that are scheduled to be redeveloped, such as Heesterveld Creative Community, Prospect Eleven etc., who act as incubators for local talent and community organisation.

They are less powerful stakeholders with high interest and a positive attitude.

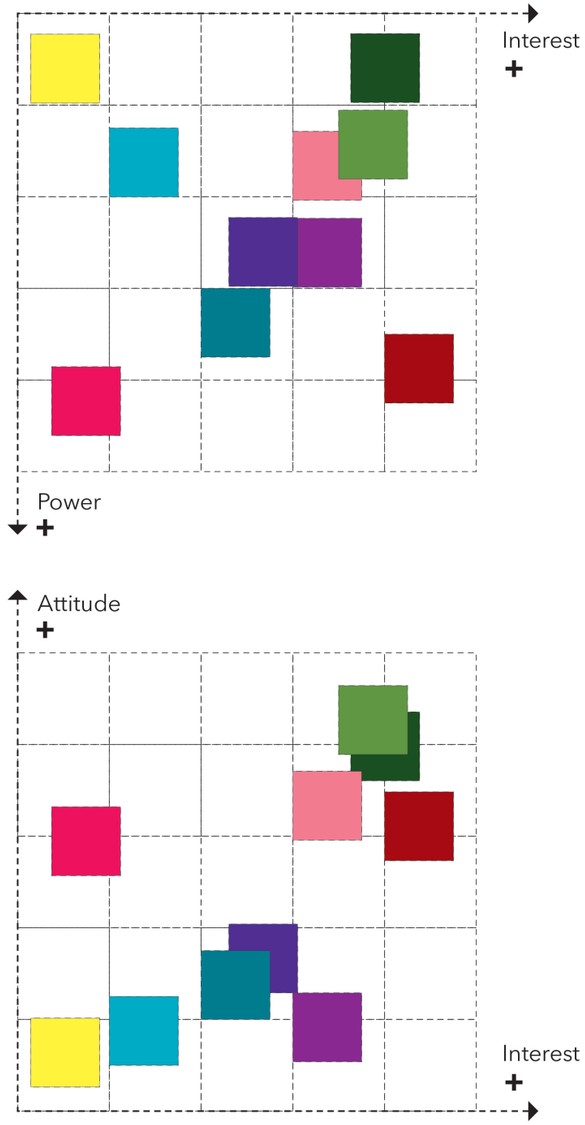
Unorganised Citizens

Unorganised Citizens are difficult to engage with since they are large in number and distributed within the city district. Since citizens with a positive attitude towards integrated development tend to be a part of an organised effort, unorganised citizens could be categorised as less powerful stakeholders with low interest and a negative attitude.

Conclusion

From the stakeholder analysis, through the positioning of stakeholder 'categories' in the three dimensional space of power, interest, attitude, we understand the starting points of different stakeholders in the urban development process.

From here, strategic actions towards ordering empowering specific stakeholders is required. This will be explored further in the operational framework in Chapter 9. However, to give initial thoughts, the intention is to empower stakeholders with high interest and a positive attitude with low power, in this case that would be special purpose partnerships, community organisations and regional bodies in the current setup.



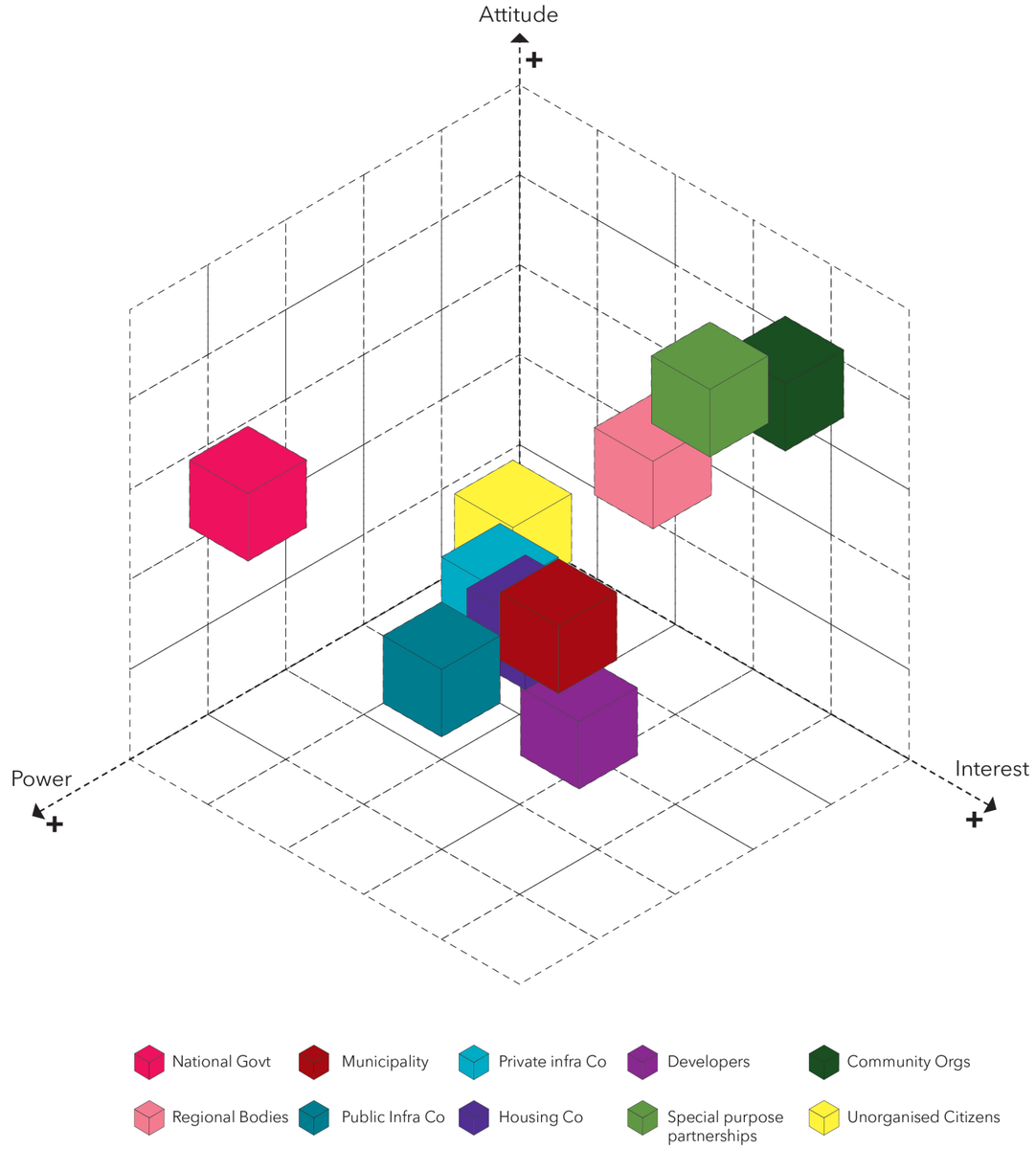


Fig 6.78: Stakeholder positions within the three dimensional power, attitude, interest space.

Source: Author

7

Strategic Framework

7.1 Strategic Frammework
7.2 Catalytic Locations
7.3 Sequence

7.1 Strategic Framework

Based on the distric level analysis of Amsterdam Zuidoost under various layers, a set of patterns towards improving the livability and sustainability of the city district has been proposed in the Chapter 8.

The strategic framework helps in organising actions in space. The fragmented and vulnerable neighborhoods of Zuidoost require a multipronged approach towards better quality of life, the first step towards it is to direct urban growth and structure activities within the city-district.

Establishing Strong urban axes and blue/ green network is the basis for further catalytic actions.

The proposed strategic framework builds on existing strengths identified as opportunities in the previous chapter, that can have synergistic effects on the whole spatial structure of the city district.

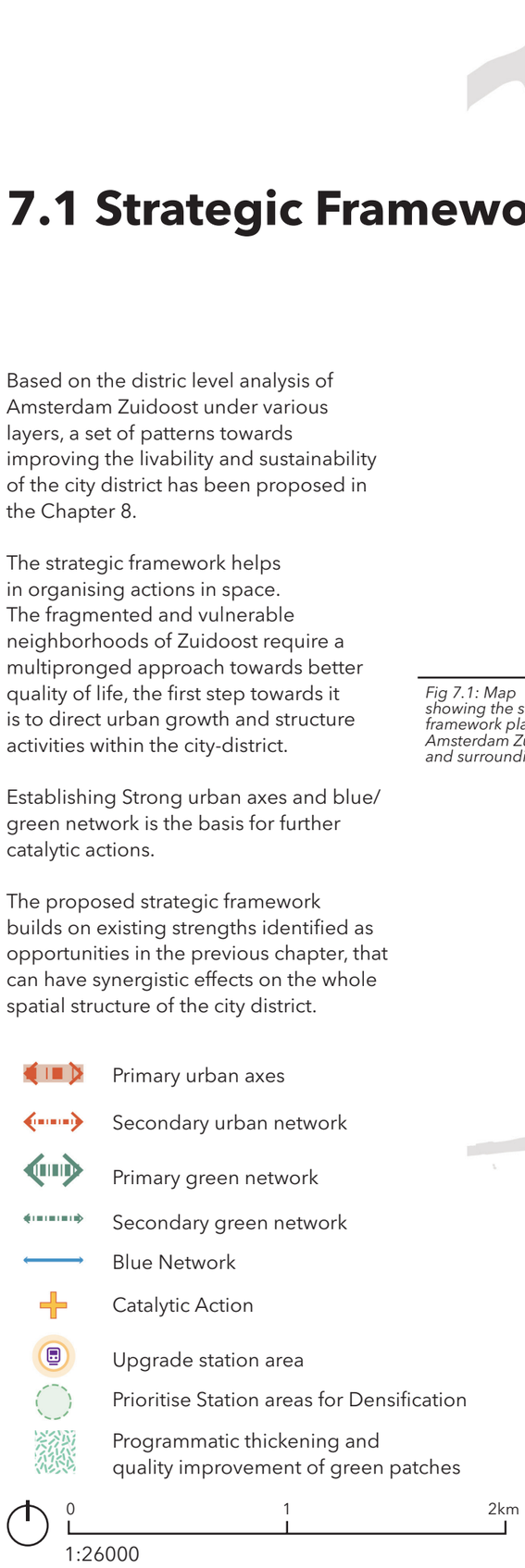
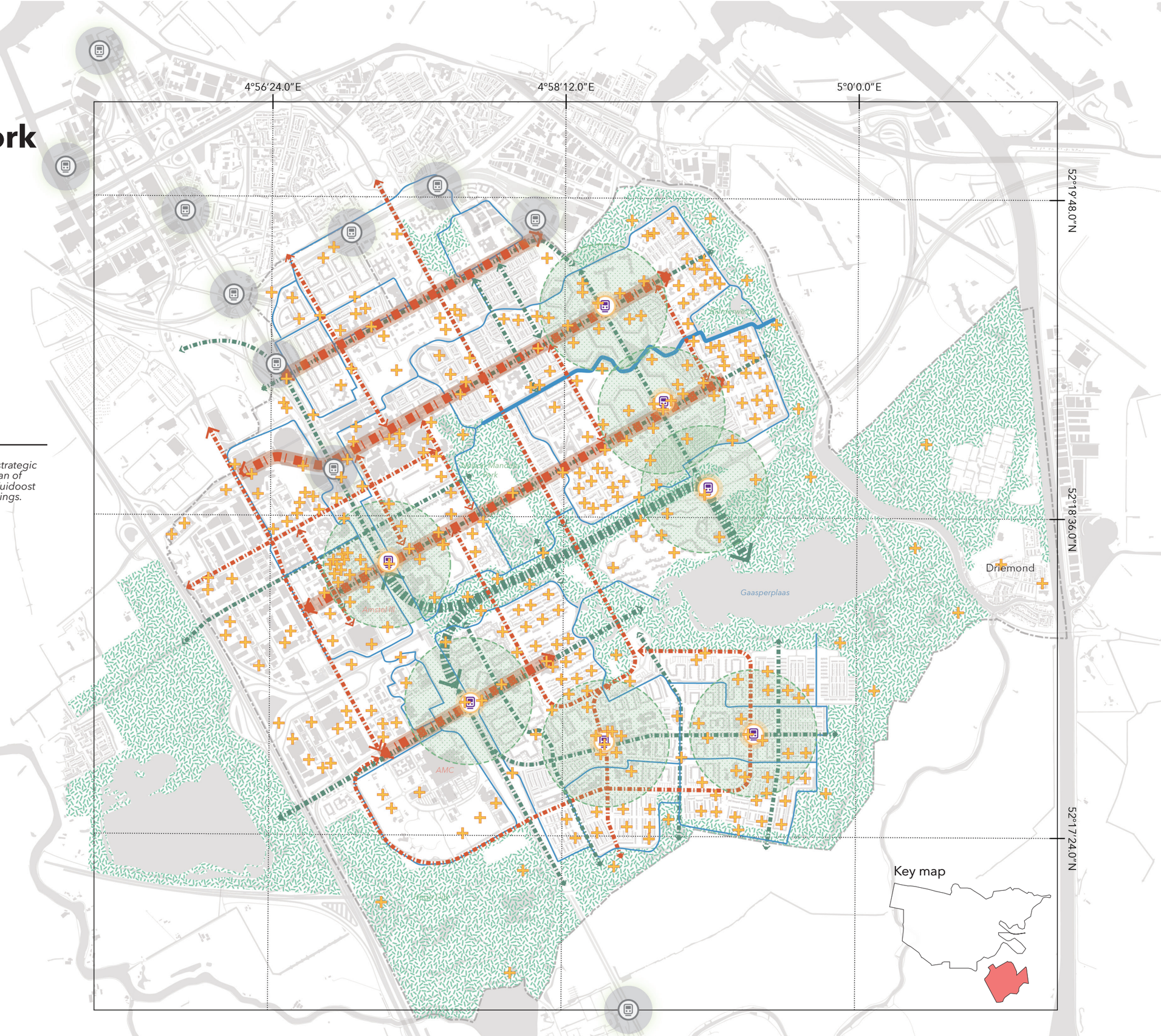


Fig 7.1: Map showing the strategic framework plan of Amsterdam Zuidoost and surroundings.



The primary urban axes structure activities within the city-district east-west. This is to ensure the new developments at Amstel III can have positive impact on the rest of the city district. The primary axes also connect existing amenity clusters to extend their network effects beyond the cluster. The secondary urban networks expand these into the rest of Zuidoost.

The three main actions along these urban axes are:

1. Introduce multi-modal transit options along this main urban structure. Currently motor traffic and active transport are separated leading to structural problems in the emergence of city streets. Through this reorganisation, that can be facilitated.

2. Introduce mixed functions to activate the ground plane along these axes.

3. Densify along these axes, since a lot of new space would be opened up for development by downgrading the elevated highways as shown in section one.

Some examples explaining how these would transpire are shown in the sections one through three to the right.

Zuidoost has a large amount of green and blue area compared to Amsterdam centre. However, the quality of these are quite low.

To improve this, the disconnected canals and green patches are connected by the extension of the blue and green networks.

With that, programmatic thickening along these are proposed to improve their recreational value as well.

Some examples explaining how these would transpire are shown in the sections four through six to the right.

Canals and railway berms, fragment the neighborhoods. Through strategic introduction of activity on and along these spaces, they can become neighborhood recreational axes.

Through these main urban and blue/green networks, the integration of neighborhoods can be facilitated.

Secondly, through the analysis in chapter 6, a large number of opportunities were identified at specific locations within Zuidoost based on the layers that were analysed.

These locations are identified as catalytic locations for transformative action. They are expanded in chapter 7.2

Beyond this, towards densification, the metro station areas can play an important role as they provide high quality public transit and can support a denser population around it, which is not currently fully exploited.

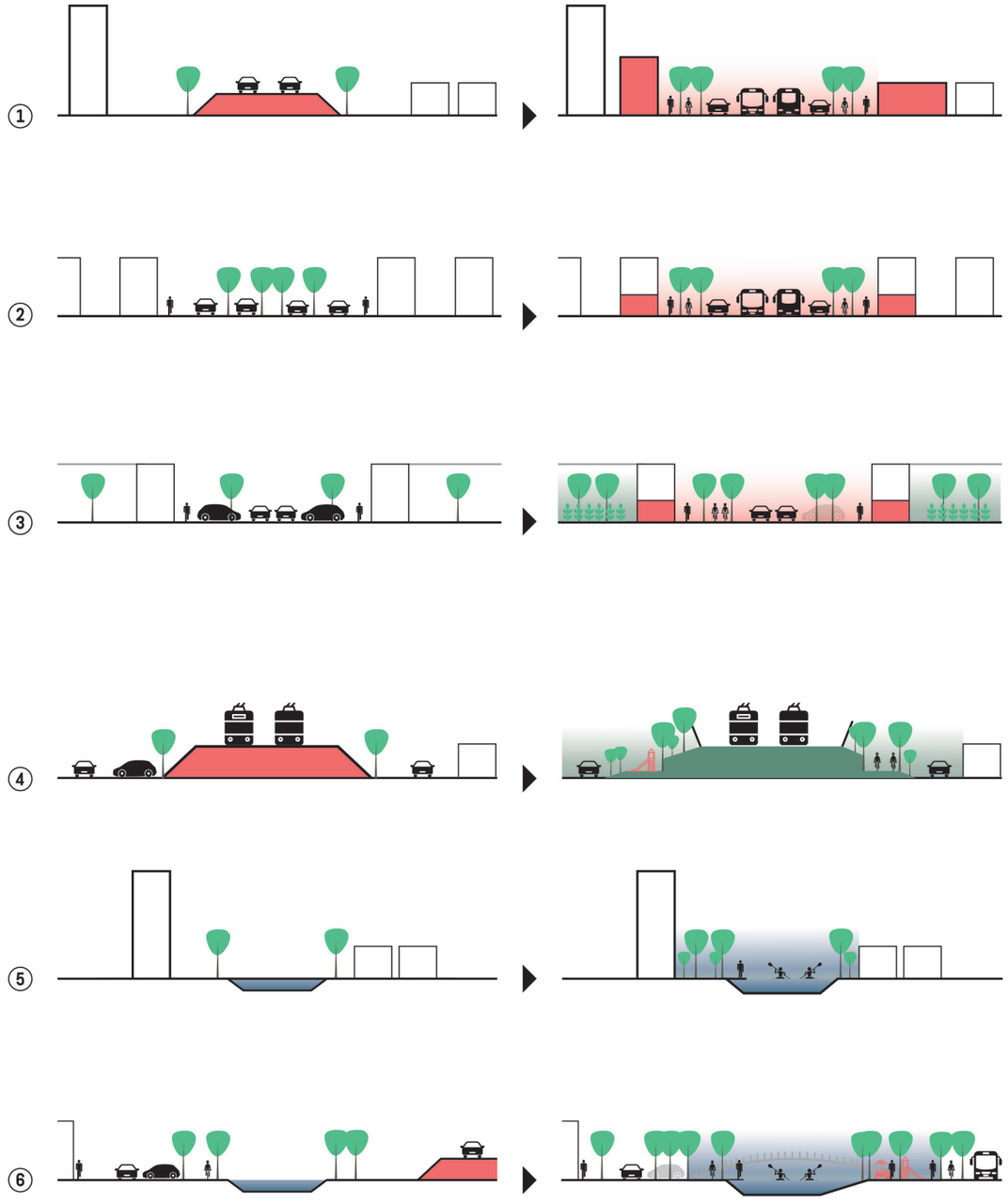


Fig 7.2: Strategic actions within the framework plan of Amsterdam Zuidoost.

7.2 Catalytic Locations

The catalytic locations for integrated action identified in the strategic framework are classified into three categories based on their potential.

1. Centralities

This category includes centralities of all scales. From metropolitan and district level to neighborhood scale. Locations such as metro stations, amenity clusters and public plazas around shared social and cultural infrastrucure such as schools and places of worships are included in this category.

2. In-between spaces

As mentioned in the analysis, Zuidoost has a lot of in-between spaces. I approach in-between spaces both spatially and temporally. Spatially, it is a kind of no-man's land that is not spatially well articulated and is thus underutilised or alternatively, it is in-between other articulated spaces. This includes vast open courtyards between high-rises and also large buffer spaces around infrastructural components. Temporally, this includes vacant lots sitting empty post-demolition of old structures waiting for a new development.

3. Off-street parking

Zuidoost designed from a car-centric world view has ample amount of space dedicated for the automobile. These are strategically important locations because of how they are spatially evenly distributed in the urban fabric. Off-street parking areas with more than 80m^2 of space are considered for this and forms the third category.

These locations are ripe for interventions. The proposal is to have these interventions citizen driven and contextually grounded as possible to address the major drivers of densification and sustainable transitions from a place based approach.

The pattern language expanded in Chapter 8 helps determine what exactly could happen at this catalytic locations.

7.2.1 Centralities

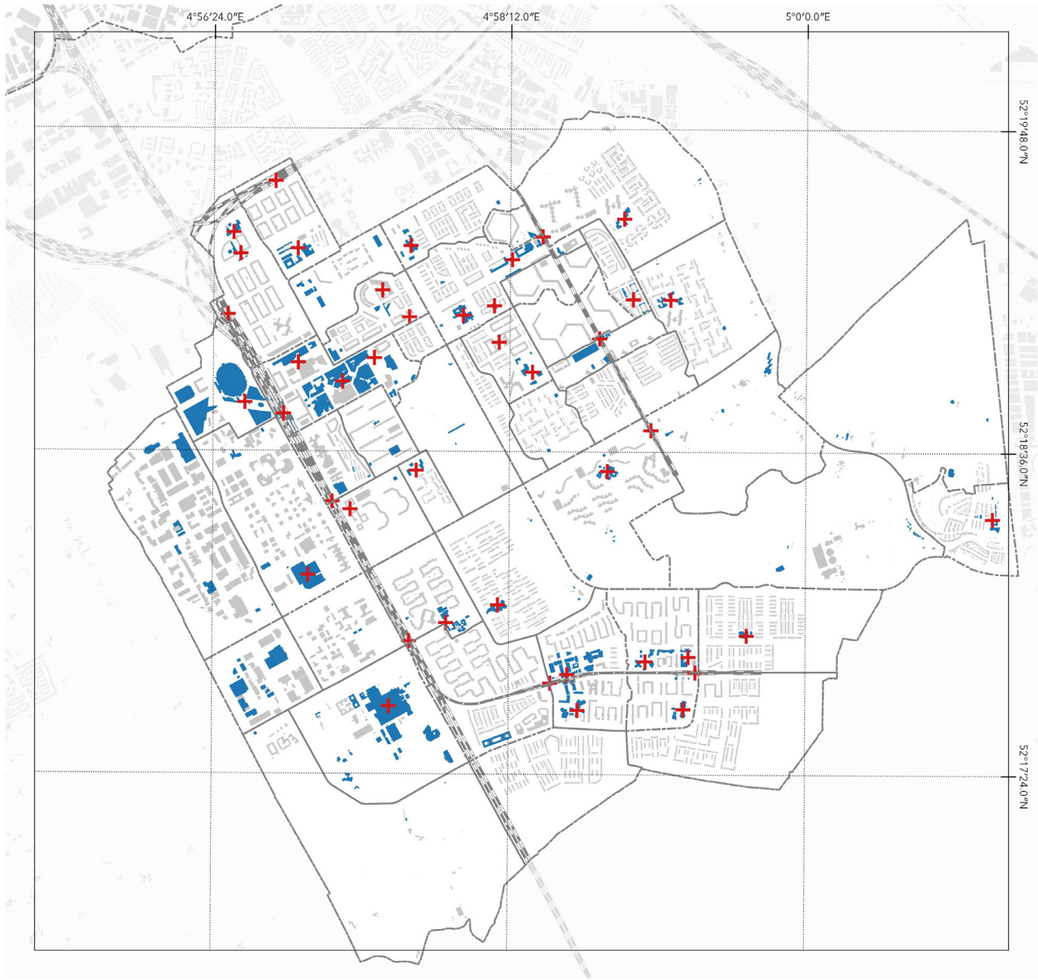


Fig 7.3: Map showing the catalytic locations classified as centralities in Amsterdam Zuidoost.

Source: Author

This category includes centralities of all scales. From metropolitan and district level to neighborhood scale. Locations such as metro stations, amenity clusters and public plazas around shared social and cultural infrastrucure such as schools and places of worships are included in this category.

Centralities, by definition are less widespread and are only at key nodes in the network. This is reflected in their relative position to the main urban and blue/green axes as identified in the strategic framework. Due to their 'central' position in the physical network, and as a corollary, in the social network as well they have the potential to have the highest potential to have the biggest impact in the rest of the urban fabric.

For example, interventions at the metro station potentially impacts everyone who uses it as compared to an intervention at a residential parking lot, which is used by only those living nearby.

In this map, the centralities are marked with a red cross and the blue buildings are multi-functional buildings in Zuidoost.

7.2.2 In-Between Spaces



Fig 7.4: Map showing the catalytic locations classified as In-Between Spaces in Amsterdam Zuidoost.

Source: Author

This category includes all the in-between spaces in Amsterdam Zuidoost, which is quite a few.

I approach in-between spaces both spatially and temporally. Spatially, it is a kind of no-man's land that is not spatially well articulated and is thus underutilised or alternatively, it is in-between other articulated spaces. This includes vast open courtyards between high-rises and also large buffer spaces around infrastructural components.

Temporally, this includes vacant lots sitting empty post-demolition of old structures waiting for a new development. The in-between spaces are also buffers in the physical system of the city district, capable of adapting to new uses over time.

Within Zuidoost, neighborhoods below the A9 including Holendrecht, Gaasperdam and Gein have a lot more in-between spaces than the neighborhoods to the north of A9, as they were redeveloped to be more 'efficient' since the early 1990s.

In the map, the blue crosses represent the in-between spaces

7.2.3 Off-Street Parking

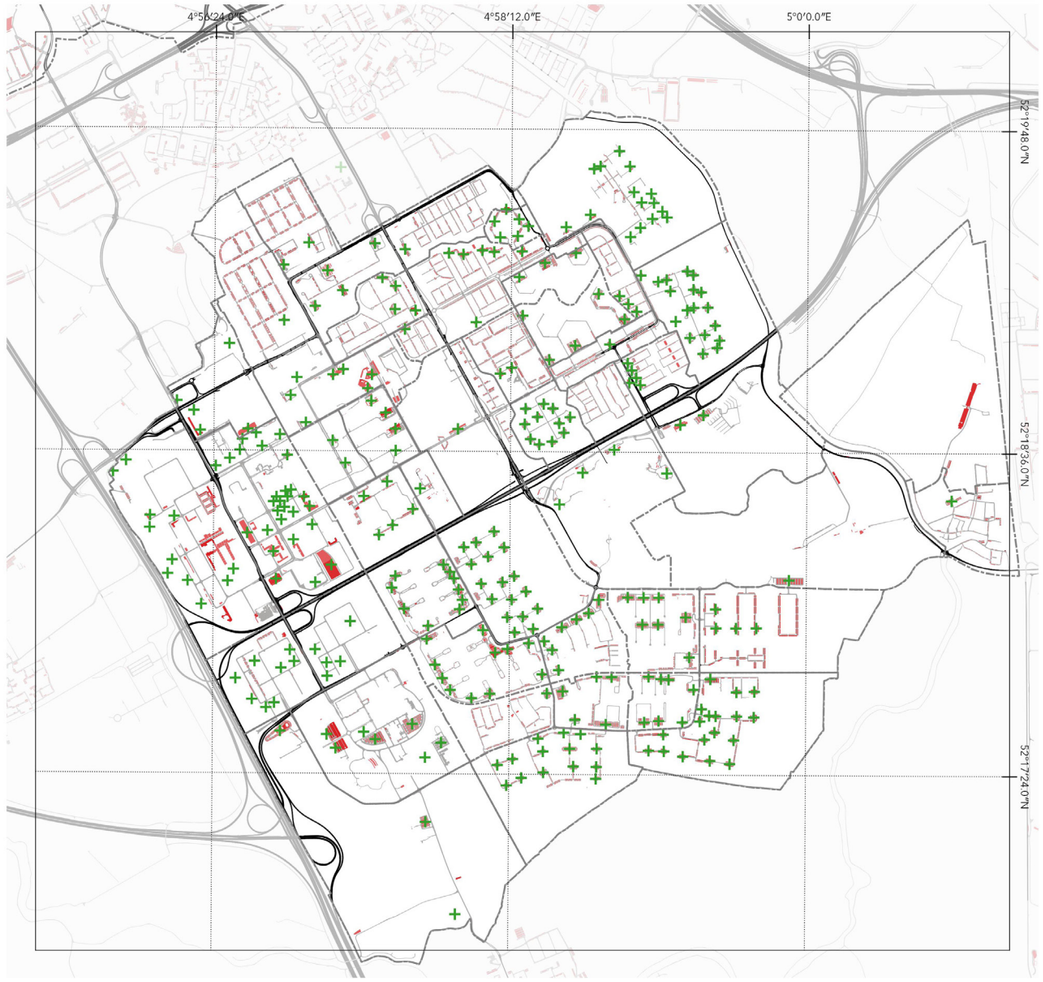


Fig 7.5: Map showing the catalytic locations classified as Off-street parking in Amsterdam Zuidoost.

Source: Author

The third category of catalytic locations include off-street parking areas with more than 80m2 of space. This includes both parking garages and off-street surface parking.

Zuidoost designed from a car-centric perspective has ample amount of space dedicated for the automobile. These are strategically important locations because of their even distribution within the urban fabric.

They are also some of the most under-utilised spaces especially considering the fact that there are multiple new spatial claims arising from the socio-technical transitions towards sustainability.

They also have static social dimensions and could potentially house hyper-local interventions to improve specific conditions.

In the map, green crosses represent these large off-street parking spaces.

7.3 Sequence

While there are many potential locations for catalytic projects to be initiated, a reach analysis was done with the street network of Zuidoost as the base.

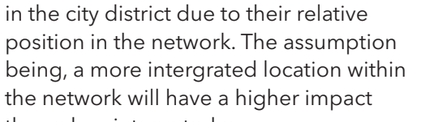
This is done to identify the locations which would have the highest impact in the city district due to their relative position in the network. The assumption being, a more intergrated location within the network will have a higher impact than a less integrated one.

The locations are thus classified based on that. The darker the +, the more integrated it is.

After this classification, they are spatially clustered to identify locations that could work together due to their proximity. The clusters are represented in different intensities of green in the map.

The three categories of catalytic locations are internally weighted as well, with the centralities weighted by a value of 6, In-between places weighted by a value of 4, and the off-streeet parking areas weighted by a value of 2 to account for their ability to have an impact in the system owing to their spatial nature.

The darkest +s represents the projects that need to be prioritised to ensure maximum impacts within the network.



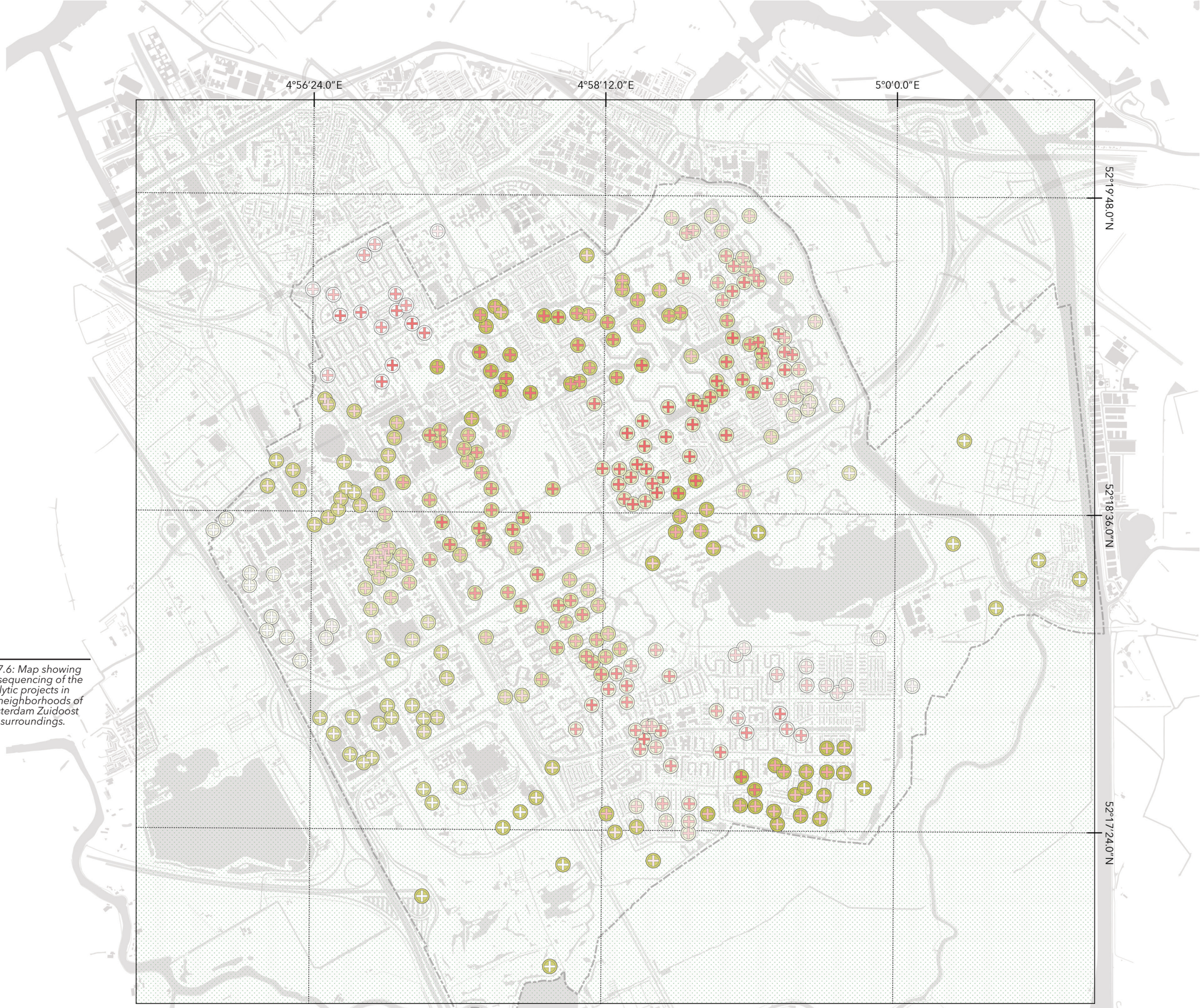


Fig 7.6: Map showing the sequencing of the catalytic projects in the neighborhoods of Amsterdam Zuidoost and surroundings.

7.3.1 Design Elaboration

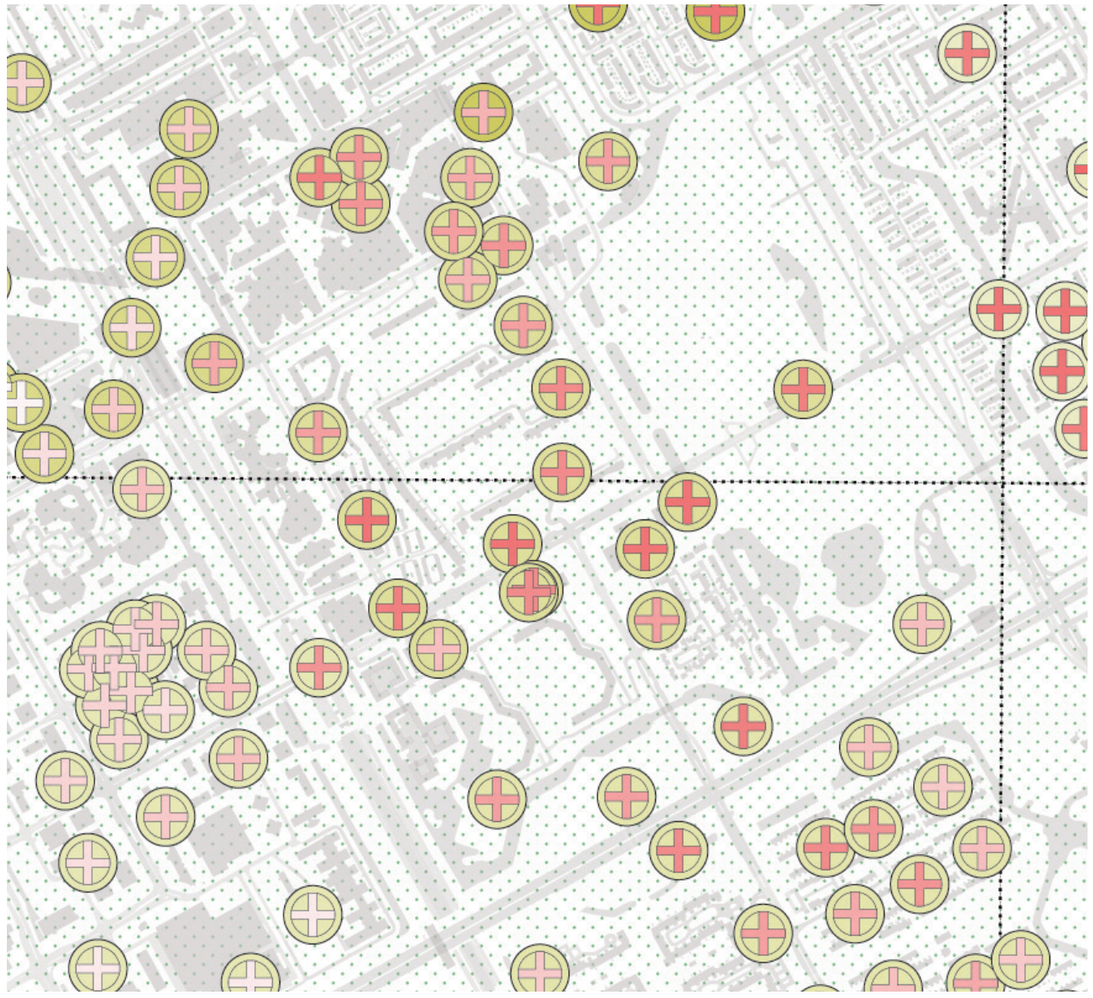


Fig 7.7: Map showing a potential elaboration project around the Bullewijk station.



Fig 7.8: Image looking at the Bullewijk station from Amstel III.

The cluster of catalytic locations around Bullewijk metro station emerges as the most integrated and it is selected for further design testing and desirable pathways towards alternate futures. This is expanded in Chapter 10.

Before we get into that, a potential study is undertaken on a selected neighborhood to derive a pattern language for livable, sustainable and just Zuidoost. This is expanded in Chapter 8.

An operational framework that helps operationalise the patterns that are to be developed is explored in Chapter 9.

8

Potential Study

8.1 Neighborhoods in Focus
8.2 H Neighborhoods
8.3 Potential Study
8.4 Patterns
8.5 Accessibility
8.6 Density
8.7 Diversity
8.8 Blue/Green Networks
8.9 Energy
8.10 Waste
8.11 Food
8.12 Reflection

8.1 Neighborhoods in Focus

Fig 8.1: Map showing different neighborhoods in Zuidoost

Fig 8.2: Exploded view of neighborhoods ordered by their land area.

There are 48 Buurts/Neighborhoods in Amsterdam Zuidoost district. The neighborhood is proposed to be the ideal scale of intervention.

A composite index for livability and sustainability that brings together specific indicators per theme are evaluated at the neighborhood level to identify neighborhoods for research by design.

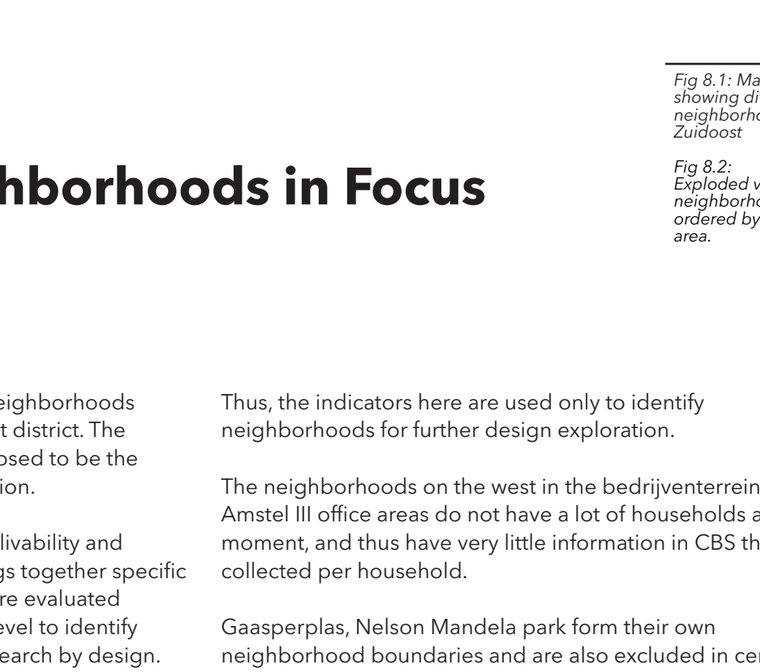
As mentioned before in the theoretical framework, indicator based evaluation systems optimise for specific indicators without nuanced understanding of second order effects in the system which lead to unforeseen externalities.

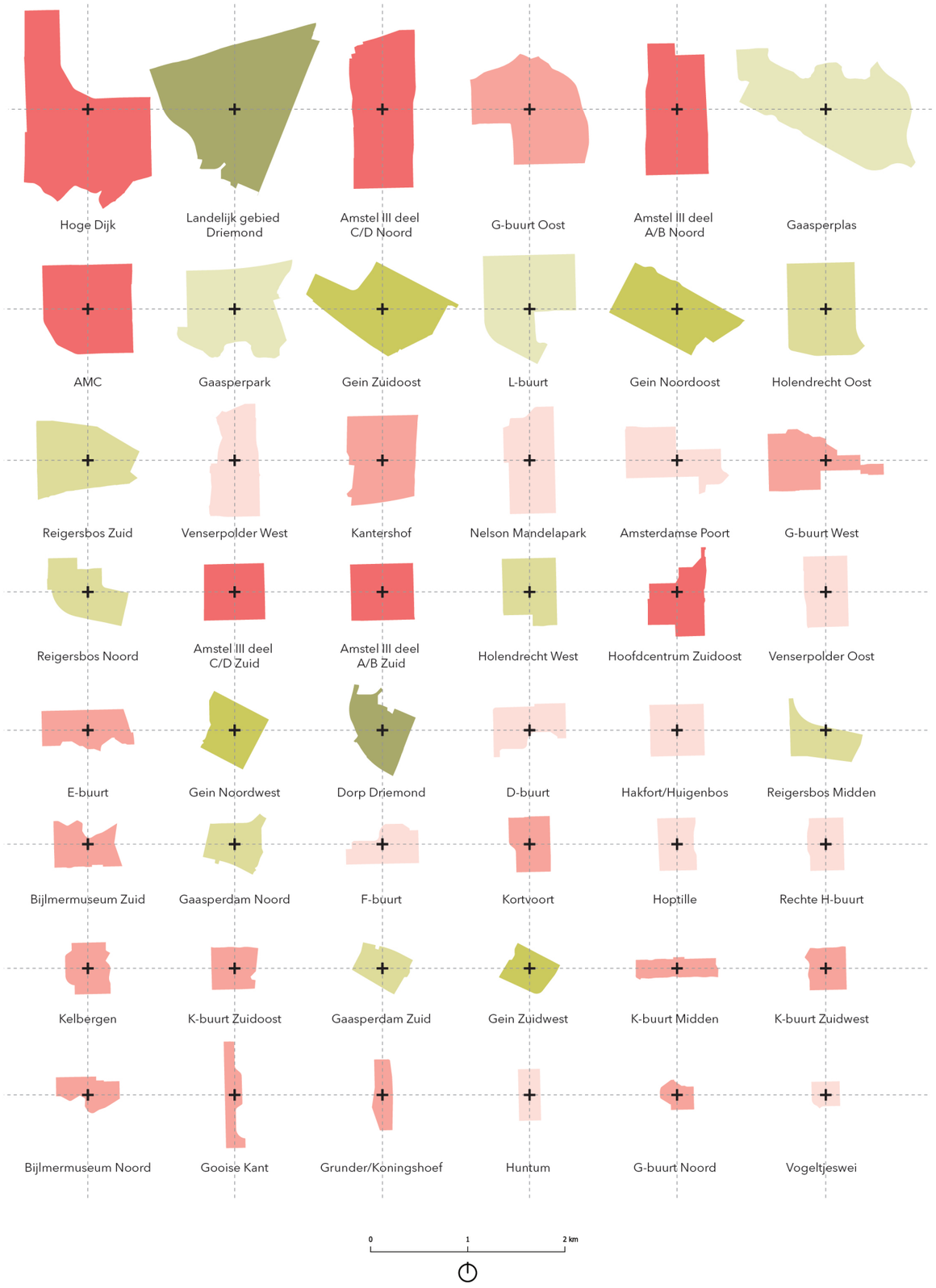
Thus, the indicators here are used only to identify neighborhoods for further design exploration.

The neighborhoods on the west in the bedrijventerrein and Amstel III office areas do not have a lot of households at the moment, and thus have very little information in CBS that are collected per household.

Gaasperplas, Nelson Mandela park form their own neighborhood boundaries and are also excluded in certain metrics since they don't have any households within their boundaries.

Material and energy flow data is not available at the neighborhood level, and thus available data at this resolution is used as a reasonable proxy to evaluate neighborhoods.





8.1.1 Indicator Analysis

The four indicators per layer of analysis are identified and are used to evaluate a neighborhood's accessibility, density diversity, nature of blue and green networks, energy systems and waste management. A composite index of a total of twenty four indicators with equal weight is calculated to identify the relative position of each neighborhood from livability and sustainability perspectives.

The better performing neighborhoods in this analysis are not normative and require interventions of varying degrees as well as they perform poor when compared with other neighborhoods in Amsterdam Centre.

The indicators identified per theme were:

Access to Primary facilities, Access to Secondary facilities within neighborhoods, Angular choice of road network per Neighborhood, and Angular integration of road network per Neighborhood to evaluate the accessibility.

Density of people per Neighborhood, Density of Businesses per Neighborhood, Density of dwellings per Neighborhood, and Average floor space index per Neighborhood to evaluate density.

Income Diversity per Neighborhood, Diversity of ethnicities per Neighborhood , Functional Diversity per Neighborhood, and Housing Tenure Diversity per Neighborhood to evaluate the degree of diversity in each neighborhood.

Surface area of Water per Neighborhood, number of Trees per Neighborhood, diversity of Trees per Neighborhood, and surface Area of Green per Wijk to evaluate the nature of blue and green networks in each neighborhood

Total Gas Consumption per Neighborhood, Total Electricity Consumption per Neighborhood, Total Solar Energy Potential per Neighborhood, and Average Energy Label per Neighborhood to evaluate the energy consumption and generation potential.

Residual waste containers per thousand population per neighborhood, Paper waste containers per thousand population per neighborhood, Plastic waste containers per thousand population per neighborhood, and Textile waste containers per thousand population per neighborhood to evaluate the waste systems in different neighborhoods of Zuidoost.

Maps of individual indicators and the underlying methodology are explained in detail in the annexures. In the next chapter, the final composite index is shown based on the combination of all information from individual indicators.

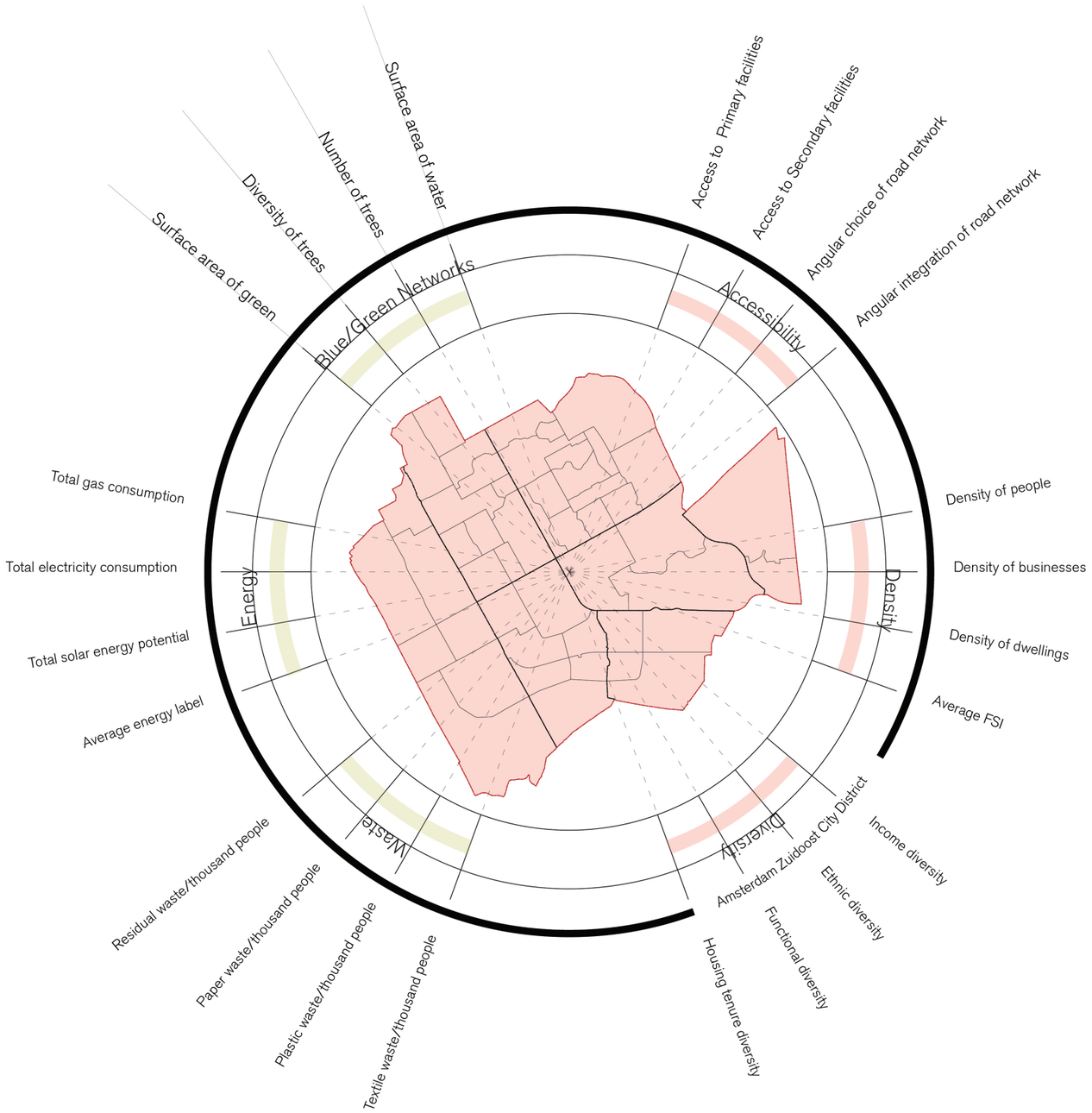
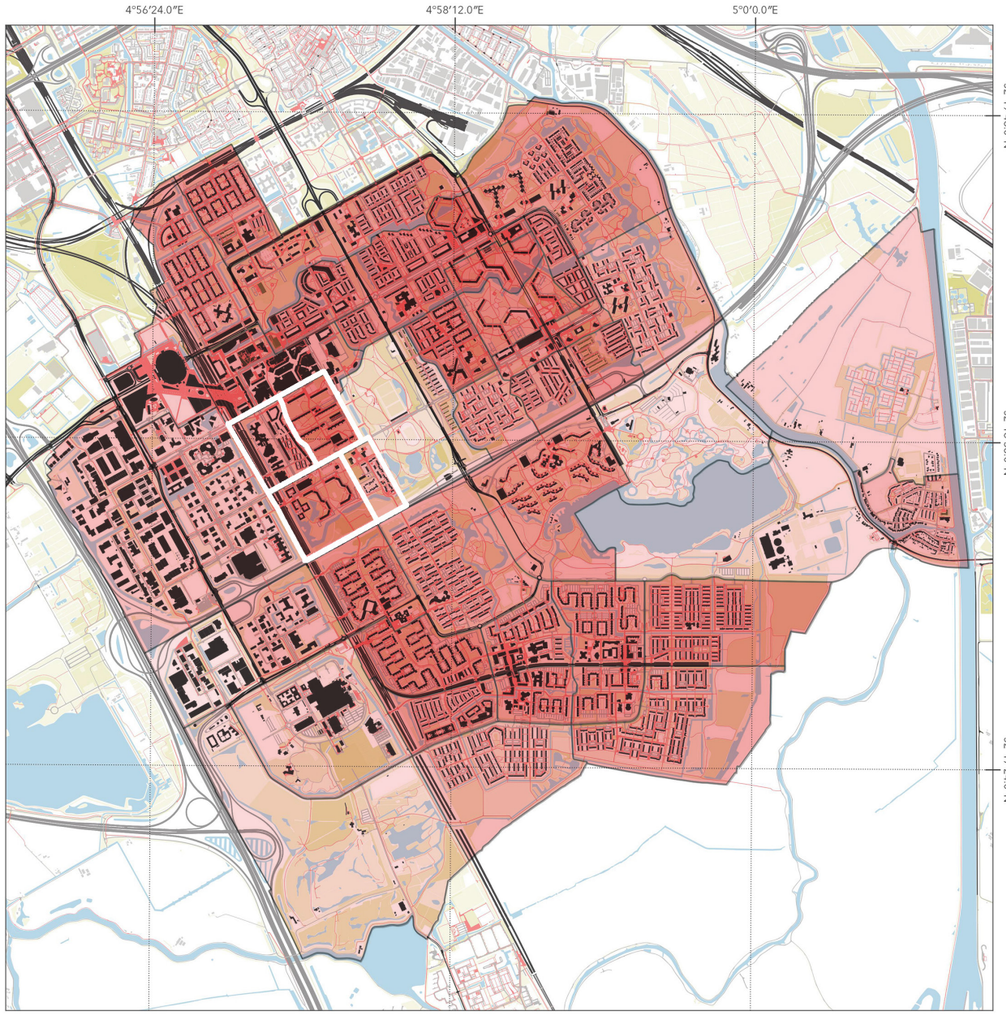


Fig 8.3: Graphic showing the different indicators used to identify the neighborhood for the potential study.

8.1.2 Neighborhood Metrics

Fig 8.4: Map showing composite livability index in the neighborhoods of Amsterdam Zuidoost.

