FOODBANISM

STRATEGY OF HEALTHY GREEN FUTURE FOR ROTTERDAM ZUID

RUOJING WU (MAZE)

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GRADUATION PROJECT - REPORT

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Ruojing Wu

Student number: 4504941

Graduation Studio: Flowscapes (AR3LA031)

First mentor: Rene van der Velde

Second mentor: Francisco Colombo

Examiner: Christian van Ees

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1. INTRODUCTION

Urban agriculture is not a new topic. It has multiple benefits related to human and environmental health, social interaction, sustainable development, and so on. I have seen many different cases of beautiful productive gardens or rooftop farms, using sustainable and organic ways of growing food. Instead of the patchwork of practicing urban agriculture, the question that always bothers me is how urban agriculture can be integrated into city planning process, to be an integral part of green infrastructure? The development of urban agriculture in a city level is my challenge to study and explore.

The challenge comes from the context as well as urban agriculture itself. Especially in the context of the Netherlands, one of the biggest food export countries, people who live in here always have access to a wide variety of food products. Growing food by citizens in the Netherlands is out of choice, not out of necessity. However, considering the relationship between the city and urban agriculture, the role of urban agriculture is far more than food: it is an active use of green in the city, brings people together, encourages a healthy lifestyle for citizens, and has direct impact on urban ecosystem. Urban agriculture implies a healthy green component in cities that citizens can directly operate and interact with.

The other challenge develops from the city. The city is changing and growing all the time. For a city-scale level, a fixed design is not the purpose of this project: space varies; different actors have different objectives for developing urban agriculture; different culture may result in various forms of gardens and food products. The planning of urban agriculture needs to embrace the uncertainty of the city - be flexible and open-ended.

The goal of design is to create the possibilities of adaptively applying urban agriculture into a spatial and strategic planning of the city. The project encourages a collaborative framework that communicates

between top-down and bottom-up, which orients to a long-term and flexible perspective. It is a healthy green structure that integrates urban agriculture as one part of the green infrastructure adapted to different physical forms in the city. The incorporation of urban agriculture into the city framework requires the strategy to consider about the land use, resource, transport, people, etc. Framing the strategy in the city level that integrates urban agricultural landscapes can help to promote ecological biodiversity, social interaction in urban environment in terms of different scales, types and locations of the urban space.

Basically, the whole project can be divided into two parts: research and design. Under the research section, there includes the research of case study and site study. The cases are about the practices of urban agriculture in four cities: Frankfurt, Tokyo, Havana and Manhattan. There are three main factors that contribute to the implementation of urban agriculture: the supportive policy, spatial feasibility and the participation of citizens. I studied their relationship between the pattern of cities and the practices of urban agriculture as well as their spatial characteristic of typologies. The site study of Rotterdam Zuid was inspired by the case study. The analysis of the morphology and the investigation of the spatial typologies in Rotterdam Zuid seek to find out the potential and the way of integration of urban agriculture.

The design outcome can be seen as a guidebook to inspire government and citizens to work together in Rotterdam Zuid. It comprises a basis green network for creating the healthy green structure for Rotterdam as well as a series of spatial tools for integrating urban agriculture according to various urban forms in Rotterdam Zuid. The design is a process of integration: 1) the integration of different urban infrastructures 2) the integration of different spatial typologies 3) the integration with different compatible programs and activities. The objective of the project is not only for promoting urban agriculture, but also viewing the underutilized space along infrastructure as opportunities to activate them as green corridors and patches with a wide variety of activities. Corridors and patches of urban landscape support livable public space, the slow mobility as well as ecosystem of the city. It is not a traditional way of top-down design that directly implement ideas on land, but a nonlinear planning process that multidisciplinary teamwork and participation of citizens are always necessary. The graduation project is not an end design, but tries to introduce other methods and ideas to stimulate thinking and discussion for the unpredictable future of Rotterdam Zuid.

RESEARCH & DESIGN QUESTIONS

CASE RESEARCH QUESTIONS

- What is the role of urban agriculture in these cases?
- What are the morphologies of four cases and how they related to the pattern of urban agriculture?
- How the city provides the opportunities for developing urban agriculture?
- What kinds of spatial typology are represented for urban agriculture in these cases?

SITE RESEARCH QUESTIONS

- What is the morphology of Rotterdam Zuid and how it was developed?
- What spatial characteristics of Rotterdam Zuid can facilitate the development of urban agriculture?
- What are the potentials and problems relating to social and spatial issues in Rotterdam Zuid?

DESIGN QUESTIONS

- How to develop the strategy for a healthy green structure in Rotterdam Zuid that communicates both decision makers and citizens?
- How Rotterdam Zuid provides the framework and condition for developing urban agriculture and integrates it into part of the green infrastructure?
- What generic forms of spatial typologies in Rotterdam Zuid can facilitate the development of urban agriculture and how to transform the space for urban agriculture?

2. METHODOLOGY

Urban agriculture creates a dialogue between food and people in the city. It encourages people to slow down and get back to the nature, to create conversations with others, to live in a healthy way. Food provides a new perspective for answering the question about how to make our cities more livable places (Philips, 2013). Situated in the urban context, the issues, limitations, advantages and potentials of urban agriculture are becoming even more immeasurably complicated. In order to generate comprehensive and holistic design, landscape architects need to deal with the aspects of spatiality, sociality, ecology, economy, and so on. Ways have had to be found to incorporate these aspects into urban agriculture, and systematic design helps to structure the ideas.

2.1 Rethinking urban agriculture

When talking about urban agriculture, many people will directly associate to rooftop farming, community gardens, or vertical farming. However, those gardens are just part of the visible manifestation of urban agriculture that people can directly perceive. In terms of urban agriculture, it mainly has two performance types: the first one is the primary agriculture, which is the land uses focus on the activity of agriculture; the second one is secondary agriculture, which comprises all the land uses that integrate agricultural activities as an add-on their primary land use (Kasper, 2015), which includes rooftop gardens, vertical farming, community gardens, etc. These performances relate to the visible part of spatial dimension, like an external layer.

Nevertheless, food is involved in every aspect of everyday life. Besides the spatial aspect, considered with the invisible part, urban agriculture has deep interactions with social, economic, ecologic, and cultural dimensions. Urban agriculture contains a complex network of relations among different aspects; hence, it is a system rather than an object – a system not only local interventions but also a bigger image of the city, not only forms but also processes, not only spatial design but also policy establishment, and all these things come together to be urban agriculture.

What emphasizes urban agriculture to be a system is the synergy of various parts, among sectors and components, through multiple scales. The complexity interweaves within people's lives, multi-culture with various habits, mediates among different disciplines, involves in designing a tiny garden as well as incorporating with other huge urban infrastructure. With the increasing involvement of urban planning, public participation, ecological disciplines, and business management, urban agriculture needs to be trans-disciplinary, multi-scalar, and process-oriented.

Based on the general system theory by Ludwig von Bertalanffy, the relationships in a complexity model between parts are more important than the parts themselves. Systematic design is required to deal with this complicated relationship. Integrating multiple processes of urban agriculture creates a holistic and contextualized strategy that can be seamlessly embedded within the city. Treating urban agriculture as a complex adaptive system allows an inter- and trans-disciplinary design process to structure the idea in a logical scheme. Only in this way, urban agriculture can function like urban infrastructure that helps to develop the city.

2.1.1. Sectors

Due to the difficulty of dealing with the multiplicity of factors and the interrelationships in urban agriculture, a systematic approach is required to target the complex issues of urban growth towards developing new and interactive infrastructures that respond to the needs of changing urban system. To perceive urban agriculture as a system helps to redefine a new design concept. Framing the concept of urban agriculture, there are three main sectors: physical environments, actors and metabolic flows (Fig.1). The statements of three sectors are below:

Figure.1 Sectors of urban agriculture © Author

1) Physical environments

As the basis of urban agriculture, physical environments include space and facilities that suitable for the practices of agriculture. The Spatial aspect consists of formal and informal space: both relate to soil, sunshine, temperature, climate, and so on. Formal space indicates that the space provides concrete areas for agriculture, while informal space provides the possibility for people to develop agriculture on their will. On the other hand, Facilities contain tools and amenities for implementing agriculture. Strongly connected to spatial dimension, physical environments facilitate the setting for agriculture activities and social interaction.

2) Actors

People are the main role in the actor sector. Actors are participants that operate the activities of urban agriculture. Unlike other urban infrastructure that people are always regarded to be users, in urban agriculture, citizens are doers who make agriculture happen in the city quarter. Actors' sector has deep association with social and cultural dimension. The different social or cultural environments may result in differing performance of urban agriculture.

3) Metabolic flows

The systematic approach requires urban agriculture to be part of the urban metabolism with flows between components and the relevant fields. This kind of flows is substantial as well as immaterial, which interacts with all dimensions. From the perspective of food, the flows connect process of producing, processing, distribution, consumption and recycling; if discuss in resource aspect, the flow of water as a crucial factor to sustain the ecological cycle; information flow encourages the shared knowledge and education of agriculture; the living environments comprises the synergy of different programs and the integration of inhabitants in social and physical circumstance; and the last but not least, all the processes stimulate the economic dimension from a positive side.

2.1.2. Components

The traditional core of activities in agriculture associated with production, processing, marketing, distribution and consumption. However, the tradition industry agriculture has a large input of resources on the programs of processing and marketing, providing for long-distance food transport from the producers to consumers. The increasing food miles lead to the degradation of the environment, which indicates the issues of unsustainability. Nevertheless, though activities of urban agriculture seems to be similar as industry agriculture, one of its purposes is to shorten the distance of food miles to reduce the emissions – eat locally and eat seasonally.

With reference to the traditional activities, the components of urban agriculture are: production, processing, distribution and acquisition, consumption, and recycling (Fig.2). When urban agriculture is thought as part of the green infrastructure, all these components should be active parts that integrate with different flows in the city and relevant to different scales. In these five components, the acquisition and recycling are also taken into account to emphasize the lifecycle of urban agriculture. The introduction of five components is below:

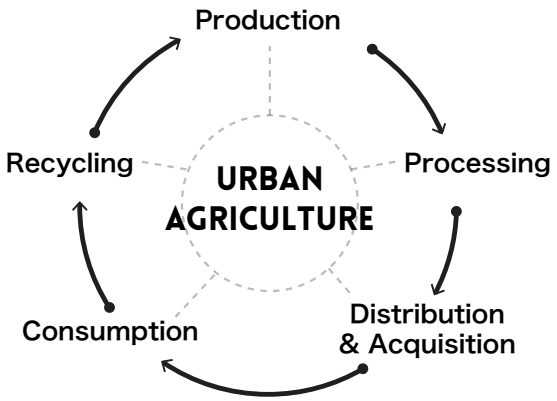


Figure.2 Components of urban agriculture © Author

1) Production

'Production' indicates the process of growing food as raw material. Urban agricultural activities have a particular role as part of food production that takes place in close interaction with the urban system, which requires physical (water management, composting system, food waste recycling, and so on) and social (learning, meeting people, working collaboratively) interaction in the urban context.

2) Processing

According to Wikipedia, food processing combines raw food ingredients to produce marketable food products that can be easily prepared and served by the consumer. 'Processing' relates to the methods of food preservation. However, because of the large reducing of food miles, part of the used-to-be highly processed food can be turned to locally refined food. Encouraging local and seasonal eating also demonstrates lower level of processing, targeting to reduce the negative environmental influence. And this process needs the cohesive networks of distribution and acquisition.

3) Distribution & acquisition

Unlike the industry agriculture, urban agriculture not just focuses on the purchased products, but also provides shared food products. The process and methodology behind food distribution is contextualized, which directly link to food distribution and acquisition. In order for the process to be both cost-effective and efficient, the networks of distribution and acquisition should be cohesive and work through multiple scales to Increase frequency of the flows of food. The performance varies, from restaurants to canteens, from mobile retailers to supermarkets.

4) Consumption

'Consumption' indicates the process from food to waste, which is influenced by the food preferences of consumers from various cultures. The pattern of food consumption is dynamic, which involves economic factors, market factors, socio-cultural factors, and geographical factors, etc. It seems that consumption happens in the household level, but indeed it has profound influence in a global scale. For instance, reducing large greenhouse gas emissions by changing consumption of foods could have a major impact on climate change. In addition, it determines the amount of waste that affects the sustainable development.

5) Recycling

Food waste is defined as all inedible and edible parts of food that creates preceding and succeeding food processing, production and consumption. As a process to convert food waste into environmental-friendly materials, food waste management demands the collaboration on different levels, such as individuals, communities, organizations, and the governments. The sizes also vary from small-scale level like household waste management to large-scale level such as dumping station.

Five components are independent and responsible to each other. The relationship between these components is dynamic and cycle-oriented. To design the components function on an integrative level, we need do develop them into schematic plans and details through different scales in the city.

2.1.3. Urban agriculture as urban infrastructure

With the foundation of sectors and components, urban agriculture provides a synergy that embraces multi-dimensional and trans-disciplinary characteristics. The merging of urban system with agriculture demonstrates a new trend that urban agriculture will be a permanent section as one part of the green infrastructure.

The definition of infrastructure changes accordingly with the development of cities. The classical theory of 'infrastructure' is derived from market-economy by Jochimsen: "infrastructure is defined as the sum of material, institutional and personal facilities and data which are available to the economic agents and which contribute to realizing the equalization of the remuneration of comparable inputs in the case of a suitable allocation of resources, that is complete integration and maximum level of economic activities" (Jochimsen 1966: 100). With this traditional point of view, "infrastructure" has been applied to permanent physical installations, such as railways, pipelines, wastewater treatment, etc. It also indicates physical facilities, for instance, facilities of education, culture, health and leisure, including public space such as parks6. Consequently, the classical definition shows that infrastructure is mainly the government's duty to build and maintain.

Since the city becomes increasingly dynamic and complicated, the definition of infrastructure should be expanded to adapt the transformation. Nowadays, Nijkamp (2000: 88) speaks about infrastructure as material public capital (roads, railways, (air)ports, pipelines etc.) and suprastructure meaning immaterial public capital (knowledge networks, communication, education, culture etc.). The term 'infrastructure' turns to be more abstract and of plurality, decentralizing from the duty of government to more private and individual sector, which is not only physical and concrete element, but also performs in processes. In 2014, Dr. Daniela Perrotti pointed out that basic urban services have to be re-bundled and re-designed as living landscapes to be green infrastructure, which focus on synergies geographical, economic, and ecological interconnections between green, gray, and blue networks within metropolitan regions.

With the above premise, urban agriculture was qualified to be part of the green infrastructure in the urban context. It consists of both material construction and immaterial capital. The status of urban agriculture is increasing to a more important level. This is because of its complexity and strong intersection of social, economy, ecology, and culture, which also promote the sustainable development of a city as a permanent activity. Simultaneously, the demands of systematic design help to define urban agriculture in an optimized structure. The development of urban agriculture not only integrates within green infrastructure, but also helps to enhance the urban ecosystem.

2.2 Landscape Ecology: Patch-corridor-matrix model

The relationship between urban ecosystem and urban agriculture is reciprocal. To establish a strong and complex urban ecosystem in the city indicates to create a healthy and beneficial environment for food growing, which provides an ecological backbone for urban agriculture. Why? For one fundamental reason, this process supports the flows of pollination: over one third of the food needs pollination; the strong ecosystem provides food recourse for pollinators like bees and other insects, in order to increase their capacity for flying across the city to pollinate flowers. A tiny change on the land cover for diverse native plant is helping the whole process. Considering the urban ecosystem as a large-scale process and urban agriculture as a component in this process, the maintenance of large-scale processes is vital for every small scale 'ecosystem' (Bailey 2002, p.87). In other words, to create a setting for urban agriculture and integrate urban agriculture into part of the green infrastructure requires establishing a healthy green structure for a city, which is not only beneficial for agriculture, but most importantly also for animals, plants, and human. How can we apply a healthy green structure in urban areas?

Nowadays the ecosystem is becoming more and more vulnerable in the city as the increasing development of buildings and road structures. These elements gradually influence and scatter the used-to-be complex and interwoven landscape. Just as Marina Alberti described "fragments, isolates, and degrades natural habitat; simplifies and homogenizes species composition; modifies energy flow and nutrient cycling". The city is lack of landscape habitat integration. A healthy green structure indicates the movement or flows of water, species, and people through the city. The restoration of the urban ecosystem is necessary for human and nonhuman species, which applies the landscape ecology theory – Patch-corridor-matrix model.

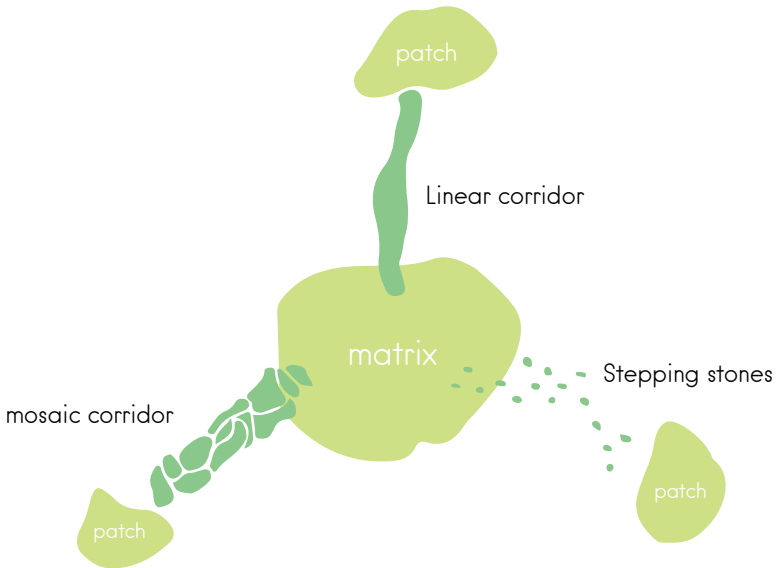


Figure.3 Patch-corridor-matrix model © Author

2.2.1 Basic elements – patch, corridor, matrix

The patch-corridor-matrix model, given by Richard Forman, provides a body of theory and principles focusing on the spatial arrangement of land uses for meshing and sustaining both natural systems and people (Forman 1995, 2004a). The followings are basic elements:

1) Patch

A habitat patch is an area inhabited by a particular collection of species. It could be large and small. Large patches sustain viable populations of many interior species, provide core habitat, and support near-natural disturbance regimes. Small natural-vegetation patches scattered across a less-suitable matrix act as stepping stones enhancing the movement of some species.

2) Corridor

A habitat corridor is a linear area that provides linkages between patches; a corridor can be terrestrial (vegetated areas) or aquatic (stream and river systems). Connectivity provided by corridors is species-specific and depends on whether an individual perceives neighboring areas as fragmented or connected (Bailey 2002).

3) Matrix

The matrix plays the dominant role in the landscape functioning because it is the combination of different landscape elements (usually patches). The characteristics of matrix structure are the density of the patches (porosity), boundary shape, networks, and heterogeneity (Barnes 1994).

Different types of elements actually relates closely to our life, because at any scale a mosaic landscape comprises patches, corridors and matrixes. If takes the spatial typologies in Rotterdam Zuid as an example (Fig,4): the patches could be residents' backyards, community gardens, pocket parks and cemeteries; the corridors imply the space along the canals, dikes, and highways, etc.; the matrix could be city park like Zuiderpark. Though some of the existing situation is not strong enough to support the whole landscape system, the objective is to improve their connectivity and heterogeneity.

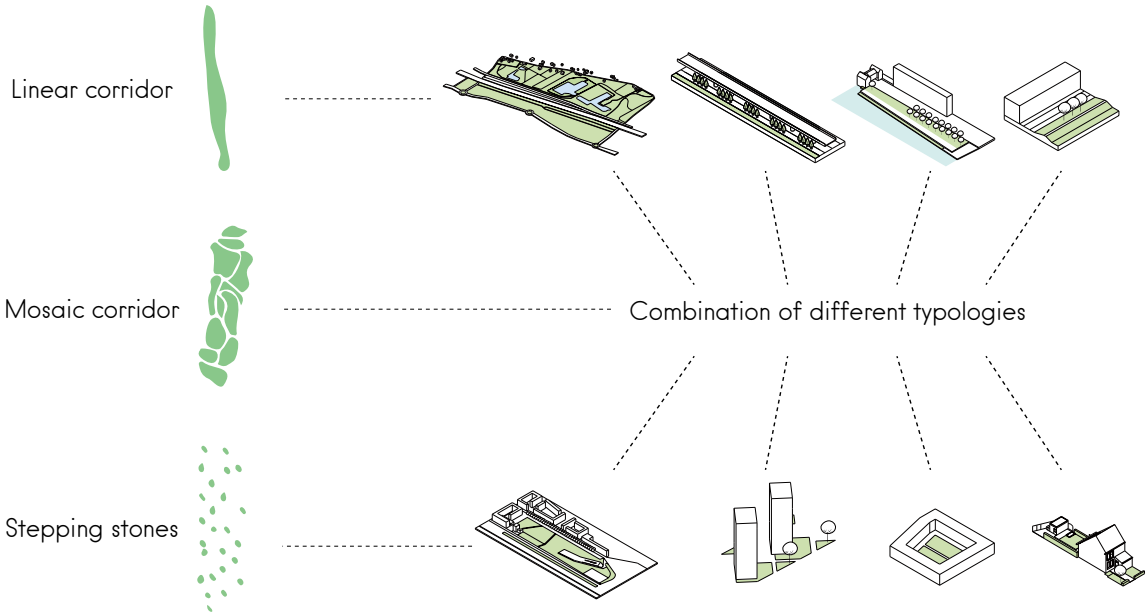


Figure.4 Representation of landscape elements © Author

2.2.2 Connection – indispensible pattern

The city we are living now is full of man-made barrier impeding the flows of plants and animals. The man-made barrier such as buildings and road structures increase the gaps between different landscape elements. The landscape connectivity provides the ecological benefits because most species evolved in highly connected heterogeneous natural landscape have difficulty to adapt to the human fragmented environment. The healthy green network implies a connective landscape, green corridors and patches in the city, trying to reduce the gap effects and less suitable spots in order to increase the chance of flow (for flora and fauna, as well as human). The connectivity is the foundation for urban ecosystem, so as to urban agriculture.

Based on the patch-corridor-matrix model, there are four"indispensable patterns" (Forman 1995; Forman 2002) that supports the connection (Fig.5): 1) large natural vegetation patches; 2) wide vegetation corridors surrounding waterways; 3) connectivity among large patches for movement of target species; 4) small patches and corridors – "bits of nature" that provide heterogeneity in developed areas.

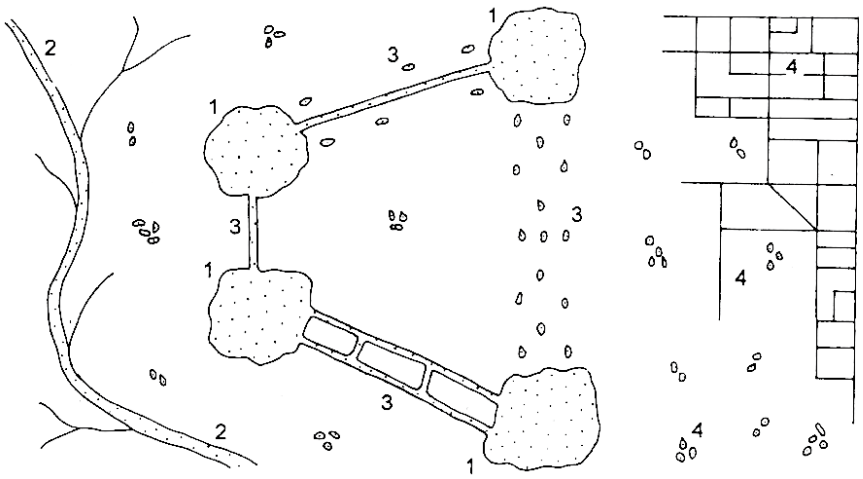


Figure.5
Top-priority 'indispensable patterns' in planning a landscape based on landscape eclogy.
1. a few large patches of natural vegetation
2. major vegetated stream or river corridor
3. connectivity with corridors and stepping-stones between large patches
4. heterogeneous 'bits of nature' across the matrix
© Forman, R. T.. Land Mosaics: The Ecology of Landscapes and Regions (1995)

It should be point out that one important factor that makes the ecosystem function is the plant composition: encourage using the native diverse vegetation to provide the habitat for native fauna and decrease the invasion by exotic species. Additionally, each urban habitat location must be considered in the context of its surroundings; connection and distance to neighboring habitat patches significantly influence the success of an individual habitat site.

Even though the fully connective landscape in urban areas is difficult to achieve, enhancing the existing urban habitat is equally essential. Consequently, constructing the healthy green network in the city is not only a top-down strategy, but also depends on bottom-up initiatives. For instance, the "bits of nature" can be developed by residents' daily action, which is bottom-up and easily implemented. Basically, this network implies the improvement of the land use and land cover in urban areas. The healthy green structure is large-scale and long-term project. The change is dynamic, and not matter what size of improvement, every transformation is helpful to the whole landscape structure.

The size and scale of the landscape elements vary. Though there is no 'natural area' in the city, there are a lot of opportunities (Fig.6) can be enhanced or redeveloped for constructing the healthy green structure in the city. From the small scale (bottom-up), building walls, balconies, front/back yards, rooftop gardens, community gardens, pocket parks: they function in maintaining the diversity of plants. Regarding the large scale, for

instance, the City Park, woodland, cemetery, and the collection of allotments, all these spaces represent the complex and heterogeneous environment for rich species. In addition, a series of underutilized space along the urban infrastructure like highway, railway, metro-line, and residual green space like canals and dikes, all have great potential to support the urban ecosystem. All the examples can be divided into patches and corridors; they represent different ecological types in the city. Considering a comprehensive network in the future development, they have to be integrated to complement each other. A synergy plan must provide both top-down and bottom-up approaches that cover the scales from small to large.

Small scale


building walls © Author


balconies © Author

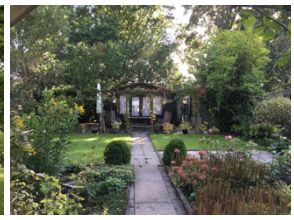

front/back yards © Author


community garden © Author

Large scale


city park © Author


woodland © Author


collection of allotments © Author


cemetery © ww2cemeteries.com

Underutilized space - potential


space along highway © Author


space along canals © Author


space along dikes © Author


space along streets © Author

Figure.6 Examples of landscape elements in Rotterdam Zuid

2.2.3 Top-down mechanism and Bottom-up initiatives

1) Top-down mechanism

Top-down mechanism requires strategic planning and design of land use for a city-scale level, a basis network developed from the urban morphology. This includes: identifying the potential space for developing or enhancing the habitat patches; how different patches connect to form a network. Since the network is not just for landscape ecology but also for citizens, it needs a synergy strategy combines with urban infrastructure (water, road structure, traffic system) to ensure the accessibility and safety; and policymaking including legislation of land use, the empowerment and participation of citizens.

2) Bottom-up initiatives

The bottom-up initiatives more relate to the effect of stepping-stones between patches. The aim is to densify the potential interaction between patches. For species movement, a cluster of stepping stones with an overall linear alignment provides alternative routes and is likely to be more effective than a weak corridor. The policymaking about legislation of land use and empowerment actually function in the bottom-up level, because it encourages citizens to concern for their living environment. Considering as a movement of beautification in the city, citizens use diverse native plants to decorate their yards, balconies; grow food in the community gardens. Every action might have small effect compared to a city level. However, as many actions accumulate, the co-operation intensifies the total effect.

2.2.4 Conclusion

A healthy green network is considered to be a foundation, not only for urban agriculture, but also for urban ecosystem. The application of landscape ecology principles to urban areas, including the redevelopment of the underutilized space along the infrastructure, interactions among patches and corridors, is valuable for achieving urban ecological health. It is like restoring and creating a beneficial habitat based on the existing situation, not only for food growing, but also for slow mobility, for human and nonhuman species.

2.3 Identifying scales

My way of studying the cases and site related to the understanding of different scales. Though this process might be immature, the study of different scales indeed helped me to structure the research and design project of Rotterdam Zuid step by step.

The systematic approach is based on the above framework and theory to create a synthesis that allows for a trans-disciplinary and flexible design. The essence of a system is that each part is independent and self-reliant individually while at the same time responsible to other components through different scales. Identifying scales in the city is necessary because: 1) the healthy green structure is relevant to all scales as above mentioned; 2) urban agriculture has diverse forms and ranges in different sizes. The main four scales of a city structure are: city scale, neighborhood scale, block scale and amenity scale. In this section, the article will analyse in different scales and try to offer the methodological discussions. Related to the realm of landscape architecture, the spatial dimension is of high priority in this section. The main questions here are what these scales relate to, and how urban agriculture functions in these scales. The examples will be added in each part in order to further explain each scale.

2.3.1 City scale

The city scale is fundamentally important in integrating urban agriculture as part of green infrastructure. Consider city scale as a top-down approach allows a bigger power on incorporating multi-benefits of urban infrastructure for the environment, the society and the economy, while at the same time encouraging bottom-up strategies. However, the analysis and application of city scale is often neglected in the existing situation. People usually attribute urban agriculture to the patchwork of the city, which explains why urban agriculture develops immaturely and fragmentarily. From a spatial dimension, city scale includes physical and social aspects:

1) Physical aspect:

The study of morphology of the city includes the land features, comprising land uses (programme and infrastructure) and forms (fabric, topography, soil, historical changes of landforms, etc.). To better understand the city structure by studying geomorphology helps to the identification of suitable locations and networks of urban agriculture with other infrastructure in the urban context.

Take the Frankfurt as an example, the Romerstadt project was proposed by Leberecht Migge and Ernst May after World War I (Fig.7). The goal of the project was to open up the city as a whole and create healthy dwelling with gardens, at the same time using urban green space productively. The new structure plan identified the locations for new residential development, which were carefully defined in relationship with the landscape. A coherent landscape was created due to the balance between housing and edible landscape according to the topography and land uses. The design showed a deep grasp of the morphology of places around Nidda Valley. Urban agriculture is not just about food production but also helps to structure the city based on the geomorphology.

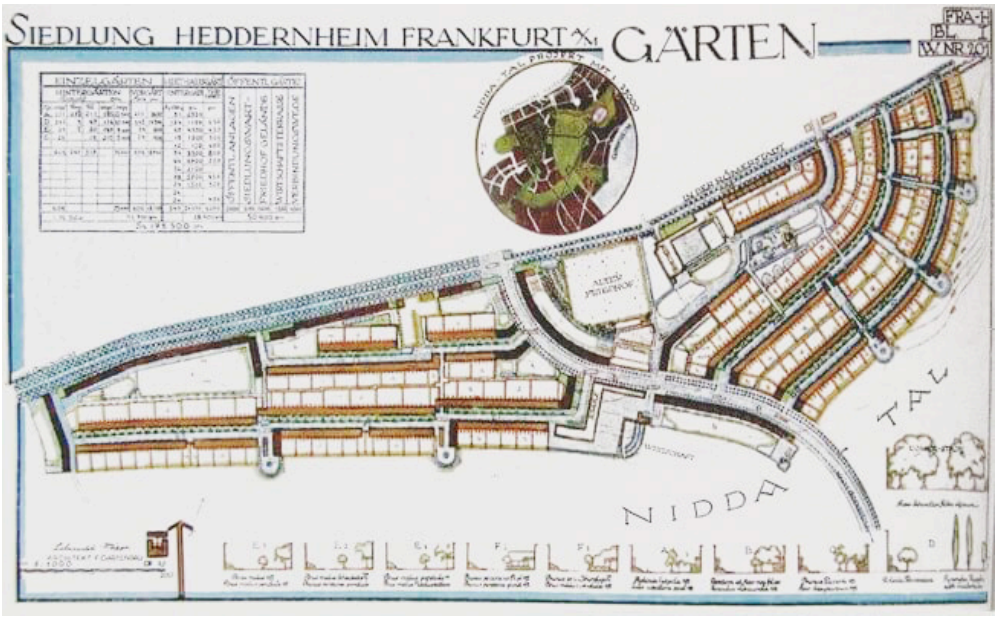


Figure.7 Romerstadt, plan and section, proposed by Ernst May and Leberecht Migge © ernst-may-gesellschaft.de

2) Social aspect:

Social aspect relates to social cohesion, social justice, and social capacity, etc. It is necessary to be discussed in the city scale because different social conditions define different spatial performance. Conversely, the changing physical environment will also influence the social life. Food culture has a deep relationship with the social environment. To understand the social dimension, start from analyzing the demographic data of a city: what is the population by age group? Where are the people from? Whether there exist social issues (safety, education...)? Once we get the information in mind, we can study the different cultures and habits of people; then we can conduct site investigation and interviews for a detailed and deeper level, which implies a more contextualized food landscapes.

Much like a watershed defines a city's water system zones or precincts, research the city scale can identify a city's 'food sheds', defining the food components within a city (Philips, 2013). The task of studying city scale is to set a framework of planning strategies that creates the big idea into physical form, identifying the potential sites and setting the urban agriculture policies and goals for the following scales.

2.3.2 Neighborhood scale

Community-led urban agriculture is the dominant performance in the existing practices in the city, which has a direct connection to the neighborhood scale. The edible gardens in the city not only provide a space for growing food, but also offer a place for meeting and sharing. With the basis image of cities, the typology study is conducted in the neighborhood scale. The typology of urban agriculture mainly demonstrates the relation between built environment and potential outdoor space for agriculture. The typologies can be divided into primary agriculture and secondary agriculture, which vary from cities to cities. For instance, cities like Havana and New York City, urban agriculture is sprouting up in the empty spaces such as vacant lots and rooftops; another city like Tokyo, the typology is more informal, using all kinds of tiny space to grow food, such as front doors, rain sheds, lamppost, corner space, and so on. The classification of the food infrastructure in typologies helps to show the spatial elements in different cities with broad enough clusters to present their similarities, as well as showing the differing compositions through typologies bound up with local specific contexts. What's more, analyzing the existing typologies in the city encourages the variation and new development of the future types and models for urban agriculture. Through this process, the integration of space and agriculture can be fulfilled in a better status.

2.3.3 Block scale

As the following level of neighborhood scale, block scale relates to buildings, which is the mediation between the buildings and outdoor space. The block scale indicates the space inside the block, and also parasitic agriculture, the integration of agriculture and architecture. With regard to this, block scale involves the studying of building forms. The city in the transformation period has more to do with this scale since it may lead to the new types of building-integrated agriculture. In this level, urban agriculture has more engagement with the private and collective sectors. The assessment of the building forms of the site or other cases helps to understand and to arrange the different elements.

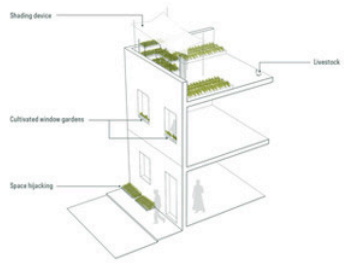


Figure.8 Type of Mirco-gardens in Havana © Farming Cuba: Urban agriculture from the ground up. Clouse, C. (2014).

Here using Havana as an example, as a paradigm city of urban agriculture, residents developed Micro-gardens (Fig.8) to highly integrate agriculture with the building. As a smallest-size garden type, Micro-gardens use the rooftop, window space, and balcony of a building to grow food. However, the case of Havana was more about the reaction to a Special Period. The above-mentioned type was informal and only for self-provision purpose, which is developed by individual level from a very limited situation.

If think of design level, the opportunities of block scale with architecture are infinite, because it contains the building as well as the space around the building (Fig.9). This requires the collaboration with architects and landscape architects. What happen inside and outside? What does the transitional space look like? What to do with the facade? How does the structure adapt to it? All kinds of questions can be exposed in this scale.

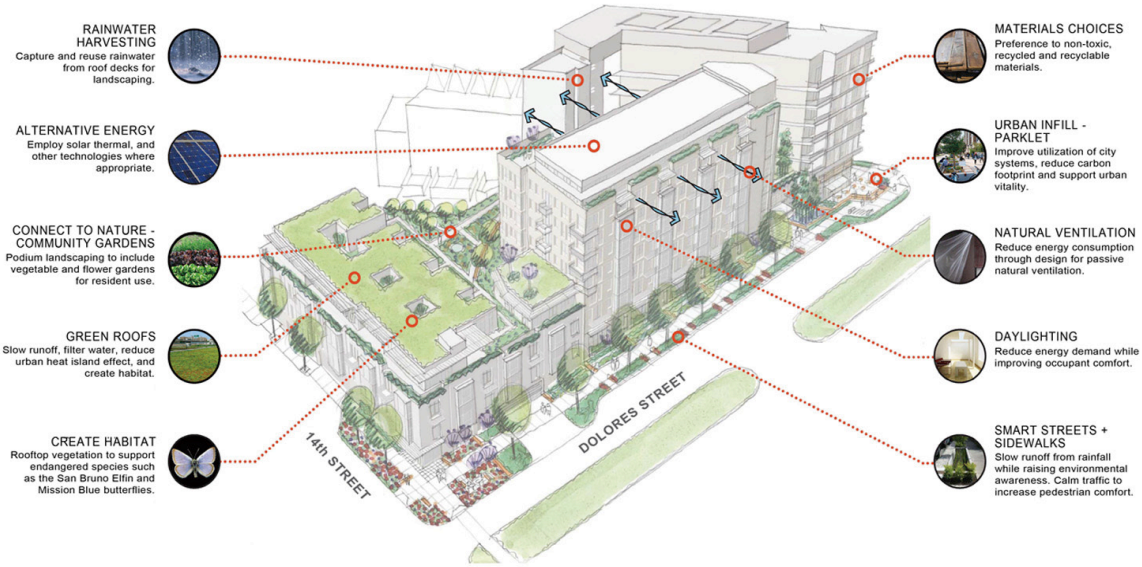


Figure.5 Example of designing in block scale © APDW studio, www.apdw.com

2.3.4 Amenity scale

Amenity means any feature that provides comfort, convenience, or pleasure, or the quality of being pleasing or agreeable in situation. In short, amenity scale relates to the experience and sensory of human. An intimate scale that people can directly perceive; a scale that people can also create by themselves. In urban agriculture, amenity scale indicates the feature that not only provides facilities for growing food, but also the atmosphere for setting agriculture-related activities. Amenity scale needs smart small-scale design, for example, using modular system or inexpensive material to create aesthetically beautiful landscape. Not only designers or architects, but also residents participate in the design process. The combination between top-down approaches and bottom-up initiatives in this scale also makes urban agriculture happen in a dense area of a city, creating the sense of ownership in a cost-effective and creative way.

2.3.5 Brief summary

It is important to identify the scale early in the design process, which can be as simple as a draft outline in the beginning. This method helps me to have ideas clear in mind about what I am going to investigate and analyse for the next step. Though in the end I might select only one or two scales to make further elaboration, studying all four scales during the research period guides me to define the problematic and create the framework of design in a holistic way. Without integrating with different scales, urban agriculture will not function in multi-scalar levels as the urban infrastructure. The more that can be defined in this process, the more the design strategy will have high interaction with different dimensions and integrate into the systems accordingly.

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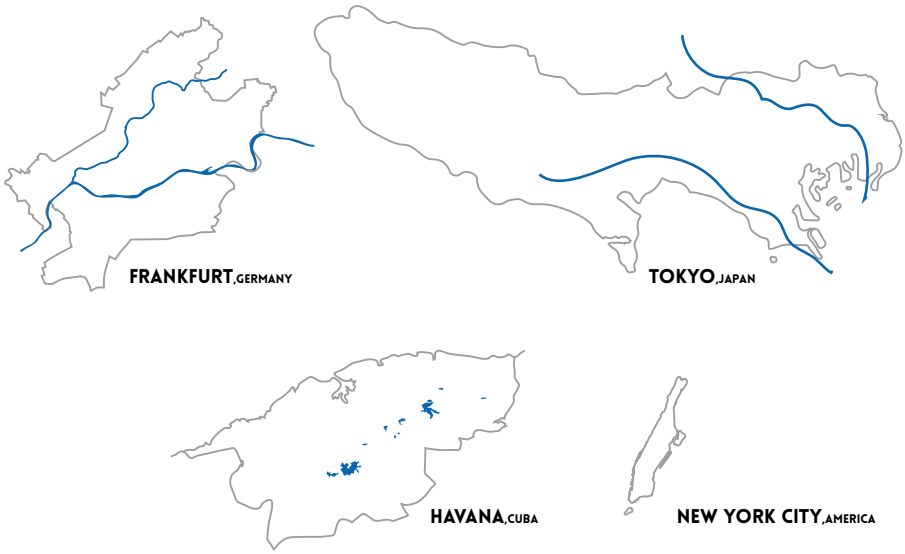


Supportive Policy & Strategy | Spatial Feasibility | Participation of Citizens

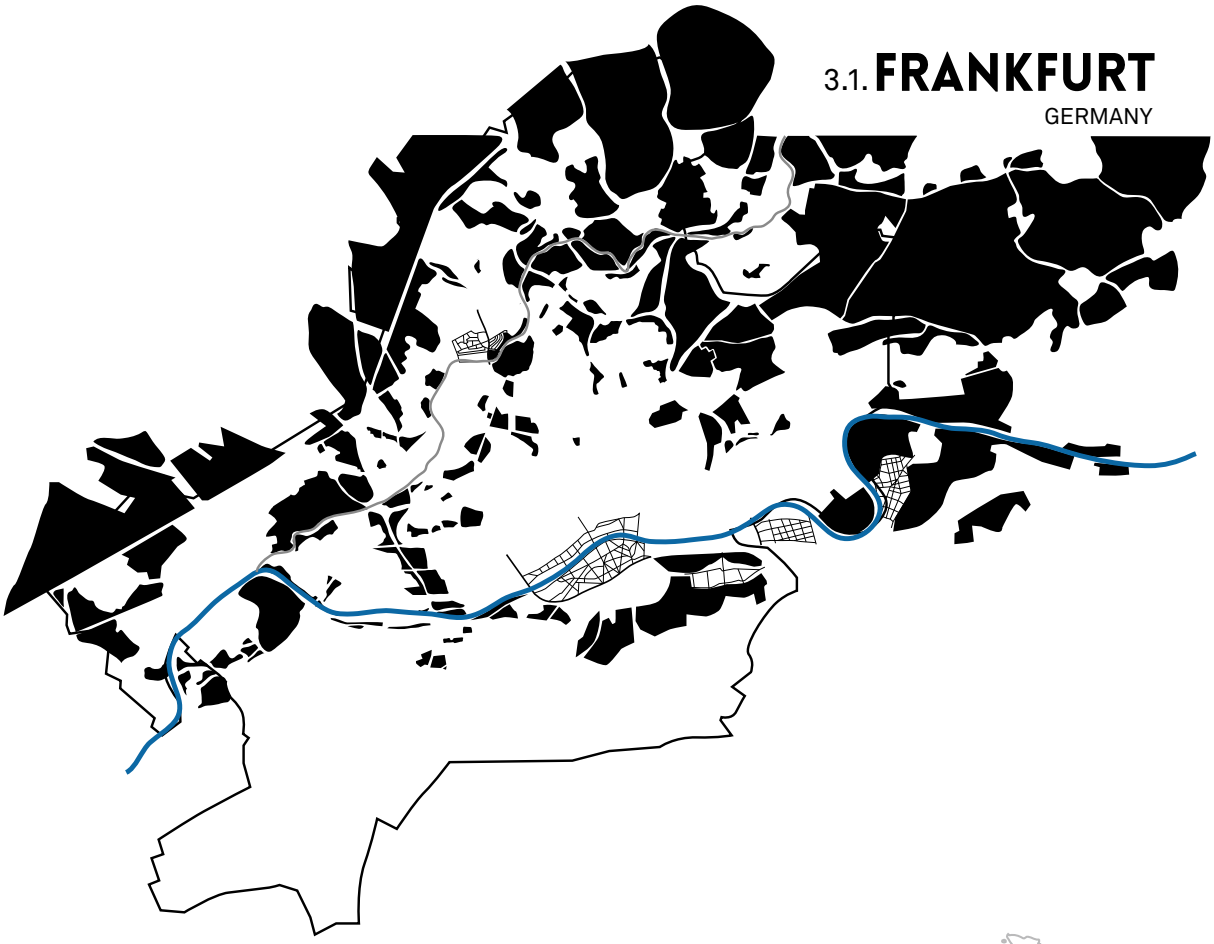
3. CASE STUDY

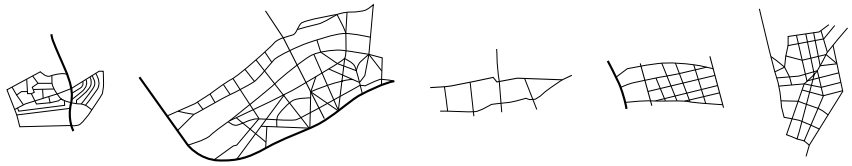
There is a wide range of reasons for developing urban agriculture. Urban agriculture has multiple benefits that contribute to health, social, economy and ecology in cities, which can be seen as the catalyst that stimulates the development of the city in a sustainable way. Therefore, the development of urban agriculture becomes a need and tactic in cities. The purpose of case studies in four cities (Frankfurt, Tokyo, Havana and Manhattan) is to understand the role and performance of urban agriculture in a city level. The first reason that I chose these four cities is that they have a long history of urban agriculture, whether in formal or informal ways of promoting the practices. The second reason is that they have different driving forces for developing urban agriculture: self-sufficiency, reaction to crisis, culture or social justice.

Urban agriculture has different meanings when it adapts to a city. There are three main factors that contribute to the implementation of urban agriculture: the supportive policy, spatial feasibility and the participation of citizens. This part includes learning how urban agriculture works in these cities (why developed and how); the comparison between the city morphology and spatial characteristics of urban agriculture. The analysis was mainly from the literature, mapping, and online searching. During the research period, I also went to Frankfurt for field study. In case study, the description of the historic background and the strategies of developing urban agriculture were given in text, accompanied by a series of mapping and diagram drawing for further explanation.

3.1. FRANKFURT

GERMANY



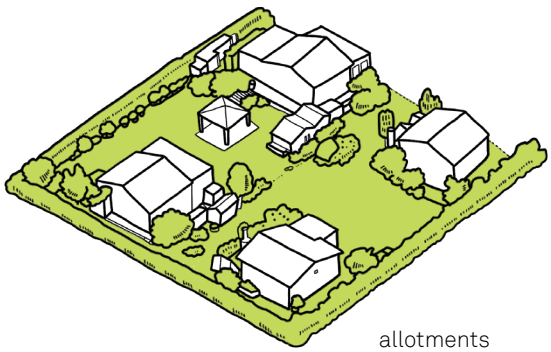


URBAN FABRIC

The development of urban agriculture in Germany is related to the periods of hunger and food insecurity of the 19th century. Due to the situation of famine and poor social conditions in the countryside, many people migrated to the city to look for a job. In a short time, the population of the city area was dramatically increased. In order to feed the growing population, the competent authorities started to gave land to people for cultivation through self-sufficiency. The form of allotments was developed during this period. The form of Allotment gardens consists of a piece of land between 200 and 400 square meters, most of them with a little shed for storing gardening tools.

Focusing on Frankfurt, known as a green city in Germany, nearly half the overall city area comprises green open areas. 24.5% of the green area is used for agricultural land. We can see the pattern of agricultural area is mainly along the space of river, highway and railway. In the rural area, the agricultural typology is mainly commercial farms. In the city area, the main typology is allotment. The green pattern was developed from the original brownfield sites and the withdrawal area (e.g. 17.7-hectare former helicopter landing site in the Nidda meadows) from the US army. Both situations led to large area of unused land. The government converted the land into green and recreational area, including parks, sports areas, natural woodlands and allotments.

Here I would like to take the Römerstadt project as an example. The Römerstadt project was developed after WWI. The period after war grew the problem of providing enough housing and food for residents.



allotments

The agriculture land at that time was difficult in feeding the rapidly growing population. However, this project did not only provide the space of allotments for self-sufficiency, but also raise a new form and relationship between housing and food growing. The Römerstadt project was designed by architect Ernst May and landscape architect Leberecht Migge. It was the combination of industrial production of the housing, and production of food through intensive forms of urban farming - using open green land productively in forms of private gardens and allotments. The place along the Nidda Valley was in a sloped and terraced topography. The project was carefully adapted to the morphology of the landscape that oriented buildings and productive space in different directions. The topography was emphasized in the plan: Rows of houses accentuate the natural form of the valley wall and give it a new architectonic form of gardens and buildings. The land for urban agriculture implies the edge of the city that close to the natural reserve Nidda Park.

In February 2017, I went to Römerstadt. The report of the observation will be presented on the following pages that show the points I concentrated on.

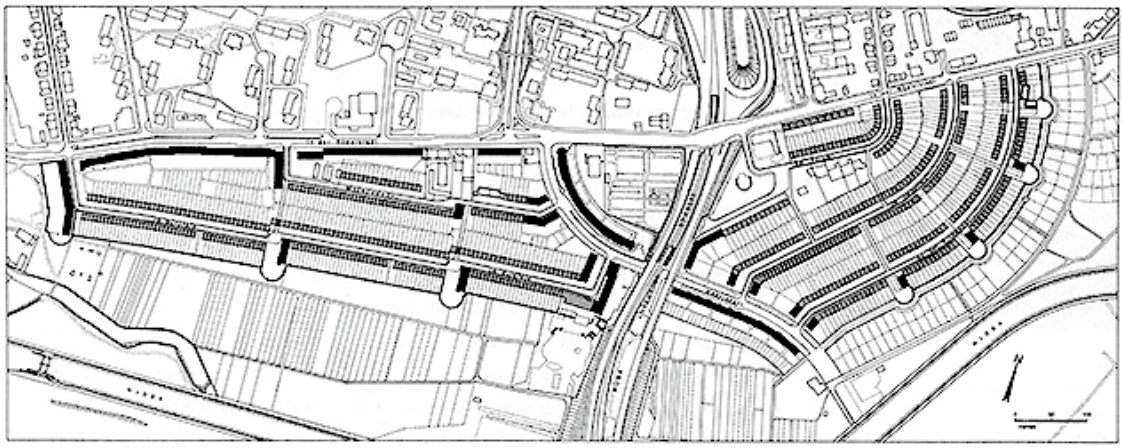
OBERVATION / FRANKFURT CASE

Romerstadt, Frankfurt, Germany / 02.2017

PERIOD	1925 - 1930
DATA	47 acres 1220 residential units built originally 2493 residents
DESIGN PRINCIPLE	- high quality - affordable rent - practical scheme - diversity and dynamism - self-sufficiency

THINGS I OBSERVED

1. topography
2. identity
3. linear
4. contrast
5. vegetation
6. geomorphology
7. guidance
8. coherence & variety
9. interactoin
10. territory
11. allotments
12. waste
13. details
14. parking
15. accessibility



"Wohnung für das Existenzminimum" - Ernst May
Plan of Römerstadtschule Frankfurt


1

TOPOGRAPHY

The inclined terrain is the character in Romerstadt, which was utilized to define different space and connection, creating the views and guidance.


2

IDENTITY

Designers left more space for residents to create their own identities. Each entrance of each house is different and unique.


3

LINEAR

Courtyards are connected by a long and slightly curved path. These paths make the space legible at the same time let passers by enjoy the courtyards designed by residents.


4

CONTRAST

The perception is always changing to avoid boredom when people walk through open and enclosed spaces.


5

VEGETATION

The vegetation is designed for different seasons, and different configurations create different atmosphere.


6

GEOMORPHOLOGY

The curves and elevation show that the buildings are carefully attached to the geomorphology of the terrain of Nidda Vally, defined in relationship with the landscape.


7

GUIDANCE

People will be guided to walk from the city space to the Nidda natural park gradually because of the hints in the design: vegetation, furnitures, stairs, etc.


8

COHERENCE & VARIETY

The design creates a coherent scheme, while at the same time producting varieties with different details.


9

INTERACTION

From the design of gardens and entry space, the housing shows a close interation between inside and outside, and also between neighbors.


10

PRIVATE & PUBLIC TERRITORY

Except for the defined space, different areas have been territorized for public, semi-public and private sectors by residents.


11 ALLOTMENT GARDENS

Besides courtyards, there are allotment gardens close to the park area, which creates a self-support community.


12 WASTE COLLECTION SPACE

There are specific areas for waste collection spots in each neighborhood, related to household waste management.


13 DETAILS

The details reveal the living style of residents from different cultural backgrounds, creating a mixed community.


14 PARKING

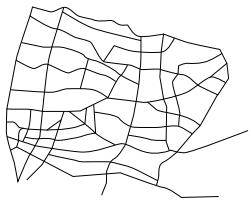
Cars were not popular in 1930s. But nowdays, almost all the streets are occupied by car parking in Romerstadt, leaving less space.


15 ACCESSIBILITY

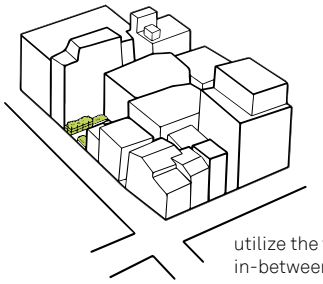
Due to the height difference, the space is not barrier free. The accessibility for the disabled is missing in the design. That's why people put boards on the stairs.