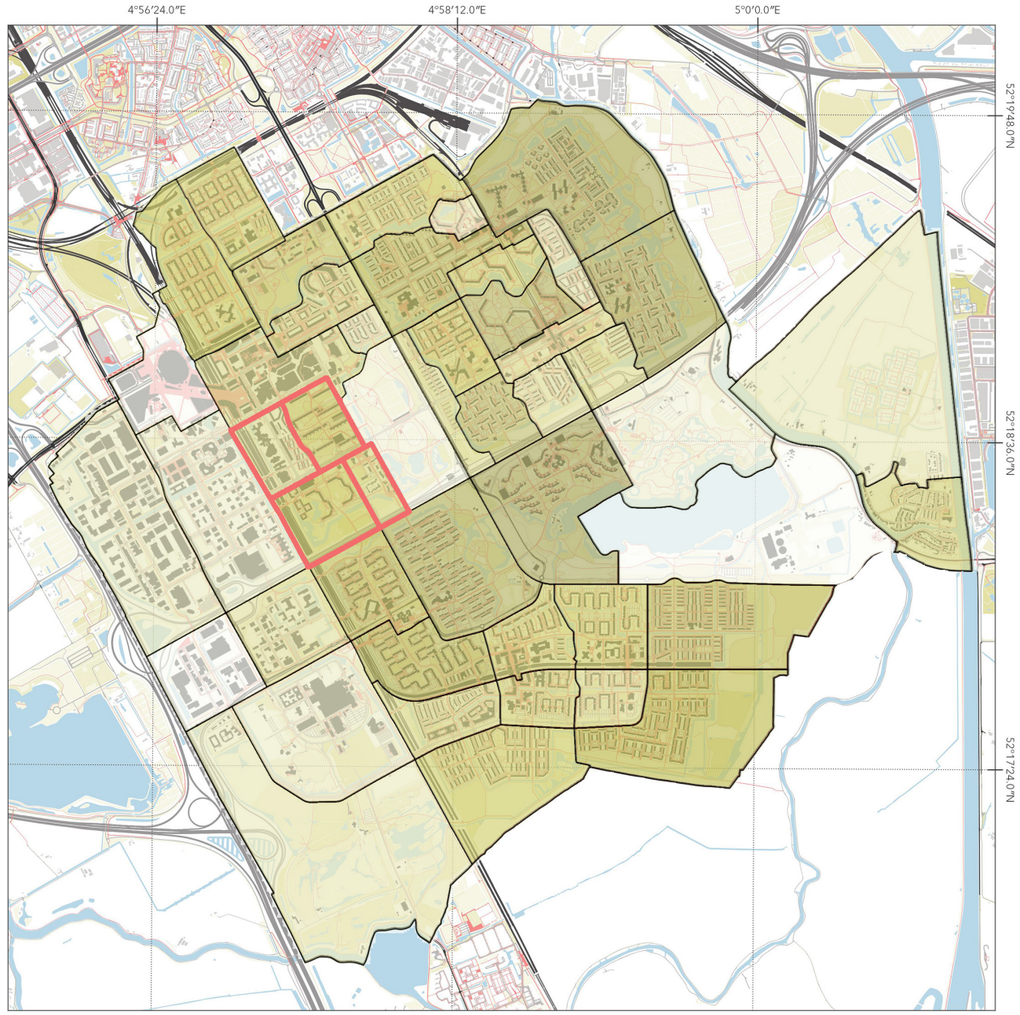


The composite map combining the indicators listed above from the specific themes of accessibility, density and diversity are equally weighted to arrive at the livability map that reveals the relative position of each neighborhood in Amsterdam Zuidoost based on the listed indicators.

As mentioned in the introduction, neighborhoods beyond the western metro line including the ones in Amstel III do not have current data to be evaluated and thus are excluded.

The four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum are selected for further study based on their relative poor performance in the livability indicators and a medium performance in the sustainability indicators.

Fig 8.5: Map showing composite sustainability index in the neighborhoods of Amsterdam Zuidoost.



Similarly the composite map combining the indicators listed above from the specific themes of green and blue networks, energy and waste are equally weighted to arrive at the map that reveals the relative position of each neighborhood in Amsterdam Zuidoost based on the listed indicators.

Beyond the indicators, the neighborhoods also have a combination of different urban fabrics indicative of a large portion of Zuidoost. This is crucial to the potential study to develop patterns that can be used later.

Fig 8.6: Map showing the physical features of H-neighborhoods.

8.2 H Neighborhoods

Rechte H Buurt:

This straight section of H district was the first part of the Bijlmer to be completed, in 1968. Four high-rise blocks of flats, each containing 300 dwellings and oriented east-west, were realized in a park-like setting. The flats are situated between the Amsterdamse Poort shopping centre and Bijlmer Park. During renovations, considerable attention was given to security in and around the flats. The entrances to the stairwells were positioned on the street, the interior streets and elevated walkways were removed, underpasses were widened and made higher.

Hakfort and Huigenbos:

These flats were originally intended to be straight, thereby linking up with the neighbouring straight section of H district. What was actually built, however, is a variant of the honeycomb model, giving rise to a spacious courtyard. All of the balconies face west or south. The parking garages on Karspeldreef were originally connected with the interior streets of the eleven--storey flats via covered elevated walkways. Following a fire in 1975, only the interior streets on the north side still remain. On the south side, the flats have been made accessible to cars by creating a connection to Huntumdreef. During renovations in 2007, the entrances were provided with glazed fronts, and the vertical circulation and the plinth were transformed. On the courtyard side, the plinth is covered with a steel grid in which climbing plants form a green veil.

Hoptille & Haardstee:

Hoptille and Haardstee are known as the first buildings in Southeast that broke with the large scale of the original Bijlmer. Here, the closed building block is introduced and brick is used instead of concrete. Hoptille consists of a central area with small blocks of single-family houses, which is protected by two parking garages and a striking, three-hundred-meter-long five-storey residential building. Three years after completion, the inner street was split into the long block and thirteen stairwells were added. At the Haardstee complex, an air bridge provides a connection between the various buildings

Heesterveld:

Heesterveld forms one area with Hakfort en Huigenbos, but has a completely different structure. The complex consists of four medium-high, assembled and interconnected residential courtyards, a design borrowed from the classic apartment buildings in Eastern European cities, applied in Amsterdam Southeast as a reaction to the original gallery flats. The 317 homes are accessed via porches that open onto the inner courtyards. The colorful facades are striking.

Huntum:

This neighborhood was originally set up as one of the more luxurious low-rise neighborhoods in the Bijlmer. Masonry garages, yard fences and storage areas ensure that remarkably few 'do it yourself' parts have been added by the residents, so that the image of the neighborhood is remarkably calm. The lush vegetation of the boundaries gives the neighborhood a green character. In 1995 seven 'Life Style Villas' with striking round roof structures were added

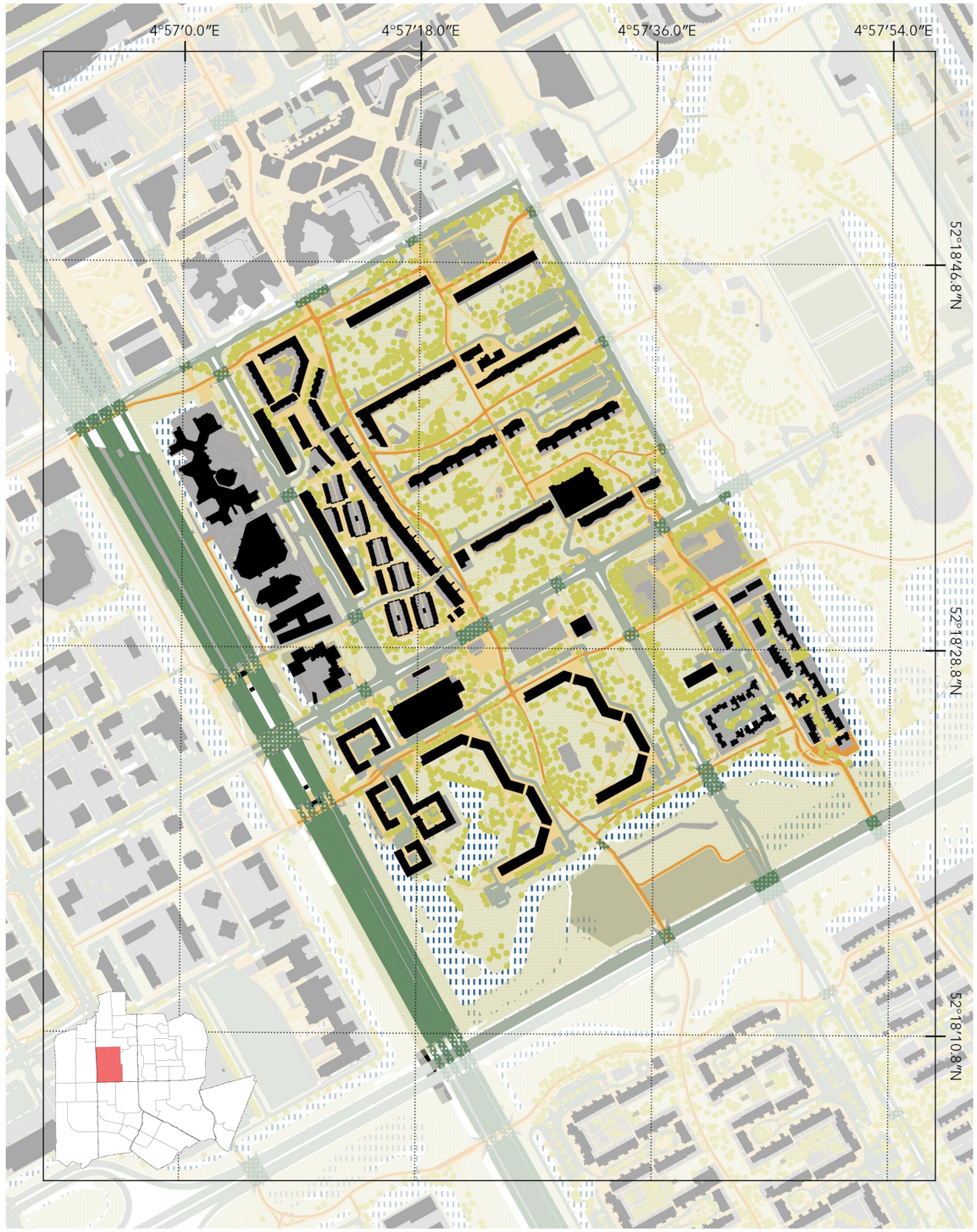


Fig 8.7:
Analytical Map of H-neighborhood and surroundings.

8.2.1 Analysis

The map represents the status quo of the H neighborhoods.

The separation of car traffic on elevated level and active transport on the ground level as proposed in the original plan has fragmented the neighborhoods. The poorly lit tunnels created as a result of this grade separation feel unsafe when passing through. Pictures of these tunnels are shown in the next spread.

Large offstreet parking spaces and garages devoid of through traffic form dead ends and are unsafe. Large urban blocks with tall towers are also disorienting at the ground plane. Elevated motorways through urban areas prevent roads from developing into urban streets with activity on either side as they prioritise through traffic and not chance encounters.

The neighborhoods were part of post-war expansion of Amsterdam on modernist principles as discussed extensively before, the paradigm of towers in a green field could be challenged with the increasing demand for housing and the policy position of creating a compact city.

While the neighborhood has some of the tallest residential buildings in Amsterdam, in terms of dwellings per hectare, the neighborhoods have fewer housing units compared to Amsterdam centre.

Since this neighborhood is close to metro and train networks, there is potential for further densification, without overloading transit networks which is not explored.

As mentioned before, the post-war expansion on modernist principles set a paradigm of work-live functional separation and this is seen in these monofunctional neighborhoods. Diversity of building form within each of the neighborhood is almost non-existent with each neighborhood having either completely high rise buildings or entirely low-rise buidings.

In terms of housing tenure, the housing in the neighborhoods are predominantly social housing. This leads to concentration of poverty within the residual social housing system in Amsterdam.

Another result of modernist ideals where that these neighborhoods have a characteristic open and green network. However large sections of this green area are underutilised as ownership is not clearly defined. The canals in this neighborhood only serve as drainage infrastructure. Their recreational and transport potential is not fully used. They are also relegated to the boundaries of the neighborhood tracking infrastructure, when they could



occupy more prominent position in the fabric.

The neighborhoods taken for study are ranked in the fourth and fifth quintiles in terms of energy usage and gas usage in the district of Amsterdam Zuidoost. This is exceptionally problematic since these neighborhoods are also some of the poorest. Except for the owner-occupied private dwellings in Huntum and the office complexes in Hoptile, no other residential building is using solar panels or other forms of on-site energy generation. This is wasteful consideing the fact that these are highrises with flat-roofs best suited for roof-top solar panels.

The key map to the right and the consequent images show the tunnels that are created as a result of the elevated motorways.

Since the cycle networks are not along existing buildings, but go through unarticulated green spaces or away from buildings, they feel isolated and these tunnels represent perceptually unsafe points along the network.

Some of these tunnels are also used for illegal parking of cars as well, reducing the effective space left for movement as well.

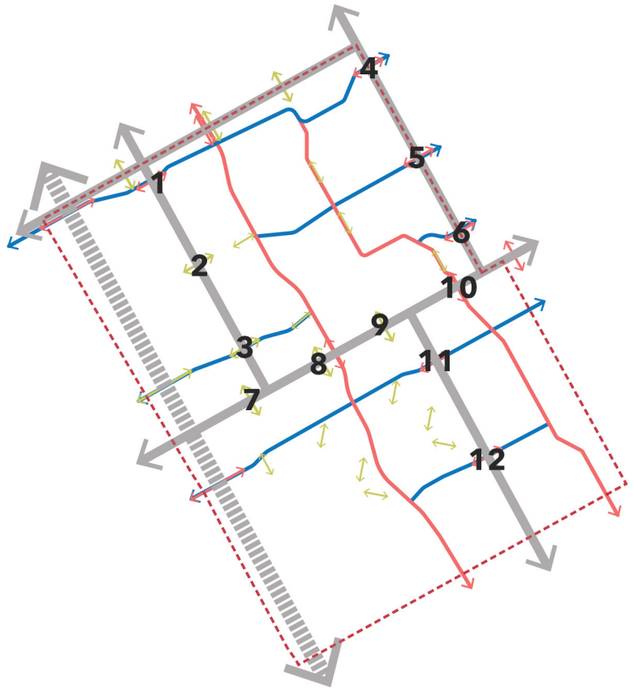


























Fig 8.8: Map and images showing the different pedestrian and cyclist tunnels in the H-neighborhoods.

Source: https://www.bruggenvanamsterdam.nl/

8.3 Potential Study

The four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum are selected for the potential study.

The potential study is a research by design process to identify the maximum potential embedded in the existing spatial structure of the neighborhood and how much it could be maximised through specific actions.

For the H-Neighborhoods, the potential study is done on the themes of Accessibility, Density, Diversity, Green Blue Networks, Energy, Waste and Food.

Here Accessibility, Density, and Diversity are looked as characteristics of the urban form, the nature and delicate balance of which leads to the emergence of a livable neighborhood.

Similarly, Green Blue Networks, Energy and Waste are looked at as spatially embedded material and energy flows. Their circularity, adaptive capacity and regenerative potential contributes to the emergence of a sustainable neighborhood and they are approached with the intention of maximising these potentials in each of those systems.
Finally, food systems are evaluated as a sort of hybrid system that is not previously analysed, but experimented to try the effectiveness of such a method to evolve solutions for other systems in the neighborhood.

The potential study is approached from a normative of a just city - one that priorities an inclusive development, thus acting as a mediating perspective in conflicting conditions.

The conceptual framework discussed in Chapter 4 represents this thought visually. The specific condition per theme are explained within each of the subsequent sub-chapters.

Within each layer, we start by identifying the specific problems in the neighborhood and stating the approach towards fixing it.

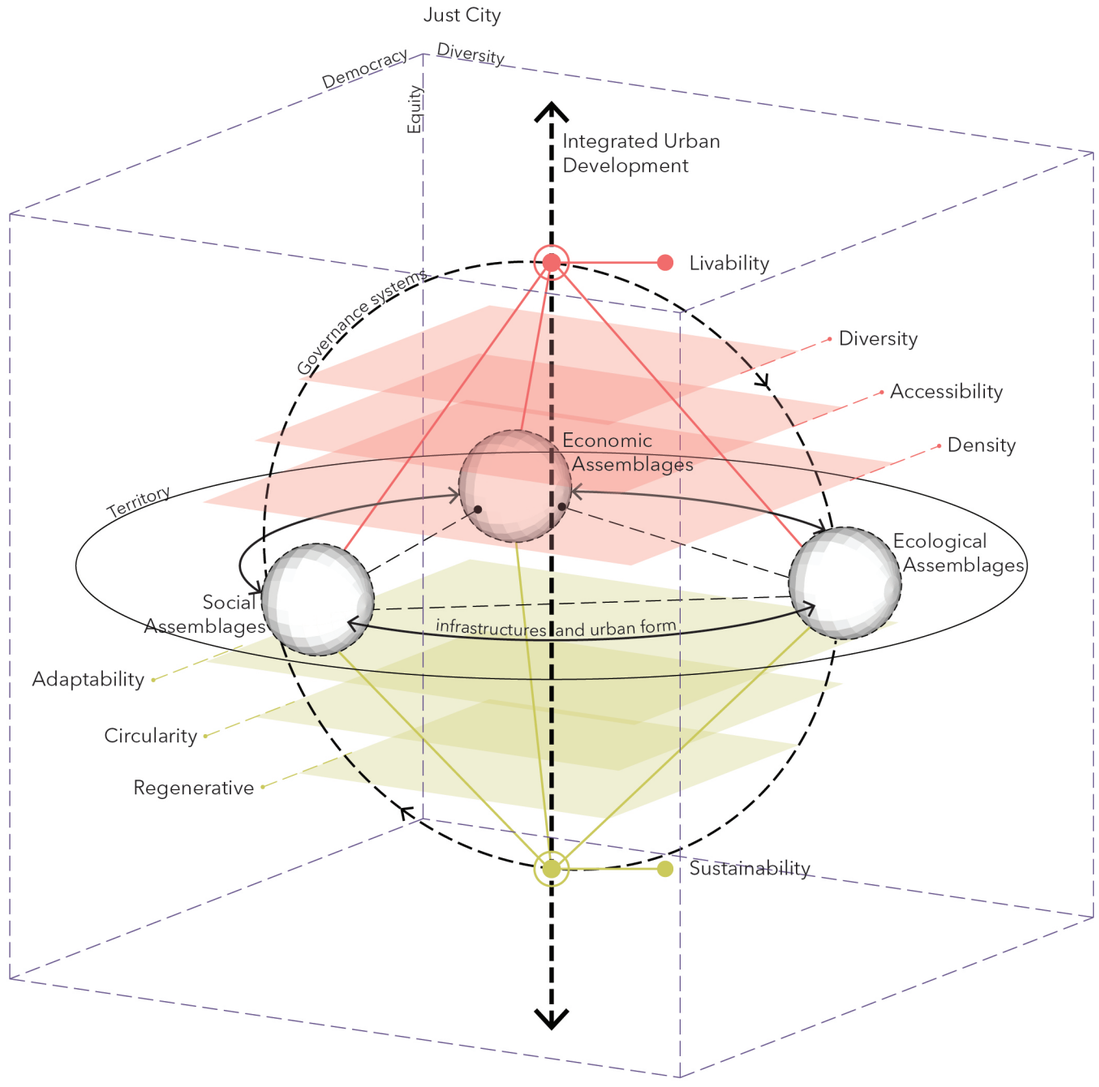
Further, the plan and exploded axonometric per layer expands on the speculative design process and the proposed design solution. This is also supported by a visualisation of the said condition at the street level to reflect on the quality of the spaces created.

In the potential studies of blue and green networks, energy, waste and food systems, a redesigned system is also proposed that facilitates circularity, adaptive capacity and regenerative potential of each of those individual system.

The process of the potential study is towards the generation of patterns per theme that contribute towards livable, sustainable and just assemblages in Amsterdm Zuidoost. The patterns developed per theme are listed at the end of each chapter, which is also informed by analysis from Chapter 6.

We'll see what exactly are patterns and how it is implemented in this project in the next chapter.

Fig 8.9: Analytical and design Framework
Source: Author



8.4 Patterns

A set of patterns geared towards livability, sustainability and spatial justice in Amsterdam Zuidoost derived from both theoretical (deductive) and contextual (inductive) approaches of engaging with the site.

These are identified based on the analytical study in Chapter 6, and the potential study in the upcoming chapters through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

"The idea of a diagram, or pattern, is very simple. It is an abstract pattern of physical relationships which resolves a small system of interacting and conflicting forces, and is independent of all other forces, and of all other possible diagrams. The idea that it is possible to create such abstract relationships one at a time, and to create designs which are whole by fusing these relationships-this amazingly simple idea is, for me, the most important discovery of the book. I have discovered, since, that these abstract diagrams not only allow you to create a single whole from them, by fusion, but also have other even more important powers. Because the diagrams are independent of one another, you can study them and improve them one at a time, so that their evolution can be gradual and cumulative. More important still, because they are abstract and independent, you can use them to create not just one design, but an infinite variety of designs, all of them free combinations of the same set of patterns." (Alexander, 1964, p. 6).

Patterns, when composed as a pattern language, are a relational tool and are well suited to engage with the understanding of the city as a complex system, while also making the complexity comprehensible for stakeholders of different proficiency in the processes of urban development.

The communication potential of pattern language helps towards operationalising generic solutions in the context through engagement with stakeholders.

Each pattern has a pattern code that helps identify it quickly. The potential positive impact on the social, ecological and economic systems are represented in three pie charts that range from zero to five. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The type of pattern states one of the following, either building, street/canal, block, open space, program, policy or principle. This helps to spatialise each of those patterns. Additionally, each pattern also has a scale of application, which mentions at what scale it could be potentially applied. This grows from XS to XL. Where XS represents interior of buildings, S represents individual site and building scale, with the public realm around it. M would mean application at the scale of the neighborhood including streets and blocks. L would refer to the city-district scale and XL would refer to the city scale and beyond.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects. While the patterns are derived per specific theme for the sake of clarity, however, they link across themes clarifying potential synergies and conflicts and opportunities for integration.

The patterns are organised around specific principles, which are further expanded to reflect individual nuances. Sustainability patterns that focus on blue and green networks, energy, waste and food systems are also organised in a circular and regenerative logic of the individual system as well.

These patterns are to be used in combination with the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

These patterns represent only a finite amount of possibilities and are not complete. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

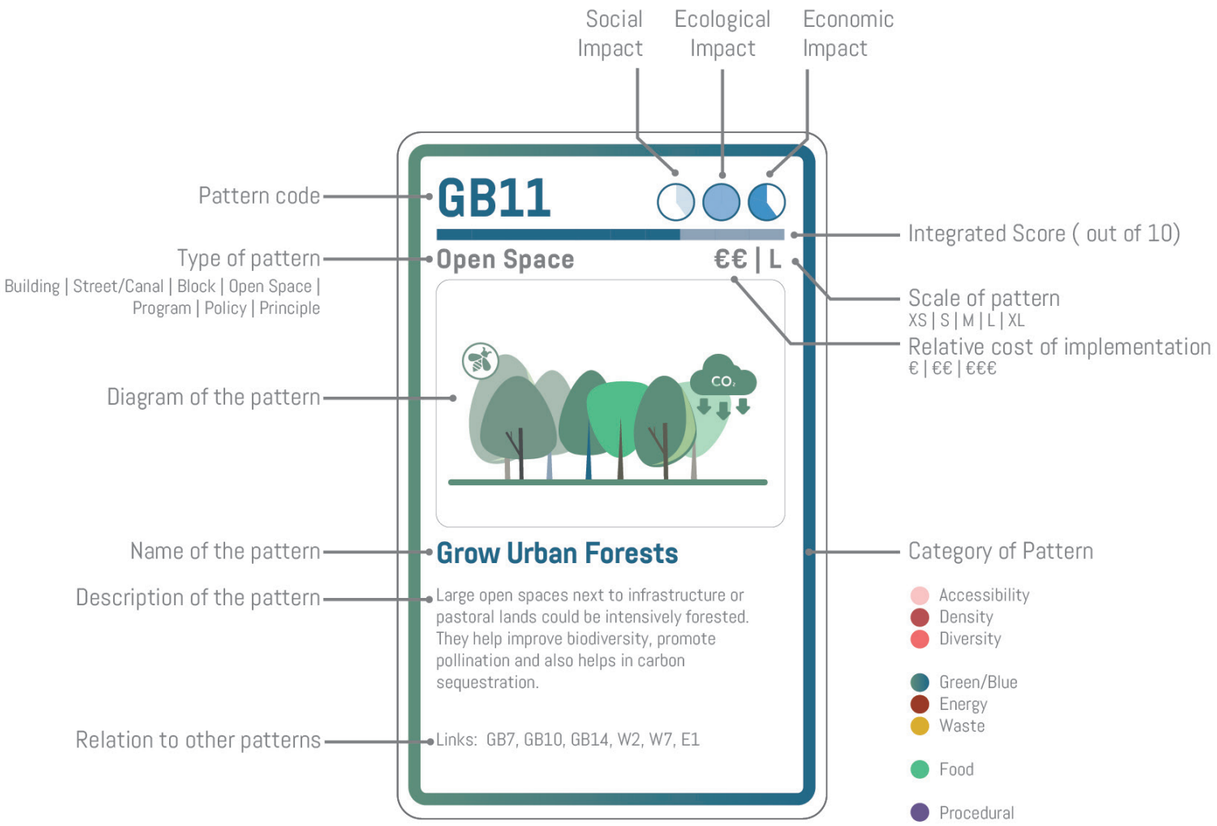


Fig 8.10: A Pattern Index card

Source: Author

8.5 Accessibility

Fig 8.11: Plan showing potential study maximising accessibility in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.12: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on maximising accessibility in the neighborhood. Here Accessibility is prioritised within a framework of Access, Density and Diversity towards improving livability.

The major issues identified within these neighborhoods from an accessibility perspective were:

1. The separation of car traffic on elevated level and active transport on the ground level as proposed in the original plan has fragmented the neighborhoods.

2. The poortly lit tunnels created as a result of this grade separation feel unsafe.

3. Large offstreet parking spaces and garages devoid of through traffic form dead ends and are unsafe. Road

4. Large urban blocks with tall towers are also disorienting at the ground plane.

5. Elevated motorways through urban areas prevent roads from developing into urban streets with activity on either side as they prioritise through traffic and not chance encounters.

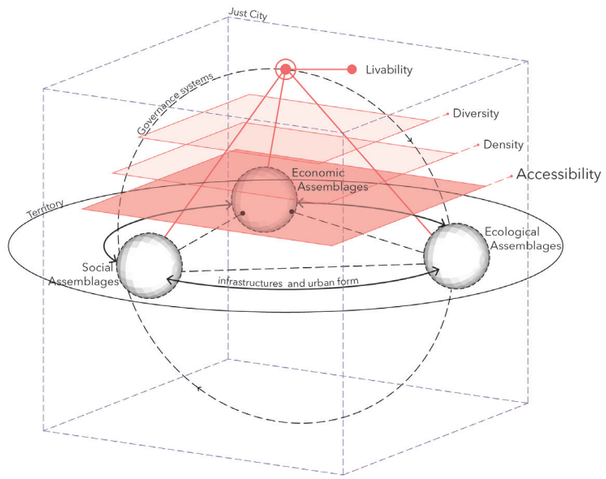
In this study, maximising accessibility is approached with the following principles

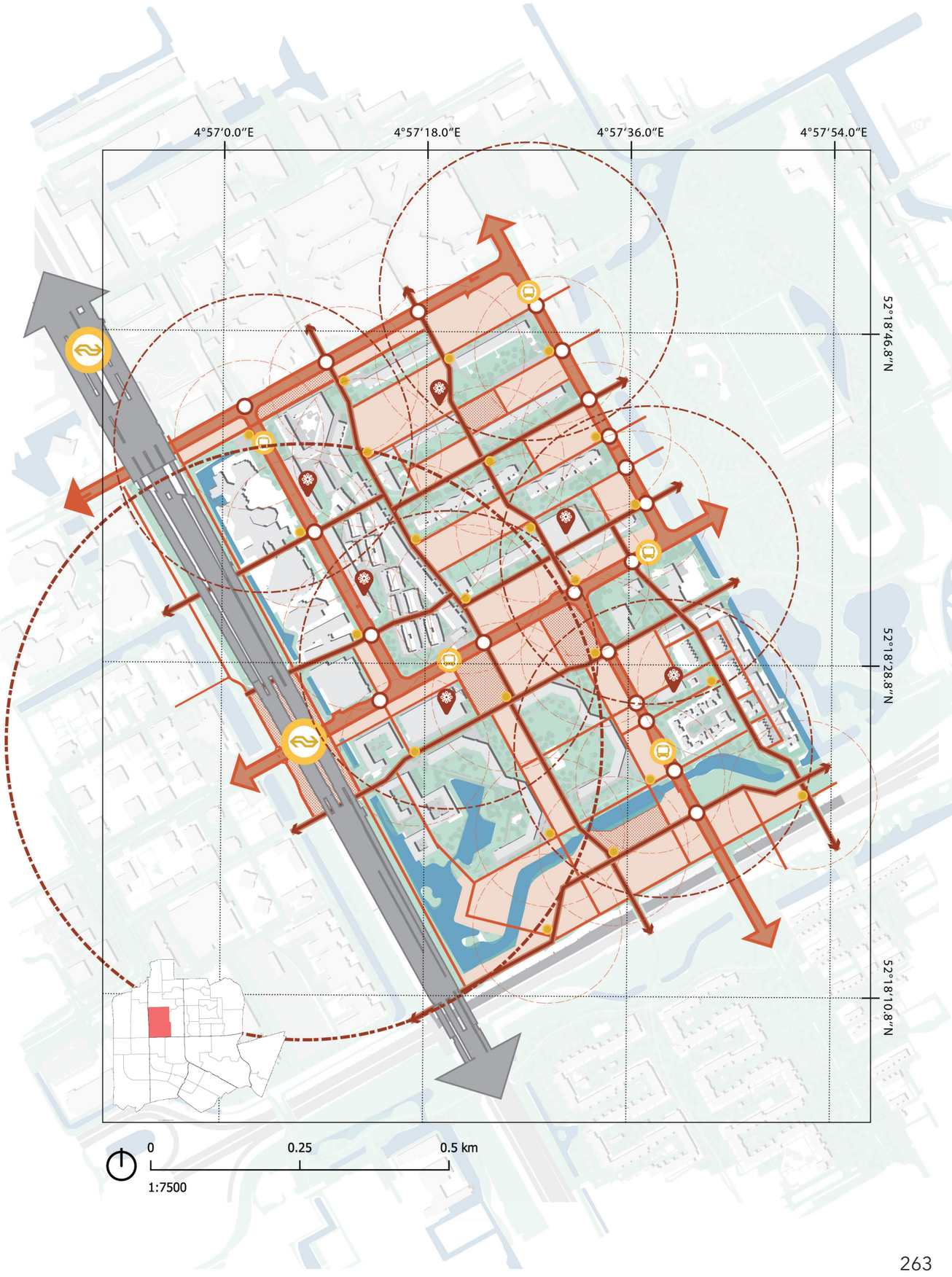
1. At grade network to promote chance encounters and engagement with the urban fabric. Road safety is to be improved by design of street profile and not separation of transit modes.

2. From roads that move vehicles to streets that move people and facilitate urban life, chance encounters and inter-modality.

3. Fine grain network to improve permeability. This inturn creates new cityblocks that could be developed in large unzoned green spaces and parking areas.

4. Prioritising active transport and low-emission public transportation modes.





The elevated arterial roads are moved to be at grade. This opens up large amounts of space that was lost as mounds and for ramps.

Through this, redundant cul-de-sacs and parking spaces are transformed to city-blocks that could be densified.

A hierarchy of network with three classfications are proposed

1. Wide arterial roads connecting rest of the district and the city, prioritising public transport, para transit, cars and cycles.
2. A shared network prioritising active transit.
3. A local street network that is only walking and cycling.

Using three typologies of road network, rationalisation of the existing network is proposed. Cul de sacs are extended to create through networks wherever possible.

A network of public spaces are created in this finer network to promote pause and play within the urban fabric. Local centralities around churches and schools are to be part of a larger network of interconnected public spaces that break monotony within the urban fabric and promote chance encounters and urban life.

Bus stops are at grade along the arterial roads to provide universal accessibility with ease. A new bus stop along Flierbosdreef is created to ensure every resident is within 400 metres of a bus stop. A network of bike sharing stations are proposed along the shared street network within 150 metres of every resident to facilitate last and first mile connectivity. Bus stops also double as bike sharing stations.

Active transit couldn't be promoted by only providing infrastructure. Policy initiatives through subsidies that promote it need to be supplemented. Bike sharing used for less than 10 minutes for last mile or first mile could be provided for free removing friction towards using public transit services.

Paratransit systems are notoriously absent in Amsterdam as it wasn't necessary with a daily-urban cycle focused on the city-centre. In this maximising scenario, paratransit systems comprising of battery operated vehicles running along the shared street networks are proposed to supplement public transit with fine grain accessibility.

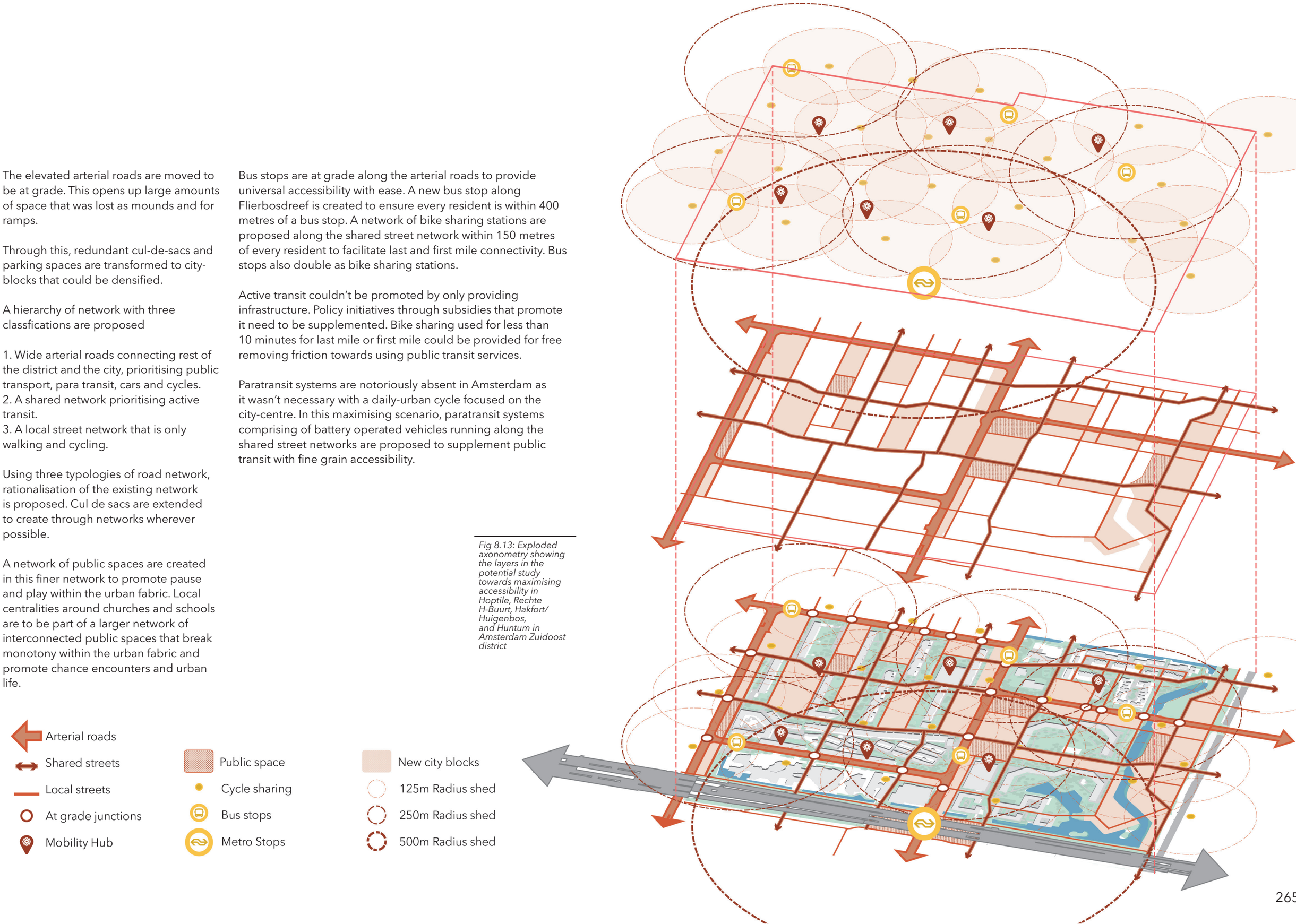


Fig 8.13: Exploded axonometry showing the layers in the potential study towards maximising accessibility in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows Hoorneboeg next to the Hoogoorddreef which is moved to be at grade, opening up space to create a public space.

The street is classified as a local street with only active transit. The downgrading of the elevated Hoogoorddreef, connects the public space visually to the ING campus and the vibrant ArenaPoort.

The green public space with open food court acts complement the high dense ArenaPoort redevelopment by providing respite to its fast pace, while also improving quality of street life next to the medium dense housing in Hoptile.



Fig 8.14: A collage showing quality of life improvements along Hoorneboeg next to the Hoogoorddreef which is moved to be at grade, providing opportunity to create an public space

8.5.1 Accessibility Patterns

The accessibility patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more accessible Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following nine main principles define accessibility, (The pattern code A denotes Accessibility.)

A1. Multi-Nuclei Model

Create multiple city-level centralities within the city. This prevents over-crowding and one way daily urban cycles focused in one centre and enables sustainable, distributed development across the city.

A2. Street Hierarchy

When laying out street grids, use a rough spacing of 400m or less for arterial streets. Within these ~400m "superblocks", provide for shorter, interrupted, lane-like shared streets that can accommodate motor vehicles, but prioritise pedestrian and cyclists.

A3. Provide for Multimodal Options

Redesign streets and transit nodes to promote multimodal options. This can help in the mobility transition by providing the requisite infrastructure for different modes of transportation including walking, cycling and PT.

The three patterns listed above define the nature of transport systems at the system scale. The next three patterns focus on the qualitative aspects of streets as social spaces and not just transit conduits.

A4. Streets to Stay

Design streets as places of stay and not just conduits of traffic. Streets are more than transportation infrastructure and are the living rooms of a city. Good streets will enable citizens to linger and engage with public life on the street.

A5. Eyes on the street

Orient activity on both sides of a street while ensuring compatability of activities with each other and rest of the street. Avoid blank walls, parking lots or other unsuitable structures facing the streets. When streets are focus of attention and use, it improves social life and security.

A6. Threshold Spaces

Create architectural features that blend private and public spaces, without stark boundaries such as arcades, courtyards and galleries. Skillful use of glass windows along the street edge can blur the distinction between exterior and interior, while keeping spaces distinct.

The final three principles describe the system level considerations for public spaces.

A7. Hierarchy of Public Spaces

Structure public spaces in a hierarchy based on their size, context and position in the city network. Large parks and important station squares are metropolitan scale public spaces, while school yards and amenity clusters are neighborhood scale public spaces.

A8. Adaptive Public Space

Provide mechanisms for public space to adapt to temporal

Fig 8.15: Accessibility Principal patterns

Source: Author

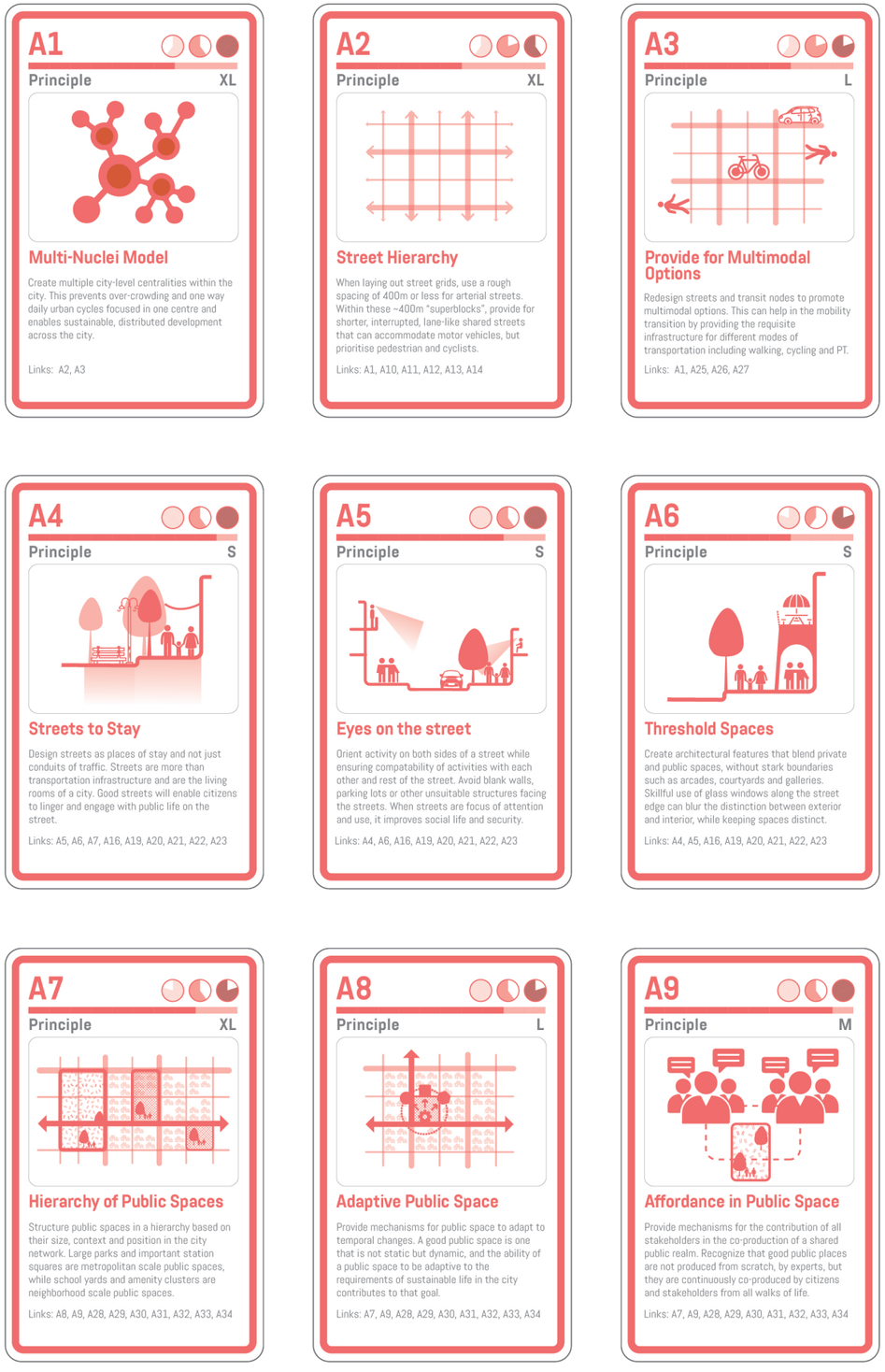


Fig 8.16: Expansion of the accessibility patterns.

Source: Author

changes. A good public space is one that is not static but dynamic, and the ability of a public space to be adaptive to the requirements of sustainable life in the city contributes to that goal.

A9. Affordance in Public Space

Provide mechanisms for the contribution of all stakeholders in the co-production of a shared public realm. Recognize that good public places are not produced from scratch, by experts, but they are continuously co-produced by citizens and stakeholders from all walks of life.

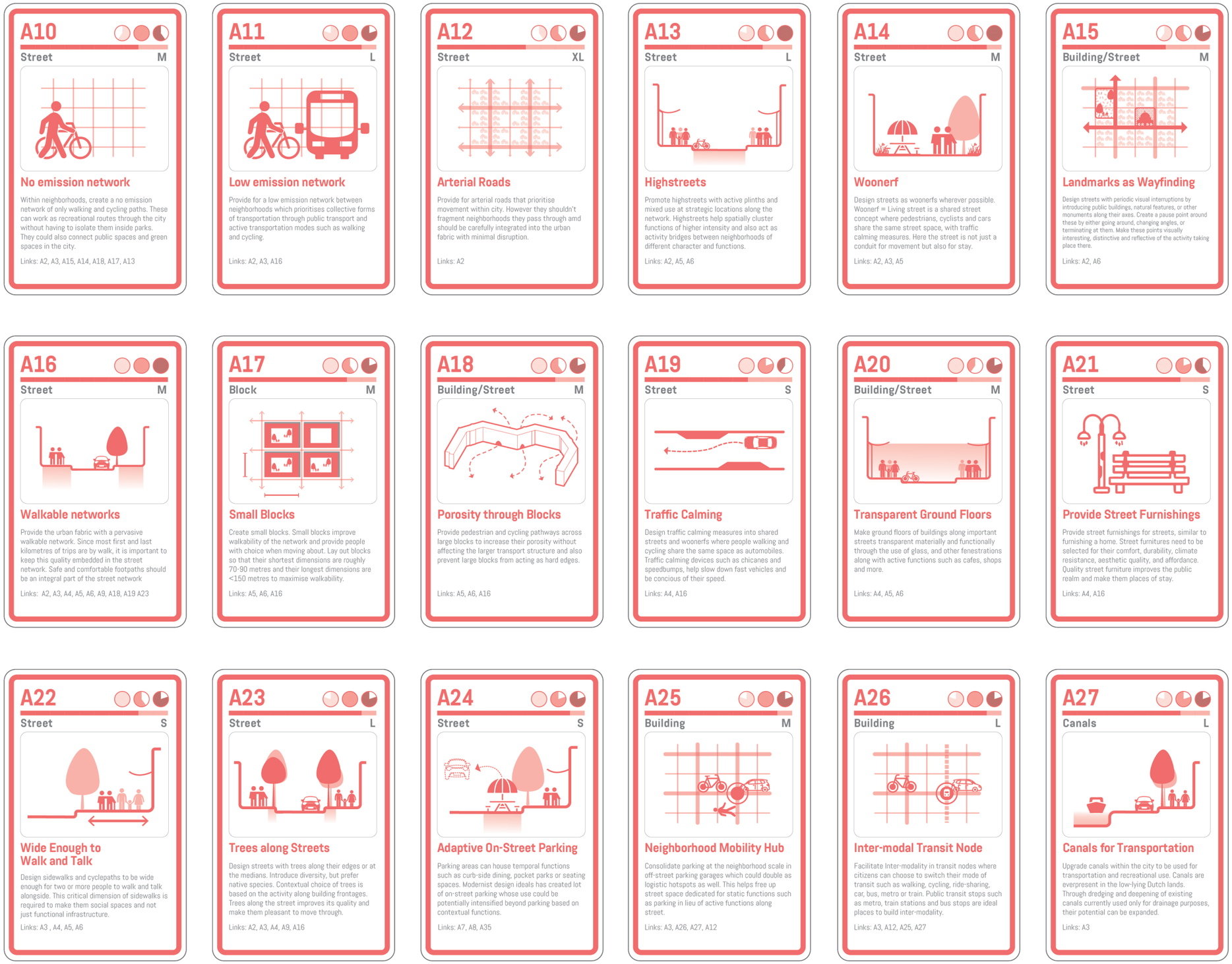
Each of these 9 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

These patterns are to be used in combination with other patterns



discussed in subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

Here, patterns A10 through A14 represent street typologies, that can help define space allocation in street profiles.

Patterns A16 through A24, describe the characteristics of human friendly streets from a qualitative and quantitative perspective.

Patterns A28 through A35 are focused on public space networks, their articulation and their positioning within the neighborhood at the system level.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

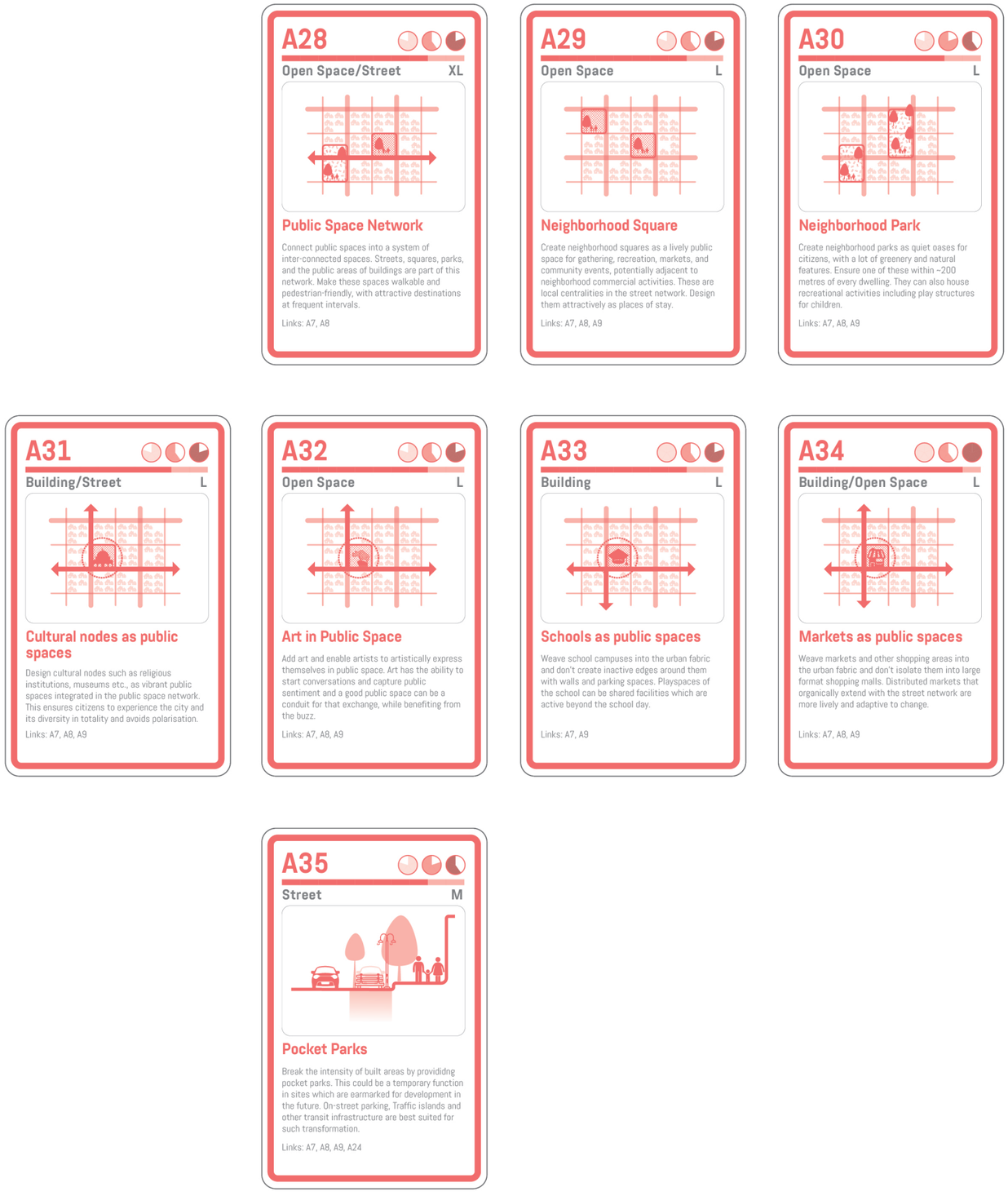


Fig 8.17: Expansion of the accessibility patterns particularly focusing on public space.

Source: Author

8.6 Density

Fig 8.18: Plan showing potential study maximising density in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.19: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on maximising density in the neighborhood. Here Density is prioritised within a framework of Access, Density and Diversity towards improving livability.

The major issues identified within these neighborhoods from a density perspective were:

1. The neighborhoods were part of post-war expansion of Amsterdam on modernist principles as discussed extensively before, the paradigm of towers in a green field could be challenged with the increasing demand for housing and the policy position of creating a compact city.

2. While the neighborhood has some of the tallest residential buildings in Amsterdam, in terms of dwellings per hectare, the neighborhoods have fewer housing units compared to Amsterdam centre.

3. Since this neighborhood is close to metro and train networks, there is potential for further densification, without overloading transit networks which is not explored.

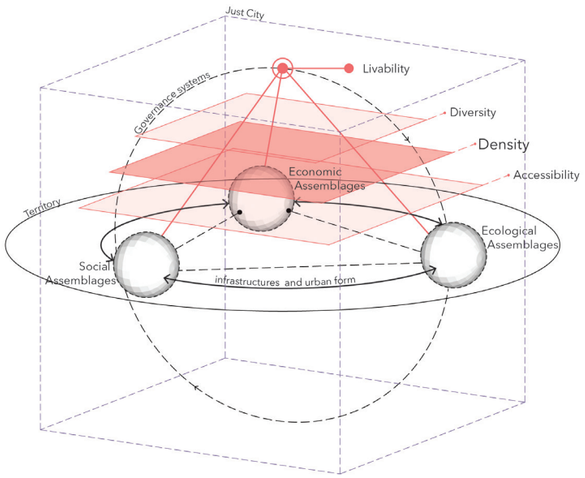
The accessibility network from the previous section is used for the densification study.

In this study, maximising density is approached with the following principles

1. Within the urban fabric, there is a place for high dense, medium dense and low dense city blocks and density doesn't need to be uniform.

2. Choice of degree of densification is determined based on existing buildings and accessibility to transportation network.

3. While greenfield densification can optimise for increasing number of available units, infill densification has to respond to the context to prioritise acces to open space and managing privacy.





Public space
Arterial roads
Shared streets
Local streets

High density city block
Medium density city block
Low density city block

Top up densification
5-10 stories
3-5 stories
2-3 stories

The elevated arterial roads are moved to be at grade in the accessibility study. This opens up large amounts of space that was lost as mounds and for ramps for densification.

The new city blocks proposed through a fine grain network and reclaiming in-between spaces are classified into three categories of high density, medium density and low-density city blocks.

This classification is based on existing density within the neighborhood with the low density reflecting an existing low density city block, in this case Huntum, and a high density block reflecting an existing high density block, in this case the office buildings in Hoptile.

High density blocks are next to arterial roads which can move larger volumes of people through prioritising public tranist. Since they are well integrated within the network, they'll be more sought after and thus they are denser. The buildings themselves in high density blocks could be as high as 10 stories owing to the large profile of the streets can accomodate this without feeling monumental.

Medium density blocks are next to shared streets and are a degree separated from the arterial networks. While they are still well-connected to the larger network they are proposed to be less intense with medium density with buildings as high as five stories tall.

The low density blocks are next to the local streets and to existing high rise buildings are natural features. This ensures the local quality of the environment is not disturbed, but also introducing a much needed variation within the neighborhoods.

In this context, the gradation of high density blocks along arterial roads to low density blocks in the interiors of the neighborhoods aims to densify the neighborhood without crowding it.

Individual urban blocks also have buildings of varying heights to respond to the adjacent buildings and street networks.

High density blocks are also complemented by voids in the form of public spaces that provide relief and variation within the urban fabric as a person moves through the city.

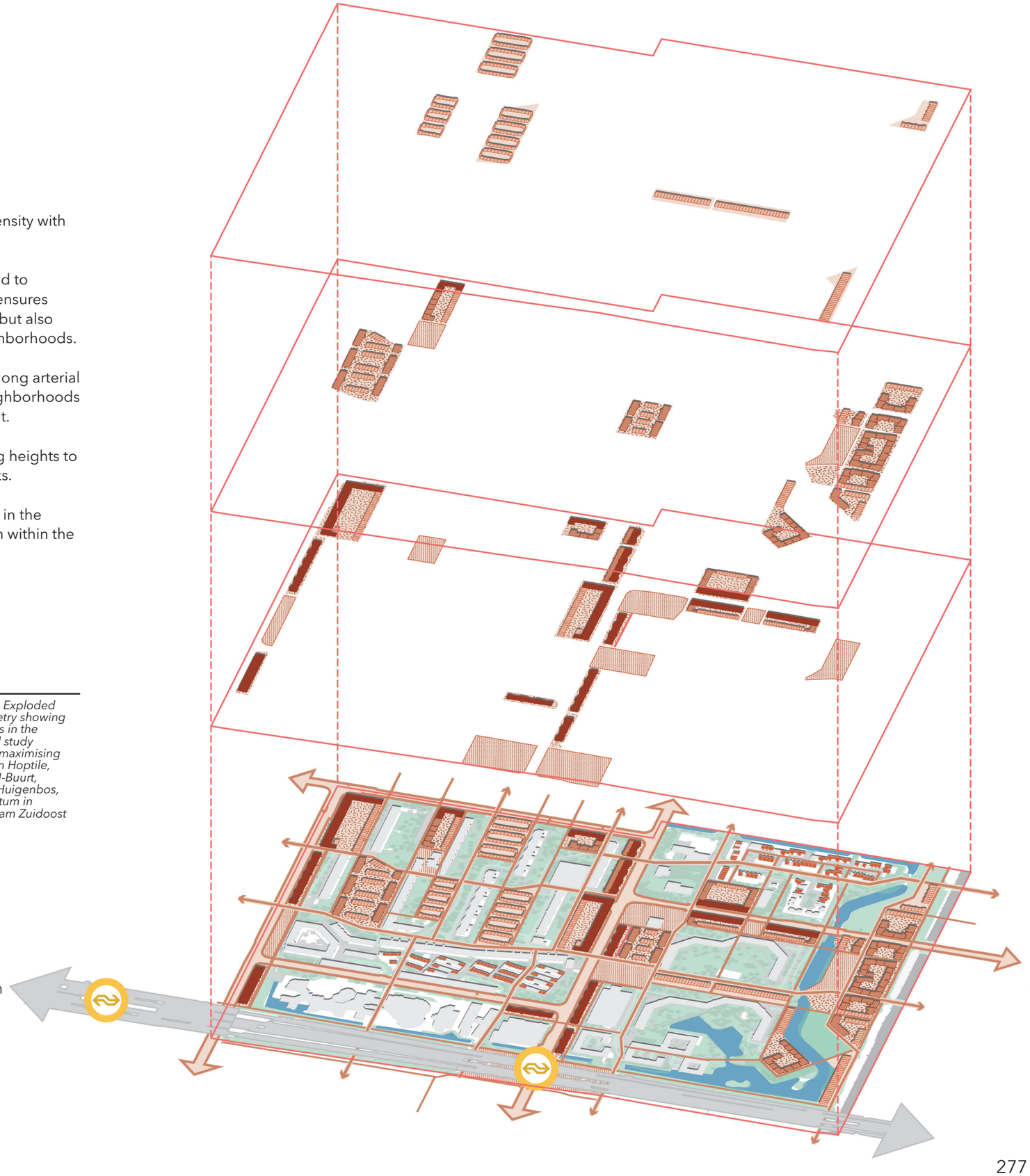


Fig 8.20: Exploded axonometry showing the layers in the potential study towards maximising density in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows low-density row houses added next to the high rise building Hakfort.

Here in-between green spaces that are unzoned and parking spaces are consolidated to introduce over 24 dwelling units as row houses.

This also improves safety and quality of street life by increasing intensity of activity and reducing less used open spaces within the urban fabric.

Fig 8.21: A collage showing densification along Hakfort by the addition of low-density housing next to the high rises.

Fig 8.22: Density patterns focusing on the principle.

Source: Author

8.6.1 Density Patterns

The density patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more dense Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following eight main principles define density, (The pattern code De denotes Density.)

De1. Modular Construction

Develop modular construction methods in new construction so that the buildings are able to adapt to changing requirements over time in the form of either restructuring or dismantling to be reused elsewhere.

De2. Specificity as Resistance

Promote specificity in urban form as a form of resistance against gentrification fuelled redevelopment. Specialised form for specific function can hinder appropriation of it to other uses over time. Use it skillfully and sparingly for public functions under constant threat.

De3. Malleability for Affordance

Design for malleability in the public realm. This can be achieved through the use of objects and materials that can be individually shaped, adjusted, and changed over time by their occupants. This helps people engage with the place and be comfortable.

De4. Integrated Affordability

Rather than subsidizing entire buildings or complexes, it is often better to subsidize a proportionate no of units in complexes scattered across town, or even the people themselves, and allow them to mix into different neighborhoods.

De5. Design for Privacy and Control

Design sidewalks and cyclepaths to be wide enough for two or more people to walk and talk alongside. This critical dimension of sidewalks is required to make them social spaces and not just functional infrastructure.

De6. Avoid Demolition

Institute policies for upgradation to address physical and social deterioration in old buildings. Demolition of buildings are not the only solution as vulnerable people in such buildings develop social and economic connections locally, which are lost with demolition and displacement.

De7. In-between spaces to In-Spaces

Identify in-between spaces such as buffer areas, unarticulated green zones etc., and densify them. They can be converted to either temporary or permanent city blocks based on the provision of requisite infrastructural services.

De8. Densify at Transit Nodes

Create higher densities in proximity to existing and new public transport nodes such as metro, bus and train stations. This can enable sustainable densification without overcrowding of cars on the streets.

Each of these 8 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of



application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

These patterns are to be used in combination with other patterns discussed in the previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

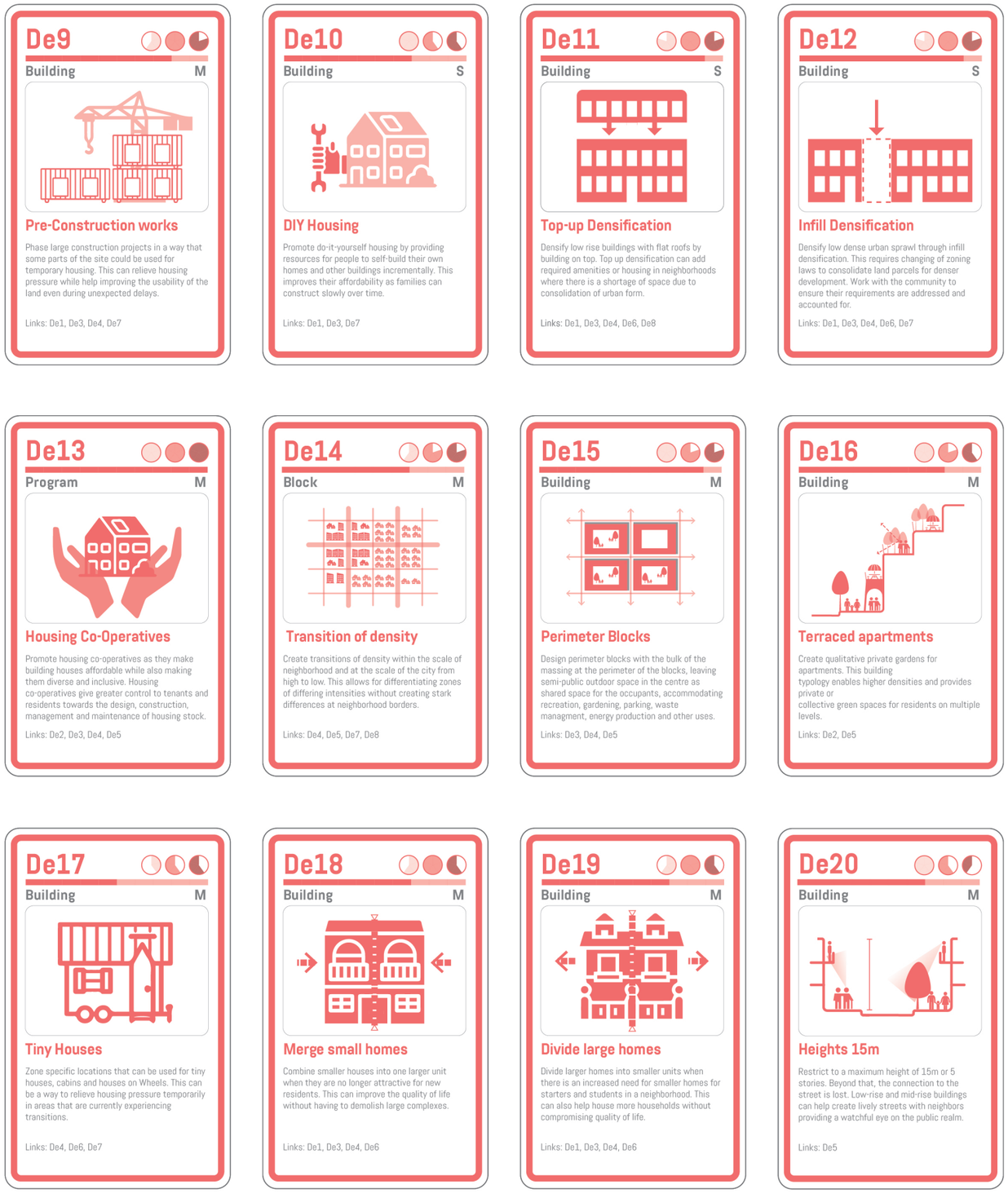


Fig 8.23: Expansion of the density patterns.

Source: Author

8.7 Diversity

Fig 8.24: Plan showing potential study maximising diversity in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.25: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on maximising diversity in the neighborhood. Here diversity is prioritised within a framework of Access, Density and Diversity towards improving livability.

The major issues identified within these neighborhoods from a diversity perspective were:

1. These neighborhoods were part of post-war expansion of Amsterdam on modernist principles as discussed extensively before. The paradigm of work-live functional separation is seen in these monofunctional neighborhoods.

2. Diversity of building form within each of the neighborhood is almost non-existent with each neighborhood having either completely high rise buildings or entirely low-rise buidings.

3. In terms of housing tenure, the housing in the neighborhoods are predominantly social housing. This leads to concentration of poverty within the residual social housing system in Amsterdam.

The accessibility network and densification from the previous section is used for the diversity study.

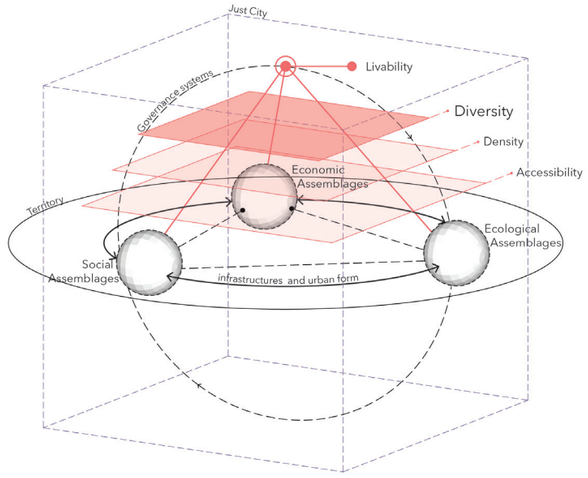
In this study, maximising diversity is approached with the following principles

1. Promoting functional diversity in neighborhoods to increase vitality of urban life.

2. Diversity is non only functional diversity, but also formal and social diversity.

3. Formal diversity looks at a mix of buildings of different size, age, style and typologies.

3. The principle of social diversity aims at avoiding spatial segregation of people according to wealth, ethnicity, gender, age or ability.





Functional mix is proposed along the arterial roads which have the potential to become high streets. It is also responsive to the surrounding context. Hoogoorddreef to the north, abutts the Arenaport area and could transition gently into a residential area without a stark border.

With potential new developments beyond the railway border in Amstel III, a high street along Karspeldreef could connect the new developments with the existing community through the Bullewijk metro station.

Existing parking garages which occupy well integrated locations in the main road network, sit under utilised. The size of the buildings can be used to upgrade them to house space intensive functions such as Makerspaces and small manufacturing within the neighborhoods.

Mixed use blocks along the wider arterial streets bring mixed functionalities and amenities from outside the borders of the neighborhoods to form a network of lively spaces within the neighborhood.

The more expensive and attractive high dense and hyper-mixed use blocks along the arterial roads are marked as developer driven projects owing to the complexity and cost of constructing them.

However, moderately mixed used blocks towards the interior of the neighborhoods are marked to be built and operated by cooperatives, which would help introduce the required diversity in the community in terms of architectural style and size, along with tenure types. Housign cooperatives with commercial space can provide affordable work spaces for people in the neighborhood and respond to local needs.

A slew of DIY plots are also proposed within the neighborhood to bring in diversity to the built form and architectural quality of the neighborhood. Low-dense city blocks with DIY housing can help break the monotony of the high-rise slabs and make the neighborhood more human scale as well.

The intensifying of urban life in these neighborhoods through their transition from mono-functional residential areas to livable mixed use areas ensures that the public realm is active during a large part of the day, thus improving the quality of street life and consequently safety on the streets as well.

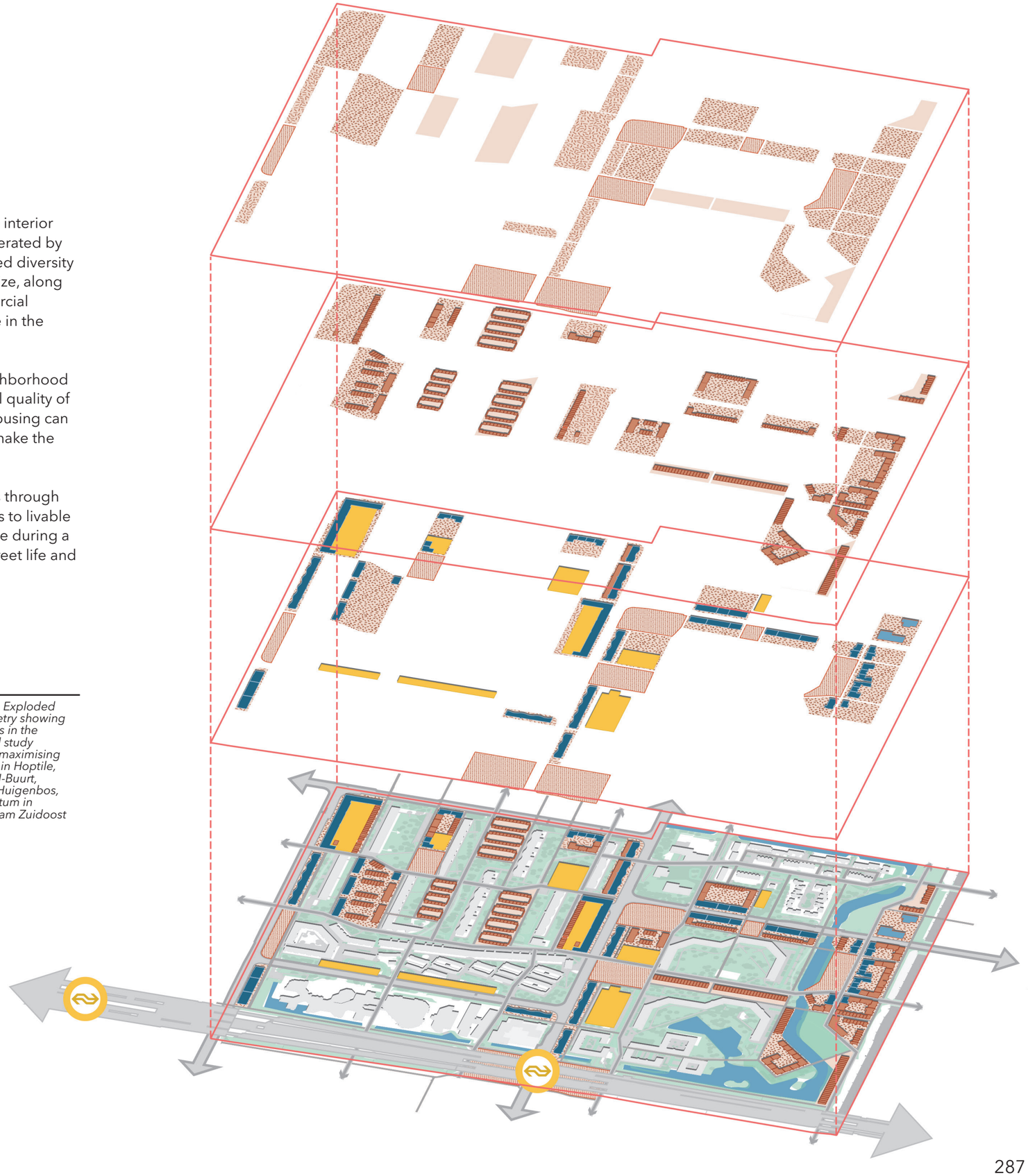


Fig 8.26: Exploded axonometry showing the layers in the potential study towards maximising diversity in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows the functional intensification and densification of the parking garage to the north of Hakfort residential complex.

The ground floor features an active plinth with shops, while the higher floors house makerspaces, amenities and housing.

This extends the lively character of the street space in and around Heesterveld further into the neighborhood and beyond.



Fig 8.27: A collage showing diversification along Hakfort by the addition makerspaces and housing.

8.7.1 Diversity Patterns

The diversity patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more diverse Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following eight main principles define diversity, (The pattern code Dv denotes Diversity.)

The first three patterns focus on formal diversity.

Dv1. Form Based Code

Develop a form-based code at the neighborhood scale to guide cohesive development and design of the public realm. Excessive regulation creates extreme standardization of building form and elements, reducing the vibrancy of streetscapes.

Dv2. Balance Standardisation and Specialisation

Balance between standardisation and specialisation in new construction. While standardisation can reduce costs, it can take away the sould and identity of the place. Promote variation in architectural expression.

Dv3. Make new buildings climate positive

Design buildings to be climate positive. Climate positive means the building absorbs more carbon than it releases. It can be achieved through careful material selection and management of energy and waste generated in its lifetime.

The next three patterns focus on functional diversity.

Dv4. Mix of Functions

Stimulate mix of functions through the diversificaton and dispersion of business locations and office spaces. This ensures vitality of local neighborhoods and provides affordable and alternative options for entrepreneurs as well.

Dv5. Vertical Mix

Encourage vertical mixing of functions within a building. Shops, amenities, and offices are compatible with housing in a same building since they have similar noise profiles. Home offices could be encouraged as well.

Dv6. Areas of Multiple Rhythms

Promote areas of different rhythms within a neighborhood. When introducing functional mix in a neighborhood, it is important to ensure compatible functionalities are together through microzoning initiatives to avoid conflict and nuisance issues over the long term.

The last two patterns focus on social diversity within the neighborhoods of Zuidoost.

Dv7. Balance Regeneration and Gentrification

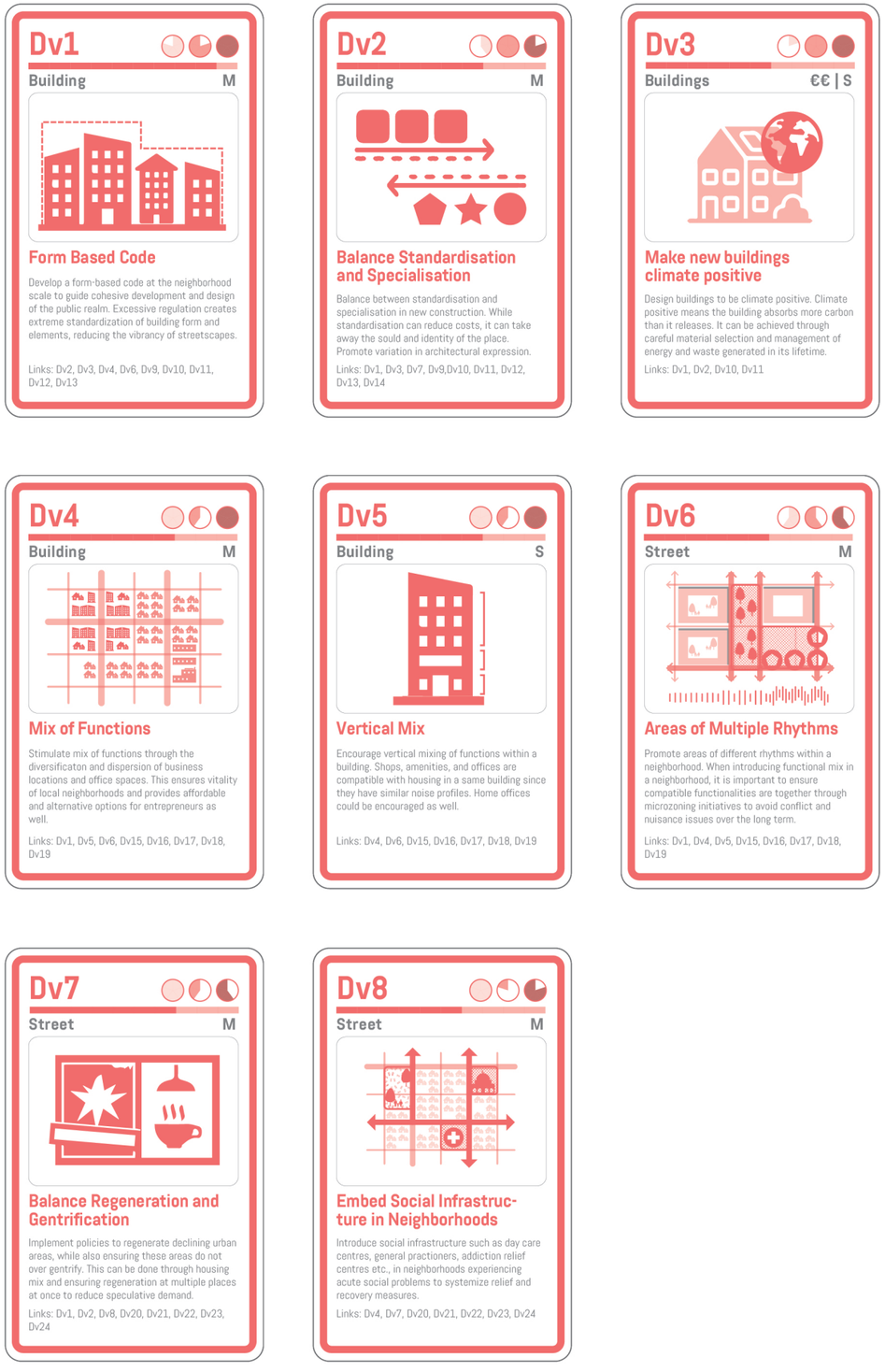
Implement policies to regenerate declining urban areas, while also ensuring these areas do not over gentrify. This can be done through housing mix and ensuring regeneration at multiple places at once to reduce speculative demand.

Dv8. Embed Social Infrastructure in Neighborhoods

Introduce social infrastructure such as day care centres, general practioners, addiction relief centres etc., in neighborhoods experiencing acute social problems to systemize relief and recovery measures.

Fig 8.28:Diversity patterns focusing on the principles.

Source: Author



Each of these 8 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

These patterns are to be used in combination with other patterns discussed in previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

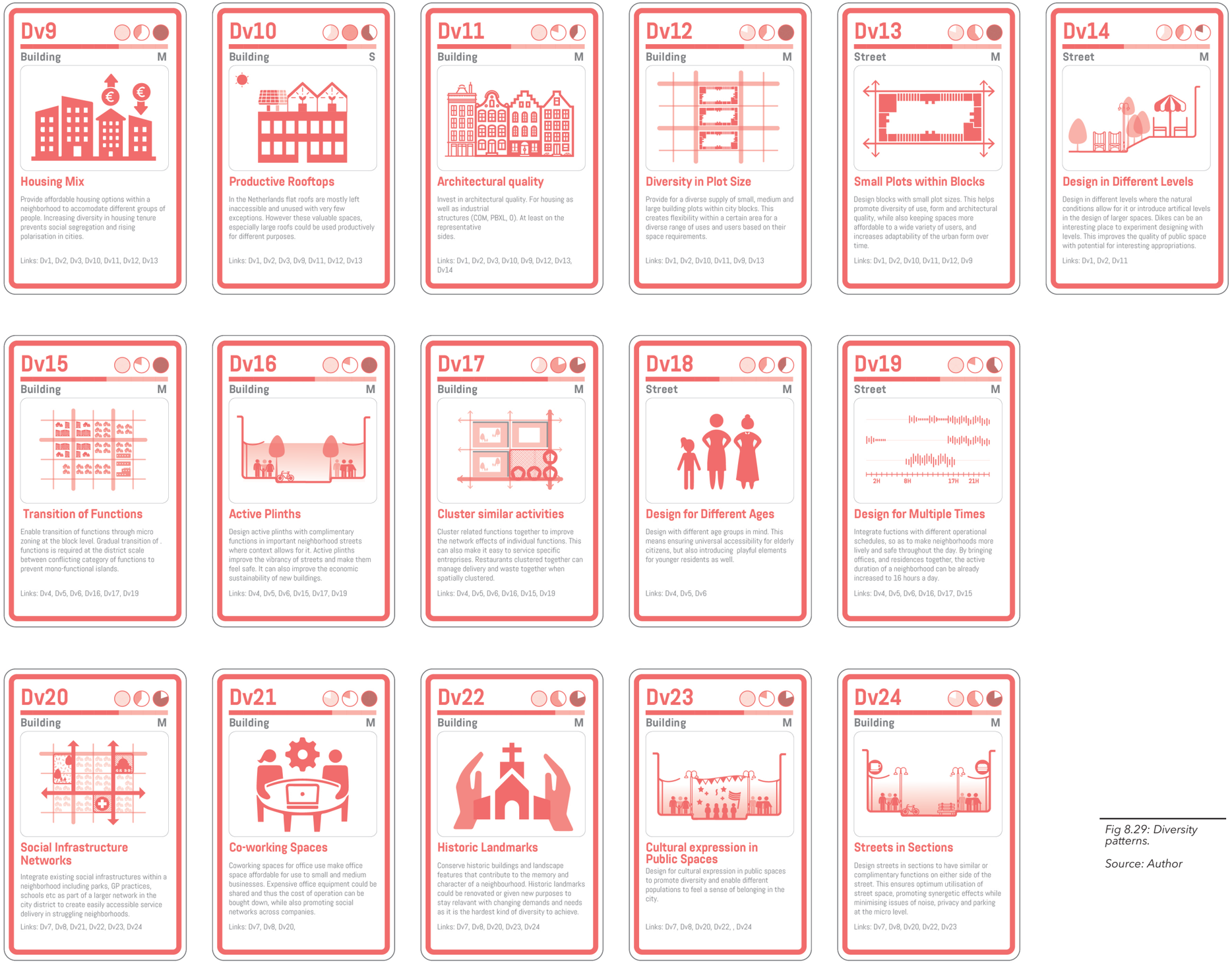


Fig 8.29: Diversity patterns.

Source: Author

8.8 Blue/Green Network

Fig 8.30: Plan showing potential study maximising the impct of blue/green networks in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.31: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on maximising the impact of blue and green networks in the neighborhood.

Here the aim is towards improving sustainability of the systems through moving from a linear to a circular material and energy flow, improving the adaptive capacity of the systems and improving the regenerative potential of the systems. Sustainability of the system is an emergent quality provided the three preconditions are improved.

The major issues identified within these neighborhoods from a Blue green network perspective were:

1. These neighborhoods were part of post-war expansion of Amsterdam on modernist principles as discussed extensively before and are known for their green character. However large sections of this green area are underutilised as ownership is not clearly defined

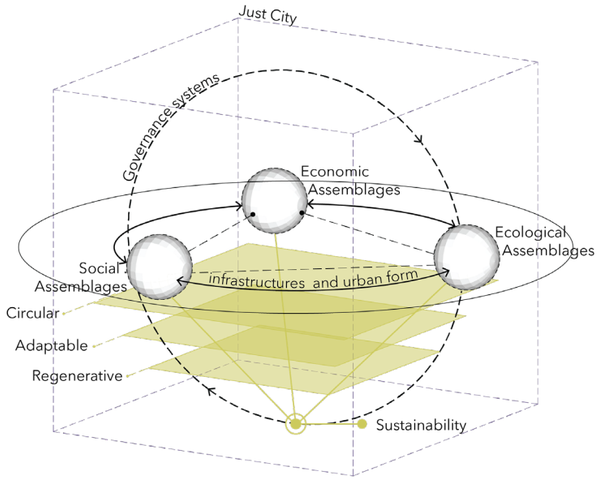
2. The canals in this neighborhood only serve as drainage infrastructure. Their recreational and transport potential is not fully used. They are also relegated to the boundaries of the neighborhood tracking infrastructure, when they could occupy more prominent position in the fabric.

In this potential study, maximising the impact of blue greeen network is approached with the following principles

1. A circular approach to the water and green network in the neighborhood.

2. Decentralising to prevent externalising impacts. Grey water could be treated on site through passive methods where there is space.

3. Introducing new forms of organisation within the community to promote social linkages coupled with material flows within the neighborhood.





Gradient of vegetation
Surface water
Room for water
Curbside water treatment
Urban forest
Blue Roof
Green Roof
Depaving
Water Cooperative
Water storage
Phytoremediation

Beyond the primary dikes and the water defence systems, three other distinct water systems and related infrastrucure in Amsterdam were discussed in the analysis.

Towards improving the circularity, adaptive capacity and regenerative potential of these systems, contributing to the overall sustainability of the systems, changes in different parts of the system are proposed.

The storm water drainage systems that move rain water falling on the surface of the city through the underground infrastructure on to the canals and pumped out into larger canal systems via the pumping stations can be rethought from a sponge perspective. Current status of quo of water management looks at moving water as soon as possible from the city surfaces to outside the city, this grey infrastructure heavy water management system, when rethought from a sponge perspective, opens up the possibility of storing water within the city and delaying the flow to allow for infiltration to underground aquifers. This system can supplement the existing system to improve the adaptive capacity of the system.

The second order effects of sponge measures such as curbside planters, bioswales etc also contribute towards the cooling of urban heat island effects. By improving the canopy quality of trees and expanding the shrubs under the canopy, rainwater can stay in the foliage and thus reducing runoff considerably as well.

Green roofs and disconnecting the roof spout from the sewer systems and using front gardens can help rain falling on the roofs to infiltrate into the ground. Alternatively rain water harvesting systems can help expand the water supply to households through the careful storing and reusing of rainwater for non-drinking purposes.

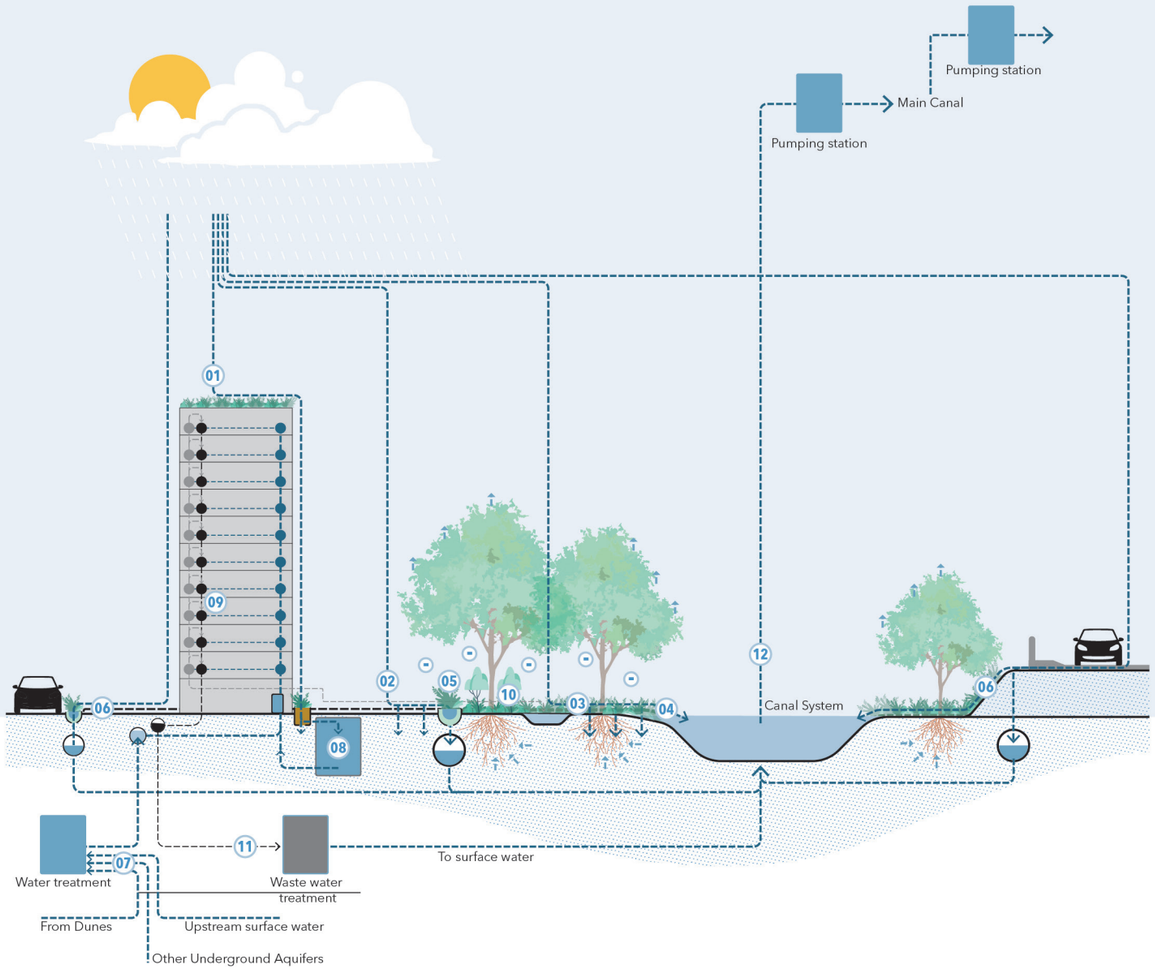
Rain falling on roads and parking lots carry chemicals with them as they drain towards the canals. Specific plants that can absorb chemicals can be planted along such surfaces to treat water before it drains to canals, thus improving water quality considerably.

The centralised water supply system provides drinking quality water for all purposes from drinking/cooking to showering and flushing. To reduce the usage of drinking water for lower order uses, existing piping in buildings could be redone to ensure greywater from kitchen could be used for flushing or grey water from kitchen and showers could be used for gardening, provided efforts are taken to ensure no harmful chemicals are used in the soaps.

Grey water from households could also be treated passively on site using phytoremediation. Here again, care should be taken to ensure harmful chemicals don't enter grey water systems, which means users need to be aware of what goes and what doesn't.

Fig 8.32: The co-ceptual systemic section shows a more sustainable water system and how it interfaces with the built environment.

Source: Author



01 The roof of buildings fitted with green roof can help slow and eventually store rain water falling on the roof.

02 Improving permeability of paved surfaces such as parking lots and roads improves infiltration of rainwater.

03 Water storage can be expanded in green areas to store runoff water and extending time for infiltration.

04 The edges of existing canals can be widened to allow water to expand and take up more space during cloudburst events.

05 Bioswales along the streets can augment stormwater systems. They move surface runoff water while allowing it to infiltrate.

06 Phytoremediation along the edges of roads and parking areas can help treat polluted water before they enter fresh water canals.

07 Water from multiple sources are purified by both natural and artifical processes by the water company waternet.

08 Rainwater storage in building premises can help offset freshwater usage for washing and flushing in toilets.

09 Water usage per household could be reduced through sensors and other monitoring tools.

10 Household greywater could be treated through phytoremediation on site before allowed to enter the canal system.

11 The waste water is pumped to the treatment facility where it is treated and drained into natural water system.

12 The interconnected canal systems are drained through a network of pumping stations to keep areas from flooding.

Of the 71 European cities ranked in the Husqvarna green city index, Amsterdam ranked 66th. It claims that an average Amsterdammer has 69.9 m² green space per person. This is probably inflated by waterland to the north. While the presence of green spaces within Amsterdam city centre is less, Zuidoost and garden cities to the west have a large percentage of their surface area dedicated to green spaces.

Zuidoost features the Gaasperpark, the Nelson Mandela Park in its geographic centre, the Bijlmerweide, Gasperzoom and the De Hoge Dijk as large green areas mostly around the periphery except for the Nelson Mandela park and the small neighborhood parks in the southern suburbs.

Most other green spaces are part of open and closed courtyards of the cityblocks and in the case of townhouses, private front and backyards.

The management of the public and semi-public green spaces in Zuidoost is currently poor due to its large expanse and relative lack of intensity of use due to low articulated programming in these spaces. If these spaces are not used by humans, they could be intensified to be taken over by nature. The maintaining of these open green lawns, takes up considerable amount of human effort and energy. Returning them to a more natural state can support more species diversity in these spaces.

Currently the built environment doesn't actively support biodiversity. Designing for nature through small interventions such as green or brown roofs, bat boxes and bird hedges along the facade of the building can provide much needed safe spaces for small birds and animals along the buildings.

Some of these measures are non-invasive and can be added in already constructed buildings as well. However, this requires awareness building among citizens as well since not everyone would appreciate allowing birds to nest along their facades.

The existing tree network in Amsterdam Zuidoost and even beyond while extensive, are chosen based on their ability to be managed easily and their aesthetic appeal. The IUCN, FAO and CLO list a number of endangered indigenous Dutch tree and plant species, which could be supported within the urban environments along the streets and in open green courtyards. This helps ensure the natural heritage and species diversity is not lost.

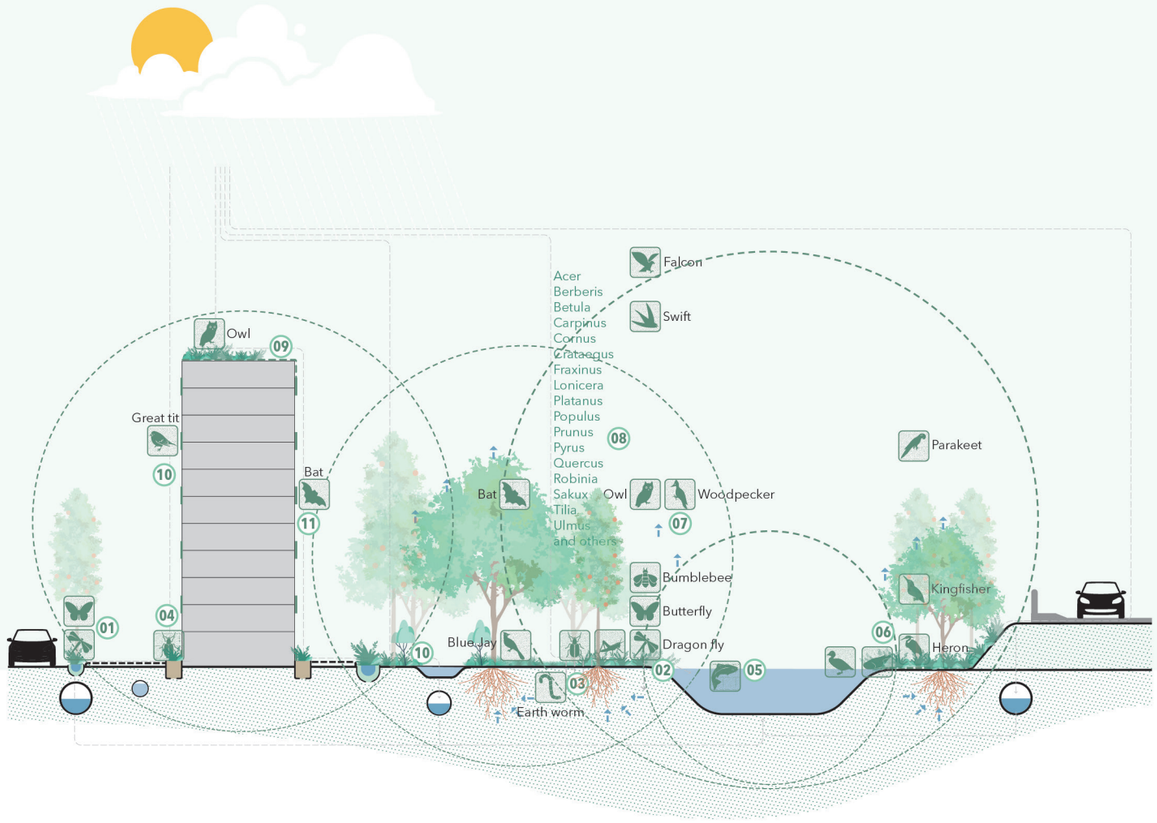


Fig 8.33: The co-ceptual systemic section shows a more sustainable green system and how it interfaces with the built environment.

Source: Author

01 Trees and hedges along roads act as corridors between green patches helping extend biodiversity into urban areas.

02 Canal edges are cleared in winter to prevent canals from clogging. They could alternatively controlled through grazing.

03 Further intensification of green areas with the miyawaki techniques can increase their biodiversity.

04 Facade gardens can help improve biodiversity at the street level and are suitable for bees and other small insects.

05 An integrated strategy towards natural maintenance of canal waters can help improve aquatic biodiversity.

06 Canal edges are currently some of the most biodiverse areas able to sustain a wide variety of birds and amphibians.

07 The large number of trees in Amsterdam Zuidoost is home to a large variety of bird species as well.

08 Autochthonous species of Dutch trees facing high threat could be introduced in urban areas to promote diversity.

09 Green roofs and brown roofs in buildings can provide safe houses for birds where they could potentially nest.

10 Nesting bricks for birds along the facades of buildings can provide safe spaces for smaller birds in urban areas.

11 Tall buildings are particularly suitable for providing recessed roosting boxes for bats along the facade.

The flat roofs of buildings are a potential space that could be used for more productive uses. While flat roofs are a rarity in the city centre, the flats and townhouses in Zuidoost have a lot of them and could be used.

Flatroofs of low-rise and mid-rise buildings are turned into green roofs, while taller buildings are converted to ensure water falling on the roof is collected. Since high-rises are prone to high speed winds at the roof and might lead to plants flying off if not inside a greenhouse or a protection of some sorts.

Existing canal systems are dredged to ensure more water could be stored. Where possible, room for canals is made to water to rise and fall based on rain and seasonal fluctuations. This ensures a dynamic ecosystem around waterbodies.

The creation of the gaasperdammertunnel has led to the formation of a no-man's land on either suide of the tunnel. While there is proposal for a park, some portions of this huge space could be allowed to be reclaimed by nature to form forests and other dense vegetation. This ensures much needed species diversity in these areas.

The existing urban form has relegated canals to the edges of the neighborhood tracking infrastructural systems such as train tracks. However, new temporal water storage systems could be created closer to life in the neighborhood in the courtyards along active streets. This solves the dual role of being a performative urban feature and a lively design element.

Large portions of the green spaces inbetween the high-rises are not well defined and are left unused. Some of them could be converted to treat grey-water on site through phytoremediation.

Depaving some sections of the parking lots and permeable pavements along active transportation networks can increase the water infiltrated into the ground.

Water co-operatives as grounded local activism can bring residents together to help improve participation in the management of shared infrastructures while also ensuring shared responsibility of the commons. Community stewardship as part of the co-operatives can be rotational paid roles, thus ensuring transfer of knowledge and a source of income in deprived communities.

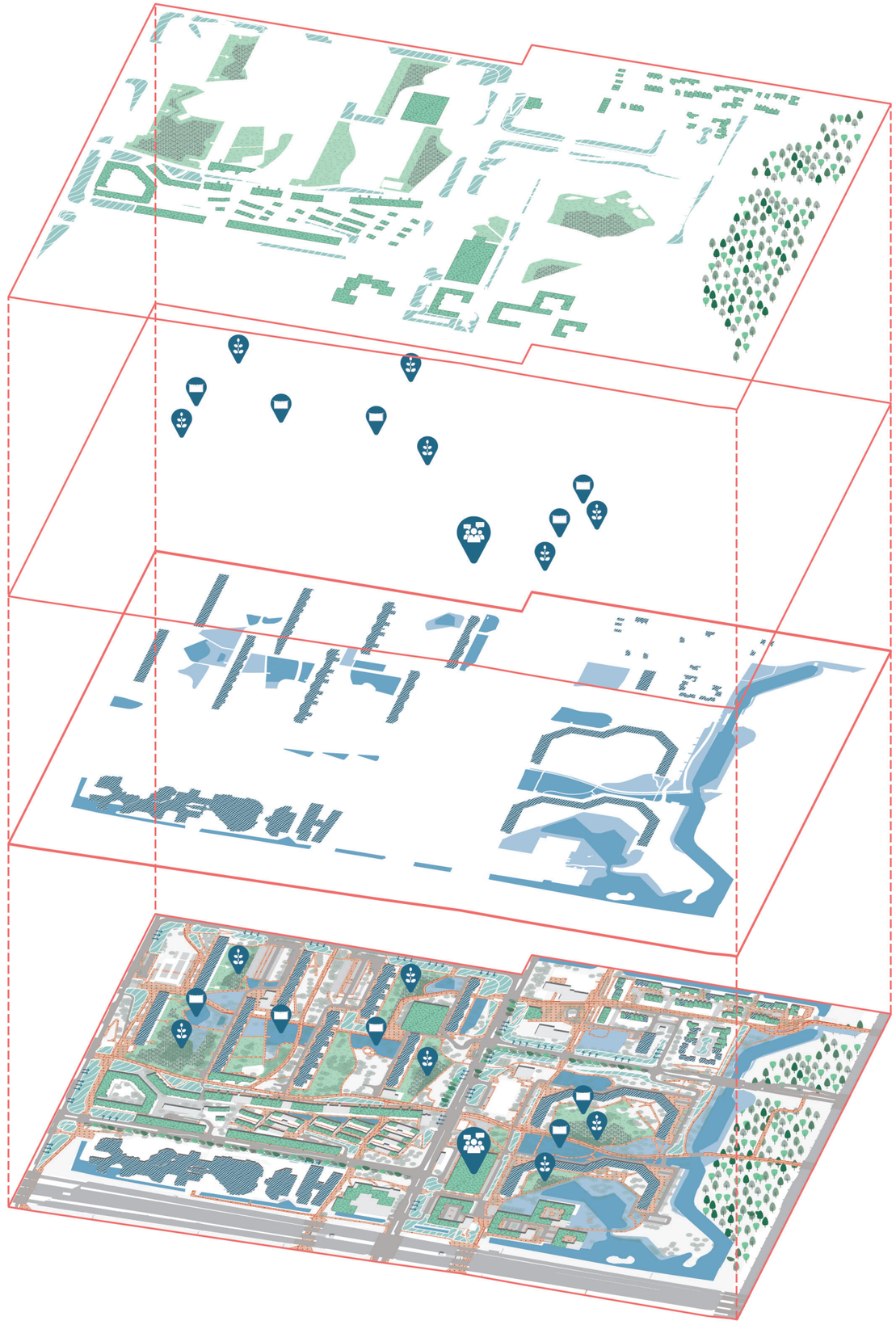


Fig 8.34: Exploded axonometry showing the layers in the potential study towards maximising blue and green networks in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows the expansion of the existing canal system to store more water during cloudburst events and the intensification of greenery in the open courtyard of tje Hakfort residential complex.

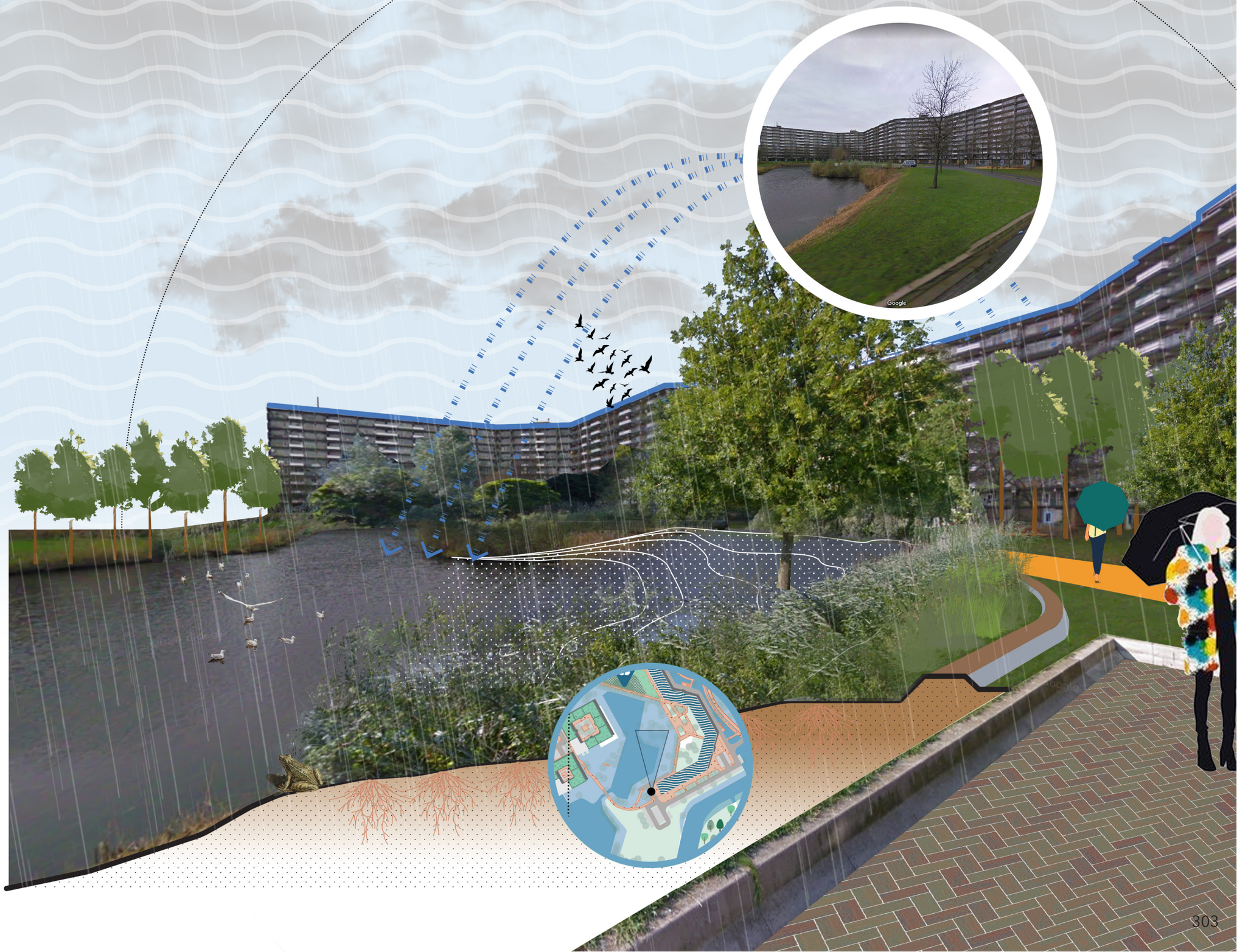


Fig 8.35: A collage showing transformation of the courtyards of the Hakfort housing complex.

8.8.1 Blue/Green Network Patterns

The patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more regenerative, circular and adaptive blue and green network in Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following eight main principles define the blue and green network, (The pattern code GB denotes green and blue networks.)

GB1. Patches and Corridors

Connect fragmented landscape patches with green and blue corridors. This is essential to ensure the ability of species to move between landlocked biodiverse patches within the urban area.

GB2. Make Systems Visible

Make urban water system as visible as possible. Underground systems are out of sight and out of mind of citizens. Visible systems can build awareness about the entire process among citizens. They also provide playful ways of engaging with the urban landscape.

GB3. Sponge City

Design nature based solutions that augment the city's ability to act as a sponge and absorb surface run off water. This can improve the resiliency of city's stormwater networks, while providing microhabitats for smaller species of plants and animals.

GB4. Design With Nature

Design elements that work with nature and not against it. Migratory patterns, seasonal changes, climatic conditions etc. are strong forces of nature. Designing with them and not against them, makes solutions interesting and long laster.

GB5. Design with Context

Respond to the context and design with it to complement the strengths of the location and rectify the problems in a specific neighborhood.

GB6. Design For Nature

Design for nature to be integrated into the built environment. Bringing nature closer to the built environment through the provision of design measures such green roofs, green facades, gardens can also help smaller animals and birds to find safe havens in urban space.

GB7. Productive Landscape

Improve the productivity of vacant lands by using them for energy generation or urban agriculture or more. This could also be done temporarily when a particular plor is waiting to be developed in the future.

GB8. Water for Recreation

Design edges of canals and other water storage interventions as public spaces that can be used as play spaces when weather permits. Water's potential as a play space is endless and can do wonders to the vibrancy of the public space, and bring people closer to natural systems.

Each of these 8 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

The specific type of patterns is also mentioned in terms of where it could be applied.

Fig 8.36: Blue/Green network patterns focusing on the principles.

Source: Author



The patterns are also organised in a circular and regenerative logic of water cycle, moving from collect, treat, release and restore.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

These patterns are to be used in combination with other patterns discussed in the previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

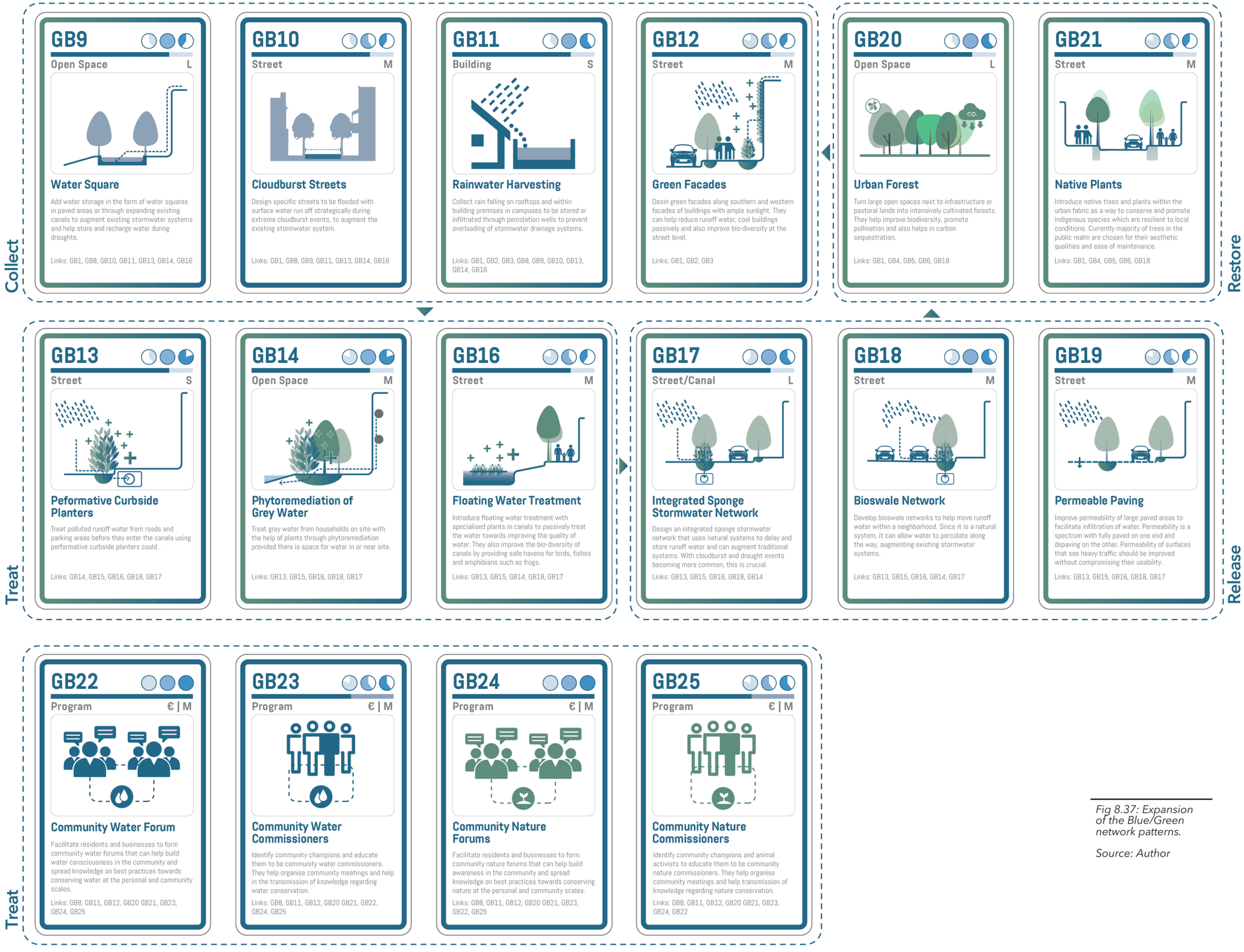


Fig 8.37: Expansion of the Blue/Green network patterns.