3.2. TOKYO

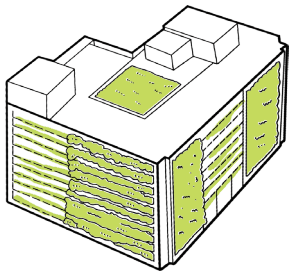
JAPAN



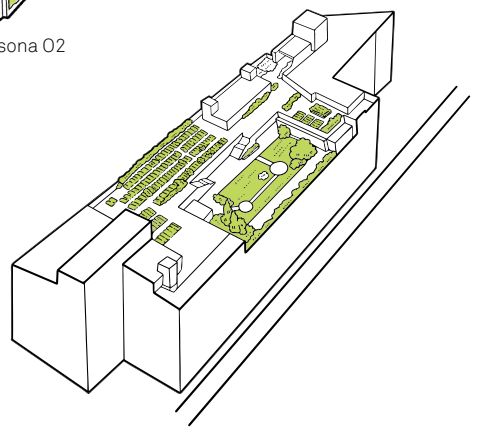
URBAN FABRIC



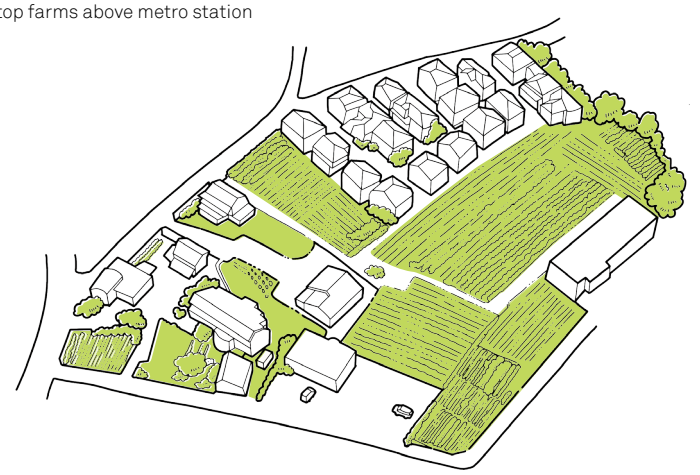
utilize the vacant space
in-between buildings



parasitic urban agriculture: Pasona 02



Rooftop farms above metro station



Peri-urban peasant farms

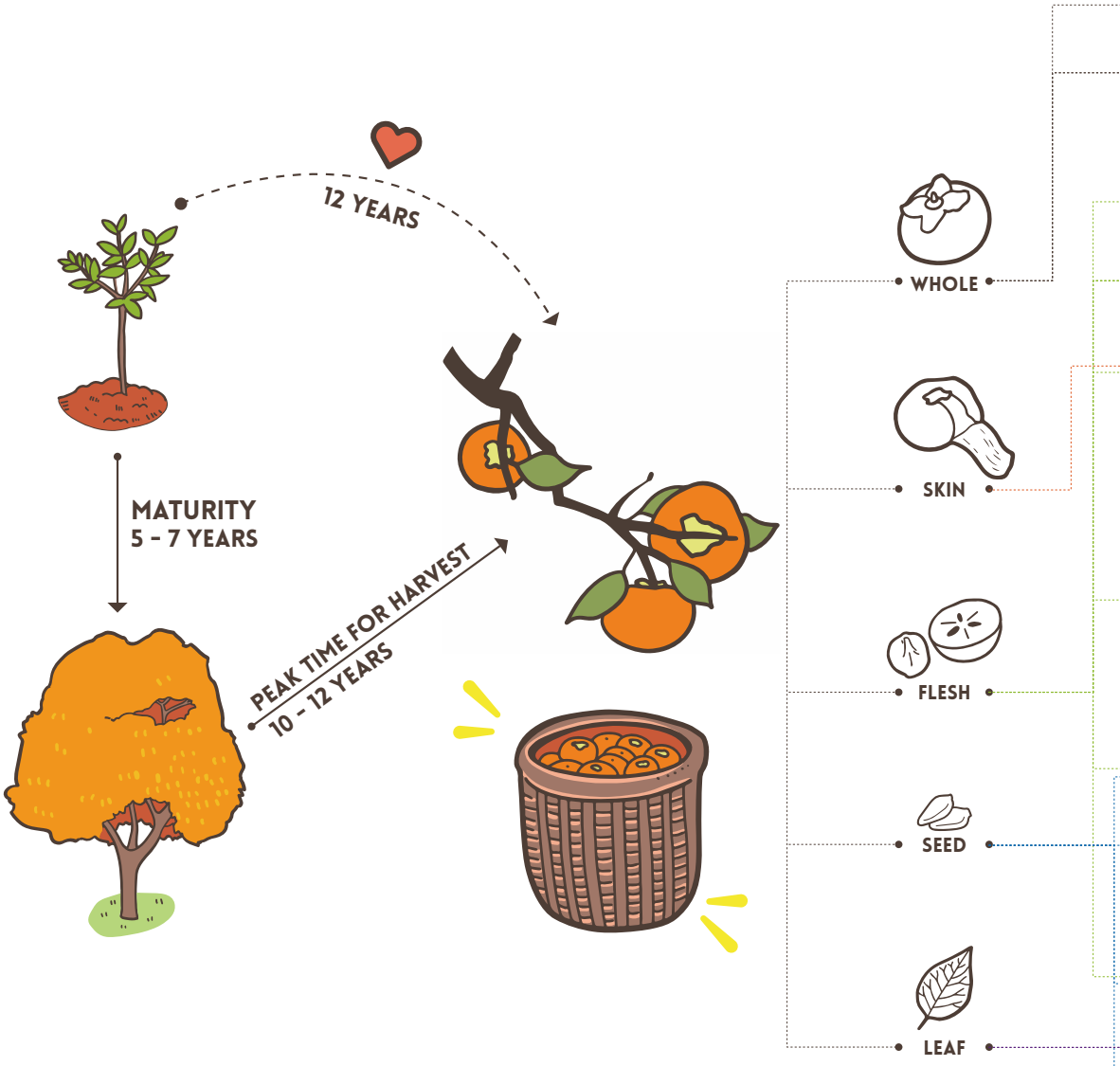
Food culture is profoundly embedded in Japan, which penetrates into the everyday life of citizens and almost every corner in the city. Food has a deeper meaning for Japanese and people always relate it to the essence of life – culture of respecting nature, culture of LOHAS (living the slow life), cultivating relationships between people. Tokyo as the concrete jungle, though it is super high density consisting of infinite buildings and road infrastructure, green can be easily seen, narrow streets, tiny balconies, eaves, and front door space...

Probably because of the higher pressure of working environment in Japan, or the profound food culture, many people consider growing food as a hobby, a way to relax. Since the 1990s, the Tokyo Metropolitan Government has opened both public and private spaces in which Tokyo residents can farm little pockets of land. Due to the growing need of the lease land, some local businesses came up ideas of purchasing the vacant land such as rooftop or lots in-between buildings for renting space to people to farm. The spaces are easily accessed by people, for instance closed to residential area for local residents, or above the metro station for commuters. Citizens have to pay for farming. The renting fee includes the land, tools, soil and mentoring from experienced farmers. This kind of business not only provides green space for people and city, but also gives collaborative opportunities for peasant farmers to make a living in order to cope with a declining small-scale farming situation in rural area.

Besides the new business type, the dense urban environment stimulates the citizens intelligently create various types of small space to grow food in Tokyo. Though the apartments and streets are narrow, there is always a way to reinvent an area for plants. They use their courtyard, rooftop, corner space, balconies, and even occupy the street space to grow food. All these behavior reflects on the tracing of map, we can see many tiny dots scattering in the city area. Except for the peri-urban peasant farms, the space for agricultural practices is small.

When I studied the case of Japan, one thing that fascinated me most was the relationship between people is cultivated and enhanced through food growing. Though the process of growing food takes time and money, which sometimes is even higher than the value of food itself, the reward is usually far more than the produce, and deep in people's life. It is priceless. Here I took a persimmon tree as an example:

The persimmon is one of their favorite fruits in Japan. Start from growing a persimmon tree; it takes 7 years to grow up, 12 years to harvest at peak time. A persimmon has different parts and people use them to make so many different kinds of products, sharing them to parents, friends, visitors, children... it seems like that 12 years is a long time, but it is also a gift of long term: you spend your time and patience and let others feel your love. Food is an intimate bond between people.

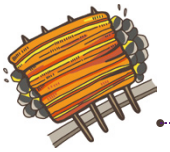


START FROM GROWING A PERSIMMON TREE

During these years, people spend their patience, care and love on growing food. Though it takes 7 year to grow a persimmon tree to harvest, it rewards much more from produce, cultivating the relationship between people.

SEMI-DRIED

WINE



BARBECUE

SNACK

SOURCE

JUICE

SEED SNACK

VINEGAR

SEED/SNACK

DRIED

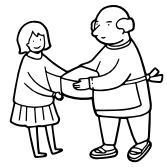
TEA

SOAP

JAM

DESSERT

PARENT



FRIEND

RELATIVE

NEIGHBOOUR

CHILD

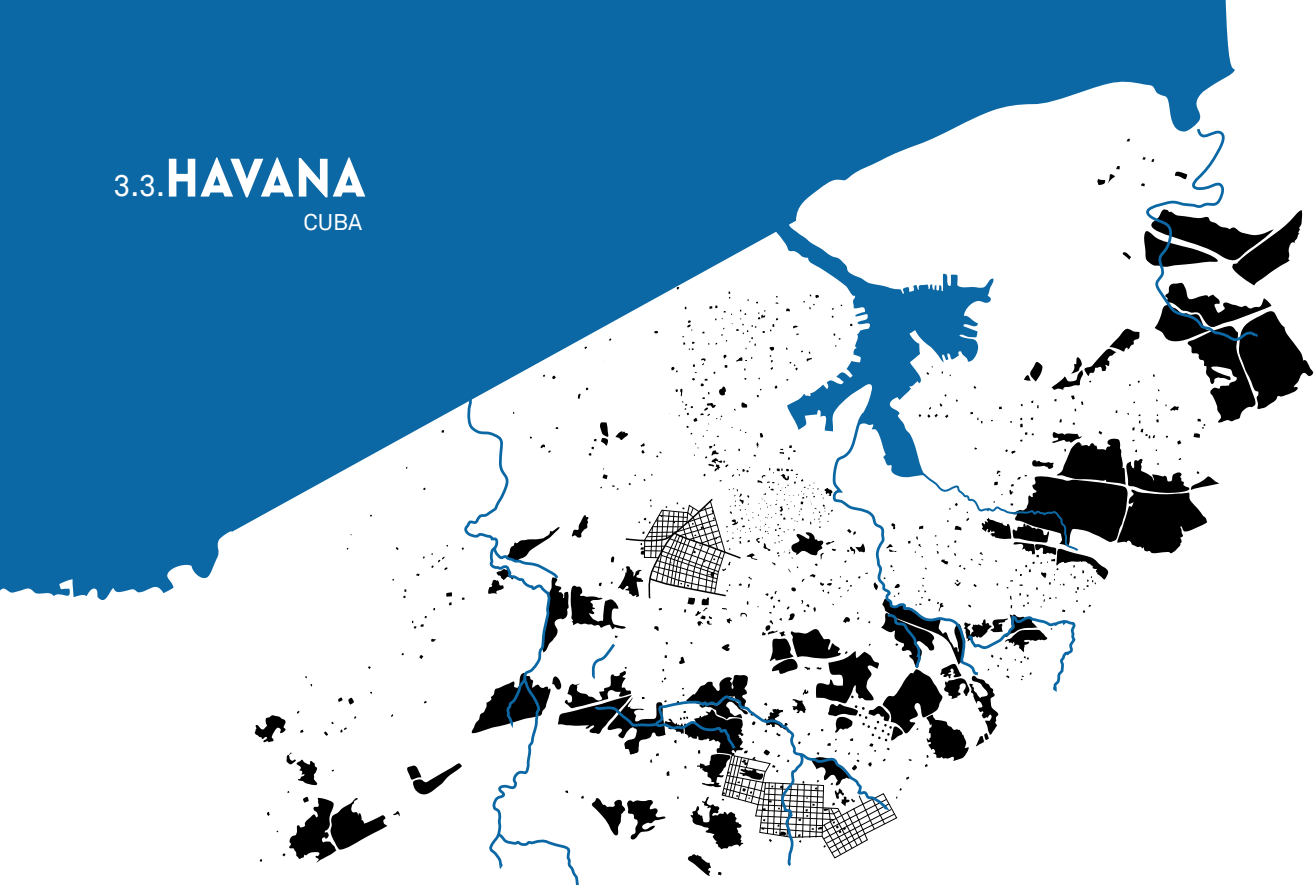
VISITOR

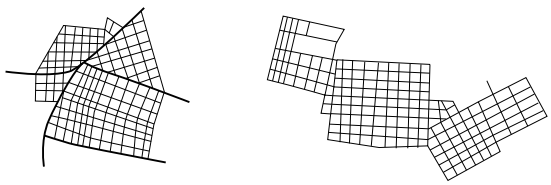
FOREIGNER

COLLEAGUE

BIRD

3.3. HAVANA
CUBA





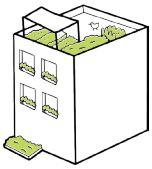
URBAN FABRIC

The greatest desire to develop urban agriculture in Cuba linked to the economic crisis in the Special Period (1990s). Since the collapse of the Soviet Union, Cuba lost the trade relation with the Soviet Bloc, which led to a great loss of imported fertilizers, pesticides, tractors, parts and petroleum. As a result, the food crisis happened – food production rapidly declined. The serious situation urged the country to re-oriented the focus on the way of farming: from the large-scale industrial agriculture to the small-scale ecological urban agriculture. The development of urban agriculture focused on self-sufficiency. Havana, as the best example in Cuba, its urban agriculture developed in almost every different forms of spatial typology in the city.

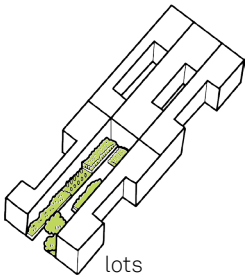
If look at the pattern of agricultural practices in Havana, we can see that the forms are the combination of dots, plots and fields. The dots came from the dense fabric of city core area. Opportunities for growing food have been explored and exhausted by citizens: rooftops, window planters, and errant silvers of land between sidewalks and walls, etc. The plots pattern largely comes from the vacant lot in the city. This outcome strongly related to the supportive policies from the government: the agrarian decentralization policies - the land redistribution program. The Ministry of Agriculture announced the dismantling of all inefficient State companies in order to provide support for creating 2,600 new small urban and suburban farms. The unused state lands were largely recycled under this polity. Also, the farmers were given the usufruct right to utilize the vacant land for growing food in the city. The strategy opened up the opportunities of small and medium scale farms. It is a top-down strategy but greatly initiates the bottom-up action, which citizens have freedom to relate food production for their own purpose. Havana's urban farming represents a people's movement (Clouse, 2014).

Under the support of the policy, there are various agricultural typologies, from the small-scale self-provisioning gardens or yards, to the large-scale intensive urban gardens and state farms. The actors vary from individual, collective, community and state enterprises. The activities included food growing, animal husbandry, compost making, selling, training, touring, and research.

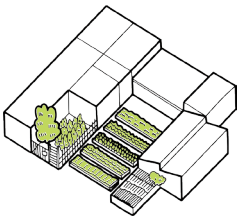
Besides the land use strategy, the supports from the city are wide range. Here the outreach and training are the primary source that provides by many organizations and institutions, including on-site mentoring, workshops, field tours, lectures and even mobile libraries. The aim is to disseminate the knowledge and information of food growing in a sustainable and efficient way. Due to the lack of resource, closing the local production consumption cycles becomes essential, which is economical and ecological. What's more, in order to monitor the implementation of organic farming, there are inspection visits conducted every three months with strict criteria. Material and moral incentives are used to encourage citizens to grow food in an organic and sustainable way. As Sinan Koont summarized, "necessity, possibility, and will" are three driving forces that ensure the success of urban agriculture in Havana.



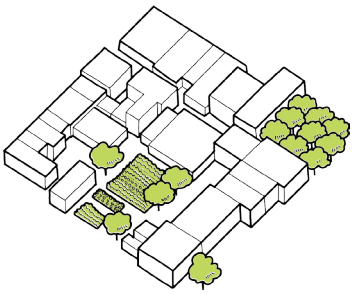
micro garden



lots



self-provision garden

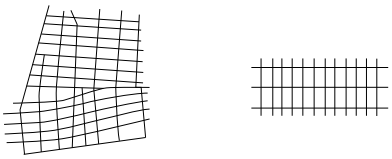


intensive cultivation garden

high-yield urban gardens

3.4. NEW YORK CITY

AMERICA



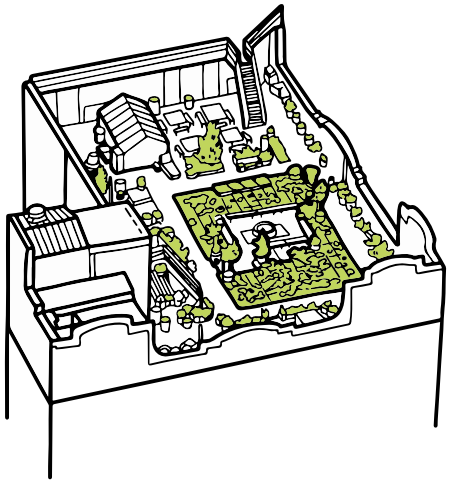
URBAN FABRIC

The development of urban agriculture in New York largely associated to food justice. The issue of food justice becomes serious in New York City that one out of every six families goes without enough food and one in four children are considered food-insecure (Satterlee, 2015). The problem arose the attention from the governments and organizations of NGO and NPO. As early as 1895, New York City witnessed its first urban agriculture campaign when Bolton Hall and the New York City Association for Improving Conditions for the Poor promoted the cultivation of vacant lots throughout the city (Lawson, 2005). It has been more than one century for New York City to develop urban agriculture. Slowly and steadily, the movement of urban agriculture is widespread and formalized revolution in New York City. There are a number of governmental policies and non-profit efforts to distribute the resources necessary for urban agriculture. The resources include physical elements such as land, soil, water, composts, and tools, as well as nonphysical components for instance funding, knowledge and access to information.

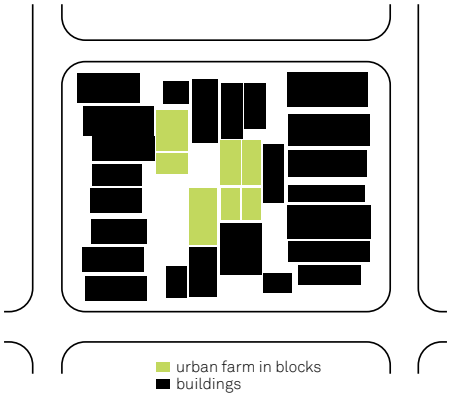
If we look at the fabric of NYC, it is a typical grid plan that formalized the city blocks in rectangles and squares, developed under The Commissioners Plan of 1811. New York City has been a leader to American urban agriculture movements, and gardens have been an integral part of New York City for a long period. The practices of urban agriculture deeply embedded in the city pattern, following the grid structure. The agricultural typologies in NYC are usually community gardens within buildings or blocks, and rooftop farms.

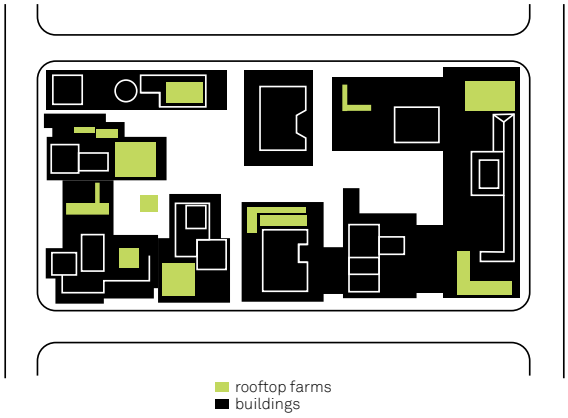
There is one important factor that encourages the development of urban agriculture, the progress of policymaking by government and relevant organizations, which provides a holistic food policy platform to a certain extent. Though the policymaking still needs to be improved, the framework supports the obvious foundation. This process needs multidisciplinary teams and departments to collaborate. According to the NPO Design Trust for Public Space (Five Borough Farms), there are four categories mainly discussed:

1. Formalize government support for urban agriculture (Identify locations for urban agriculture/ assess the economics including value and cost/ establish goals such as numbers of farms and food waste captured/ create process to ensure the coordination across city agencies)
2. Integrate urban agriculture into City policies and plans (Integrate into the green infrastructure program to support stormwater management through program provided by the Department of Environmental Protection/ availability and accessibility of composts through program provided by the Department of Sanitation)
3. Identify innovative opportunities to build urban agriculture into the cityscape (Incorporate urban agriculture in new projects in programs and design guidelines/ encourage temporary urban agriculture projects)
4. Address race- and class-based disparities in New York City's urban agriculture community (Increase access to information about available resources/ support capacity building/ establish transparent, citywide procedures for distributing city-owned land and other resources)

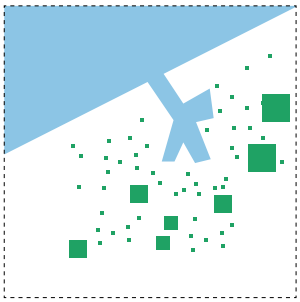


rooftop farm in NYC





FRANKFURT,GERMANY



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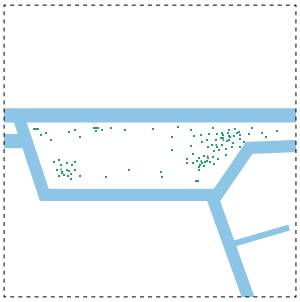

NEW YORK CITY,AMERICA

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4. SITE STUDY OF ROTTERDAM ZUID

This part is the site analysis of Rotterdam Zuid, which can be categorized into three sections: 1) spatial analysis; 2) social analysis; 3) conclusion. First two sections contain desk study and on-site study. The last section would be presented on a conclusion map.

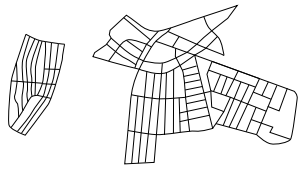
For the first section of spatial study is mainly about the spatial character of Rotterdam Zuid. The desk study includes analysis of the historical pattern, the morphology of the city; how the morphology of the city developed and what influenced. The on-site study marked the different green spaces during the field trip in Rotterdam Zuid, using different indicators to evaluate those spaces; and typology study, derived from the recorded spaces and separated them into 20 types.

Then, the desk study of the social analysis is about the data collection and visualization of the information comprising social score, population and criminality, etc. This process actually inspired me to relate the spatial character and the social performance, trying to find out whether the spatial form would influence people's behavior. The on-site study of this section is interviews, containing semi-structured interviews with people on streets and deep interviews with founders and volunteers of NPO.

The last conclusion section starts with an illustrated conclusion map, which is the combination of the first two analyses. The map is compact with a lot of information. The conclusion will indicate what I learned from the site and what inspired me for the next step.

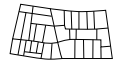
4.1 MORPHOLOGY STUDY

Inspired by the case study, the first thing I did is to trace the pattern of agricultural practices and morphology of Rotterdam Zuid. Though Rotterdam Zuid also has the practices of urban agriculture, the relation with city pattern is missing. In addition, the fabric of Rotterdam Zuid was in a fragmented situation. The historical development will explain how the fabric developed.

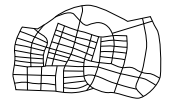


Medival/inner city patterns

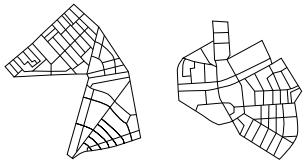
Rational



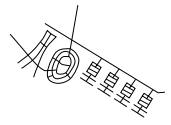
Functional/open blocks



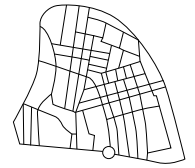
Urbanised Landscape



Garden village



Romantic/vinex district



urbanised landscape

FRAGMENTED PATTERNS

HISTORICAL DEVELOPMENT

ST. LUCIA'S FLOOD/1288
GRAAF FLORIS V

1300

1400

1500

1600

1700

1800

1850

1905

1953

2010

VALENTINE FLOOD/1374

ST. ELIZABETH'S FLOOD/1421
THE AGRARIAN CRISIS
DIKE REHABILITATION
dammed in smaller & larger polders

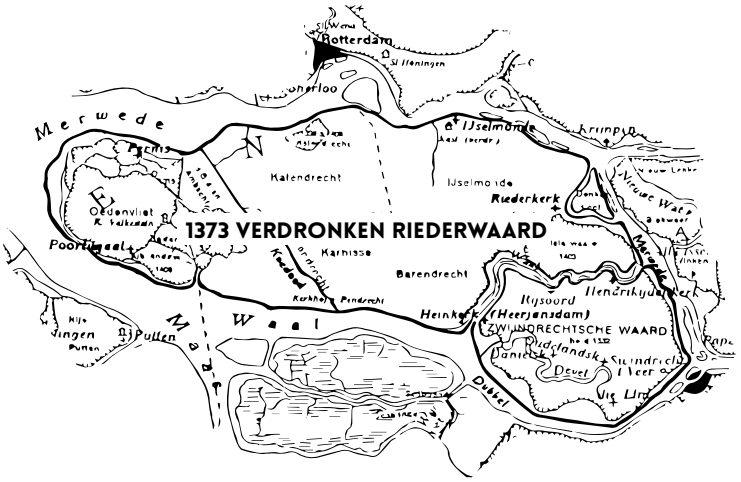
ALL SAINTS' FLOOD/1570

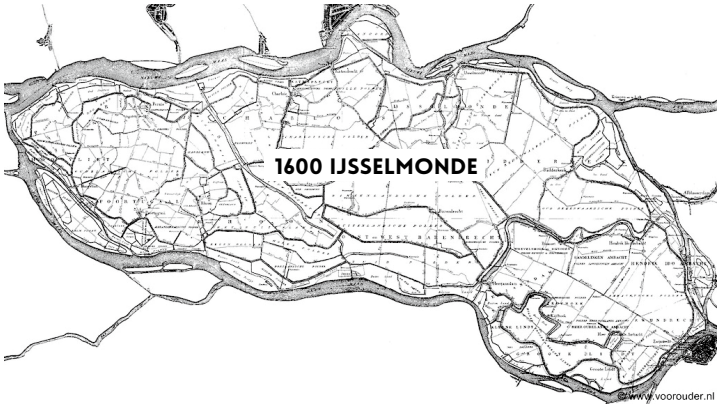
NORTH SEA FLOOD/1953
On island Ijsselmonde was above the water board "The Dike IJsselmonde" was founded in 1955, from 17 polder boards and water boards.

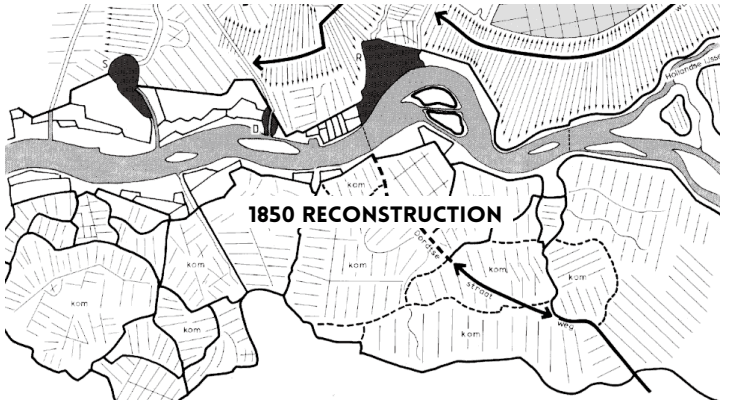
Rotterdam Zuid is located on the island Ijsselmonde. More than 700 years ago, this land used to be in separative parts. As it was developed, lands started to combine. However, due to several serious floods, the floods separated cities and most of the land remains flooded even today. In order to protect their lands, people built ring dikes based on the forms of lands. The ring dikes were not regular but in a distorted pattern, which more or less defined the fragmented pattern of Rotterdam Zuid.

ISLAND IJSSELMONDE

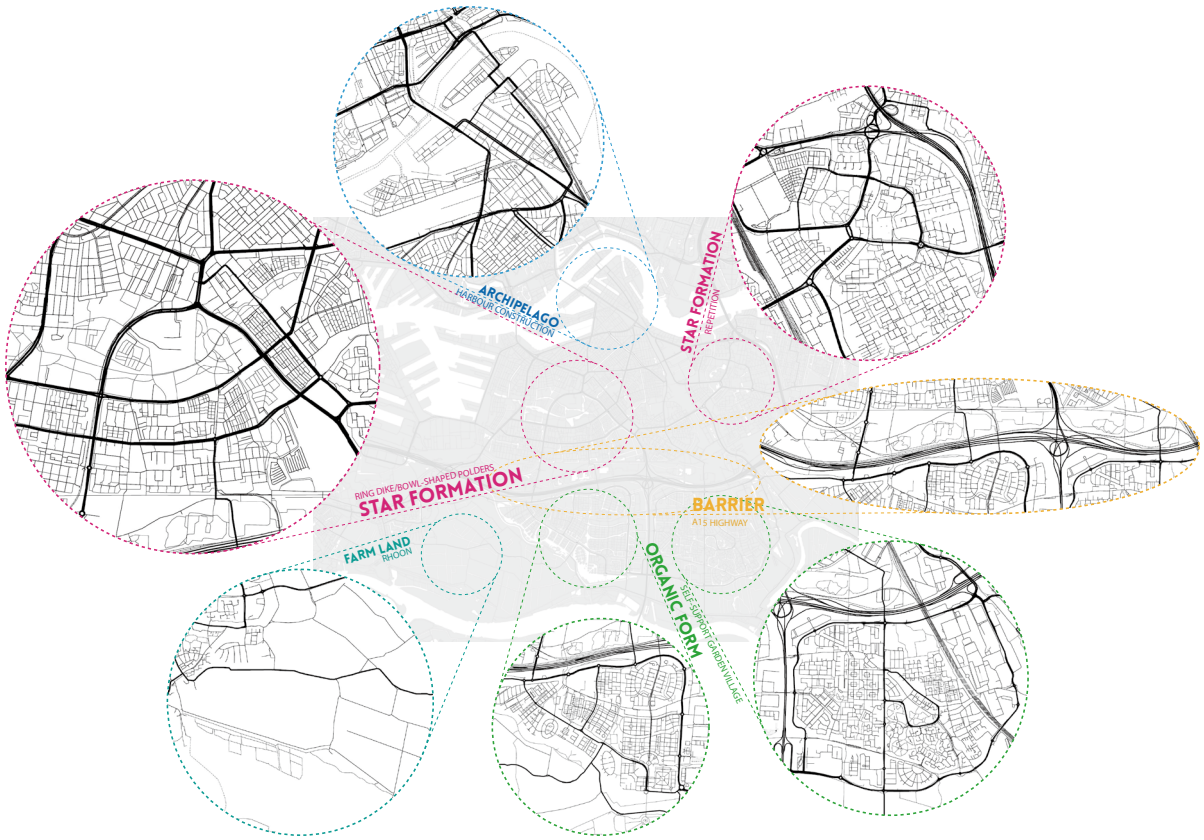
The island Ijsselmonde was once a rich agricultural region, but is mostly suburbs today. Only the mid-south parts of the island have retained their agricultural character. It has Bowl-shaped polders that formed by a series of ditches, and their individual polder patterns vary in orientation.





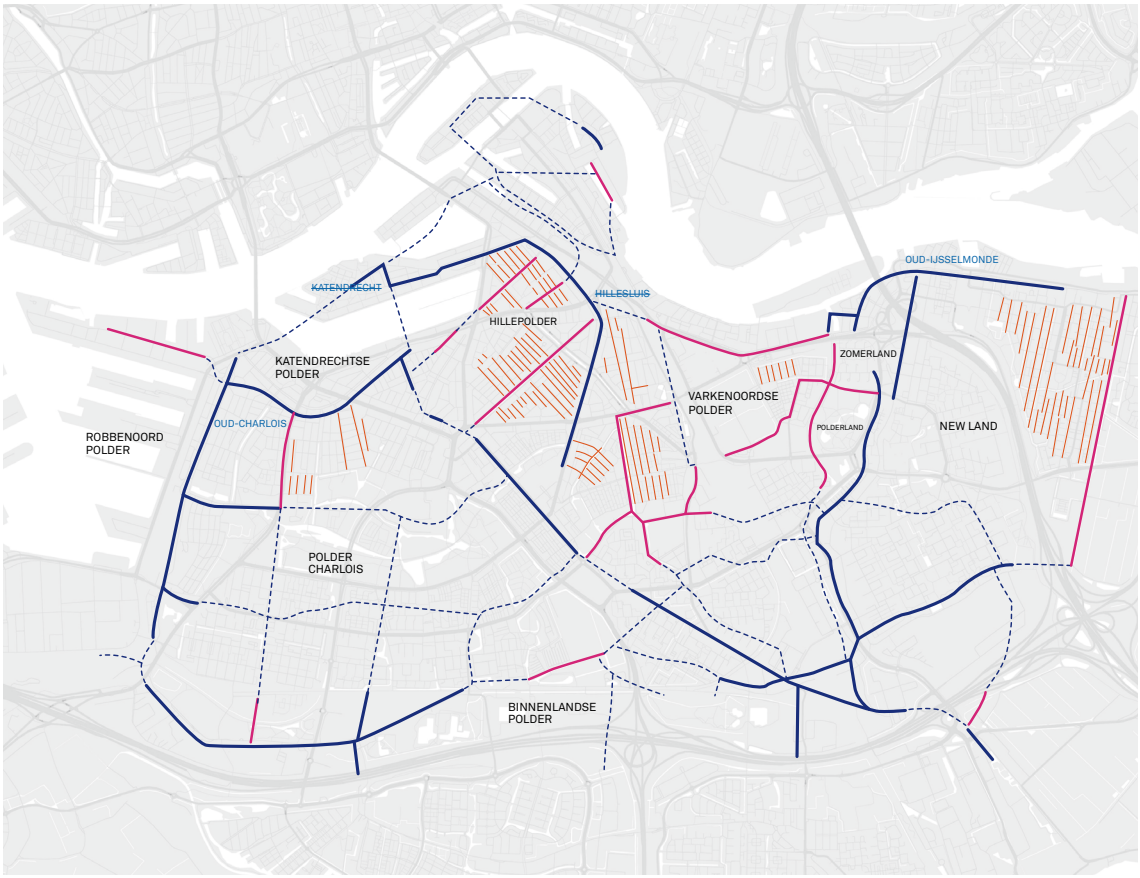


FRAGMENTED PATTERNS



Trying to categorize the fragmented pattern of Rotterdam Zuid, we can see there are five types: 1) pattern of archipelago was developed from the logic of harbour construction through the efficient organization of traffic movement around the needs of shipping; 2) pattern of star formation was influenced by ring dikes and bowl-shaped polder on one hand; on the other hand it was also planned in a repetition of star-shaped symmetry, with center and park at its heart; 3) organic forms in district Barendrecht – the Vinex plan during 1990s; 4) Peri-urban area: barrier– A15 Highway; 5) farm land area – the retained agricultural character.

INFLUENCE OF THE POLDER LANDSCAPE



FORMER RING DIKE

MISSING PART

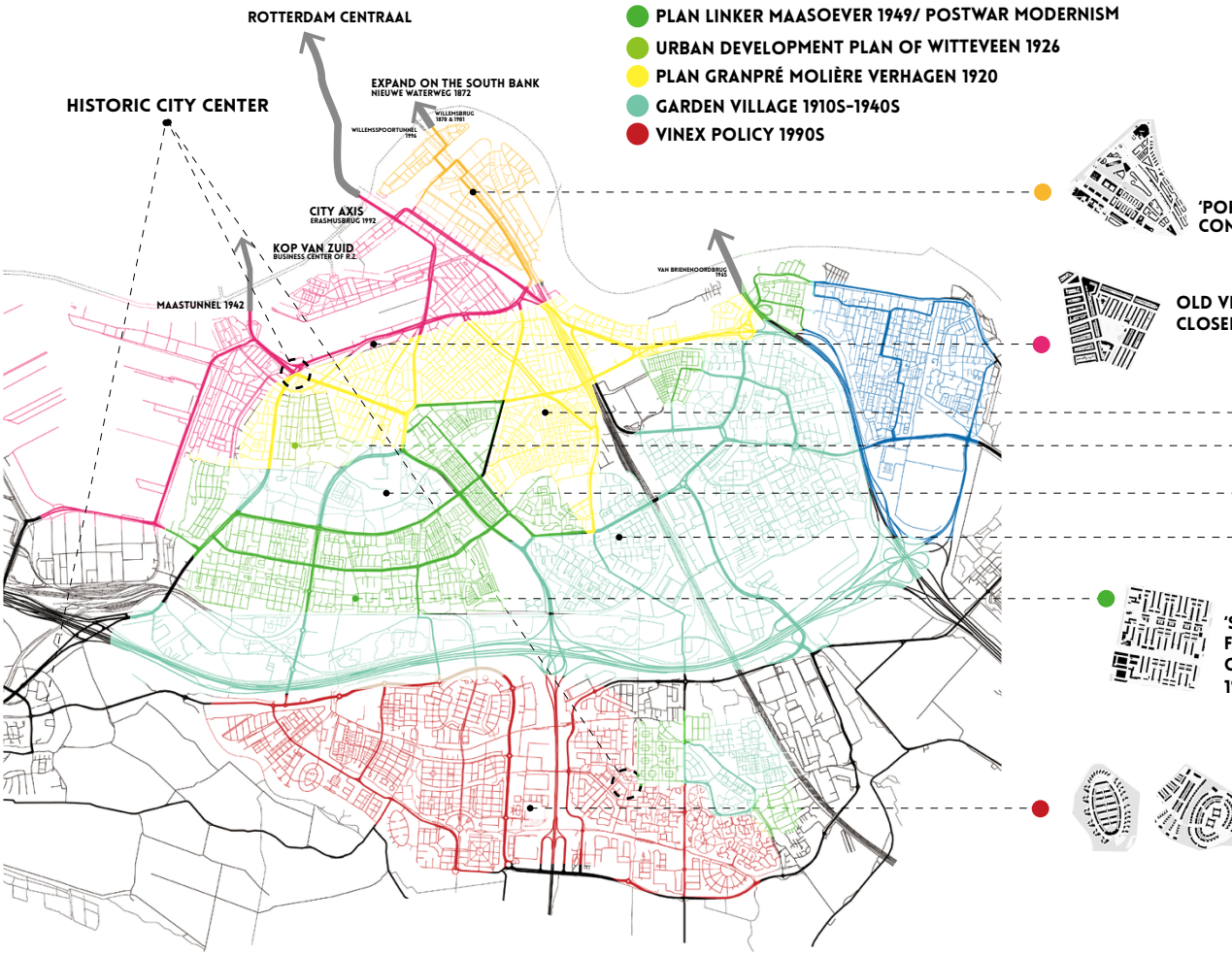
TRANSFORM INTO ROAD PATTERN

PRESERVE STREET PATTERN

Though the patterns are quite different, the urban structure still reflects some essential characteristics of the original polder landscape. Compared with the historical map, we can still find the well-preserved structure or patterns of dikes and parceling system.

PLANS OF DIFFERENT PERIODS

The historical development was one factor that defined the fragmented pattern of the land. In addition, the planning of Rotterdam Zuid was in a dispersed manner, with different focus on different periods. After combining maps in different times, the diagram illustrates the plans, typical fabrics and their spatial performance. The morphology of the city also influenced the housing forms in Rotterdam Zuid, which would be shown in the next page.



RT CONSTRUCTION'
NNECTION TO NORTH


ILLAGE
D BUILDING BLOCKS


SYMMETRIC FORM
STRONG SOCIAL CONTROL
INWARD CHARACTER
1920 PLAN GRANPRÉ MOLIÈRE VERHAGEN


1926
PLAN WITTEVEEN
REDESIGNED IN 90S

ZUIDPARK



'GARDEN CITY'
LOOSE PLANNING


STAMPS'
UNCTIONAL GRID
OPEN BUILDING BLOCKS
949 PLAN LINKER MAASOEVER


LATE 90S 'VINEX'
FUNCTIONAL GRID


MORPHOLOGY AND MAIN BUILDING FORMS

The morphology and building forms strongly intertwine with each other in Rotterdam Zuid. Even though there are many types of patterns, they can be categorized into characteristics due to the different periods of planning. Besides, different morphologies manifest the different relationships between the plantation and buildings. In this section, not all the typologies are included. I chose the most typical ones in the Rotterdam Zuid.
(The typologies will be shown on page 54.)

TYPE 3+5+7 District Feijenoord developed early in 1910s because of the harbour construction. But it was still changing, so that we can find unbuilt area with green. Some areas are in grid pattern with closed buidling blocks. But most of them followed the shape of the harbours.

TYPE 3+7
Charlois is an old village which dates back to 1200. It is shaped by enclosed squares and closed building blocks, and sponteneous composition of different buildings. The whole area lacks of public space and green space, giving us a private atmosphere.

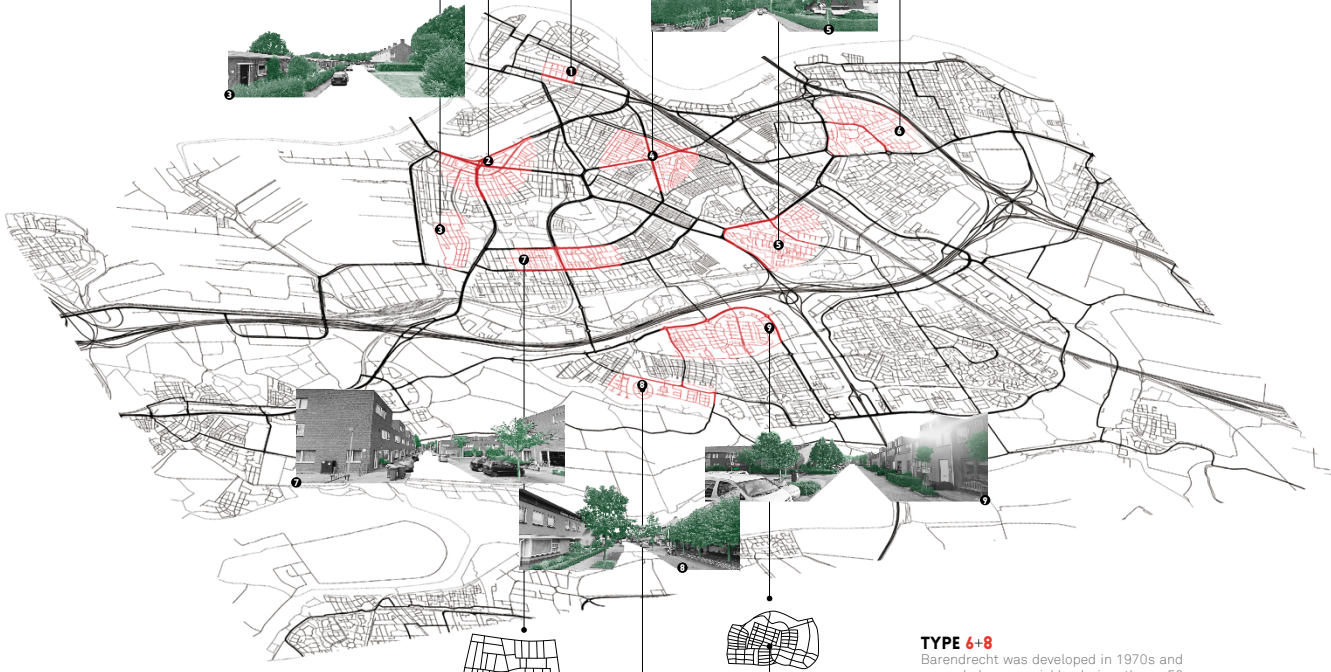
TYPE 8+18 As one of the garden villages, due to the development of the city, Bloemhof is also renewed into closed building blocks style with innter courtyards. The axes are still there, but the green space is not as much as Vreewijk.

TYPE 4+10 Vreewijk was built under the principles of garden village. Low-rise buildings with private or collective green courtyards. The street is symmetrical with corner gardens. The pattern is loose and organized.

TYPE 7
During postwar period, Carnisse introduced open strip parceling, with configuration like: building strip + green strip + building strip. The green area is still for private use, fenced with wall.

TYPE 4+7
Groot ijsselmonde was developed after 1960s. Bounded by the rivers Nieuwe Maas and strongly influenced by polders, this area grew from the shape of landscape in random dimensions. Open building blocks, curve streets, lots of green, short distances, it is priority for pedestrians and creates many places for meeting people.

TYPE 4+8+10
Contrast to the dense planning like Carnisse, Charlois, the district Wielewaal is loosely arranged and one-floor buildings, surrounded by large area of green space.



TYPE 6+8
Barendrecht was developed in 1970s and expanded very quickly during these 50 years, which followed the VINEX policy. The place offers more possibilities for public transport due to the short distances. It also protects more open space for public activities.

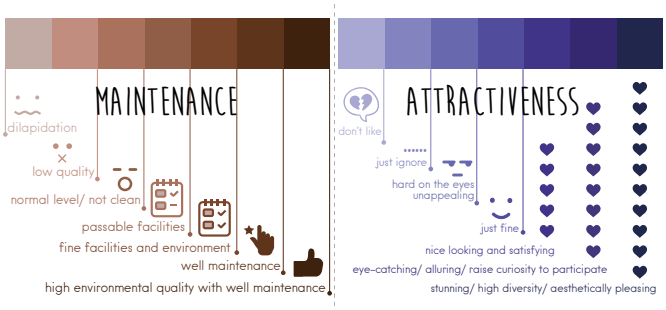
TYPE 3+6+8+9
District Pendrecht and Zuidwijk were built after World War II, which strictly followed the functional planning: open building blocks, orthogonal, repetition. The streets look almost the same and the trees are planted in rhythm.

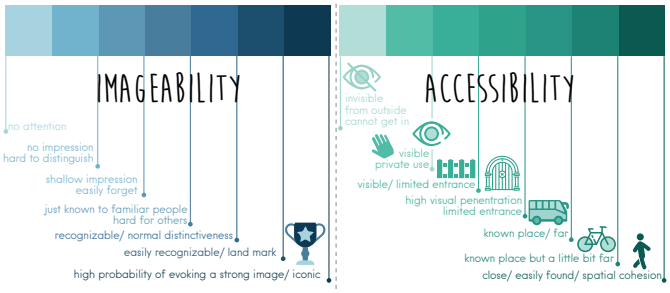
TYPE 4+14
Also in Barendrecht, this area was built like an island: surrounding by water. Small-scale buildings surrounded by green space, tt is described as urbanised landscape.

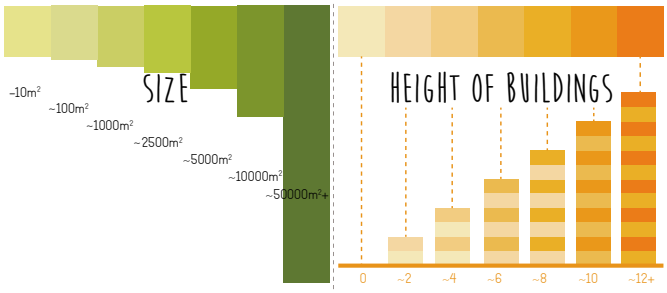
4.2 ON-SITE STUDY

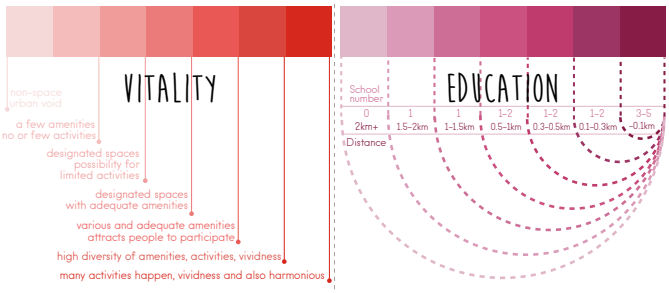
ROTTERDAM ZUID

- maintenance
- attractiveness
- Imageability
- accessibility
- size
- height of buildings
- vitality
- education









INDICATOR EVALUATION

Based on the study of morphology, I went on fieldtrips in Rotterdam Zuid several times by bike. Here I used different indicators to evaluate the green space in order to study their existing situation. Some landscape indicators came from literature (maintenance, attractiveness, imageability, accessibility, vitality); others came from myself that I considered they had relationship with urban agriculture (size, height of buildings, education). The criteria are presented in a colored ruler. The process of evaluation is both objective and subjective.

Regarding the green space in this area, Rotterdam Zuid has a huge potential that indicates the existing green space is enough to develop urban agriculture; there is no need to recreate a new space for that. There is a wide variety of different open green space. However, certain areas are underutilized, such the space along canals, dikes, and highway, etc. I considered these spaces as opportunities that need to activate and redeveloped.

REFERENCE:

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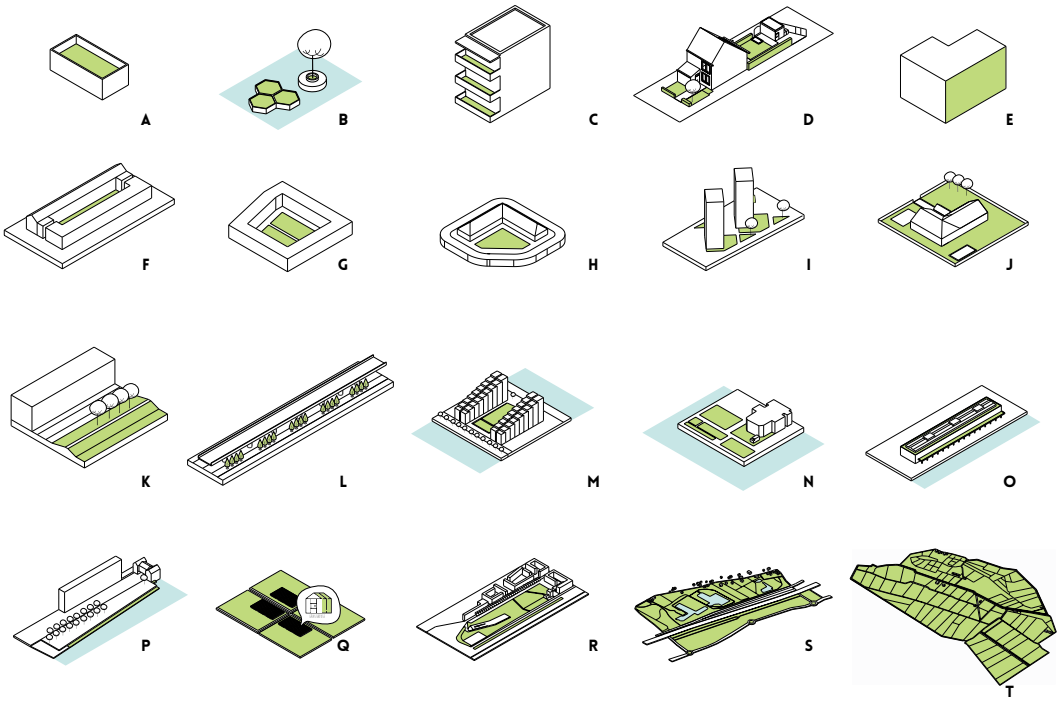
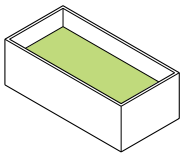
TYPOLOGY STUDY

After the evaluation of the space, I selected and categorized the space potential for developing urban agriculture. The above-mentioned green spaces can be categorized into 20 types. They are distributed in different parts of the city and vary in different sizes and forms.

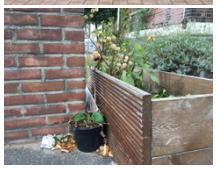


TYPOLOGY STUDY

1



size: XXS
surrounding: building side
character:
box/not related to ground
location: core



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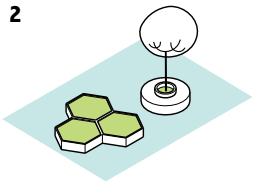
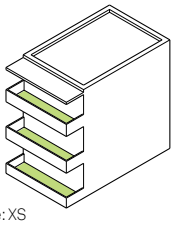


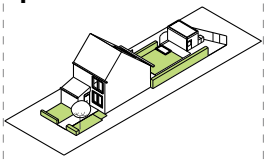
size: XXS
surrounding: water
character:
public/floating
location: core

3



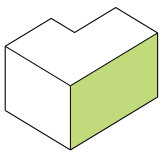
size: XS
surrounding: in building
character:
private/balcony
location: core

4



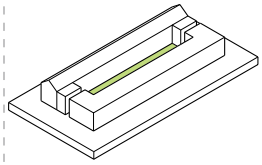
size: XS
surrounding: single house unit
character:
private garden
location: core

5



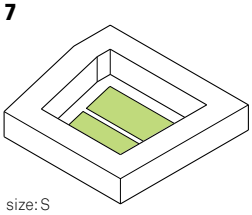
size: XS-S
surrounding: building
character:
living walls/greenery
location: core

6



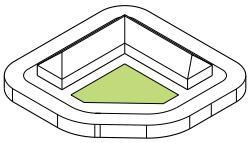
size: S
surrounding: building block
character:
semi private/community garden
location: core

7



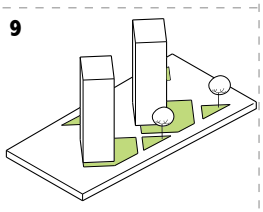
size: S
surrounding: building block
character:
private community garden
location: core

8



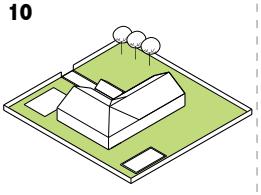
size: S-M
surrounding: building+street
character:
public/high accessibility
location: core

9



size: S-M
surrounding: high rise+street
character:
public/less sunlight
location: core

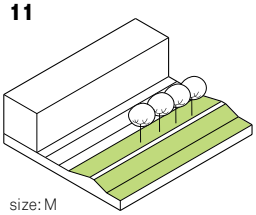
10



size: S
surrounding: farmhouse
character:
private garden
location: fringe

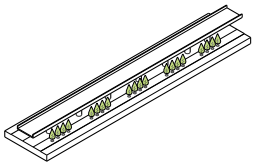
TYPOLOGY STUDY

11



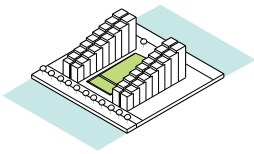
size: M
surrounding: street+building
character:
public/old dike/elevated
location: core

12



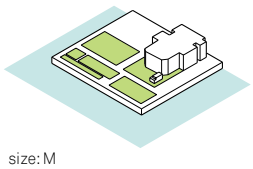
size: S-M
surrounding: under bridge
character:
public/high accessibility
location: core

13



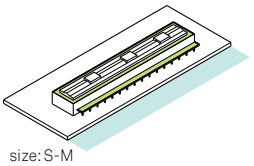
size: M
surrounding: buildings+canal
character:
public square/nice view
location: core

14



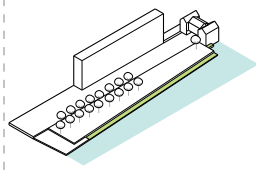
size: M
surrounding: river Maas
character:
public/open view
location: core

15



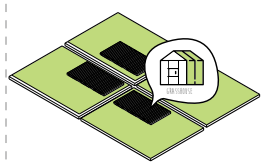
size: S-M
surrounding: rooftop+canal
character:
semi public/commercial area
location: core

16



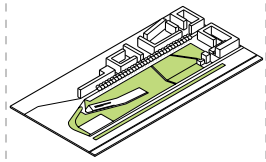
size: M
surrounding: river/canal+street
character:
public/no one notices
location: core

17



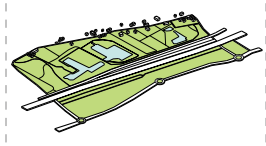
size: M-L
surrounding: farm land
character:
not for public/low accessibility
location: fringe

18

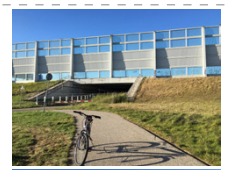


size: L
surrounding: building+street+road
character:
public/multi-function
location: core

19



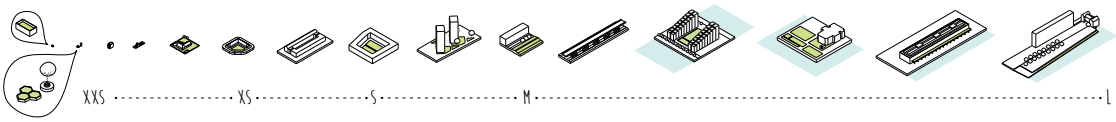
size: XL
surrounding: freeway/old dike
character:
low accessibility/not so safety
location: fringe



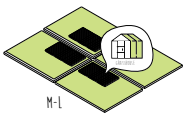
20

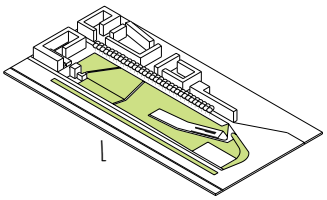
size: XXL
surrounding: farm land/dike
character:
not for public/low accessibility
location: outskirt

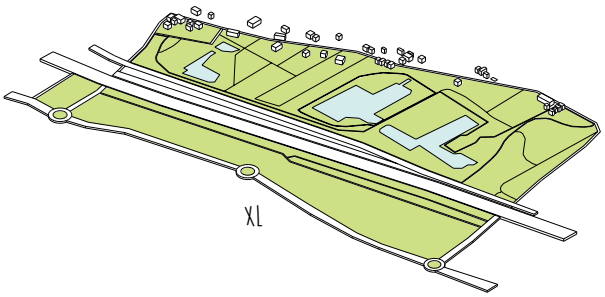
VARIETY OF SCALES



If put all the spatial types into one scale, the scales vary a lot. Urban agriculture can be various forms and sizes. Typology study helped me to define my design realm. If we try to view the typologies as opportunities, how can we transform the space for agricultural programs? Or, how can we integrate urban agriculture as one component? What types are suitable for developing that? What are the potential and limits?