Source: Author

8.9 Energy

Fig 8.38: Plan showing potential study improving energy systems in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.39: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on improving the energy systems in the neighborhood.

Here the aim is towards improving sustainability of the energy system through moving from a linear to a circular material and energy flow, improving the adaptive capacity of the systems and improving the regenerative potential of the systems. Sustainability of the system is an emergent quality provided the three preconditions are improved.

The major issues identified within these neighborhoods from an energy perspective were:

1. The neighborhoods taken for study are ranked in the fourth and fifth quintiles in terms of energy usage and gas usage in the district of Amsterdam Zuidoost. This is exceptionally problematic since these neighborhoods are also some of the poorest.

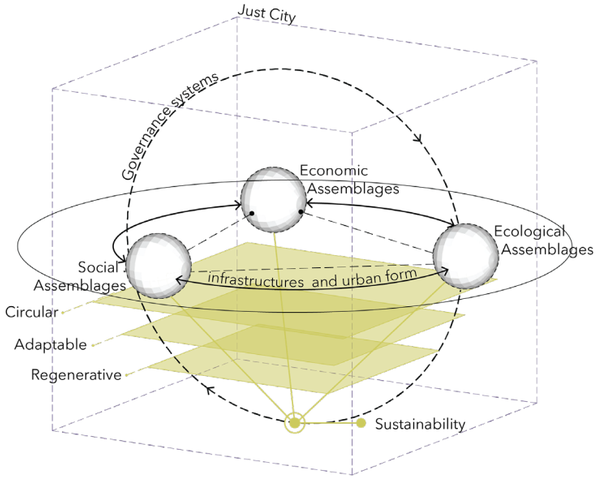
2. Except for the owner-occupied private dwellings in Huntum and the office complexes in Hoptile, no other residential building is using solar panels or other forms of on-site energy generation. This is wasteful consideing the fact that these are highrises with flat-roofs best suited for roof-top solar panels.

In this potential study, improving the energy system is approached with the following principles

1. A circular approach to the energy system, which not only looks at generating energy on-site, but also conserving energy as much as possible.

2. Decentralising generation and storage to prevent externalising impacts. .

3. Introducing new forms of organisation within the community to promote social linkages coupled with energy flows within the neighborhood.





In Amsterdam Zuidoost district, green house gas emissions from buildings accounts for around 3442 kiloton CO_2 per year. This was from the consumption of over 1,700 GWh energy, which equals to a collective annual energy bill of over 108 million euros (Hermsen 2016).

Of this, 34% is from residential buildings, while the rest is from a combination of offices, educational institutions, hospitals and others. Of the overall energy consumption, the amount of energy spent on heating and cooling takes up a large part.

By utilising the rooftops and open spaces next to infrastructure, energy could be generated on site to help minimise energy costs in the long run.

While generating energy is one part, conserving it through better insulation and energy efficient appliances can add towards it.

Improving the local microclimate by reducing the number of paved surfaces and expanding the greenery can reduce urban heat island effect in the summer months.

While the city is planning for a natural gas free Amsterdam in 20 years. no one solution fits all. Depending on the energy demands and capacity of individual buildngs a wide variety of different systems could be used.

Considering the fact that tremendous amount of research is happening in this space, any new system that is proposed should be adaptive enough to accomodate new changes and technology to ensure residents of these neighborhoods are not left with systems that are difficult to maintain in a few short years

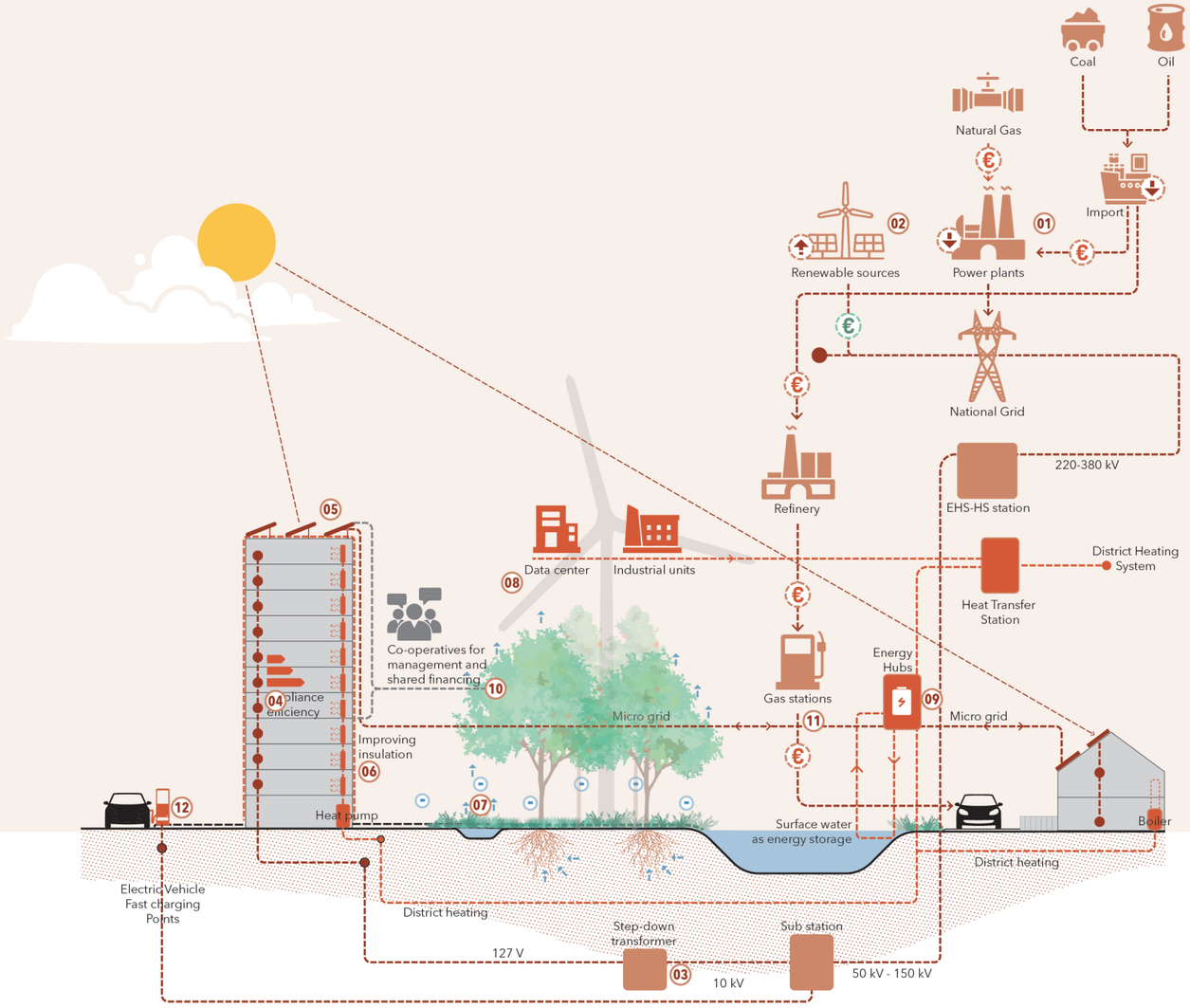


Fig 8.40: The co-ceptual systemic section shows a more sustainable energy network in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 Taxing fossil energy sources and using the revenue on renewable energy projects can help speed the transition out of fossil fuels.

02 EU has set a target of ~40% renewable energy by 2030 doubling the current share of the Dutch energy sector.

03 The step-down transformers in Amsterdam could double as awareness objects towards the energy transition.

04 With the new energy labels for appliances, consumers are expected to invest in more energy saving household items.

05 Subsidies could be extended for solar panels on large buildings and collective housing projects in Zuidoost.

06 Subsidies for insulation in old buildings and shared structures can help reduce the energy costs of vulnerable communities.

07 Introducing water features and greenification of open spaces help reduce the urban heat island effect to a large degree.

08 Data centres and other industrial functions in Zuidoost produce excess heat that could be used to heat dwellings in the vicinity.

09 Shared energy hubs at the neighborhood scale can help pump up LT district heat systems while also housing battery storage.

10 Energy cooperatives can help facilitate financing and management of insulation and energy generation infrastructure.

11 Existing gas stations could be redesigned to be neighborhood energy hubs. Their bunkers could help in carbon sequestration.

12 Smart grid management can help reduce load on the electric grid due to an increase in charging of electric cars at the same time.

The flat roofs of buildings are a potential space that could be used for more productive uses. While flat roofs are a rarity in the city centre, the flats and townhouses in Zuidoost have a lot of them and could be used for energy generation through solar panels.

The temperature differential between water and land could be applied to use existing canal systems as a potential heat storage system.

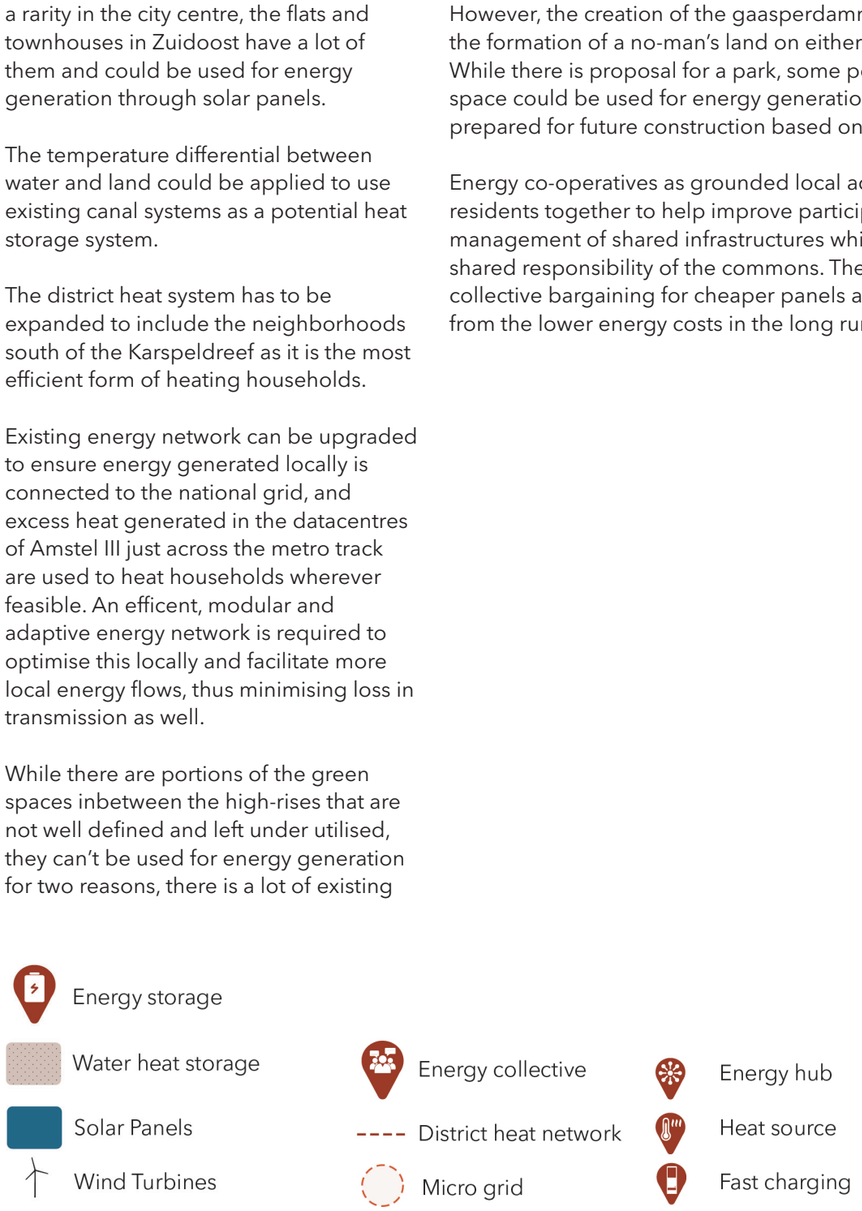
The district heat system has to be expanded to include the neighborhoods south of the Karspeldreef as it is the most efficient form of heating households.

Existing energy network can be upgraded to ensure energy generated locally is connected to the national grid, and excess heat generated in the datacentres of Amstel III just across the metro track are used to heat households wherever feasible. An efficent, modular and adaptive energy network is required to optimise this locally and facilitate more local energy flows, thus minimising loss in transmission as well.

While there are portions of the green spaces inbetween the high-rises that are not well defined and left under utilised, they can't be used for energy generation for two reasons, there is a lot of existing vegetation making it less optimal and the general public have an aversion towards having energy infrastructure close to home.

However, the creation of the gaasperdammertunnel has led to the formation of a no-man's land on either suide of the tunnel. While there is proposal for a park, some portions of this huge space could be used for energy generation, while the land is prepared for future construction based on investment proposals.

Energy co-operatives as grounded local activism can bring residents together to help improve participation in the management of shared infrastructures while also ensuring shared responsibility of the commons. They can also facilitate collective bargaining for cheaper panels and directly benefit from the lower energy costs in the long run.



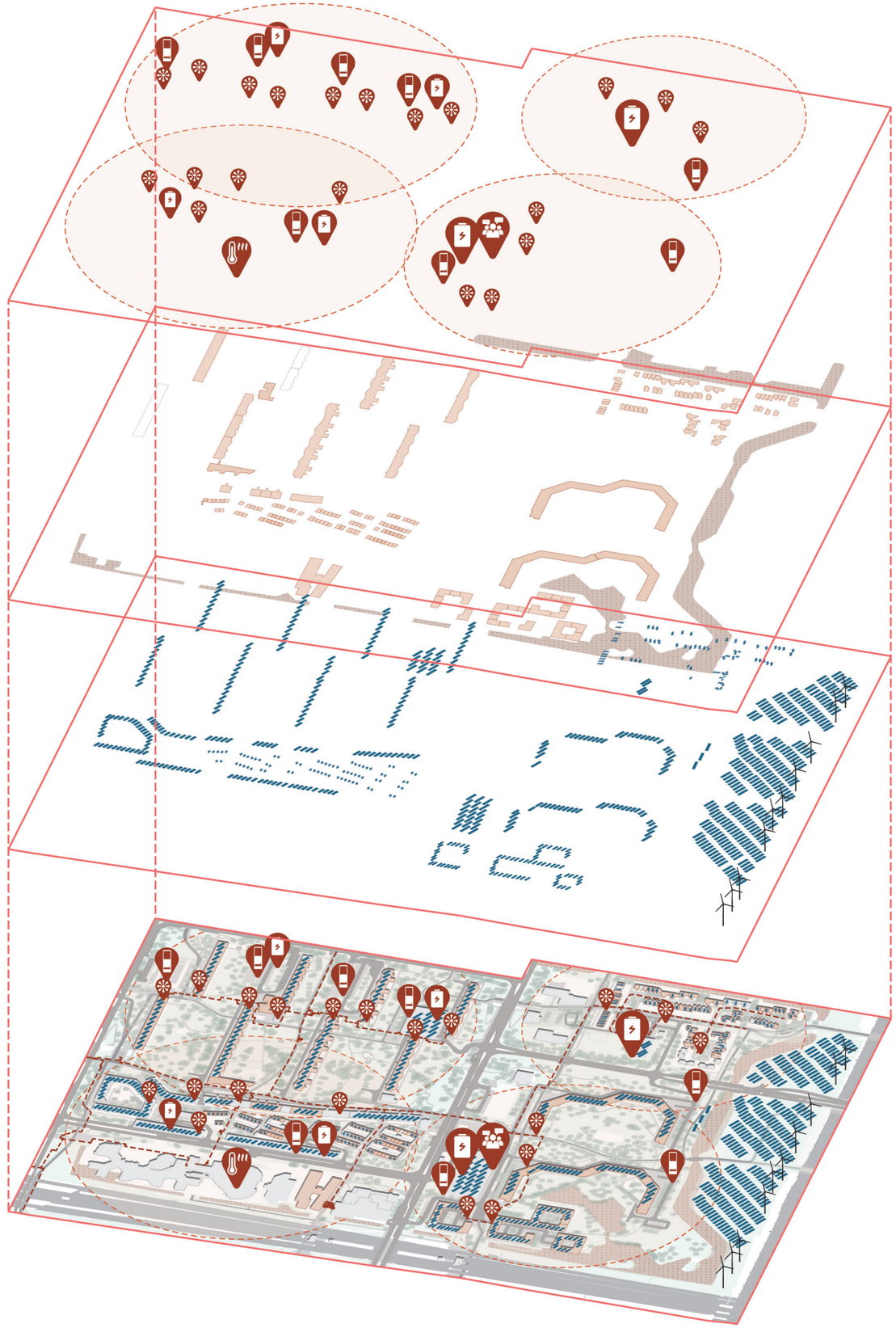


Fig 8.41: Exploded axonometry showing the layers in the potential study towards improving the energy networks in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows the wind turbines beyond the treeline along the Gaasperdammerpark next to the Huigenbos residential complex.

If energy infrastrucutre is to be integrated into the existing urban form, it is important that they are desinged as aesthetically pleasing objects with care given to their form as well. Since public opinion is generally against infrastructural objects in the public realm. While solar panels on roof tops, out of daily site can take a more functional approach, the ones that we see everyday need to engage with the landscape in more nuanced ways to garner public support.

The energy transition also brings the mobility transition along with it, with an increasing number of electric vehicles as well, a distributed charging system that utilises existing infrastructural systems effectively is required to ensure that they don't occupy too much space along the streets.

Fig 8.42: A collage showing transformation of the public realm around of the Huigenbos housing complex.

8.8.1 Energy Patterns

The patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more regenerative, circular and adaptive energy network in Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following seven main principles define the energy system, (The pattern code E denotes Energy.)

E1. Energy Net Neutral Buildings

Ensure new buildings are energy neutral. That is, they generate as much energy as they consume. Work towards making older buildings in the neighborhood energy neutral as well.

E2. Energy Mix

Introduce a mix of renewable energy sources to ensure there is resiliency in the system. Renewable energy generation can be sporadic based on weather conditions. Building additional generation/storage capacities can help.

E3. Decentralise Infrastructure Systems

Decentralise grey and black water treatment plants on site to treat household water waste at a block level. This can help augment and reduce load on the centralised waste water treatment plants.

E4. Infrastructure as Beautiful Design Objects

Design energy infrastructure to be attractive objects. EV chargers, energy hubs, solar panels, transformers etc., are occupying more space in the public realm, they can be designed to look beautiful and integrated with their context.

E5. Integrate IOT with Infrastructural Systems

Integrate internet of things with infrastructural systems including energy generation and consumption meters, to obtain real time information on grid capacity and more.

E6. Cluster Infrastructure with Social Amenities

Design energy infrastructure such as batteries and hubs to be accompanied with social amenities as well. This improves their visibility and builds awareness in the collective conciousness about energy use.

E7. Multi-functional Infrastructure

Design energy infrastructure to be multi functional. This can operate at multiple scales and save a lot of public space that comes at a very high premium.

Each of these 7 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

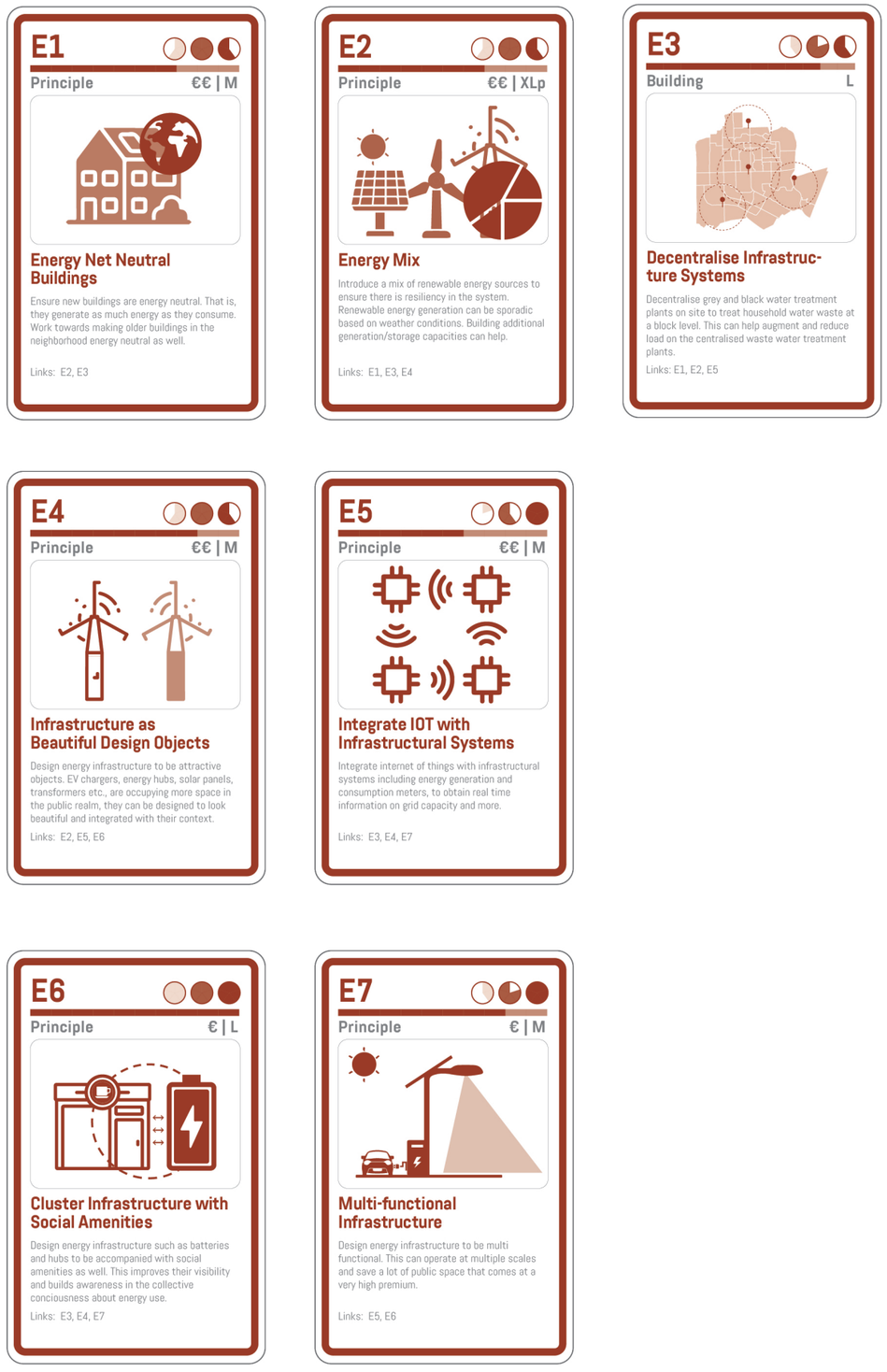
The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

Fig 8.43: Energy patterns focusing on the principles

Source: Author



The patterns are also organised in a circular and regenerative logic of the energy cycle, moving from generate, distribute, consume and conserve.

These patterns are to be used in combination with other patterns discussed in the previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

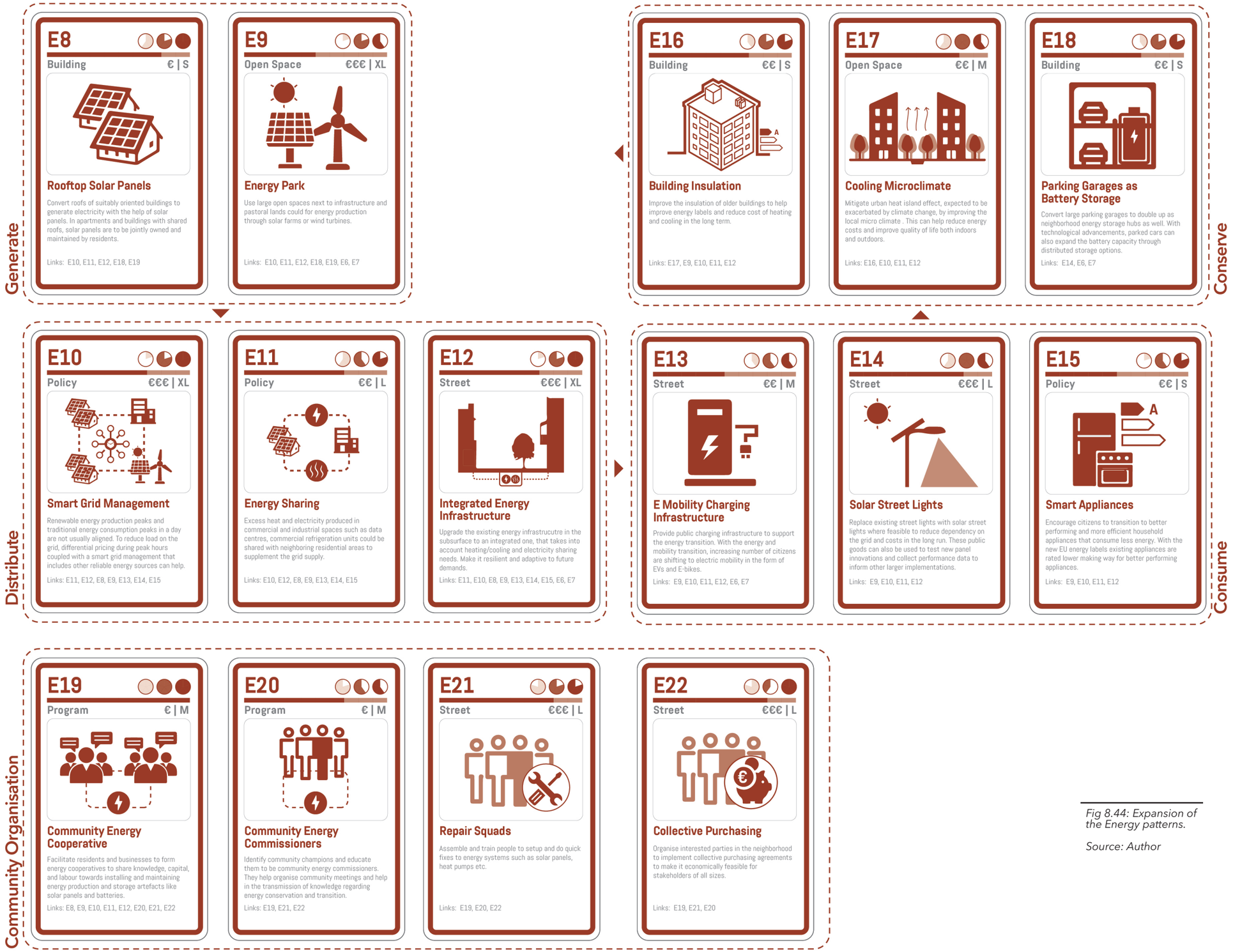


Fig 8.44: Expansion of the Energy patterns.

Source: Author

8.10 Waste

With the waste system, segregating waste effectively starts at the home. Awareness building campaigns towards that are required. Municipality could potentially provide households with the required bins to facilitate segregated collection as a pilot.

All existing waste collection points are expanded to collect segregated waste. This is to ensure convenience and gaps in infrastructure shouldn't be the reason why a significant percentage of waste streams are not recycled.

The organic waste generated in neighborhoods could be potentially composted locally in micro-compost pits. This is already being piloted in many neighborhoods of Amsterdam. Expanding this in Zuidoost, creates a network of individual who can work towards extracting economic value from waste as well.

The existing network of shops and stores that work towards repairing and refurbishing could be expanded to ensure the amount of 'fixable' commodities ending up in the garbage bin. To test out the business viability of such initiatives, they can be piloted with the help of a municipal incubator fund.

It is important to improve the quality of urban space around waste receptacles so that they are not conceived as dirty places, which are a necessary evil, but rather a more interesting punctuation in the urban space. An example implementation of such an idea is demonstrated in the collage in the next section.

The existing receptacles could also be fitted with sensors, and operated through a citizen card, similar to the program piloted in Amsterdam Noord. This can help calculate the amount of waste being generated by individual households and also improve the efficiency of waste collection runs.

The waste collection vans could be battery operated to reduce their carbon footprint and noise nuisance.
Ultimately, a lot of these proposals require maintenance and co-ordination among multiple individuals. A community co-operative could be a facilitating agency, bringing together entreprises working on recycled and upcycled goods, and citizens who take responsibility for the management of waste receptacles and compost bins.

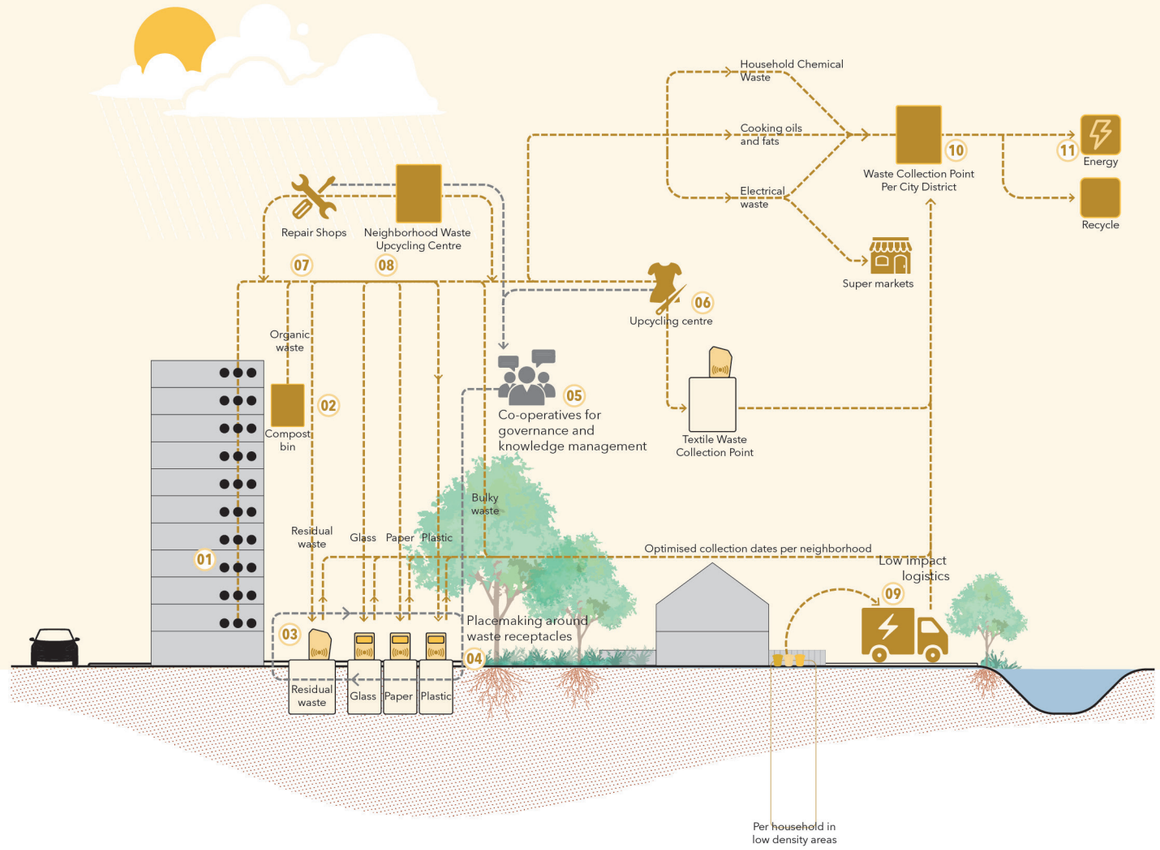


Fig 8.46: The co-ceptual systemic section shows a more sustainable waste network in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 Segregation of household waste at homes need to be encouraged and awareness need to built regarding it.

02 Organic waste could be potentially composted on site to be turned into valuable manure.

03 Existing waste receptacles can be fitted with sensors to collect data to learn insights and improve the waste collection process.

04 Currently bins are placed in residual spaces. Placemaking around them could integrate them better in the public fabric.

05 Management and recycling of common household waste could be encouraged and facilitated by co-operatives of citizens.

06 Textile waste could be easily reduced through either fixing them or upcycling them for reuse.

07 Similarly other special purpose repair shops within the neighborhoods can help extend the lifespan of consumer goods.

08 In case of discarding, specific goods could be refurbished or upcycled to extend their lifespan and reduce wastage.

09 The fleet of garbage trucks that collect waste during the week could be upgraded to include no emission options.

10 The district waste collection facility also takes in other bulky waste, cooking fats and chemical waste for safe processing.

11 Waste that couldn't be recycled could finally be burned to recover energy. This should be the final possibility and not the to go solution for waste management.

A collage showing the space infront of Hogevecht residential comples, where the waste collection point is also an information point that communicatss with the residents about the amount of waste being generated.

Residents could potentially get tax breaks based on their collective offset. Additionally the parking garage in the backdrop is upgraded to house a makerspace to facilitate the repair and refurbishment of multiple commodities and for the creation of new niche products.

Fig 6.48: A collage showing transformation of the public realm around the Hogevecht housing complex.



8.10.1 Waste Patterns

The patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more regenerative, circular and adaptive waste management system in Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following seven main principles define the waste system, (The pattern code W denotes Waste.)

W1. R Ladder

Promote the R ladder as a way of thinking to refuse, rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose and recycle waste flows at the neighborhood and at the personal level.

W2. Collection Points as Social Spaces

Improve perception of waste collection points through placemaking efforts. This can build a sense of ownership and improve the social utility of waste collection points.

W3. Build Awareness

Build awareness on the potential impact of individual and systemic sustainable practices. In a capitalistic society, consumers have the ultimate say only when they are well informed. Awareness can help towards behaviour change in the long term.

W4. Information Centre for Metabolic Flows

Make information on how the city functions more transparent. History and transitions of urban service delivery and metabolic flows can be interesting points of local knowledge and culture which can be documented and shared.

W5. Infrastructure as Spectacle

Design new icons out of performative buildings that are part of the waste and energy cycles. Designing conspicous buildings can bring traditionally invisible infrastructure to public culture.

W6. Branding

Develop eye-catchy branding for neighborhood initiatives towards sustainability transitions. This can help build strong narratives of local successes and help scale it up eventually to other parts of the city.

W7. Open Monitoring

Collect and monitor data on waste generation and how it is processed. Transparent data can help individuals understand the impact of their actions and make informed choices based on that.

Each of these 7 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

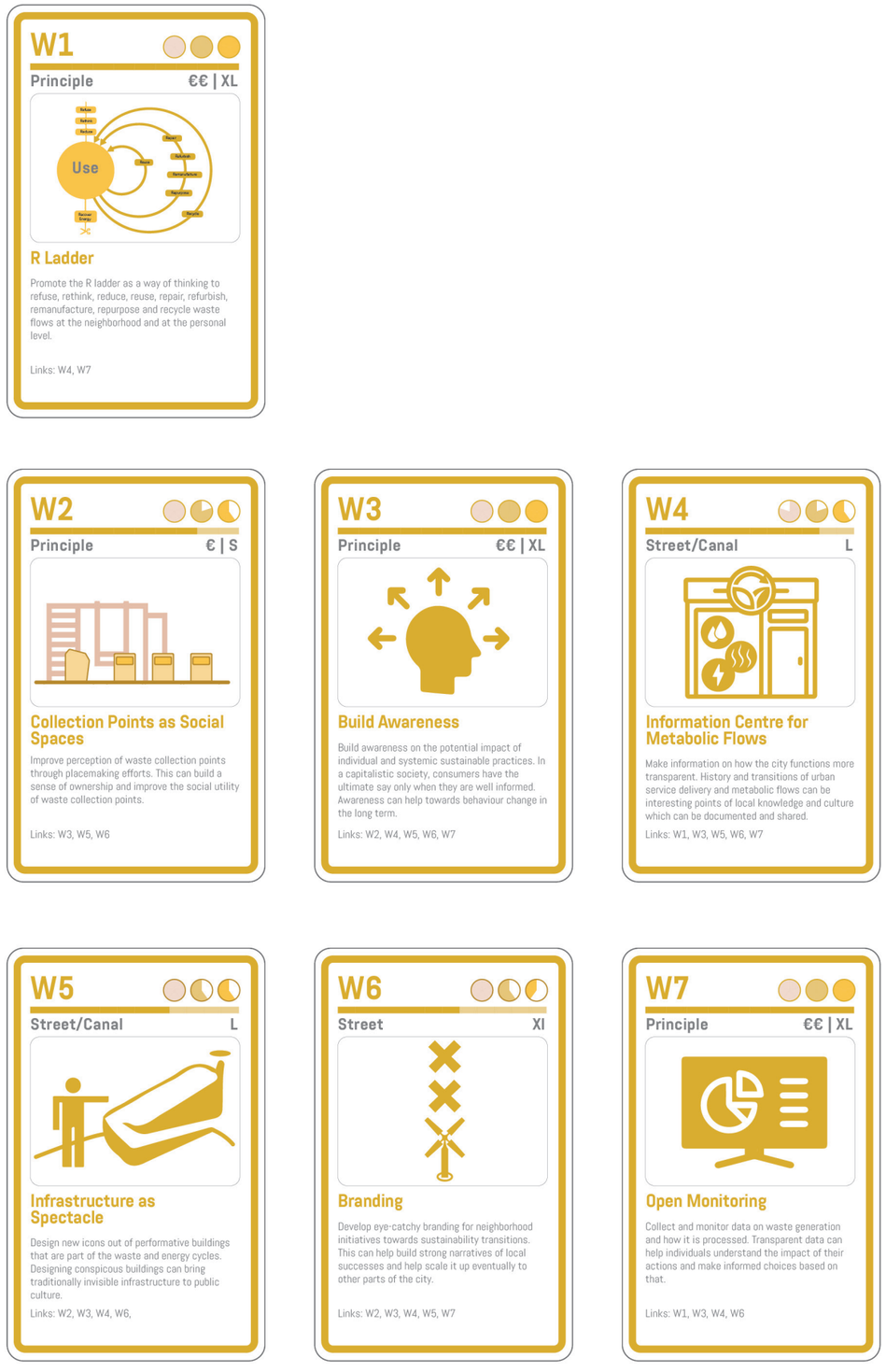
The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially

Fig 8.49: Waste patterns focusing on the principles

Source: Auhor



combined for synergistic effects.

The patterns are also organised in a circular and regenerative logic of the R ladder, moving from Reduse and reuse to repair and refurbish and recycle to revover.

These patterns are to be used in combination with other patterns discussed in the previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

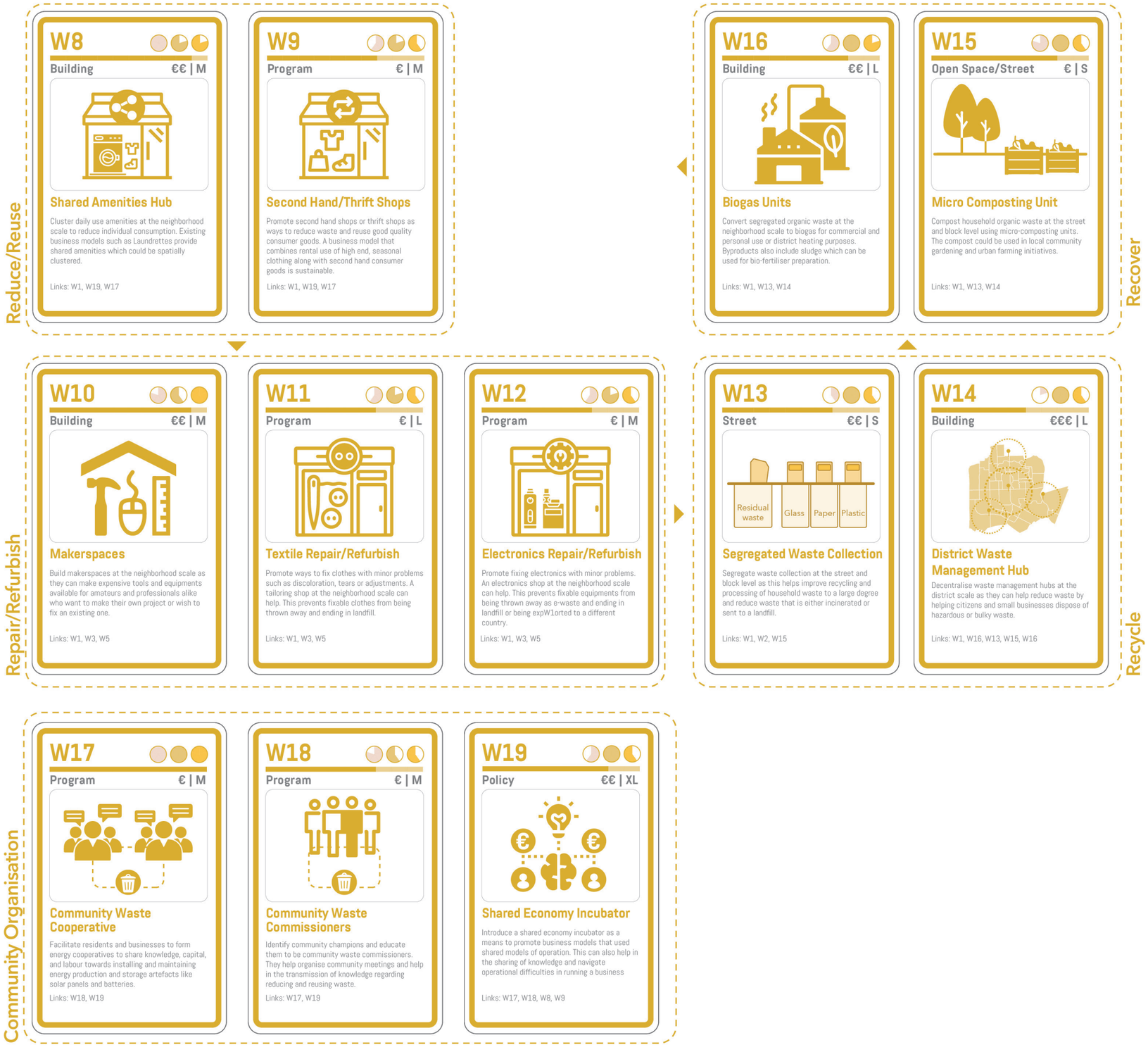


Fig 8.50: Expansion of the waste patterns.

Source: Author

8.11 Food

Fig 8.51: Plan showing potential study improving food systems in Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district

Fig 8.52: Framework for the potentiality study

This potentiality study of the four neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/Huigenbos, and Huntum in Amsterdam Zuidoost district focuses on improving the food systems in the neighborhood.

Here the aim is towards improving sustainability of the food system through moving from a linear to a circular material and energy flow, improving the adaptive capacity of the systems and improving the regenerative potential of the systems. Sustainability of the system is an emergent quality provided the three preconditions are improved.

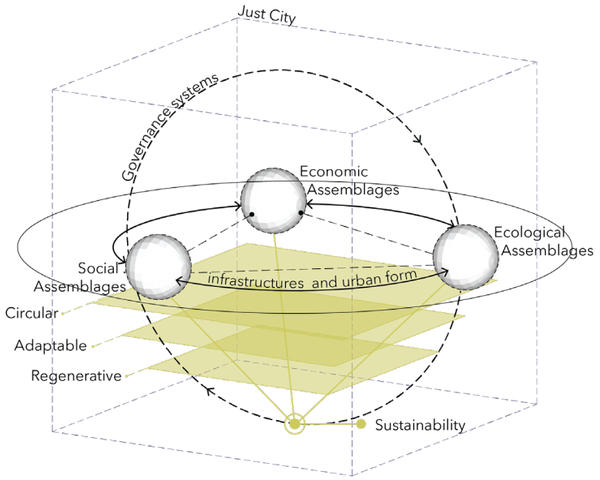
While the food system was not analysed at the district scale, due to its cross-cutting nature and potential social impact, the design possibiliities were explored.

In this potential study, improving the food system is approached with the following principles

1. A circular approach to the food system, which not only looks at growing own food on-site, but also trading it locally and finally composting it to ensure the mineral cycle is complete.

2. Turning underutilsed lands into community gardens and other shared forms of garening to improve their productive capacity.

3. Introducing new forms of organisation within the community to promote social linkages coupled with food flows within the neighborhood.





- Food bank
- Farmers Co-Operative
- Pop-up stalls
- Compost pits
- 250m Radius to Compost pit
- Foraging forests
- Rooftop green house
- Curbside agriculture
- Community gardens
- Cycle network for logistics
- Allotment gardens
- Super market
- Weekly market

In the Netherlands in general, there is an imbalanced system of food production where food produced in the country is exported elsewhere, while the food consumed in the country is imported from elsewhere. At the national scale, there is a need for policy changes and campaigns to change this practice towards the reduction of carbon emissions in the transportation of food across the globe.

Zuidoost also has a high percentage of obesity compared to the rest of Amsterdam. This is due to a complex array of factors including cheaper availability of junk food, stress in life etc. A good food system is not only a way towards reducing carbon footprint, but also plays a social role in strengthening community ties and building new ones if done properly.

At the local level, it is importatnt to facilitate the local economy and farm to table initiatives to reduce the embodied carbon in the food cycles.

This requires the expansion of locally grown produce. In Amsterdam Zuidoost. modernist ideals has led to the creation of large expanses of green areas which are currently underutilised. They could be successfully converted to community gardens to make sure these lands are put to productive use.

Not only community gardens, but different degrees of food production is possible with everything ranging from personal gardens at home and rooftop gardens to curbside agriculture.

However, all these requires knowledge towards caring for the plants and possible ways in which the harvest could be sold eventually.

Social organisations such as farmer markets, community kitchens etc are required to ensure the entire food cycle is accessible and has a shared ideal to it.

The waste from food could be composted locally in compost bins or in the case of large volumes such as from restaurants, they are to be turned into energy in biogas digesters.

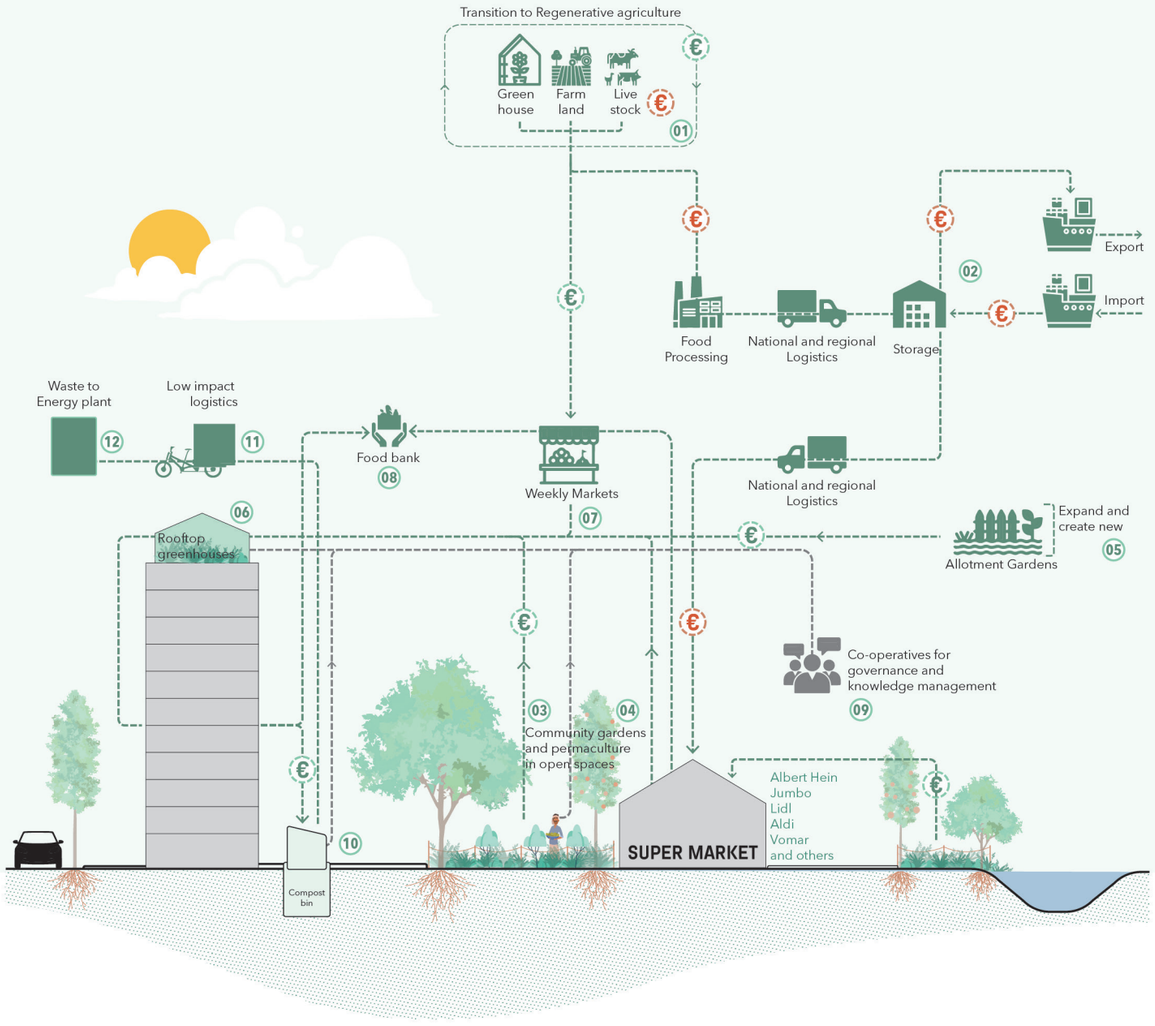


Fig 8.53: The co-ceptual systemic section shows a more sustainable food system in Amsterdam Zuidoost and how it interfaces with the built environment.

Source: Author

01 Subsidising sustainable farming practices and taxing unsustainable ones at the national level is required.

02 Exporting locally produced food and importing food to consume, the complex import-export balance requires work.

03 The vast amount of open green spaces in Zuidoost are maintained poorly. The could be converted to productive food gardens.

04 Trees in Zuidoost, while large in number are less diverse. More fruit producing trees can contribute positively to the local community

05 There are small allotment gardens along the edges of the city district, which could be expanded to locally produce food.

06 Rooftops are quite poortly used, The ample space and flat roofs could be used to produce food in greenhouses.

07 Weekly markets in Zuidoost could also expand to sell fresh produce along with the usual wares that are being sold.

08 Food banks expand the care network in the city district, reduce food wastage while also improving food access for the vulnerable.

09 To ensure local knowledge in cultivation is documented and for collective bargaining power, cooperatives can be setup.

10 Household organic waste can be composted locally to ensure the waste is turned into manure to be used in agriculture.

11 Segregated organic waste could also be alternatively moved from the city district using emission free cargo bikes.

12 A centralised waste to energy plant can recover segregated household organic waste as a way to close the energy cycle.

The flat roofs of buildings are a potential space that could be used for more productive uses. While flat roofs are a rarity in the city centre, the flats and townhouses in Zuidoost have a lot of them and could be used for food production through rooftop green houses, which can be productive even during winters.

The shared green spaces inbetween the high-rises are not well defined and are currently under utilised. They are to be converted to community gardens for food production. Since there isn't enough space for everyhousehold to have a plot of garden, the community garden is a shared resource that is to be maintained in cycles sharing responsibility across interested households.

The creation of the gaasperdammertunnel has led to the formation of a no-man's land on either suide of the tunnel. While there is proposal for a park, some portions of this huge space could be converted into a natural forest still accessible for residents who would like to forage.

While production is one part of the story, food outlets and farmers market can help sell some of the food that is produced in excess. This is supported by a community kitchen, where small scale businesses and entrepreneurs can utilise the shared infrastructure to cook delicious food to be sold.

And finally food waste generated from the neighborhood is to be segregated and composted on site based on their volume. Excess waste is to be moved to biogas digesters for conversion into green energy.

Farmers co-operatives as grounded local activism can bring residents together to help improve participation in the management of shared infrastructures while also ensuring shared responsibility of the commons. They can also facilitate collective bargaining and sharing of knowledge in the community.

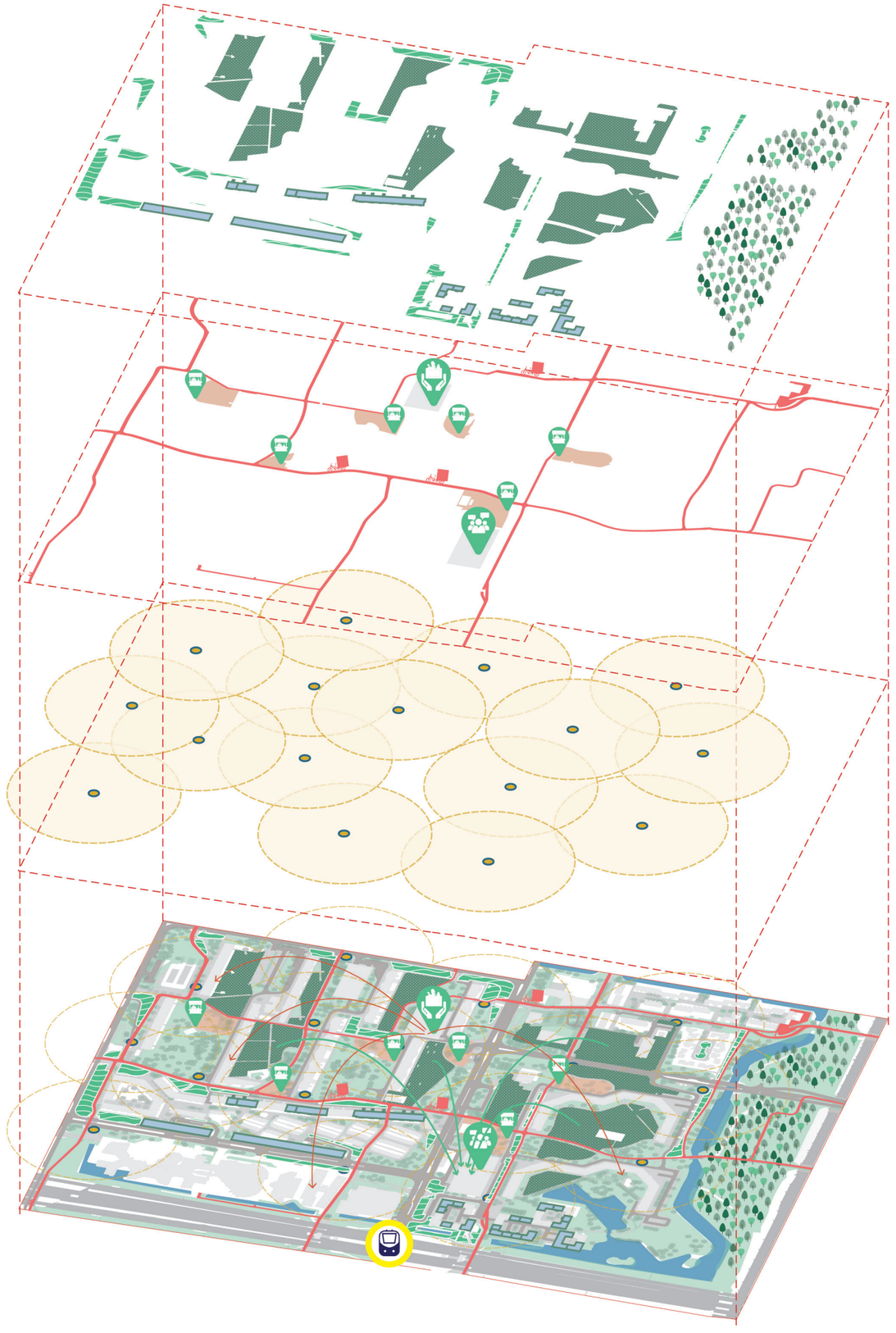


Fig 8.54: Exploded axonometry showing the layers in the potential study towards improving the food systems in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

The collage shows the northern facade of the Huigenbos residential complex along with the curbside agriculture and community gardens next to it..

Food kiosks and transformation of some of the ground floor storage areas in the housing complexes into shops can also bring in a degree of urbanity into these streets which are currently used only as transit conduits.

Fig 8.55: A collage showing transformation of the public realm around the northern edge of the Huigenbos housing complex.

Fig 8.56: Food patterns focusing on the principles.

8.11.1 Food Patterns

The patterns represent the normative principles and the related interventions that are required at various spatial scales to achieve a more regenerative, circular and adaptive food system in Zuidoost.

These are identified based on the analytical study in Chapter 6, and the potential study in the previous chapter through research by design. Some of the patterns are also informed by observations of existing practices on site and in other parts of Amsterdam and some patterns are derived from literature study.

The following six main principles define the food network, (The pattern code F denotes Food.)

F1. Permaculture

Promote permaculture as the way of growing food. It is an approach to land management and philosophy that adopts arrangements observed in flourishing natural ecosystems. It includes a set of design principles derived using whole systems thinking.

F2. Self Sustaining Food Chain

Conceive and nurture a local and self sustaining food chain as much as possible. This means locally producing food, selling in local markets and finally processing food waste within the neighborhood.

F3. Embodied Energy in Food

Prioritise locally grown produce that doesn't have a lot of embodied energy due to agricultural practices and transportation. Global food supply chains optimise for economic value and not environmental value.

F4. Local Food Economy

Promote and sustain a thriving local food economy over unhealthy fast food chains. This ensures that money is spent within the neighborhood and stays within the neighborhood to add second and third order benefits.

F5. Diversity in Food Offering

Encourage a thriving food culture. Zuidoost in particular has people from over 130 nationalities who have interesting things to offer for the rest of the city if given the requisite infrastructure.

F6. Utilise Residual Spaces

Rethink convential usage of space to improve its productive capacity. Buffer spaces, rooftops, excessive parking areas can be rethought as urban farmlands for food production with the required safety precautions.

E7. Multi-functional Infrastructure

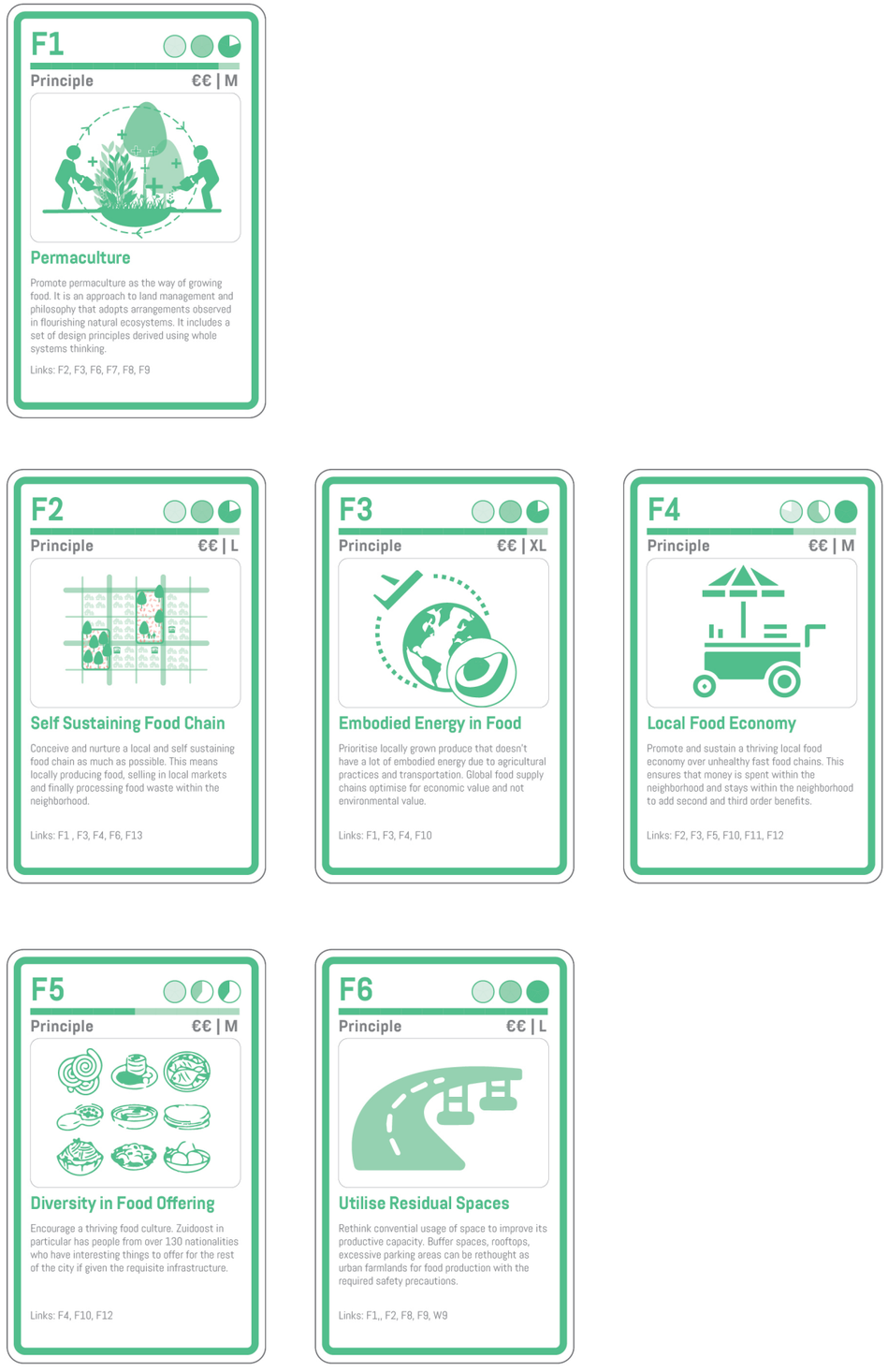
Rethink convential usage of space to improve its productive capacity. Buffer spaces, rooftops, excessive parking areas can be rethought as urban farmlands for food production with the required safety precautions.

Each of these 6 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

The specific type of patterns is also mentioned in terms of where it could be applied.

As mentioned in chapter 8.4, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies



its relation to other patterns and how they could be potentially combined for synergistic effects.

The patterns are also organised in a circular and regenerative logic of the food cycle, moving from produce, trade, consume and compost.

These patterns are to be used in combination with other patterns discussed in the previous and subsequent chapters and the procedural patterns discusssed in Chapter 9, as these expand on the procedural and financial aspects as well.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

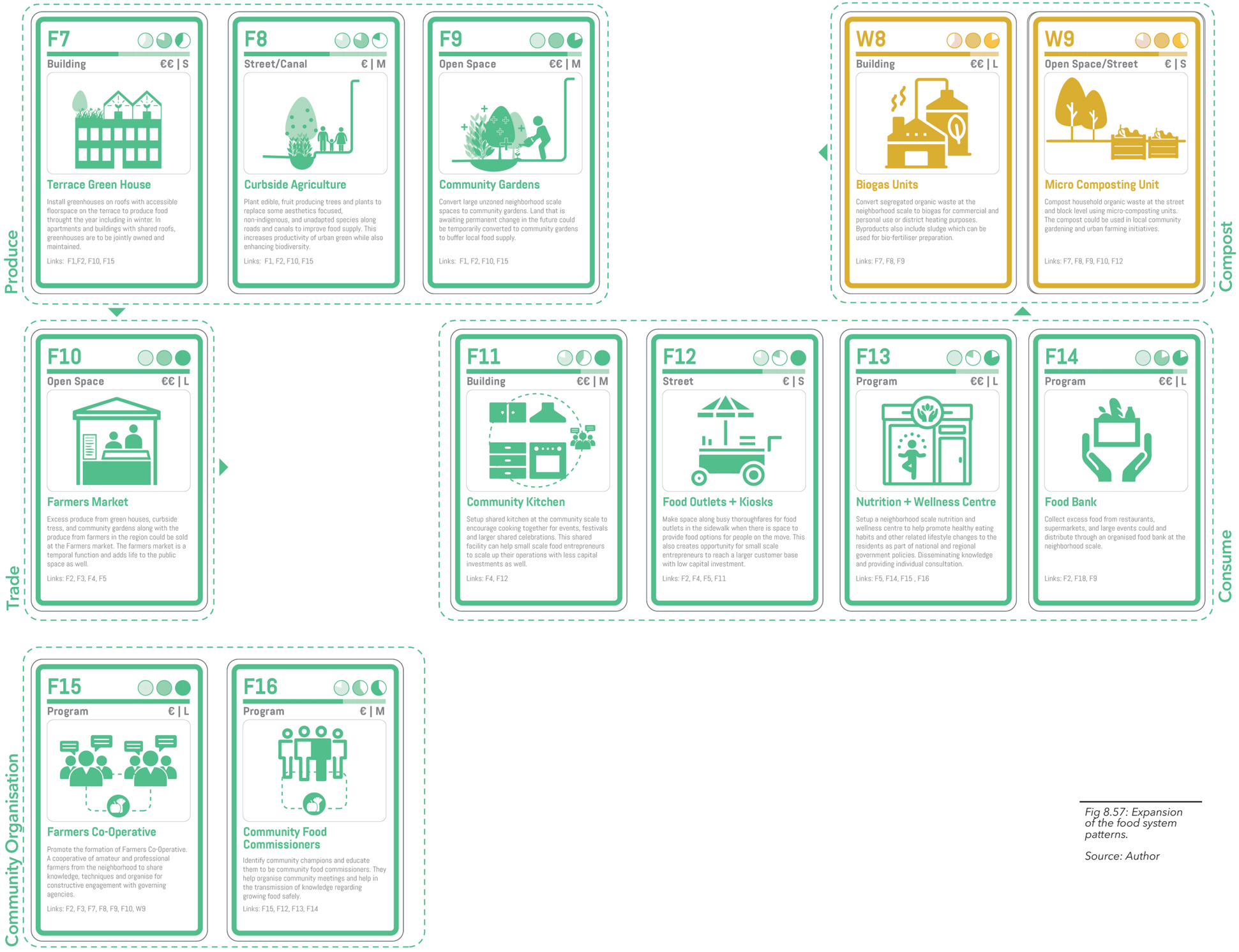


Fig 8.57: Expansion of the food system patterns.

Source: Author

8.12 Reflection

The potential study is an interesting research by design method to derive patterns. Where a hypothetical maximisation perspective helps us see what the site under study could potentially 'hold'.

In this particular example, accessibility, density and diversity layers of the urban form and infrastructural systems of the H neighborhoods were designed consecutively due to their interconnected nature and each acting as a precondition for the other to be 'maximised'.

Here in the relation graphic to the right, only the principle patterns are shown to not overwhelm the reader and reveal only the most prominent patterns and the links between them.

The principles for accessibility, density, and diversity are inter-related and the principles for the material flows of the blue/green network, energy, waste and food systems are inter-related.

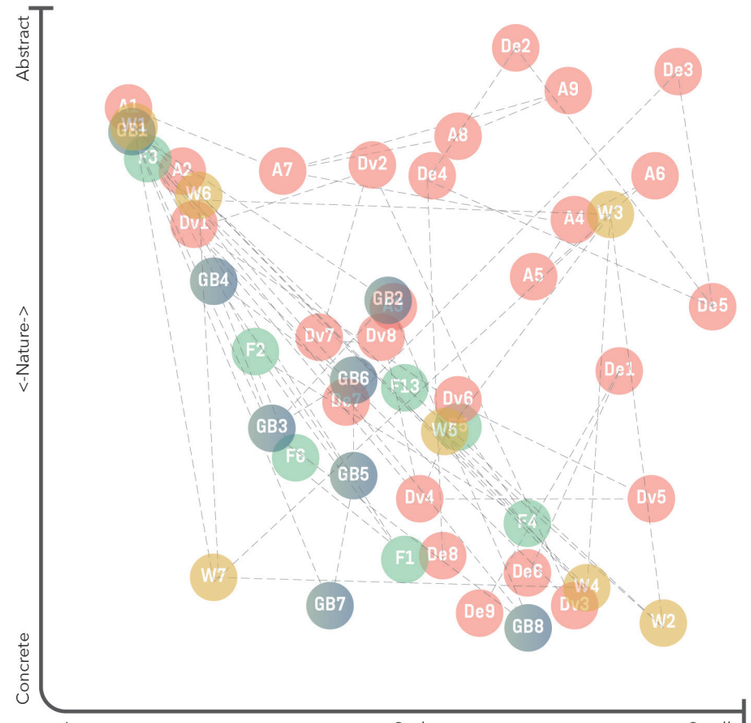
Here sustainability principles are relatively more concrete than the livability principles, which tend to be more on the abstract side. There are also very few large scale concrete patterns, a result of the process of deriving these patterns which focused on the city-district and zoomed into the neighborhoods from there.

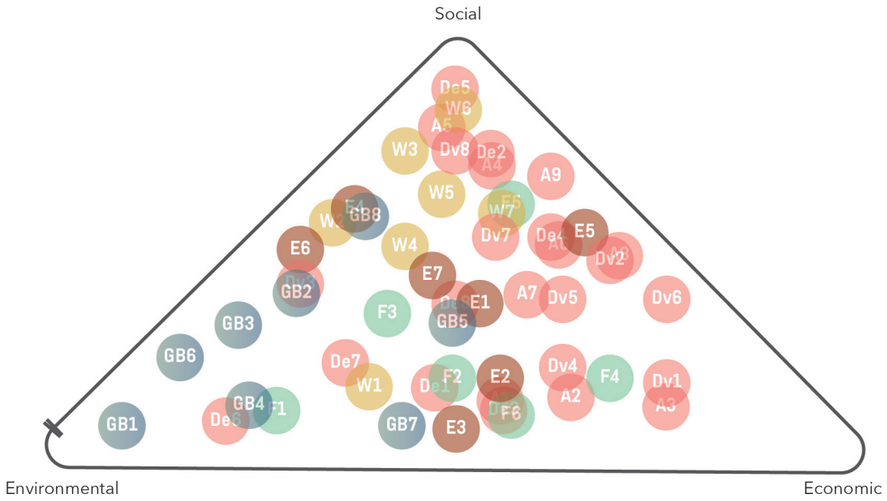
In the social, environmental and economic mapping, it can be seen that the patterns for accessibility, density and diversity predominantly occupy the socio-economic space, revealing an inherently human centric nature of these patterns. These play an important role in improving the livability of a neighborhood.

Similarly the patterns for the material flows of the blue/green network, energy, waste and food systems are more integrated occupying a central position with a slight skew towards the environment for blue/green networks. These play an important role in improving the sustainability of a neighborhood.

The patterns focusing on he operational aspects towards spatial justice are discussed in chapter 9.

The relations for other pattern sets are in the Annexure.





9

9.1 Stakeholder Repositioning
9.2 Operational Patterns
9.3 Operational Framework
9.3 Organising at the Neighborhood scale
9.4 Operational framework

Operational Framework

9.1 Stakeholder Repositioning

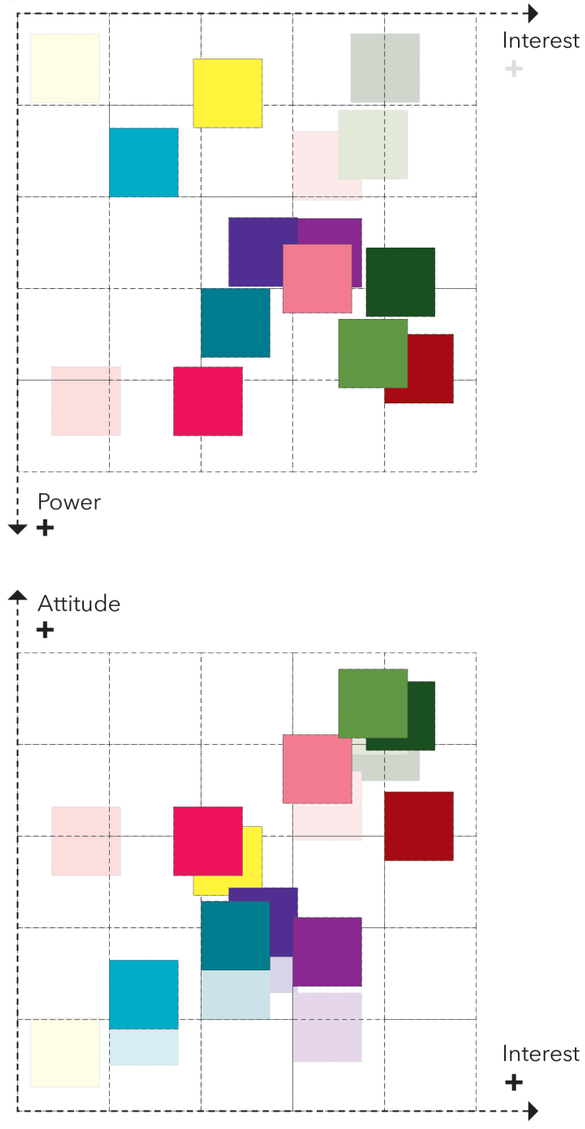
From the stakeholder analysis, through the positioning of stakeholder 'categories' in the three dimensional space of power, interest, attitude, we understand the starting points of different stakeholders in the urban development process.
in chapter 6.11.

Diagrams 9.1 through 9.3 reflect the proposed repositioning of stakeholders in terms of their power, interest and attitude.

Here the most important action that needs to be taken is empowering stakeholders with high interest and positive attitude but with low power. This includes special purpose partnerships, community organisations and regional bodies in the current setup, so they could move from the category of 'friends' to 'saviours' as defined in the model proposed by Murray-Webster and Simon (2006).

There is also general improvement of attitude of all stakeholders involved through the democratisation of the urban development process and active synergy seeking behaviour. This is a complex and long task that involves effective communication and clear description of intentions and expectations to ensure risk mitigation and productive value creation for all stakeholders involved.

Within this rethinking, co-owned and democratically functioning citizen organisations operating at the neighborhood scale and sector specific expert organisations operating at the regional scale are to work together, mediated by the municipality towards livable, sustainable and just outcomes. The patterns that could help towards this are discussed further.



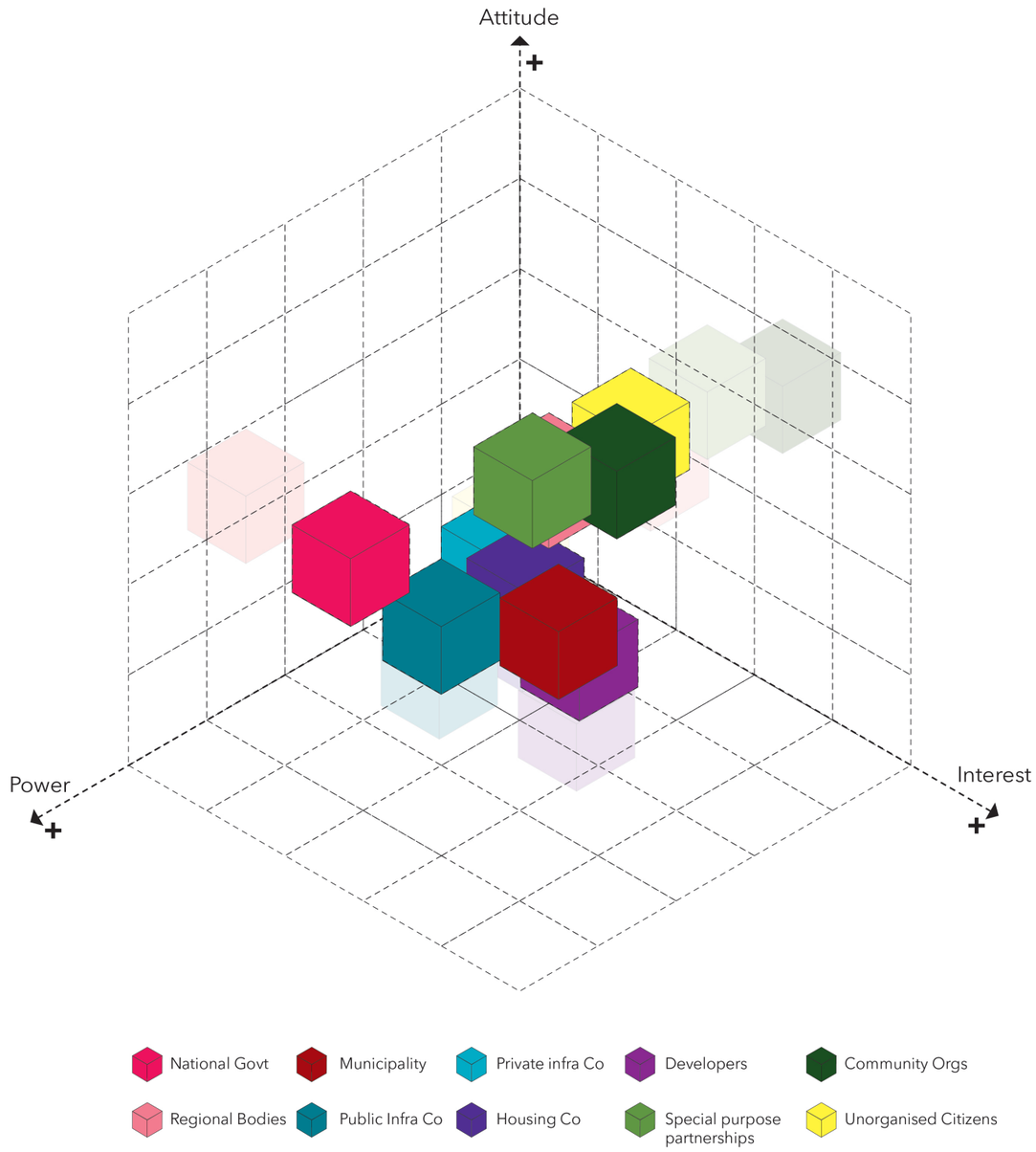


Fig 9.1: Stakeholder repositioning in the three dimensional space of power, interest and attitude.

Source: Author

9.2 Operational Patterns

The operational patterns represent the normative principles and the related program and policy measures required to achieve a livable and sustainable Zuidoost, that is also just.

Five main principles define the procedural aspects contributing to procedural justice in the urban development process and three principles define the financial aspects, which indirectly contribute to distributive justice in the process. (The pattern code G denotes Governance.)

G1. Subsidiarity

Subsidiarity is a principle of social organization that holds that social and political issues should be dealt with at the most immediate (or local) level that is consistent with their resolution. Thus, more finer forms of organisation at the community level is required to engage with issues with more nuance and not at the stopera or Binnenhof.

G2. Place based policy modifiers

In close relation to the first principle, place based policy modifiers focuses on the ability to modify policy made at the municipal or national scale to reflect local conditions. This is built on the notion that policies are formed based on the average condition of the constituent geography and outliers could be disproportionately affected by this. For example, the per capita income of the 'average' Amsterdammer is €34,6K, in the city center it is €41k and in Bijlmer Oost it is €31k.

G3. Commons

Using "the commons" as a new discourse helps re-frame the terms of discussion for many issues and declare our personal stake in protecting shared public resources. It helps draw new linkages among disparate market enclosures, and in this sense, helps fragmented public-interest constituencies develop a new, shared language.

G4. Co-Production

Co-production is a principle in which the delivery of public services to citizens involves citizens in the conceptualisation and eventual implementation of public policies and services. It is contrasted with a transactional notion of public service delivery in which citizens are treated as consumers of public services which are conceived and provided by governments and other private stakeholders.

G5. Community cooperatives

To facilitate co-production and eventual maintenance and monitoring of urban services and shared resources, community cooperatives can play a crucial role. As an institutional setup, they distribute benefits and risks among all constituents, helping them with a stake and a reason to be personally responsible. Operationalising community co-operatives in specific cases were discussed in chapter 8 as well.

Together, these 5 prinicples help structure procedural justice in how urban development processes could happen. In addition to these, the following 3 financial principles pave way for distributive justice.

G6. Financial Nudges

Taxation and subsidising are some of the most commonly used policy instruments to shape desired behaviour. Here desired behaviour is defined through the normative standards defined by the community towards a livable, sustainable and just neighborhood.

G7. Leveraging new forms of Funding

Existing infrastructural and natural assets within a neighborhood could be leveraged to improve the quality of life and fund required infrastructural improvements towards sustainability transitions. This requires re-evaluating the relationship between residents and their neighborhood beyond what is exerted through the ownership of private property.

Fig 9.2: Principle operational patterns

Source: Author



G8. Collective Financing

PPP models have become mainstream to reduce government spending and move public goods to the hands of private investors albeit for a finite period of time, depending on contractual obligations. However, similar models if decentralised, could help individual residents invest into the improvement of their neighborhoods, contributing to increased ownership and responsibility. Tax breaks on collective financing methods could facilitate true bottom-up city building.

Each of these 8 priniciples are further expanded to add nuance towards how they could be implemented in specific cases. Some of them are direct spatial solutions, while some of them are policy suggestions.

As with all the patterns discussed before, each pattern has a scale of application, which mentions at what scale it could be potentially applied, and their potential positive impact on the social, environmental and economic systems. This is further combined as the integrated score out of 10, represented as a bar at the top of the pattern, which can help choose between different patterns.

The links mentioned at the bottom of each pattern clarifies its relation to other patterns and how they could be potentially combined for synergistic effects.

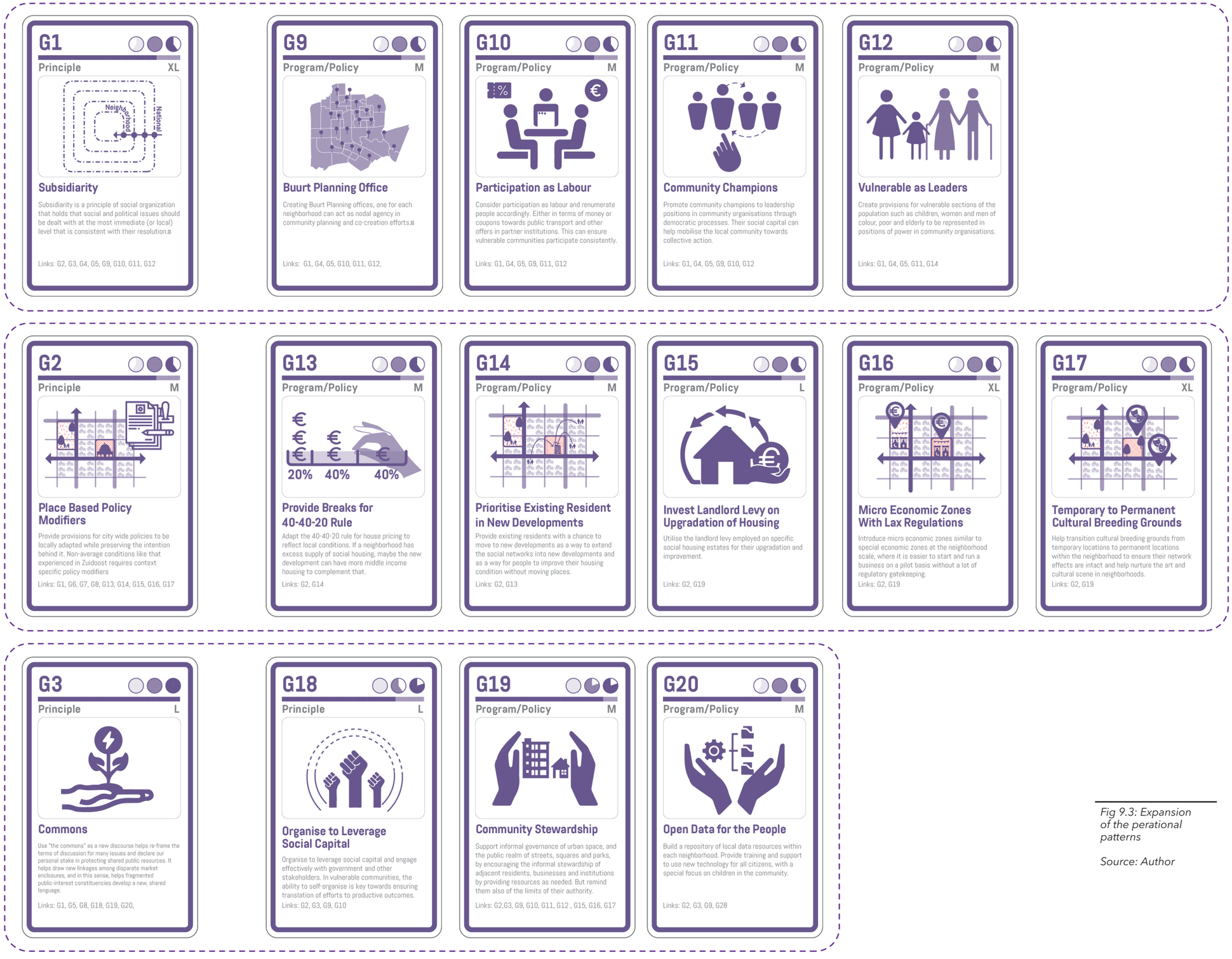


Fig 9.3: Expansion of the perational patterns

Source: Author

These patterns are to be used in combination with the more specific patterns developed in chapter 8, as these expand on the procedural and financial aspects of previously discussed propositions.

For example, the pattern G5 is linked to different forms of Co-operative setups suggested in previous explorations per theme, which in turn is a suggested precondition for multiple proposals in those respective themes.

As explained before, these patterns doesn't represent all possibilities. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

Fig 6.31: Exploded axonometry showing the layers in the potential study towards maximising accessibility in Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum in Amsterdam Zuidoost district

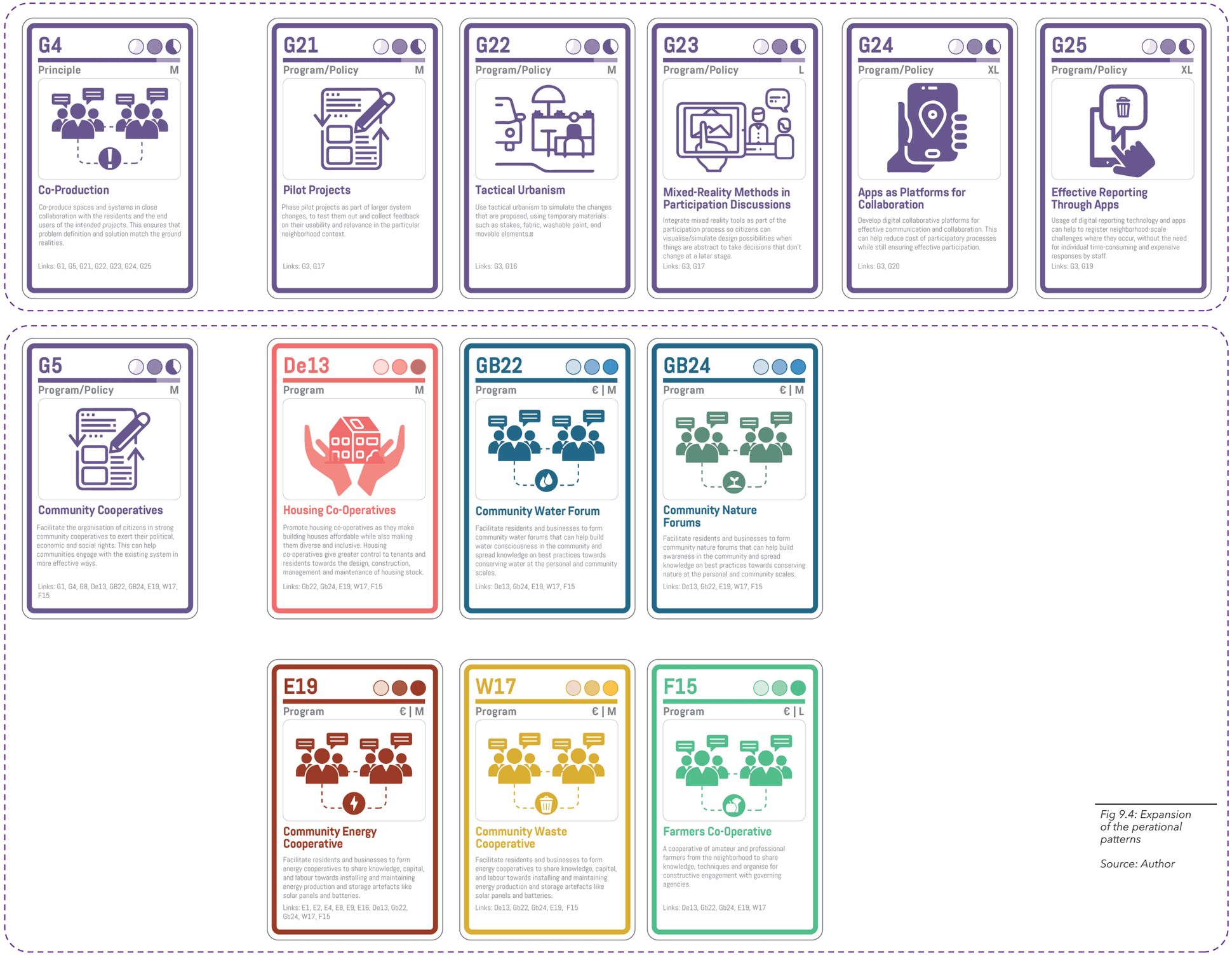


Fig 9.4: Expansion of the perational patterns

Source: Author

As with the procedural patterns, the financial patterns doesn't represent all possibilities as well. They represent a good selection of starting points that have potential within the context of Zuidoost, through co-production(G4) more such patterns could be identified as well.

There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

Some of these patterns are based on smaller cases being already experimented within Zuidoost, for example Community land trust(G31) is being experimented and studied at Bijlmer for over two years now as a means to collectively finance and improve the economic sustainability of housing projects. This can be extended to other development goals, such as renewable energy transition and waste management etc, when strategically combined based on contextual needs.

Thus these patterns facilitate integrated thinking by establishing potential connections from the get go. A more detailed look at organisational restructuring and operational framework is discussed in the next chapters.



Fig 9.5: Expansion of the perational patterns

Source: Author

9.3 Organising at the Neighborhood scale

Organisation of residents at the neighborhood scale with specific objectives is fundamental towards ensuring an inclusive development that prioritises the needs of the most vulnerable.

The fundamental unit involves organising individual citizens as part of co-operatives with specific aims towards the improvement of the community. Since individual stakeholders are numerous and it is incredibly difficult to identify and address specific concerns individuals may have.

Through this process of collective organisation, individual stakeholders are empowered to have a positive impact as they are organised towards specific objectives. Co-operatives could solve the additional purpose of maintaining and leveraging shared resources towards community wealth creation, thus creating a positive feedback loop.

In the potential study, some possible ways in which co-operatives could function were explored per layer of study. This isn't exhaustive, since the possibilities of locally grounded co-operatives are endless.

However, to illustrate an example, we focus only on the co-operatives that we discussed so far.

The co-operatives are formed based on specific objectives – energy transition for energy co-operatives, affordable and quality housing for housing co-operatives and so on.

The municipality is to set up a neighborhood planning office, which could be one per neighborhood, or one per strategic combinations of neighborhoods (as in the case of the H neighborhoods explored in the potential study). This combination of neighborhoods is to be informed by shared culture, history, and physical conditions of urban form and infrastructure systems.

This neighborhood planning office becomes the nodal agency for urban development at the neighborhood scale, co-ordinating with the municipal departments, the local stakeholders, other adjacent neighborhood planning offices, external experts and other interested stakeholders.

Community co-operatives engage with the neighborhood planning office towards developing proposals for the identified catalytic locations within each neighborhood. The pattern language acts as a communication tool towards mediating discussions on possibilities and prioritising actions based on impact and needs.

The neighborhood planning office coordinates actions on ground within the neighborhood towards multiple pilot projects, through monitoring and evaluation, more successful projects can be identified and expanded. The knowledge created as part of the process is shared in a common open data platform for Zuidoost, which can help inform and inspire other neighborhoods. The process can potentially promote friendly competition among neighborhoods.

The neighborhood planning office ensures new proposals are in line with metropolitan and regional ambitions.

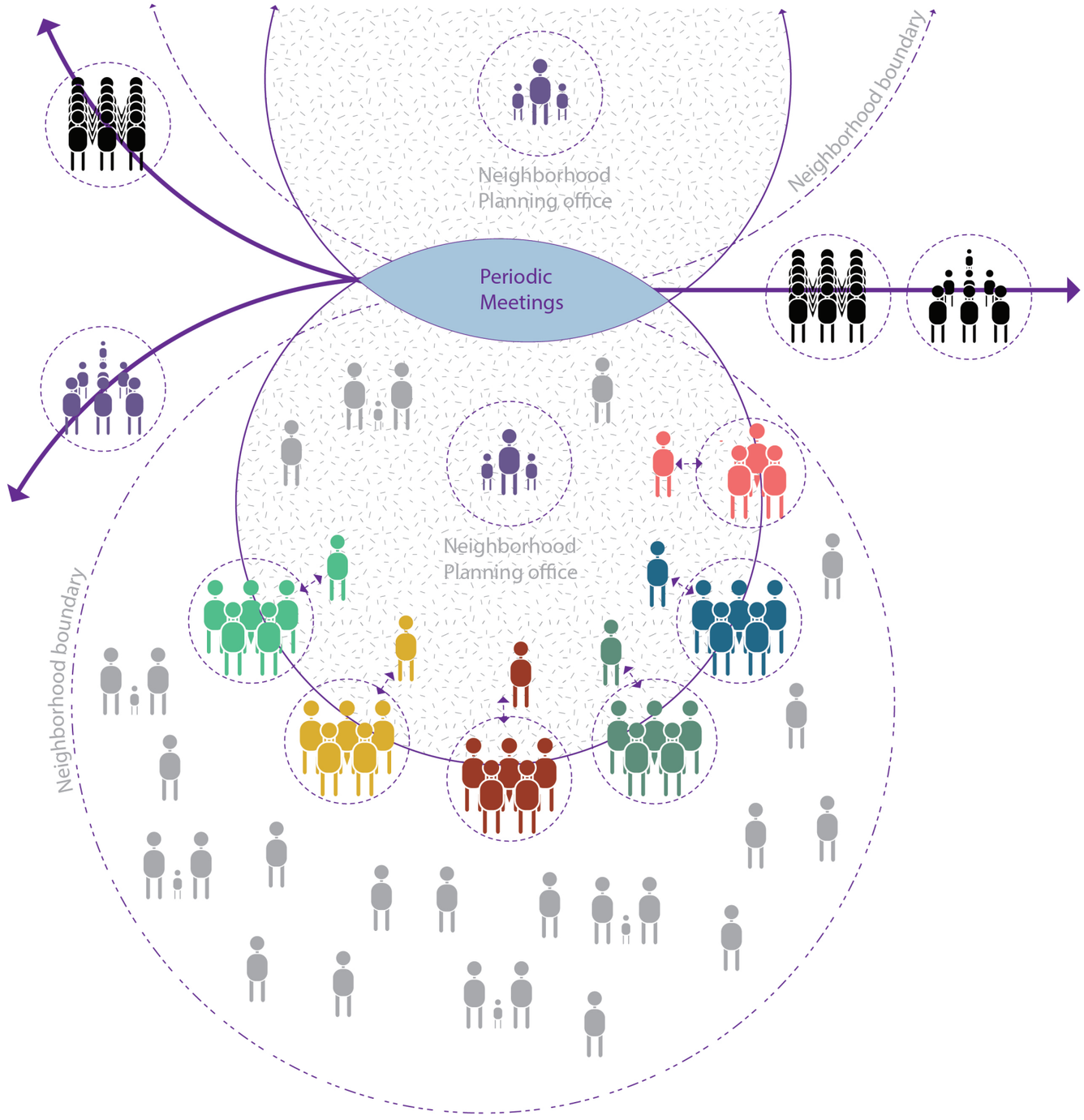


Fig 9.6: Conceptual organisational structure.

Source:Author

9.3.1 Community Co-operatives

Citizens organised as part of co-operatives can leverage their strength in numbers towards achieving the specific aims under which they are organised.

Since individual stakeholders are numerous and it is incredibly difficult to identify and address specific concerns individuals may have, organised individuals can be better participants in co-production of new futures.

The community co-operative is envisioned as a specific kind of organisational setup towards achieving procedural and distributive spatial justice.

As part of the co-production process in association with the neighborhood planning office, they help represent distinct and diverse voices from residents of the neighborhoods in the urban development process.

Parallelly, specific community co-operatives ensure the management of community assets as part of the commons, while ensuring its financial sustainability as well. This leads to new job creation and promotes the hyper-local economy.

For example, If we take energy co-operatives, they'd could potentially do the following:

1. Help towards the transmission of information in the community regarding energy conservation from thicker curtains to total upgradation of the energy system.

2. The co-operatives can leverage their strength in numbers towards obtaining solar panels and insulation for housing and commercial establishments at cheaper rates.

3. The co-operatives could operate the solar panels and run the micro grid of the neighborhood and offer electricity at cheaper rates to the community.

And a lot more. There are second order and third order social and economic effects of organising in this way as well. Such as upskilling of residents, stronger social connections, productive competition and learning between neighborhoods.

For the municipality, the proposed model is a way to generate a large volume of possibilities that can help inform the socio-technical transitions and any future crises better.

The map to the right shows tentative neighborhood scale organisation that proposes a combination of specific neighborhoods to be organised together

There is a possibility of 15 neighborhood clusters each with a nodal neighborhood planning office. The nature of urban form discussed in Chapter 6.3 is the major deciding factor in determining what neighborhoods could be combined, since the potentialities in neighborhoods with predominantly single family housing with front and backyards is significantly different from neighborhoods with predominantly high-rise social housing with a lot of unarticulated green space around it.

Neighborhoods that have predominantly city-scale amenities such as Arenapoort, AMC, and Gassperplas are distinguished from this setup

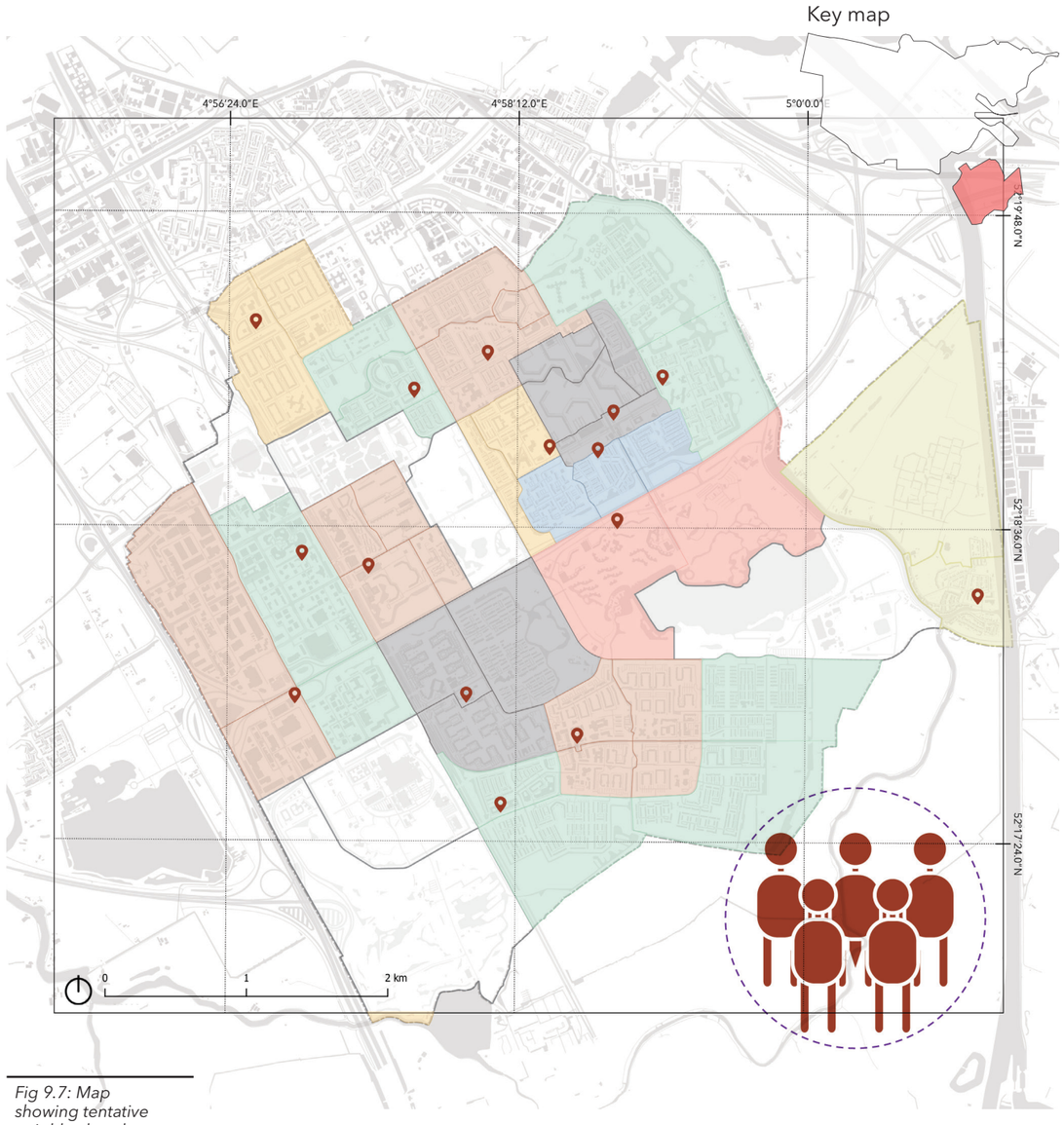


Fig 9.7: Map showing tentative neighborhood scale organisation that proposes a combination of specific neighborhoods to be organised together

Source:Author

9.4 Operational Framework

As discussed briefly in chapter 9.3 Organising at the Neighborhood scale, the neighborhood planning office is the nodal agency that coordinates planning and action on ground.

The operational framework explains the conceptual sequence of activities and how they are structured.

As part of the strategic spatial framework, specific key structural changes were proposed to the urban system of street networks and the blue-green networks to shape growth in Zuidoost. They form the preconditions for urban development. Since right now, neighborhoods are fragmented, without an unifying structure, catalytic actions at identified locations cannot have the intended effort. So, as part of pre-conditions, these underlying structures are to be re-structured as proposed in the framework

Also as part of the strategic spatial framework, multiple catalytic locations within Zuidoost were identified that can undergo transformations of varying degrees.

The catalytic locations can be combined based on geographic proximity to identify pilot projects that can have the highest impact within a neighborhood.

Multiple pattern workshops are conducted by the neighborhood planning office in close collaboration with the community co-operatives and other interested stakeholders towards identifying projects that can be implemented in a specific location.

Based on the local conditions, and community interest, the projects can vary from community gardens and public plazas to mixed-use apartment buildings.

However, if there are multiple potentialities and mixed interests, some of the projects are piloted through tactical urbanism proposals.

Through close monitoring and observation of the tactical urbanism intervention at the specific local condition, a more long term solution is identified to be scaled up.

The adjacent catalytic locations also follow a similar process of testing out multiple solutions towards identifying either one or a combination of solutions that best responds to local requirements extending synergistic network effects of the initial project throught the neighborhood.

Over time, projects stabilise towards a large narrative in a process of co-production. The knowledge created as part of the process is shared in a common open data platform for Zuidoost, which can help inform and inspire other neighborhoods. The process can potentially promote friendly competition among neighborhoods.

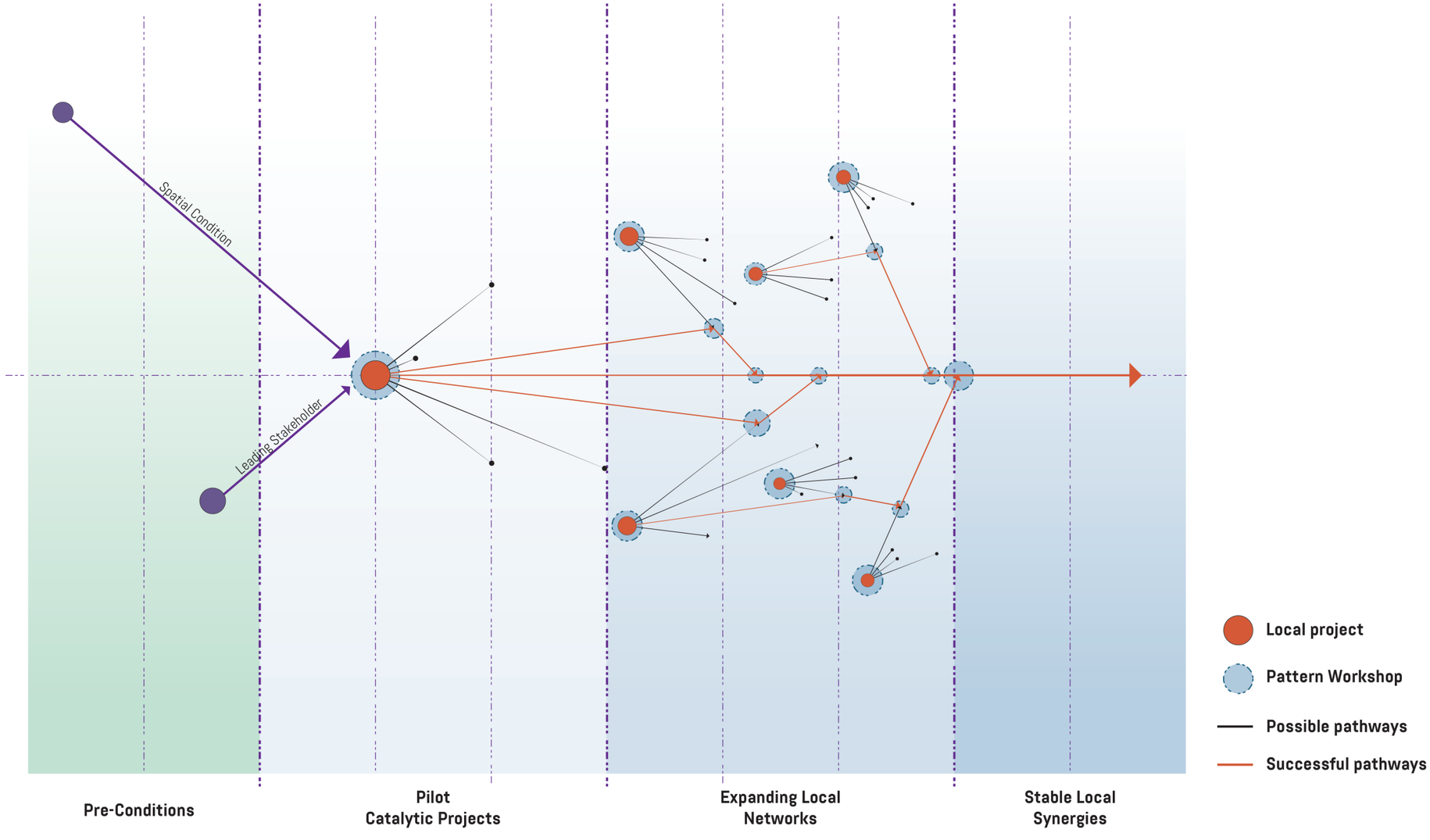


Fig 9.8: Operational framework

Source:Author

10

Design Testing

10.1 Bullewijk Cluster
10.2 Conditions
10.3 Scenarios
10.4 Adaptive Pathways
10.5 Evaluation and Reflection

10.1 Bullewijk Cluster

Bullewijk is a metro station along metro lines 50 and 54. On one side of the station is the Amstel III business district and on the other isde is Bijlmer Oost, with the neighborhoods of Hoptile, Rechte H-Buurt, Hakfort/ Huigenbos, and Huntum.

Karspeldreef runs east-west under the metro station. While the road is at grade level on the Amstel III side, it is elevated on the other side of the railway track with a bus stop along the way.

The railway track itself is elevated on a berm and acts as a border between the east and west.

The Huigenbos parking garages was demolished, and the Hakfort parking garage is slated for demolition. With that, the space between Karspeldreef and the high-rise housing blocks of Hakfort and Huigenbos are planned to be developed.

On the other side of the track, the high rise blocks on Karspeldreef 14, and Karspeldreef 16 are also slated for redevelopment. The investment decision on these are already taken.

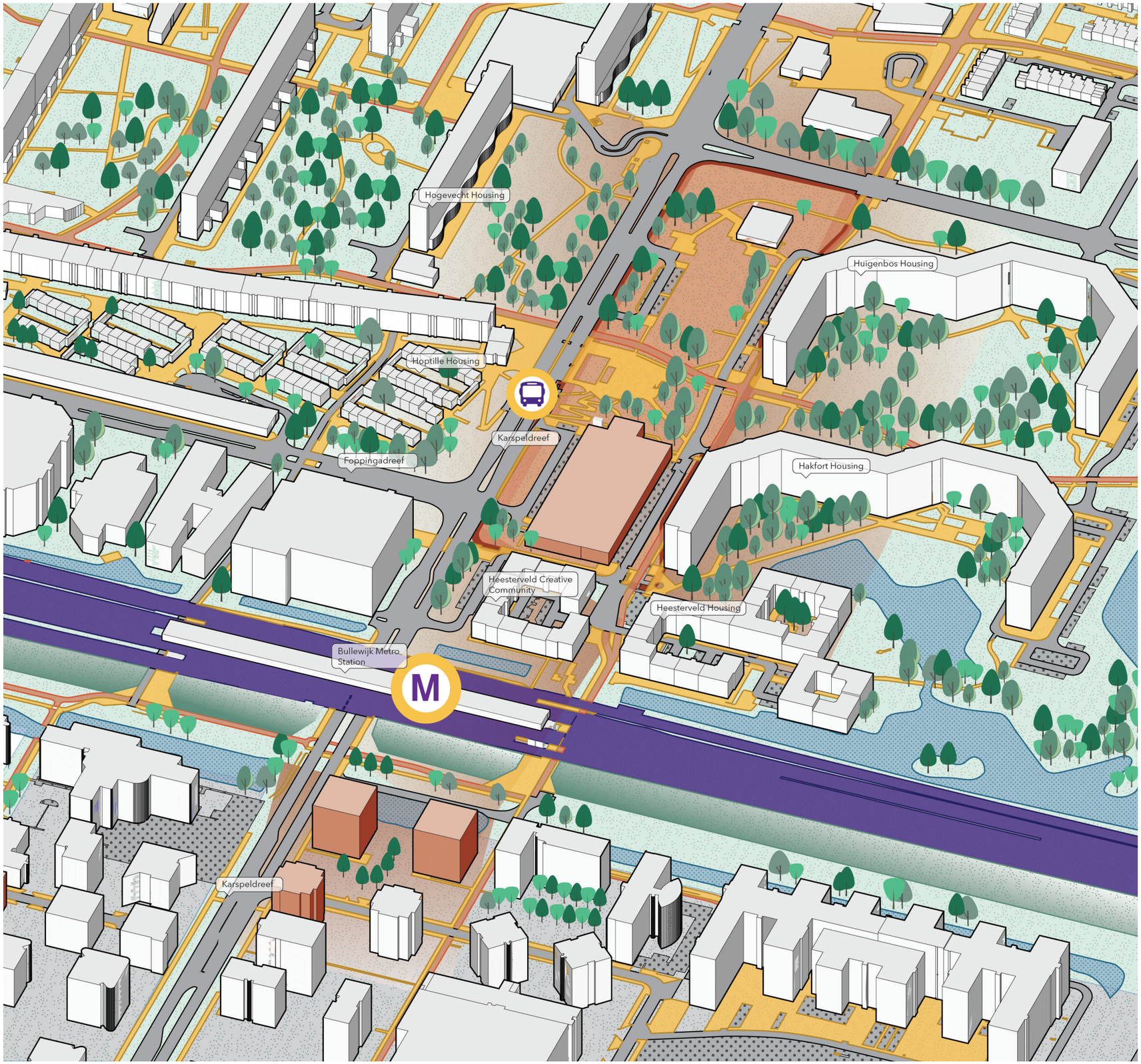


Fig 10.1: 3D view of the Bullewijk Cluster

Source:Author

10.2 Conditions

In the strategic plan, there are three major proposed changes around this cluster.