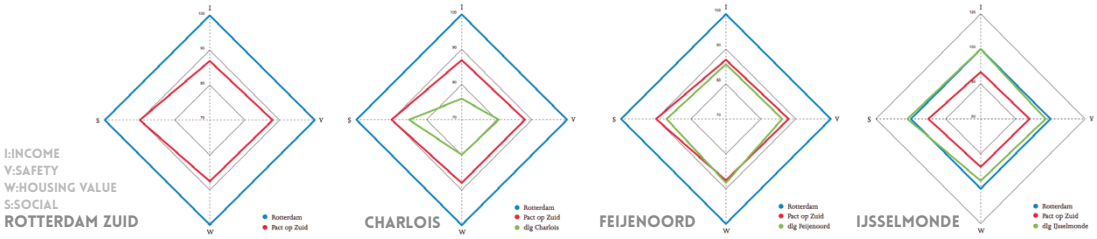


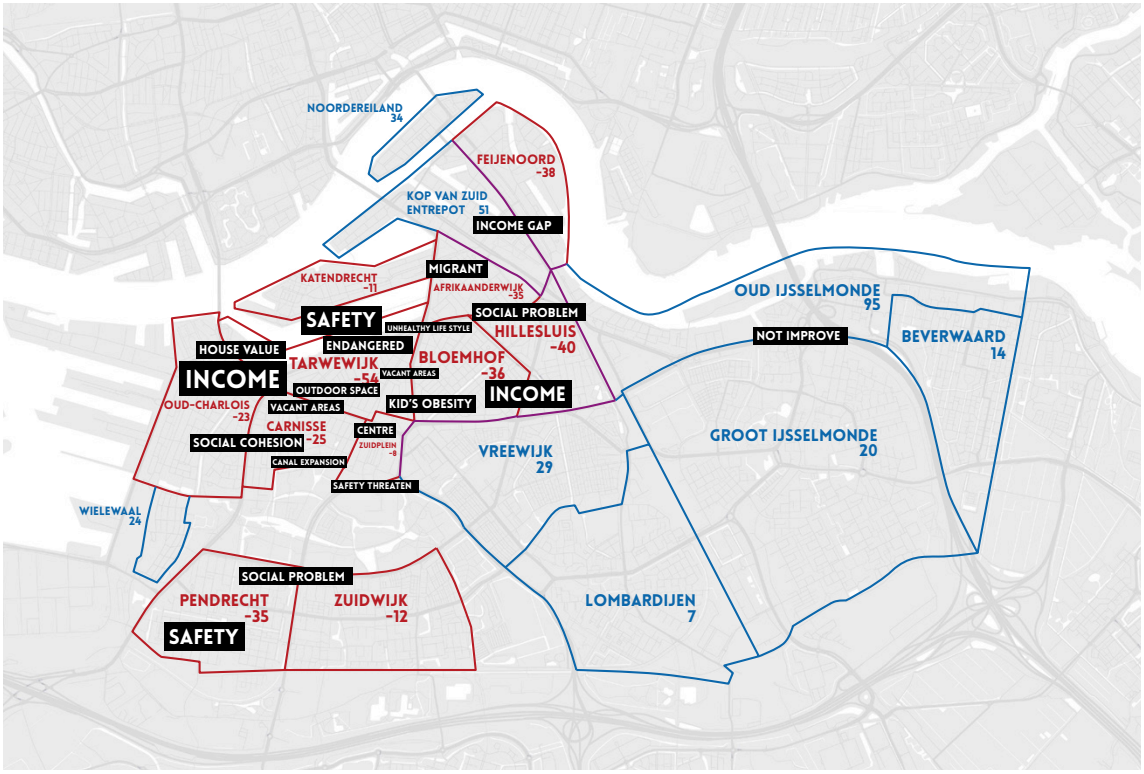




4.3 SOCIAL OVERVIEW

The social scores indicate that Rotterdam Zuid is lower than the average of Rotterdam in terms of income, safety, housing and social. Rotterdam Zuid is regarded to be a problematic city with low income and high criminality in some districts. The following page shows the data analysis of criminality.

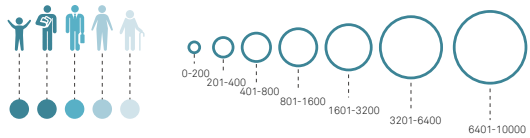


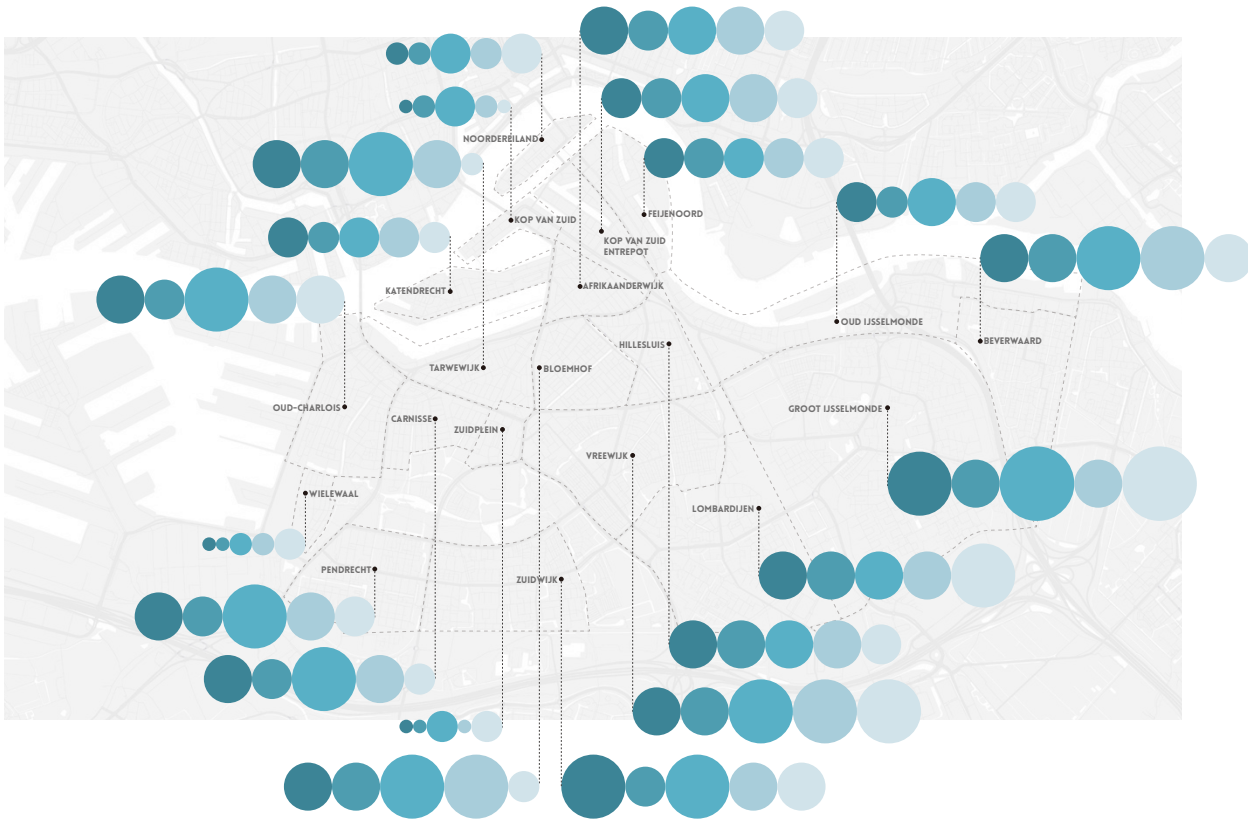


REFERENCE: Pact op Zuid Reisgids

POPULATION BY AGE GROUPS

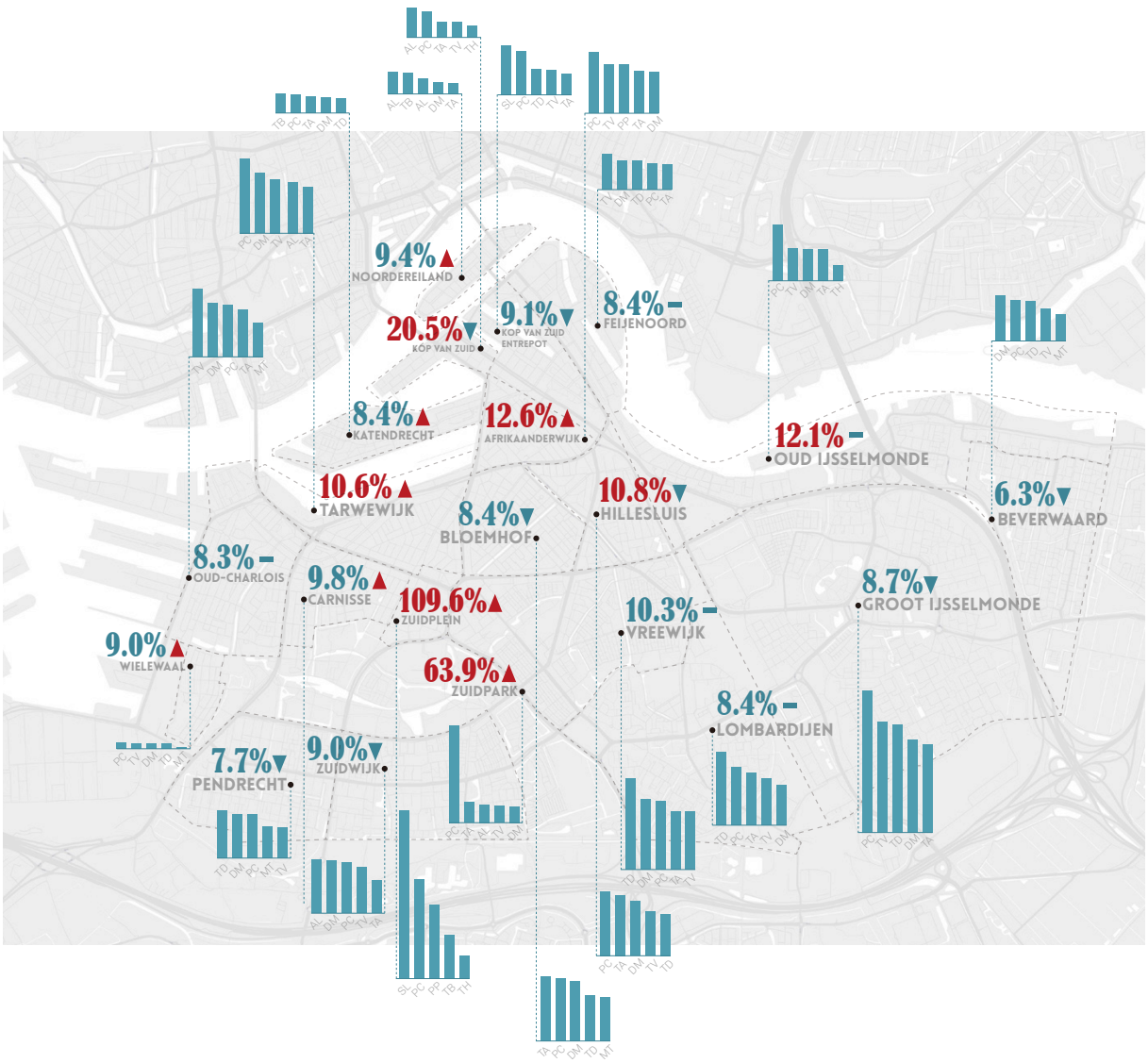
I visualized the population report, and we can see that elderlies have large proportion on the eastern area such as vreewijk and lombardijen, because of the quiet and spacious environment. Young people and children are more on the western part. If we look at the size of districts and population, districts Carnisse and Tarwewijk are high-density district.





REFERENCE: rotterdam.buurtmonitor.nl

CRIMINALITY ANALYSIS



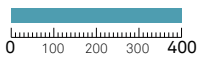
CRIME RATE PER 1000 PEOPLE

AVERAGE LEVEL OF WHOLE ROTTERDAM

105/1000 = 10.5% (2014)

- Higher than Rotterdam
- Lower than Rotterdam
- ▲ Increase (compare with former rates)
- ▼ Decrease (compare with former rates)
- – Maintain

CRIME NUMBER 2013

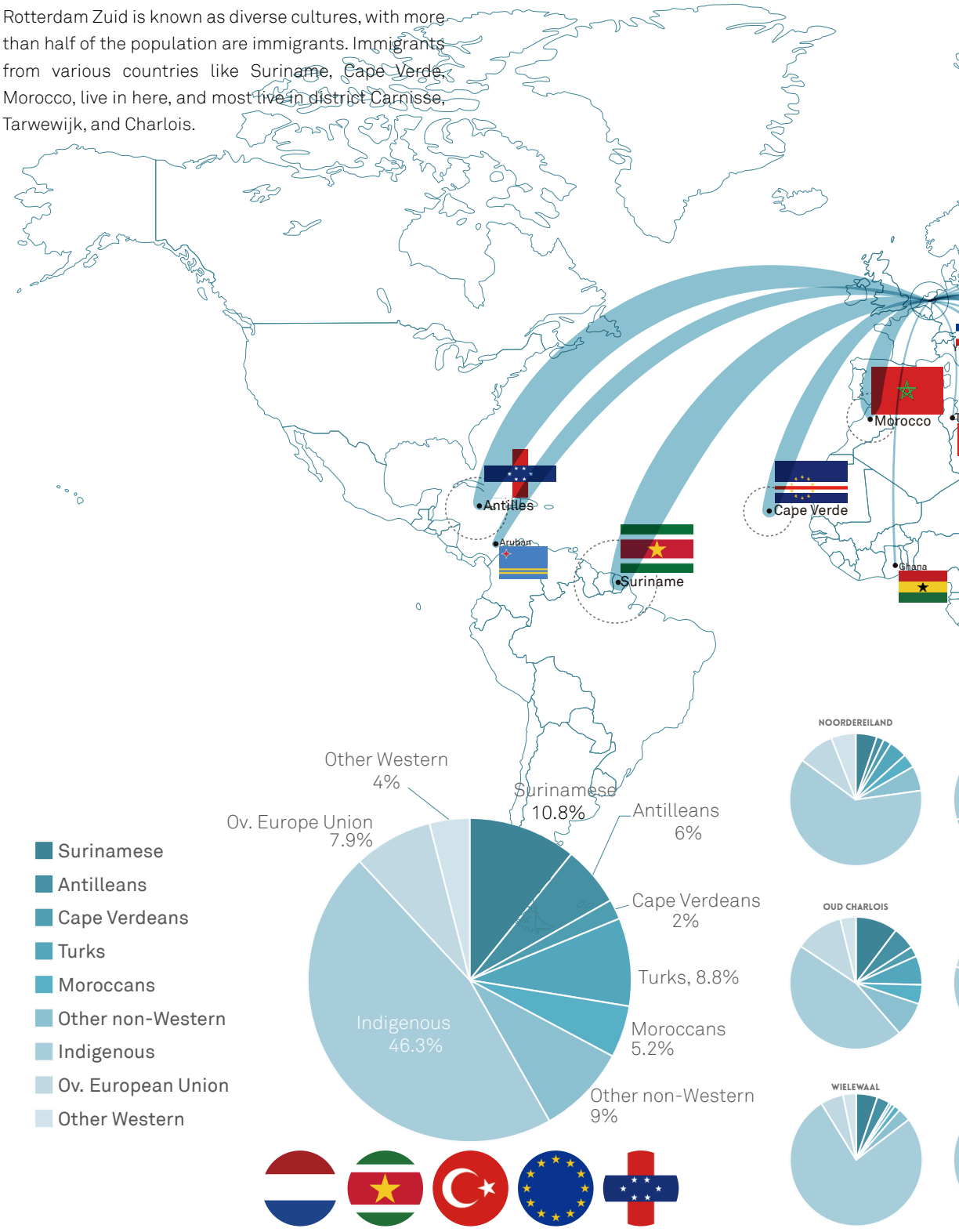


TOP CRIME TYPES/ROTTERDAM ZUID

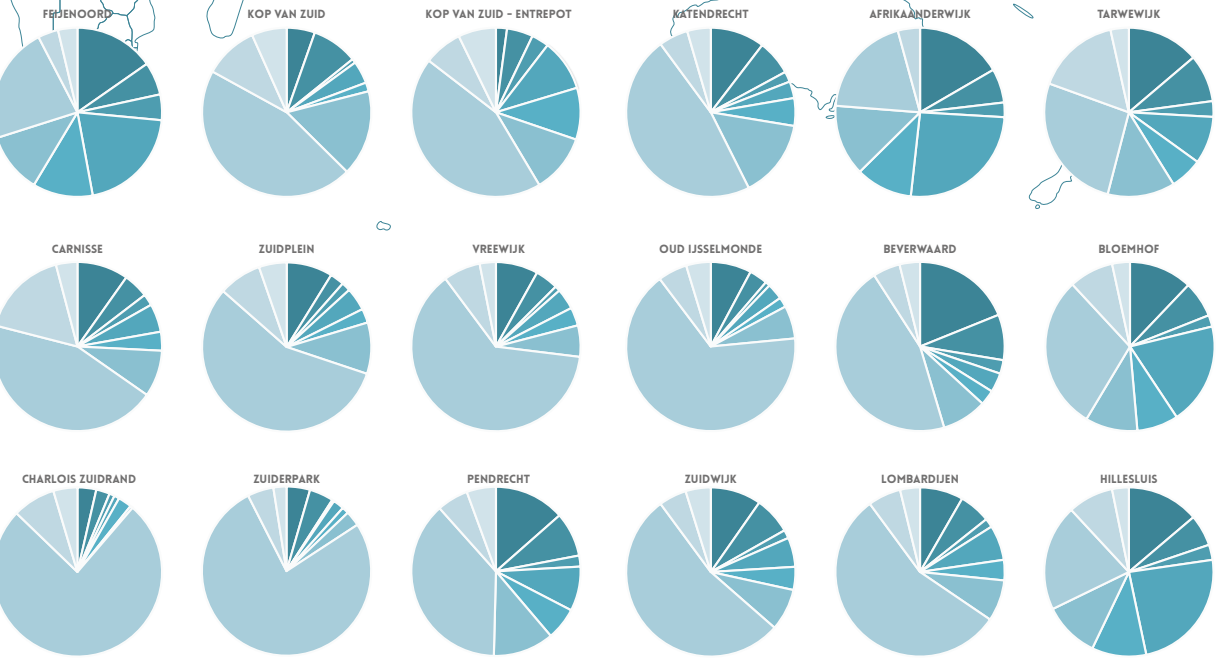
DM: destruction. cause damage
TD: Theft / burglary dwelling
TA: Traffic accidents
MT: mistreatment
PP: pickpocketing
AL: Alcohol
TV: Theft of motor vehicles
TH: Threat
PC: Other property crimes
TB: Theft of bicycles, motor scooters, mopeds
SL: shoplift

IMMIGRANTS

Rotterdam Zuid is known as diverse cultures, with more than half of the population are immigrants. Immigrants from various countries like Suriname, Cape Verde, Morocco, live in here, and most live in district Carnisse, Tarwewijk, and Charlois.




Poland
Romania
Bulgaria
Turkey
Tunisia
Afghanistan
Iran
China
Japan
Somalia
Sri Lanka
Indonesia


FEIJENOORD
KOP VAN ZUID
KOP VAN ZUID - ENTREPOT
KATENDRECHT
AFRIKAANDERWIJK
TARWEWIJK
CARNISSE
ZUIDPLEIN
VREEWIJK
OUD IJSSELMONDE
BEVERWAARD
BLOEMHOF
CHARLOIS ZUIDRAND
ZUIDERPARK
PENDRECHT
ZUIDWIJK
LOMBARDIJEN
HILLESLUIS

4.4 INTERVIEW

Unlike other types of landscape, in urban agriculture, people are not just users, but also doers that initiate the practices. I conducted the interviews in order to know more from the citizens: what they think about the area they live in; what they feel about urban agriculture. During the period of research, I did three things: join the local activities, including open market, community activity, winter festival; conducted semi-structured interviews with people on the street; made the in-depth interviews with founder and volunteers of the NGO of urban agriculture.

I conducted semi-structure interviews with people, who tried to avoid limiting the thinking of people, and let them to tell their story. In this way I got to know that people who are living or working or visiting there sometimes more difficult to give a strong image of Rotterdam Zuid when compared to Rotterdam North. And they are not very confident, especially talking about the safety issue. But something out of my expectation was that this process of interview helped to build my confidence! I got many supports from them. People gave me their phone number, email, and told me that if I have any question difficult they can help me. And even an old lady held my hand and said that I had to do this well – to promote agriculture in this area.

On the other hand, I also made in-depth interviews with founders, volunteers in some NGOs of urban agriculture to study the existing practices in the Netherlands. People that I met were so nice and willing to answer all the questions I would like to know. We discussed about the existing situation, the financial issues, the choice of products, the ecological methods, and seasonal problems, etc. And we even talked about psychology aspects.

1

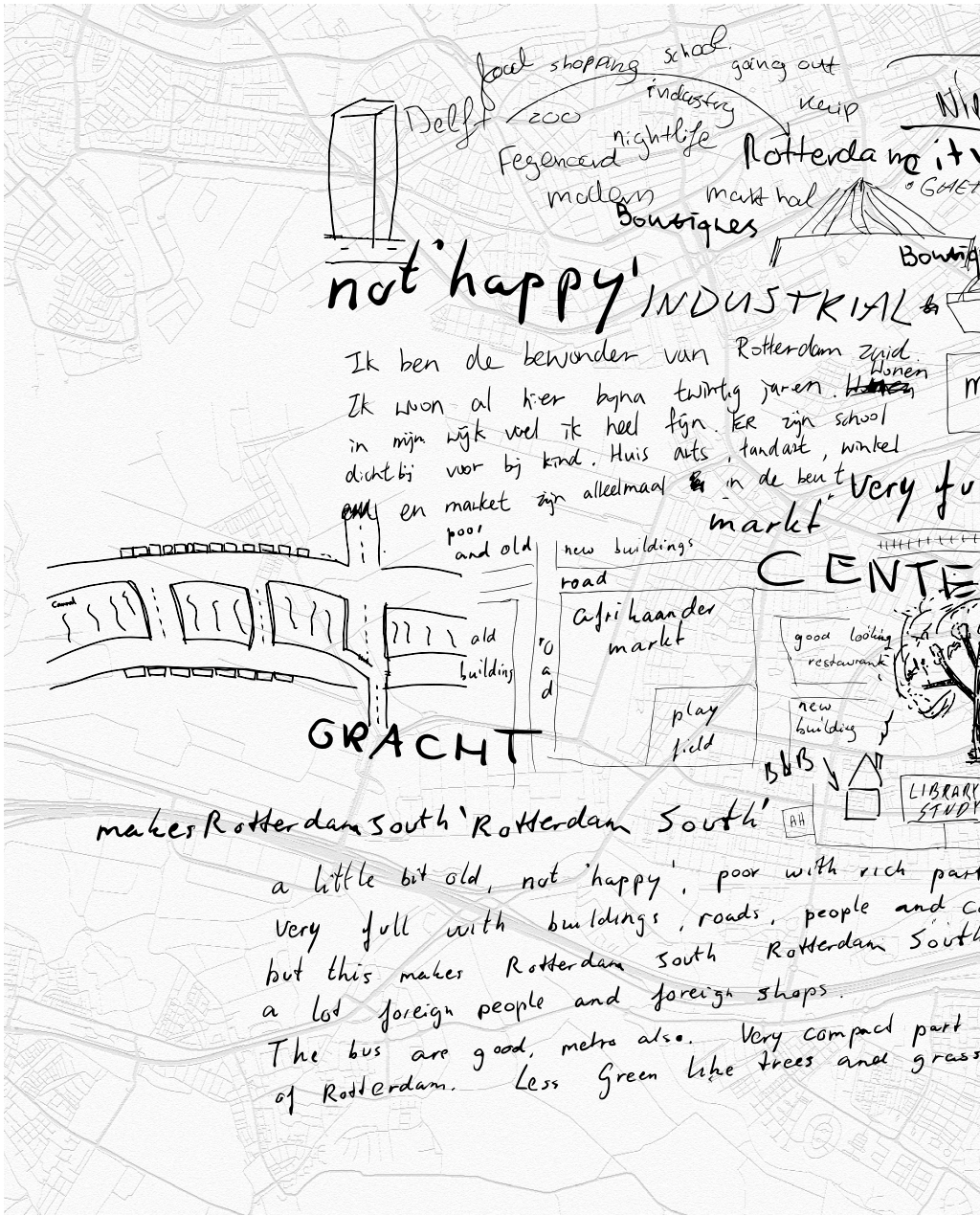
Join in the local activities

2

Semi-structured Interviews

3

In-depth Interviews



INTERACTIVE MAP CREATED BY CO

"WOULD YOU LIKE TO DO URBAN AGRICULTURE?"

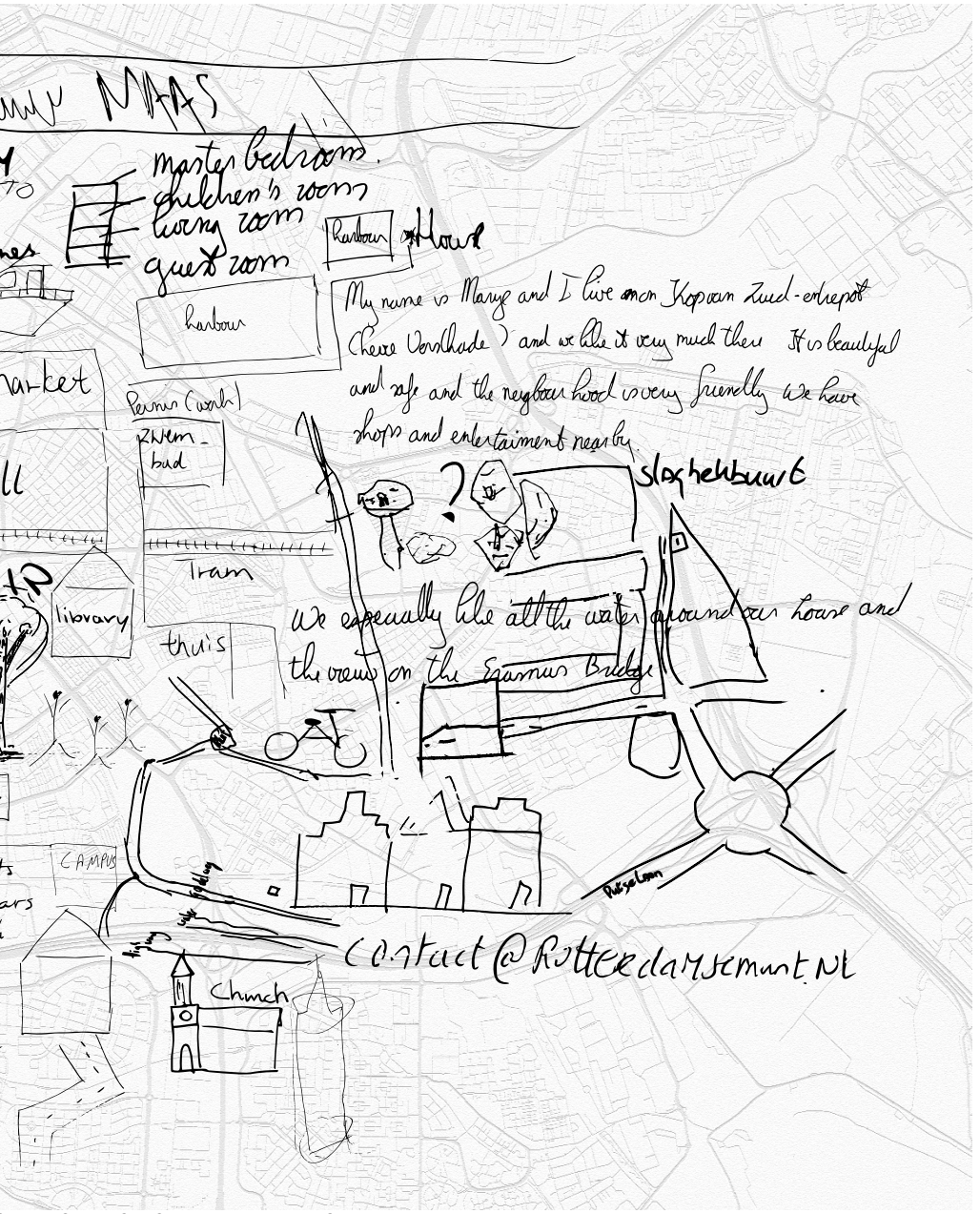
YES, it's just like watching TV!
Why not? I love gardening!
Relaxing/Gardening is a good thing!
I'm a volunteer.I don't live here but I come every week!
just because I love eating!
We need some bottom-up strategies, not just top-down.

Yep,

Will get to know more people!
I love flowers. I love fruits.
There will be more activities. More safe
Good to the environmnet.
take a rest/ comfort
Hope more space to do that!
it's a different way of learning!

JA,

You really need to promote this!!



OLLABORATION OF INTERVIEWEES

MAYBE, Kids will like to do that/
I think my kid will love it. If he loves to do that, I will.
"To see how tomatoes grow up!"
If I have enough space to do that, I think I will.
If my neighbours do, I will join them!
If it is near where I live/work, I will do that.
it's an opportunity to learn something from it

NO, I don't live here; I just work here.
don't know how to do it.
Would rather do something esle./Just not my thing.
Never done before. Busy...

NEE, Time-spent/ need to be patient,
weather is bad in winter.
Difficult to do that.

INTERVIEW
with Ingrid Ackermans
21.12.2016

My graduation plan is to integrate urban agriculture into the city fabric in the Rotterdam Zuid area. I would like to know more from you as you are the founder of Rotterdamse Munt. What was the drive to establish Rotterdamse Munt?

The municipality has the vision about how to change Rotterdam Zuid. I was a kind of experiment because we wanted to develop a kind of concept which you can make city green. Though there are a lot of green spaces, not only public parks, but also this semi public green space which communities have an ownership to use the space to bring other people, other citizens of Rotterdam, more to the origin of food. And my idea was to only use the herb garden because herbs create tastes, which are also important for food. In this sense, you don't have to make all food products.

What you want to achieve is not just create green space, but also use green space to link people. Is that you purpose?

Yes, the green space and also herbs, the work and garden. That is the key bringing people together. But not only bringing people to work here, as well customers.

Right, I observed that there were lots of green space in Rotterdam Zuid, but they were just there, and nothing happened.

Yes, it's not used.

Then what is the advantage of Rotterdamse Munt compared to others?

I don't know, but we are different if you compare to our neighbors. There is also another green space with agriculture nearby. They are not an organization and they don't have fence. They also don't have a kind of central person who organizes things, to make things happen. People have their own gardens and that's it. So they do not use the garden to invite other people to join to community.

That's more private?

Yes. Because there is no fence on it, but it is more private, because they are only used by small groups of people. And if you compare to Rotterdamse Munt, that is more happening here.

Yes, I also met the volunteer who lives in Amsterdam also working here! What is the main age group in Rotterdamse Munt?

We have volunteers but trainers as well. The group is from 15 years old to 70.

Oh that's a large group!

Yes, people are in expansion. They have a lot of spare time. But there are young people use to work in the garden to train gardening skills and social skills.

Is it like making a workshop?

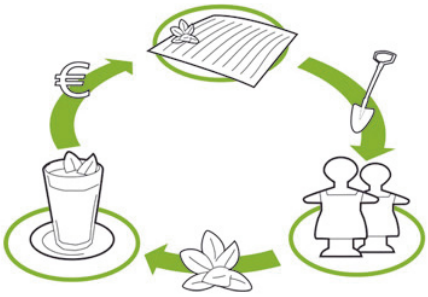
No, they have training periods. They also work with us, from the garden to the shop.

From the very beginning, did you use any methods to promote Rotterdamse Munt?

It is a kind of mixture. We are on this spot, which is very obvious. And we organized festivals, workshop, training, and therefore we promote that in all kinds of media. And then people get to know it.

What kinds of ecological ways you are using to plant herbs?

We used totally a natural ways of gardening. We used the way of permaculture. We used that in our composts.



Is it the self-made composters?

Yes, but it takes time. So we do combination.

Also do the same for water?

We have containers for collecting water, but that's not enough. So we collaborate with the water company.

Combine with the city infrastructure.

Yes, but that is not very sustainable. Because we are now on a temporary location, and we don't make the investment to make bigger water containers. So probably, in 2018 we have to move and we are going to build housing on other location, which will be a permanent location. At that time we will invest more on that. It will be also in Rotterdam Zuid, near the railway (pointed out the location).

Is there any regulation to support urban agriculture in the Netherlands?

Not yet. We are now in a transition period. The municipality likes this idea very much, but they don't have regulations yet. So therefore we had an analysis of the cost and benefits for the society. So you have your own a kind of administration, which you see what are the costs, what are the incomes. You can make the analysis of the benefits for the society, and that is not only doing in Europe.

Does selling the products the only way to earn income?

Selling the product is the main income, but we as well receive children that they have lessons in the garden.

I have heard that some of the organizations' investment is higher that incomes. Did that also happen in your organization?

Yes. If you look at only the financial, it is higher. Because we don't pay for the labor, then we have a break-even. But if you pay for the labor, that is not going to be enough.

Do you have some measures to change this situation?

More educational projects, we want to do different types of programs for children, maybe as well for adults, but that is more difficult to get finance for adults' education. We are working on that.

Do you also collaborate with markets or online shops?

We collaborate with Rechtstreex (www.rechtstreex.nl). They bring the objects of local farmers to sell products. They can do the grocery online and people can pick up in different locations. That's the concept. On the other hand, restaurants will also come here to pick the herbs, which are mostly local restaurants.

Is the food here more expensive than the supermarkets?

No, I think it is cheaper or the same as the supermarkets for example online, but we are more expensive than the markets. The price in the markets is so low. But sometimes the quality of food in the market is not very good. Here is fresh and organic.

And there is a farmers' market (Afrikaanderwijk market) just nearby, which is one of the biggest market in the Netherlands.

Yes, it is very big and very cheap. But there are also many people living here who don't have a lot to spend.

Yes, this district is a low-income area. Do you think of a way to balance low-income area, or deal with the social issues in this area? Or just focus on the garden itself.

This is a difficult question. We are thinking about that, but how are we going to do that? We have to have more cooperation with the municipality and even with the housing company here. So we can learn that more people to grow their own food. They have the balconies and they can be more activated and more inspired to grow their own vegetables or herbs. And also you can make the projects and bring them to the market so they can earn some money. They have a lot of talents of doing this. But we need finance. These people they don't have a kind of culture of investing themselves. They don't have a lot of self-esteem. If you don't have a lot of self-esteems, you are not going to invest yourself. So I think that is the main barrier.

←Fig.4 Logo of Rotterdamse Munt
↓ Fig.5 Volunteers
→Fig.6 Ingrid Ackermans

The problem of self-esteem is the main barrier. That is a new aspect for me. I never think of this before.

If you think about yourself, you don't think you can learn things or you can do something, so that you won't invest yourself. You need a bit of self-esteem to convert.

The problem of self-esteem is the main barrier. That is a new aspect for me. I never think of this before.

If you think about yourself, you don't think you can learn things or you can do something, so that you won't invest yourself. You need a bit of self-esteem to convert.

What is your future plan?

We want to develop more educational activities and to find finance for that. And then next year we are going to make more herbs gardens on other places in this city, more on the area of business. We are now preparing our move of the permanent location. And there we want to build bigger places, which is warmer to grow herbs.

Warmer place?

Yes, bigger and warmer. We can grow foods even in winter and raining days.

Fight against the winter in the Netherlands?

No, it is not going to be a fight. But it is not very nice to be outside in the winter.

Besides winter feest, do you have any other activities to do in the wintertime? The food cannot grow well in this season.

No, from Christmas (24th Jan) to January (24th Jan), the garden is going to be closed. And then we wait for the spring.

Do you have a desire to change this? Also open in the wintertime?

Yes, when we are on our new place, we will have more warm places and then you can go on the work with people. Because we have a lot of dries in summer, and in the winter we can make projects with it to continue in the winter. Now we don't have nice working place because the temporary location. In the future we will have the bigger glass house for the bigger climate system, and then we can grow herbs in the wintertime. Some herbs, yes, because mint cannot grow well in winter. We tried that before and it did not taste well.

Oh, the quality will also change.

Yes. Warm places with more lights will be better.

But that also means more investment.

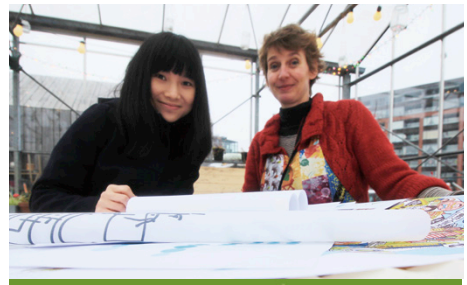
Yes. But the money can be earned back because the product is good. So it is not a good business case to do in the winter. Therefore, we work in the next stage for a better price. But that is a long term, because you also need to change the way of what people think.

I think sometimes the design of packaging is important. And do you have plans to grow other plants?

No, there is still a lot we don't have already. And we got to know from the restaurants that some of them they want to work more with the local products. Therefore, you have to be more creative, for example, the fresh taste of lemon. Because lemon is not growing here, you can replace the lemon with some other herbs. You can make the food chain more local. So we have to do more research.

KEY WORDS

- Existing condition
- Choice of products
- Volunteers
- Regulation
- Ecological methods
- Financial issues
- Seasonal problems
- Creativity
- Self-esteem



Rotterdamse Munt
lokale kruiden met eigenwaarde

CONCLUSION MAP

ZUIDPLEIN
The main shopping venue in the south of Rotterdam is Zuidplein, an accommodation center for shows, exhibitions, sporting events, concerts and congresses. But Zuidplein is also the place with highest criminality in Rotterdam Zuid.

ZUIDPARK
Zuidpark is the largest city park in the Netherlands (215 hectares). The park makes you have a sense of getting rid of the city. But it is isolated and divided by wide city roads which looks like a sandwich structure. (Park+Road+P+R+P).

AHOY ROTTERDAM
Located nest to Zuidpark, the Ahoy Rotterdam complex is used for pop concerts, exhibitions, tennis tournaments, and other activities. It is surrounded by large area of car parking space.

AFRIKAANDERPLEIN MARKT
Located in the multicultural district, Afrikaanderplein market can date back to 50 years ago. It is held on every Wednesday and Saturday, which is the third largest market in Netherlands (308 stalls).

DE KUIP
De Kuip, called Stadion Feijenoord, is the second largest in country, after the Amsterdam Arena. It has hosted many ernational football games. There are concrete plans to ld a new stadium with a capacity of at least 80,000 seats.

EILAND VAN BRIENENOORD
The island Brienenoord (21 hectares) is located on the river nieuw maas. The park is like a forest with different kinds of animals, which is especially famous for Highland cattles.

BARENDRECHT
Established in 1264, Barendrecht is a medium town, located as a suburb of Rotterdam. Barendrecht is dramatically increased by its population, served with sufficient facilities.

RHOON
Rhoon is part of the island of IJsselmonde and situated in the south of this island. Established in 1199, it is a small village but not part of Rotterdam, with large area of farm land.

A15 MOTORWAY
(Ring South): Europoort – Rotterdam – Nijmegen

A16 MOTORWAY
(Ring East): Rotterdam – Breda (- Antwerp – Paris)

4.5 CONCLUSION

For the conclusion, there will be two layers discussed. The first layer 'Savour the city' is the basis conclusion about what I learned from the site, which is more related to the potentials and questions. The second layer 'Rethink the site' is my thinking and consideration of the limits of Rotterdam Zuid, which will be discussed in different scales.

FIRST LAYER

- Savour the city -

People who are not familiar with Rotterdam Zuid would like to consider this place as 'problem area'. High criminality, low income, full of immigrants, they even described it as 'grim' districts. But if you once really walked into these areas, Rotterdam Zuid is not bad as you thought before. It is vivid, but also complex. 'Every place has more assets than first meets the eye, hidden in the undergrowth, invisible, unacknowledged or under-acknowledged (Charles Landry). ' It is difficult to use one or two words to conclude this place. The map is the integration of my site survey, people's opinions, social reports. It indicates characteristics, typologies, and infrastructures of Rotterdam Zuid, which shows the problems, advantages, and also potentials. If you read carefully, you can find many interesting points in this map - Rotterdam Zuid deserves you to savour with heart. The followings are the key points:

1. Diverse Combination

Rotterdam Zuid is largely inhabited by non-Dutch. People from various countries living together combine to a multicultural place. However, it is necessary to say that combination doesn't mean integration. Diversity can lead to conflicts and also social segregation. What is the importance of multi-culture? What is the limitation? How to balance between different cultures?

2. Complexity of Everyday Life

The diversity of population makes this place full of activities: markets, outdoor performances, agricultural practices, exhibitions. These become part of their life, not to mention the daily activities. Colours mix, daily routines, ephemeral happenings of everyday life are the essences of Rotterdam Zuid. How to read them and how to react to them?

3. Issue of Social Cohesion

Why some places exist high criminality? One of the reasons is that people don't know each other, the lack of social cohesion. They don't have a sense of belonging, and thus they don't very care the place they live in. The issue of communications, issue of language, issue of education... What is the role of landscape architects when we try to cope with these problems?

4. Various Typologies

According to the typology study, Rotterdam Zuid has various typologies of green areas and architectural forms, because of the planning of different periods. Nevertheless, we can see that large parts of them are inwardly facing with strong private sense. If we consider space for interaction, how to rethink these typologies? What are the pros and cons? How to develop from them?

5. Large Amount of Green Space

Most areas of Rotterdam Zuid are village-like, with large amount of green space presenting in different typologies. This provides the great potential for the development of urban agriculture. But we need to admit that many of them are in low accessibility (because of location, social control, etc.). What can these green spaces be a possibility for the future strategy?

6. Demolish and Modification

Some areas of Rotterdam Zuid are now facing the demolishment and modification of the planning (For example, Carnisse and Oud-Charlois, and Tarwewijk.). Because they are not suitable for the growing population, the government needs to react. Instead of reacting the situation, what about being proactive?

SECOND LAYER

- Rethink the site -

1. City scale

As I learned the morphology of Rotterdam Zuid, I realized that the fragmented pattern actually implied the lack of coherence. This condition was displayed in different street systems and the inaccessibility of some areas. Also, If we look into the programs of Rotterdam Zuid, it seems to meet all the needs (Fig.1), but it is just from the functional perspectives. The programs in the city did not truly integrate into the city structure. I am thinking is there any possibility that develops a structure to integrate different parts of the city into a relatively coherent landscape? How does urban agriculture utilize and improve the fragmented patterns while at the same time interact with other programs?

Figure.1 A wide variety of programs in Rotterdam Zuid

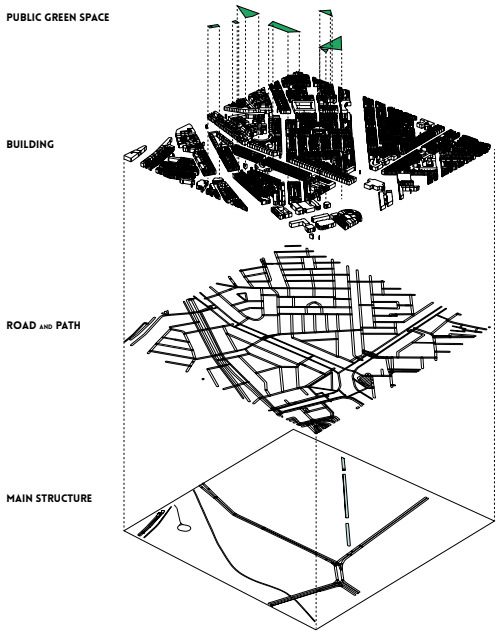


Figure.2 Original condition

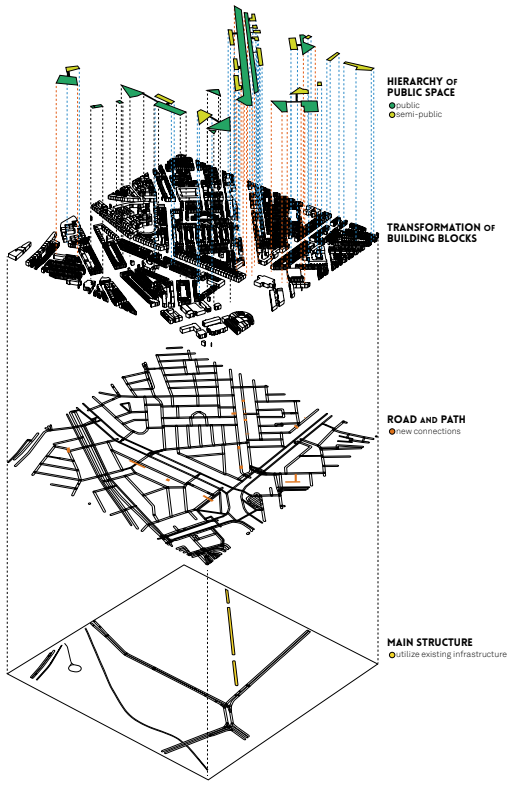


Figure.3 Preliminary proposal

2. Neighborhood scale

The city scale reveals the problem of neighborhood scale. I combined the social aspect and spatial character to discuss. The districts with high criminality show two extremes: the one is too private that limits the social interaction (like Carnisse, and Tarwewijk); the other one is too open that forms space of anonymity (like Zuidwijk). Vreewijk and Lombardijen are somewhere in-between, but there are still places that people feel unsafe.

For instance I pick Tarwewijk as an example and decompose it (Fig.2). We can see that the canal here was just a place for passing by. Most of the building blocks are closed for private. The public space is very limited. The anonymity of the space and limits of social interaction lead to the unsafety and weak social cohesion. The existingsituation stimulated me to come up with some ideas (Fig.3). What and how can I create the space within the city limits? What kinds of typologies are appropriate for developing urban agriculture? How does the space represent the multi-culture, the complexity of life? How to identify the potential stakeholders and encourage them to participate?

3. Block scale

The city pattern has a direct influence on the building forms of Rotterdam Zuid, and the typology study helps the research on the block scale. In this part, I study the typical building (dwelling) forms of Rotterdam Zuid to find the relationship between

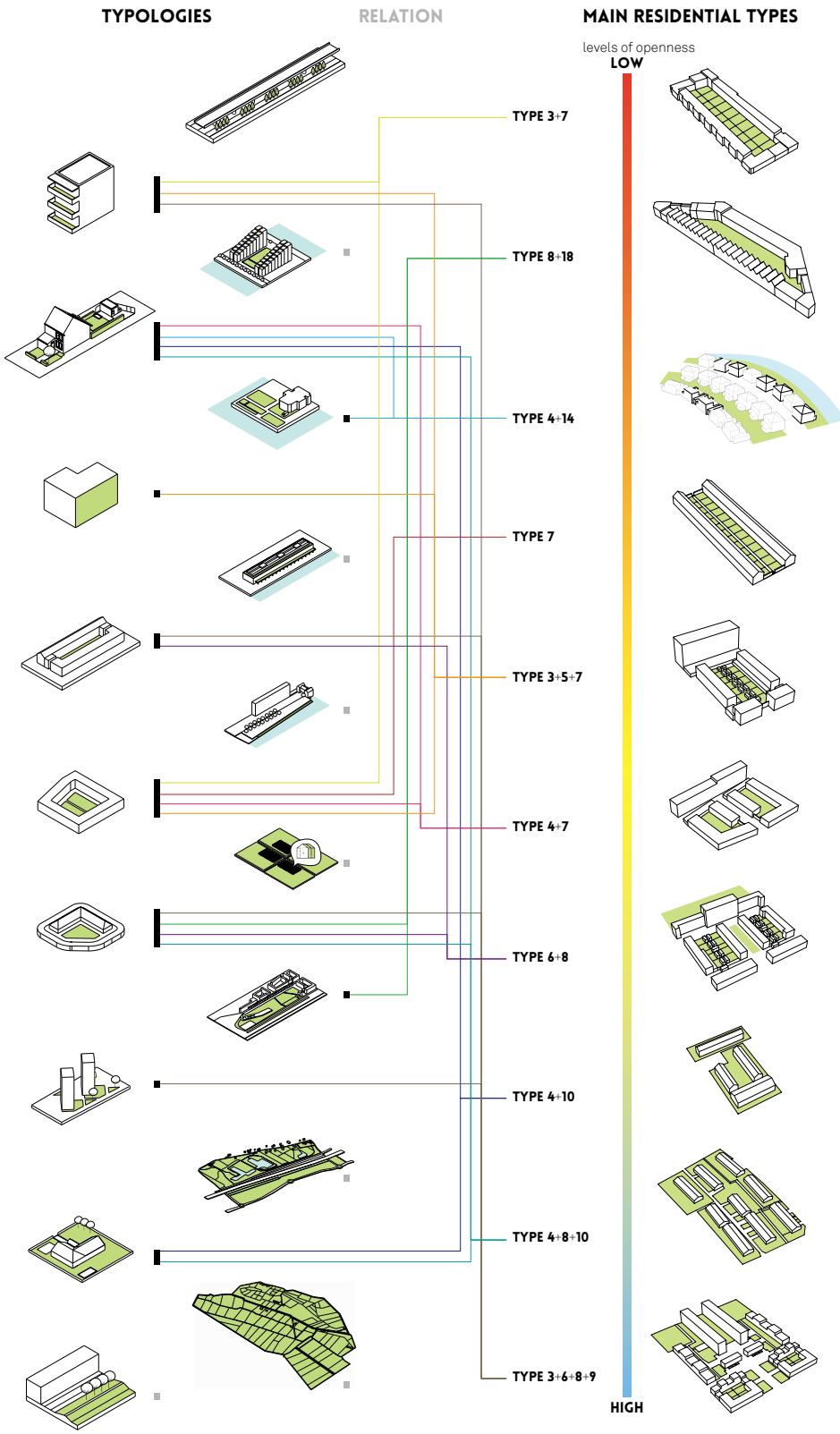


Figure.4
Match game between typologies and typical building forms

buildings and the outdoor spaces.

The diagram (fig.4) displayed the relation between basis types and typical building forms. We can see that, except the types that are not suitable for this scale, not all the types are used: most of the chosen types are more private ones. Besides the analysis, I make experiments on the variation of building blocks (fig.5). Through the variation, the inward-facing or too public character can be changed to create different levels of privacy, increasing the semi-public territory to create the sense of ownership. The essence of urban agriculture is the constant communication within the city, encouraging social interaction between people and people. How does the space fulfill the advantage of interaction in terms of social implications of different forms?

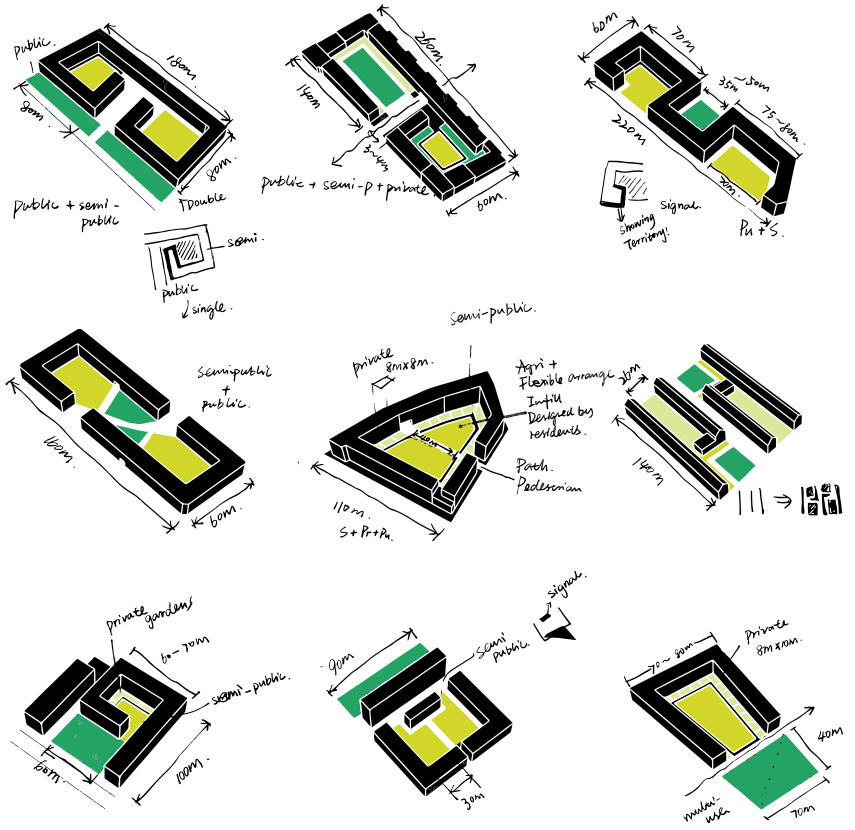


Figure.5
The experiment on the variation of blocks

5. REFLECTION

Urban agriculture encourages people to slow down and get back to the nature, to create conversations with others, to live in a healthy lifestyle. Urban agriculture provides a new perspective for answering the question about how to make our cities more livable places. Situated in the urban context, the issues, limitations, advantages and potentials of urban agriculture are becoming even more immeasurably complicated. In order to generate comprehensive and holistic design, landscape architects need to deal with the aspects of spatiality, ecology, sociality, and so on. The essence of urban agriculture is the constant communication in the city with space, people and nature, which implies the character of interconnectivity. Instead of fragment ideas, to perceive urban agriculture as a cohesive synergy helps to the full potential of ecological, social, economic and cultural value.

In the context of the Netherlands, the meaning of urban agriculture is far more than food, but an effective way of activating space to encourage social interaction and healthy life. To understand the role of urban agriculture, a question I need to know is the role of city on urban agriculture. The city as a mega scale, it has various spatial typologies - How these typologies support urban agriculture? What are their potentials and limits? In addition, the city as an organism is always changing and growing. It is important to realize that we need to take into account the uncertainty of the future. How a changing city provides the setting and flexibility for developing urban agriculture?

Another question turns back to the role of urban agriculture. I explored in this level when I was writing my methodology paper about rethinking urban agriculture. For me, urban agriculture is not a patchwork, but has to be an integrative and permanent section of the green infrastructure within the city. As I mentioned in the first paragraph, urban agriculture should function as a synergy strategy that embrace multidimensional

and trans-disciplinary characteristics. There are three sectors of urban agriculture: physical environments, actors and metabolic flows: 1) Urban agriculture requires space to implement; 2) It needs citizens to participate and indicates different kinds of activities, such as education, culture and recreation; 3) Urban agriculture integrates with green, gray and blue network, supporting the flow of movement and flow of plants and animals.

With the above considerations in mind (the role of city on urban agriculture/ the role of urban agriculture on the city), I worked on my research. The research methods comprise literature review, data analysis, mapping, observation, typology study and interviews. There are two main categories of my research contents: the case study and the site study. I studied these two categories simultaneously because they will inspire with each other.