1. A primary urban axis along the Karspeldreef. This involves the downgrading of the elevated urban highway to grade level and transforming it to a city street.

2. Strategic greenification of the railway berm, converting it from a border to a recreational attraction and a place of stay.

3. The upgradation of the Bullewijk metro station itself and the public space surrounding it.

These projects are capital intensive infrastrucural projects generally approached from a top-down perpsective in terms of how they are carried out.

As part of the strategic plan, these are proposed as the underlying structure and backbone that can facilitate the transformation of the city-district.
In the design testing four conditions are explored.

1. The underlying structure proposed in the strategic plan is realised and the community is not well organised at the neighborhood level as proposed in the operational framework.

2. The underlying structure proposed in the strategic plan is realised and the community is well organised at the neighborhood level.

3. The underlying structure proposed in the strategic plan is not realised and the community is not well organised at the neighborhood level.

4. The underlying structure proposed in the strategic plan is not realised but the community is well organised at the neighborhood level.

With these four different starting conditions, development on the catalytic locations in the Bullewijk cluster is explored through design testing with the help of patterns identified before.

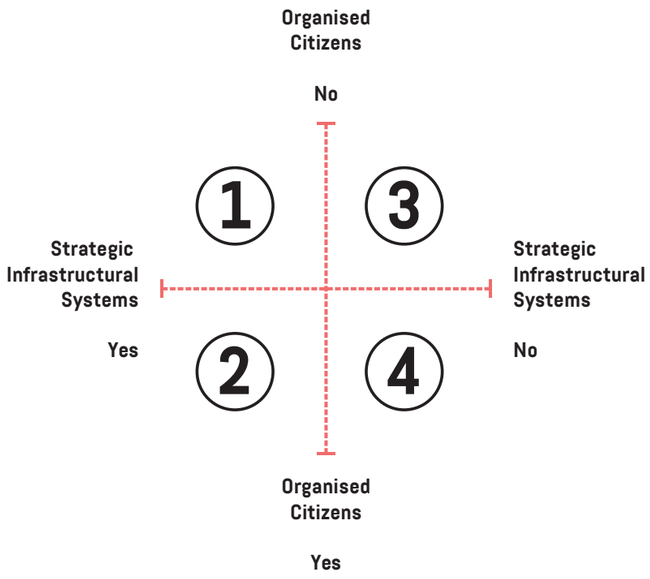
Fig 10.2: Close-up of the strategic plan around the Bullewijk cluster

Source:Author



Fig 10.3: Four starting conditions for the design testing

Source:Author



The development of the catalytic locations has different possibilities as demonstrated in the potential study.

The same location could be developed into housing, green space, solar park and more. As part of the operational framework, it is proposed that such multiple possibilities need to be tested out on site through tactical urbanism interventions to check their potential in the context. These initiatives can help towards 'scope definition' in other parts of the neighborhood as well.

However, for the purpose of design testing, the idea of a leading scope is used per design exploration.

Each design testing has one or more leading scopes, combined with one or more trailing scopes and the possibilities at the catalytic locations are designed based on that.

This helps us prioritise possibilities and design based on that. The five scopes identified are.

1. Housing: In which, the focus would be on densifying towards house construction.

2. Mixed use: In which, the focus would be on introducing new functionalities in the neighborhood

3. Climate adaptation: In which, the focus would be on expanding blue/ green networks towards climate adaptation.

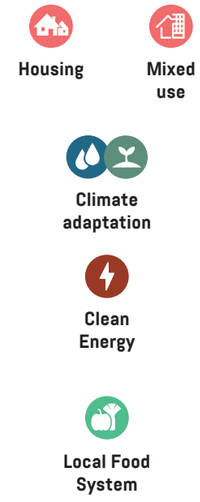
4. Clean energy: In which, the focus would be on generating energy within the neighborhood and ensuring the upgradation of buildings towards energy conservation.

5. Local Food System: In which, the focus would be on producing food within the neighborhood.

With these five possible leading scopes, development on the catalytic locations in the Bullewijk cluster is explored through design testing with the help of patterns identified before.

Fig 10.4: Five leading scopes for the design testing

Source:Author



10.3.1 Scenario 1

The underlying structure proposed in the strategic plan is realised and the community is not well organised at the neighborhood level.

Densification towards housing as the leading scope, with mixed use as the trailing scope.

Moving the Karspeldreef to the grade level, increases available real estate for development along the road. The cost of the project, combined with the activation of the public space around the metro station and the railway park can be justified by densifying along Karspeldreef intensely, with mixed use functionalities along Karspeldreef helping it transform into a highstreet.

This scenario closely tracks the status quo, where new projects are approached from an area development perspective. No of homes that need to be developed are assigned based on the available land, location and the cost of construction.

Public space upgradation as part of the development such as pocket parks are marketed as contributing to the larger neighborhood. However, this kind of development poses extreme threat towards gentrification as well.

Since, large developments like these tend to attract affluent residents from different parts of the city, expats or from other cities to move into the neighborhood. This sudden influx would change the social structure and

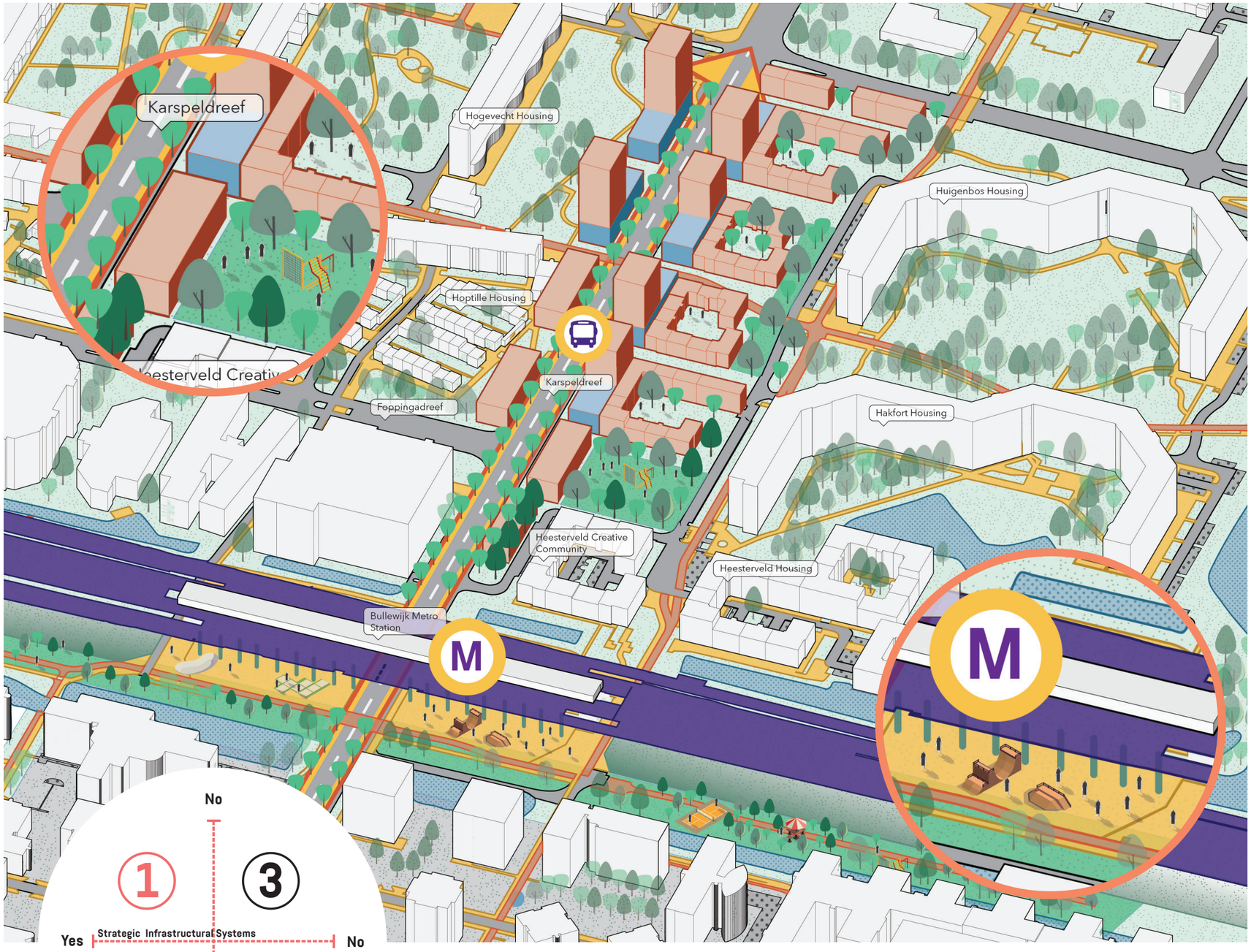


Fig 10.5: 3D view of the Bullewijk cluster based on scenario 1.

Source:Author

the kind of life in this neighborhood, especially because of the central location of this cluster.

From a financial perspective, this would make sense for any developer, to create an attractive mixed-use neighborhood close to Amstel III and Arenapoort. Because, the development is on the other side of the track, existing pre-conceived notions might be against the project, but because of the upfront infrastructural upgradation assumed in this scenario, the neighborhood is well integrated with the rest of Amsterdam as well.

The patterns used in this scenario are predominantly along the socio-economic spectrum and less on the environmental side of things, owing also to the leading scope of this scenario, which is only Housing and mixed use.

More abstract, large scale patterns were used for structuring of the site, while concrete patterns helped in the detailing.

From a quantitative perspective, this scenario produces the highest amount of density in terms of number of dwellings and an increased amount of diversity and accessibility within the neighborhood as well.

Coming back to the question of spatial justice, such a scenario, while makes economic sense, could potentially be detrimental to the neighborhood because of network effects of over-gentrification. Since citizens aren't organised in this scenario, they might not be able to provide solid alternatives, but only respond to what's presented.

As we've seen in other cases, a neighborhood park or a street upgradation might be projected as something that improves the rest of the neighborhood, but because of the difference in the quality of existing buildings, they wouldn't read as part of the neighborhood. Let's look at an example of a scenario where the residents are organised as an alternative.

Fig 10.6: Radar chart showing the quantity of different layers in scenario 1.

Source:Author

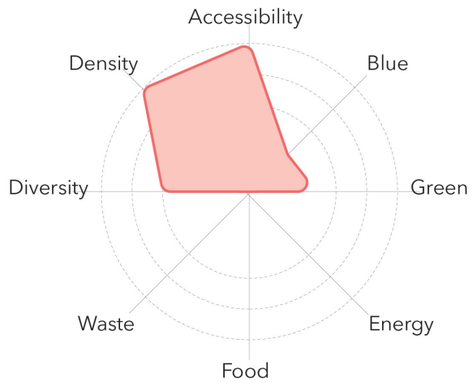
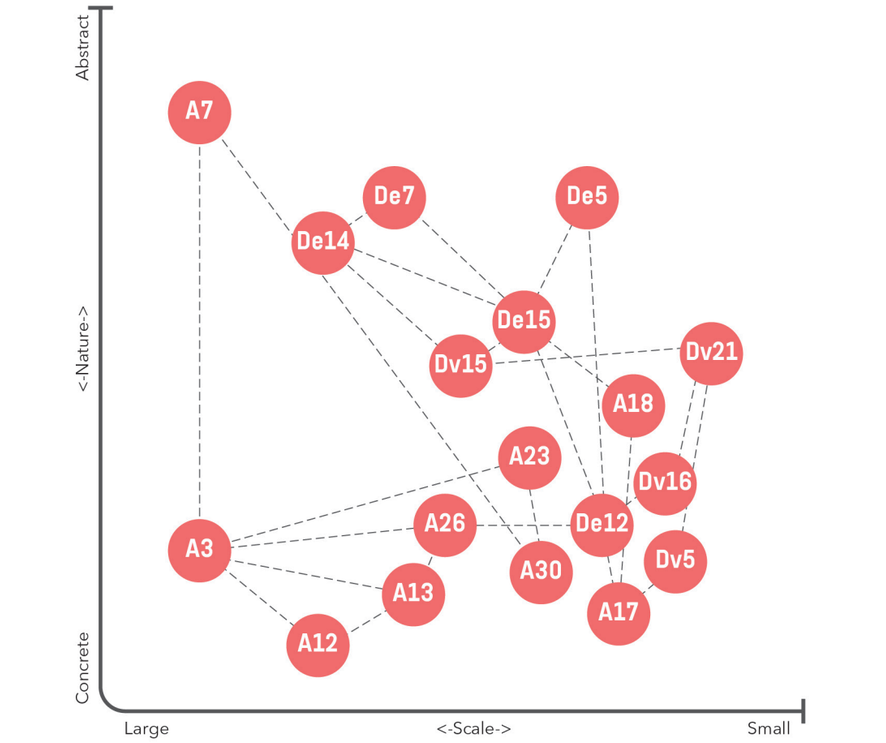
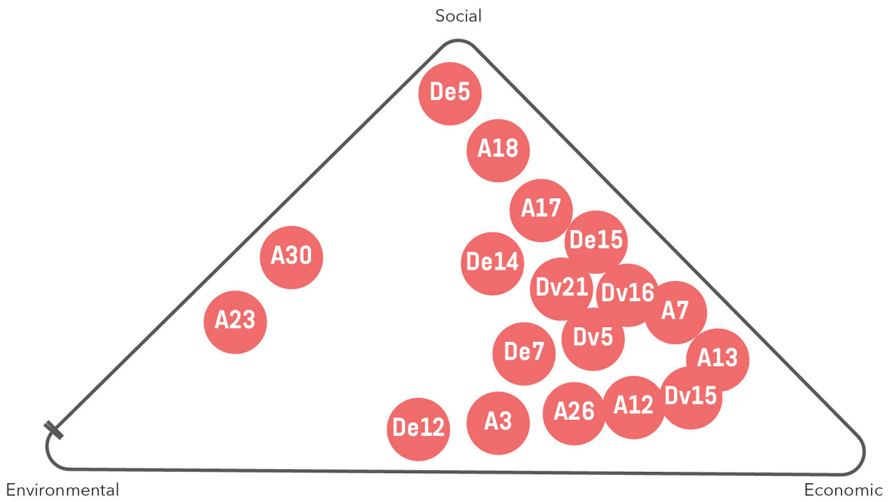


Fig 10.7: Relations of patterns used in scenario 1.

Source:Author





10.3.2 Scenario 2

The underlying structure proposed in the strategic plan is realised and the community is well organised at the neighborhood level.

Densification towards housing and climate adaptation as the leading scope.

Moving the Karspeldreef to the grade level, increases available real estate for development. In this scenario, since we assume that the residents are organised, the development comproses of three housing co-operatives (De15) that includes part of the old neighborhood, and a part of the new land opened for construction.

Huigenbos, Hogevecht and Hakfort form individual housing co-operatives based on the above mentioned setup. This would require the handing over of the social housing units to the newly formed housing co-operation from the existing housing corporations.

Within the housing corporations, if we use local policy modifiers to adapt the existing limit of 40-40-20 towards social, medium and high end housing, more medium housing could be constructed, since the existing housing complexes have predominantly social housing.

Thus, extra medium priced housing could be offered to residents moving within the neighborhood from one of these social housing complexes, thus opening up new social housing units as well.

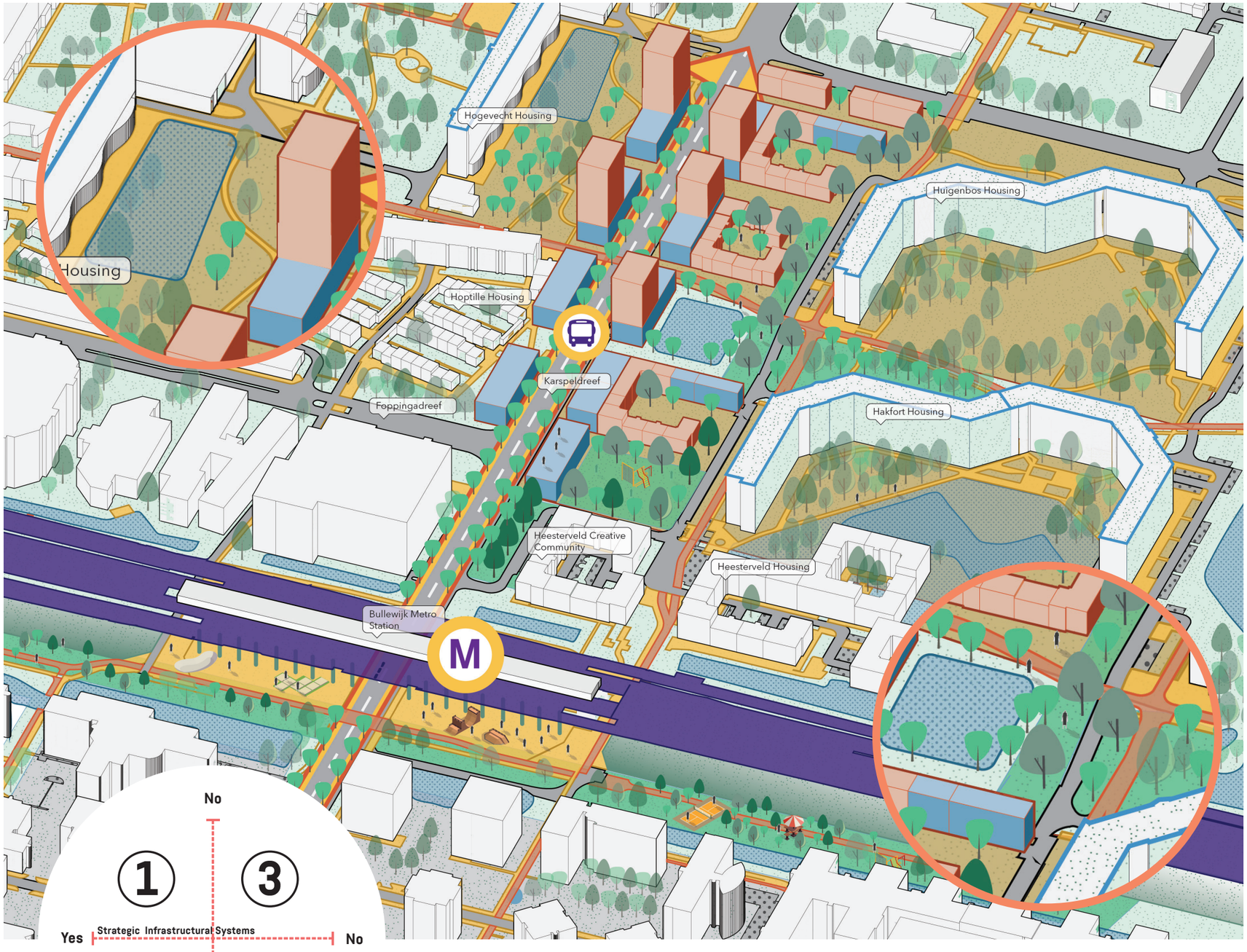


Fig 10.8: 3D view of the Bullewijk cluster based on scenario 2.

Source:Author



Since the new construction includes overlapping social linkages, new amenities such as park feel shared and are not territorial. New residents also join a co-operative housing community with a stated intent and not as speculative house flippers.

Since development is driven by housing co-operatives, some of the profit generated through commercial use could be used towards expanding the water holding capacity and rainwater harvesting in older structures within the housing co-operative as well, thus extending the benefit of the new development beyond the scope of the original site. This could be managed in the long term by a water forum, that brings neighborhood champions with expertise on water management.

This scenario also includes the capital expenditure of downgrading Karspeldreef, upgrading the station plaza and the railway park, this can be offset to a certain degree through the provision of added commercial space in the ground floors.

As part of the co-operatives, some of these are reserved for the local residents, thus promoting local entrepreneurship as well.

In terms of numbers, the density, diversity and accessibility of this scenario is as good as the previous one, but because we had climate adaptation as a leading scope as well, we could achieve an increase in green area and water storage capacity, because of the expansion of the site under consideration and upgrading the neighboring residential complexes as well.

The patterns are still concentrated at the socio-economic space, as is the case with any mixed-use development, however the focus on climate adaptation, balances it to a certain degree.

There are more abstract patterns that the previous scenario owing to the fact that there is a large amount of organisational setup required to achieve this sort of development.

Fig 10.9: Radar chart showing the quantity of different layers in scenario 2.

Source:Author

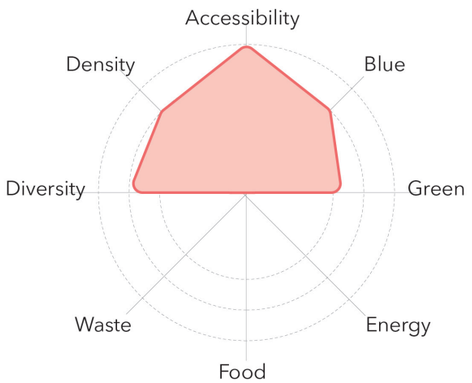
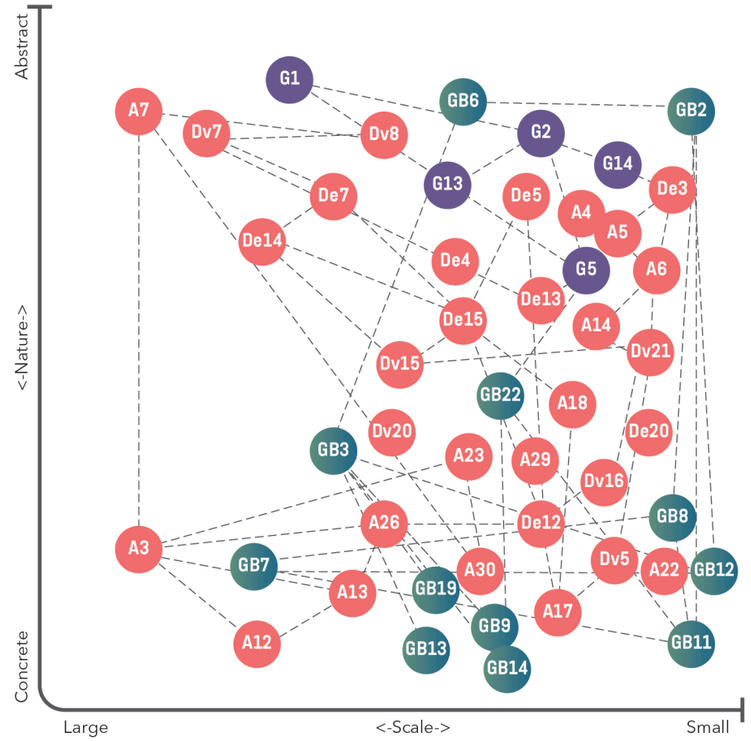
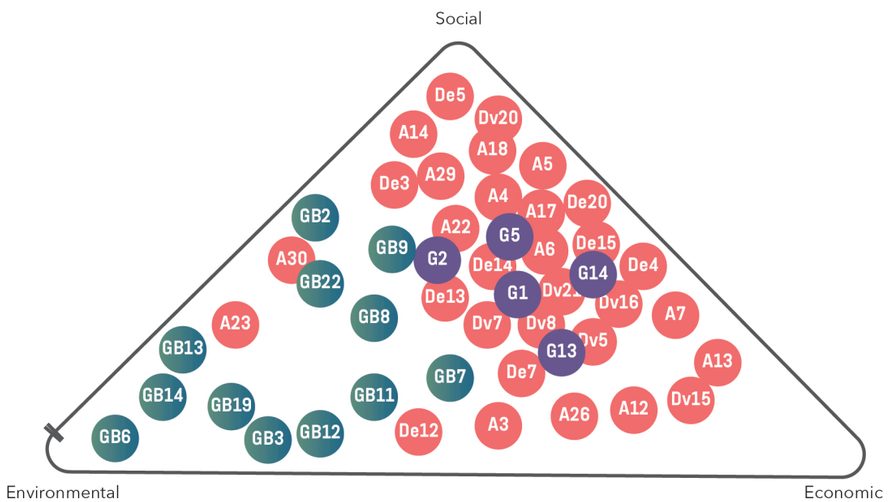


Fig 10.10: Relations of patterns used in scenario 2.

Source:Author





10.3.3 Scenario 3

The underlying structure proposed in the strategic plan is not realised and the community is not well organised at the neighborhood level.

Organising residents as the leading scope.

In this scenario. Karspeldreef is still elevated, and there is no extra real estate for development apart from the vacant lot infront of Huigenbos.

In this scenario, the assumption is that the construction halt in Zuidoost, post-corona crisis is extended and if there is less investment interest in the area, the catalytic location could still be activated, albeit for a low impact.

As the leading scope of this scenario is to facilitate resident organisation, the catalytic locations are used for short-term tactical urbanism projects and pilot projects towards testing different conditions as explained in the operational framework.

There is very little change to the existing urban form. The building with the highest adaptive capacity is the Hakfort parking garage, which is upgraded to include a community space, which can be a space to host discussions towards the future of this location.

Three pilot projects could be proposed in this location.

The roof of the garage is to be fitted with solar panels for testing by the municipality which could be sold

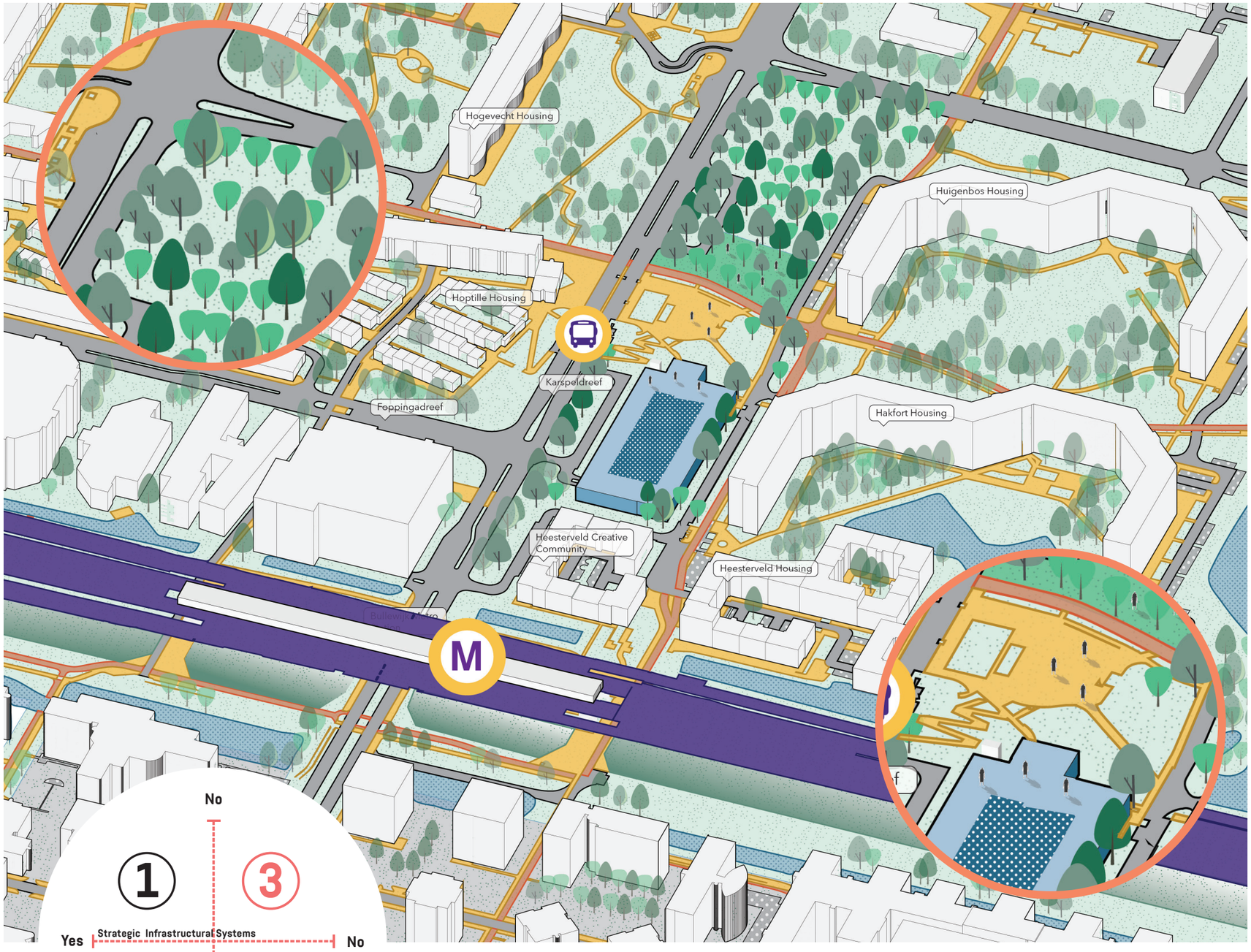


Fig 10.11: 3D view of the Bullewijk cluster based on scenario 3.

Source:Author

eventually to future developments in the area. This can act as seed-investment towards setting up an energy co-operative in the neighbothood.

Part of the vacant land infront of Huigenbos could be used to grow trees which sequester carbon meanwhile and promote infiltration. If the right kind of trees are chosen, they could eventually be used for construction of housing in this neighborhood in the future. However, this depends on how long the site will stay idle.

The remaining portion of the vacant land could house a small scale community garden along the edge as a seed-investment for the farmers co-operative to bring interested residents together towards growing their own food.

With very little investment, three forms of community organisations could be started, and based on interest from the community, the direction of the development in this particular site could be determined, when more capital is available as well.

In terms of quantity, there is an increase in the amound of green space, energy and food produced. These functions create a spike in diversity of functions as well.

Patterns are mostly evenly distributed towards the centre in the social, economic and environmental spectrum, owing to the fact that there is a mix of attempts being made towards identifying a lasting setup.

Fig 10.12: Radar chart showing the quantity of different layers in scenario 3.

Source:Author

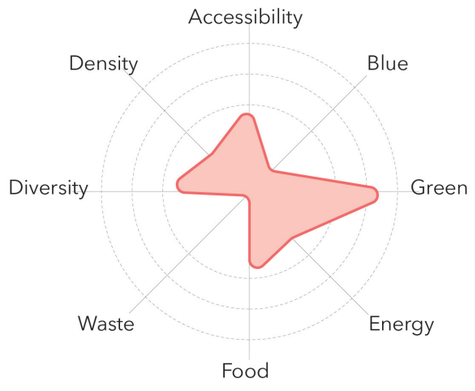
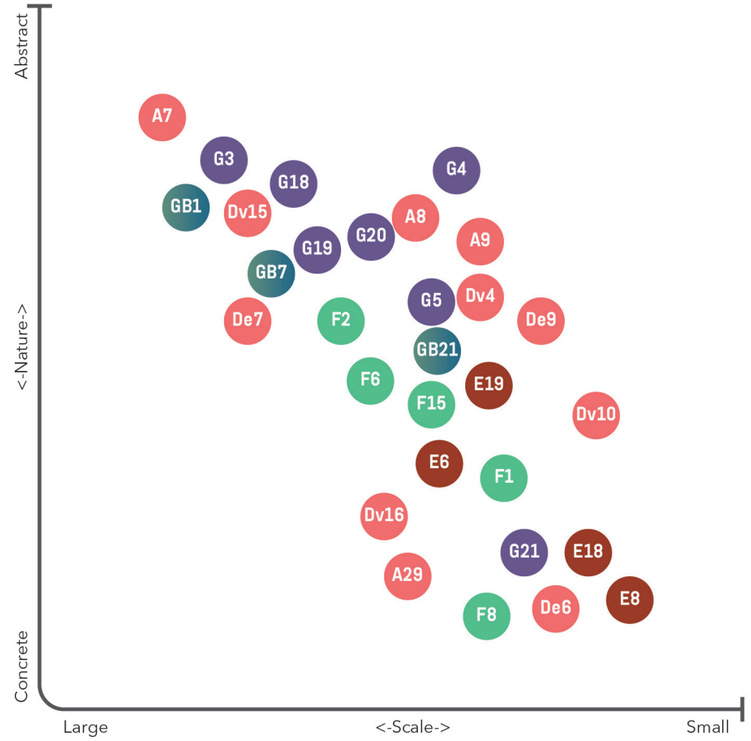
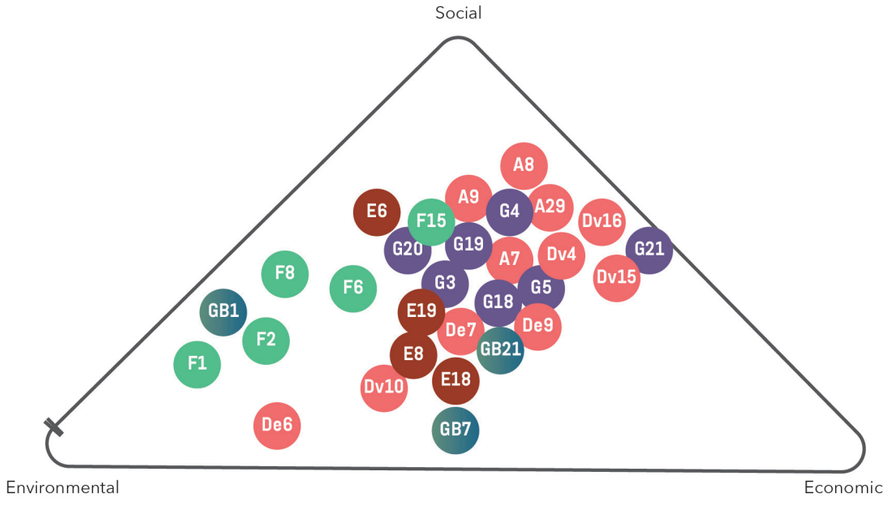


Fig 10.13: Relations of patterns used in scenario 3.

Source:Author





10.3.4 Scenario 3A

The underlying structure proposed in the strategic plan is not realised and the community is not well organised at the neighborhood level.

Climate adaptation as the leading scope, with food production and housing provision as trailing scopes.

This scenario could potentially be considered as a development from a previous scenario, assuming that climate adaptation emerges as a leading scenario.

Since the Karspeldreef is still elevated, there is no extra real estate for development. The demolition of the parking garage towards opening up new land is used to form a mound towards the edge of the site.

In line with the leading scope, large waterbodies are created in place of the parking lot, to expand the water holding capacity of the neighborhood, which could be beneficial especially if the construction on Amstel III picks up pace and there is an increased amount of paving, leading to higher run-off.

The trees grown in Scenario 3 could be used to construct detached wooden homes around these waterbodies.

The land is allowed to be reclaimed by nature to a certain degree.

The kind of housing is in stark contrast to the immediate built fabric.

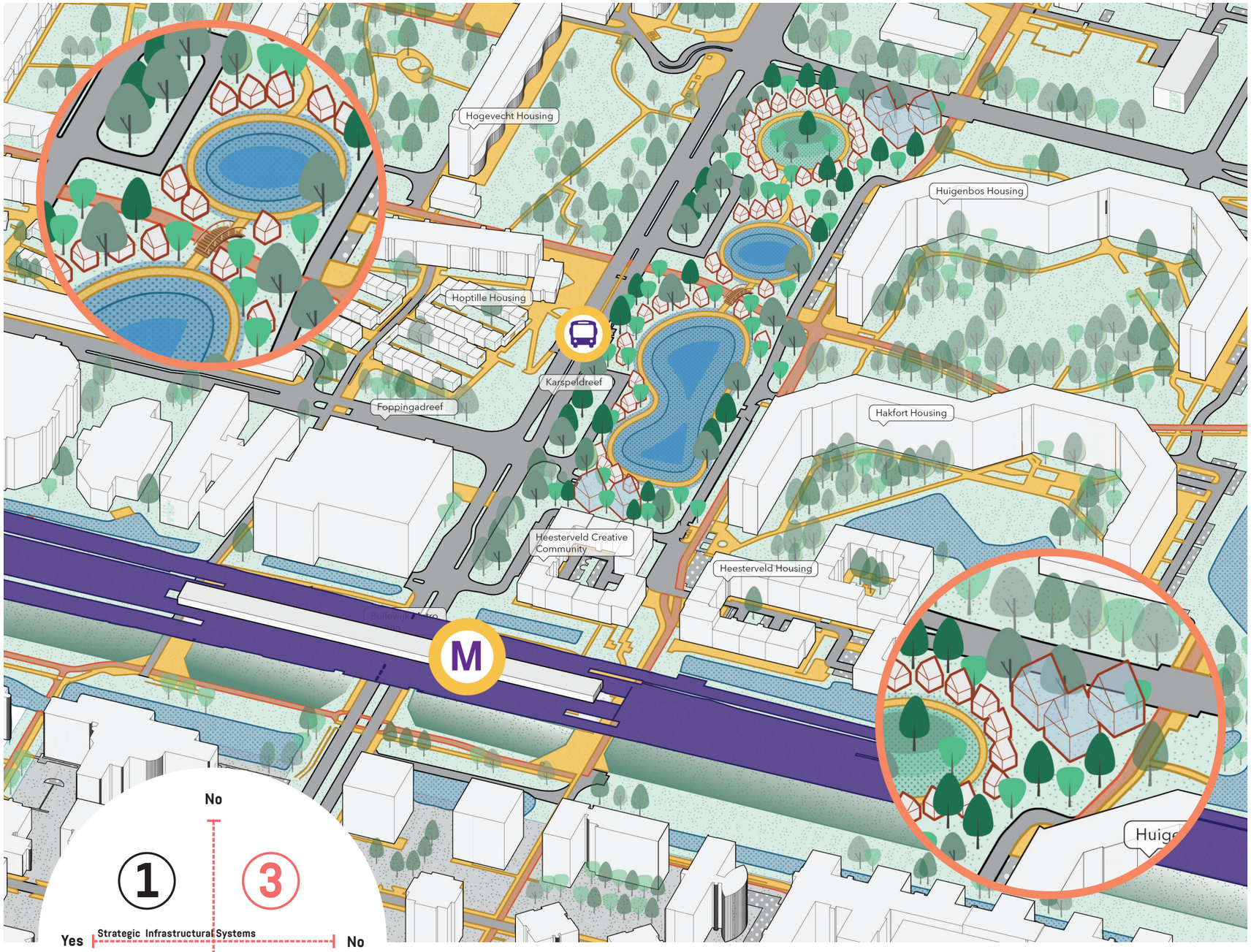


Fig 10.14: 3D view of the Bullewijk cluster based on scenario 3A.

Source:Author

Fig 10.15: Radar chart showing the quantity of different layers in scenario 3A.

Source:Author

However, the contrast could be used as an activator since some of these wooden cabins could be rented during the summers to bring tourists from Amsterdam centre to Zuidoost.

Food is produced on site in greenhouses placed along the edges of the site, which could still be operated by the farmers co-operative.

The housing is not temporary and is again a temporary solution in place of a long term solution, if there is less interest towards investment in this neighborhood.

Once, an investment decision has been made, the cabins could then be moved around the city-district in locations that are waiting to be developed.

In terms of quantity, this scenario expands the green and blue area considerably, with a modest increase in density and diversity. However, practically, such a scenario is the farthest from happening, especially considering the current pressure for housing in Amsterdam.

However, this is a potential way in which the site could respond in case of an extended crisis.

Since climate adaptation is the leading scope, majority of the patterns are oriented towards environmental concerns and more shared concerns.

There are more abstract patterns as well, since this scenario involves a lot of preconditions within the site that needs to be substantiated as well.

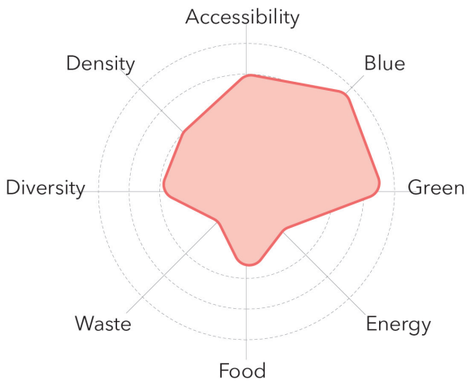
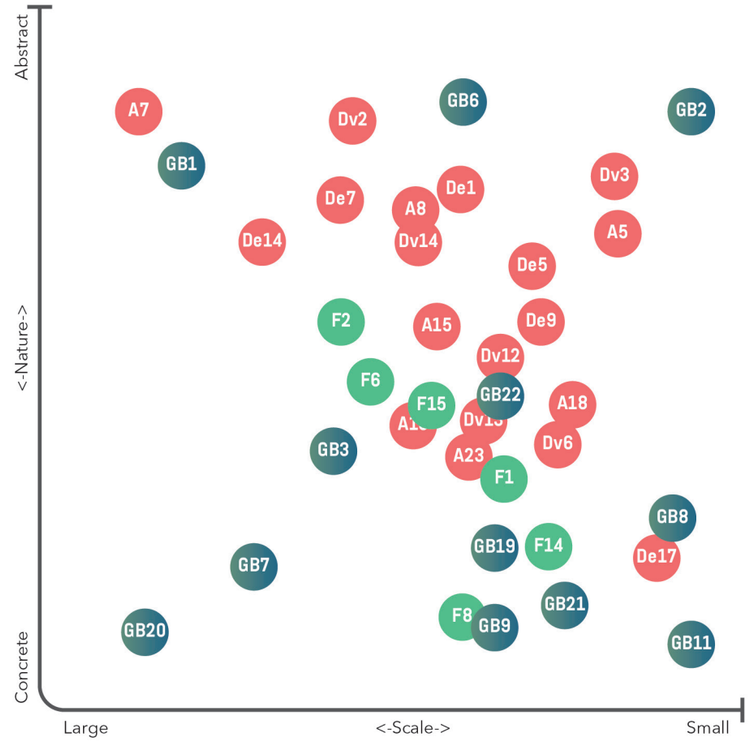
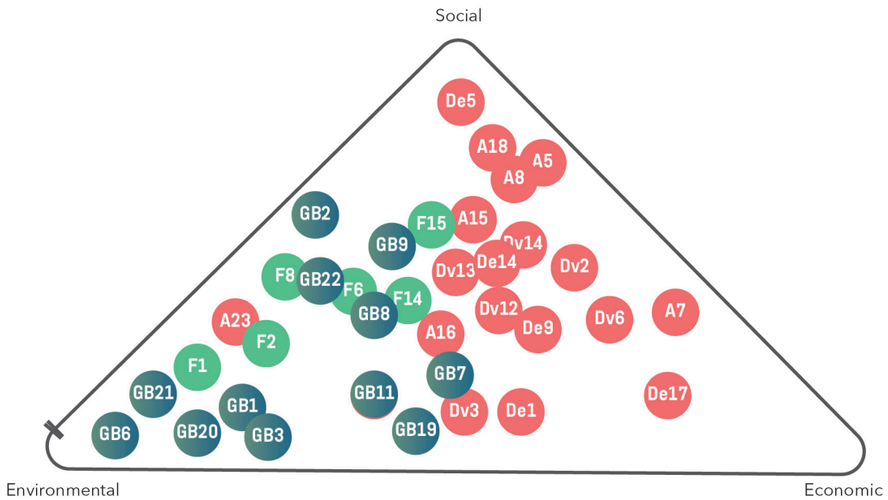


Fig 10.16: Relations of patterns used in scenario 3A.

Source:Author





10.3.5 Scenario 3B

The underlying structure proposed in the strategic plan is not realised and the community is not well organised at the neighborhood level.

Densification towards housing provision as the leading scope, with food production and energy generation as trailing scopes.

There are three options tested in this particular starting condition, because this is the current state of the site. The strategic structures proposed aren't introduced, and the citizens aren't actively organised. So, testing multiple options within this condition, helps us understand the possibilities better.

Since the Karspeldreef is still elevated, there is no extra real estate for development. The existing land is densified in through three city blocks that are built to be climate neutral in line with the trailing scopes.

The open space around the site is used for both local recreation as parks and for food production for the inhabitants.

The roof of the buildings are used for energy generation. It is Possible to develop climate neutral developments within the existing system of area-baed development. The kind of urban form with shared community spaces for activities such as urban farming could potentially lead to social cohesion within the new development.

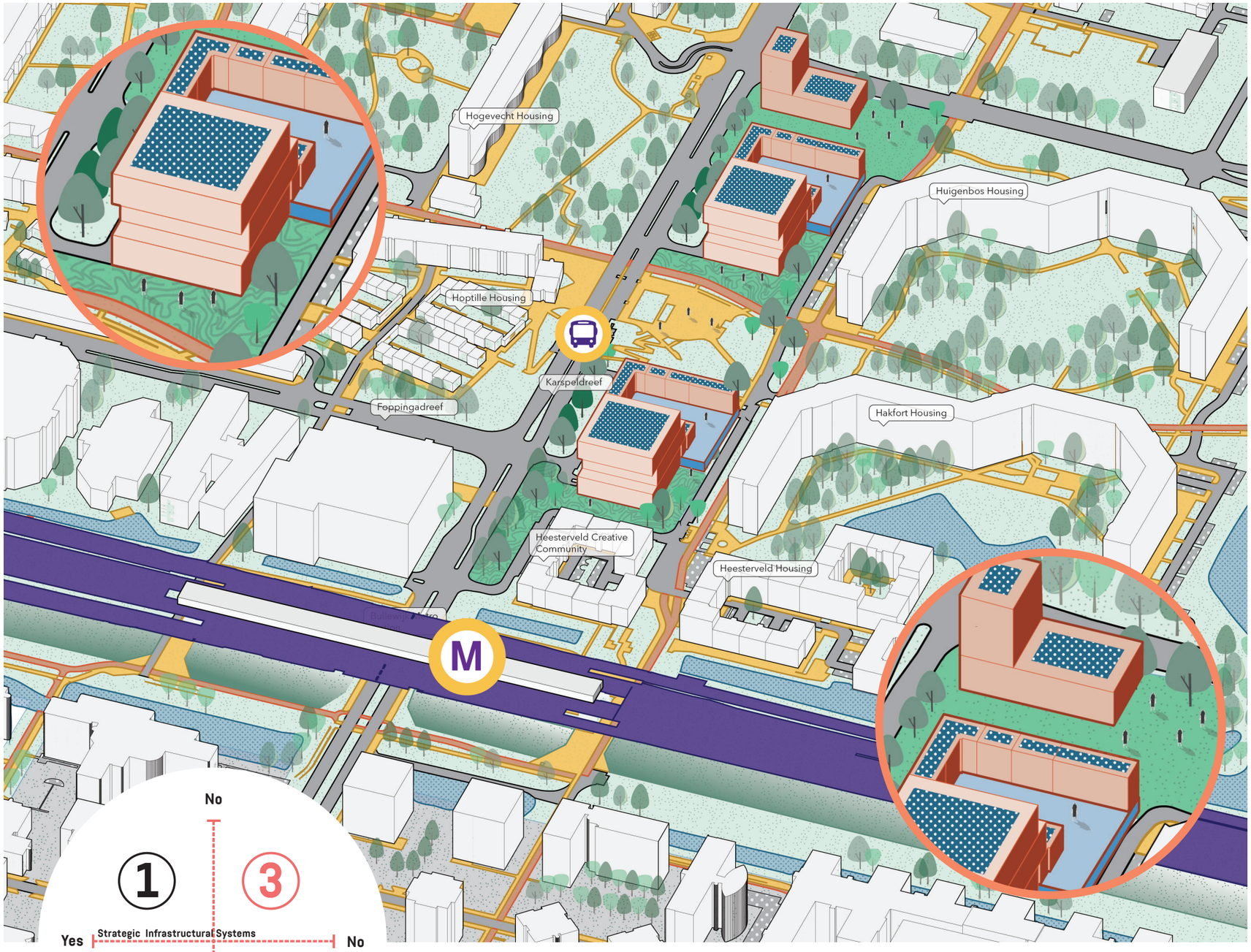


Fig 10.17: 3D view of the Bullewijk cluster based on scenario 3B.

Source:Author

However, by focusing only within the area under development, the synergestic effects that could be potentially achieved beyond the site are not fully realised as we saw in scenario 2.

There is a draft proposal for this site currently which is similar to this scenario, where three city distinct buildings are to be developed within this area, with a few extra amenities towards benefiting the community.

The plinth of these buildings could be used for commercial uses, however since they are facing a street of lower hierarchy, having intense functions wouldn't be feasible similar to scenarios 1 and 2. Hence, the functions could be more community focused such as community centre, food bank or a community kitchen, in line with the trailing scope of the food system.

In terms of quantity, there is higher density than the previous two scenarios, however food and energy production are significantly higher in this scenario. This reveals that integrated design that brings together different scopes is possible within the existing system as well, however integration at the spatial scale and integration of existing residents and stakeholders wasn't achieved in this scenario.

With the patterns, similar to other housing focused scenarios, there is a higher concentration of socio-economic patterns, the leading trails contribute to the environmental patterns that balance it to some degree.

Fig 10.18: Radar chart showing the quantity of different layers in scenario 3B.

Source:Author

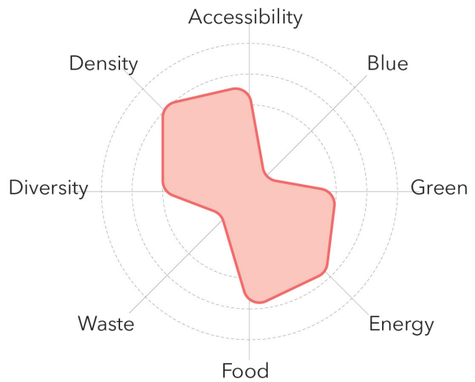
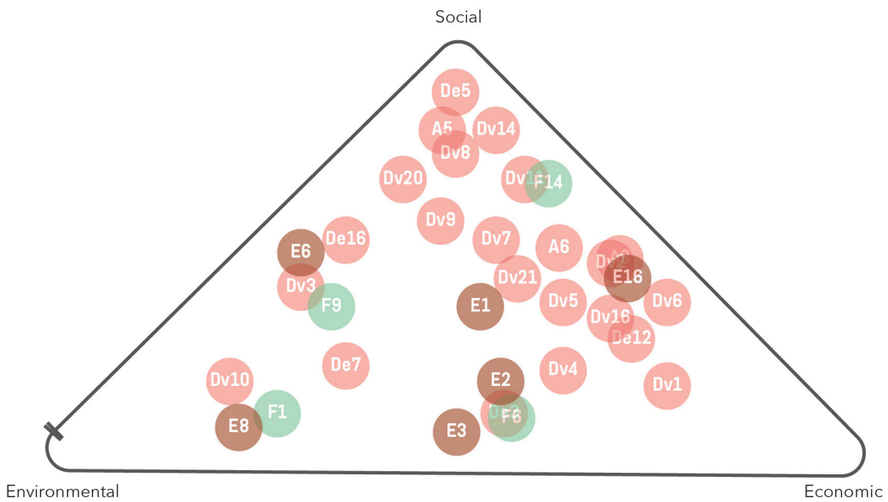


Fig 10.19: Relations of patterns used in scenario 3B.

Source:Author





10.3.6 Scenario 4

The underlying structure proposed in the strategic plan is not realised but the community is well organised at the neighborhood level.t

Energy production and densification towards housing production as the leading scope.

Since the Karspeldreef is still elevated, there is no extra real estate for development. In this scenario, since we assume that the residents are organised, the development comproses of two housing co-operatives (De15) that includes part of the old neighborhood, and a part of the land opened for construction.

Huigenbos and Hakfort form individual housing co-operatives based on the above mentioned setup. This would require the handing over of the social housing units to the newly formed housing co-operation from the existing housing corporations.

Within the housing corporations, if we use local policy modifiers to adapt the existing limit of 40-40-20 towards social, medium and high end housing, more medium housing could be constructed, since the existing housing complexes have predominantly social housing.

Thus, extra medium priced housing could be offered to residents moving within the neighborhood from one of these social housing complexes, thus opening up new social housing units as well.

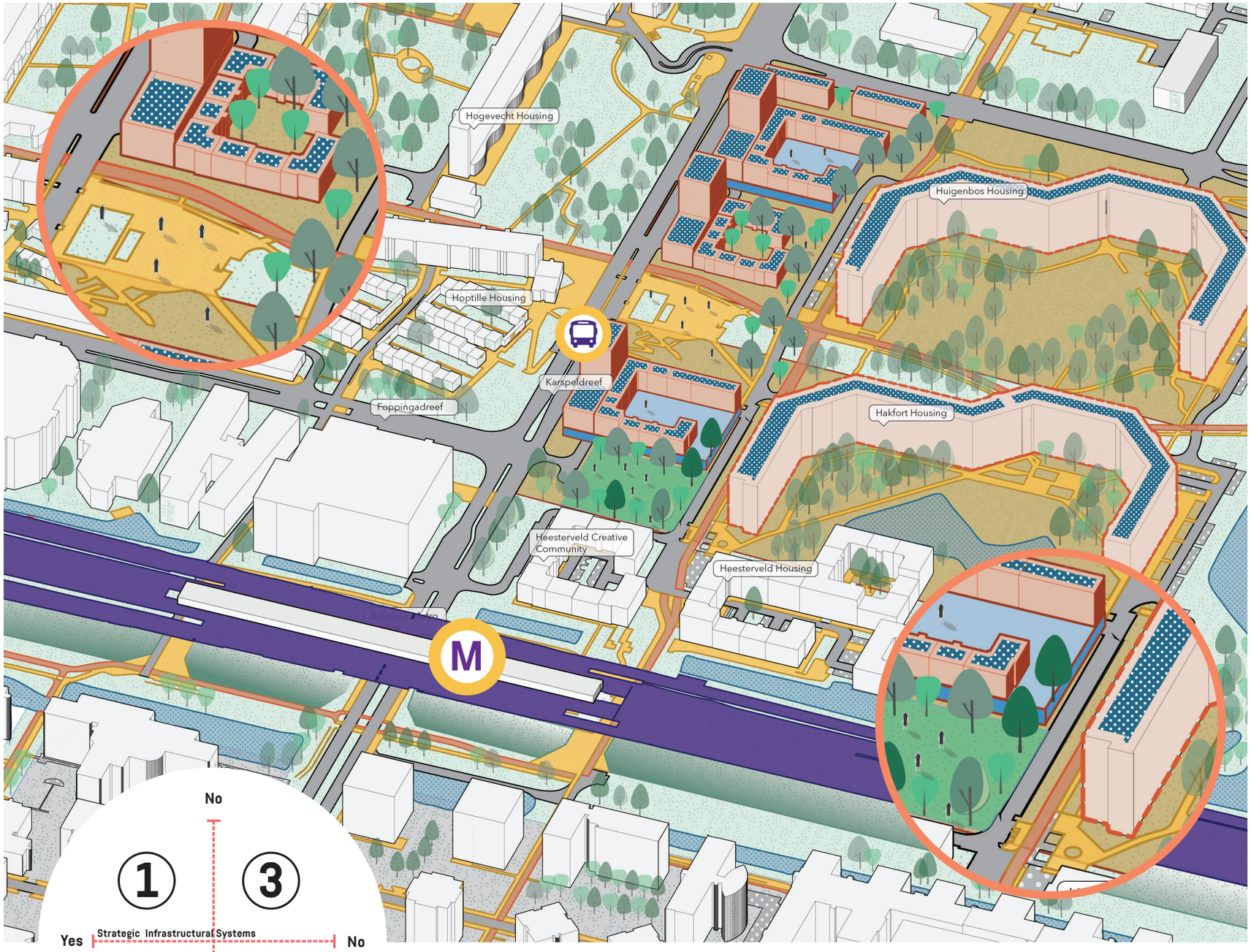


Fig 10.20: 3D view of the Bullewijk cluster based on scenario 4.