The case study (Frankfurt, Havana, Tokyo, and New York City) let me understand the development of urban agriculture needs multiple driving forces to support. There are three main factors that contribute to the implementation of urban agriculture: the supportive policy, spatial feasibility and the participation of citizens. Though the influence of these three factors is different according to different cases, none of them can be neglected. The supportive policy encourages the action of citizens, the spatial feasibility leads to the physical environment to implement urban agriculture, and the participation of citizens helps to promote the movement. As a landscape student, I paid more attention on the spatial feasibility. Since four cities have their own morphology, how urban agriculture is represented within different contexts? My curiosity guided me to study the relationship between the pattern of agriculture and the morphology of the city. I used the mapping to trace and compared with each other. In order to get a deeper understanding of spatial forms of performing urban agriculture, I read and collected their spatial typologies from these cases. I found out that the spatial typologies of urban agriculture vary from cities to cities, derived from morphology of the city, and most of them did not purposefully create a new space for urban agriculture but utilized the existing potential space, for instance the leftover space. Let me give an example of this. The super high density of Tokyo leads to the dot's pattern of urban agriculture: citizens recreate all kinds of small-scale space such as corners, street sides and vacant lots in between buildings to grow food. I realized that urban agriculture in four cases all have their own characteristics. What determined the differences of spatial forms was the morphology of the city, like DNA of a city, which made urban agriculture special in different cities.

Inspired by these cases, I used what I learnt to analyse Rotterdam Zuid: what its morphology looks like; how its pattern developed from time to time; what types of spaces contain in it. The area is quite large and I worked a lot on it. I would like to demonstrate urban agriculture is not a patchwork; it has great potentials to happen in different kinds of space and different locations with different scales within the city. 'What types of space can be used to developed urban agriculture in Rotterdam Zuid? Where is the potential space?' I kept

these questions in mind all the time and visited the site many times, trying to find the potentials and limits. During this period, I documented the typologies that exist in Rotterdam Zuid, using typology study as an analysis technique. The typology study worked effectively that provided the basis for my design period. This process helped me to develop the idea of integrating with urban infrastructure, trying to create a set of flexible strategies.

The research phase helped me to understand what I need for the design project, and the problems I wanted to tackle, though I struggled for a period of time to try to order everything into one coherent framework. Since the graduation project started, my study realm focused on the city and different scales within the city – the interpretation of the morphology and spatial typologies of the four cases, the study of Rotterdam Zuid. Unlike a specific design task, the context of city is large and complex, including a wide variety of spatial typologies, cultural pluralism, different needs of citizens, etc. In terms of urban agriculture, the heterogeneity of the city leads to different forms of space, different choices of food production. It is crucial that the development of urban agriculture needs the advocacy of citizens: they are the actors in the movement. Accommodating the complexity and uncertainty becomes one of the main considerations of the project.

The purpose of my project is not about finding a place to make an edible garden design, but seeking a strategic planning of integrating urban agriculture into part of the green infrastructure for the future of Rotterdam Zuid. The project hopes to open up the possibilities of urban agriculture to inspire people like planners, decision makers and residents in Rotterdam Zuid. How can I develop the strategy for a healthy green structure in Rotterdam Zuid that communicates both decision makers and citizens? With the main design question and understanding of urban agriculture and site analysis, other design questions arose: 1) How to integrate urban agriculture into part of the green infrastructure in the city? How the city supports this possibility? 2) What types of space provide the spatial feasibility for developing urban agriculture and how?

The proposal based on the collaborative communication combining the supportive policy, spatial feasibility and the participation of citizens. For the first question, the project is a strategic approach that embeds a city-scale green network within the city. Consequently, the proposal is not a finalized space of a certain area, but a flexible framework – the healthy green structure. This graduation project aims to generate a large scale, long-term and flexible vision as well as a set of spatial tools of urban agriculture to elaborate into the large-scale vision.

Integrating urban agriculture into part of the green infrastructure in the city determines that I cannot just focus on the vision of food, but also the urban ecosystem and other members of green infrastructure. The robust urban ecosystem supports a healthy setting for growing food. The interaction between urban agriculture and other green infrastructure enriches the programs and experience in the city. Taking them into

consideration from a broad perspective of urban agriculture, the essence of promoting urban agriculture is actually about reconfiguring a healthy green city based on the existing landscape and the potential leftover space. The vision for Rotterdam Zuid is the healthy green network. This network contains agriculture and nonagricultural programs that dominated by parks, community gardens, collective yards, playgrounds, and sports activities, etc. It represents a connective landscape: a connective condition for the flows of not only pedestrian and cyclers but also animals and plants. The network integrates urban agriculture as part of the ecological model. The connective landscape strongly supports food growing since it restores the fragmented landscape and provides the opportunities for pollination activity.

The vision requires an operational system that intersects top-down mechanisms and bottom-up initiatives. The aim is to create an interaction between two approaches. Within the vision developed I concentrated on the second question: what types of space provide the spatial feasibility for developing urban agriculture and how? If the vision could be considered as a framework and strategic planning, then the second part is about the spatial tools - a guidebook of citizens and government. Spatial feasibility means to provide a set of new agricultural spatial intervention through different scales as spatial tools. In this part the typology study helps me to translate the research into design that not just for professions but also easy for anyone who interest. The spatial toolbox is like a resource as well as catalogue about tactically transforming the space for urban agriculture, also combining with other activities. The goal is to inspire people to act and have their own design interpretations for participatory design.

I focus on the semi-public and public sectors of space. I re-evaluate the recorded typologies and selected the relevant types of space for developing urban agriculture. Each type has one or more corresponding solutions. The basis content of the spatial tools comprises the identification, the transformation and the involvement. Each tool has an example for explanation, isometric drawing and section describing the spatial implications of turning the space for agricultural use. The images are illustrated to visualize the design interventions and also ingredients, food products, activities, etc. The range of spatial typologies varies from different scales. From the smallest scale – the block scale, the transformation can be achieved within the collaboration in the neighborhood. As the scale getting larger, the way of transformation requires more involved partnership. The toolbox does not indicate a finalized design, but opens the possibility for unexpected results. The tools can thus be a useful connection between the top-down and bottom-up collaboration. The citizens partner with designers and planners to develop the space for integrating with urban agriculture.

The vision of the healthy green network and the tools of the spatial intervention of urban agriculture consist the main part of my design. The process is inspired by Alexander Christopher, who believed that the structure of a town could be woven much more deeply, more intricately, from the interaction of its individual acts

of building with a common language, than it can from a blueprint or a master plan. The future is unpredictable and the city is always growing. I gave my own interpretation through the design process: considering the open network is a large-scale pattern, the vision provides the rules of growth; the spatial tools are the knowledge of small patterns for people to guide the growth of the large pattern. The strategies are flexibly interpreted, arranged, and assembled. Slowly, piece-by-piece, every intervention or transformation helps to construct the whole network, collaborating and interacting for a healthy green future.

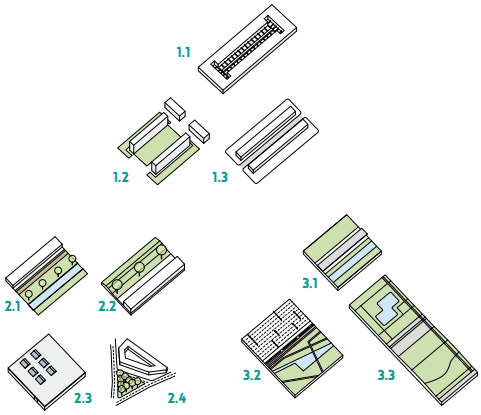
6. DESIGN

One paradox always came in my mind is that the Netherlands as one of the biggest food exporter countries, what is the real meaning of urban agriculture? Apparently food is not the only answer. Though in the beginning I studied about food growing and food cycle, as I learned deeper, I realized that the profound answer in this context might be 'health' and 'green'. Besides the health of food, it is more about a healthy green city and healthy lifestyle for citizens. A healthy green environment can supports not only food growing, but also benefits human, animals and plants. A healthy lifestyle for citizens is not only about healthy eating, but also trying to concern for our living environment, to contribute a sustainable future as one of the participants.

Urban agriculture desires more systematic approaches to be structured and integrated within the city, which means to integrate it as one component of the green infrastructure in urban areas. The strategy of urban agriculture in a city level does not mean to create productive landscape everywhere in the city, but tries to smartly intersect within the city structure. The development of new methods and analysis to interpret urban agriculture will allow better cooperate, in order to create interconnected planning strategies and shape the design for flexibility and openness.

A healthy green network is considered to be a foundation. The application of landscape ecology principles to urban areas, including the redevelopment of the underutilized space along the infrastructure, interactions among patches and corridors, is valuable for achieving urban ecological health. It is like restoring and creating a beneficial habitat based on the existing situation, not only for food growing, but also for slow mobility, for plant and animal species. Under this strategy (Part I), a set of spatial tools (Part II) is put forward related to transform the space for urban agriculture. A case about how to apply strategy and vision will be given as Part III. The design is not dead means, but a way of inspiring. All three parts try to generate a series of methods interacted to be a flexible synthesis through the combination of ingredients and continuity of different scales. The future is unpredictable, but full of surprise.

PART I
VISION AND STRATEGY



PART II
SPATIAL TOOLS

PART III
ADAPTATION OF STRATEGY AND TOOLS

PART I
VISION AND STRATEGY

HEALTHY GREEN NETWORK

To develop urban agriculture in a city scale needs a healthy setting – the proposal connects over the existing landscapes and potential space along infrastructures to provide a healthy green network in the city. The network is dynamic landscape and always growing, which enhances urban ecosystem as well as supporting food growing in the city. The network is dominated by parks, community/collective gardens, agricultural space, playgrounds, and sports activities (the toolkit will have more explanation) organized around the slow mobility lines, supporting a healthy lifestyle and ecological backbone. The vision is developed from two bases:

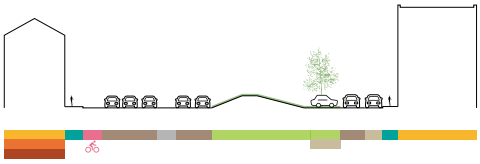
1) The hidden connection of the urban morphology that provides the potential space for redeveloping

2) The ecological mechanism: patch-corridor-matrix model

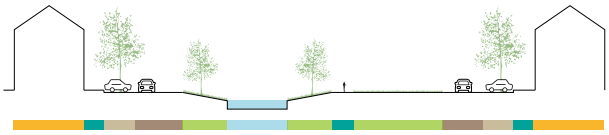
THE HIDDEN CONNECTION

The hidden connection indicates that the fabric of the city has already provides the potential network to link different parts of the city. These spaces were discovered during my on-site study phase (page 50): large amount of underutilized green space along the city infrastructure such as highway, railway, metro line, dikes and canals, also in some districts like Zuidwijk and Pendrecht with anonymous public space within open building blocks. For now they are just green space with grass and trees. The proposal aims to reuse these spaces to create public or collective territory for inviting people to participate, as well as beneficial habitats for plants and animals.

EXISTING SECTION

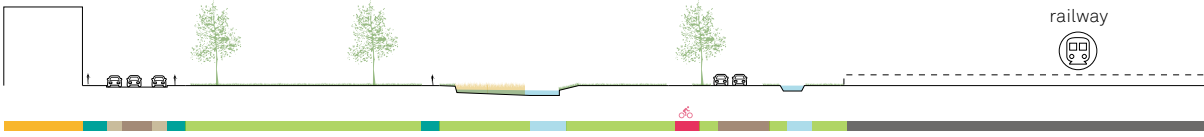


A. DIKE



B. CANAL

C. METRO LINE







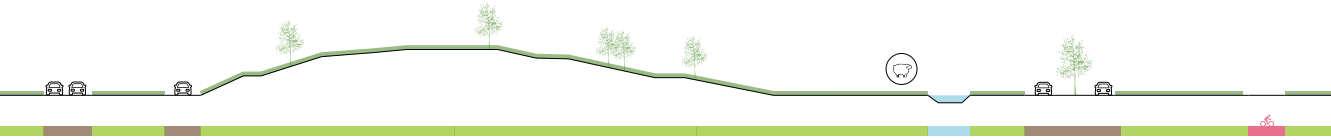



1.2. space along highway/ 3. space along canal/ 4. space along dike/ 5.6. space along metro line/ 7.8 space along railway © Author

LEGEND

- green space
- automobile road
- railway
- water
- pedestrian street
- parking
- residential building
- office building
- factory
- bike path
- undeveloped

D. RAIL WAY



E. HIGHWAY

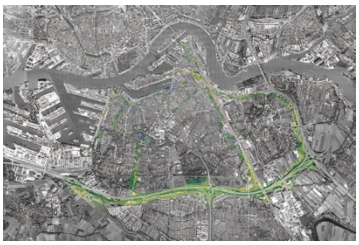
LAYER-1

EXISTING AGRICULTURAL PRACTICES
MAINLY ALLOTMENTS AND COMMERCIAL FARMS

LAYER-2

EXISITING PUBLIC GREEN SPACE

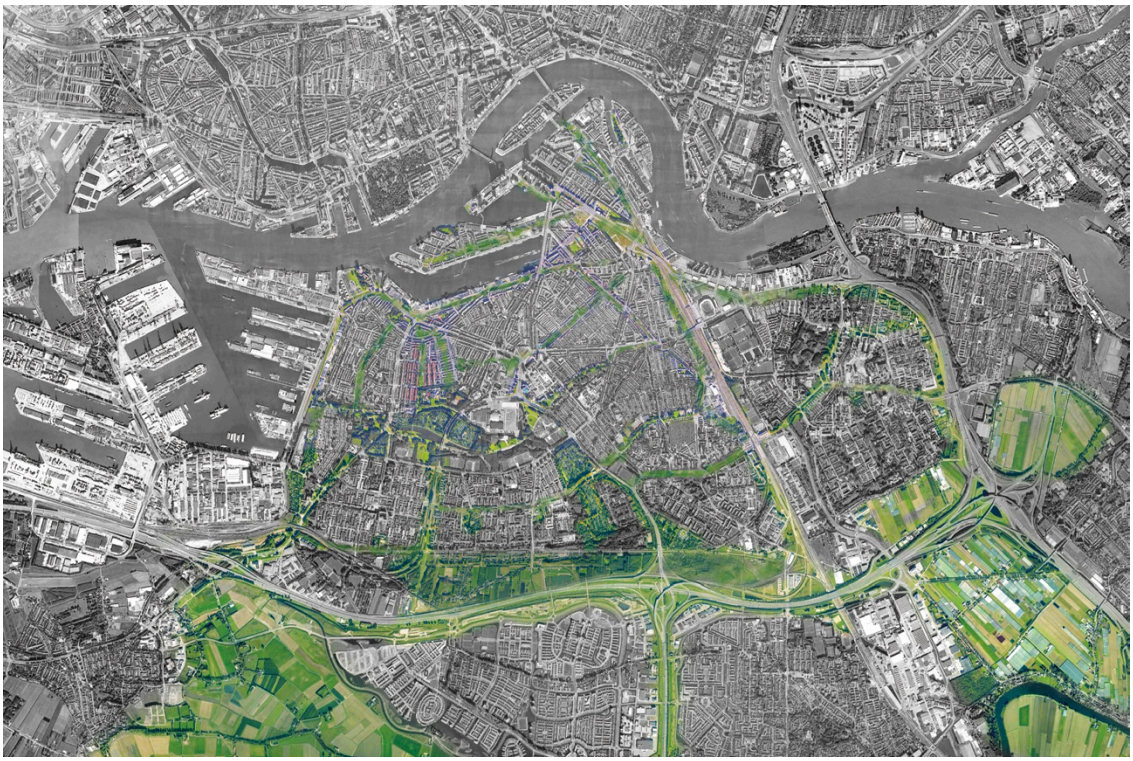
LAYER-3



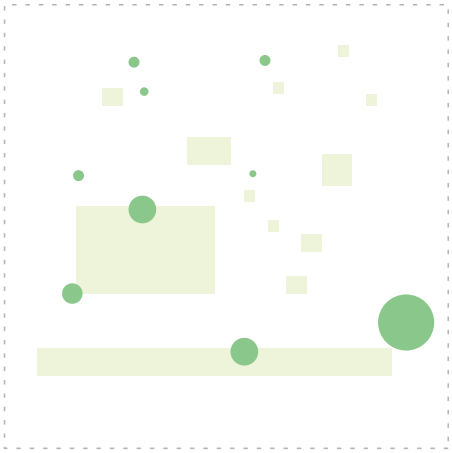
UNDERUTILIZED SPACE
ALONG CITY INFRASTRUCTURE

DEVELOPMENT OF HEALTHY GREEN STRUCTURE

OVERLAP AND CONNECT THREE LAYERS



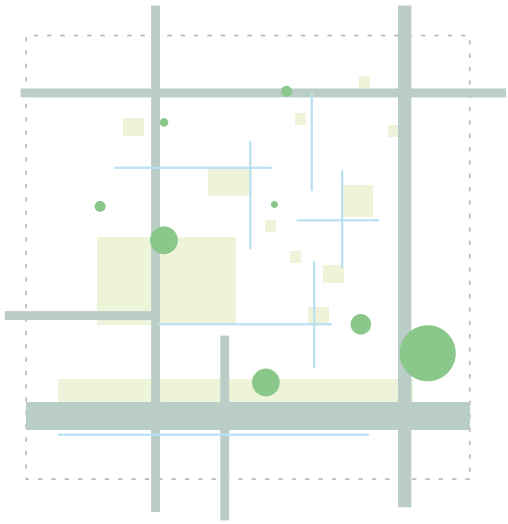
CONCEPT DEVELOPMENT



EXISTING SITUATION

green space for recreation
agricultural practices

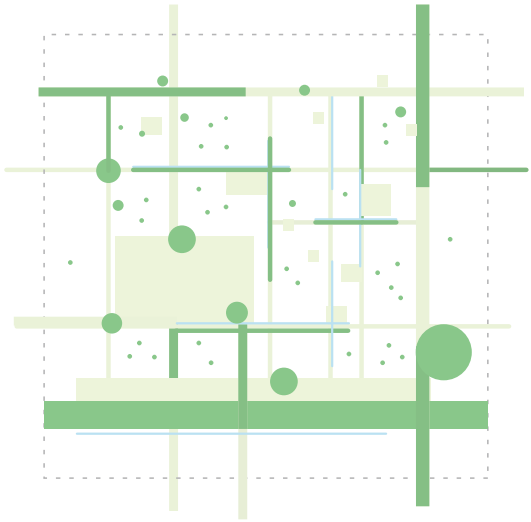
The situation of the urban landscape in Rotterdam Zuid is scattered in the city with few connection. The agricultural practices are more for private users and isolated from the surrounding. The existing condition provides weak slow network and fragile ecological setting for food growing.



THE HIDDEN CONNECTION UNDERUTILIZED SPACE

space along infrastructure (highway, railway, metroline, dike)
canals

The great opportunity is that the existing urban infrastructure such as highway, railway and metro line has large amount of unused green space. In addition, the space along the canals in Rotterdam Zuid is underutilized. Both structures suggest a potential connection of the scattered landscape.



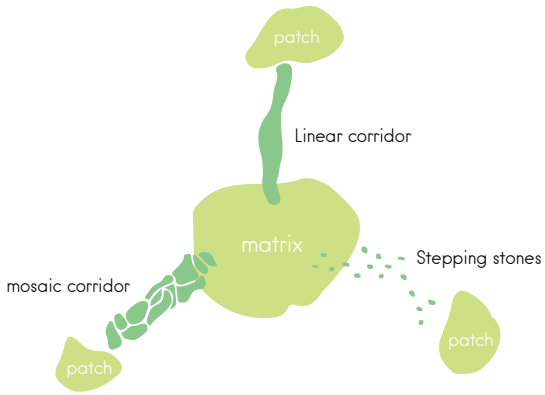
CONNECTIVE LANDSCAPE

walk & bike | greenery recreational | food edible | insect pollination

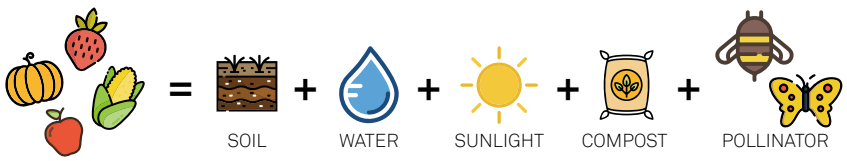
Utilizing the potential connection and the existing landscape to create a morphological green network for the combination of greenery and edible landscape. The network integrates the infrastructure and green space to provide an ecological setting for vegetation, food and pollination, which also support the slow network of pedestrians and cyclers.

THE ECOLOGICAL MECHANISM

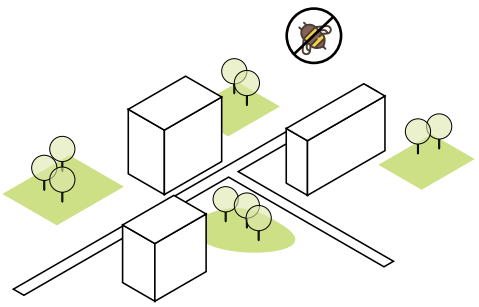
The ecological mechanism is based on the patch-corridor-matrix model of landscape ecology. Considering city as an urban ecosystem, the environment we are living now is vulnerable as we simplified the city into fragments based on our needs. The landscapes do not connect to each other and the environment becomes fragile. The fragile landscapes limit the development of urban agriculture, because growing food like melons or fruits not only needs soil, water and composts, but also needs pollinators. The pollinators require a connective landscape that provides opportunities for them to cross the man-made barrier such as roads and buildings. Consequently, the green network is proposed to support this mechanism through connection in the city.



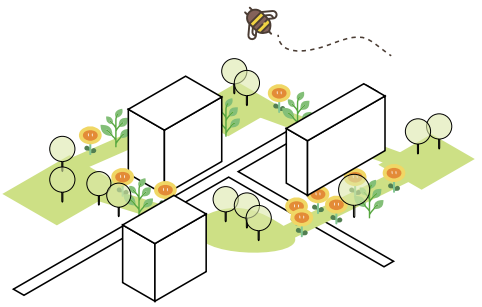
PATCH-CORRIDOR-MATRIX MODEL



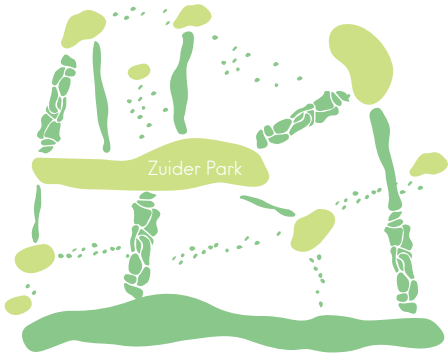
OVER 1/3 OF FOOD



EXISITNG man-made barrier in the city: difficult for pollinators to cross

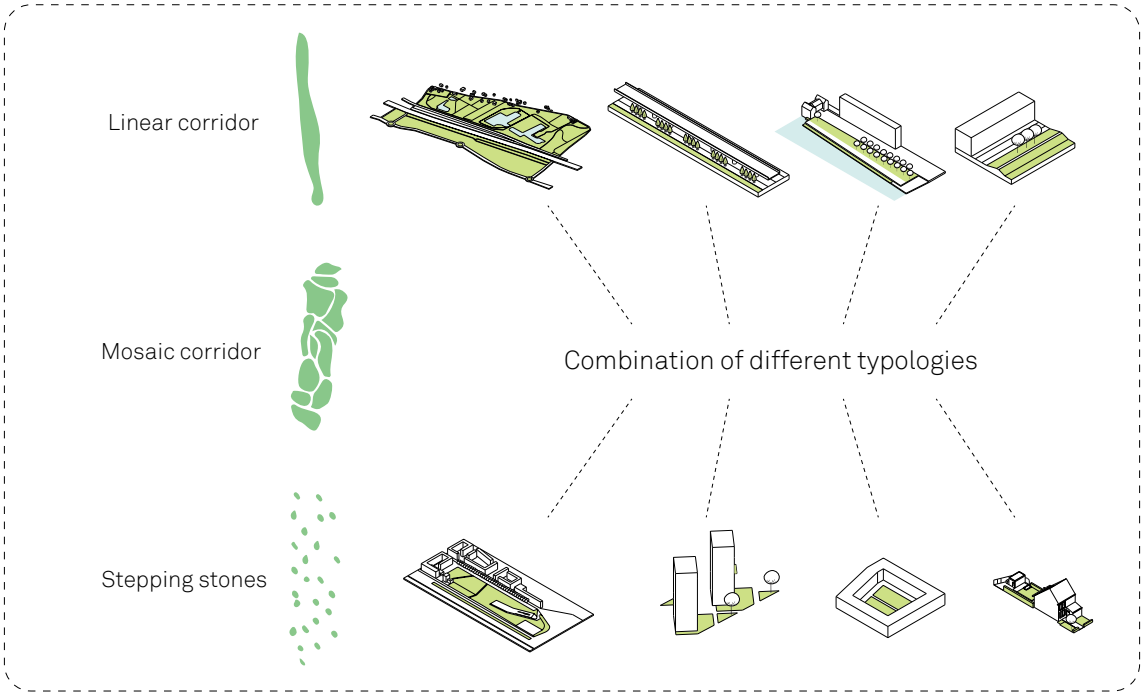


PROPOSAL connective landscape creates opportunities for pollinators to move within the city



The network serves as a 'transport' system. It is a network not just for pollinators, but also for plants and people: the flow of movement, food and nutrition.

The proposal mixes recreational green space, productive space and green streetscape to support a complex urban landscape. All of these spaces represent habitat opportunities for native flora and fauna. Space along infrastructure like highway, canal and railway will be corridors provides linear habitats. Zuiderpark would be a big matrix with the extensive and connected landscape elements. The community gardens or courtyard are considered to be patches. Residents' backyards or front gardens have potential to form stepping-stones. There will have various ways of combination. Most importantly, the improvement of each link is effective and useful: it is a potential to contribute to biodiversity. The goal is to grow diverse native plants in the network. Urban agriculture would be one important contributor for maintaining diversity as well as one beneficiary.



BASIC COMPONENTS

When I study the patch-corridor-matrix model, I realized its effect is far more than habitats for pollinators, but also benefits the biodiversity and improve the urban ecosystem. Nowadays, the process of urbanization is the major force of the land conversion, which reduced the diversity of native species in urbanized region. Conversions of land use and land cover lead to the lack of integration of patches. The scattered landscape of the city isolates and degrades the urban ecosystem. The integration needs vegetated patches interconnectivity and corridor connection.

Patch and corridor as basic components, have influence on human activities and species habitats. Patch, as nonlinear surface area, is the fundamental unit of the landscape. The patch structure of size, number and composition impacts the ecological condition. Patches can be various scales. There are two situations leading to fragmentation: the decrease in the amount of habitats and the decrease in the connectivity between habitat patches. As the diagram shows, large, more and interconnected patches indicate a stronger and better habitat. The corridor as linear surface areas link patches together, serving as conduit for organisms to move from one patch to another. Corridors have origins similar to patches, so a cluster of patches like stepping-stones actually provides alternative routes as a corridor. The wider and continuous we make the corridor, the better outcome.

We have to acknowledge that in the highly urbanized environment, the ecological functions of patch and corridor impossibly equal to those in natural environment. Nevertheless, the improvement of the urban pattern will impact on urban ecosystem to certain extent. The healthy green structure can be considered as an optimal spatial arrangement of patches and corridors. The proposal tries to increase the amount of patches and enhance the connectivity between corridors and patches. Through modifying the land use and land cover, restoring the relationship, the urban ecosystem can be improved to support the biodiversity, runoff, nutrient cycling, and so on.

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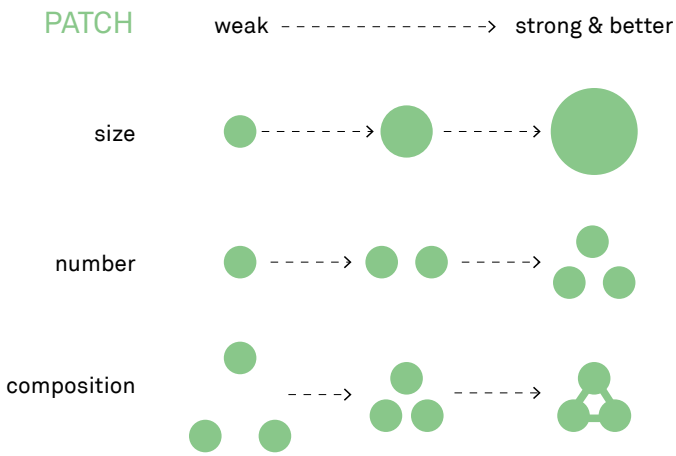
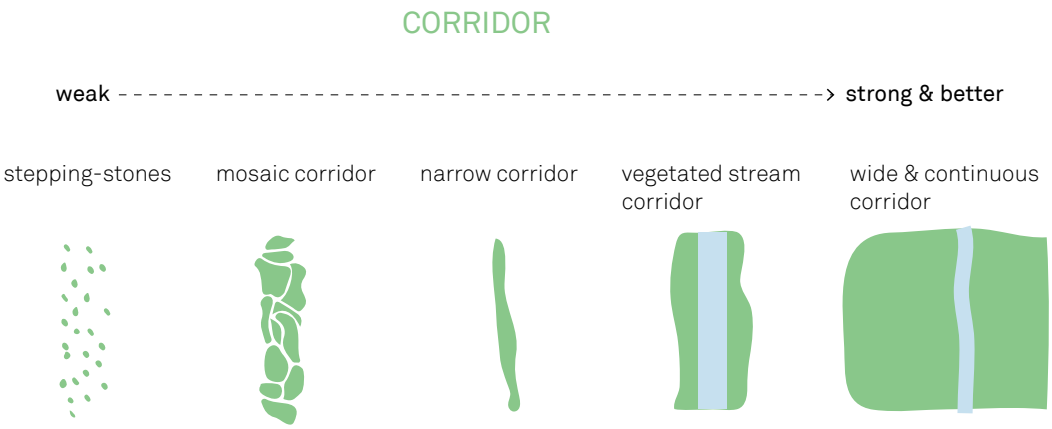
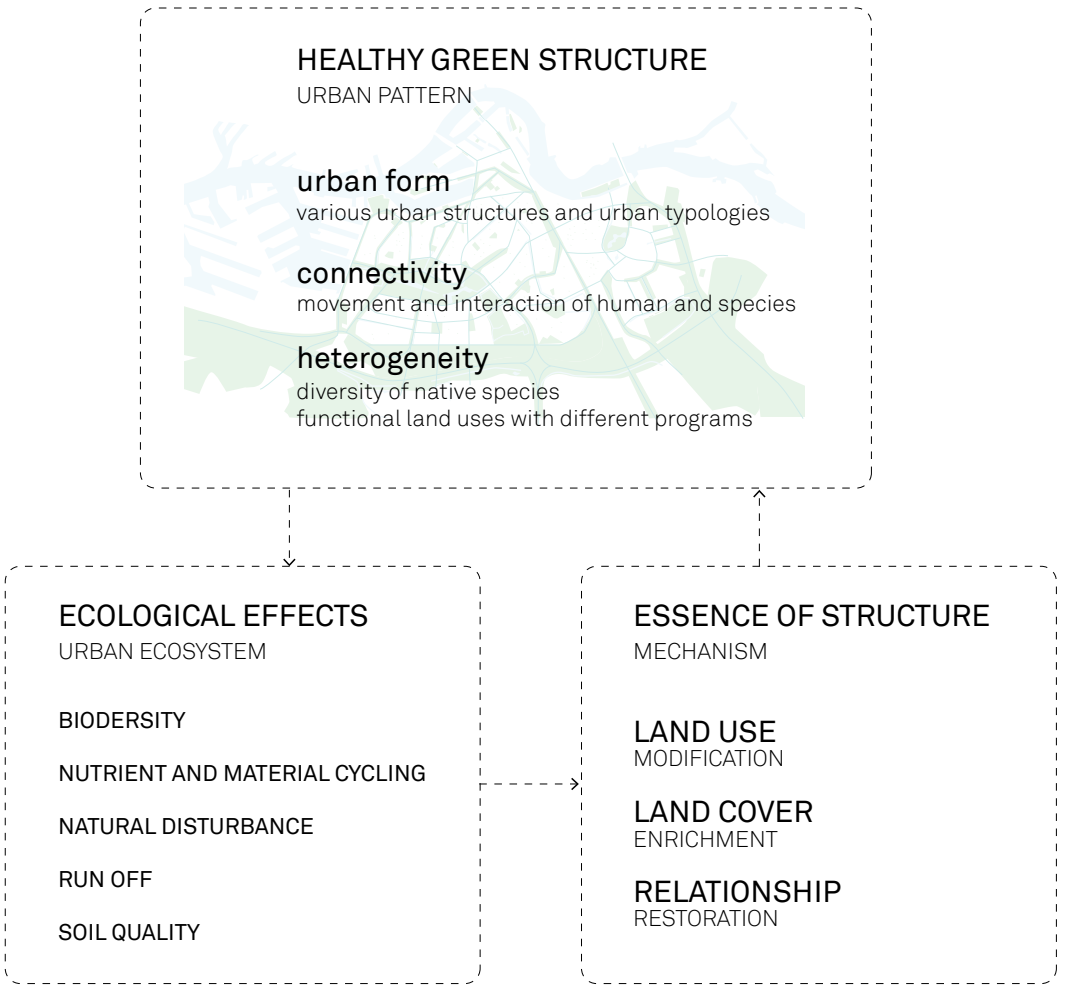

PATCH
weak
strong & better
size
number
composition


CORRIDOR
weak
strong & better
stepping-stones
mosaic corridor
narrow corridor
vegetated stream corridor
wide & continuous corridor

MODIFY URBAN ECOSYSTEM

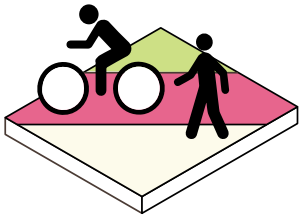
The essence of healthy green structure in Rotterdam Zuid actually aims to modify the land cover and land use of urban landscapes (diversity of native species and land use heterogeneity), and relationship (connection and interaction between scattered landscapes) among them. The proposal is to improve the existing situation of urban form, land use connectivity and heterogeneity, trying to use the structure to affect ecosystem function.

The vision proposes an optimized urban pattern that generates differential ecological effects. The structure represents the interactions between human and ecological process. Since humans depend on earth ecosystems for food, water, and other important products and services, changes in ecological conditions that result from human actions in urban areas ultimately affect human health and well-being. Therefore, the structure has double meaning: not only modify the living environment that improve the biodiversity, but also increase the slow network and gathering opportunities for human, which encourage social interaction and healthy life style.



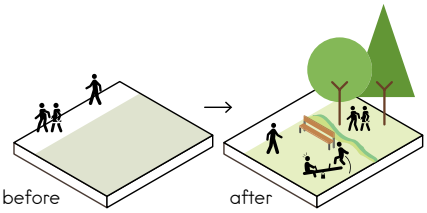
RULE-BASED DESIGN

The network is not just the flow of movement, but also the flow for animals and plants. In order to make the network function, there are 3 rules as basis foundation.



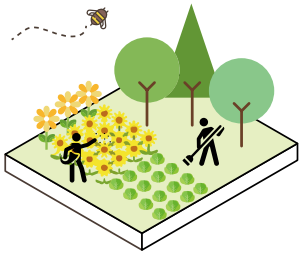
1 Pedestrian & cycler friendly environment

This is the basic rule for the flow of slow mobility - spaces conveniently walkable and bikeable in the network. For the existing situation parts of the network has already meet the demand, providing nice environment. However, the rest part is still in car-based condition, requiring for improvement.



2 Develop underutilized space

This is the basic rule for the flow of slow mobility - spaces conveniently walkable and bikeable in the network. For the existing situation parts of the network has already meet the demand, providing nice environment. However, the rest part is still car-based condition, requiring for improvement.



3 Diverse native vegetation

This rule supports the ecological function. Diverse native vegetation complexifies the existing landscape, providing enough food for insects and better growth for plants. What's more, maintaining diverse native vegetation is to discourage invasive species that provides beneficial habitat for flora and fauna.

TOOLKIT FOR THE NETWORK

The network covers whole Rotterdam Zuid, connecting different parts of the city. Hence, a set of programs is recommended to enrich the experience of the journey. The toolkit provides some ideas to equip the network: the first set of tools is general options such as park, playground, sports fields; the second set of kits is food-related program including the whole food cycle from production to recycling. The toolkit presents parts of the options. The network encourages citizens to provide more interesting ideas.

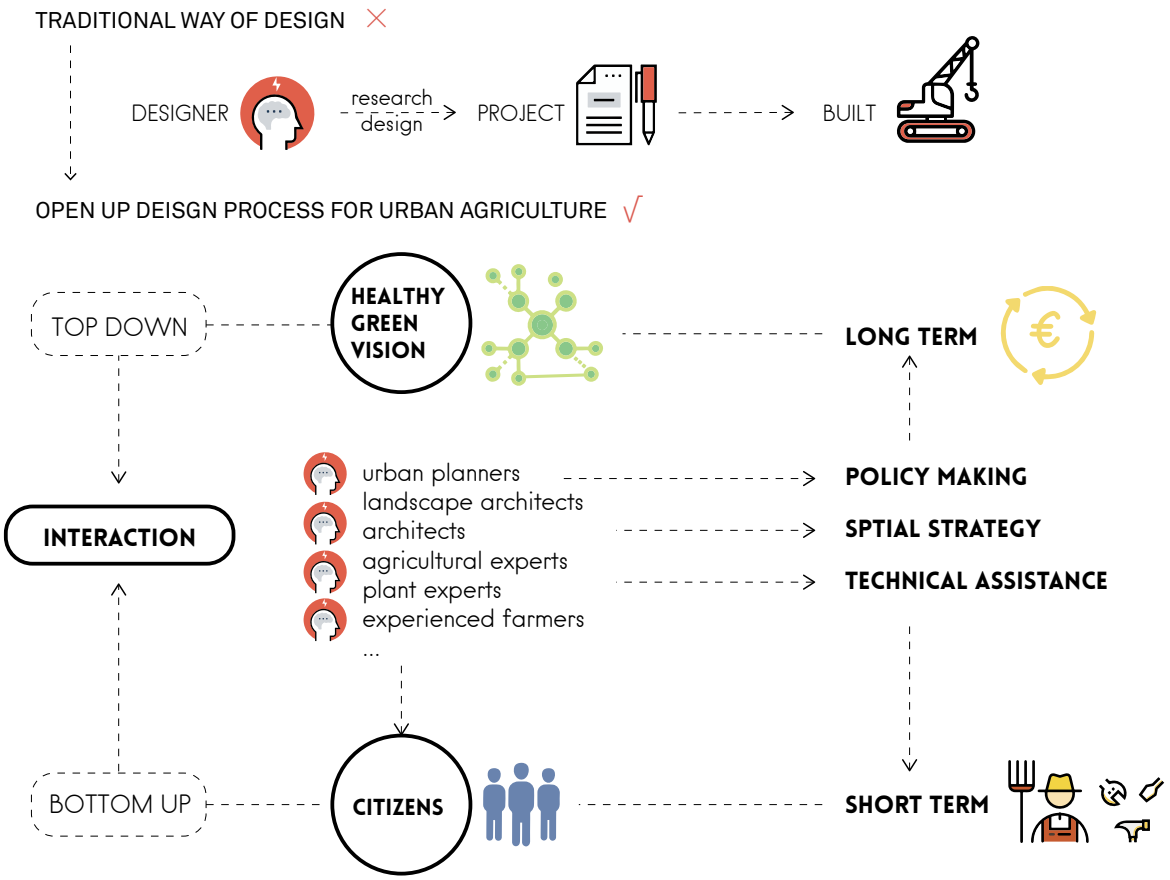
They can be assembled to have different combinations; consequently, the future outcome of programmatic scheme can be various according to the needs and context. It is an adaptive and flexible process. However, a few interventions are necessary in order to trigger and guide citizens. The interventions will be presented in the third part of application.

OPEN PROCESS FOR COLLABORATION

Top-down, interaction, and bottom up approach

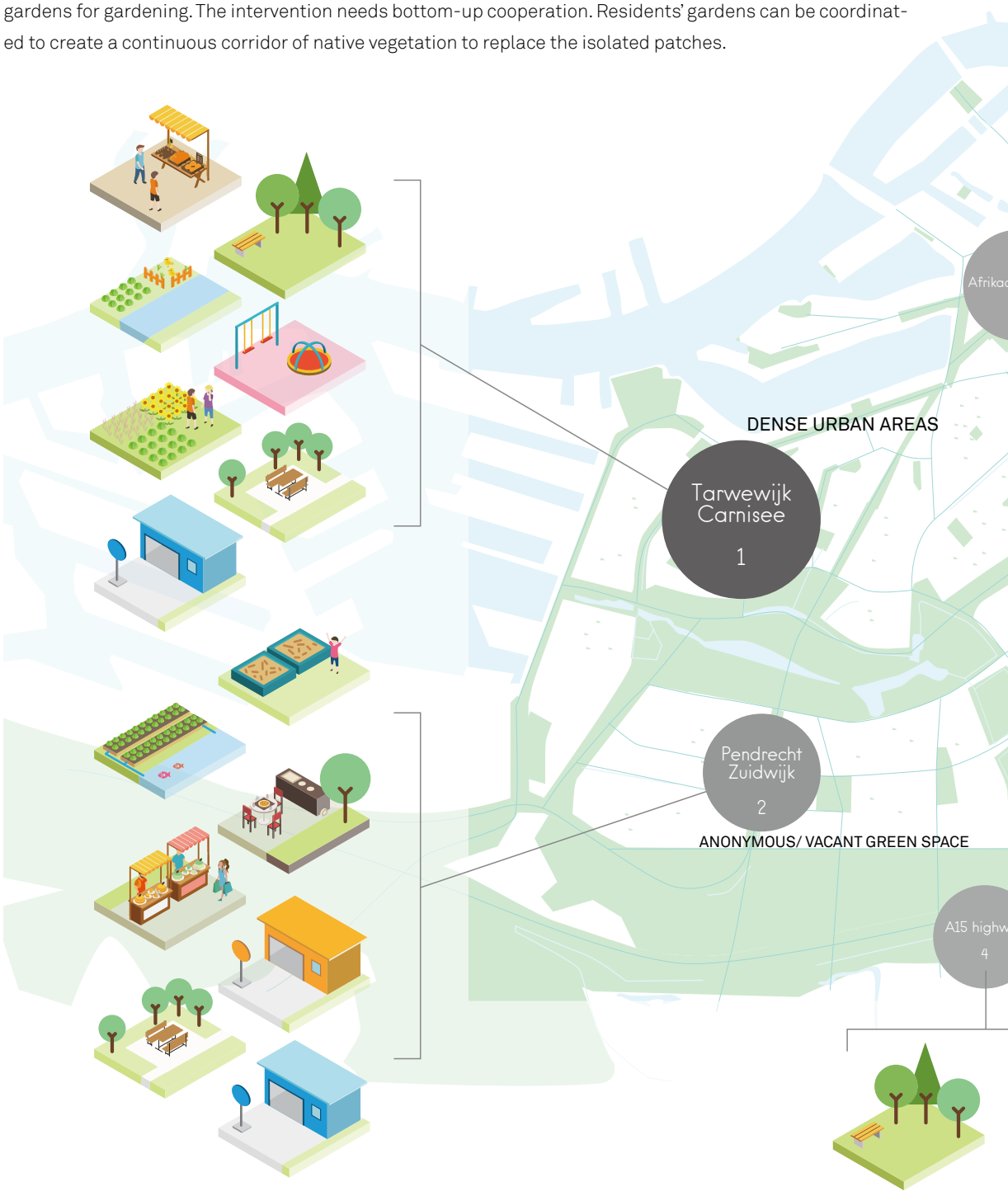
The realization of healthy green structure is achieved by modifying land use and land cover, and restoring their relationship. Citizens are the dominant driving force. It is not a top-down approach, but collaborative process that everyone can participate. Every neglected corner has the opportunity to be improved to support the whole system.

The project encourages a top-down and bottom-up integration design. Unlike the traditional way of design, the top-down approach provides an open and flexible network instead of a masterplan or blueprint, which empowers citizens that invites people to participate the process of design and discuss the future of the city. The interaction becomes fundamentally important because it create the link between top-down and bottom-up. It requires multidisciplinary team of urban planners, landscape architects, architects, agricultural experts, experienced farmers and other experts of related realm.. The interventions vary from short-term to long-term. Short-term projects relate more to bottom up process that is more easily to operate, and long-term projects may need more investment on the large-scale construction.



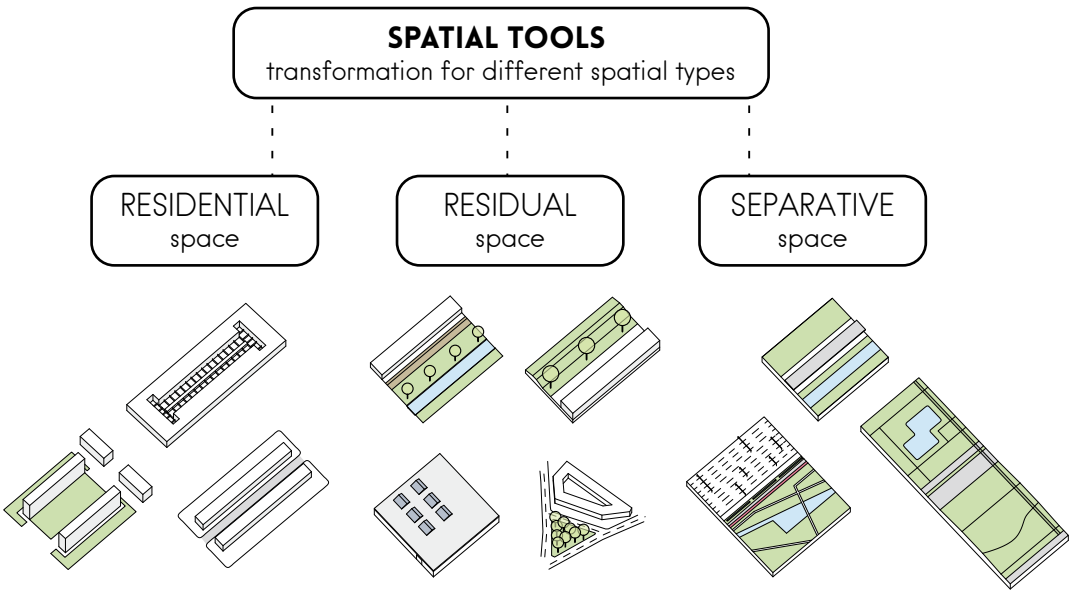
PRIORITY OF INTERVENTION

The project sets the priorities of intervention to give more focus for long-term planning. For example, the districts Tarwewijk and Carnisse are the top priority because of dense urban area. The invention needs the investment on the slow network establishment and public green space creation. Districts like Vreewijk and Bloemhof are of the lowest priority for intervention because they are garden villages and have many private gardens for gardening. The intervention needs bottom-up cooperation. Residents' gardens can be coordinated to create a continuous corridor of native vegetation to replace the isolated patches.




anderbuurt
3
URBAN CORE
UNDERUSED GREEN AREA
Railway area
4
Bolemhof
6
GARDEN VILLAGE
IJsselmonde
5
GARDEN VILLAGE
Vreewijk
7
UNDEVELOPED GREEN AREA

PART II



Part II is the spatial toolbox concentrating on how to develop urban agriculture according to different spatial types. The spatial strategy is the interaction between top-down and bottom-up approach: the readers of this part are not just residents but also communities, planners and decision makers. The aim is to empower citizens to create a better neighborhoods and collaborating with different agencies to improve the living environment for a healthy green future.

The tools illustrate and demonstrate how these typologies can be developed a setting for urban agriculture, to activate the space with not only agricultural program but also facilitated with other activities. The strategy consists of multi-scale interventions: from the amenities scale, blocks scale, neighborhood scale to the city scale. The strategy encourages people to concern for their living space and stimulate the neighborhood interaction.

It should be pointed out that this part considered more about semi public and public sector; the private sector is less discussed here. The ideas concentrated on the context of Rotterdam Zuid as the prototypes were developed from the site. However, through the variation of the strategies, the idea can be developed for more results, which is also the expectation of unpredictable outcome.

Every idea has the similar format, including the identification of the spatial type, the concept of transforming the space, including site consideration and involved partnership, and one example picked from the real site in Rotterdam Zuid to demonstrate.

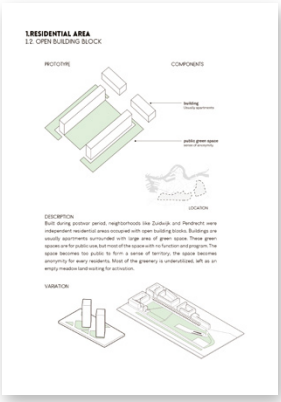
FORMAT

IDENTIFICATION

LOCATION

SPATIAL CHARACTERISTIC

PROBLEMS & POTENTIALS

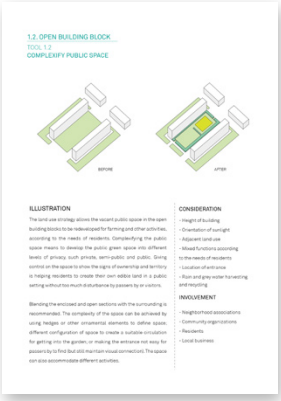


TRANSFORMATION

IDEA

SITE CONSIDERATION

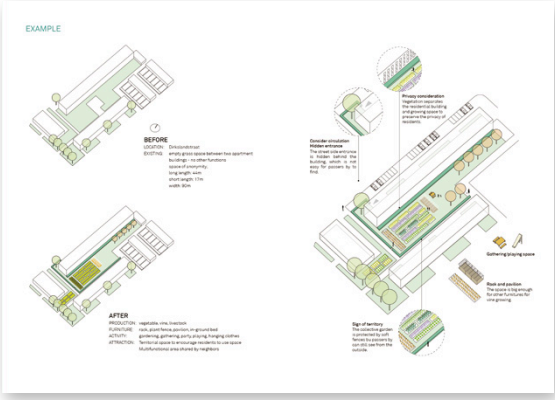
INVOLVED PARTNERS



DEMONSTRATION

EXAMPLE FROM SITES

ZOOM IN POINTS



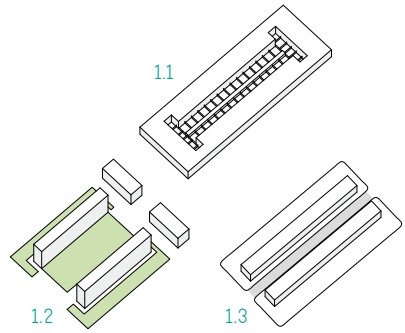
IDENTIFICATION

According to the typology study in Rotterdam Zuid, the selected types are divided into three categories: residential space, residual space and separative space. Under three categories, there will have 10 basic prototypes that the toolbox is going to further describe.

1 RESIDENTIAL SPACE

1.1. closed building block
1.2. open building block
1.3. in-between street

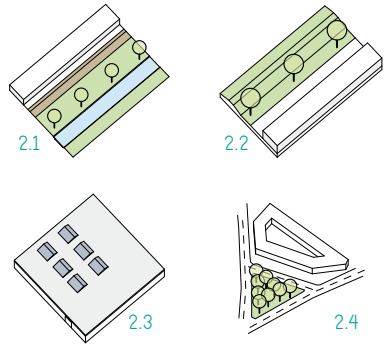
It indicates the living space of residents. For instance, there are two typical urban forms in Rotterdam Zuid: the closed building blocks and open building blocks. Their inner courtyards of the closed building blocks and the anonymous green space around the open building blocks are considered to be residential area that the tools discuss about.



2 RESIDUAL SPACE

2.1 canal space
2.2 space along dike
2.3 undeveloped rooftop
2.4 triangular space

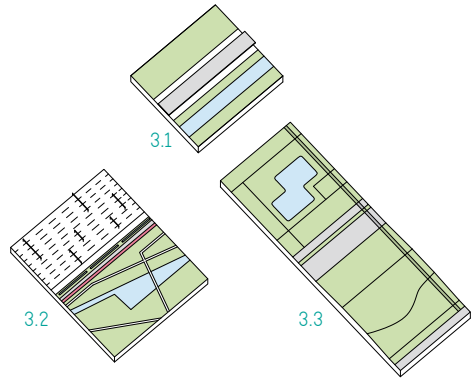
The residual space indicates the green space along infrastructure like canal, dike and roadside, and also includes undeveloped rooftop. Just as its name described, these spaces usually can be easily accessed in the city as green area, but they usually do not have other functions.



3 SEPARATIVE SPACE

3.1 space along metro line
3.2 space along raiway
3.3 space along highway

The separative space means the green space along the infrastructure such as highway, railway and metro line, which are used to isolate the large-scale structure from cityscape. The traditional view is that those transport infrastructures should be avoided from public eyes. The proposal is to integrate and redevelop these neglected area in the city.



TRANSFORMATION

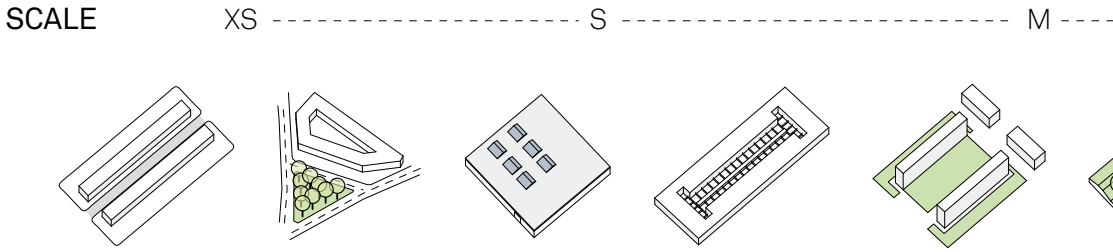
This part is the idea about how to transform the space for the use of urban agriculture and other activities. Providing tools doesn't mean that all the space of the same prototype can be changed; they might have limitations: site consideration suggests people to rethink whether the site is suitable for transformation. For example, some streets are not wide enough to accommodate more activities; streets along the arterial road with large volume of traffic are not safe to implement tools, etc. In addition, the part 'Involvement' means the involved partners of the spatial transformation, from the private property owners to relevant departments of the city agencies, depending on the level of the intervention. The most important section is the way of changing; this part will be illustrated in iconic drawings, giving description and details.

DEMONSTRATION

With the idea equipped, this part will choose a real site in Rotterdam Zuid that match the prototype; then apply the idea on the site as a design example, to explain how the idea works. It will be illustrated as isometric drawing and different colors indicate different land use of space. The zoom-in circles will show the concerned aspects, such as elements we can use, tips for arranging the space, the proposed programs, etc. It does not only indicate the pattern of space, but also the pattern of different activities.

DISTRIBUTION AND SCALES

These ten typologies have different scales and distributed on different locations. They can be divided into patches and corridors. The patches relate to the small and medium scales, such as rooftops, building blocks and open underused space. The corridors concentrate on large and extra large scales, relating to the urban infrastructure, for instance, canal, dike, and highway. The tools for intervention would have different strategies, depending on patches or corridors. Both strategies need the interaction between top-down and bottom-up, which will be explained on the following pages.

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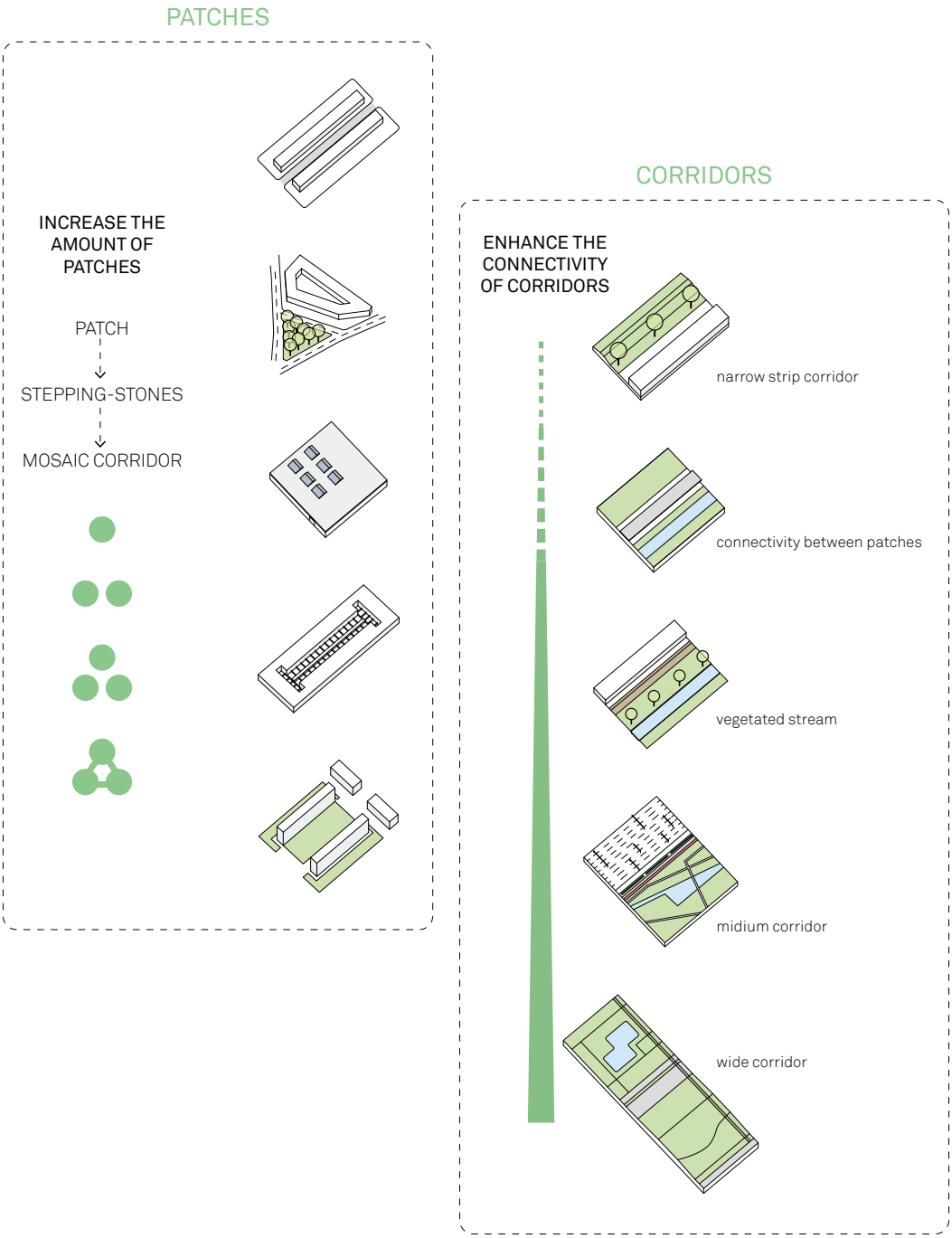
PATCHES AND CORRIDORS



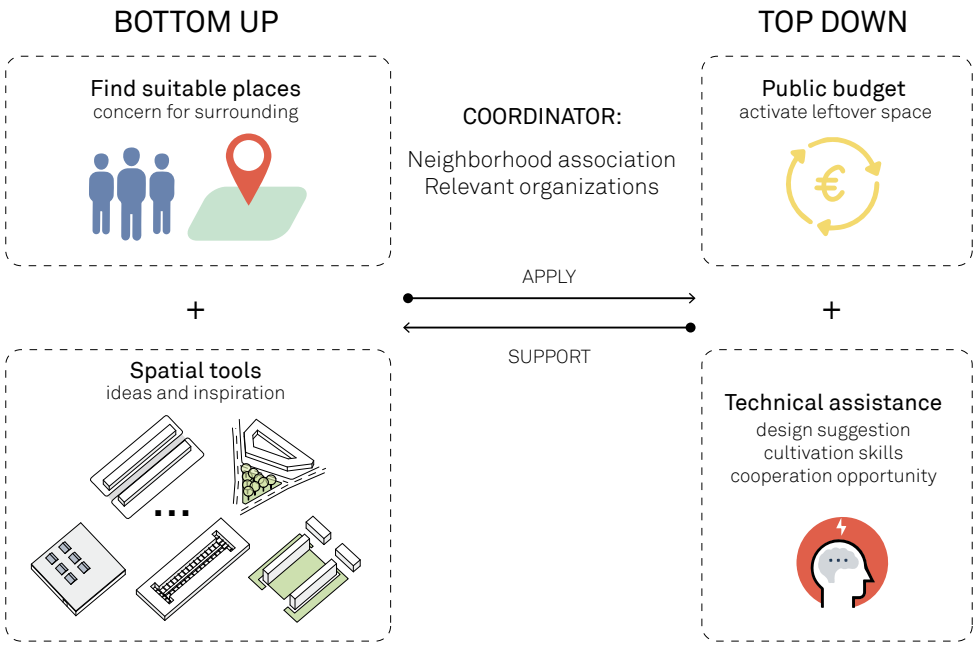
PATCH TYPOLOGY

The patch typology has more relation to the bottom-up process. Patches have possibility to form stepping-stones to increase the landscape connectivity. The strategy combines with policy incentives of public budget and technical assistances, which empower citizens to activate their living environment.

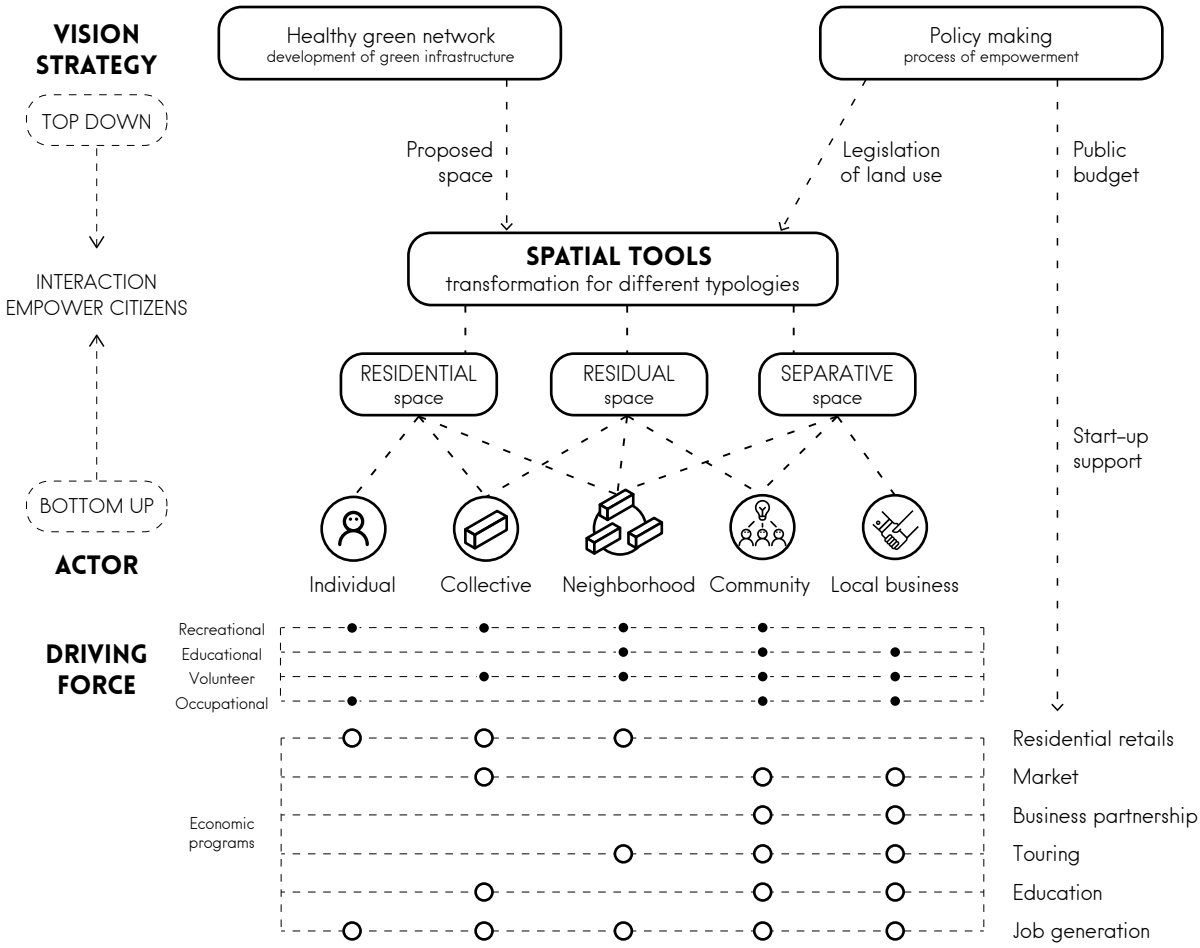
The goal is to encourage citizens to concern for their surrounding, find suitable places for productive use and create community-gathering places. The patches could have multiple functions, according to the needs of residents. It is the process of activating neglected space into healthy green area by citizens.

The process implies the collaborative vision that proactively engages residents, local businesses and communities into the participation of the healthy green movement. The benefits not only create a more beautiful and comfortable living environment, but also enhance the sense of community, greater social interaction and healthy lifestyle.

The toolbox shows some ideas about how to transform the space related to different spatial typologies. They are not fixed design, but a way of inspiring. Everyone could be a good designer and gardener. The outcome would be various and unexpected.



STAKEHOLDER ENGAGEMENT

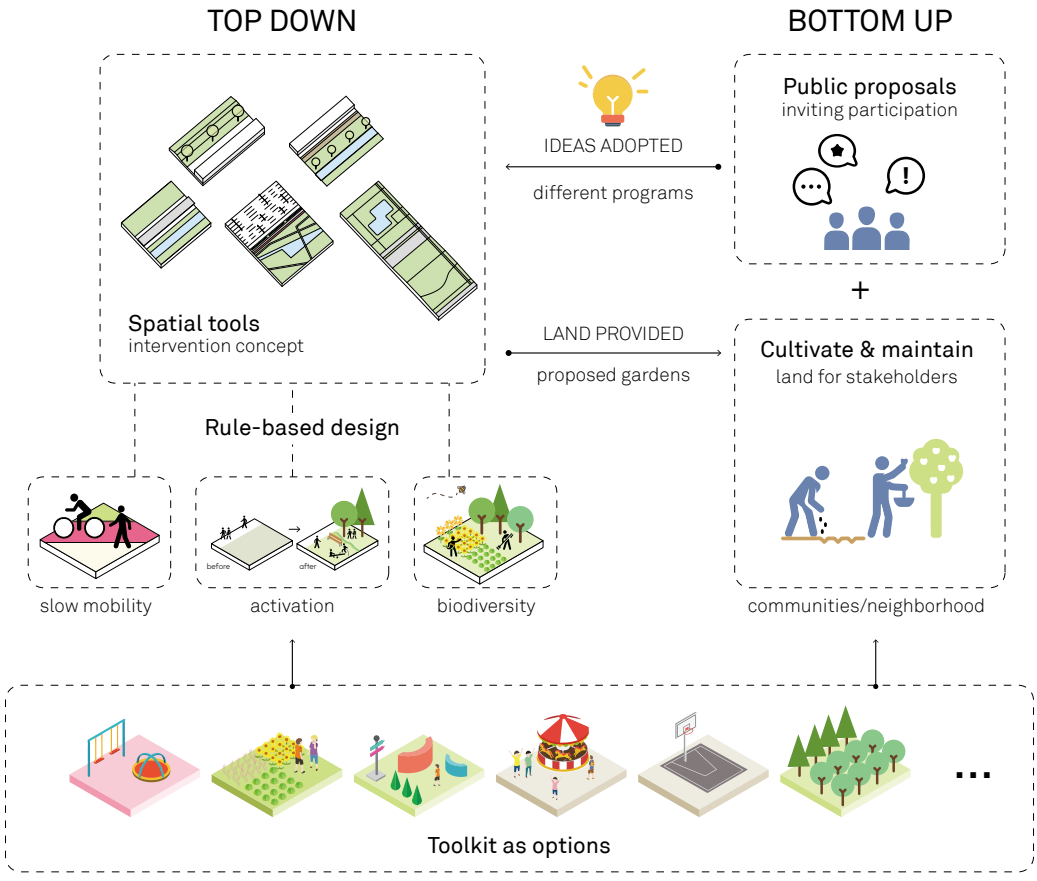


The above diagram shows the potential actors of bottom-up initiatives: individuals, collective, neighborhood, communities and local businesses. According to the benefits of urban agriculture, actors might have different driving forces to start a garden. However, no matter what actors and forces, all forms of urban agriculture require land, water, tools and labor to keep the garden up. The spatial toolbox is based on providing the access of resources.

CORRIDOR TYPOLOGY

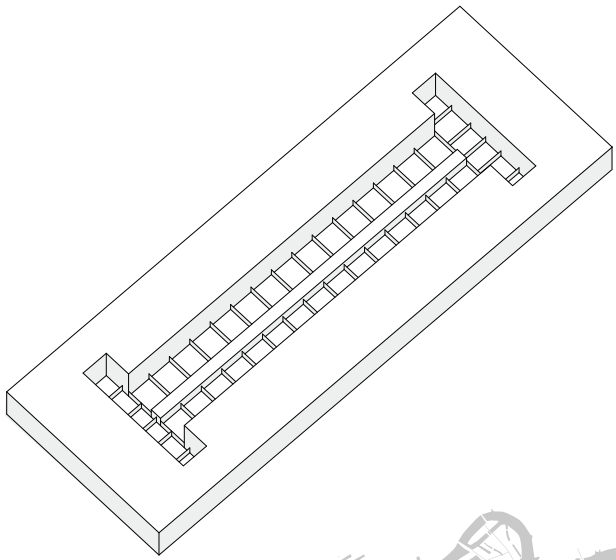
The corridor typology is the intervention integrating with the urban infrastructure, which indicates a top-down mechanism. The strategy requires the investments on the activation of the leftover/underutilized space. The goal of the corridor intervention is to provide a friendly environment for slow mobility for pedestrians and cyclers, a better connection among scattered public green space, and improve the biodiversity of urban areas.

The intervention provides beneficial habitats for animals and plants, as well as combining with various programs for citizens. As a long linear structure embedded in the city area, the corridor typology strongly relates to everyday life of citizens. Consequently, the opinions from citizens are important. With the toolkit as options, the strategy requires an open call for interesting ideas; citizens especially relevant nearby residents have rights to propose suggestions to enrich the programs of corridor. Besides different programs, the strategy provides a series of public space equipped with water accessibility for proposed locations as community gardens for interest stakeholders. Individuals or communities can adopt for urban agricultural use, which also have obligations to maintain the public space and cultivate in a sustainable way.



1. RESIDENTIAL AREA
1.1. CLOSED BUILDING BLOCK

PROTOTYPE

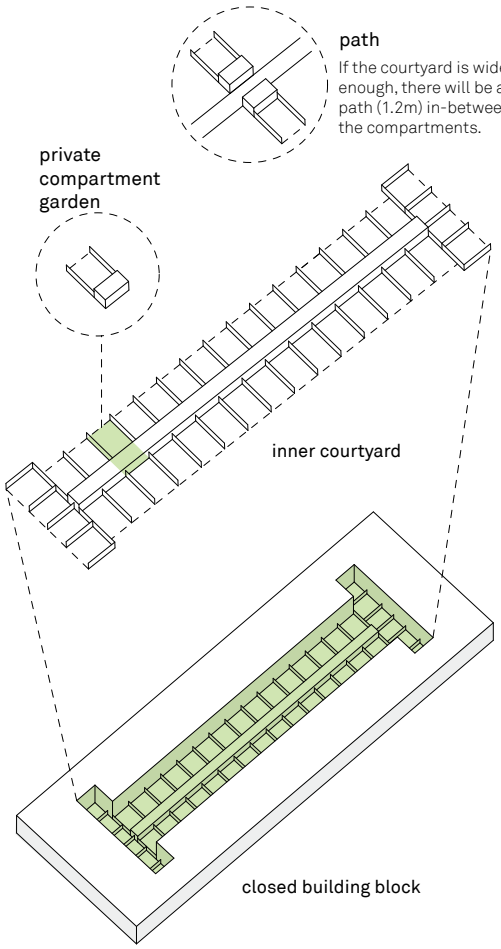


LOCATION

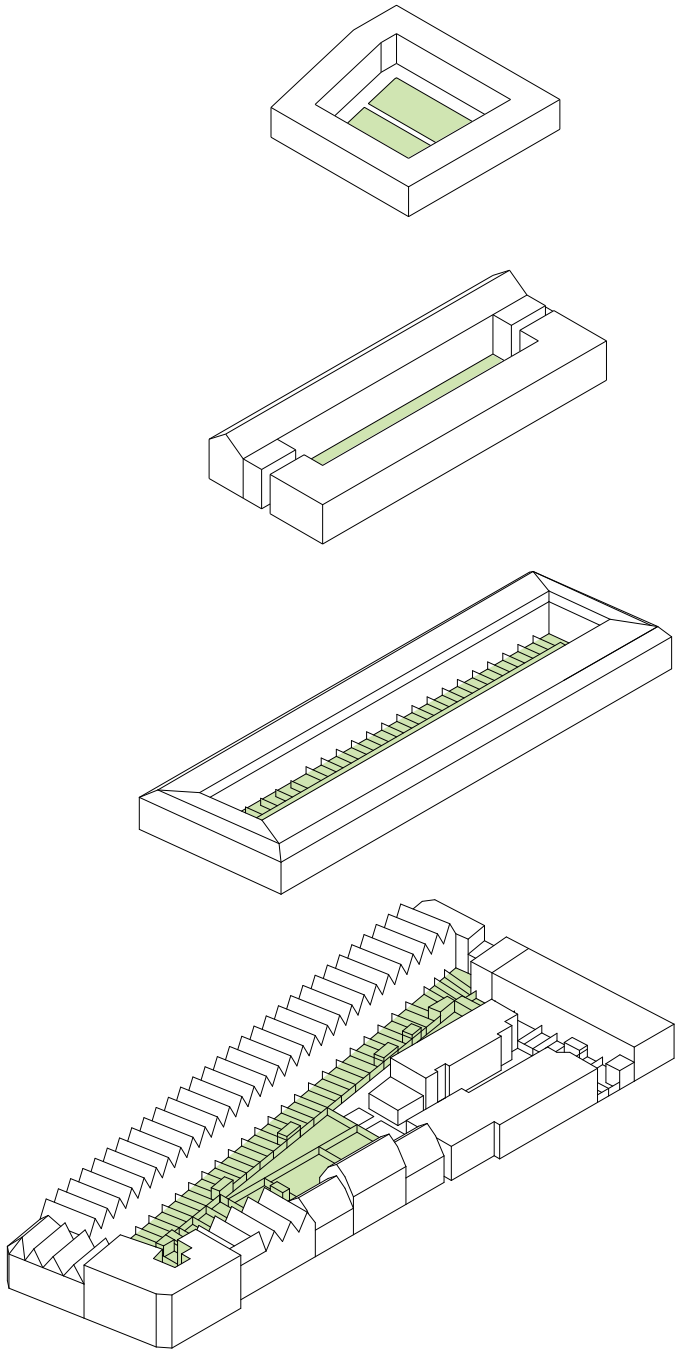
DESCRIPTION

Closed building blocks mainly locate in district Tarwewijk and Carnisse. Both districts are mainly dense residential areas. The block style followed the former ditch landscape pattern, which in a grid fabric. Blocks are with private inner courtyard inside. The courtyard space was divides into several private compartments for residential gardens. The size of the courtyards varies. This typology shows a strong private sense that impedes social interaction with neighbors. The activity in each compartment is limited because of the small size. In addition, the height of building influences the sunlight, which means part of the courtyards are not suitable for plant growing.

COMPONENTS

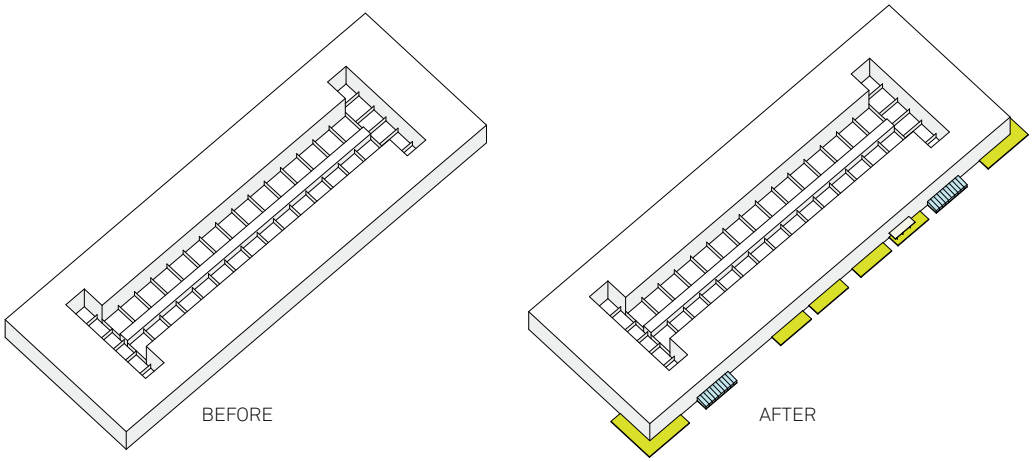


VARIATION



1.1. CLOSED BUILDING BLOCK

TOOL 1.1.A
UTILIZE BUILDING SIDE SPACE



ILLUSTRATION

Using the building side space to grow food is an easy and cost effective way of developing urban agriculture, with raised beds, portable planters made by recycled materials, or street intervention such as changing street pavement to create in-ground beds with permeable surface. According to the width of the side street, the area can be transformed to accommodate other activities, such as gathering spot or composting site for wider area, or vertical gardening if the space is limited. The small alterations can break through the monotonous sense of long façade to enrich the pedestrian's experience as well as creating identity and territory for the street.

This strategy adapts to apartment buildings that not only ground floor residents, but also serves for other floor users that they can have own growing space nearby, which is also an alternative for complementing less sunshine inner courtyard.

CONSIDERATION

- Side street width
- Orientation of sunlight
- Height of building
- Height of ground floor window space
- Avoid large volume of traffic street
- Rain and grey water harvesting and recycling

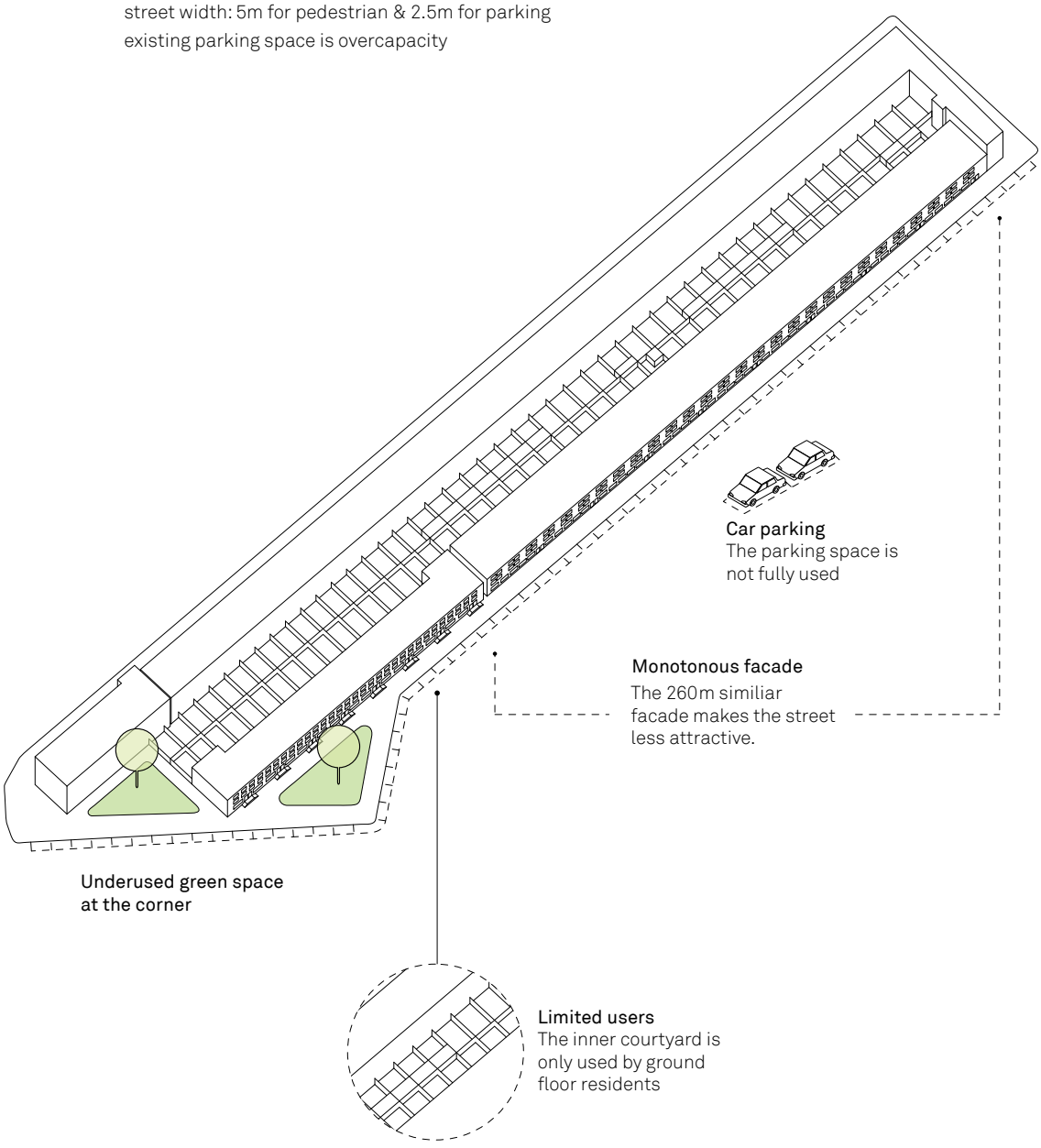
INVOLVEMENT

- Local residents
- Adjacent property owner
- Community groups
- Neighborhood associations
- Public utilities

EXAMPLE

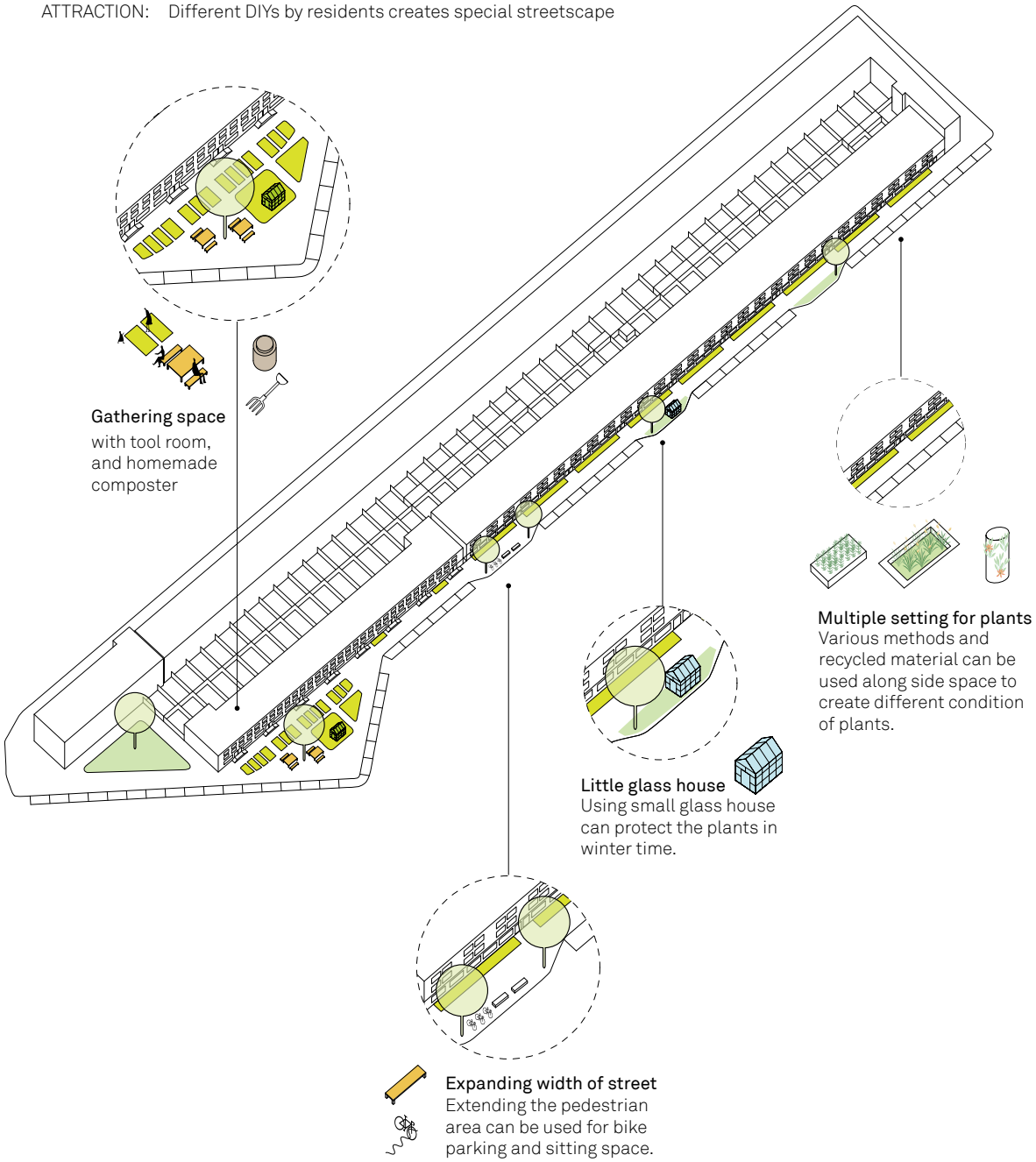
BEFORE

LOCATION: Verschoorstraat
SIZE: 260m long building facade along the street;
street width: 5m for pedestrian & 2.5m for parking
existing parking space is overcapacity



AFTER

PRODUCTION: vegetable, herb, ornamental plants
FURNITURE: seating, planter, pot, compost bin, water container, little glass house
ACTIVITY: gardening, gathering, composting, bike parking
ATTRACTION: Different DIYs by residents creates special streetscape



Gathering space
with tool room, and homemade composter

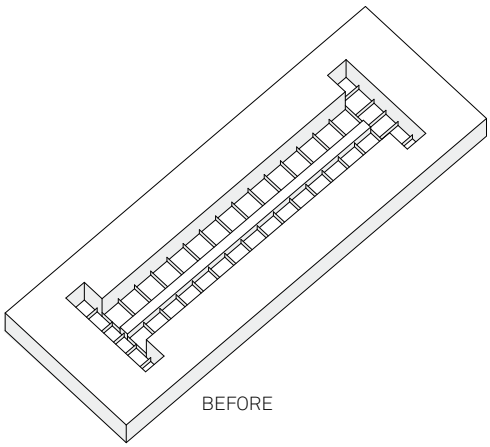
Multiple setting for plants
Various methods and recycled material can be used along side space to create different condition of plants.

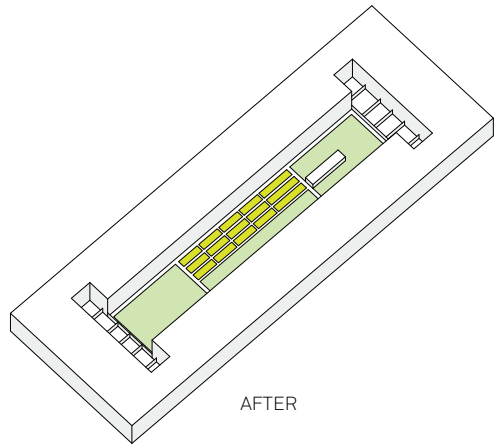
Little glass house
Using small glass house can protect the plants in winter time.

Expanding width of street
Extending the pedestrian area can be used for bike parking and sitting space.

1.1. CLOSED BUILDING BLOCK

TOOL 1.1.B
SHARE INNER COURTYARD





ILLUSTRATION

Removing the fences to share private compartments is an effective way of using the inner courtyard. In the existing condition, for one reason, not all the residents have time to take care their own garden space; on the other hand, the frequency of using the private courtyard is influenced by the sunlight situation – shadow area leads to low frequency of using gardens. This method largely reduces the number of tool rooms in order to release more space and create a collective environment for social interaction. Sharing the inner courtyard to reorganize the isolated space for different activities of farming, playing, gathering, which is based on the needs of residents. The space could be collectively owned by neighbors or allow public access to attract nearby residents for participating in gardening.

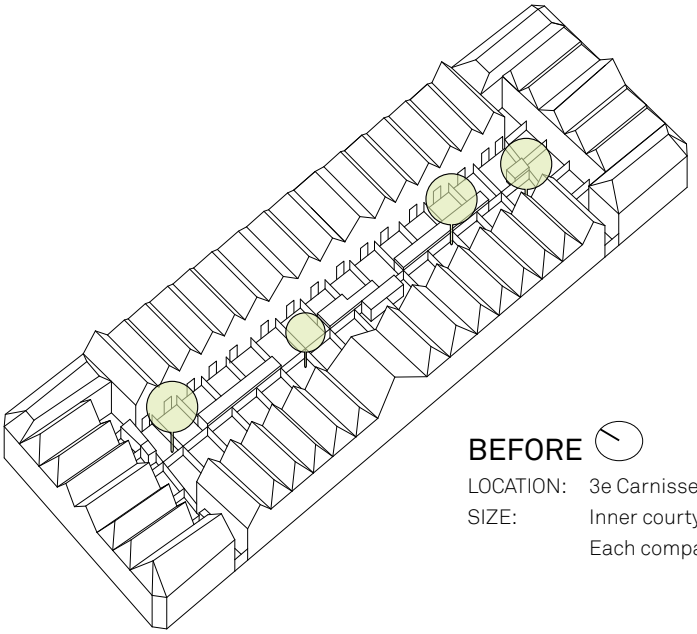
CONSIDERATION

- According to courtyard size to arrange space for collective and private use
- Orientation of sunlight
- Height of building
- Needs of residents for different activities
- Application for land use

INVOLVEMENT

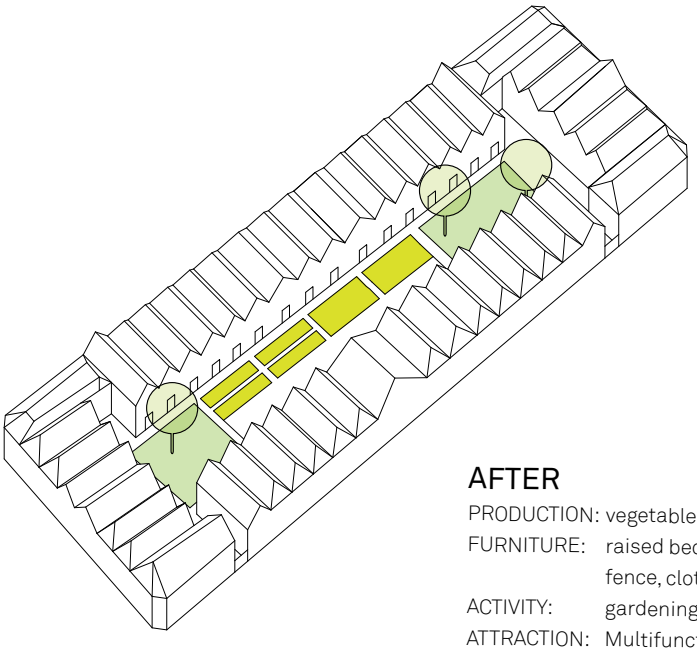
- Housing associations
- Private property owners
- Relevant residents
- Community groups
- Neighborhood associations

EXAMPLE



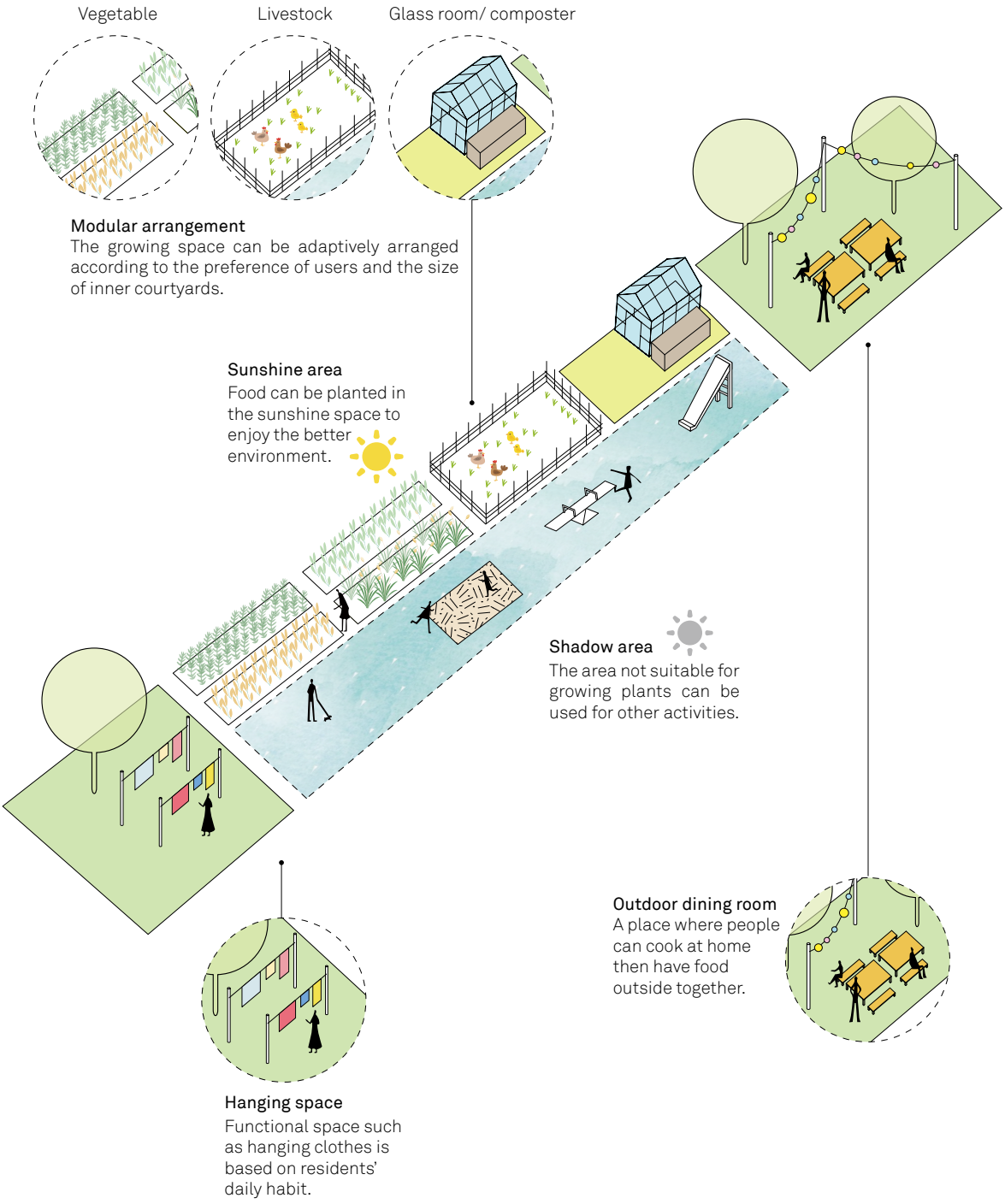
BEFORE

LOCATION: 3e Carnissestraat
SIZE: Inner courtyard size - 81m*16m
Each compartments - 4m*6m



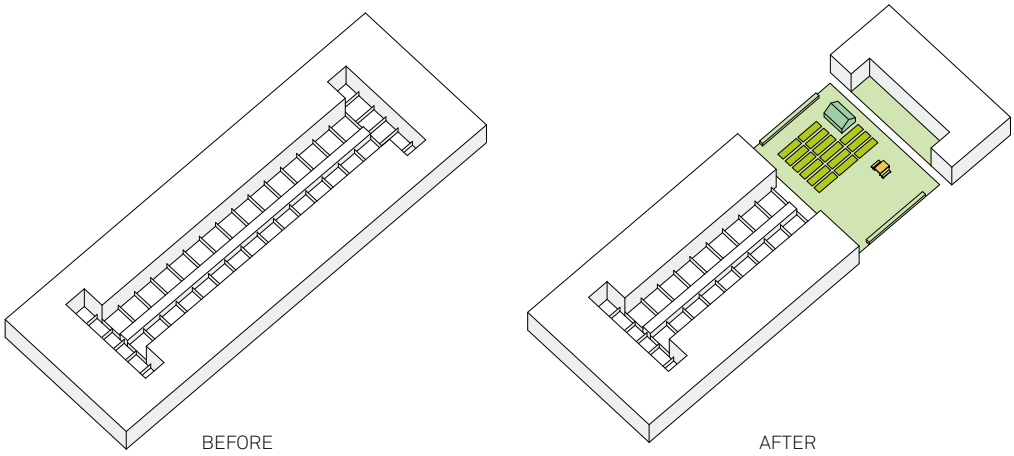
AFTER

PRODUCTION: vegetable, small livestocks
FURNITURE: raised bed, glass house, tool house, planter, cage, fence, clothes rack, play facility, table and bench
ACTIVITY: gardening, gathering, party, playing, hanging clothes
ATTRACTION: Multifunctional space shared by neighbors
More collective activities happen in a limited area


Vegetable
Livestock
Glass room/ composter
Modular arrangement
The growing space can be adaptively arranged according to the preference of users and the size of inner courtyards.
Sunshine area
Food can be planted in the sunshine space to enjoy the better environment.
Shadow area
The area not suitable for growing plants can be used for other activities.
Outdoor dining room
A place where people can cook at home then have food outside together.
Hanging space
Functional space such as hanging clothes is based on residents' daily habit.

1.1. CLOSED BUILDING BLOCK

TOOL 1.1.C
OPEN CLOSED BLOCK



ILLUSTRATION

Closed building block style was the designed before 1950s, which is the reaction after WWII that generated large amount of housing to accommodate the growing population. Hence, some buildings are too old and defective that required to be renovated or redesigned. Besides, this type of housing neglected the aspect of social interaction due to the isolated characteristic.

This strategy adapts to buildings that need to be renovated. It can be considered as an opportunity to create more collective space and bring more sunshine into the blocks. Wider space provides space not only for food growing but also for various activities. By opening part of the blocks (through taking out buildings or create entrance space) can still preserve the sense of territory as well as supporting more encounters with neighbors.

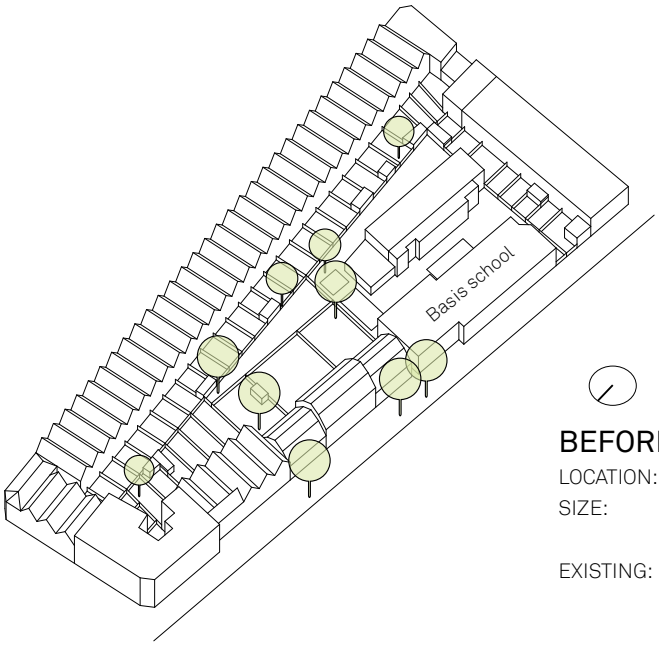
CONSIDERATION

- Building renovation plan
- Size of opening
- location of entrance
- Adjacent land use
- Needs of residents
- Rain and grey water harvesting and recycling

INVOLVEMENT

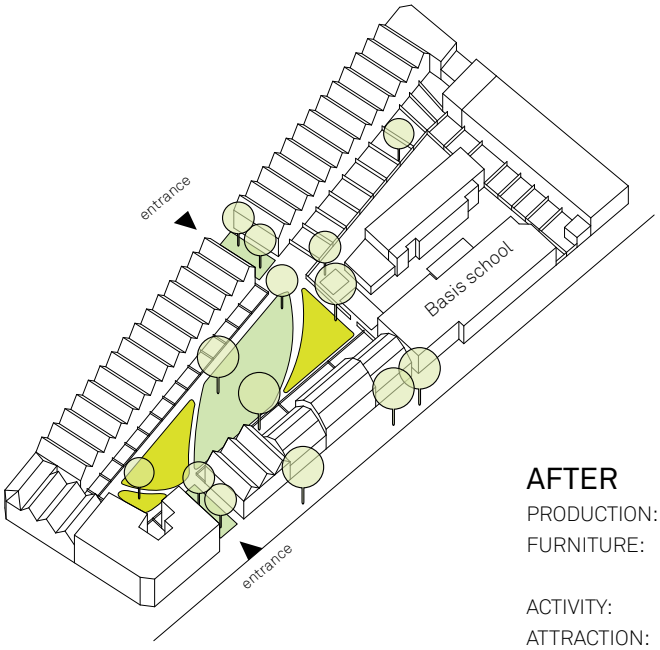
- Housing associations
- Property developers
- Private property owners
- Neighborhood associations
- Residents

EXAMPLE



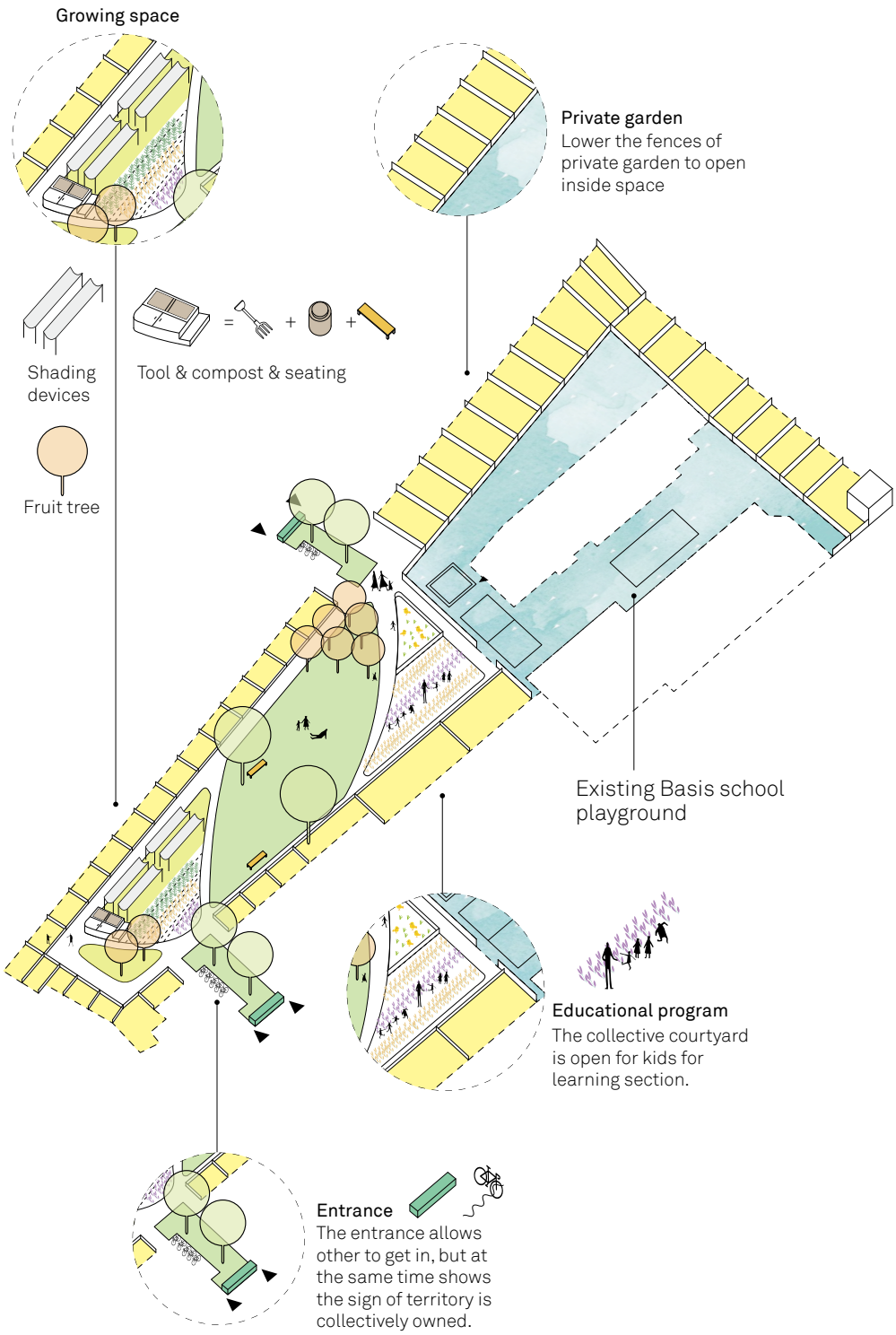
BEFORE

LOCATION: Klaverstraat
SIZE: courtyard width - 16 to 31m
length - 75m
EXISTING: The place is not just residential function but also a basis school inside, surrounded by private gardens. The courtyard is not fully used with triangular residual space wasted.



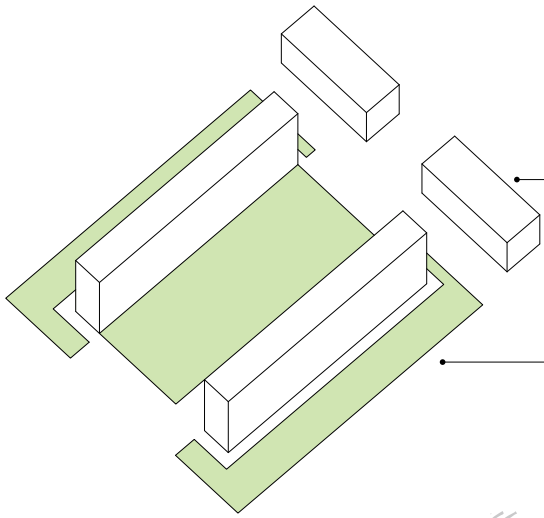
AFTER

PRODUCTION: vegetable, small livestock, fruit tree
FURNITURE: raised bed, glass house, tool house, planter, hutch, fence
ACTIVITY: gardening, gathering, party, playing, hanging clothes
ATTRACTION: Multifunctional space shared by neighbors
Introducing the educational program for kids for taking part in the collective garden


Growing space
Private garden
Lower the fences of private garden to open inside space
Shading devices
Tool & compost & seating
Fruit tree
Existing Basis school playground
Educational program
The collective courtyard is open for kids for learning section.
Entrance
The entrance allows other to get in, but at the same time shows the sign of territory is collectively owned.

1.RESIDENTIAL AREA
1.2. OPEN BUILDING BLOCK

PROTOTYPE



COMPONENTS

buildings
Usually apartments

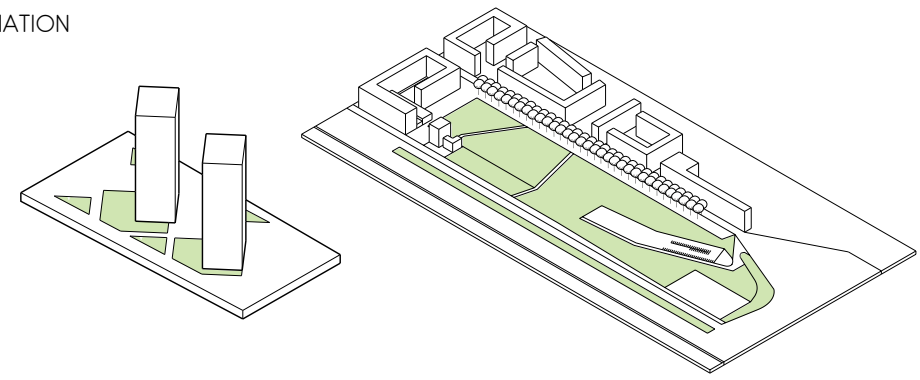
public green space
sense of anonymity
with no function

LOCATION

DESCRIPTION

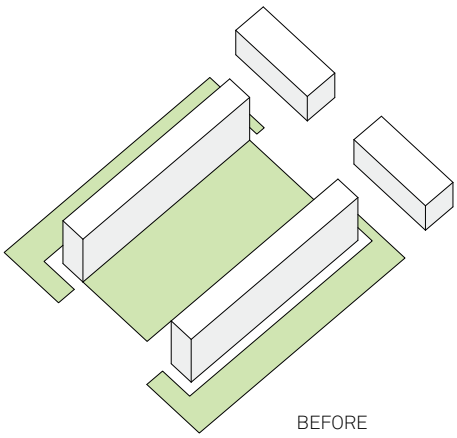
Built during postwar period, districts like Zuidwijk and Pendrecht were independent residential areas occupied with open building blocks. Buildings are usually apartments surrounded with large area of green space. These green spaces are for public use, but most of the space has no function or program. The space becomes too public to form a sense of community; the space becomes anonymity for every resident. Most of the green space is underutilized, left as an empty meadowland that people just walk pass without resting, which is waiting for activation for new activities.

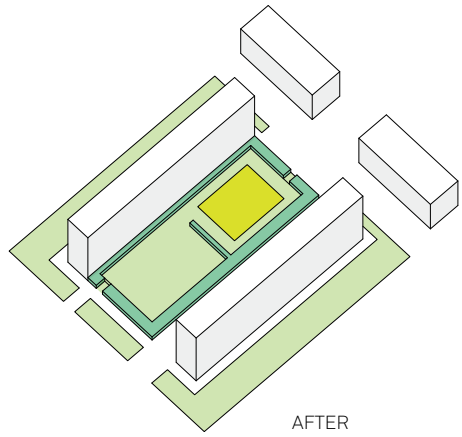
VARIATION



1.2. OPEN BUILDING BLOCK

TOOL 1.2
COMPLEXIFY PUBLIC SPACE





ILLUSTRATION

The land use strategy allows the vacant public space in the open building blocks to be redeveloped for farming and other activities, according to the needs of residents. Complexifying the public space means to develop the public green space into different levels of privacy, such private, semi-public and public. Giving control on the space to show the signs of ownership and territory is helping residents to create their own edible land in a public setting without too much disturbance by passers by or visitors.

Blending the enclosed and open sections with the surrounding is recommended. The complexity of the space can be achieved by using hedges or other ornamental elements to define space; different configuration of space to create a suitable circulation for getting into the garden; or making the entrance not easy for passers by to find (but still maintain visual connection). The space can also accommodate different activities.