Source:Author

Fig 10.21: Radar chart showing the quantity of different layers in scenario 4.

Source:Author

Since the new construction includes overlapping social linkages, new amenities such as park feel shared and are not territorial. New residents also join a co-operative housing community with a stated intent and not as speculative house flippers.

Since development is driven by housing co-operatives, some of the profit generated through commercial use could be used towards expanding the energy generation capacity and insulation of older structures within the housing co-operative as well, thus extending the benefit of the new development beyond the scope of the original site. This could be managed in the long term by an energy co-operative, that brings neighborhood champions with expertise on energy transition.

The plinth of these buildings could be used for commercial uses, however since they are facing a street of lower hierarchy, having intense functions wouldn't be feasible similar to scenarios 1 and 2. Hence, the functions could be more community focused such as community centre, energy hub or a energy transition incubator, in line with the trailing scope of energy production.

As part of the co-operatives, some of these are reserved for the local residents, thus promoting local entrepreneurship as well.

In terms of numbers, the density, diversity and accessibility of this scenario is not as high as the first two scenarios due to space limitations. However, with energy generation as a leading scope as well, we could achieve an increase in energy generated and net energy conserved within this neighborhood, because of the expansion of the site under consideration and upgrading the neighboring residential complexes as well.

The patterns are more evenly distributed to represent social, economic and environmental concerns.

There are some abstract patterns that help structure the of organisational setup required to achieve this sort of development, beyond which, it is mostly concrete small scale patterns focusing on specific implementations.

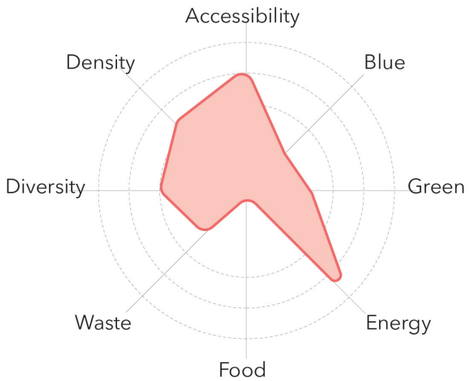
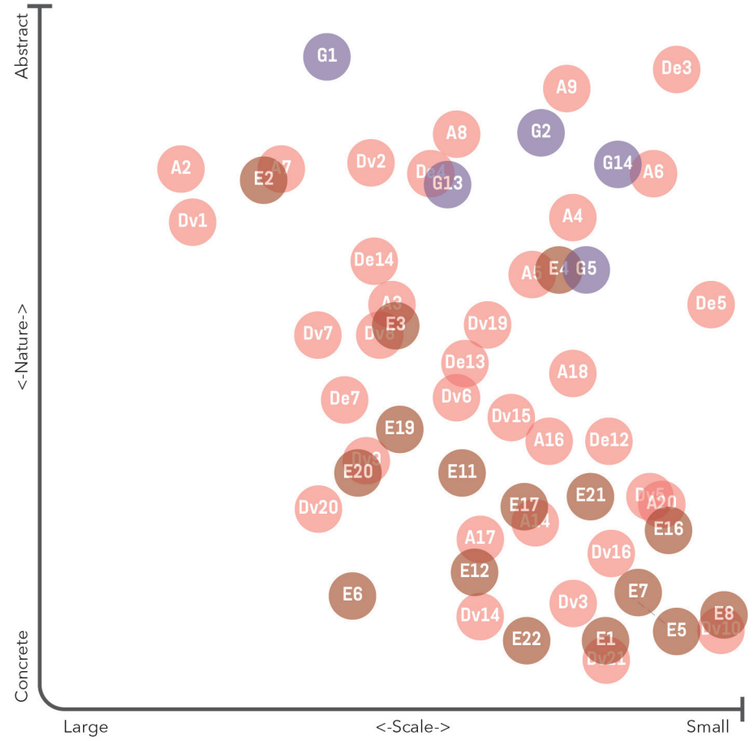
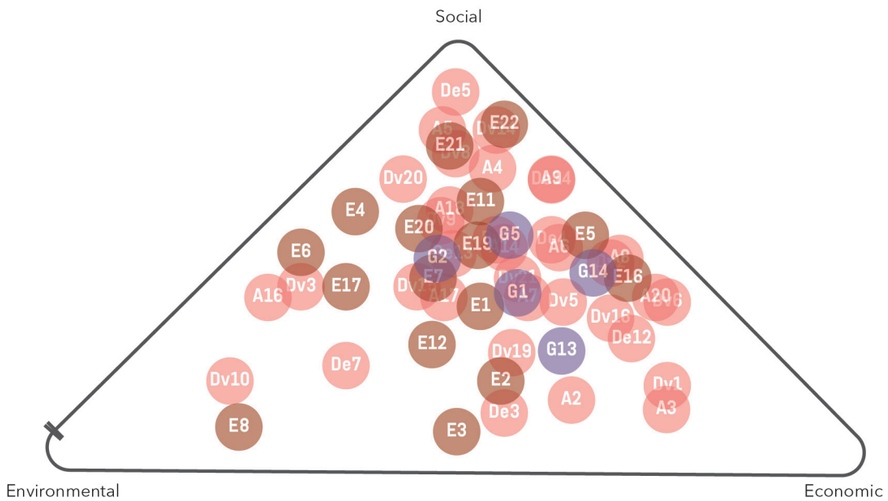


Fig 10.22: Relations of patterns used in scenario 4.

Source:Author





10.4 Adaptive Pathways

We discussed some of the possible scenarios that could potentially unravel in the site, given the starting conditions and the leading scope.

One another important reading from the scenarios based design testing is the degree of adaptability within each scenario.

The site as it stands now, has the potential to become anything. But, its adaptability reduces drastically, as soon as it is densified to the maximum, because then there isn't enough buffer space left to adapt to any changes.

The leading scopes would change over time. The housing demand might dissipate if there is a bad economy for a few years together, tying up a large investment in one site could be potentially dangerous.

An adaptive pathways way of thinking reveals the different directions a potential development could take, before adapting to another state based on changing conditions.

If we treat cities as complex adaptive systems, it is important to provide the buffers necessary within the system to adapt to changing external conditions. As mentioned before, Zuidoost's urban form provides plenty of opportunity to adapt it to respond to changing needs.

While, the potential study was a way towards understanding the possibilities within a neighborhood, maximising one particular layer shouldn't be the end goal. It is the delicate balance of the layers discussed so far that would bring about a more resilient development process that can respond to changing times.

It is not just the processes, but also the institutions we build along the way, that are crucial to this capacity of the city. Within this scenario based design testing as well, the possibility of having community co-operatives beyond the traditional site bounds, opened up new possibilities for transformation within the neighborhood as well.

We'll discuss the evaluation of the design testing and design recommendations in the next chapter.

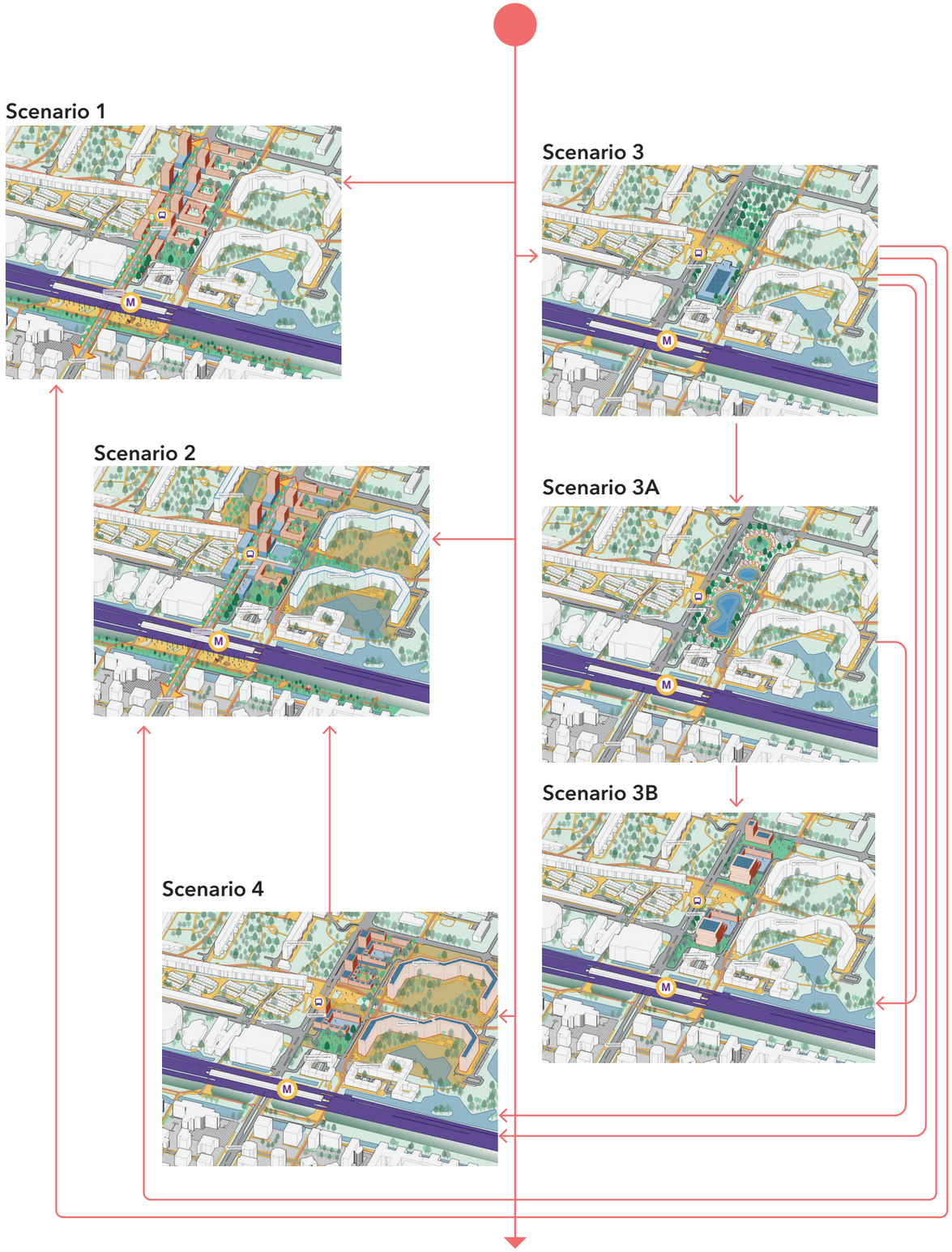


Fig 10.23: Adaptive Pathways

Source:Author

10.5 Evaluation and Recommendations

To give a quick recap of the process so far. We analysed the city district based on various layers to identify the opportunities and urgencies.

Based on those, a strategic framework with catalytic locations were proposed. In order to identify the actions that needs to be made at the catalytic locations, a potential study was done to derive a set of patterns.

To operationalise the patterns, an operational framework that proposes how integrated urban development process could take place was detailed.

The patterns were then tested in a high impact site within Zuidoost to see how it would transpire based on different starting conditions.

The main research question for this project was

"How can fragmented and vulnerable neighborhoods of Amsterdam Zuidoost become more livable, sustainable and just through an integrated urban development process?"

The strategic framework proposes a spatial structure for integrating the fragmented neighborhoods of Zuidoost, the patterns for livability, sustainability and spatial justice focus on improving the process and product of urban development in Zuidoost. Here, because of the relational nature of the pattern language, using them as a tool for design, brings different possibilities together. For example, if an open space needs to be redesigned, looking at all patterns with open space as the type will reveal the possibilities, and we can choose a possibility based on the contextual reading and the leading scope for the project, even still, it reveals the other sustainability, livability and procedural patterns towards spatial justice that are linked to it, thus helping us design in an integrated way and not in silos.

This is the first part of integrated design, to not design in silos. The second part focuses on the spatial aspects of looking beyond the site boundaries. Approaching urban redevelopment based on the catalytic locations means that every potential location is a project that needs to be synthesised based on the local available synergies, this means thinking beyond the boundaries and seek out to build synergies, as we saw in the examples of scenarios 2 and 4.

The third part is to position the community front and centre. The operational framework provides a clear framework for how this could be done. Subsidiarity at the neighborhood level ensures that the proposals reflect the actual conditions on ground based on how people experience their everyday life. While a nodal agency ensures that there is alignment with the larger city level visions and ambitions, which set the space of play.

Reterritorialising Zuidoost towards livable, sustainable and just assemblages requires the combined effort of organised citizens, it is through their empowerment, long lasting upliftment of the community and the upkeep of the neighborhoods could be achieved.

Finally, spatial justice in this project focuses on procedural and distributive forms of spatial justice as described within the operational patterns in chapter 9. This puts a lot of onus on communities to be driven and work in good faith. This is something that is not always easy, thus requires a long-lasting mutual relationship of trust between the community champions and the municipality as represented in the neighborhood planning office. Another major concern is that, most poor neighborhoods aren't great at participation because residents don't have the time to engage in long discussions when they have to do multiple jobs to stay afloat.

That is why the process proposes a formalised way of organisation where participants are compensated for their time and effort, through the effective functioning of the community organisations that they represent and each organisation is in turn responsible for maintenance and management of community assets. This in turn could be developed into a sustainable business model for self-organised effective citizenship at the neighborhood scale.

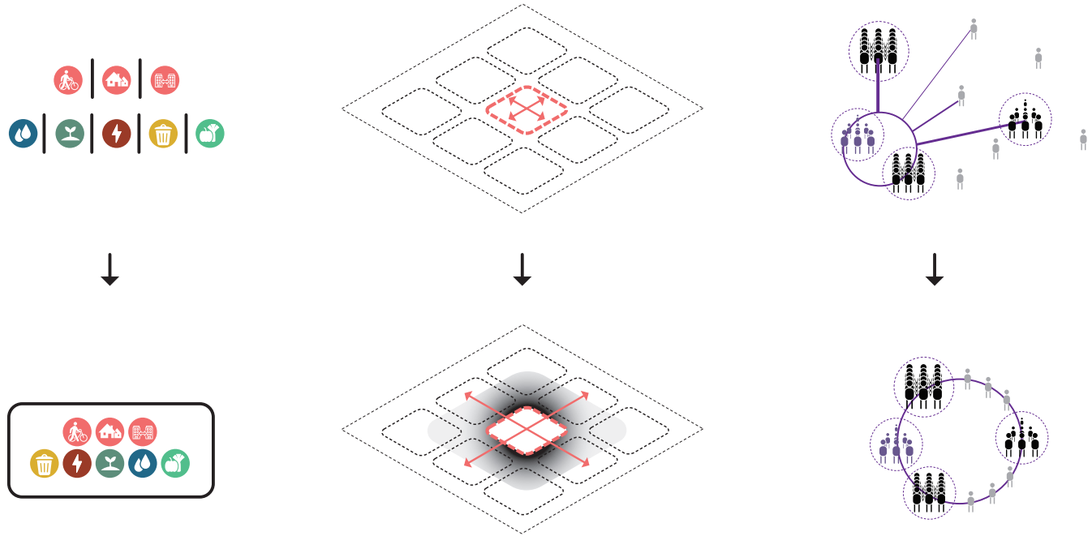


Fig 10.24: Conceptual representation of the integrated development process.

Source:Author

11

Conclusions and Reflection

11.1 Conclusions

Main Research Question:

How can the fragmented and vulnerable neighborhoods of Amsterdam Zuidoost, become more livable, sustainable, and just, through an integrated urban development process?

In the problem definition, we identified Zuidoost to be composed of spatially fragmented and vulnerable neighborhoods, which were further analysed to identify specific opportunities for catalytic change from multiple perspectives, considering the current demands for densification and socio-technical transition towards sustainability.

Livability, sustainability and spatial justice were identified as the objectives of an integrated urban development process. Specific spatial and policy actions in the form of a pattern language was developed towards achieving the stated objectives, which helps operationalise catalytic actions within the neighbourhoods.

The strategic spatial framework and operational framework propose a model for integrated urban development process, that brings together knowledge from multiple disciplines, perspectives from multiple stakeholders. and an expanded spatial thinking in a process of co-production facilitated by the pattern language.

SRQ1 What is the relationship between livability, sustainability and spatial justice in an urban development context?

Livability and sustainability are interrelated but have conceptually different objectives, and due to their loose conceptual boundaries, the terms are being appropriated in different contexts. There can be livable communities without sustainability, albeit for a short time, since it wouldn't be sustainable long term. Suburban neighborhoods are generally considered more livable in common perception, even though the urban form isn't sustainable. Alternatively, sustainable settlements could potentially be less livable if human conveniences are not addressed.

To give a general overview:
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Livability - Human centric, local condition with a global effect
Sustainability - Systems centric, global condition with a local effect.

Livability is influenced by spatio-temporal culture and context and is a contested topic in a multi-ethnic and multi-cultural setup with different perspectives and worldviews. Sustainability is concerned with the sustenance of resources and systems over a long period of time.

In the context of the urban development process, both livability and sustainability are 'objectives' to be achieved and aren't mutually exclusive, but compatible concepts.

However, the way in which livability and sustainability are defined and measured is a political act because these definitions and measures can justify actions which would otherwise be considered unethical or immoral. For example, using the Rotterdam act, the municipality of Rotterdam forbids certain groups of poor residents from moving into certain neighborhoods. This sort of exclusionary policies are justified under the guise of improving the livability of the neighborhoods. Subsidies towards promoting electric vehicles or solar panel installations disproportionately help rich individuals, while poor neighborhoods with low-quality housing stock pay more in energy bills.

This is why it is important to recognise the notion of spatial justice while spatialising livability and sustainability objectives. The current economic system is inefficient when it comes to equitable wealth distribution and actions driven by livability and sustainability concerns, while well intended, could potentially have unintended consequences. This is why the project proposed a more integrated urban development process, where concerns of livability and sustainability are addressed through a process of co-production, where citizens have the ability to define and design their neighborhoods promoting procedural, distributive and distributive forms of spatial justice. especially in contested neighborhoods.

SRQ2 How did the urban development process of Amsterdam Zuidoost influence its social, spatial, economic and environmental realities?

The historical development of Amsterdam Zuidoost was discussed extensively in chapters 3.1 and 6.1. It was further analysed in terms of specific layers in subsequent chapters in Chapter 6.

The development was driven by a top down technocratic process which was built on modernist ideology and grand-narratives of life. It was unable to respond to the changing conditions on ground. Between the proposal and completion, local and global changes within the Amsterdam context and the global Dutch colonial kingdom's context. For example, cheaper owner occupied housing that was made available in the region at Lelystad and Almere proved more attractive to the Dutch middle class that Bijlmermeer was targeted at. A large exodus of Surinamese to the Netherlands, who were discriminated against from the old neighborhoods, occupied housing in the Bijlmermeer, separated from the rest of the city. Since a large number of new residents didn't have social networks that overlapped with people in the rest of the city, where jobs were available, they were deprived of potential job opportunities, paving way for a history of concentrated poverty.

While the physical design addressed most of the problems of the era and proposed innovative solutions for them, the design 'worked' as a whole and not in parts, thus the years leading to its completion were filled with a lot of problems, due to a lack of amenities and proper access. This was due to budget cuts and design changes during the process, such as reducing the number of lifts in an apartment to the metro connection to the city, delays and changes to some of the infrastructural preconditions made Bijlmermeer less than habitable.

Some of the proposed solutions to existing problems were problematic. Modernist mono-functional zoning deprived Bijlmermeer's potential to develop into a bustling urban centre. The transport design put cars central with grade separation and a garage to garage design. Most of the garages were largely empty. Since they were static spaces they also became perfect breeding grounds for crime and anti-social activities. The grade separation led to a creation of a vast expanse of walking and cycling network in the ground plane. But they passed through large unarticulated green spaces with less social control and were less than ideal at the end.

The second order, third order effects of initial mistakes were too difficult to rein back. Eventually, in the renewal of the Bijlmermeer, the authorities continued to make the same mistakes from a procedural perspective. Opting for top-down demolition and reconstruction of a large part of the urban fabric. Aspects of landmark driven urban renewal was attempted through the construction of Johan Cruyff arena and the upgradation of Amsterdamse Poort. However, they were framed to serve the larger context of Amsterdam both physically and mentally through branding and association and not the local Bijlmer context.

The challenge of adapting these urban fabrics that followed a different social and developmental logic is still there. While we shortly discussed the shortcomings in the original design and the renewal process, there is still potential for redemption. The urban fabric of Bijlmermeer has large buffers built into it, which

are adaptive to future use. Not only that, in the recent years, there has been an increasing politicization of organising at the grass root levels in Bijlmermeer leading to strong community associations that can lead redevelopment from a community friendly perspective as proposed in the operational framework of the project.

SRQ3 What are the potentials and urgencies regarding densification and socio-technical transition towards sustainability in Amsterdam Zuidoost?

The potentials and urgencies in Zuidoost in relation to Densification and Socio-technical transitions towards sustainability were explored in Chapter 6 in detail. Identification of which led to the development of the strategic spatial framework bringing together the potentials.

The potentials in the existing urban form and infrastructural systems were catalogued as catalytic locations in Zuidoost which are conducive for a wide range of new developments. Specific actions at the catalytic locations are expanded in the pattern language.

SRQ4 What are the patterns of liveable, sustainable and just settlements?

In this project, pattern language as a relational tool has been adopted to engage with the complexity of multiple perspectives without having to engage in reductive processes to make it comprehensible. Patterns are individual abstractions of specific ideas - spatial action or policy suggestion. They are then interlinked to other possibilities, which in turn form the pattern language.

They are discussed extensively in Chapter 8. The patterns are organised around specific principles, which are further expanded to reflect individual nuances. Sustainability patterns that focus on blue and green networks, energy, waste and food systems are also organised in a circular and regenerative logic of the individual system as well. Operational patterns towards spatial justice are classified into procedural and financial patterns, focusing on procedural and distributive spatial justice.

These patterns represent only a finite amount of possibilities and are not complete. There is potential to expand both the principles and subsequent patterns based on new insights and challenges as and when they arise during testing and eventual implementation.

The pattern language as a design and collaboration tool helps in communicating intent and strategising potential futures with a wide variety of stakeholders and eventually help in scaling up solutions towards other territories as well.

SRQ5 How to improve the affordance of urban form in Zuidoost towards socio-technical transitions?

Zuidoost's modernist ideals and development history has left a lot of unarticulated urban spaces that could be potentially used for productive purposes and are identified as catalytic locations. The specific actions at these catalytic locations are provided by the pattern language. The pattern language as a communication tool explicitly connects space and its potentialities from different perspectives of livability and sustainability.

In addition, the potential study expands on the identified potentialities, to understand the 'maximum' potential of specific layers. While within the project, through design testing, alternate possibilities are designed and discussed, the operational framework suggests a framework for rethinking the urban development process.

Through co-production local communities need to be empowered to 'shape' the identified potentialities as they seem fit is essential to connecting local needs and city scale/national scale targets.

To reiterate, improving the affordance of urban form involves identifying specific potentialities and making it explicit. In addition, the possibilities within those 'potentialities' need to be explored and established. With these in hand, citizens need to be empowered to realise those potentialities through co-production.

For example, in the project, the large off-street parking garages were identified as potential locations for catalytic action. As part of the potential study, various possibilities for the transformation of the parking garages were discussed under specific layers. From transforming to mixed-use building to an energy hub, these possibilities were wide. Equipped with this information, through an inclusive co-production process, the future of these parking garages could be determined.

SRQ6 How to improve the agency of low-power stakeholders in the procedural aspects of an integrated urban development process?

The project proposes a rethinking of current participatory systems which consider citizens as consultants and municipalities as the client, towards the citizens and stakeholders as co-creators with the end-beneficiaries of the neighborhood as the client.

The fundamental unit of this new system involves organising individual citizens as part of co-operatives with specific aims towards the improvement of the community. Since individual stakeholders are numerous and it is incredibly difficult to identify and address specific concerns individuals may have.

Through this process of collective organisation, individual stakeholders are empowered to have a positive impact as they are organised towards specific objectives. Co-operatives could solve the additional purpose of maintaining and leveraging shared resources towards community wealth creation, thus creating a positive feedback loop.

11.2 Reflections

Relationship between project, studio and Urbanism track

The Urbanism track in TU Delft is unique in its inter-disciplinary approach towards dealing with all things urban. The idea that urban planning and design could be studied together with a dash of urban studies was what drew me to pursue my master degree here in the first place.

Within the project, and through my process, I've tried to push the conventional boundaries of what is defined as the scope of an 'urbanist' through the exploration of new tools and modes of representing ideas.

The thesis was done as part of the urban fabrics studio. The studio focuses on design of cities and the topic of Urban Transformation and Qualities of Density of urban environments.

The project was one of the most ambitious personal undertakings for me to understand the process of urban development in cities and challenge it with alternate possibilities. The project contributes to the studio's research through the recognition and exploration of alternate urban transformation models that puts citizens front and centre. Where, transformation is understood as a political process producing winners and losers and not only as a formal and material exploration along with proposing more integrated and equitable ways of urban development.

Relationship between research, planning, and design within the project

Beyond the analysis and research towards the problematisation, the project adopts a research by design approach. The initial analysis of Zuidoost was aimed at identifying potentialities in the city district, embedded in the existing urban form and infrastructural systems in the form of opportunities and urgencies, which could be designed for.

In the potential study, research by design was used to identify the maximum potential of the selected neighborhoods. This exercise of speculative design was done with a normative end goal of a livable, sustainable and inclusive neighborhood in mind, but was done without being embroiled in procedural difficulties of getting something like that implemented. This was done to experiment and identify what was possible, given the contextual conditions.

The act of designing 'ideal' conditions, maximising for individual layers revealed the underlying potential of the neighborhoods, which wouldn't have been revealed in a convential design process of identifying, framing and solving specific probelms through spatial design.

This informed the development of a pattern language that was also informed by analysis and literature review. The pattern language as a relational design tool straddled the domains of urban planning and urban design.

The strategic spatial framework and the operational framework were built based on these learnings to identify specific concrete actions that could be deployed on site and were explored through design testing.

Societal relevance

The project operates at the convergence of two defining crises of our times: The climate crisis and the inequality crisis.

Urban development processes that are driven by market forces to absorb surplus capital pose a threat towards an inclusive city. In Amsterdam, the neighborhoods in the Zuidoost district are particularly vulnerable, which consistently ranks poorly in social, economic and spatial dimensions of well being. With over 30,000 new homes to be built in the city district, the project questions the nature of urban development and how it could more inclusive.

In recent decades, instead of resident's perception of livability, the nature and composition of the resident population has become the defining factor in the national livability index (Leefbarometer). Unemployed, single-parent families, ethnic minorities are undesired and negatively affect the livability of neighborhoods. State sponsored gentrification is a tool to reconfigure the population mix of neighborhoods by changing the housing mix through the selling off of social housing stock.

This residualisation of social housing has created an affordable housing crisis in Amsterdam, with waitlists for social housing going above 15 years. Amsterdam Zuidoost has some of the last pockets of large social housing estates in the city. The new proposals bring in a significantly large proportion of high end privately owned housing to the district, potentially gentrifying it, casting a doubt on whether Amsterdammers of all classes and races have the right to the city or does the city only prefer the relatively well-off.

Amsterdam is currently one of the most inequal cities in the Netherlands in terms of wealth. With a total private household wealth of 85.7 billion euros, and an average private household wealth at 187,700 euros, it is the richest among the G4, however the median private household wealth is at an abysmal 8400 euros revealing the vast wealth disparity between people.

While housing construction is a huge portion on one side of the coin of urban development, the other side is that of urban infrastructural service provisions. With a rapidly changing climate, the city of Amsterdam is also transitioning to new socio-technical regimes of production (circularity), energy and climate adaptation. Requiring large investments in infrastructure upgradation in the next thirty years in the public realm, which have both benefits and burdens.

In the existing model of urban development, it is the vulnerable populations: the low educated, non-western and poor populations who are disproportionately affected. By bringing together the two driving forces of housing development and infrastructure upgradation, the project speculates an integrated urban development process that respects the complexity of urban life by placing the concepts of livability and sustainability within the framework of a socially just city, thus imagining ways to reclaim the right to the city.

As stated in the very beginning, if we could develop more equitable and inclusive models of urban development in the low-conflict conditions of the Netherlands, it could potentially pave way for more adoption in complex situations around the world.

As an architect and urbanist from India, for me the process has helped imagine better futures where co-production of cities is a possibility, which wouldn't have been possible for me to imagine in an Indian context, because of preconceived notions of what is possible. Now, I could translate some of these learnings to the conditions in countries like India, where the urgency is imminent.

Scientific Relevance

While creating liveable environments has been a key pursuit of urban design and planning in the past, sustainability is seeing a growing importance due to the increasing understanding of the interconnectedness of the global biophysical systems and the urgency of climate change. Sustainability and livability both need to be the defining characteristics of an integrated urban development going forward.

Contemporary literature in urbanism is filled with both the notions, addressing specific challenges within urban development. While the relevance of sustainable cities and livable communities are a given, the notions of sustainability and livability are not always compatible in practice. Thus, operationalizing sustainability and livability together at the scale of the neighborhood towards integrated urban development is a challenge for planners and policy makers.

This project aims to bring together sustainability and livability with a critical look at how they are operationalized in urban development today and how the processes towards achieving them could be made socially and spatially just to ensure the equitable distribution of the resultant boons and burdens.

The proposed conceptual framework recognises the complexity of perceived livability and sustainability, and hypothesizes that they are emergent phenomena based on the underlying properties of urban form and infrastructural systems, mediated by existing governance systems.

In the project, I've tried to identify and expand on the patterns of these underlying properties towards a pattern language, which form a step towards dealing with this complexity. While the strategic framework identifies possibilities and potentialities in space, the pattern language proposes concrete actions that could be implemented.

By virtue of it being a relational tool, it reveals the interconnected possibilities that could be attempted in a said condition.

These patterns add to the growing body of relational design tools, that engage with the complexity of the city as a complex adaptive system and not as a physical ideal to be designed.

Reflection on the methodology

Developing pattern language as a product and a process was helpful in engaging with the inherent complexity of cities without having to simplify them reductively. The relational nature of pattern language helps to establish the interconnectedness of solutions and how no single solution is a panacea to a highly interconnected reality and the systemic problems it produces.

Research by design and potential study as a process towards developing the pattern language were used alongside conventional methods such as spatial analysis and literature review. However, design methods that involved manual resolving of the design were slow in engaging with the complexity of issues at hand and maybe adopting computational methods in scenario explorations could have led to more options in terms of the possibilities.

For example, to see the energy generation potential of the neighborhood, I had assumed all surfaces to get equal solar irradiance and explored solutions towards making use of it. However in reality, it is much more complex with other parameters such as slope of surface, shadows, season, time of day, cloud cover etc., which could have been more effectively processed using computational methods. Such a level of detail could have enriched the process and products, but unfortunately it is beyond the scope and time limitations of this graduation thesis.

In terms of data collection, the Netherlands is a planner's paradise since a large amount of data is publicly accessible in a ready to use format. However, some composite data also comes with certain inherent biases, like in the case of the leefbarometer which classifies the livability of neighborhoods in the Netherlands. Thankfully, there is a large active community of academic researchers in the Netherlands who actively talk about these methodological biases and thus helped me to be wary of relying on them too much.

Another point to be observed is that, while spatial data on the physical environment and demographic data is readily made available through nodal agencies at a finer spatial resolution, data on urban metabolic flows aren't readily available. The ones that are available are also at a much higher spatial resolution at the scale of municipalities and not at the scale of neighborhoods to make use of them actively in the project. This is actively changing and shouldn't be a point of concern in a few years.

Transferability of the project

The use of pattern language was a conscious choice because of the ability to generalise and repurpose patterns. While, it might not be possible to use patterns as modular components in any context, and they require a fair amount of positioning in the context, they are non-zero starting points to translate results of the research in other contexts, which is very important considering the urgency of issues touched upon in this thesis project.

I intend to share the patterns online under a Creative Commons Attribution-ShareAlike 4.0 license to facilitate others to distribute, remix, adapt, and build upon the work.

The context of the project is in the urban peripheries of Amsterdam. The economic, societal and to a lesser degree morphological conditions observed here are similar across other urban peripheries in the Netherlands and in other western european contexts to a large extent, where transference of the results can be achieved much readily. An abstracted version of the operational framework can also be transferred to other neighborhoods with the right organisational preconditions.

Ethical Considerations

As established in the theoretical framework, perceptions of what constitutes a livable environment changes over time with the changing technology, societal and economic contexts. In Amsterdam Zuidoost, with its large portion of citizens with non-western origins, cultural perceptions of liveability are different compared to the mainstream Dutch culture. As a migrant in the Dutch context myself, my knowledge of the context is theoretical and anecdotal and less lived, and thus generalisations are made which are made explicit to allow for clarification and updation in the spirit of the scientific process.

Development of an inclusive, participatory model of integrated urban development is at the heart of the thesis project. However, in Amsterdam Zuidoost, which is the case site, trust on existing participatory processes has been low for a few years (van den Hende et al, 2018) with the residents' participation strike coming to an end only recently. My interactions were only with organised groups within the community and not un organised individuals so as to not give any false hope of radical transformation and to not interfere with the existing efforts to rebuild trust by the townhall with the community

Working through a Pandemic

I think it is important to record that the project was developed during one of the most disruptive moments in recent history.

As an inherently optimistic person, I am able to see positives to this whole experience as well. Training to be an urbanist during a pandemic has provided me with a front seat to see the underbelly of some of the most fragile systems we have in place to deal with a pandemic and the inherent inequalities propagated in our built environments. Between developments in college towns built on the promise of a steady supply of students, laying bare on one hand and countless invisible migrant labours from Odessa or Patna slipping between the cracks of blanket government measures on the other hand, there are hundred such examples.

It is high time we challenge the underlying systems that propagate spatial and social injustice as externalities. By developing concrete evidence based solutions as part of the research, the project adds to a growing movement of applied research towards spatial justice.

The Covid-19 pandemic reveals how our current globalised world with planetary urbanisation presents a new set of challenges that are distinct from the past public health crises.

The academic experience of the graduation thesis is designed to be carried out in person, with close collaboration with mentors and other studio colleagues. However, the pandemic made ideal academic conditions a thing of the past. While my mentors made every effort to help support me through the process, helping me stay sane through bouts of increased isolation, I cannot help but wonder what could have been possible if not for the pandemic.

As a part of a larger system of debt-financed education, I lacked the privilege and resilience to pause and wait for a more conducive time for academic research. However, working on the project helped me stay sane and orient myself in the face of increasing unpredictability in terms of what the future holds.

I have deep respect for my mentors and colleagues who persevered through an insanely difficult period and strived to produce quality academic works. I believe the process has made me more resilient, but I hope to not test the resiliency anytime soon.

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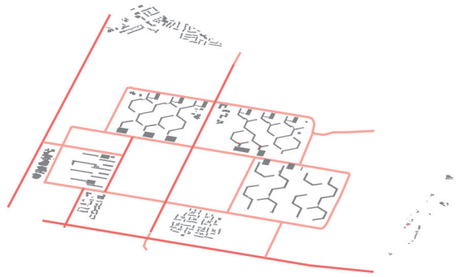
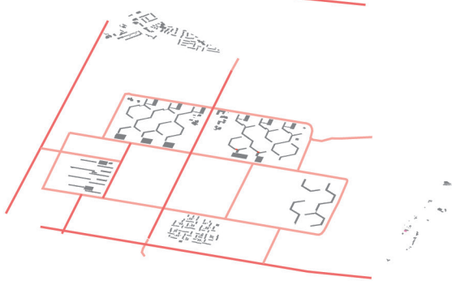
ii

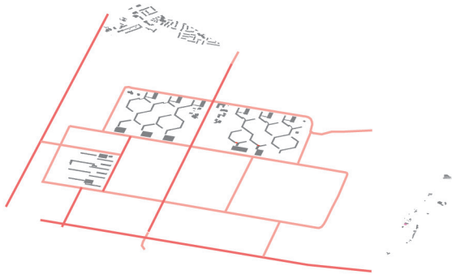
Annexures

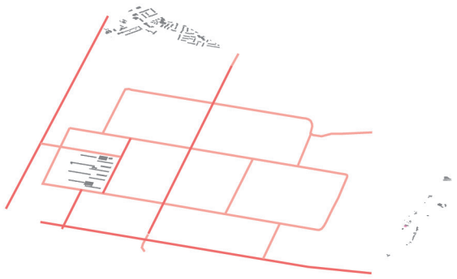
A. Phases of Transformation

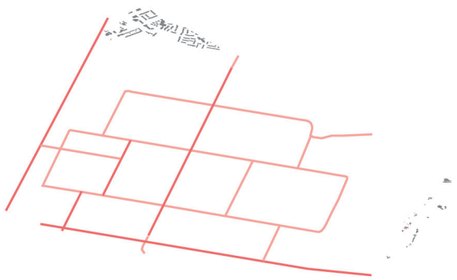
construction and transformation of Bijlmer











1966 Car traffic was isolated on the dreven allowing fast and fluid movement and separating it from the cyclists and pedestrians on the ground level. The dreven were connected with the flats' parking garages through a system of hallways, galleries and elevators.

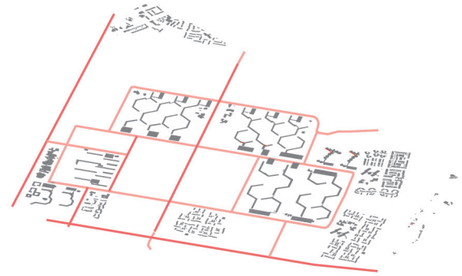
1968 Phase A is completed. The H-buurt is finished and the first inhabitants get the key to their apartment in Hoogoord.

1971 Phases B, C and the F- and G-neighbourhoods are finished.The first criticism on the urban plan appears in the media. Inhabitants organize themselves to protest against the absence of promised facilities such as public transport, collective spaces and shops.

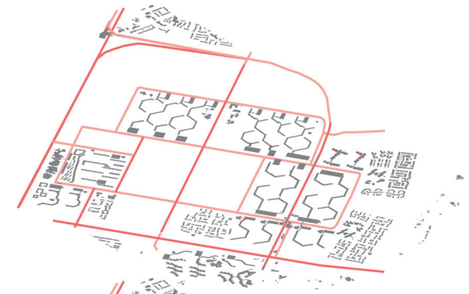
1972 Phase E and the G- and K neighbourhoods are finished. Shopping centers are still absent, temporary shopping facilities are put into place. In the south the neighbourhood Kelbergen is realized: the first 'Anti-Bijlmer'.

1973 Phase D and the flats Kikkenstein en Kruitberg are finished. Preparations for the first shopping centers are initiated.

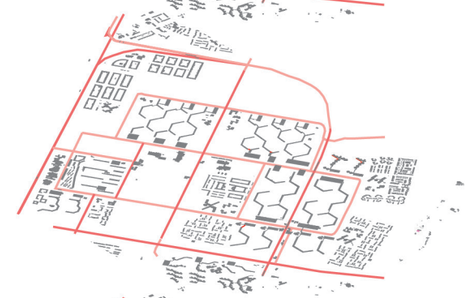
1975 De Gouden Leeuw and Groenhoven, the flats Hakfort and Huigenbos and the low-rise areas Kantershof and Geerdinkhof are finished, as well as the subcentres Ganzenhoef, Kraaiennest and Fazantenhof. Suriname becomes independent and a lot of immigrants come to the Bijlmer



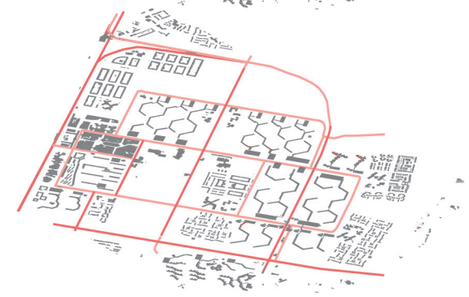
1982 In 1980 the metro connection with the city centre is realized. Hoptille, Haardstee and Heesterveld are built: smaller and more diverse living area's. 'Projectbureau Highrise Bijlmermeer' rallies against the emerging dilapidation of the flats.



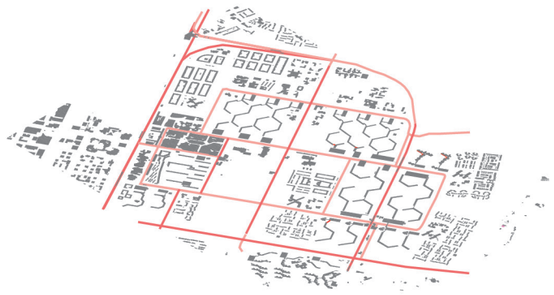
1984 The Venserpolder is built: a large dwelling area reintroducing large enclosed building blocks consisting of four or five storeys.



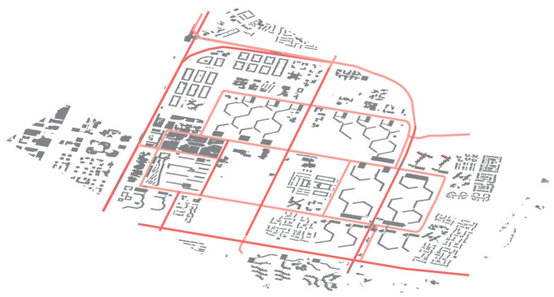
1987 Almost 20 years after the first people moved to the Bijlmermeer the main shopping and business centre is finished. The Amsterdamse Poort is located next to the Bijlmer train station in the West of the Bijlmer, 20 minutes by foot from the eastern part.

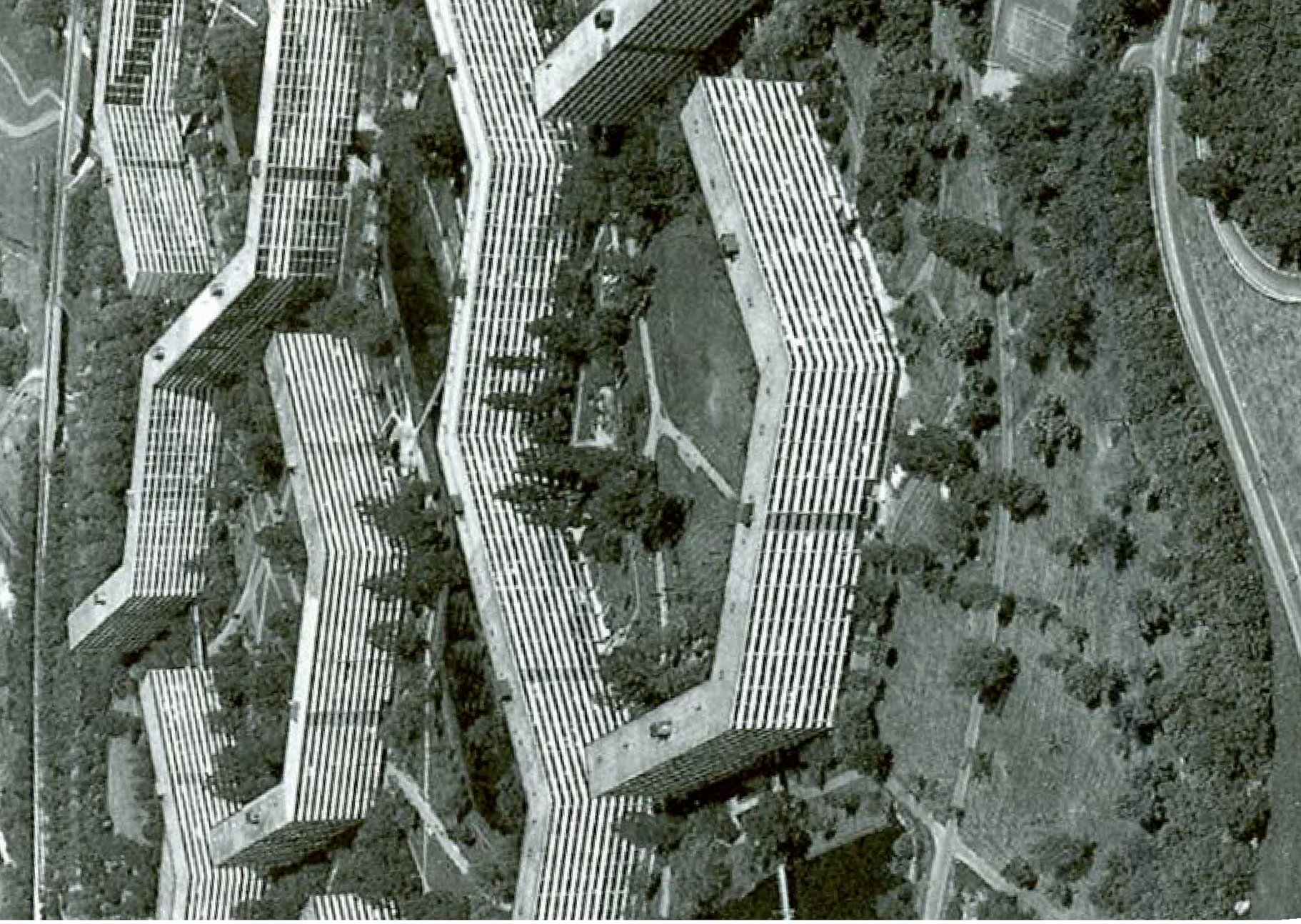


1992 All around the Bijlmer offices emerge. The 'Steering Group Renewal Bijlmermeer' makes plans for the demolition of 25% of the flats, causing a renewed interest in the original concept. The first parts of Groeneveen and Kruitberg are torn down after the Bijlmer plane crash.



1995 Demolition of Geinwijk and Gerenstein. 'Bijlmerbelievers' and argue that the flats are not the reason for the problems in the area. Meanwhile the urban renewal focuses on differentiation of dwelling types, easily manageable public space and mixing socialeconomic.

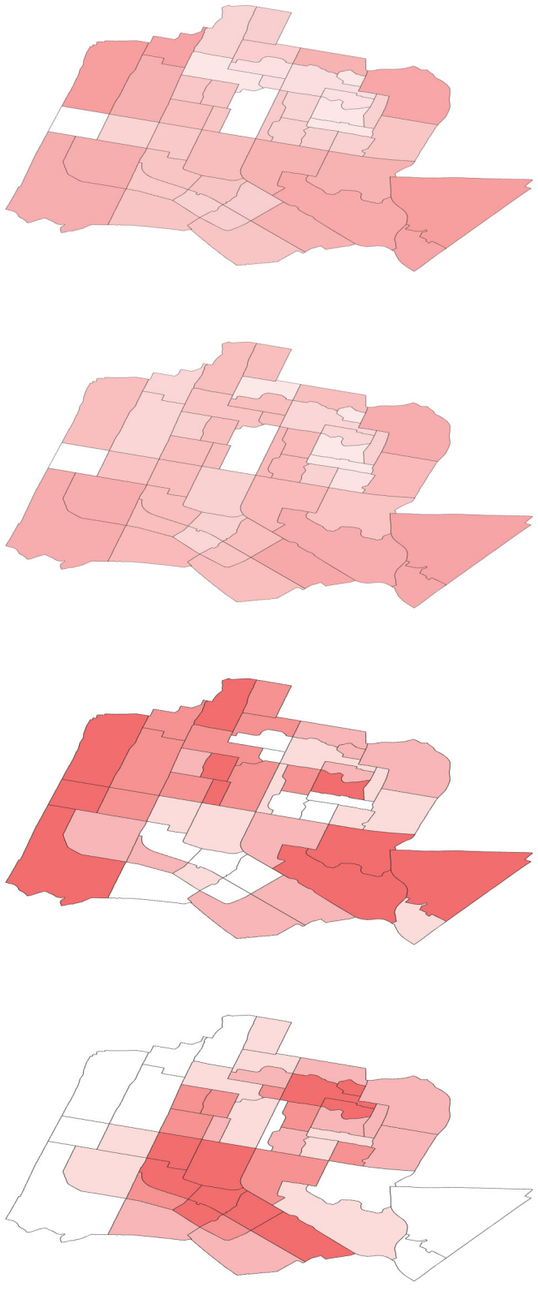






B.1 Accessibility

Fig B.1: Maps showing relative performance of neighborhoods in Amsterdam Zuidoost based on mentioned accessibility indicators.



7.2.1 Access to Primary facilities from the Neighborhoods

This is a composite indicator showing the average distance of every household in a neighborhood to the nearest general practitioner, pharmacy, and a supermarket. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the best performing and the darkest being the fifth quintile and comparatively worse off.

7.2.2 Access to Secondary facilities from the Neighborhoods

This is a composite indicator showing the average distance of every household in a neighborhood to the nearest primary school, day care, cafe, and a restaurant. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the best performing and the darkest being the fifth quintile and comparatively worse off.

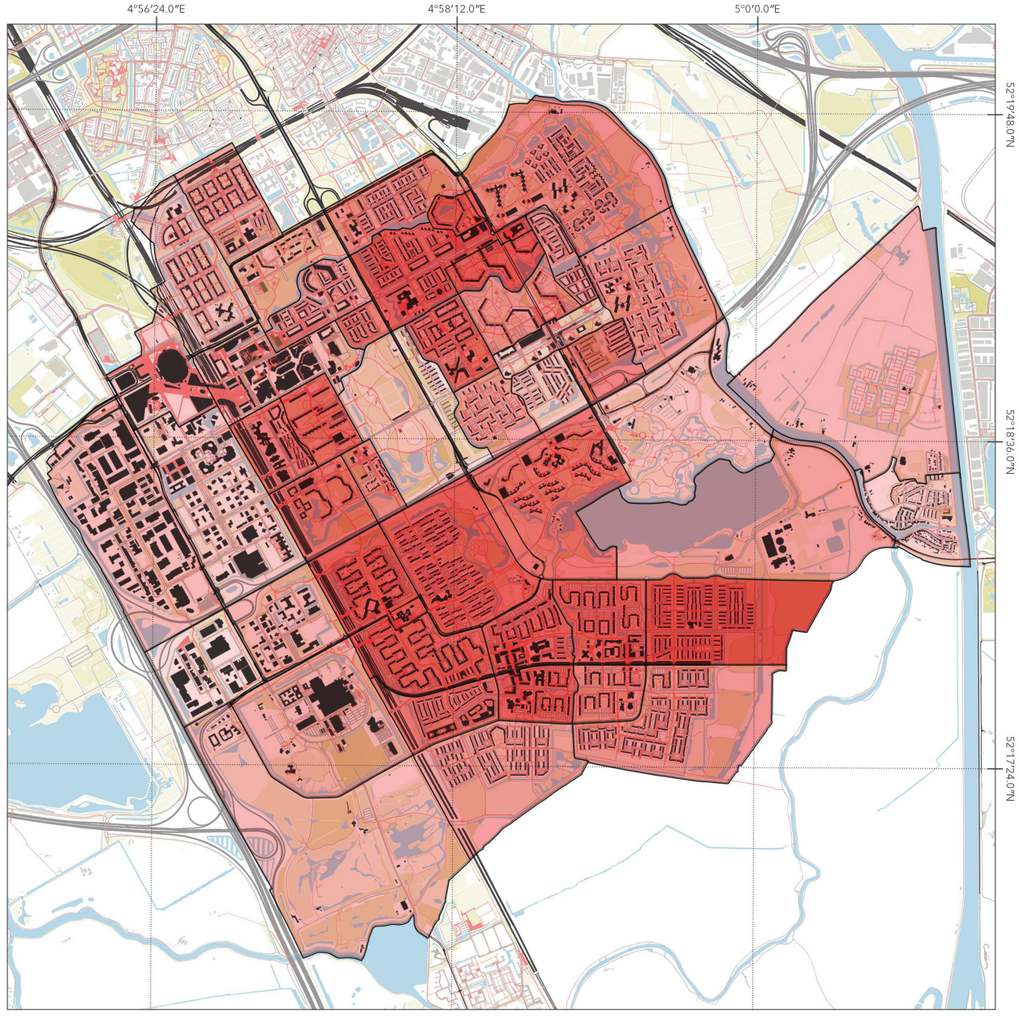
7.2.3 Angular choice of road network per Neighborhood

The angular choice analysis of the road network within a neighborhood are calculated and the results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the best performing and the darkest being the fifth quintile and comparatively worse off.

7.2.4 Angular integration of road network per Neighborhood

The angular integration analysis of the road network within a neighborhood are calculated and the results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the most integrated and the darkest being the fifth quintile and the least integrated.

Fig B.2: Map showing composite accessibility measure of neighborhoods in Amsterdam Zuidoost.



The four indicators described are used to evaluate a neighborhood's accessibility, A composite index of the four indicators with equal weight is calculated to identify the most and least accessible neighborhoods in Amsterdam Zuidoost district.

To reiterate an important point, the indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone in terms of accessibility.

The better performing neighborhoods in this analysis are not normative and require interventions of varying degrees as well as they perform poor when compared with other neighborhoods in Amsterdam Centre.

B.2 Density

Fig B.3: Maps showing relative performance of neighborhoods in Amsterdam Zuidoost based on mentioned density indicators.