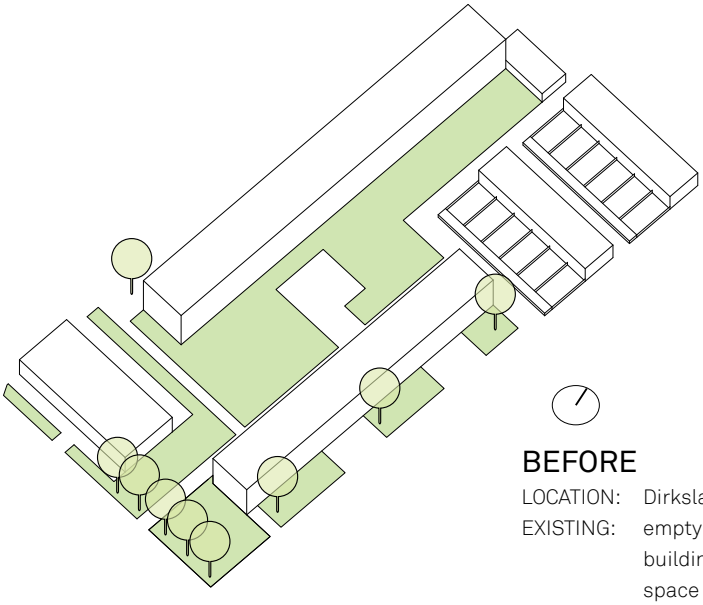
CONSIDERATION

- Height of building
- Orientation of sunlight
- Adjacent land use
- Mixed functions according to the needs of residents
- Location of entrance
- Rain and grey water harvesting and recycling

INVOLVEMENT

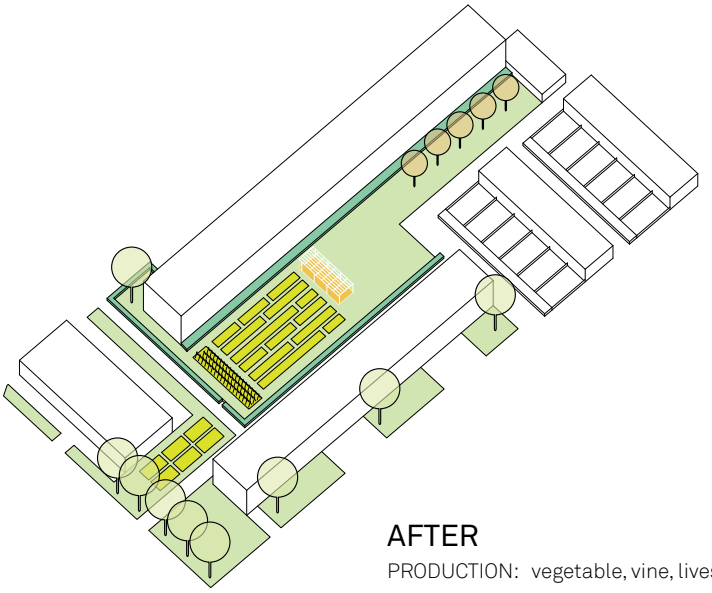
- Neighborhood associations
- Community organizations
- Residents
- Local business

EXAMPLE



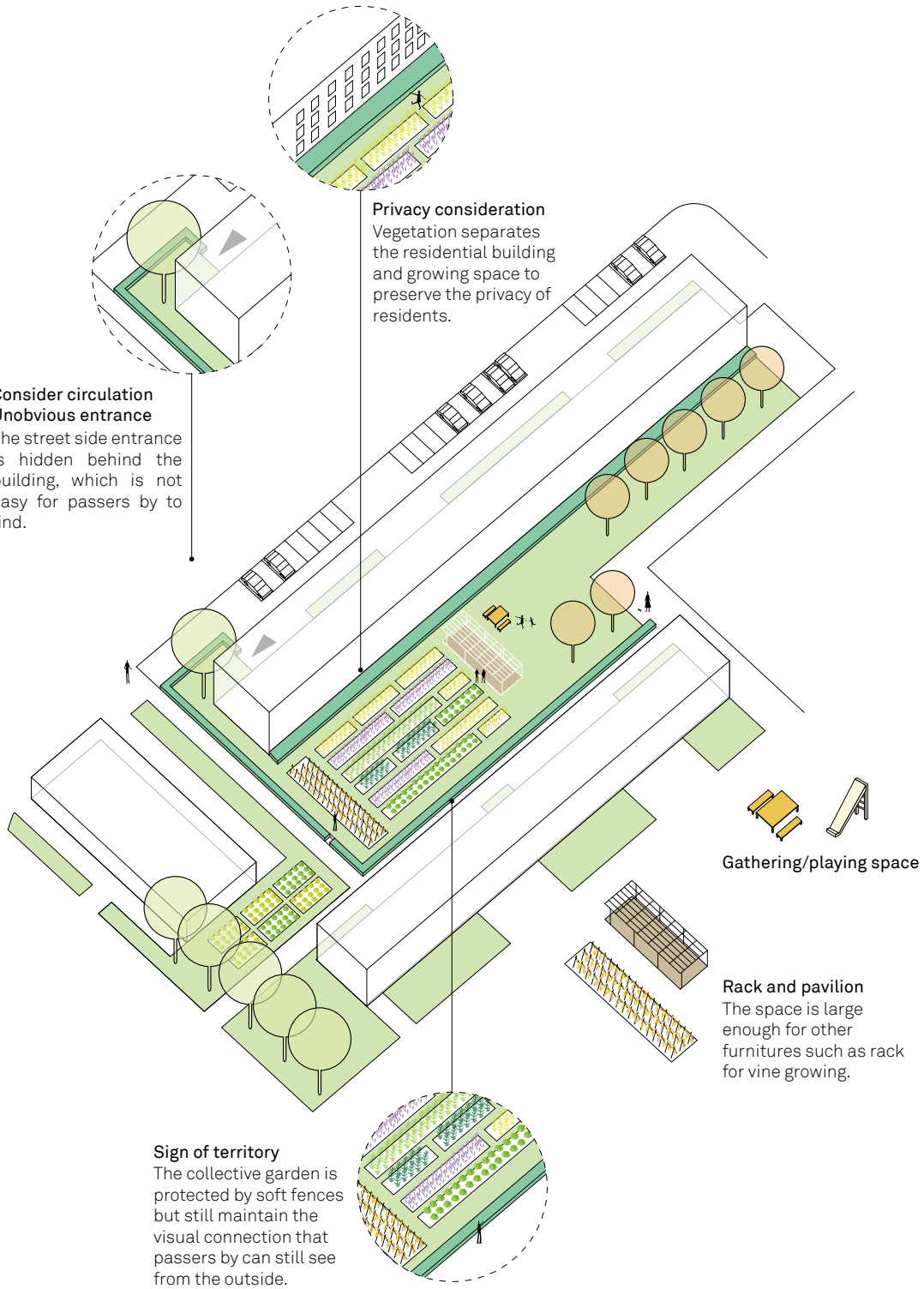
BEFORE

LOCATION: Dirkslandstraat
EXISTING: empty grass space within two apartment buildings - no other functions for residents
space of anonymity;
long width: 44m
short width: 17m
length: 90m



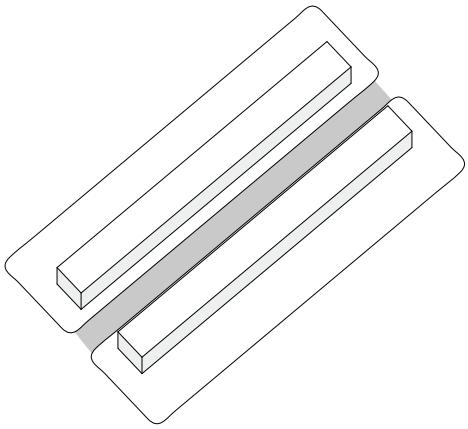
AFTER

PRODUCTION: vegetable, vine, livestock
FURNITURE: rack, plant fence, pavilion, in-ground bed
ACTIVITY: gardening, gathering, party, playing, hanging clothes
ATTRACTION: Territorial space to encourage residents to use space
Multifunctional area shared by neighbors


Privacy consideration
Vegetation separates the residential building and growing space to preserve the privacy of residents.
Consider circulation
Unobvious entrance
The street side entrance is hidden behind the building, which is not easy for passers by to find.
Gathering/playing space
Rack and pavilion
The space is large enough for other furnitures such as rack for vine growing.
Sign of territory
The collective garden is protected by soft fences but still maintain the visual connection that passers by can still see from the outside.

1.RESIDENTIAL AREA
1.3. IN-BETWEEN BUILDING BLOCKS

PROTOTYPE



COMPONENTS

vehicular lane
all along the street
share with bicycle lane

parking space
all along the street

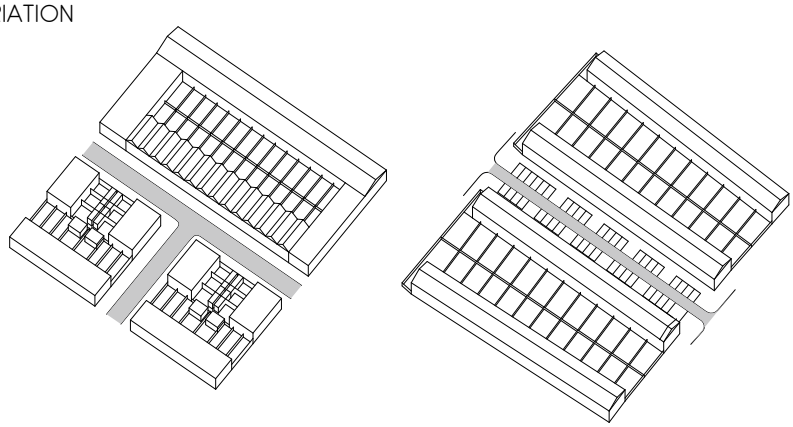
buildings
residential dominant
mono-used

LOCATION

DESCRIPTION

The space in between building blocks usually indicates the street space. This typology focuses on providing ideas for the residential streets with low traffic volume, no front gardens, and lack of amenities. The main functions of these streets are parking and passing by, less attractive from public eyes, fewer people care; in some areas, this kind of space even leads to an untidy or dangerous situation. However, the space has great potential to be programed to farm, play and socialize.

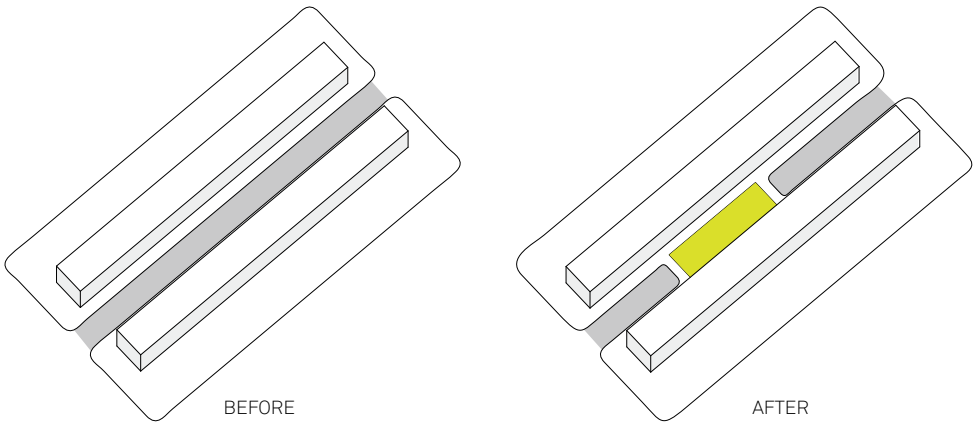
VARIATION



1.3. IN-BETWEEN BUILDING BLOCKS

TOOL 1.3

STREET GARDENING SPACE



ILLUSTRATION

This idea can be considered as creating a designated gardening street that transforms part of the residential street for agricultural usage by calming or diverting the traffic flow (which still maintain the connection for cyclers). The tool encourages the interaction out of the limitations of the building (block). The residents can use this as a gathering and play space in between two adjacent buildings (blocks). The traffic volume is the most important factor that needs to be considered: this tool can only be used in the non-arterial street of low traffic volume. For some specific area, in order to balance the land use for parking and other functions, changing the parking direction of cars is also another solution to release more space on the street.

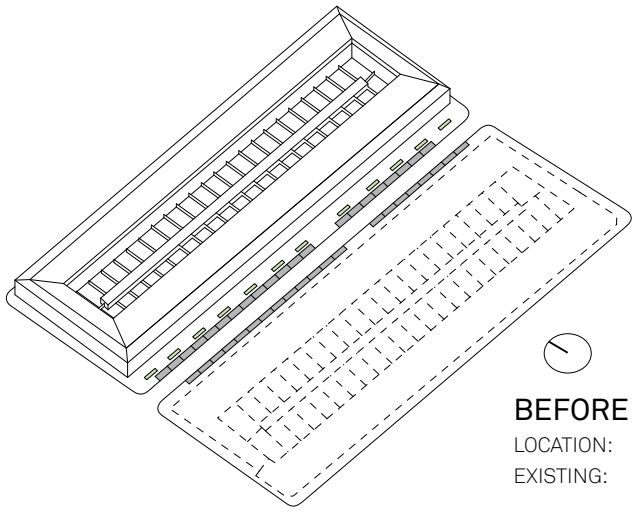
CONSIDERATION

- Height of building
- Volume and speed of traffic
- Street width and length
- Bicycle traffic
- Impacts on residents
- Maintainance plan
- Application for land use
- Impact on traffic

INVOLVEMENT

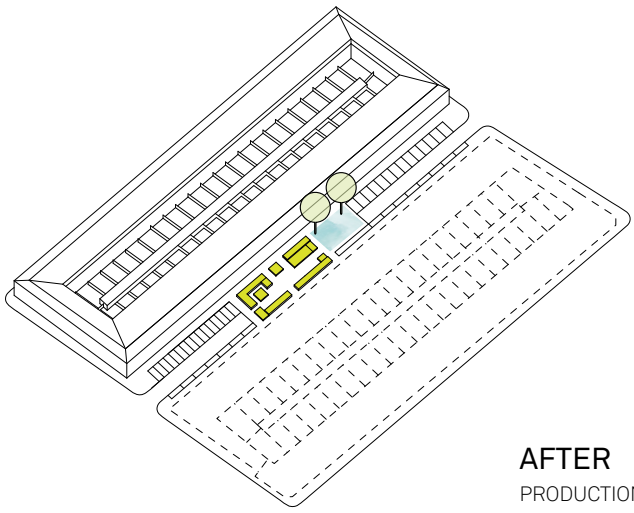
- Traffic department
- Neighborhood associations
- Community organizations
- Residents

EXAMPLE



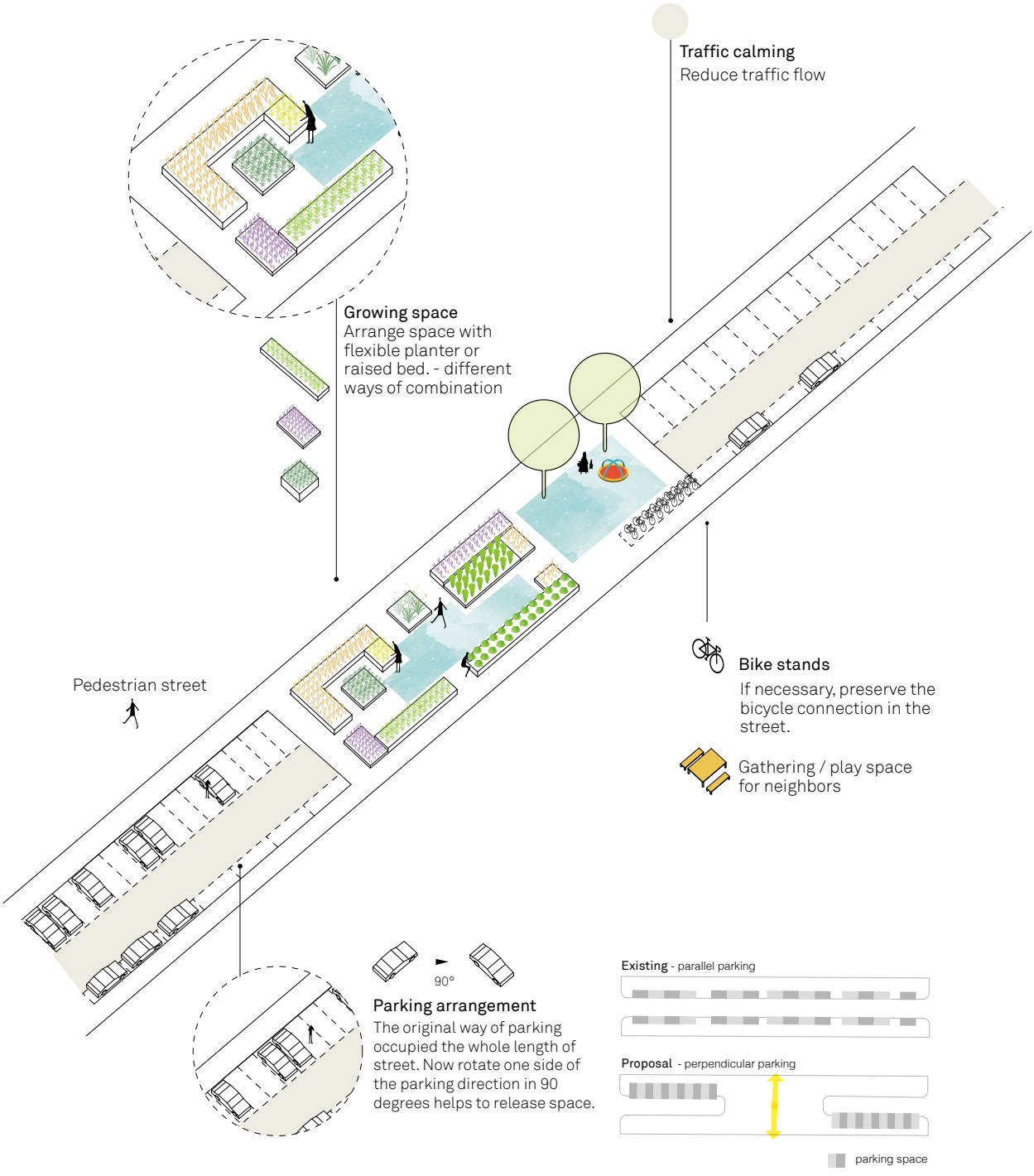
BEFORE

LOCATION: Kruizemunstraat
EXISTING: parking space on both sides
usually not fully used
street width: 15m
length: 140m
parking space



AFTER

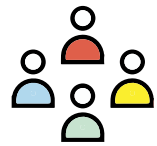
PRODUCTION: vegetable
FURNITURE: raised bed, planter, seating, bike stands
ACTIVITY: gardening, gathering
ATTRACTION: small scale street park
safe zone for residents
adaptively arrange the elements
for multiple uses


Traffic calming
Reduce traffic flow
Growing space
Arrange space with flexible planter or raised bed. - different ways of combination
Pedestrian street
Bike stands
If necessary, preserve the bicycle connection in the street.
Gathering / play space for neighbors
90°
Parking arrangement
The original way of parking occupied the whole length of street. Now rotate one side of the parking direction in 90 degrees helps to release space.
Existing - parallel parking
Proposal - perpendicular parking
parking space

SUGGESTIONS FOR RESIDENTS

The tools for residential area relate to the bottom-up initiatives, encouraging residents to concern for their living environment and create space for gardens. There are several suggestions to keep the garden up and running:

1. Gathering interested people

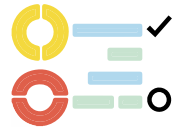


Teamwork can make the garden work more creative and full of fun! Gathering neighbors or volunteers who are interested encourage brainstorm and collaboration process. In addition, participation of more people is a way of activating the neighborhood, improving the social interaction between people.

2. Identify suitable places in public also private domains

Considering as the process of activating green, residents can identify places for gardens with the consideration of sunlight, water, traffic and safety issue. Also, the municipality will also provide suitable locations for the proposed garden from space on the healthy green network. The process also encourages private property owners to share their land into collective use for a more effective way of using land.

3. Creative layout and long-term maintenance plan



The garden can be designed into different styles and shapes according to the size and context. In addition, the entrance, circulation and activities are appropriately arranged in the site according to the needs of residents. Besides a creative layout, a long-term maintenance plan also needs to be discussed, setting up certain rules and schedules for team members to keep the garden clean and healthy.

4. Setting space for compost and organic waste collection

Closing the food cycle is an ecological and economical way to maintain the garden. Depending on the size of the garden, if the area is large enough, set space for compost bin as well as waste spot, so that the organic waste can be reused directly. If the size is not allowed, try to contact the nearby relevant locations to manage the organic waste.

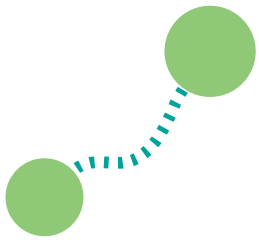
5. Utilize environment-friendly materials

No matter planters, beds, water bins, or decoration, be creatively to utilize recycled materials. Cultivating the garden in an sustainable way and with organic material (such as organic pesticides and compost) is required and essential. The result would not only support the sustainable environment, but also attract beneficial habitats for pollinators.

6. Encourage creating open atmosphere

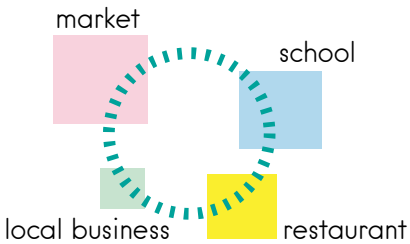
Though it is necessary to protect the garden in good condition, strong sense of enclosure is not recommended. Using plants or ornamental elements as fences give a sign of territory, at the same time remaining the visual connection and public accessibility. An open atmosphere of a garden can improve the quality of the environment, and invite more residents and visitors to participate.

TIPS FOR ESTABLISHING HEALTHY GREEN NETWORK



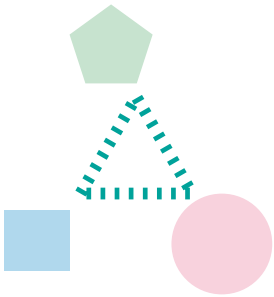
CONNECTION BETWEEN PATCHES

When identify the suitable locations for gardens, find out the nearby patches such as pocket parks, community gardens, or other public green space, to establish stepping-stones of connection. It would be nice if the new green space were part of the network that helps to support the whole ecosystem in the city.



INTERACTION WITH SURROUNDING

Consider the context of the surrounding to find opportunities for collaboration with different potential actors, such as schools, local businesses, restaurants, and so on; hold activities, workshop, cultural events or learning visits to activate the garden; encourage nearby residents, students, and visitors to participate; share food, plants, seeds with people.

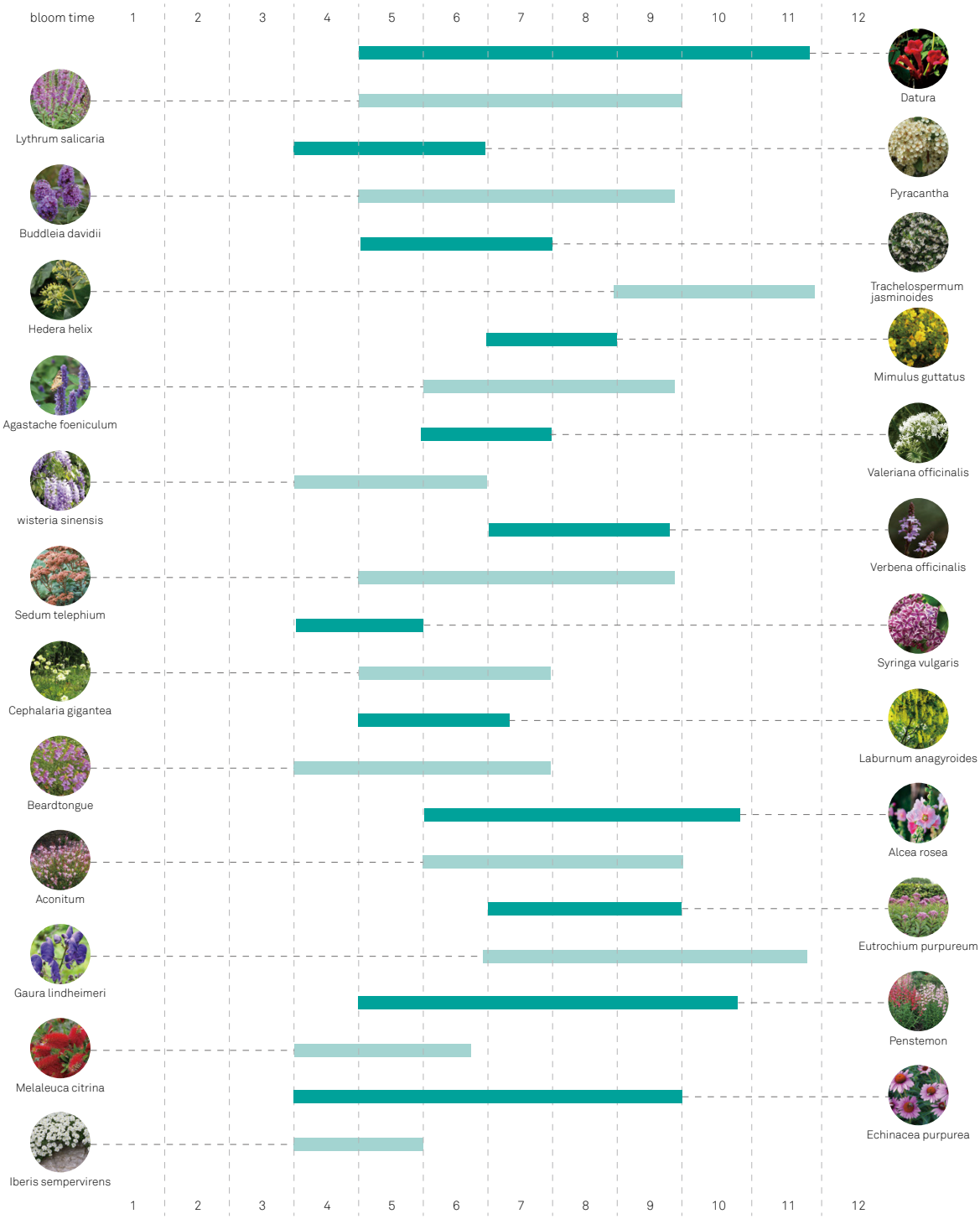


DIVERSIFICATION OF PRODUCTS & PROGRAMS

If neighbors or groups also have gardens nearby, try to cooperate and support with others as 'strategic partners': organize meeting and workshop together to share skills and experience; arrange with different programs and products in each garden. Different programs combination can enrich the whole neighborhood with various and comprehensive activities; different products encourage food sharing and bartering.

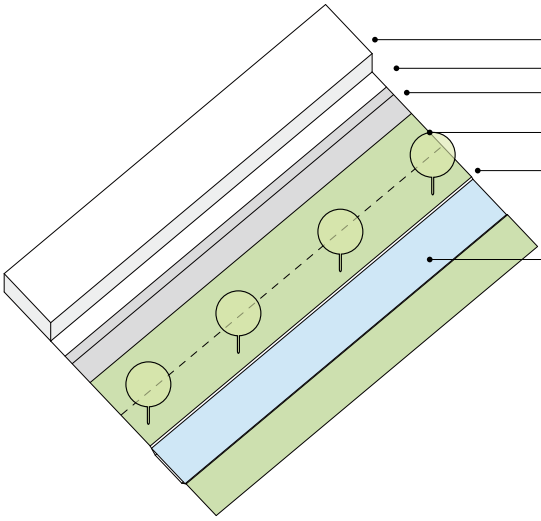
CHOICES FOR TARGETING PLANTING

The followings are some choices for attracting pollinators such as bees and butterflies that residents can easily find and grow in the Netherlands.



2. RESIUAL AREA
2.1. CANAL SPACE

PROTOTYPE



COMPONENTS

- **Buildings**
- **Pedestrian space**
- **Vehicular space**
  road and parking space
- **flat area with greenery**
  Vacant or tram lane space
- **sloped area**
  guide groundwater runoff
- **water surface**

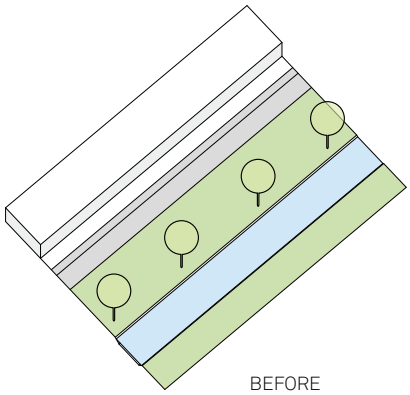
LOCATION

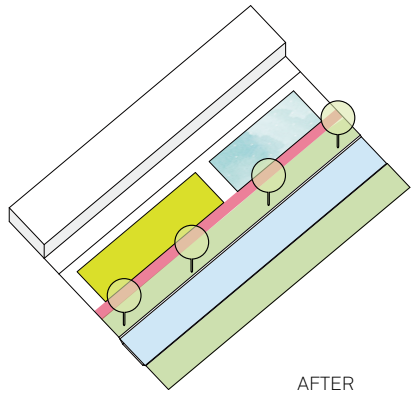
DESCRIPTION

The canal as part of the water discharge system is important to maintain the water level in the city. The canal mostly functions for water issue and traffic connection on both sides. However, its spatial quality is somehow neglected. The canals of Rotterdam Zuid are usually car-dominated area that is isolated by vehicular roads on both sides. For the existing situation, canal space is difficult for citizens to access, not to mention to stop for other activities. The tool aims to focus on the canal space that is not along by tram lane, so as to preserve the public transport system. In the future, canal space is created not only for traffic movement, but also for a new attractive environment, activity corridors, helping to structure the city as well as providing different activities and beneficial habitats for people and plants.

2.1. CANAL SPACE

TOOL 2.1
EDIBLE CANAL WITH MIXED PROGRAM





ILLUSTRATION

The idea is to limit/reduce the traffic flow on one side (or both sides) to let canal be public open space reconnecting to the surrounding. The released space will support agricultural activities and other activities, engaging with interest stakeholders.

The storm water management and irrigation water will be designed combined with canal water. The stormwater collected from roofs and permeable street surface is conducted through a network of infiltration trench system. The underground cistern would storage water for irrigation. Extra water will be discharged to canals. The street along the canal that located in the residential area can be developed as a usufruct streets, which means people can grow and sell their food products in this area by means of temporary food stands or markets.

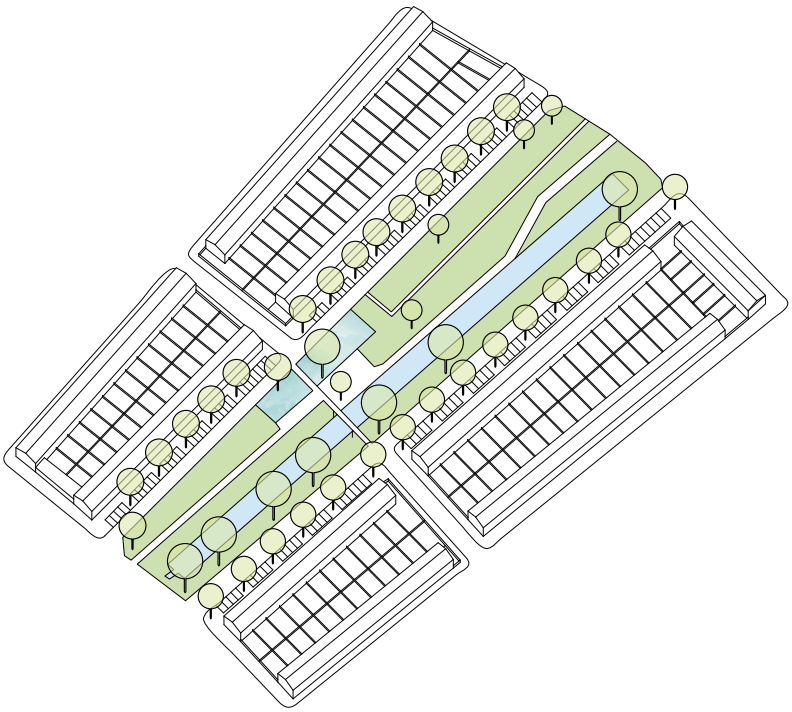
CONSIDERATION

- Land tenure
- Usufruct rights
- Volume of traffic
- Rainwater collection
- Mixed programs
- Rain and grey water harvesting and recycling

INVOLVEMENT

- Traffic department
- Community groups
- Neighborhood associations
- Local esidents
- Adjacent property owners
- Local business

EXAMPLE

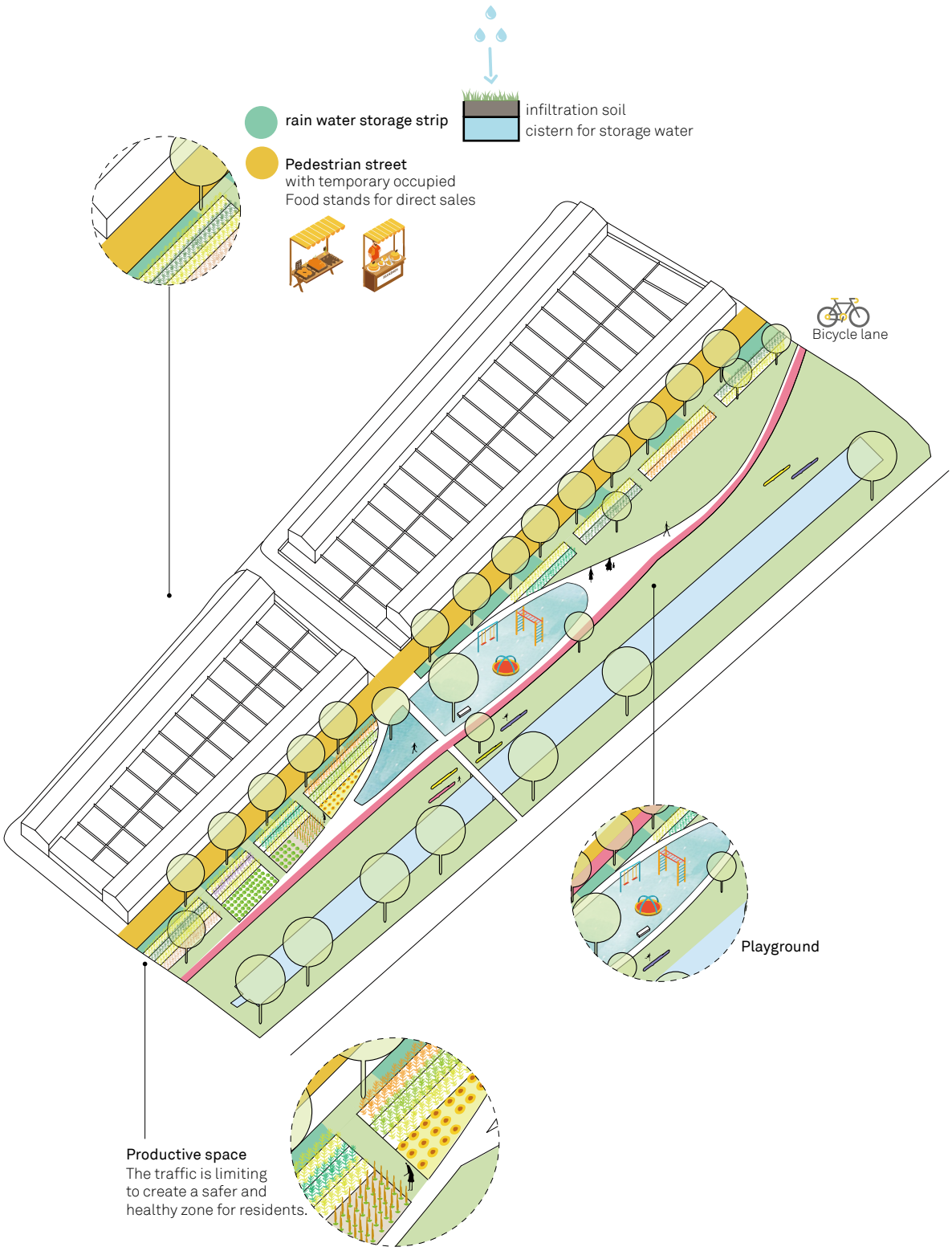


BEFORE

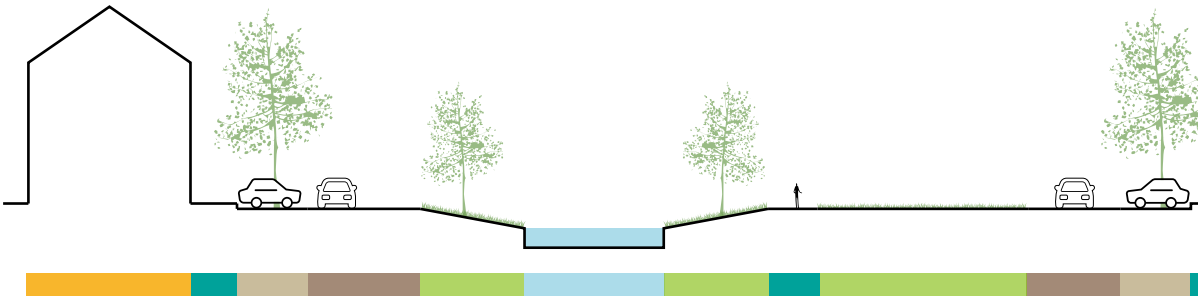
LOCATION: Lepelaarsingel
EXISTING: the street is occupied by vehicular roads and car parking space; a playground is in the middle area in the existing situaltion
the width between the canal and building varies from 34 to 46 meters

AFTER

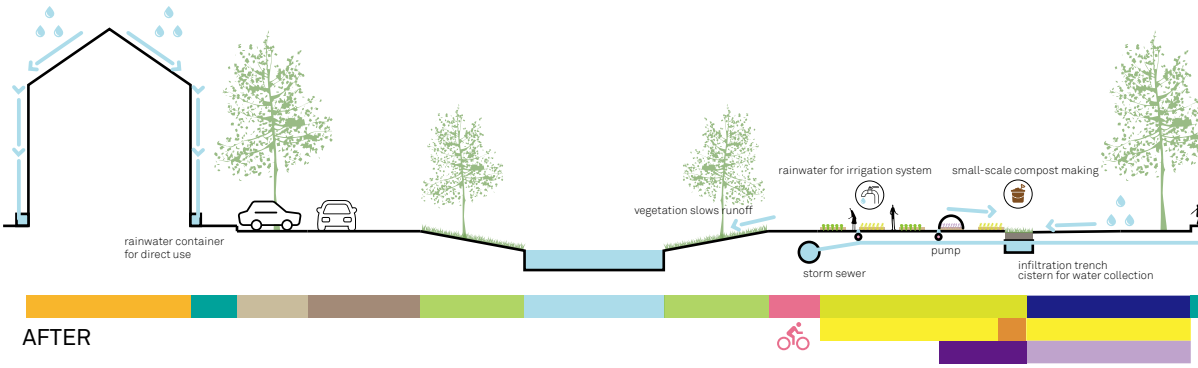
PRODUCTION: vegetable, herb, ornamental plants, flower
FURNITURE: moveable food stands, in-ground raised beds, seating, play facilities
ACTIVITY: gardening, selling, gathering, playing, event space
ATTRACTION: a public realm for agricultural use and also combined with social and play space, a direct food sale street combined with commercial facilities


rain water storage strip
infiltration soil
cistern for storage water
Pedestrian street
with temporary occupied
Food stands for direct sales
Bicycle lane
Playground
Productive space
The traffic is limiting
to create a safer and
healthy zone for residents.

PROPOSED SECTIONS & PERSPECTIVES



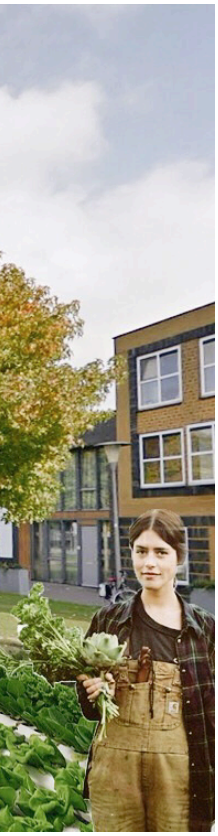
BEFORE



AFTER

LEGEND

- green space
- automobile road
- water
- pedestrian street
- parking
- residential building
- flowery vegetation
- agricultural space
- gathering space
- compost making
- playground
- outdoor kitchen
- temporal food stands
- bike path

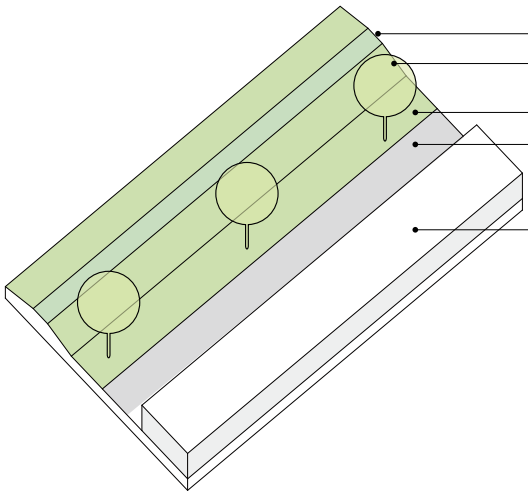


The space along the canal is isolated by vehicular roads. Limiting the traffic or reducing the parking space on one side can create a safer and healthy space for growing food as well as other activities. The rainwater is collected by the infiltration trench or bio-swale and the adjacent rooftop water. The underground cistern would storage the water for irrigation. And because the activity space is getting larger, it can have different programs and space for bicycle path.

BEFORE ↓
AFTER ←

2. RESIUAL AREA
2.2. DIKE SPACE

PROTOTYPE



COMPONENTS

top of the dike
sloped area
height difference
parking or greenery
one-way road
pedestrian side street
buildings

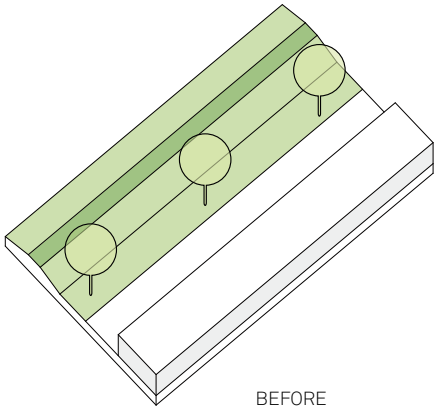
LOCATION

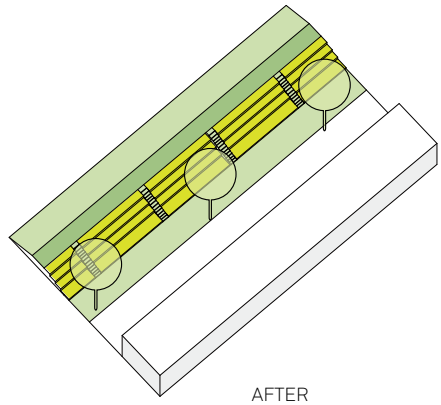
DESCRIPTION

There are two types of dikes discussed in this part: the river dike – located at the edge of the city still functions nowadays; the old former ring dike– as historic elements as preserved structure in Rotterdam Zuid. In the existing situation, the dike as an essential landscape element crosses the city mainly supports the transport infrastructure for automobile. The condition of dike is underused because it is isolated by vehicular lanes on both sides, which is difficult to access by citizens. The primary concern on this area has been to design for traffic movement, resulting in poor environment for pedestrians and cyclers for the existing situation. However, the dike as a linear structure has great potential to link different patches in the city, which can serve as a direct connector not only for slow mobility but also for recreational options.

2.2. DIKE SPACE

TOOL 2.2
SLOPED VEGETABLE GARDEN





ILLUSTRATION

The sloped topography is the main character of the dike structure. A sloped vegetable garden can create a vertical effect. Since the topography is not steep, it is suitable to develop as a small-scale terrace for a special landscape along the street. The strategy suggests using raised bed to enhance or thicken the soil on the dike with stone/wood wall to maintain the water of soil. As a long linear structure in the city, the dike is not only used for gardening, but also a new space for playing, socializing and gathering. The dike space can even be flexibly arranged for events and festivals.

It is important to point out that the width of dike space and the condition of the surrounding traffic needs to be considered. For instance, some portion of dike is in the middle of two automobile roads, creating access to enter or limiting the traffic flow is necessary for safety.

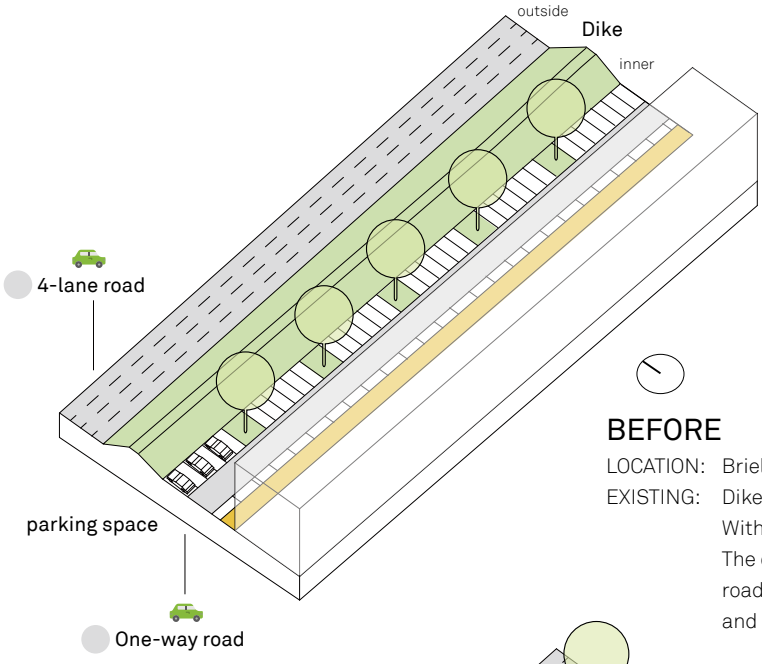
CONSIDERATION

- Width of street
- Volume of traffic
- Accessibility
- Soil preparation
- Adjacent land use
- Rain and grey water harvesting and recycling

INVOLVEMENT

- Department of Infrastructure
- Traffic department
- Community groups
- Neighborhood associations
- Residents

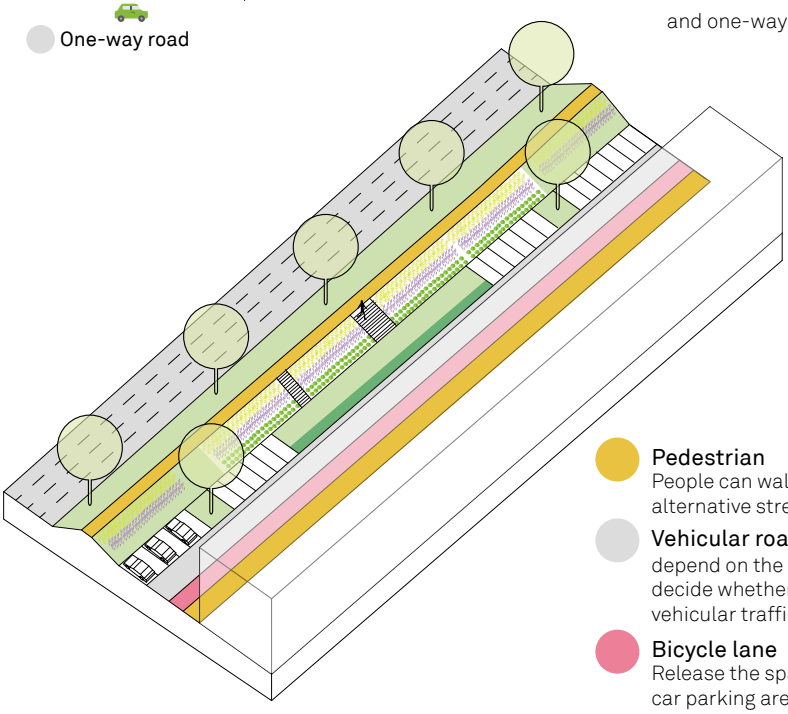
EXAMPLE - 1



BEFORE

LOCATION: Brielselaan

EXISTING: Dike is 15m wide and 2 meters higher
With automobile road on both sides
The outside dike is high volume traffic road, with inner dike area parking space and one-way road



Pedestrian
People can walk on the dike as an alternative street

Vehicular road
depend on the existing situation to decide whether to maintain the vehicular traffic of inner dike area

Bicycle lane
Release the space by reducing the car parking area and narrowing the vehicular space.

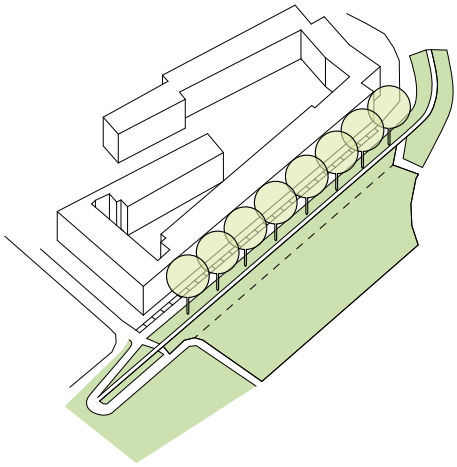
AFTER

PRODUCTION: flower and ornamental plants

FURNITURE: raised bed, stairs, trench for storaging water

ATTRACTION: a continuous landscape on the street
can mix with multiple programs

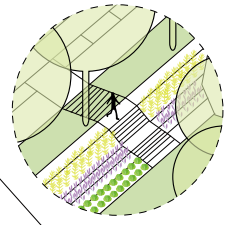
EXAMPLE - 2



BEFORE

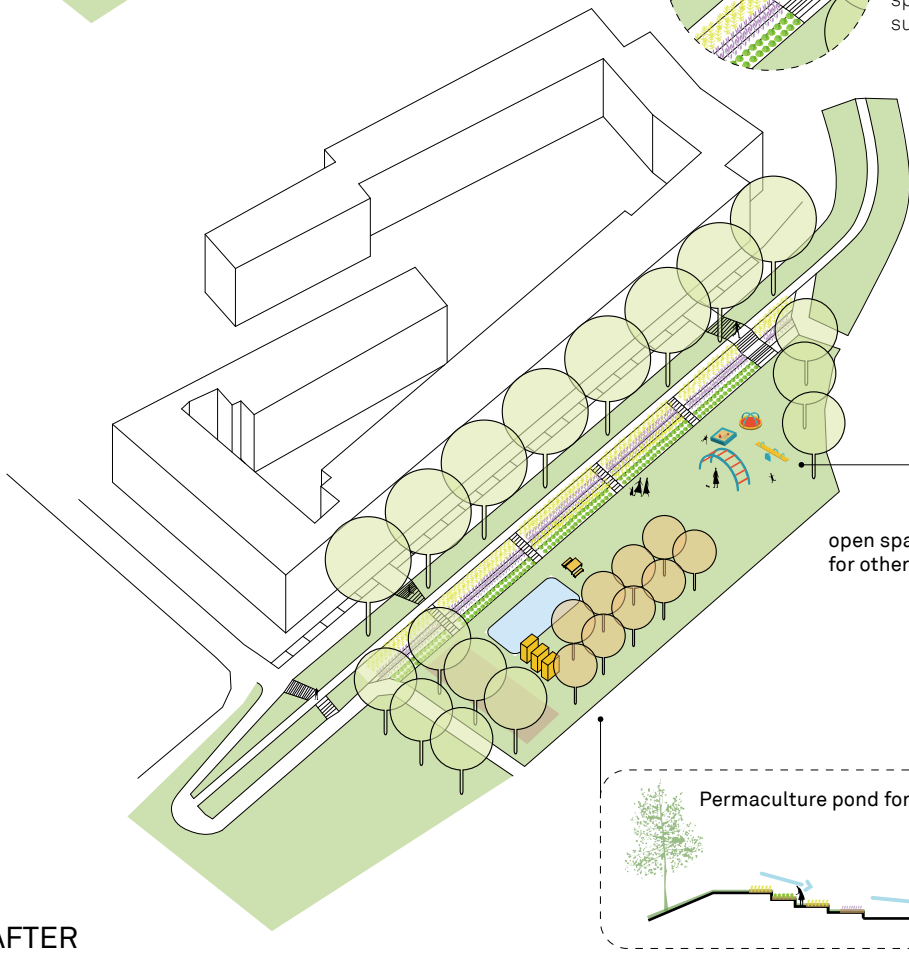
LOCATION: Hilledijk

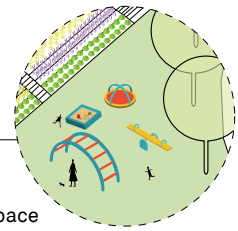
EXISTING: Dike is 15m wide and 2 meters higher than the street with large area of empty space on the eastern part.



Orientation of Sloped vegetable garden

It is important to decide which side for garden space according to the surrounding.





open space for other activities

AFTER

PRODUCTION: vegetable, fruit trees, ornamental plants, flowers

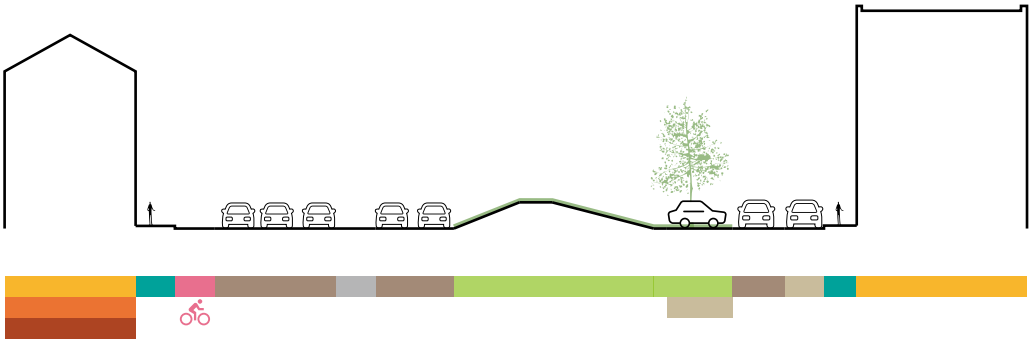
FURNITURE: raised bed, planter, seating, play facilities

ACTIVITY: gardening, gathering, playing

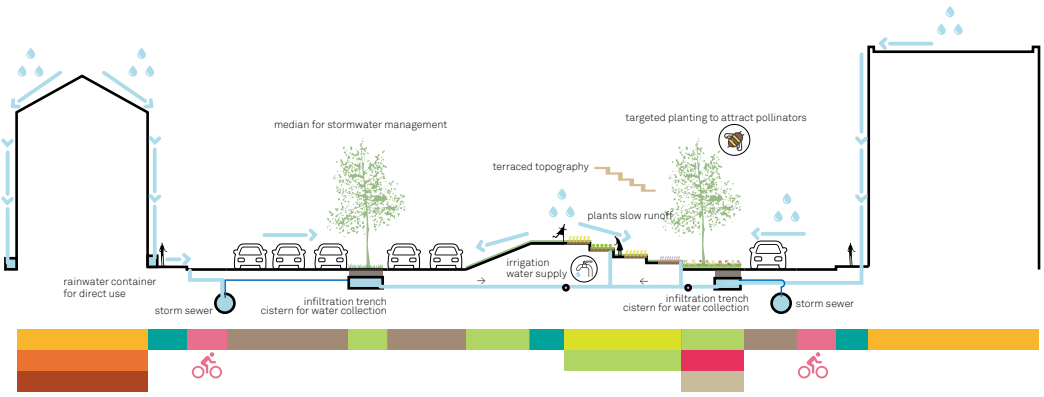
ATTRACTION: create an open and simple meeting place

blend with the surrounding landscape for more activities

PROPOSED SECTIONS & PERSPECTIVES



BEFORE



AFTER

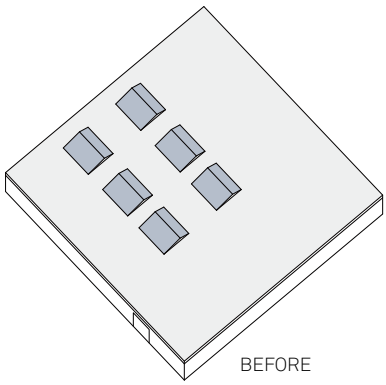
LEGEND

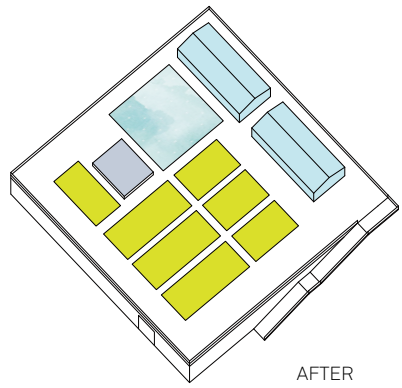
green space	automobile road	residential building	water
agricultural space	parking	office building	flowery vegetation
pedestrian street	bike path	factory	

BEFORE →
AFTER ↓

2.3. UNDEVELOPED ROOFTOP

TOOL 2.3
ENHANCE AND RECYCLE ROOFTOP STRUCTURE





ILLUSTRATION

The flat rooftops can be seen as an urban platform in the city. The strategy recommends utilizing the undeveloped rooftop in Rotterdam Zuid, transforming the empty rooftop into the public/community resource for urban farming. The advantage is not only about using waste space to grow food, but also helps to reduce the heating of buildings. It is better to choose the rooftop without people living on the top floor.