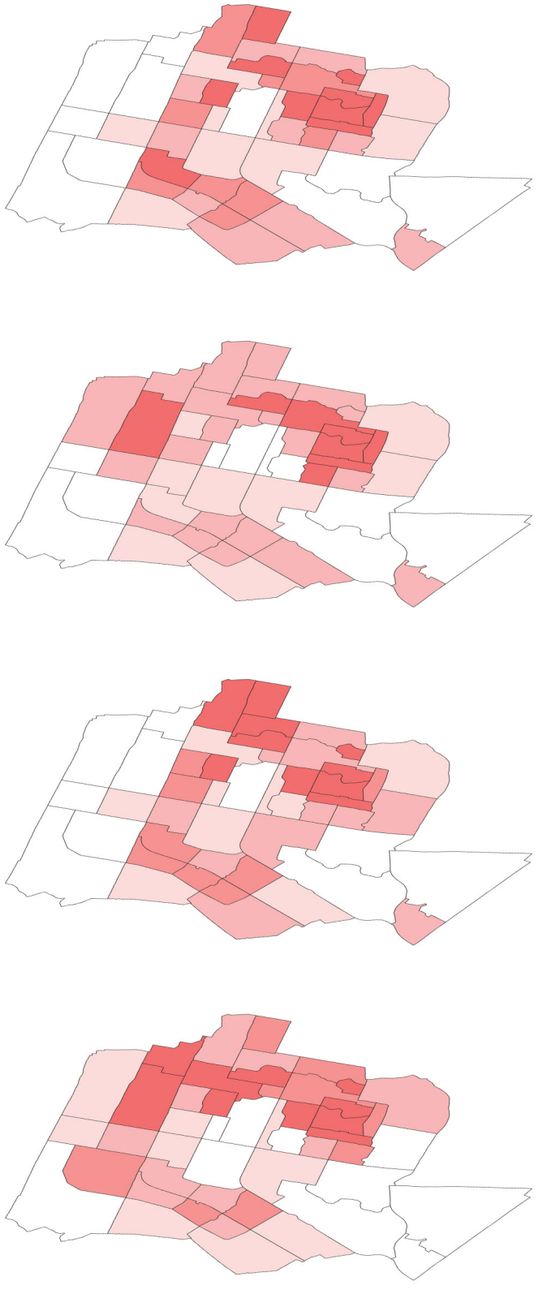
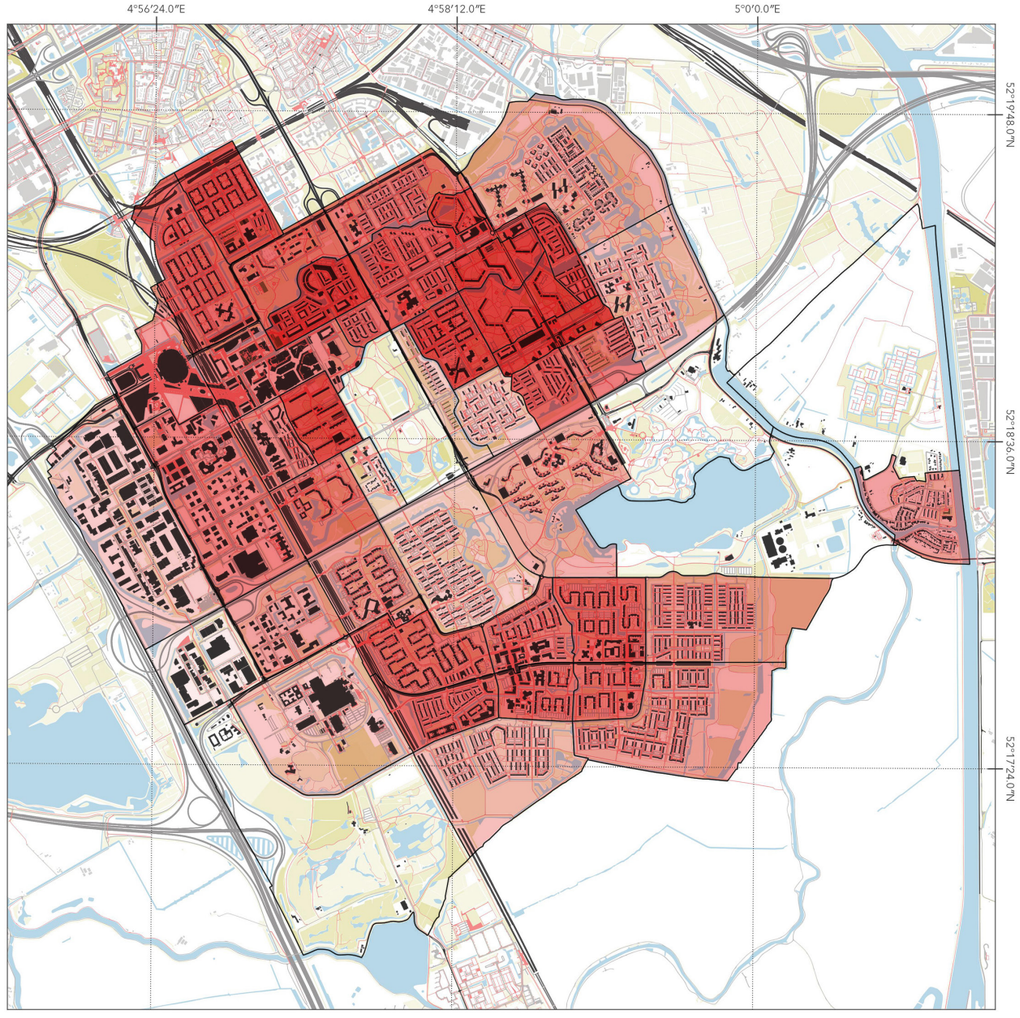


Fig B.4: Map showing composite density measure of neighborhoods in Amsterdam Zuidoost.



7.3.1 Density of people per Neighborhood

This metric reflects the number of people living in a registered address in a neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the least dense and the darkest being the fifth quintile and most dense. This reflects only registered residents and doesn't reflect visitors and other floating population.

7.3.2 Density of Businesses per Neighborhood

This metric reflects the number of registered businesses in a neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the least dense. Amstel III businesspark and the urban renewal neighborhoods of Bijlmer standout.

7.3.3 Density of dwellings per Neighborhood

This metric reflects the number of dwellings in a neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile with less dwellings. Amstel III Businesspark and the city parks don't have registered dwellings.

7.3.4 Average floor space index per Neighborhood

This metric reflects the average FSI of city blocks in a neighborhood as listed in PBL RUDIFUN. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and highest average FSI. Neighborhoods with high rises clearly stand out.

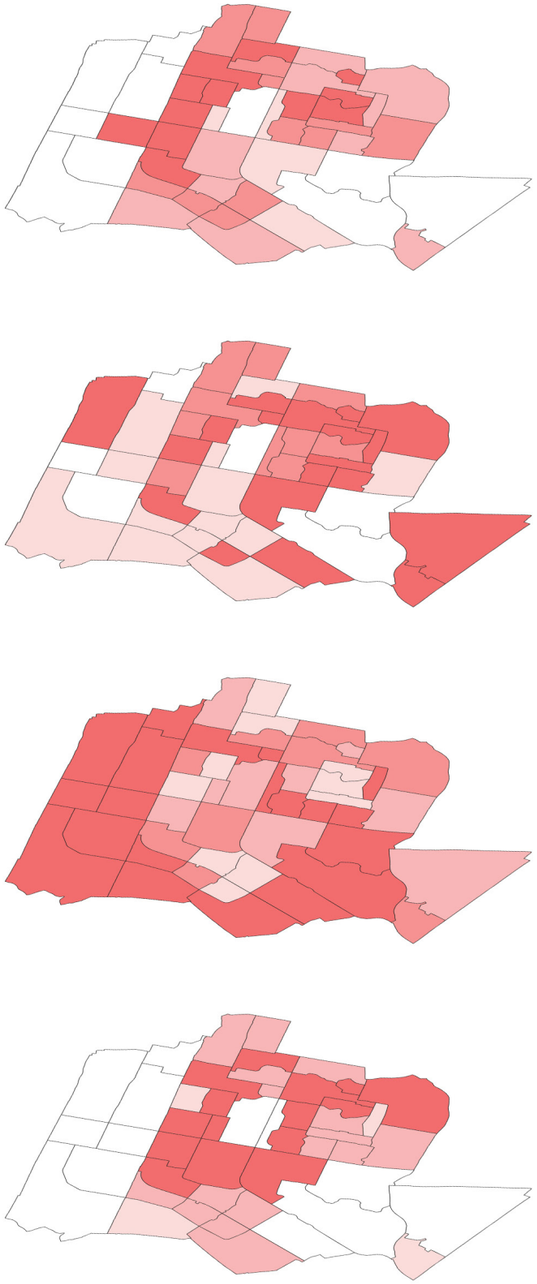
The four indicators described are used to evaluate a neighborhood's density. A composite index of the four indicators with equal weight is calculated to identify the most and least dense neighborhoods in Amsterdam Zuidoost district.

To reiterate an important point, this indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone, in terms of Density.

The better performing neighborhoods in this analysis are not normative and require interventions of varying degrees as well as they perform poor when compared with other neighborhoods in Amsterdam Centre.

B.3 Diversity

Fig B.5: Maps showing relative performance of neighborhoods in Zuidoost based on mentioned diversity indicators..



7.4.1 Income Diversity per Neighborhood

This metric reflects the income diversity in a neighborhood in terms of below social minimum, low, middle, and high income households as published in CBS. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the least diverse.

7.4.2 Diversity of ethnicities per Neighborhood

This metric reflects the diversity of ethnicities in a neighborhood based on the classifications published in CBS. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the least diverse.

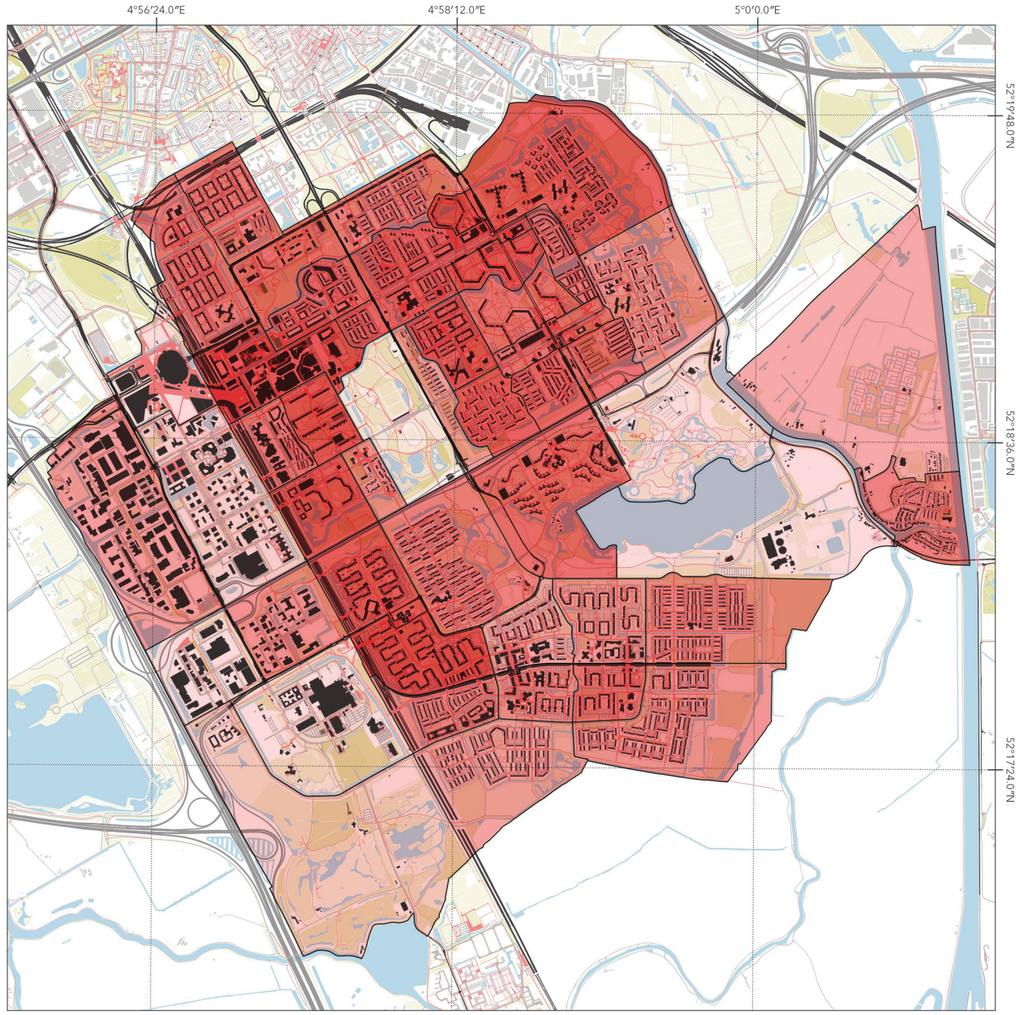
7.4.3 Functional Diversity per Neighborhood

This metric reflects the functional diversity in a neighborhood in terms of mix of amenity, work and live functions as calculated in PBL RUDIFUN. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the least diverse.

7.4.4 Housing Tenure Diversity per Neighborhood

This metric reflects the housing tenure diversity in a neighborhood in terms of social housing, privately owned, social rental, and private rental households. The results are grouped into five quintiles with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the least diverse.

Fig B.6: Map showing composite diversity measure of neighborhoods in Amsterdam Zuidoost.



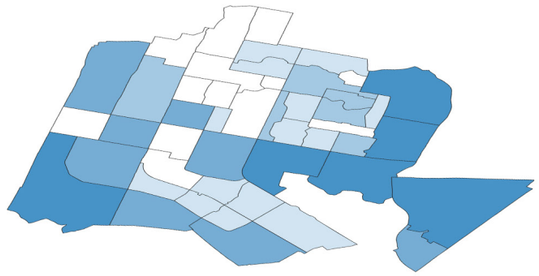
The four indicators described are used to evaluate a neighborhood's diversity. A composite index of the four indicators with equal weight is calculated to identify the most and least diverse neighborhoods in Amsterdam Zuidoost district.

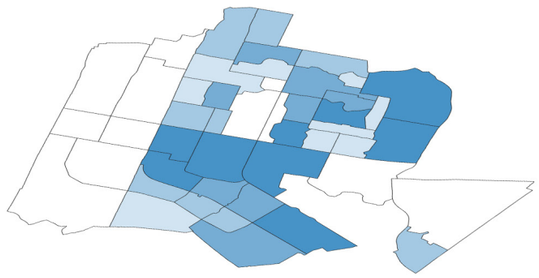
To reiterate an important point, this indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone, in terms of Diversity.

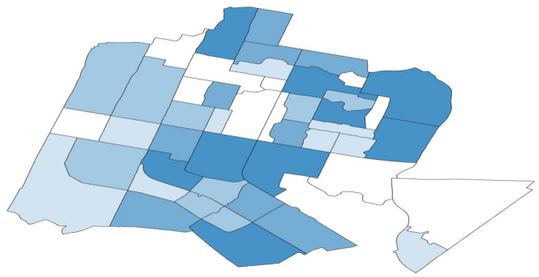
The better performing neighborhoods in this analysis are not normative and require interventions of varying degrees as well as they perform poor when compared with other neighborhoods in Amsterdam Centre.

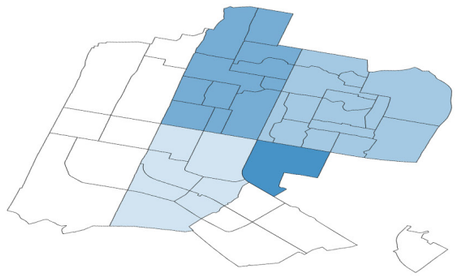
B.4 Green and Blue Networks

Fig B.7: Maps showing relative performance of neighborhoods in Zuidoost based on mentioned indicators reflecting green and blue networks.









7.5.1 Surface area of Water per Neighborhood

This metric reflects the area of surface water per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile with the highest area of surface water.

7.5.2 Number of Trees per Neighborhood

This metric reflects the number of trees per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile with the most number of trees. Nelson Mandela park and Gaasperpark were omitted as outliers.

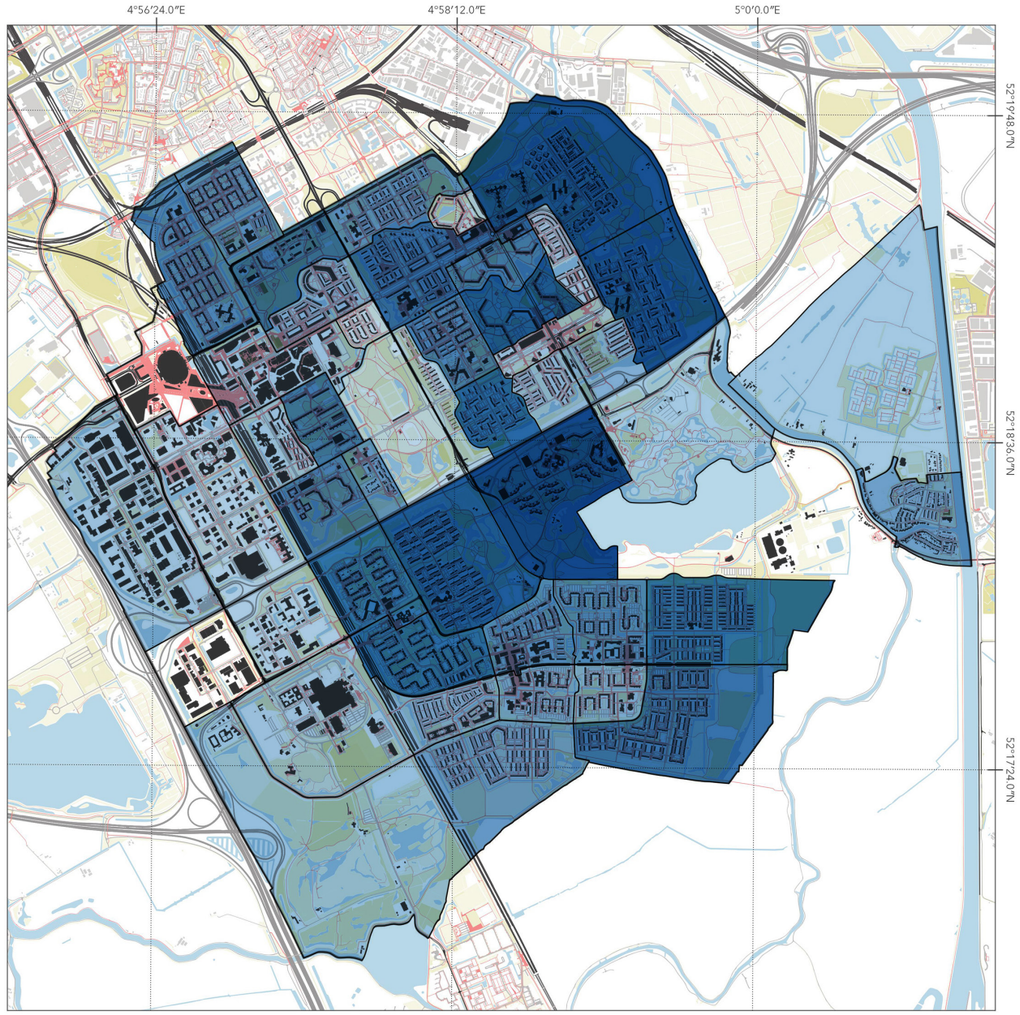
7.5.3 Diversity of Trees per Neighborhood

This metric reflects the diversity of trees per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifthe quintile and the most diverse composition of trees. Nelson Mandela park and Gaasperpark were omitted as outliers.

7.5.4 Surface Area of Green per Wijk

This metric reflects the area of green cover per neighborhood. The results are grouped into five quintiles, with the lightest neighbothood being the fifth quintile with the most area under green cover. This data is not available at the buurt scale, but only at the wijk scale and was used accordingly.

Fig B.8: Map showing composite blue/green network measure of neighborhoods in Amsterdam Zuidoost.



The four indicators described are used to evaluate a neighborhood's blue and green networks. A composite index of the four indicators with equal weight is calculated to understand the nature of blue and green networks in neighborhoods of Amsterdam Zuidoost district.

To reiterate an important point, this indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone in terms of their blue and green networks.

The better performing neighborhoods in this analysis are not to be taken as normative as they require interventions of varying degrees to improve their quality. However most Zuidoost neighborhoods perform better when compared with other neighborhoods in Amsterdam Centre in these metrics.

B.5 Energy

Fig B.9: Maps showing relative performance of neighborhoods in Zuidoost based on mentioned indicators reflecting energy use and potential.

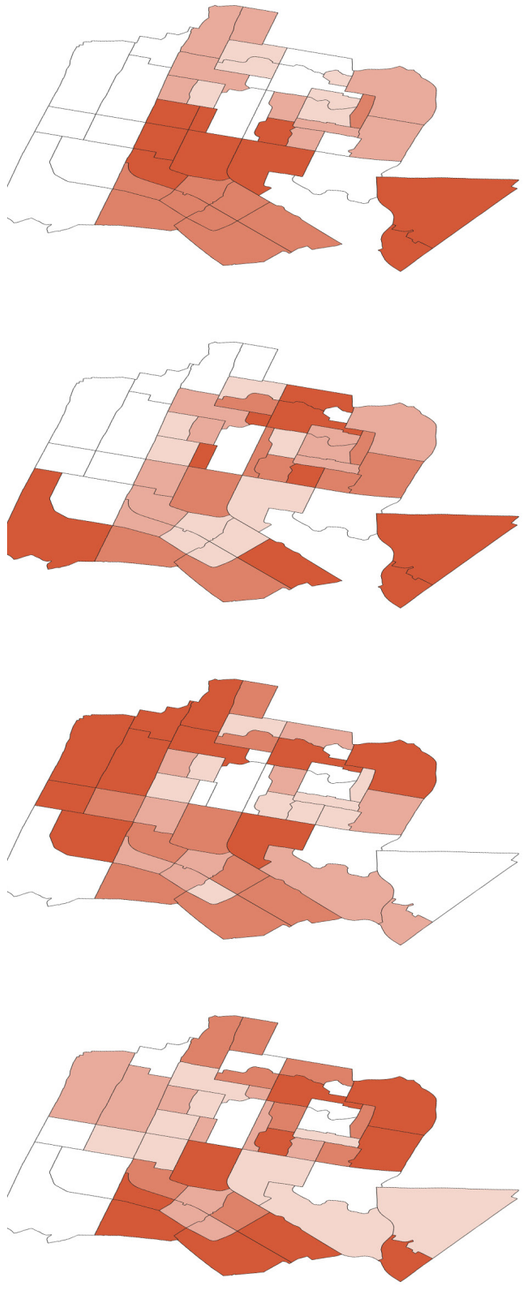
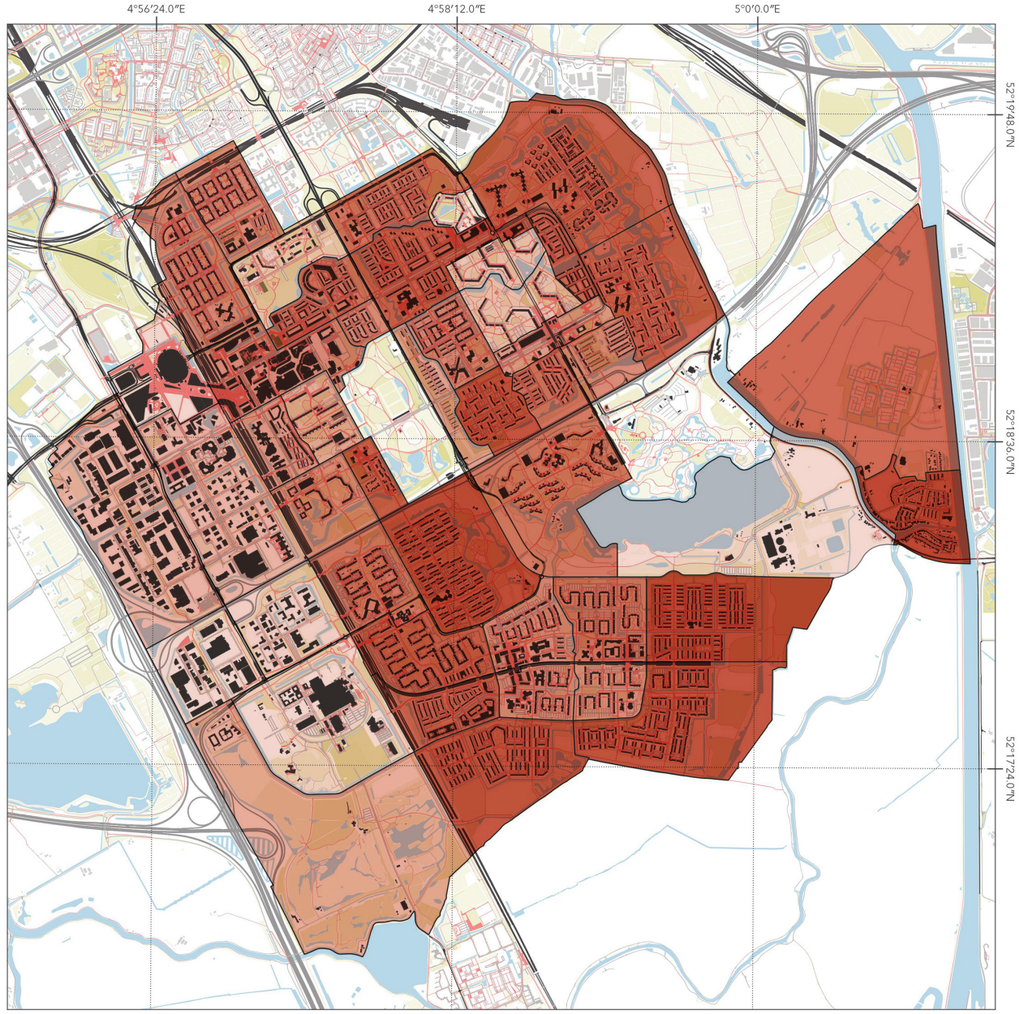


Fig B.10: Map showing composite energy use and potential measures of neighborhoods in Amsterdam Zuidoost.



7.6.1 Total Gas Consumption per Neighborhood

This metric reflects the total household gas consumption per neighborhood. The results are grouped into five quintiles with the lightest neighborhood being the first quintile and the darkest being the fifth quintile with the highest amount of gas consumption.

7.6.2 Total Electricity Consumption per Neighborhood

This metric reflects the total electricity consumption per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile with the highest amount of electricity consumption.

7.6.3 Total Solar Energy Potential per Neighborhood

This metric reflects the total rooftop solar energy generation potential in a neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile with the highest potential for energy generation.

7.6.4 Average Energy Label per Neighborhood

This metric reflects the average energy performance of buildings per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the worst performing.

The four indicators described are used to evaluate a neighborhood's energy use and production potential. A composite index of the four indicators with equal weight is calculated to understand the nature of energy use and potential in neighborhoods of Amsterdam Zuidoost district.

To reiterate an important point, this indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone in terms of their energy use and potential.

The better performing neighborhoods in this analysis are not to be taken as normative as they require interventions of varying degrees to improve their quality. However most Zuidoost neighborhoods perform better when compared with other neighborhoods in Amsterdam Centre in these metrics.

B.6 Waste

Fig B.11: Maps showing relative performance of neighborhoods in Zuidoost based on mentioned indicators reflecting household waste generated.



7.7.1 Residual waste containers per thousand population per neighborhood

This metric reflects the number of residual waste containers per thousand population per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the highest number.

7.7.2 Paper waste containers per thousand population per neighborhood.

This metric reflects the number of paper waste containers per thousand population per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the highest number.

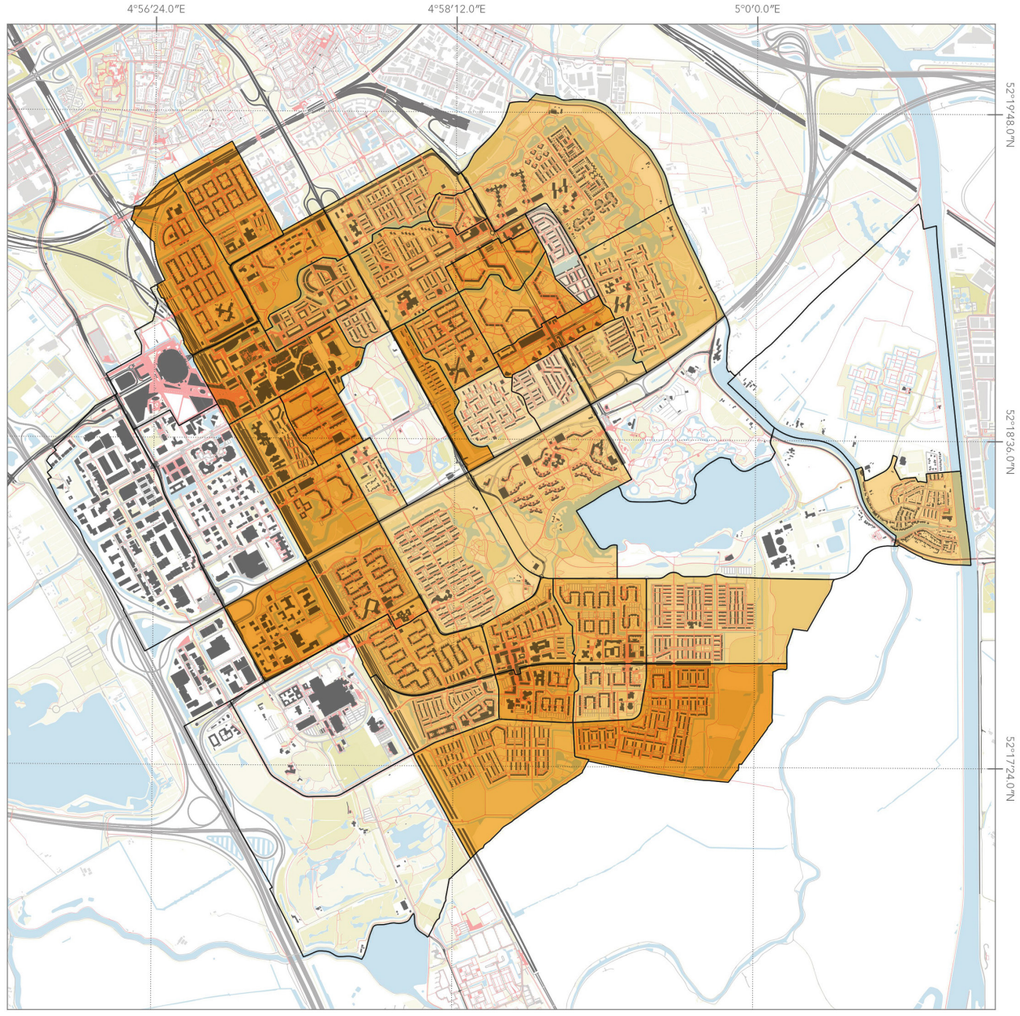
7.7.3 Plastic waste containers per thousand population per neighborhood

This metric reflects the number of plastic waste containers per thousand population per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the highest number.

7.7.4 Textile waste containers per thousand population per neighborhood

This metric reflects the number of textile waste containers per thousand population per neighborhood. The results are grouped into five quintiles, with the lightest neighborhood being the first quintile and the darkest being the fifth quintile and the highest number.

Fig B.12: Map showing composite household waste measures of neighborhoods in Amsterdam Zuidoost.



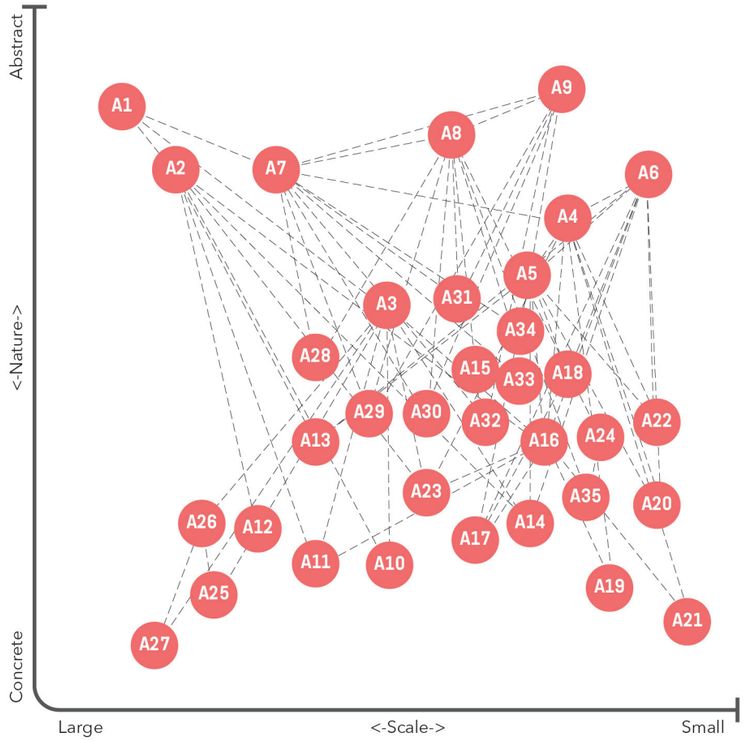
The four indicators described are used to evaluate a neighborhood's energy use and production potential. A composite index of the four indicators with equal weight is calculated to understand the nature of waste use and potential in neighborhoods of Amsterdam Zuidoost district.

To reiterate an important point, this indicator analysis is to understand the relative positions of Amsterdam Zuidoost's neighborhoods alone in terms of their energy use and potential.

The better performing neighborhoods in this analysis are not to be taken as normative as they require interventions of varying degrees to improve their quality. However most Zuidoost neighborhoods perform better when compared with other neighborhoods in Amsterdam Centre in these metrics.

Fig C.1: Accessibility Pattern relations.

C.1 Accessibility



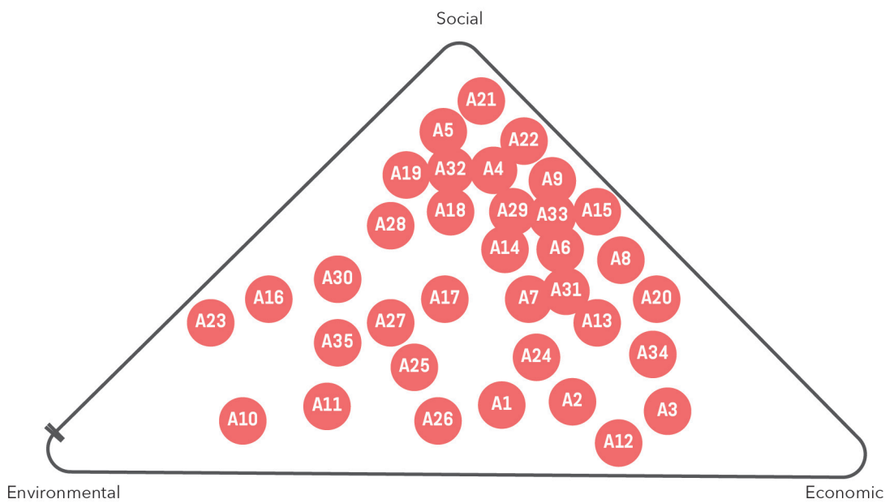
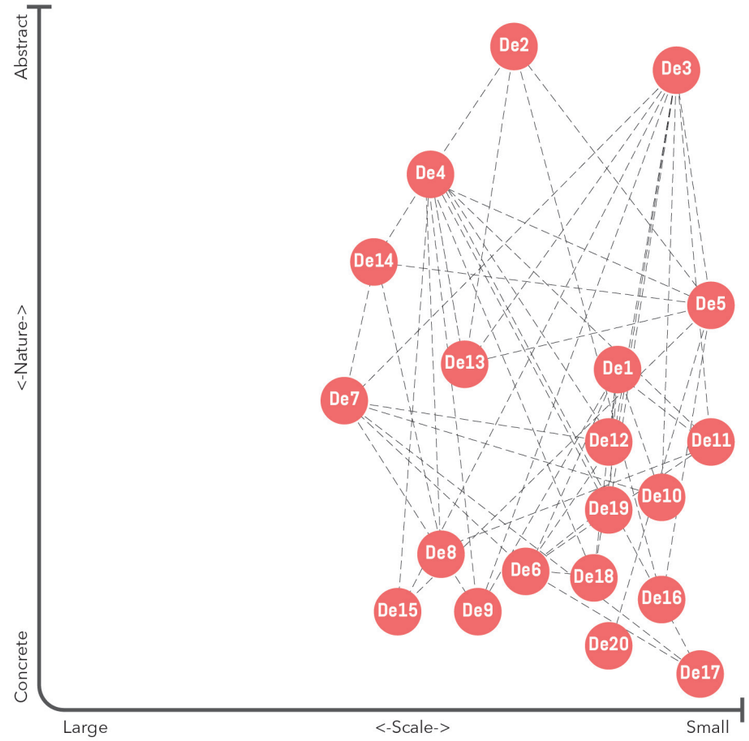


Fig C.2: DensityPattern relations.

C.2 Density



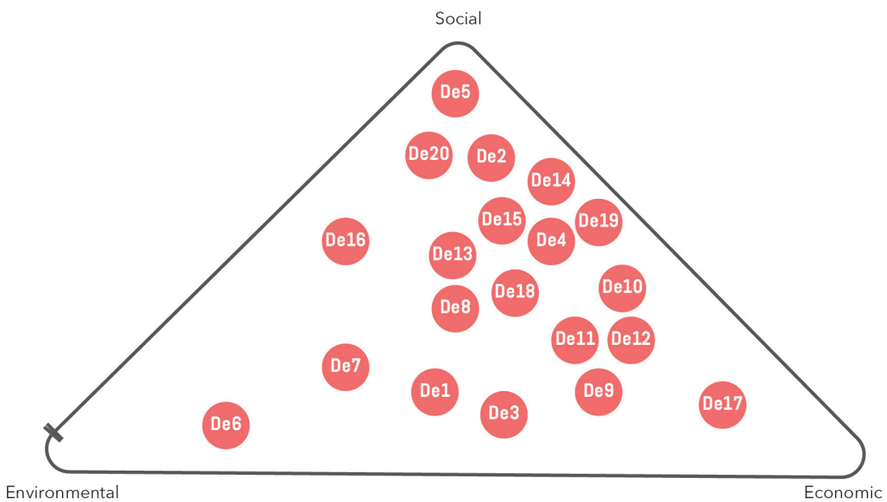
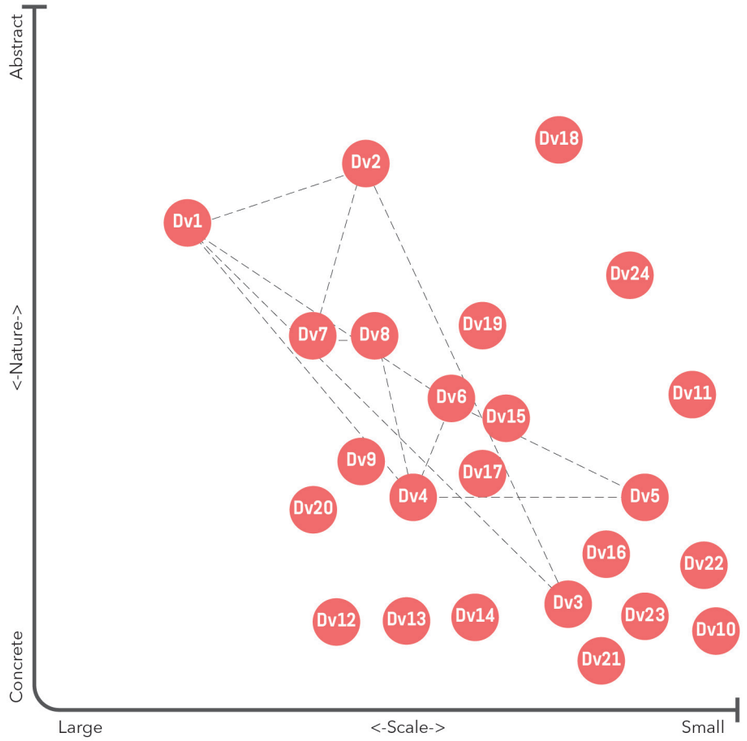


Fig C.3: Diversity Pattern relations.

C.3 Diversity



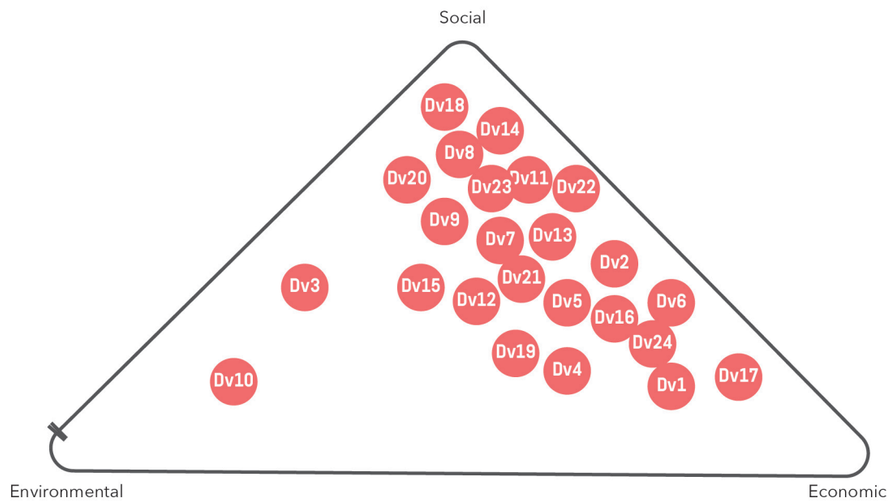
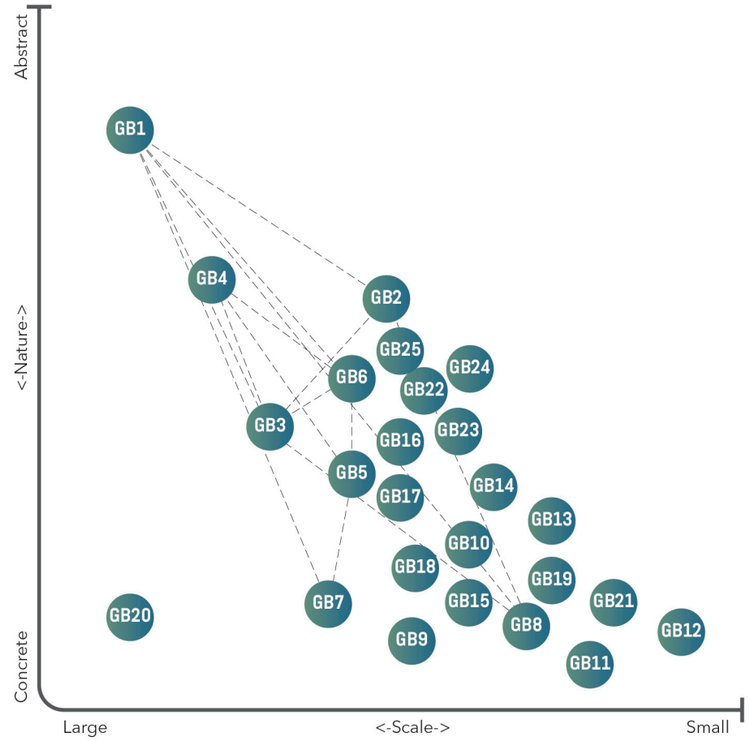


Fig C.4: Green/ Blue Pattern relations.

C.4 Green/Blue



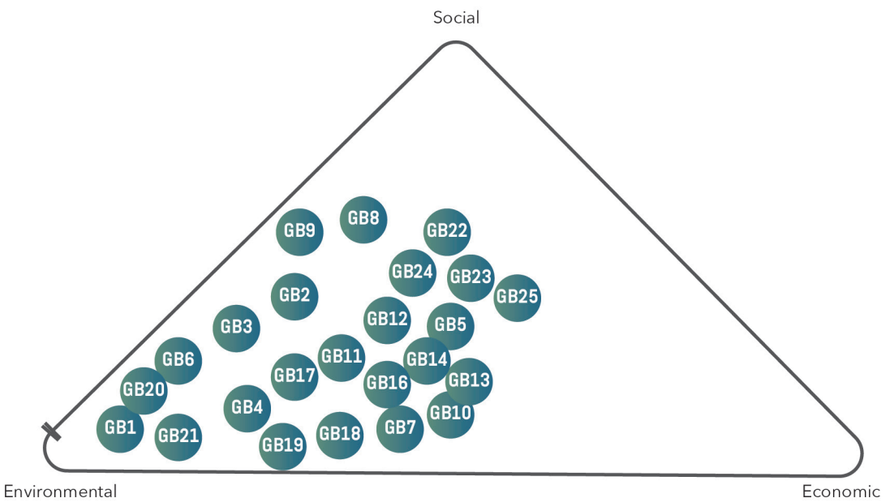
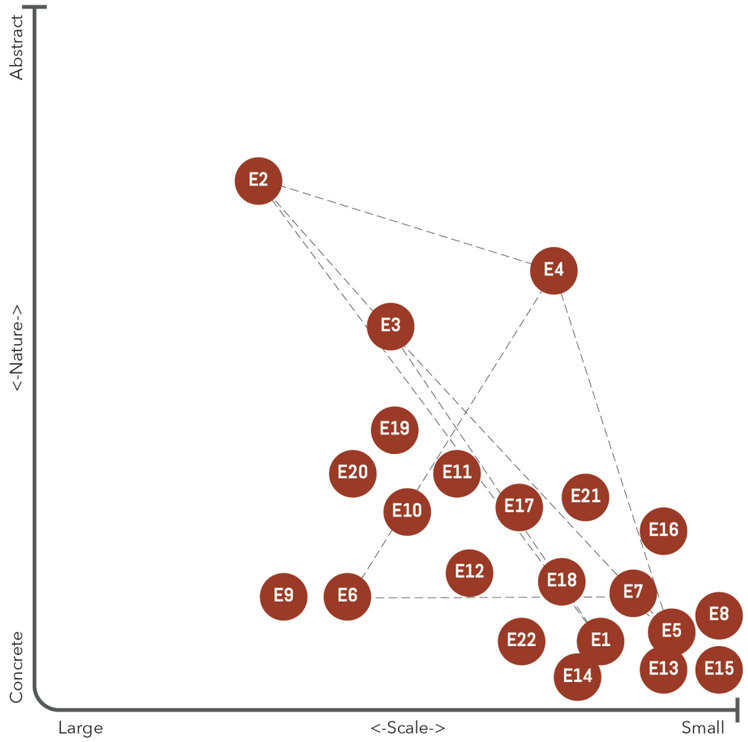


Fig C.5: Energy Pattern Relations.

C.5 Energy



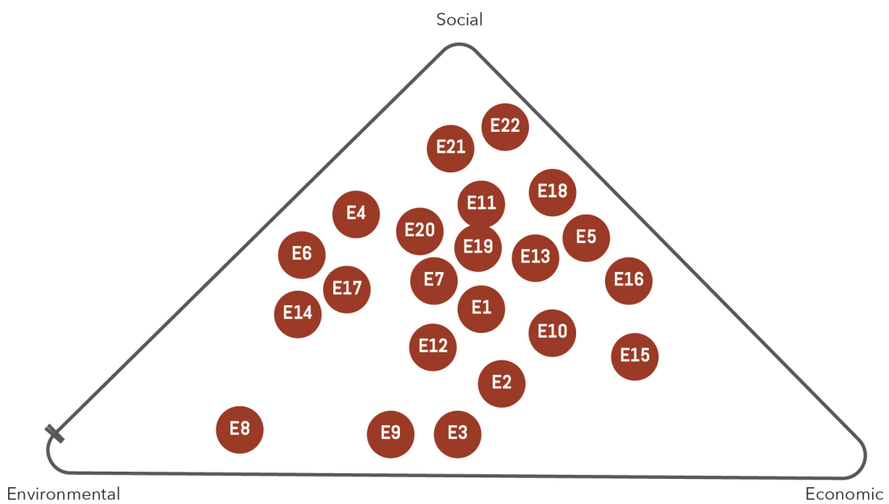
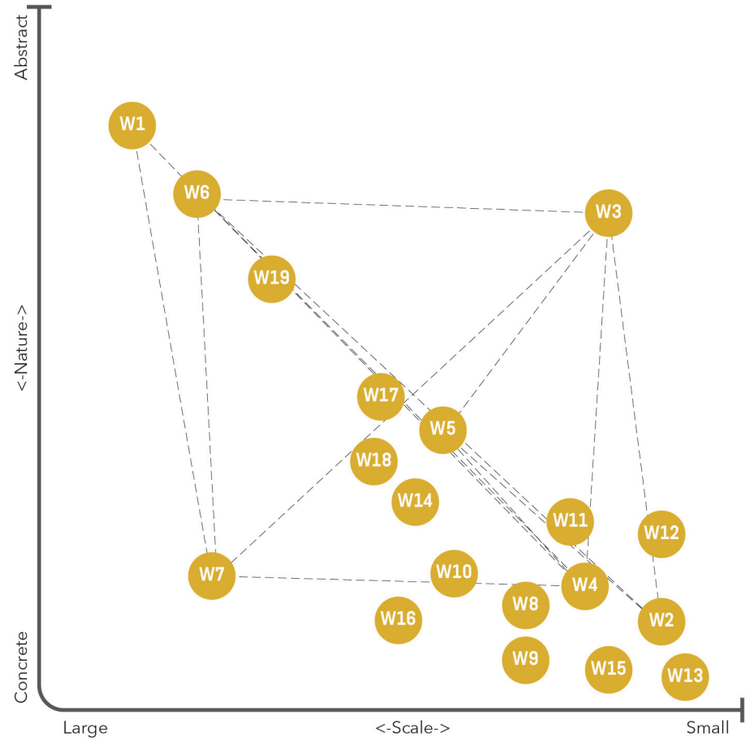


Fig C.6: Waste Pattern relations.

C.6 Waste



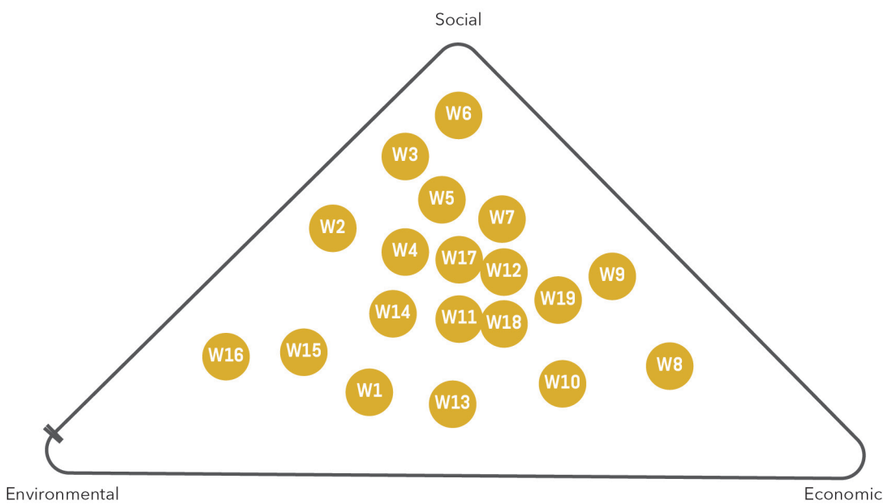
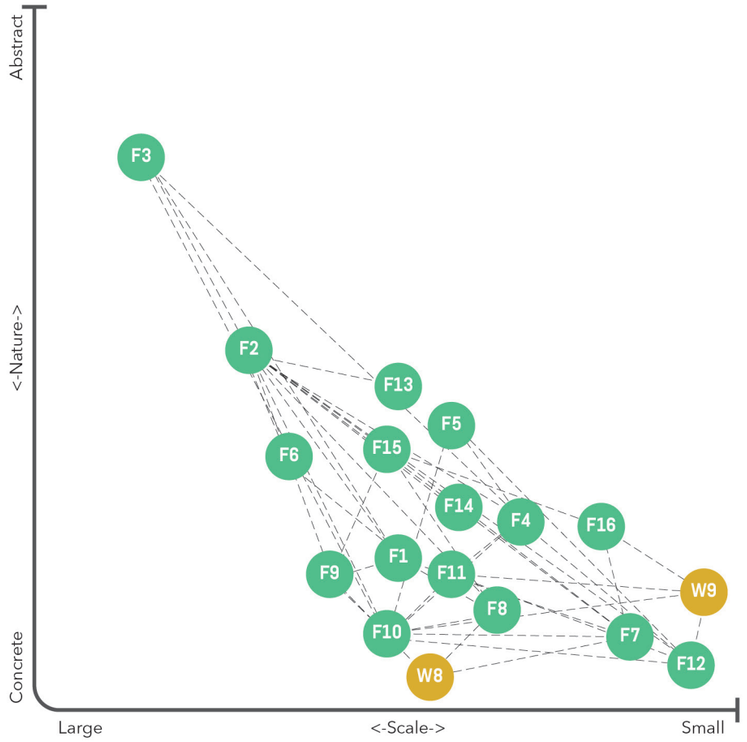


Fig C.7: Food Pattern relations.

C.7 Food



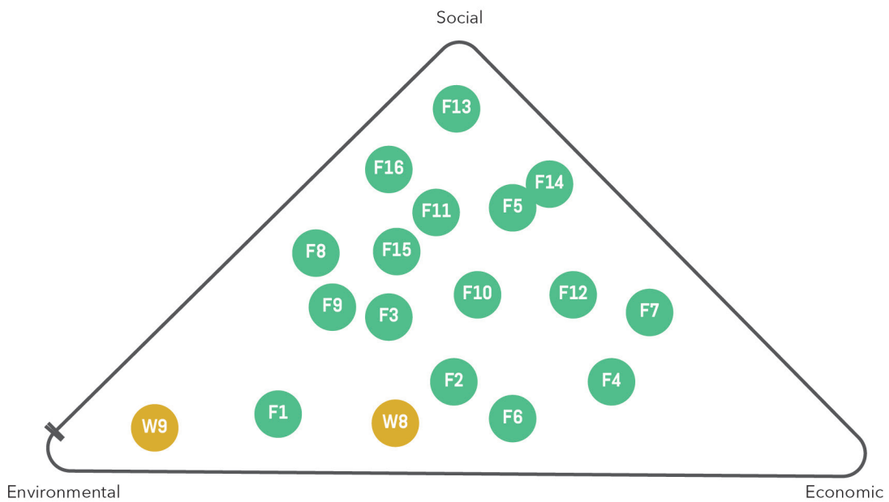
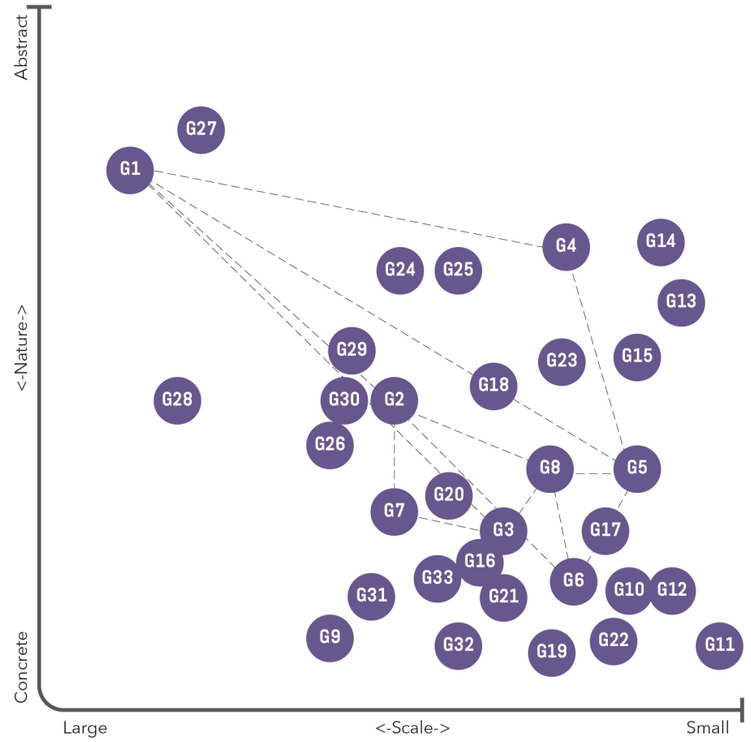
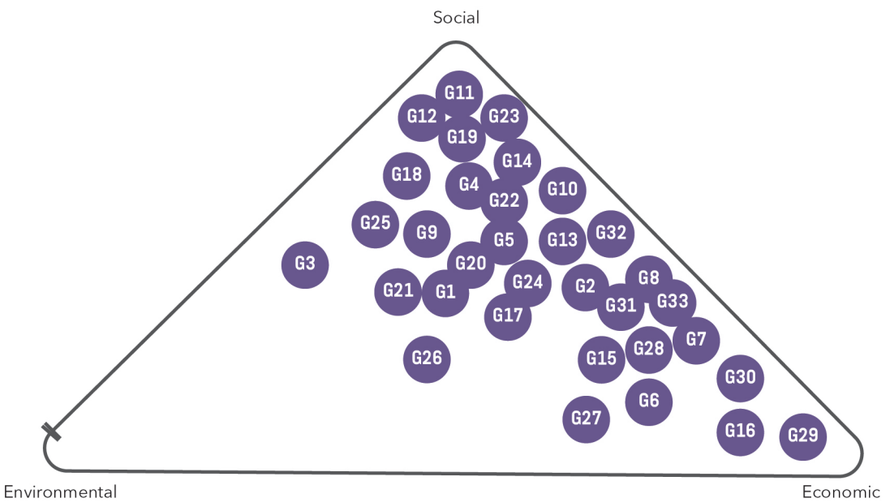
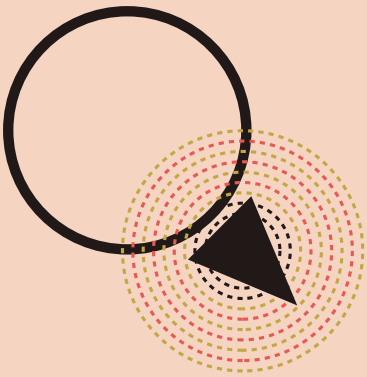


Fig C.8: Governance Pattern relations.

C.8 Governance







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First mentor: Dipl.ing. Birgit Hausleitner
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Graduation thesis report

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