To recycle the undeveloped rooftop needs combine with building renovation to secure the rooftop structure. In addition, in Rotterdam Zuid there are some industrial buildings (usually only one floor) with large area of undeveloped flat rooftop. To develop this kind of buildings needs to consider the ventilation, natural light and the vertical transportation of the ground floor.

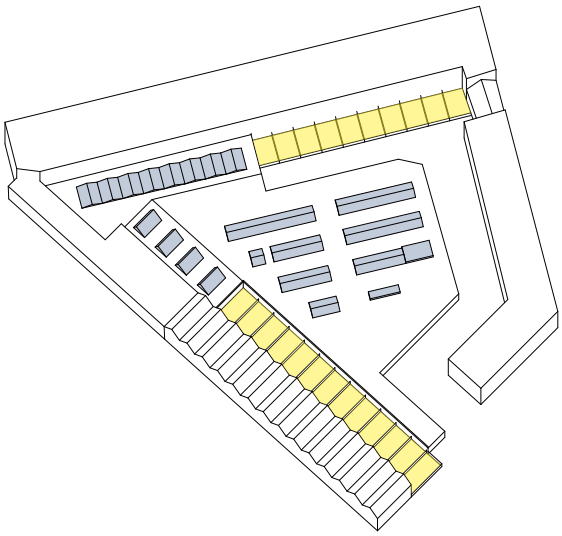
CONSIDERATION

- Enhancement of rooftop structure
- rooftop load-bearing
- Vertical traffic
- Groundfloor Ventilation
- Lightweight roof soil
- Rainwater collection
- Application for development

INVOLVEMENT

- Adjacent property owner
- Community groups
- Neighborhood associations
- Nearby residents

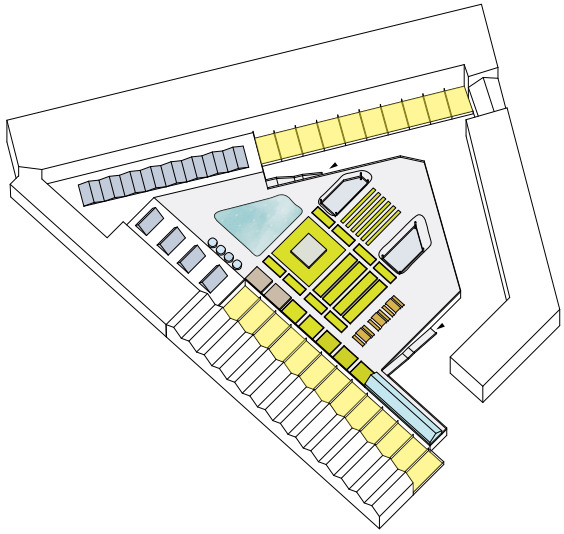
EXAMPLE



BEFORE

LOCATION: Pleinweg

EXISTING: The groundfloor space is used for a supermarket, surrounded by residential buildings. The shape of the rooftop is irregular, with the shortest width 6.5 meters and the longest 52 meters.



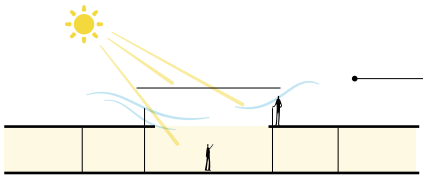
AFTER

PRODUCTION: vegetable, herb, flower

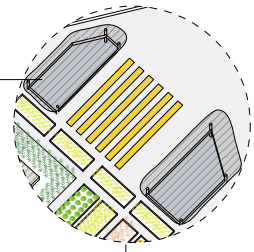
FURNITURE: rainwater container, lightweight roof soil, water container recycled material as planters, seating, compost bin

ACTIVITY: gardening, gathering, playing, events

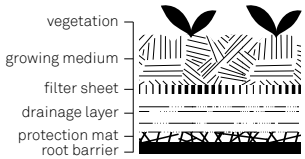
ATTRACTION: redevelop an vacant rooftop inside a residential space for neighbors



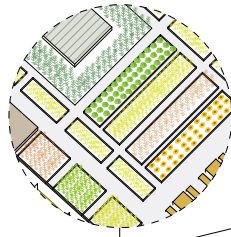
Space for ventilation



Performance space
For rooftop movie or residential events

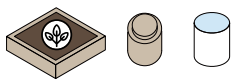


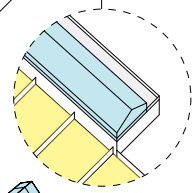
Multiple growing methods
Besides using lightweight soil, there are also other techiniques recommended: aquaponics, hydroponics, aquaculture,aeroponics

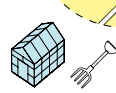


Vertical connection
Stairs to rooftop

Compost making & rain water collection







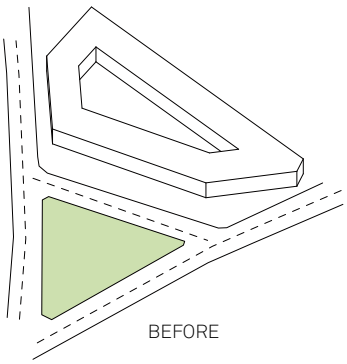
Glass house & indoor elevator

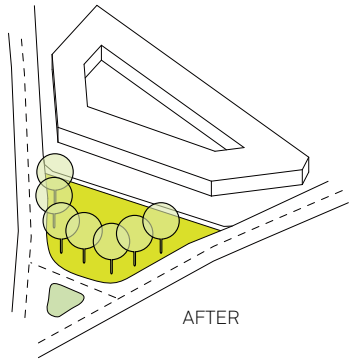
Existing private garden

2.4. TRIANGULAR SPACE OF JUNCTIONS

TOOL 2.4

RE-ARRANGE CIRCULATION





ILLUSTRATION

This type of space means the triangular space surrounded by vehicular roads in the city. The oversized radius of slip lanes for cars produce leftover vacant 'island' in the city. Though this type of residual space is usually neglected, it has potential to be reused and activated as the city becomes denser in the future. The idea proposes to reduce the radius of the slip lane or close a portion of street (suitable for low volume of traffic) to release the more space for activities and green habitat.

The strategy creates safer condition at the intersection for pedestrians, and space of food-related programs and other programs. Activities can be arranged according to the surrounding. The amenities or installation could be temporal (event or market space) or permanent (urban farm, playground, seating).

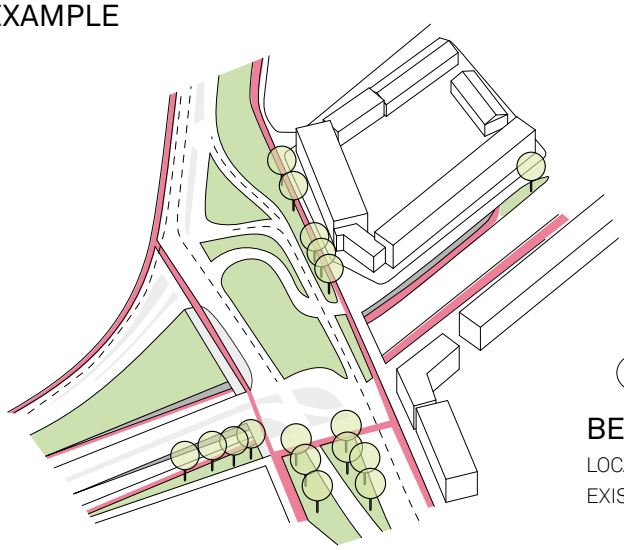
CONSIDERATION

- Volume and speed of traffic
- Corner radius for large vehicles
- Pedestrian accessibility
- Adjacent activities
- Application for land use

INVOLVEMENT

- Traffic department
- Community groups
- Neighborhood associations
- Adjacent property owners

EXAMPLE



BEFORE

LOCATION: Pleinweg

EXISTING: The area is 65m wide with several vehicular roads in different radius separated the space into pieces

Reduce radius to release space

Through arranging and optimizing the circulation of vehicular flows can create a new public space.

AFTER

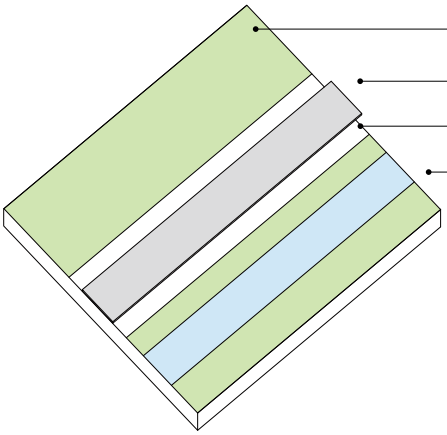
PRODUCTION: vegetable, ornamental plants, fruit trees

FURNITURE: planter, seating, play facilities

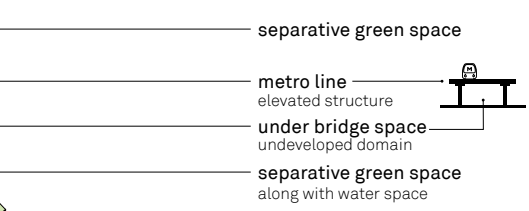
ACTIVITY: gardening, gathering

3. SEPARATIVE SPACE
3.1. SPACE ALONG METRO LINE

PROTOTYPE



COMPONENTS



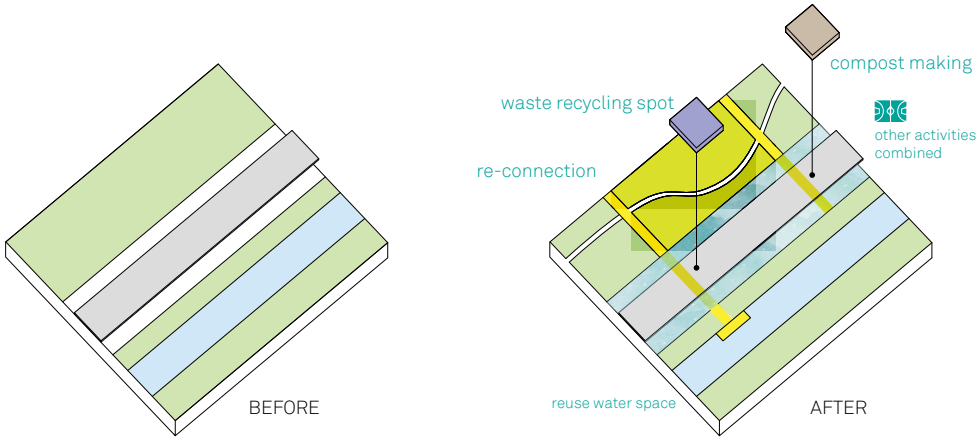
LOCATION

DESCRIPTION

The metro line is an elevated structure across Rotterdam Zuid from north to south. In the city core area (district Feijenoord, Afrikaanbuurt), the metro line blends into the city context lined with other road infrastructure and buildings. In the districts Pendrecht and Zuidwijk, the metro line is separated by highly enclosed green space on both sides, disconnected from the city space and diminished the public space. Tool 3.1 concentrates this type of green space, activating and restoring the relationship between it and the city. The area contains greenery as well as water space, which provide good foundation for agricultural activity. The under bridge space needs to be enlivened by introducing different programs on the undeveloped domain for the residents, by soliciting the public opinions. The elevated metro line offers a new public realm to accommodate various activities based on residents' needs.

3.1. SPACE ALONG METRO LINE

TOOL 3.1
OPEN & RE-CONNECT TO SURROUNDING



ILLUSTRATION

This tool focuses on nearby green space along the metro line. The existing metro line is strongly enclosed by greenery in residential area, isolating from the public eyes with low accessibility. The tool is to open the space and restore its relationship with the city, by slow network connection and adding activities on it, no mater along green space or the strip covered by the elevated structure. Part of the green space along the metro line will be proposed gardens for the interest stakeholders and nearby citizens, while the space under the structure will be utilized for compost making and waster recycling spots. The energy will be harvested through solar photovoltaic system and vibration from the passing metro. The nearby water space will function as ground water drainage system as well as irrigation through filtration. The redeveloped public space will be returned for the community and the citizens through a highly participatory process that everyone can provide their ideas of various programs.

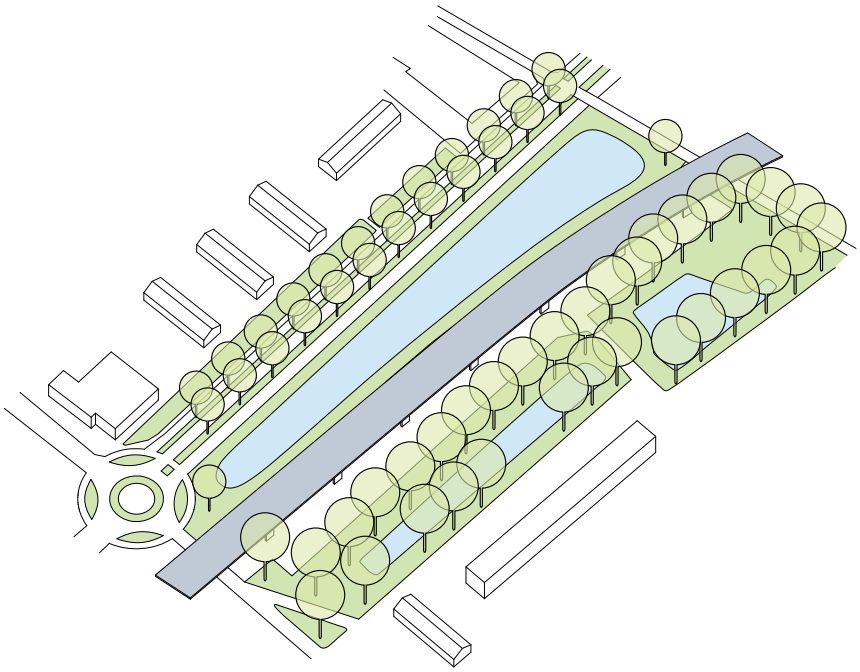
CONSIDERATION

- Openness and Accessibility
- vehicular connection for transit waste and food
- Height of under bridge space
- quality of canal water (cleaning and filtration)
- Alternative energy harvesting

INVOLVEMENT

- Department of Infrastructure
- Community groups
- Neighborhood associations
- non-profit organizations
- Local business
- Citizens and local residents

EXAMPLE



BEFORE

LOCATION: Ooltgensplaatweg

EXISTING: The metro line is 7-meter-tall elevated, surrounded by green space and two canals along both sides; the width of the space varies from 30 to 70 metres; dense trees strongly hide the space, result in a vacant land

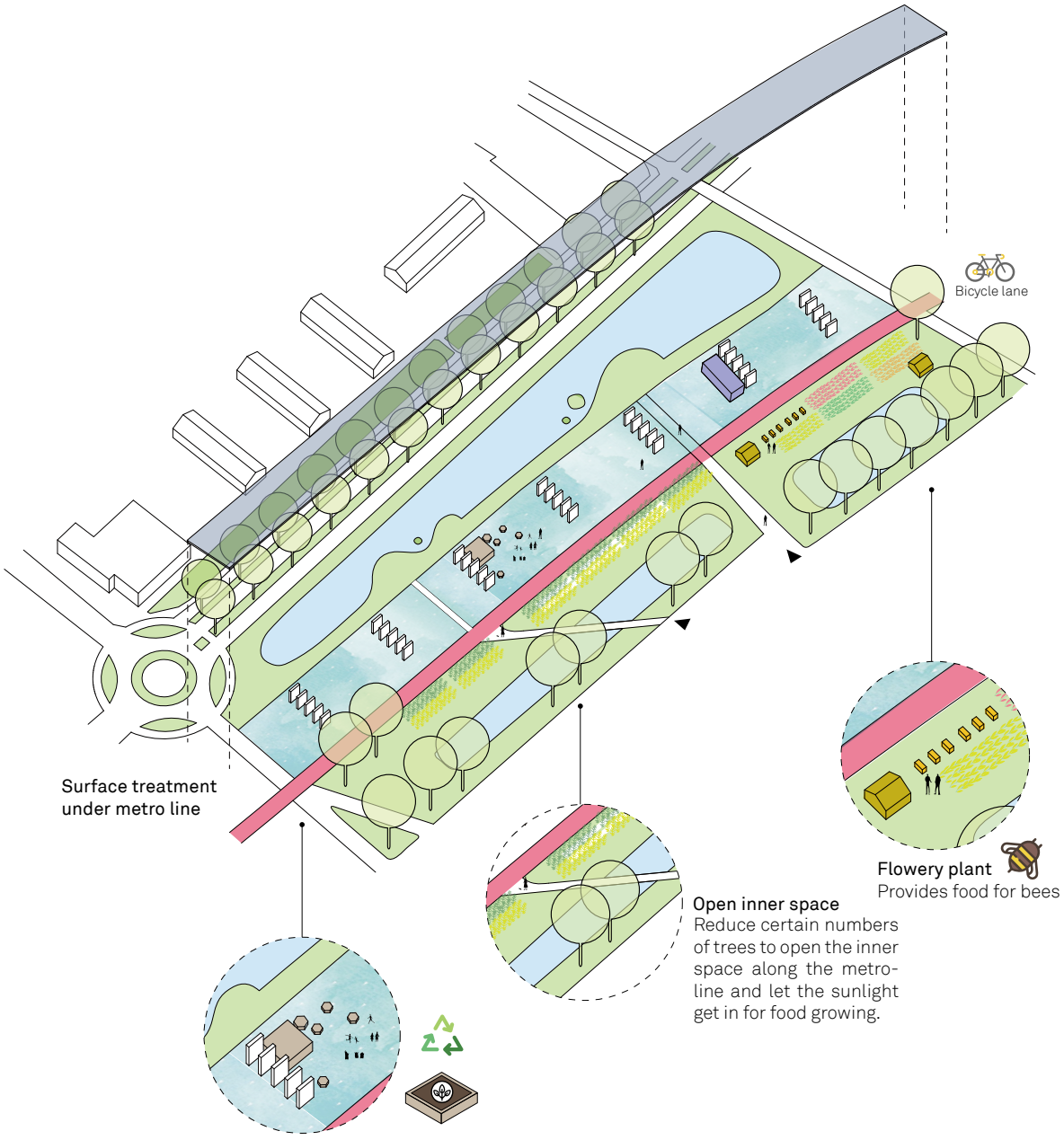
AFTER

PRODUCTION: herb, vegetable, flower, ornamental plant

FURNITURE: raised bed, planters,shipping container as small-scale architecture, compost making facilities, seating and tables,

ACTIVITY: community farm, event space, sports, playground

ATTRACTION: provide a new urban open public space for adjacent residents; restore the connection between both sides of the metro line space and the urban space; enrich the space with different programs and a bicycle lane penetrates into the site

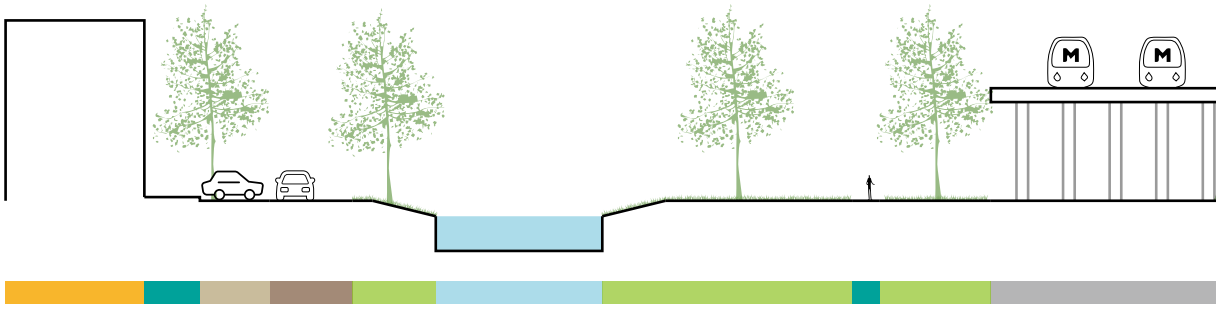


Flowery plant
Provides food for bees

Open inner space
Reduce certain numbers of trees to open the inner space along the metro-line and let the sunlight get in for food growing.

Enliven the space covered by metro line
The space under the metro line provides the area for organic waste recycling center, and compost making, integrating other activities like exhibition and play space.

PROPOSED SECTIONS & PERSPECTIVES



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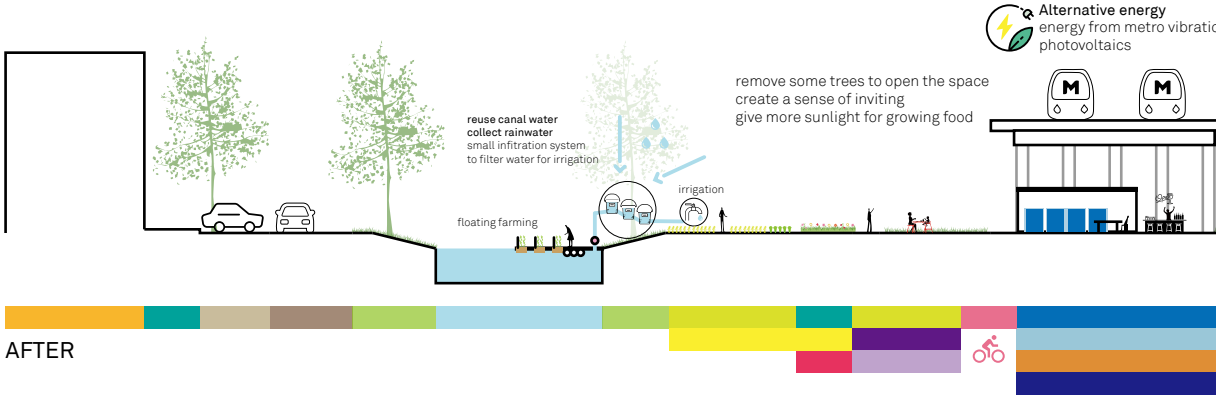
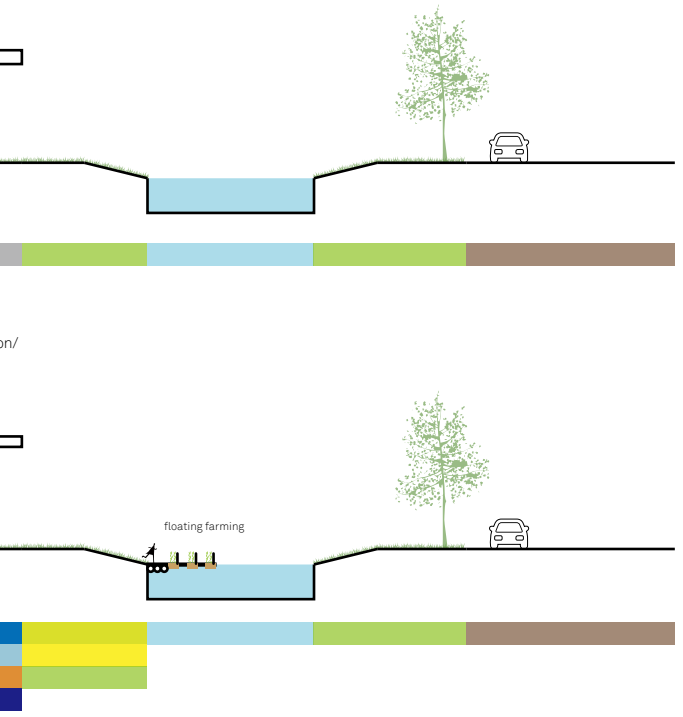


AFTER

BEFORE ↓ AFTER →

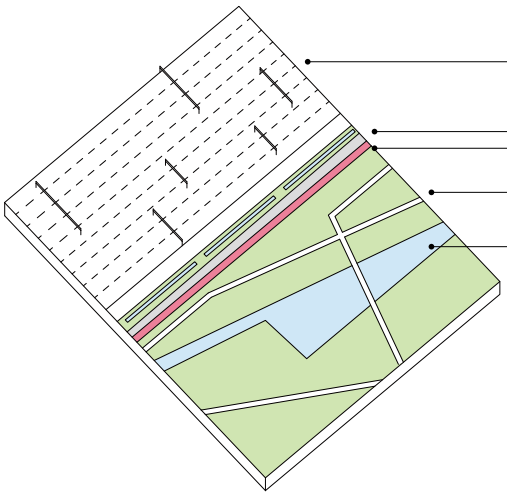


LEGEND

- green space
- automobile road
- railway
- water
- pedestrian street
- parking
- residential building
- office building
- factory
- flowery vegetation
- agricultural space
- gathering space
- compost making
- organic waste recycling
- food storage
- playground
- outdoor kitchen
- temporal food stands
- bike path
- undeveloped

3. SEPARATIVE SPACE
3.2. SPACE ALONG RAILWAY

PROTOTYPE



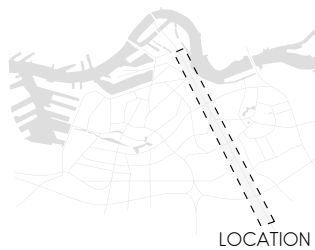
COMPONENTS

railway lanes

vehicular lane
bicycle lane

park or
underutilized green space

water space



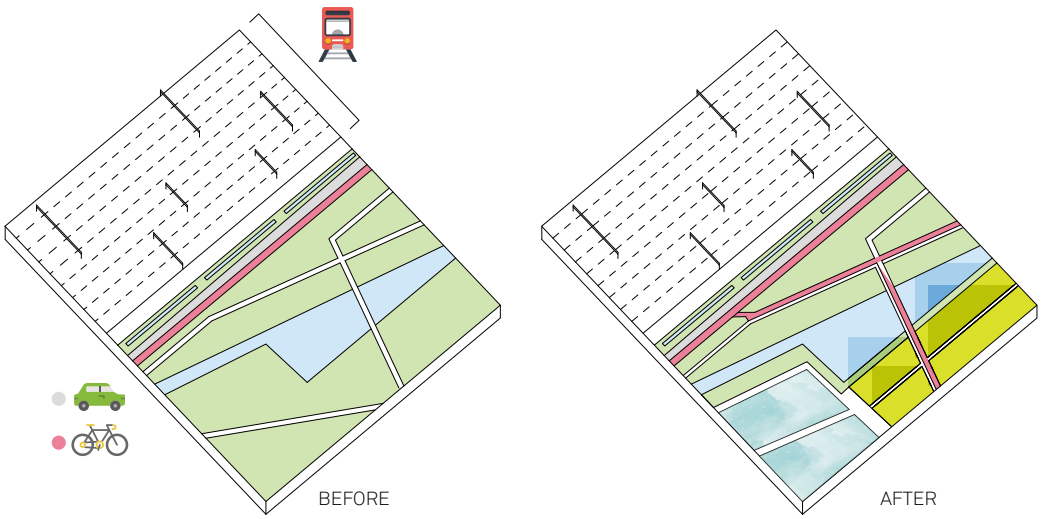
LOCATION

DESCRIPTION

The railway locates in between districts Vreewijk and Ijsselmonde, which more or less cut off the relationship on both sides. The existing space along the railway comprises sports space, park, industrial site and undesignated green space. Though the land is not vacant, it is not an attractive place for people to visit since limited activities and less interaction with the surrounding. The redundant greenery along the railway has potential to be transformed for a more fascinating and usable way. The green area can serve much more than just greenery; it can be a setting for nearby community interaction, a place that fosters a diversity of activities. The goal is to provide continuous link for bicycles and pedestrians, improve connections to the adjoining neighborhoods and provide needed open space amenities.

3.2. SPACE ALONG RAILWAY

TOOL 3.2
MIXED PROGRAM ACTIVATION



ILLUSTRATION

Tool 3.2 focuses on the green area along the railway: part of green space has been developed as Varkenoordse Park, which provides a foundation for improvement. However, the park is not very popular in the existing situation, which is mainly for passing space due to the limited programs provided and limited space for activities. The bicycle path is along the railway and vehicular roads, which does not really integrate into the green area.

The tool is to activate the space with a variety of programs and re-organize the routes for passers by and visitors. Agricultural programs such as herb or vegetable gardens will be also introduced for the communities. At the same time, optimized the existing activity space with larger and more comfortable space. In addition, to let cyclers get opportunities to experience the park instead of cycling outside.

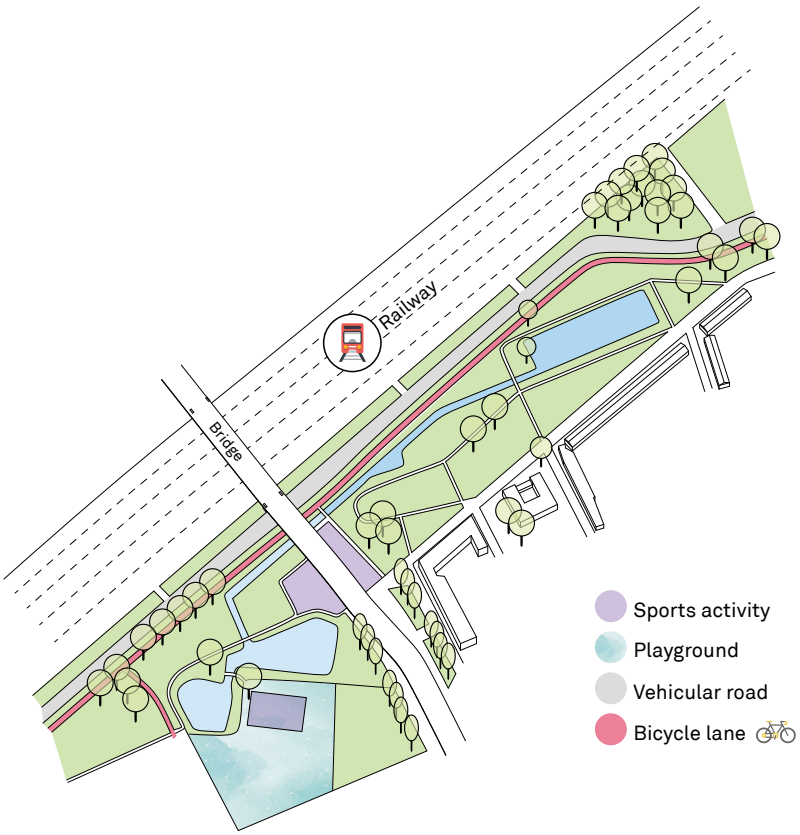
CONSIDERATION

- Accessibility for pedestrians and cyclers
- Stormwater wetland
- Program arrangement
- Alternative energy harvesting
- Maintenance plan

INVOLVEMENT

- Department of Infrastructure
- Landscape design company
- Community groups
- Neighborhood associations
- non-profit organizations
- Local business

EXAMPLE



BEFORE

LOCATION: West-Varkenoordseweg

EXISTING: The space along the railway has been designated as Park Varkenoordse. The space is large enough (width varies from 60 to 170 meters) to accommodate volunteer-based edible garden for complementary activities, as well as different programs.

AFTER

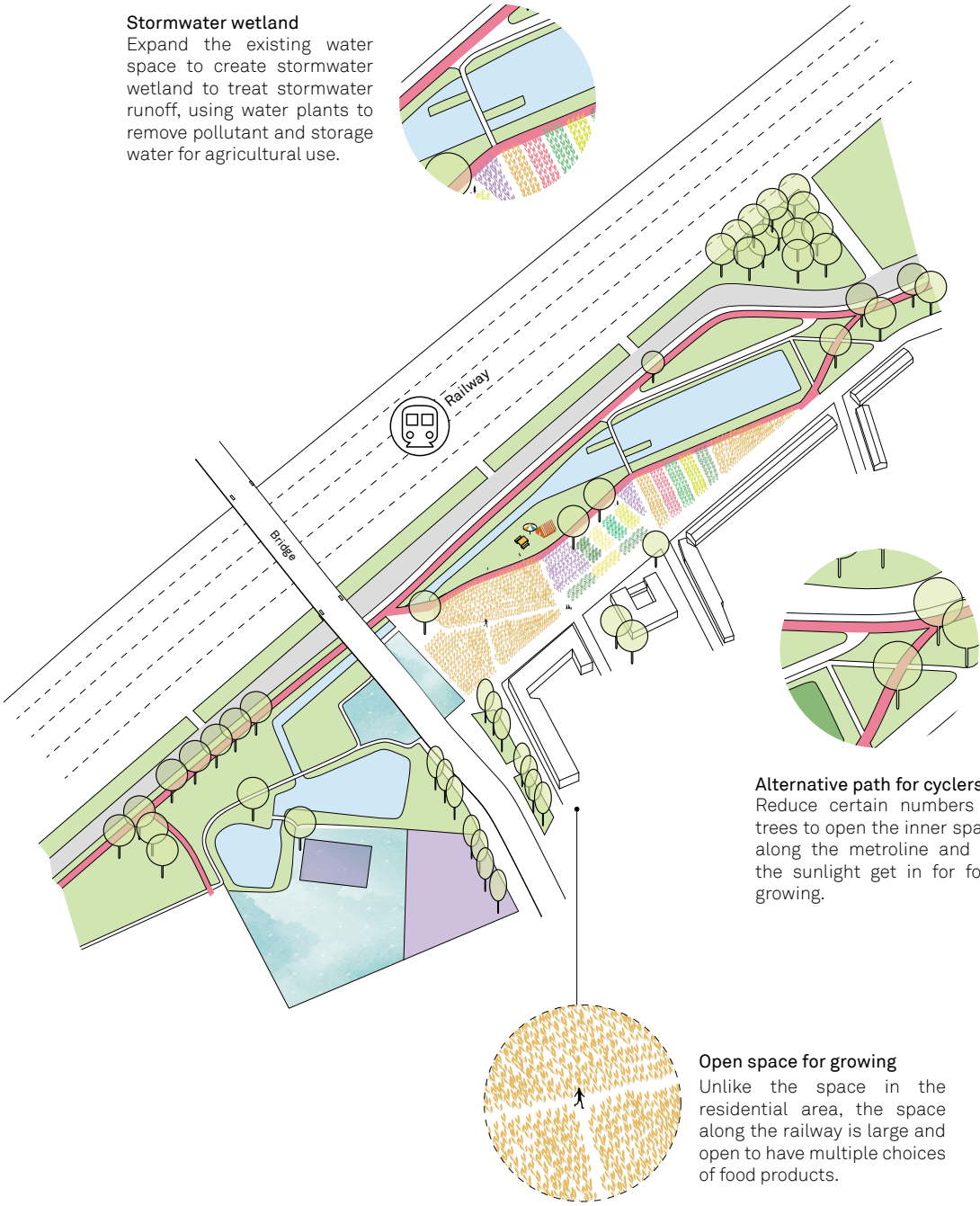
PRODUCTION: herb, vegetable, flower, ornamental plant

FURNITURE: in-ground bed, beehive, green house structure, seating, table

ACTIVITY: touring, community farm, event space, sports, playground

ATTRACTION: Peri-urban open space with multiple programs; collaborate with commercial and educational activities; but also provide designated space for nearby farmers

Stormwater wetland
Expand the existing water space to create stormwater wetland to treat stormwater runoff, using water plants to remove pollutant and storage water for agricultural use.

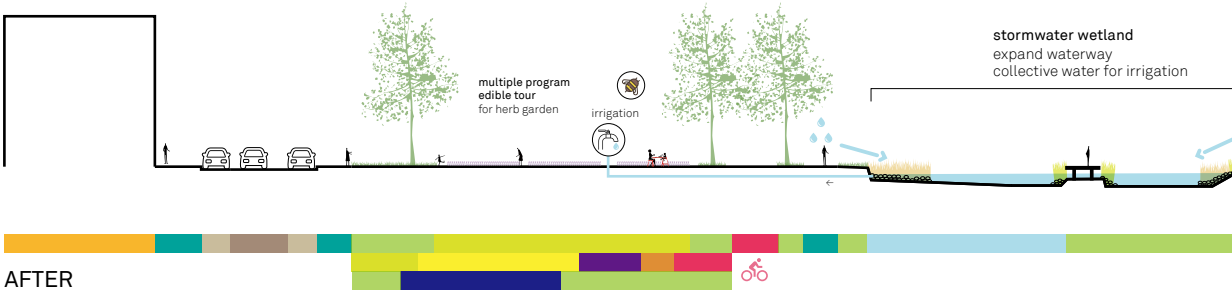


Alternative path for cyclers
Reduce certain numbers of trees to open the inner space along the metroline and let the sunlight get in for food growing.

Open space for growing
Unlike the space in the residential area, the space along the railway is large and open to have multiple choices of food products.

PROPOSED SECTIONS & PERSPECTIVES

BEFORE



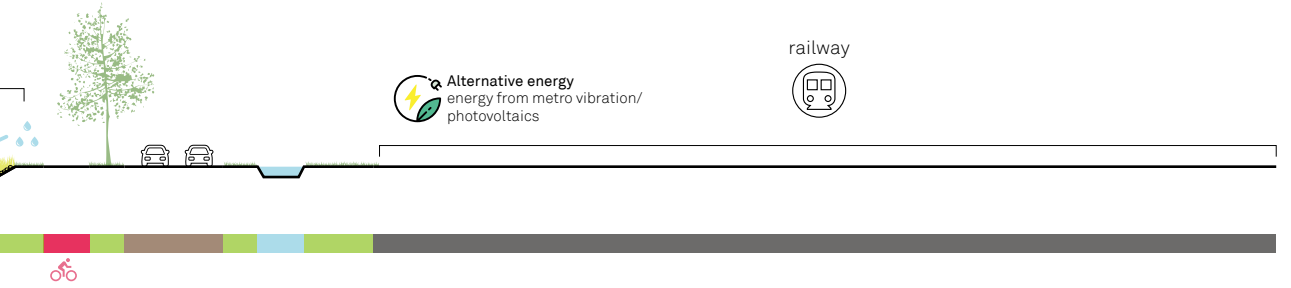
AFTER

LEGEND

- green space
- automobile road
- railway
- water
- pedestrian street
- parking
- residential building
- office building
- factory
- flowery vegetation
- agricultural space
- gathering space
- compost making
- organic waste recycling
- food storage
- playground
- outdoor kitchen
- temporal food stands
- bike path
- undeveloped

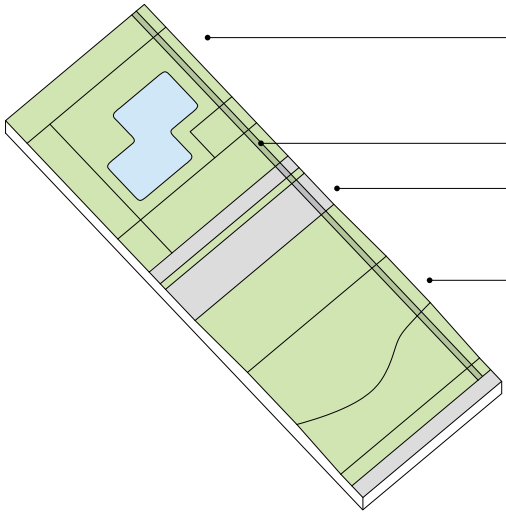
BEFORE ↓ AFTER →


railway


railway
Alternative energy
energy from metro vibration/
photovoltaics

3. SEPARATIVE SPACE
3.3. SPACE ALONG HIGHWAY

PROTOTYPE



COMPONENTS

park/ nursery land/ farm

bridge or tunnel connection

A15 highway

Undeveloped green space
a few nearby farmers occupy plots of land for livestock

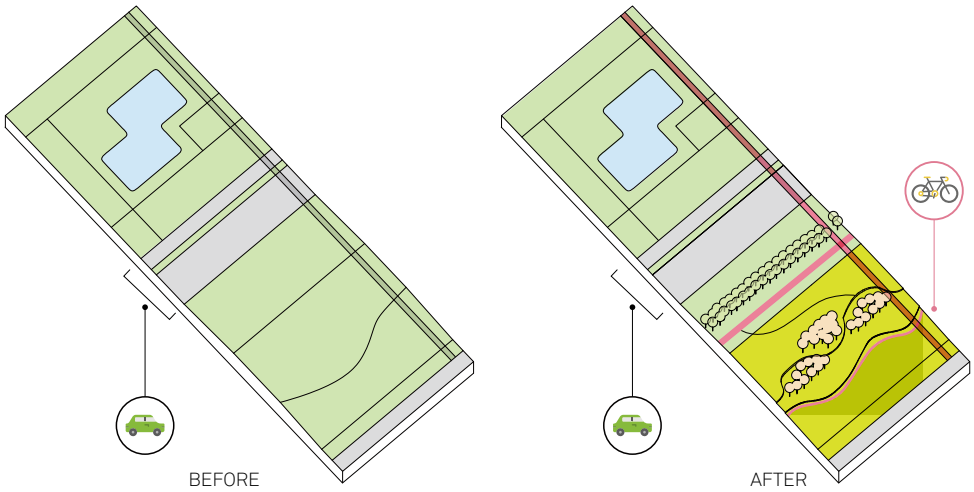
LOCATION

DESCRIPTION

The A15 highway situates on the periphery of Rotterdam Zuid, with northern side developed into parks and nursery land and southern side undeveloped green space. The green space along the highway covers a large area (80m-190m), which has possibility to accommodate a wide variety of activities. The proposal attempts to enhance the connection between both sides of the highway and to activate the space along the southern side. The periphery space could also be the destination for citizens. What's more, the large green space as a wide corridor could convert into beneficial habitats for pollinators including bees, butterflies and birds.

3.3. SPACE ALONG HIGHWAY

TOOL 3.3
PRODUCTIVE & RECREATIONAL GREENBELT



ILLUSTRATION

The recreational and productive greenbelt for A15 highway is a large-scale and long-term project. The strategy is to integrate the agricultural component as part of the identity along the highway area, combining with wetland environment and recreational park, while at the same time using existing tunnels and bridges to connect both sides to be a cohesive whole.

The public access for pedestrians and cyclers is one important factor to consider: utilize the existing connection combining with public transportation and also redevelop the existing closed tunnel to connect both sides. The second point is to utilize the topography along the highway to create fruit gardens for fruit trees (see section). The third point is to utilize the waterway with the irrigation system for agriculture. The productive greenbelt is not just for agricultural use but also with educational, commercial, recreational programs and tourism.

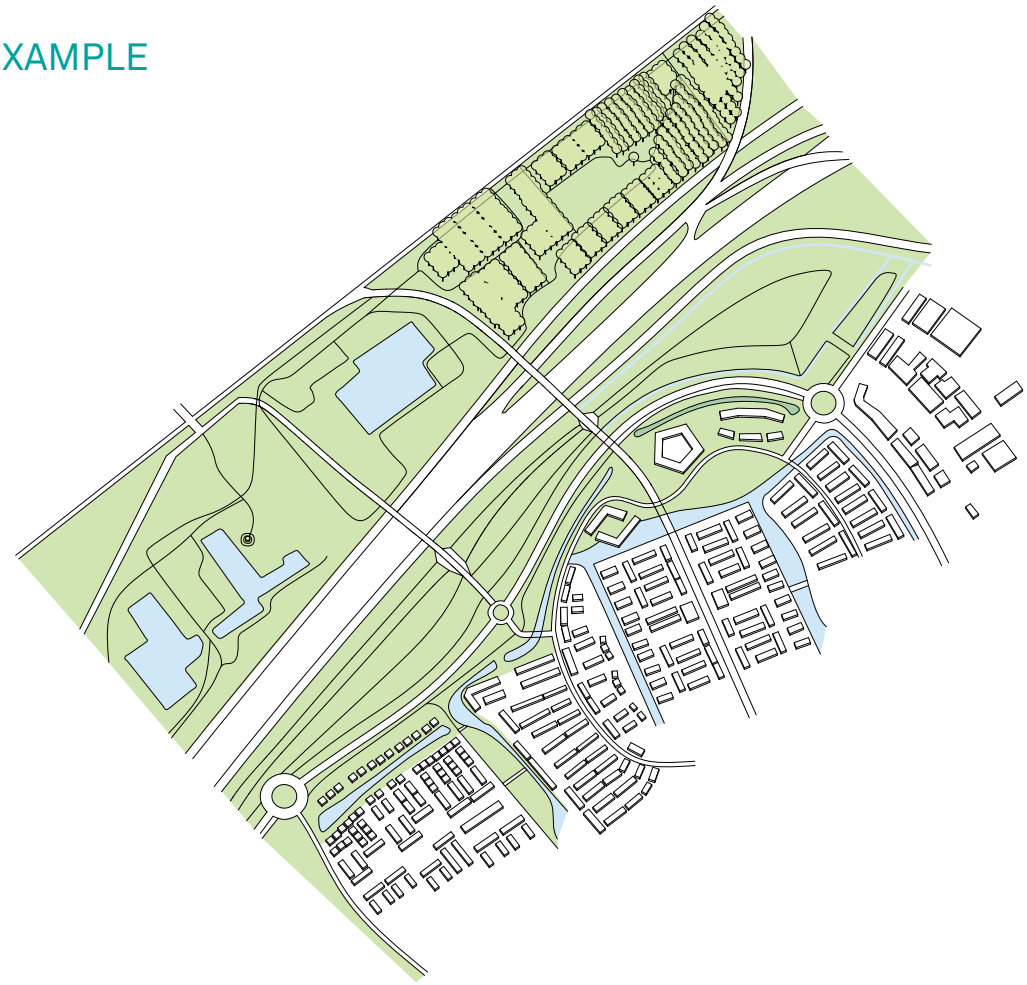
CONSIDERATION

- Soil preparation
- Public access for safe crossing
- Polluted air cleaning
- Topography adjustment
- monitoring & maintenance
- Alternative energy harvesting

INVOLVEMENT

- Rijkswaterstaat
- Ministry of Infrastructure and the Environment
- Ministry of Education, Culture and Science
- Nursery and fruit company

EXAMPLE



BEFORE

LOCATION: A15 highway

EXISTING: The northern side has been used as park and nursery space, but the southern side is undeveloped with meadow space, a few number of trees and canals. The width of the southern side varies from 80 meters to 190 meters, large enough to accommodate different kinds of activities.

AFTER

PRODUCTION: vegetable, orchard, livestock, wetland

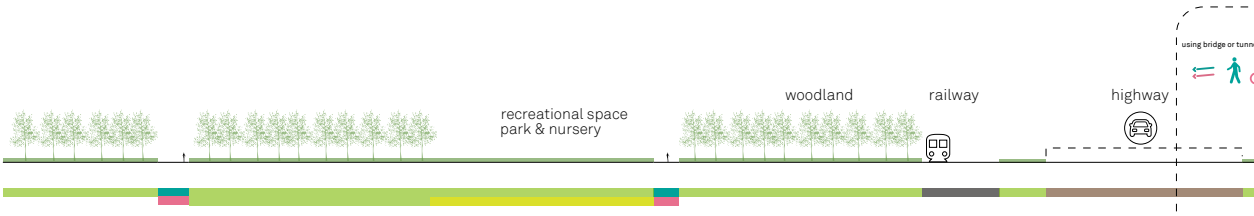
ACTIVITY: touring, learning farm, recreation, local business

ATTRACTION: Peri-urban open space with multiple programs; wetland conservation for animals and plants collaborate with commercial and educational activities; but also provide designated space for nearby farmers

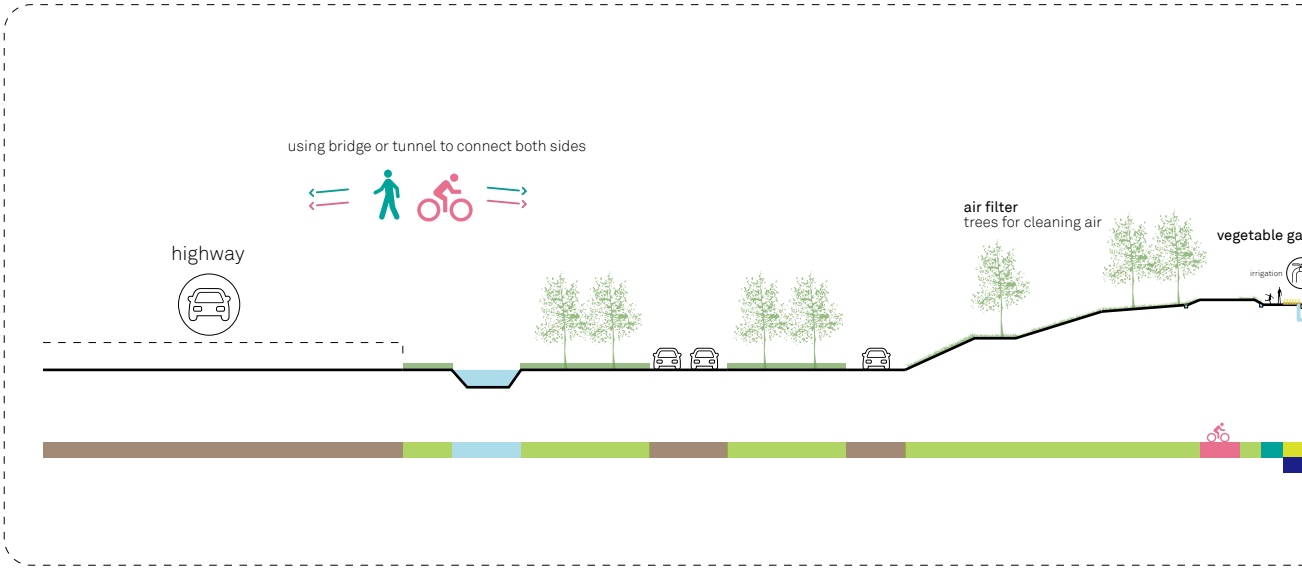

Existing nursery land
Collaboration with
the nearby nursery
company
Increase accessibility
pedestrian, bicycle lanes
public transport
Beekeeping for fruits
Orchard/ fruit garden
Provides commercial
and educational programs
Land lease
Preserve
Small-scale
Livestock space
for adjacent farmers
Stormwater runoff ponds -
Utilize the existing water space
Combine with the existing ditches
and water space to design irrigation
system and wetland biotope

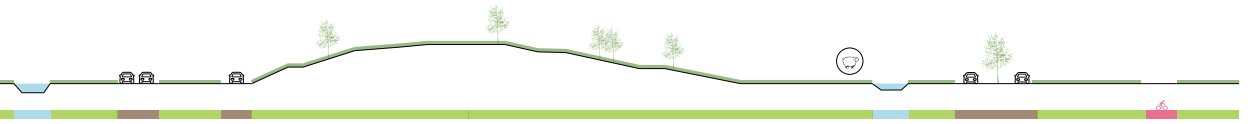
PROPOSED SECTIONS & PERSPECTIVES

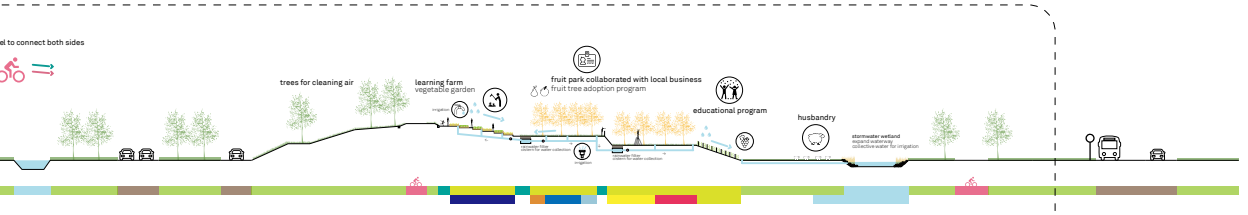
BEFORE

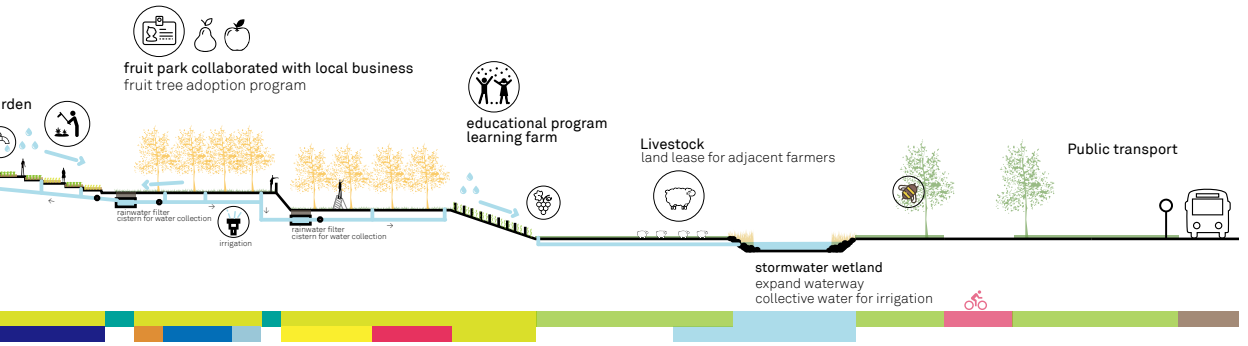


AFTER









LEGEND

green space	parking	agricultural space	playground
automobile road	residential building	gathering space	outdoor kitchen
railway	office building	compost making	temporal food stands
water	factory	organic waste recycling	bike path
pedestrian street	flowery vegetation	food storage	undeveloped

BEFORE ←

The existing space is empty and wasted, with meadow, a few trees and water space (for drainage).

AFTER ↓

← PREPARATION PERIOD

For the first few years the site needs topography adjustment, soil preparation and waterway transformation, in order to create condition for fruit growing and wetland conservation area. This process requires the collaboration with ecologists, plant experts, agricultural experts and transportation engineers. The proposal also incorporates local bussiness for commerical programs and educational program for students and children to initiate. The preliminary period may take 5 - 8 years to develop and grow up.

← DEVELOPMENT
more than 8 years to grow over time

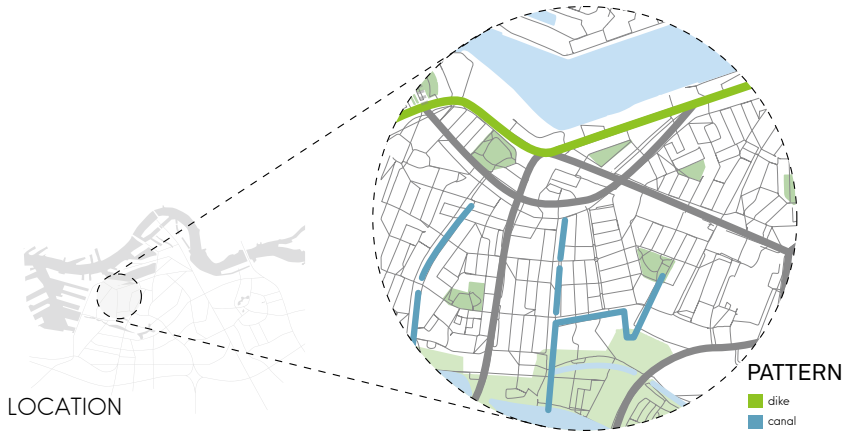
PART III

ADAPTATION OF STRATEGY AND TOOLS

The third part is an adaptation of part I and part II – to see how the healthy green network applies and how the spatial tools work on one specific site. Located in the districts Tarwewijk and Carnisse, the site is a dense residential area lack of a sense of community. The case shows how the top-down approach of the city vision and the bottom-up initiatives collaborate; it is not only about the transformation of the space, but also integrate with social and educational programs that serves as the catalyst of active green action, social interaction and healthy lifestyle for residents living there.

SITE DESCRIPTION

The site locates in districts Tarwewijk and Carnisse, in-between Zuider Park and Maashaven. As a dense residential area, many low-income people and families with children live in here. This area features three important characters: canals, dikes, and closed building blocks. The existing situation lacks a sense of community that the place does not provide enough space for people to stop and chat with others. The canal and dike space are isolated by vehicular roads, few opportunities for activities.



LAND USE

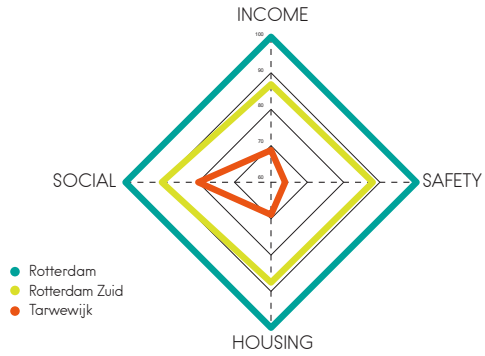
dike
water
buildings
green public space

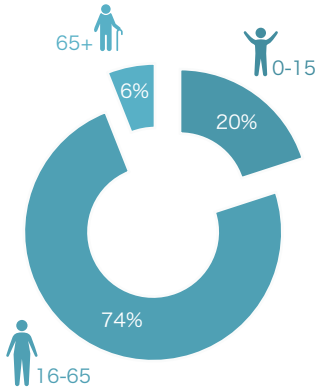
PROGRAMS

residential
green
water
dike
garage
factory
school
restaurant & cafe
shop
mosque
church

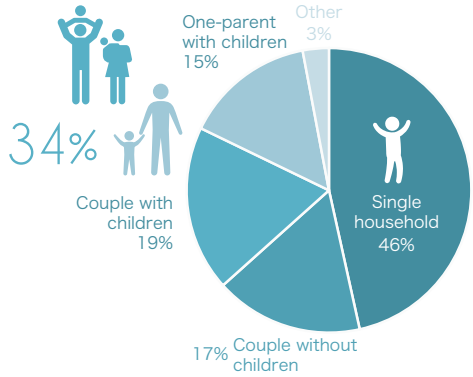
DATA ANALYSIS

69% of the population in this place is low-income people and 34% of the household type is family with children. This area is considered to be a problematic area with a lower score on social, income, safety and housing than the average level of the city. The problems more or less reflect on the spatial quality of the streetscape, the defective buildings, car-dominated streets and limited public space.



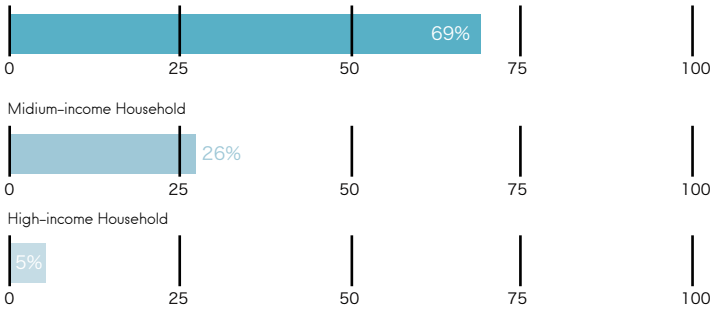


AGE



HOUSEHOLD TYPE

INCOME LEVEL



DATA INFORMATION:
Reisgids Pact op Zuid
rotterdam.buurtmonitor.nl

CANAL SPACE

The canal is part of the central space in the neighborhood, but is isolated by vehicular roads on both sides in the existing situation.

STREET SPACE

The streets are mostly occupied by car parking spots, limiting the activities such as gathering and playing. The place becomes less attractive and dangerous when fewer people walk or notice the street.

DIKE SPACE

The outer dike area is a high-volume vehicular road and the inner dike area is parking space and one-way road. The bicycle lane is shared with vehicular lane. The pedestrian street is narrow and people would use the dike as an alternative street.

CAR-DOMINATED DISTRICT

The site is a car-dominated district: cars cross every street and car parking space is everywhere. However, the situation is that the car parking space is overcapacity, and in the future the car ownership will be reduced. Mentioning this is because the strategy needs to sacrifice some of the parking space and limiting the traffic in certain area. The aim is to release more space for pedestrian and cyclers, creating a friendly slow mobility network. The result here would not be lack of parking space after intervention, but some residents need to walk to their cars.

Katendrechtse Lagedijk

Lepelaarsingel

Wolphaertsbocht

Van Eversdijckstraat

BUILDING ANALYSIS

Most of the buildings were built before 1949, and over one-third of the buildings are social housing. Some of the buildings are defective and got a lot of complaint from residents, which require to be renovated or replaced in the future. The main building forms here are closed building blocks. We can see from the photos that the closed building blocks show a strong private sense. More details of analysis will be shown in the appendix 2.

BUILDING CONSTRUCTION YEAR

< 1800	1900 - 1930	1960 - 1975	1995 - 2005
1800 - 1950	1930 - 1945	1975 - 1985	> 2005
1850 - 1900	1945 - 1960	1985 - 1995	

SOURCE
map: code.waag.org
housing complaints:
www.huurcommissie.nl

TOP-DOWN AND BOTTOM-UP INTERACTION

With a dense place lacking sense of community, how can we renew the neighborhood by activating the neglected space for interaction and cultivating a healthy life? The whole process needs to be achieved by the interaction between top-down and bottom-up collaboration. The healthy green structure requires an effective engagement to encourage residents involved the process.

Top-down process

The top-down process includes a multidisciplinary team of urban planners, landscape architects and architects that defines the land use strategy and the identification of the basis green network (Page 177). The network aims to support the slow mobility and activities. The traffic department optimizes the circulation and reduces a number of parking spots to complement the system. The department of water management is responsible for implementing the stormwater management system, including collection and storage of rainwater for irrigation, recycling of grey water, as well as changing streets into porous paving surface. Based on the network, the public participation will be involved on planning process. The strategy needs to be promoted through media so that facilitates the contact with residents and communities. Relevant groups will function as mediators to collect and arrange different ideas until that reach consensus. The process contains soliciting the public opinions, and meeting with residents/communities that might influence the project, in order to discuss the interests and expectation.

On one hand, the top-down process provides a foundation to improve the environment; on the other hand, it provides a series of spaces for various activities according to the needs or residents and proposed community gardens engaged by interest stakeholders.

Bottom-up process

The bottom-up process needs communication and cooperation. The actors of bottom-up initiatives consists of local residents, private property owners, neighborhood associations, non-profit organization and local business.

For the open public space like canals and dike, neighborhood association and NPO function as coordinators to connect the basic network and organize citizens' activity. Certain land area will be distributed to people who in need for food growing as an income generation opportunity. In addition, local residents who interest in gardening can form teams, which can apply for places and support for gardening. The network provides a series of proposed garden space for them. Nevertheless, residents can also find suitable places by themselves and apply for land use rights.

For the open private space like building blocks, cooperation is essential. Considering the defective building blocks, the housing department and neighborhood association function as coordinators to organize meetings and workshop for residents and relevant private property owners. The content contains the renovation of buildings, the plan of private courtyard donation/sell/rent, and the future maintenance plan. The objective is to retrofit defective buildings and effectively use the space of inner courtyard. The sharing of private courtyards has many benefits. Every one just shares a small piece of land, but what obtains is far more than that, not only about a more open view of space, but also activating space for food harvest and other activities, encouraging social interaction with neighbors.

TOP-DOWN STRATEGY

municipality
urban planner
land use strategy
strategy promotion
solicit public opinion
mediator

landscape architect
architect
define green network
spatial design
building renovation plan

housing association
housing renovation
building removal

traffic department
traffic calming
parking space reduction
circulation optimization

department of
water management
stormwater management
street surface treatment

BOTTOM-UP INITIATIVES

local residents
interest participants
and groups

Individual

find suitable places
apply for supports

private property owners
groundfloor courtyards
in closed building blocks

Collective

private courtyard - collective use
share land: donation/sell/rent

neighborhood association
coordinator
management
organize meetings

Neighborhood

support residents' application
land use rights empowerment

land re-distribution
open public space - land adopters
support low-income people

non-profit organization
non-government organization

Community

management of open public space
for community garden
and activity space

restaurant
cafe
retail, etc

Local business

set up business partnership
collaborate with above actors

VISION ADAPTATION

IDENTIFY THE EXISTING SITUATION

With the Part I vision as a basic network, identify the patches and potential corridors. Layer 1 shows the patches of green public spaces. The biggest patch is the city park Zuiderpark, with other small open public space scattered in site. Layer 2 indicates the potential connection of canal and dike. Layer 3 overlaps layer 1 and 2 to develop a basis network, but there are missing links between dike and canal.

layer 1
exisiting patches

layer 2
potential corridors

layer 3
overlap layer 1 & 2

NETWORK DEVELOPMENT

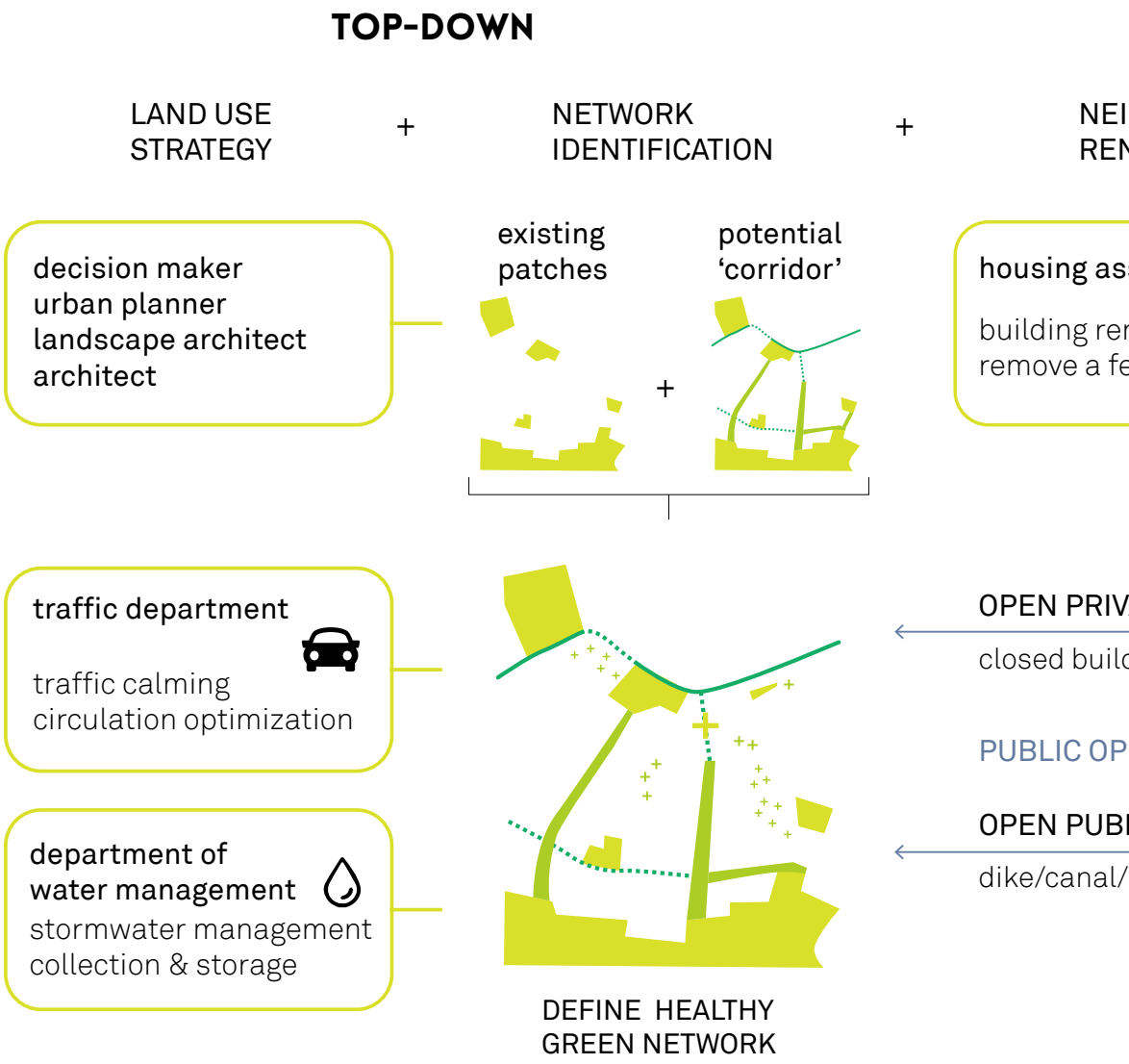
The main idea is to use the potentials links to connect the existing patches of the green public space - to create a safe and healthy slow mobility network for residents and green corridors. The defective old building blocks are retrofitted open with shared inner courtyards, creating a series of neighborhood landscape for residents' interaction. Urban agriculture plays a role to provide the opportunities of income generation opportunity for low-income people and educational programs for children, stimulating the social interaction in the neighborhood.

1. scattered landscape

2. connection

3. program activation

TOP-DOWN AND BOTTOM-UP INTERACTION DIAGRAM



BOTTOM-UP

GHBORHOOD
NEWAL

+

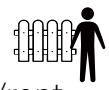
COMMUNICATION
COOPERATION

sociation

collaborate

novation plan
ew buildings

private property owner



courtyard donation/sell/rent

sharing courtyard space with people who
don't have a yard (convert into collective use)

ATE SPACE

ding blocks/ building side space

local residents

gather interested participants

collaborate

establish stepping-stones:
identify suitable sites for gardens

INION/EXPECTATION

LIC SPACE

road side garden

neighborhood association

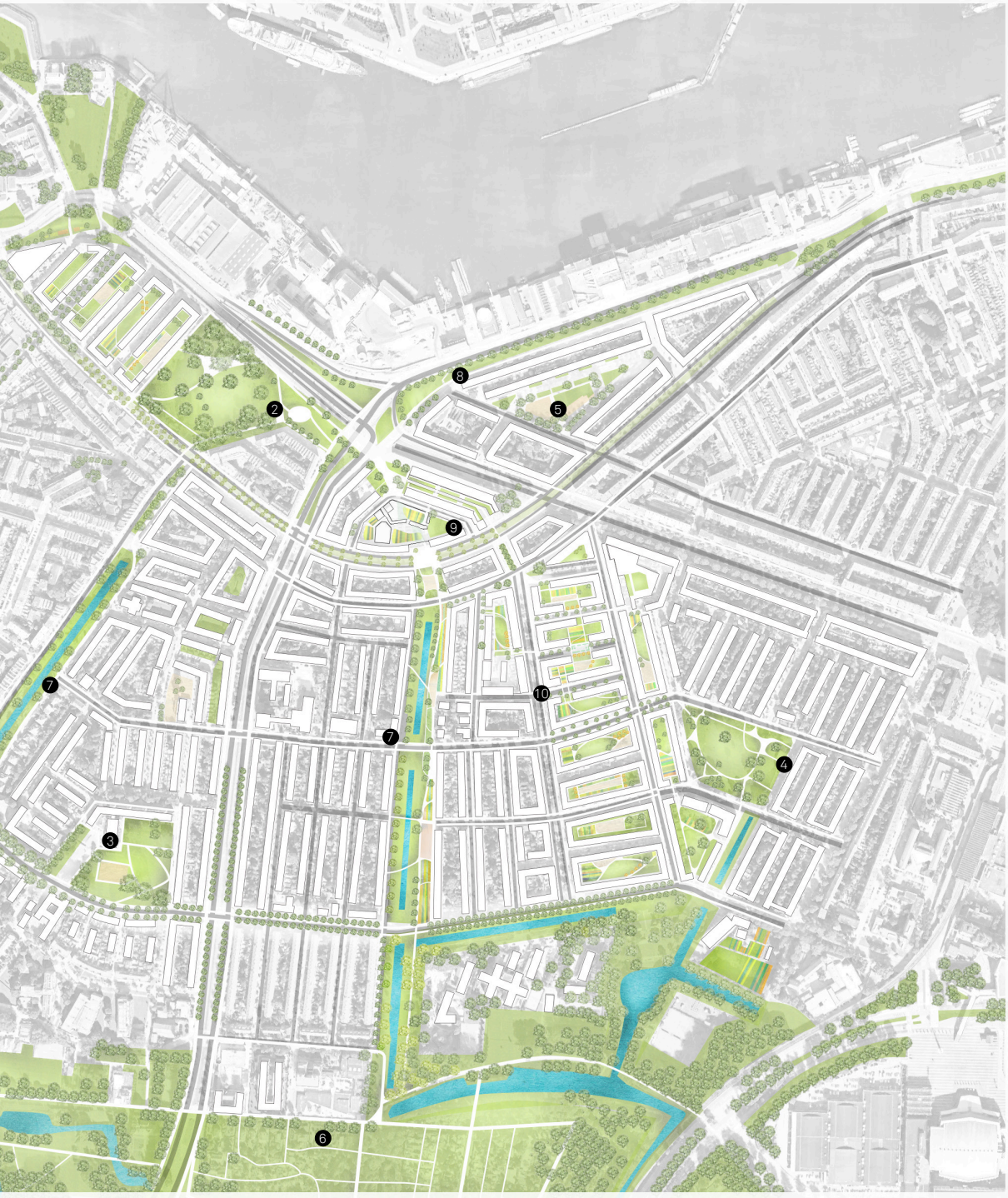
organize meetings & activities

RELEVANT ORGANIZATIONS
NGO/ NPO ...

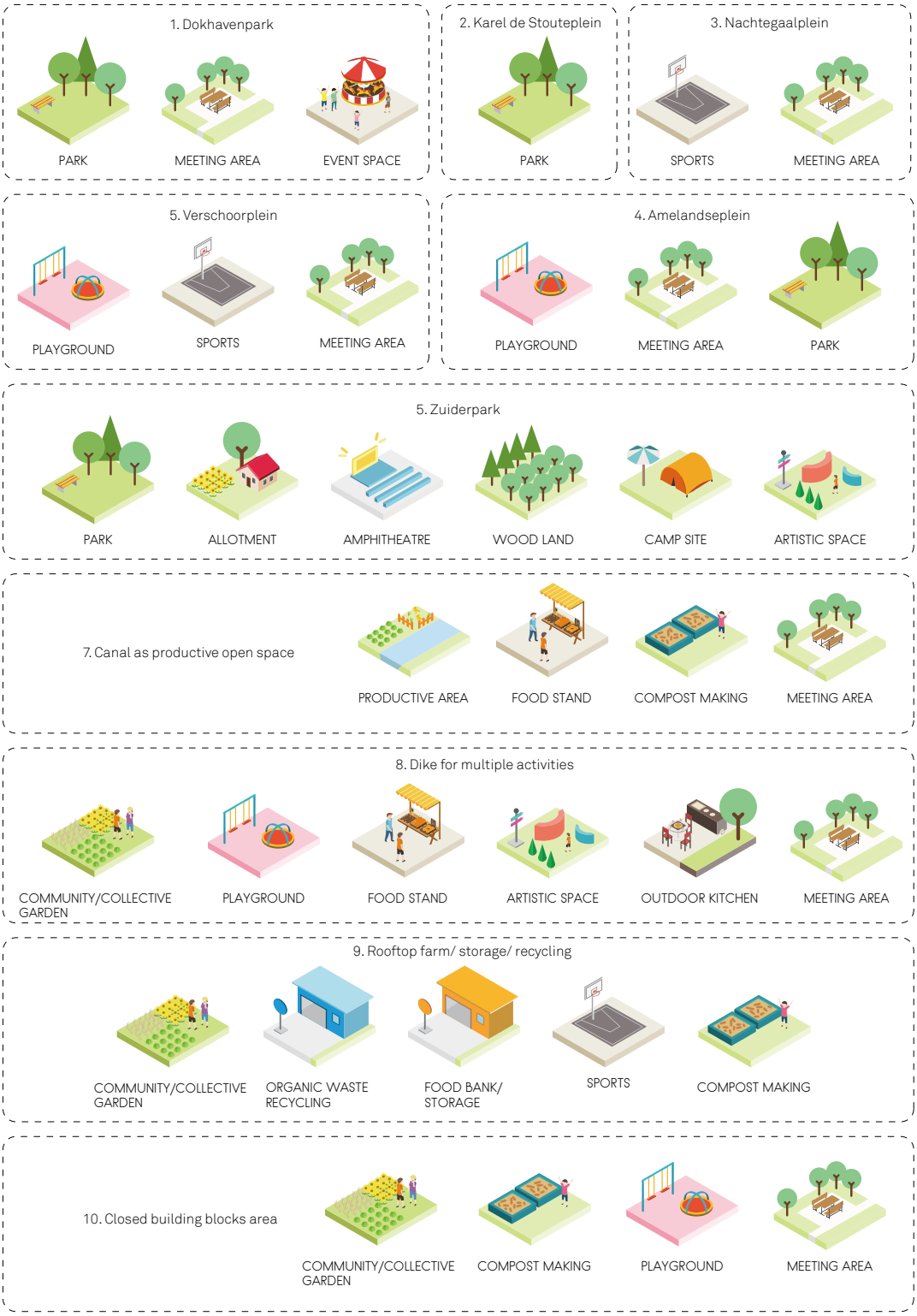
PROPOSED SITE PLAN

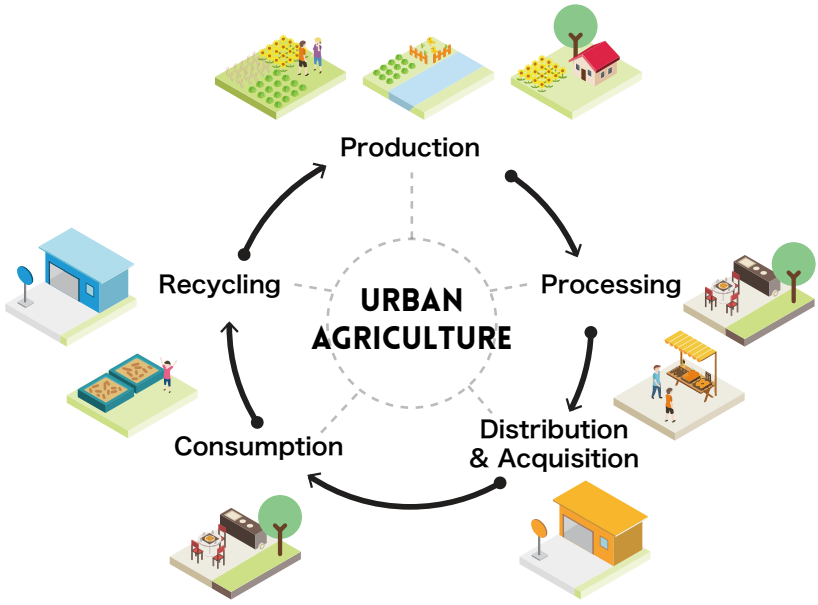
The site plan is the connection of the existing public green space (patches) with the intervention of the potential corridors. The project creates a setting for highly participation in the process of design. The proposal emphasizes a healthy green network in this area for citizens to walk/cycle/jog from one green patch to another while enjoying comfortable environment and various activities, which invites people to stop and interact. A variety of uses were introduced into the site, appealing to a range of resident needs and interests. The journey will be enriched with various programs and activities, allowing flexibility to change for events and festivals.

1. Dokhavenpark
2. Karel de Stouteplein
3. Nachtegaalplein
4. Amelandseplein
5. Verschoorplein
6. Zuiderpark
7. Canal as open public space
8. Dike for multiple activities
9. Rooftop farm/ storage/ recycling
10. Block intervention


2
8
5
9
7
10
7
4
3
6
50
200
0
100
500

PROGRAMS ACTIVATION

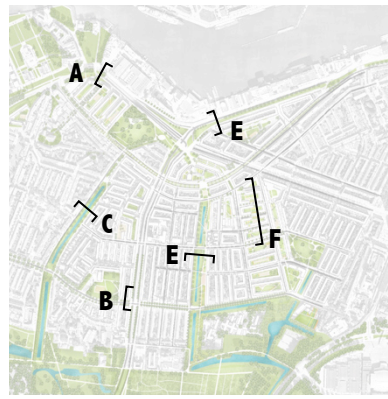




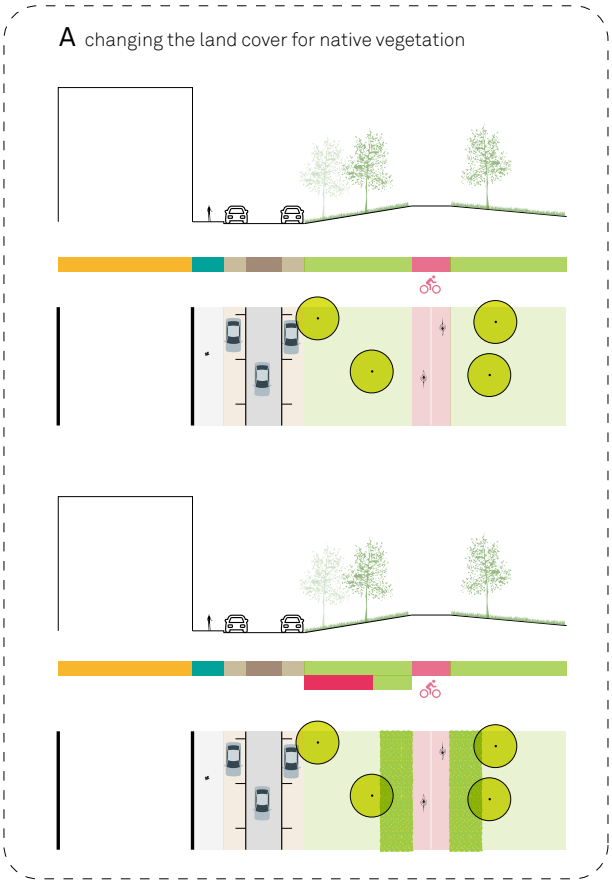
The diagram (left side) shows the toolkit of recreational options is applied on different locations. The food-related programs are also integrated, while at the same time aim to close the food cycle, from production to recycling.

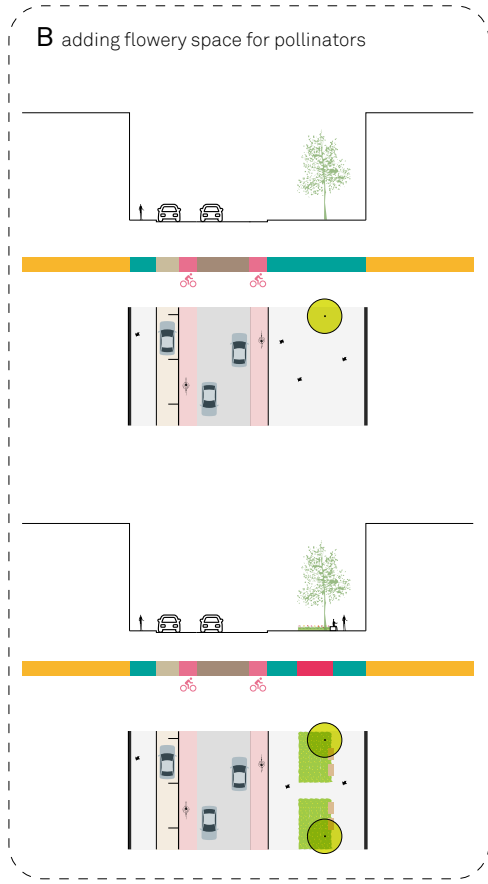
SECTIONS

The proposal aims to provide a comfortable connection for pedestrians and cyclers between different patches. The intervention mainly focuses on these connections. The sections and plans show the before and after drawing of the interventions. The level of intervention depends on the situation of the site. For low intervention, if the area has good accessibility for pedestrians and cyclers, the intervention is to improve the vegetation of the street, like changing the land cover for native vegetation or intersecting the green space. For high intervention, if the connection does not have enough space for slow mobility, the intervention is to transform the space in order to create setting for slow mobility, through diverting the traffic, reducing parking space, etc. Meanwhile, various programs will be added in to activate the site.

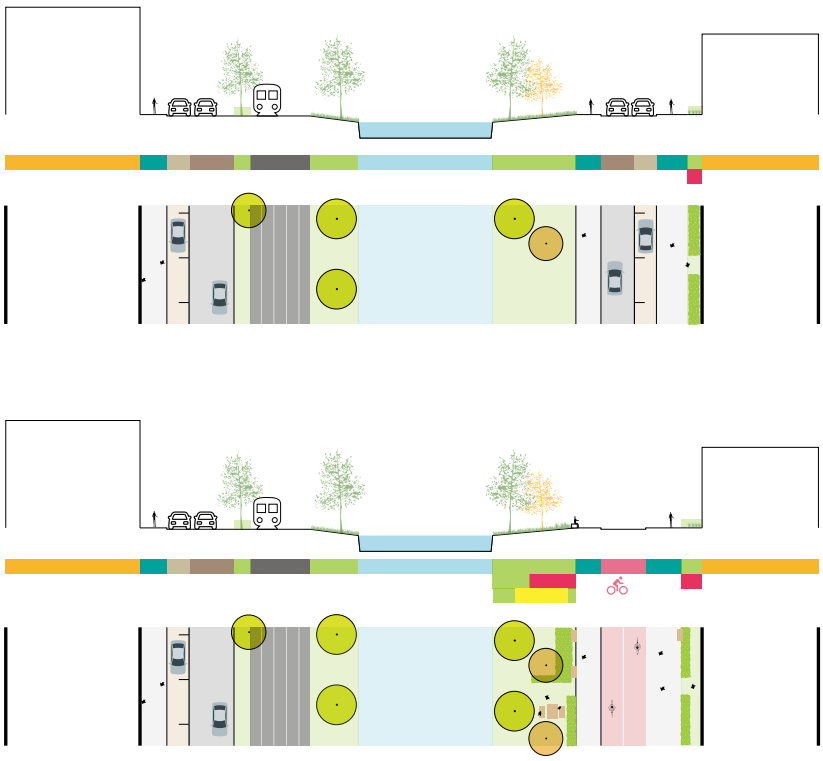


- green space
- automobile road
- tram lane
- water
- pedestrian street
- parking
- residential building
- office building
- tool room
- flowery vegetation
- agricultural space
- gathering space
- compost making
- playground
- temporal food stands
- bike path
- undeveloped

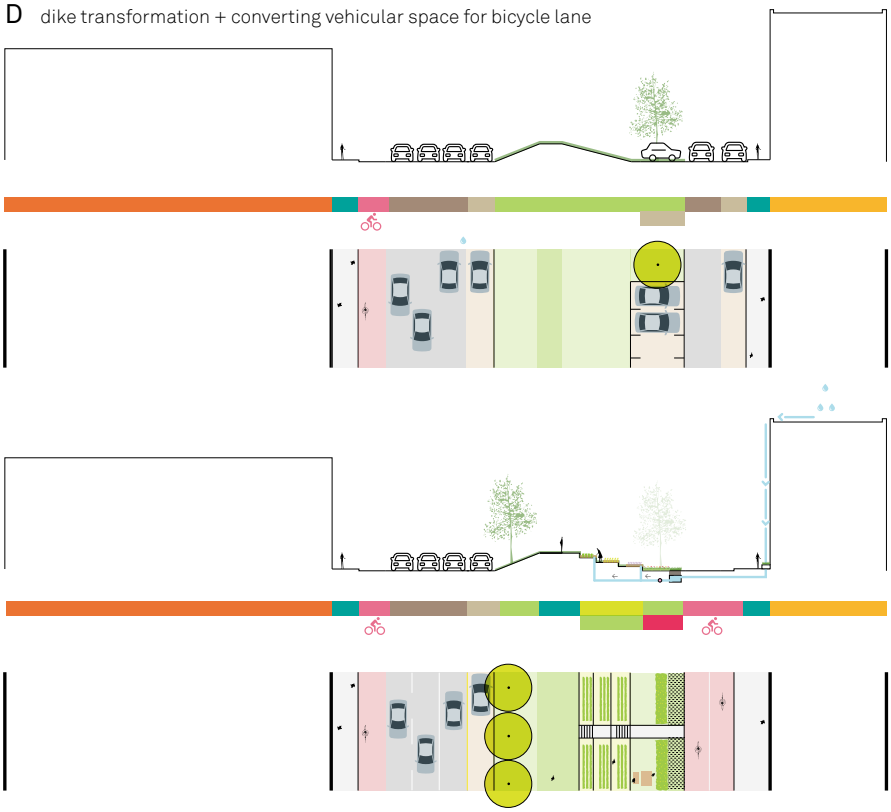




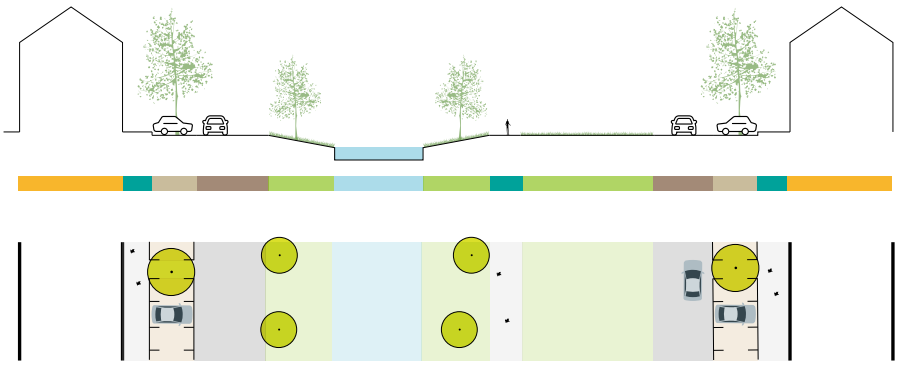
C improving land cover for native vegetation + reducing parking space



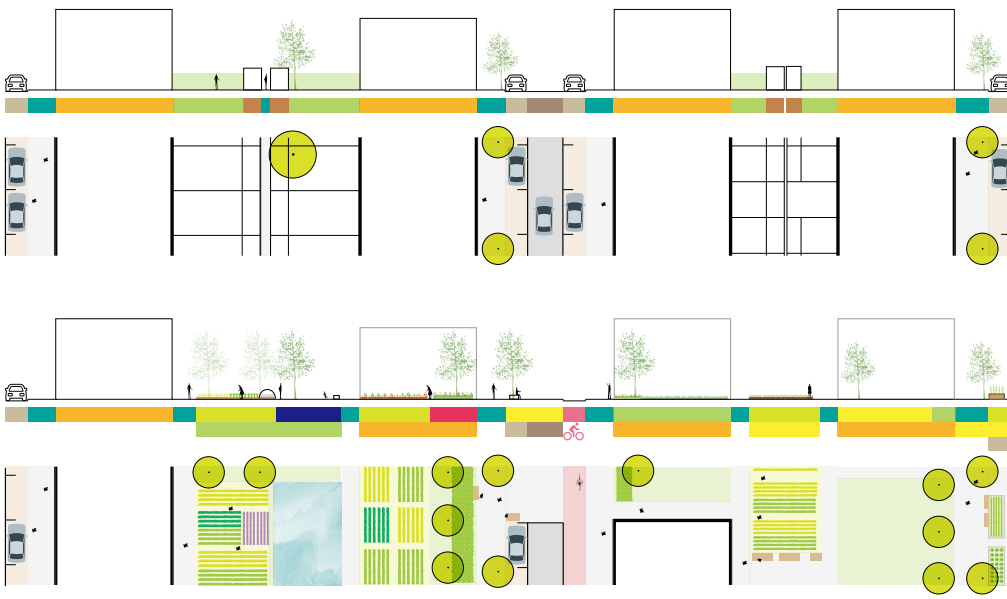
D dike transformation + converting vehicular space for bicycle lane

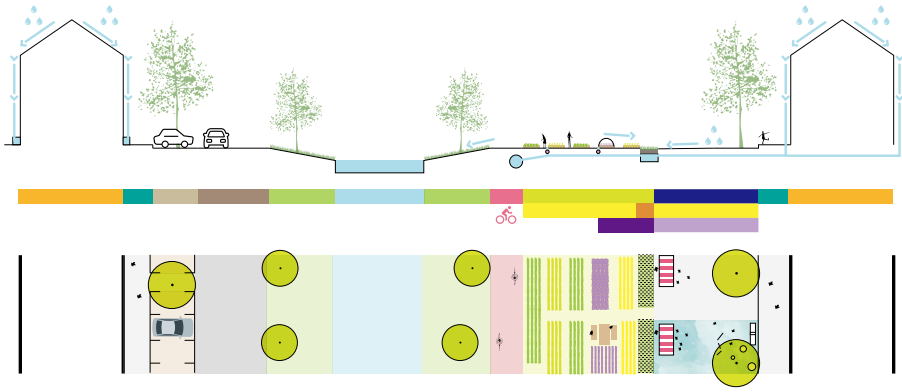


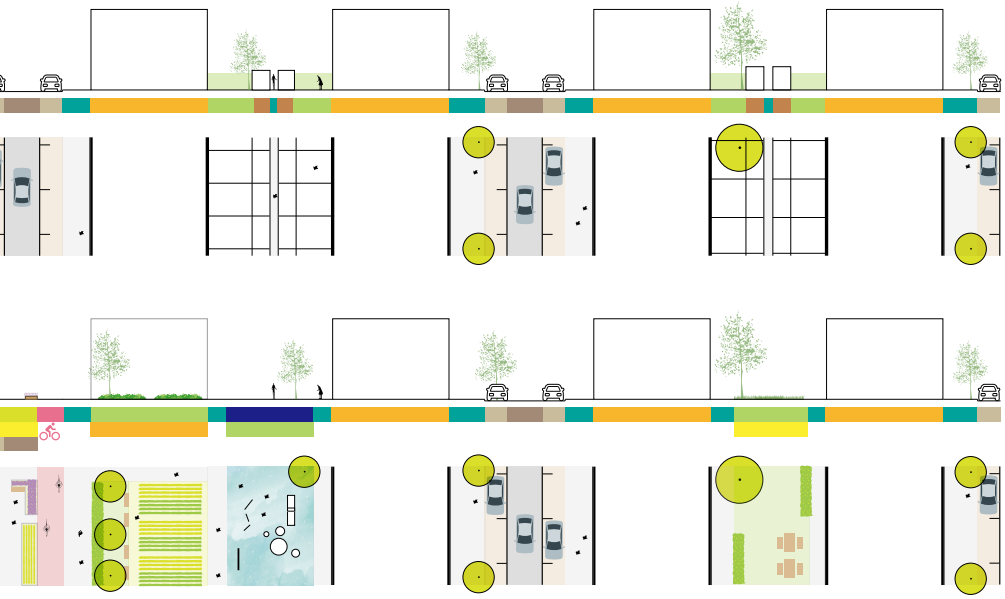
E canal transformation + converting vehicular space for slow mobility + multiple program activation



F closed building blocks transformation + multiple program activation inside blocks

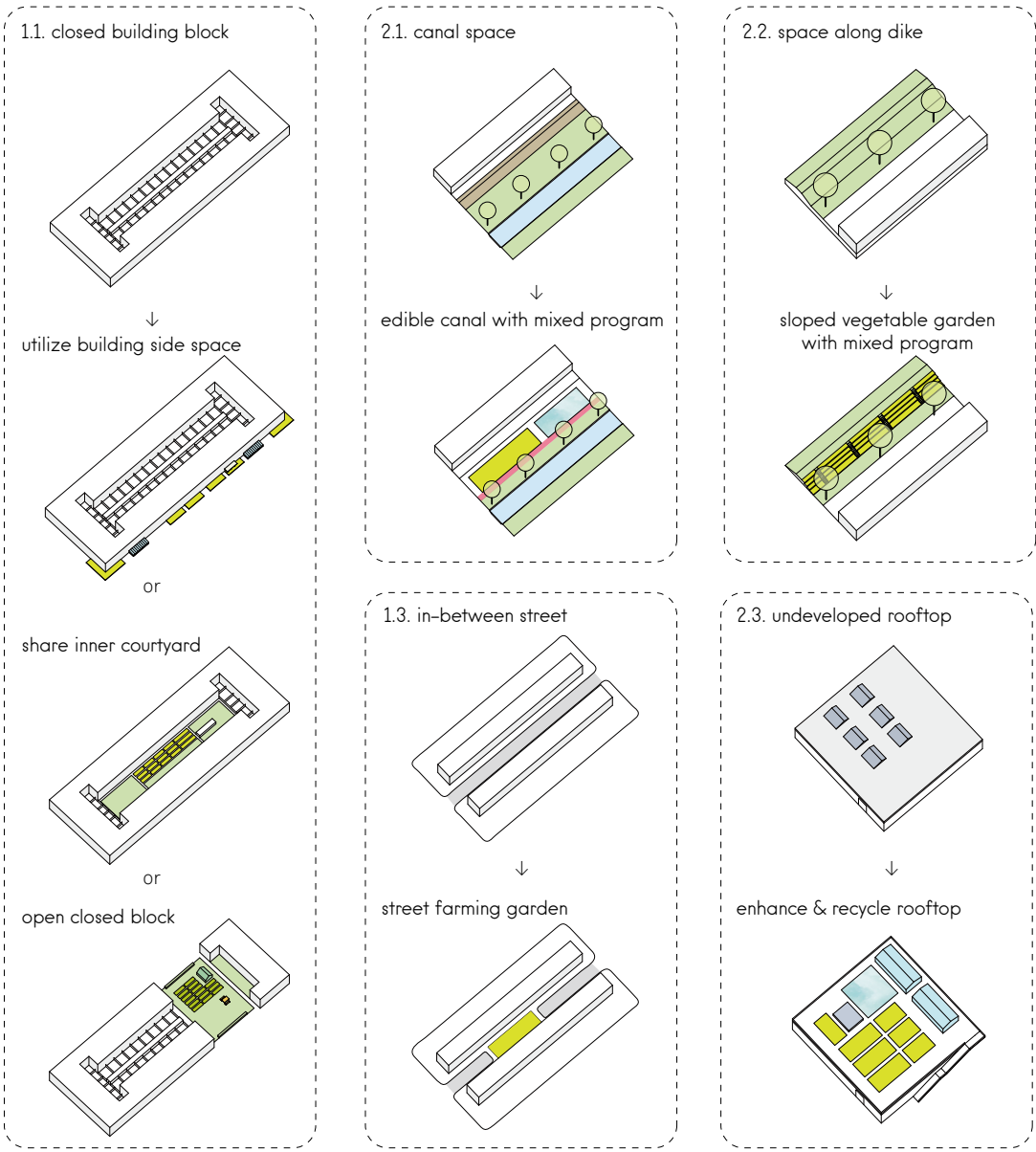






SPATIAL TOOLS ADAPTATION

The main spatial typology of the site is canal, dike, and closed building blocks, with secondary ones like in-between block streets and undeveloped rooftops. The relevant tools are applied: the canal and dike function as corridors and others function as stepping-stones. From the spatial character, the canal and dike space can be defined as open public space (serves for public and more types of stakeholders), while blocks can be defined as open private space (mainly serves for local residents).

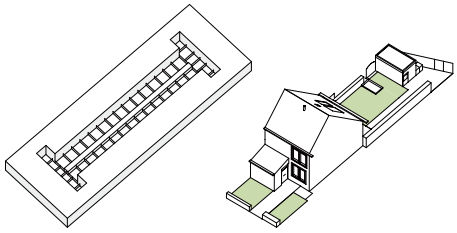


PRIVATE TO SEMI-PRIVATE SPACE
BOTTOM-UP

SECTOR

private

TYPOLOGY



inner private courtyards
front yards & back gardens

ACTOR

individuals
families

ORGANIZE

self-management

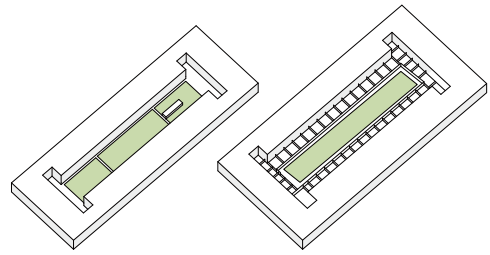
RULES

no rules

SECTOR

semi-private

TYPOLOGY



inner collective courtyards
with strong social control

ACTOR

property owners
residents/renters
interest groups
neighborhood association

ORGANIZE

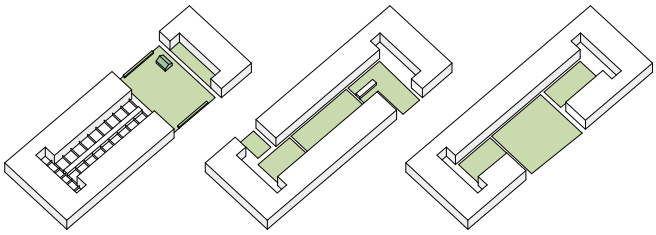
- conduct residents'/group's meeting
- define programs
- define communal tasks
- appoint leaders to better organize
- neighborhood association steps in if discussion cannot meet the consensus

RULES

maintain shared-use space
clean and tidy

SEMI-PUBLIC SPACE
BOTTOM-UP --- TOP-DOWN

SECTOR
semi-public

TYPOLOGY


different ways of intervention to make space
for collective courtyards with public access

ACTOR
property owners
residents/renters
interest groups
neighborhood association
housing association
NGO/NPO

ORGANIZE
define the level of intervention

define programs & activitiies of courtyards

top-down

housing association
- finance and intervention
- building renovation & replacement

mediation

neighborhood association
NGO/NPO/ organizations
(eg. Opzoomer Mee Foundation)
- organize meetings and activities
- coordinate between housing association and residents

bottom-up

residents or interest groups
- appoint leaders
- define programs & activities
- define communal tasks

implement strategies

support and facilitate

RULES
- 20-30% of the land for growing food
not for commercial purpose

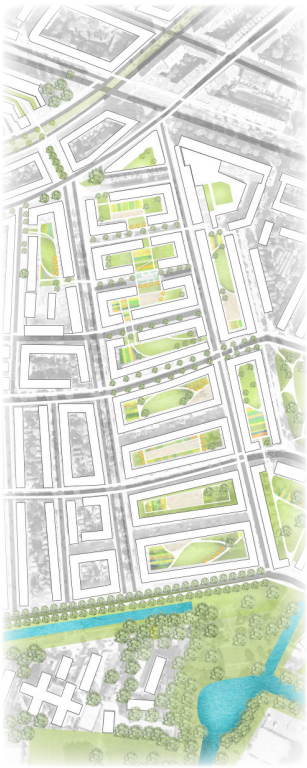
- maintain public access
fences not higher than 1.5m
(visual connection for public)

- define communal tasks
maintain shared-use space clean and tidy

- enhance the sense of community
conduct & support activities and events,
collaborate with potential programs

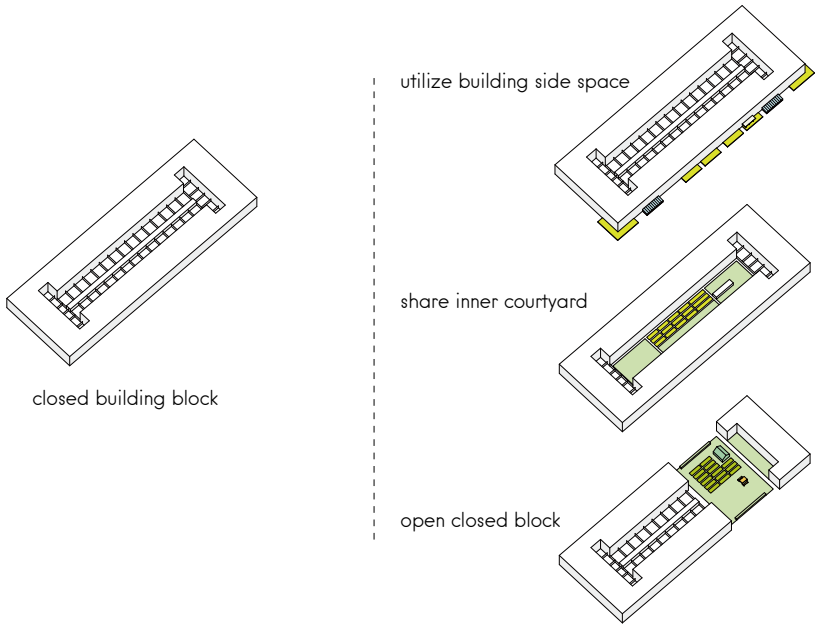
OPEN PRIVATE SPACE - CLOSED BUILDING BLOCKS

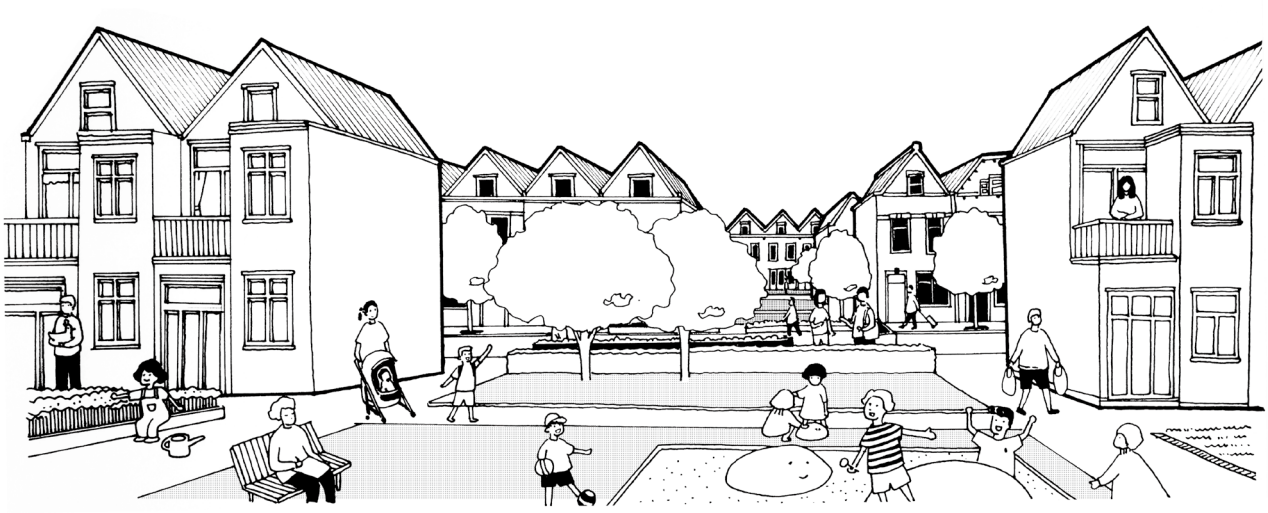
- section F



The transformation of closed building blocks needs the cooperation with private property owners, relevant residents and housing association. The cooperation might lead to different results of design. The project concentrated on the defective building block area in order to proposed one of the possibilities. The space of the existing inner courtyards is too narrow to divide into several compartments for private use, so sharing the inner courtyard is an effectively way to use the space and create interactions between neighbors. The tools for the closed building blocks are applied.

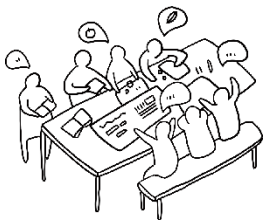
The proposal takes out a few buildings to open the blocks and share the inner courtyard. The landscape is transformed into a continuous image. The intervention creates a scale that is beyond one building block scale and a sense of neighborhood that different blocks are connected. The landscape does not just limit inside one block, but penetrating from one to another. The proposal encourages neighbors to sit together and design (about products and activities) – Each block would house a certain activities and they can produce different products for community share or food bartering.





CREATING A CONTINUOUS LANDSCAPE

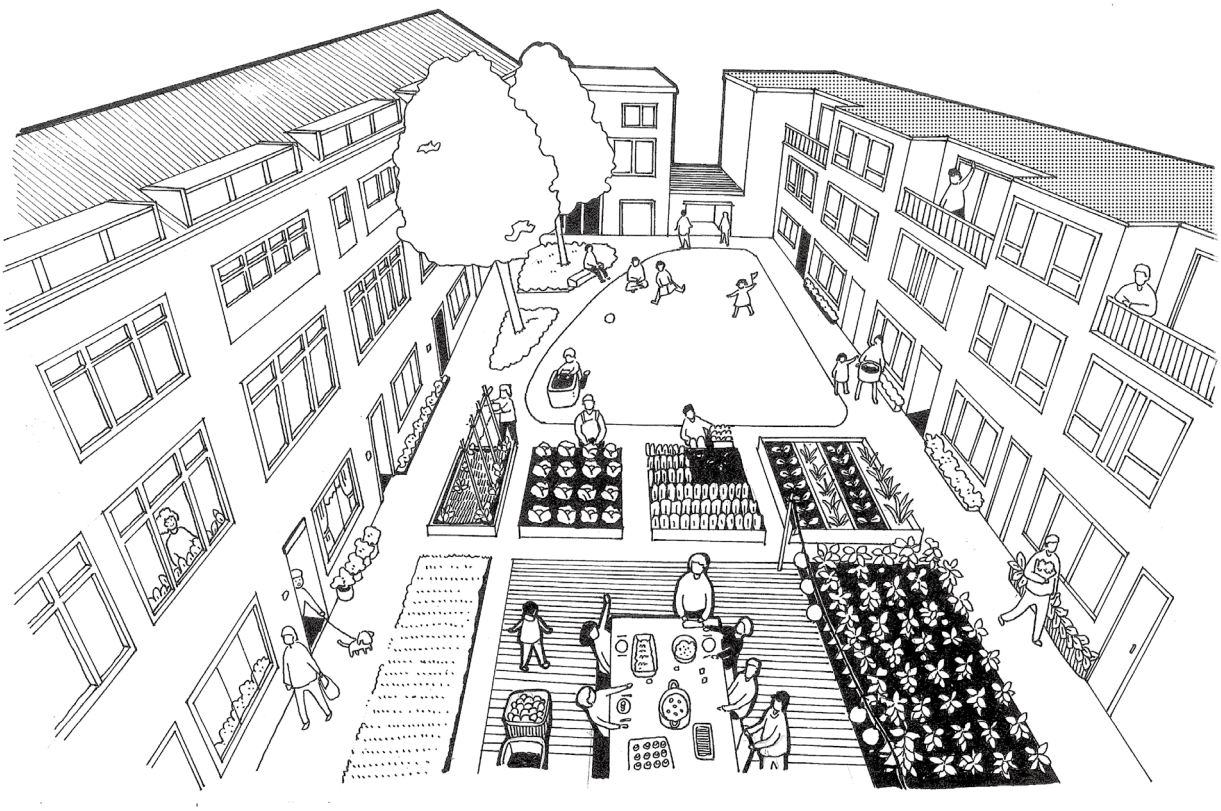
The intervention creates a scale that is beyond one building block and a sense of neighborhood that different blocks are connected. The landscape does not just limit inside one block, but penetrating from one to another.



neighborhood discuss on
programs and food products

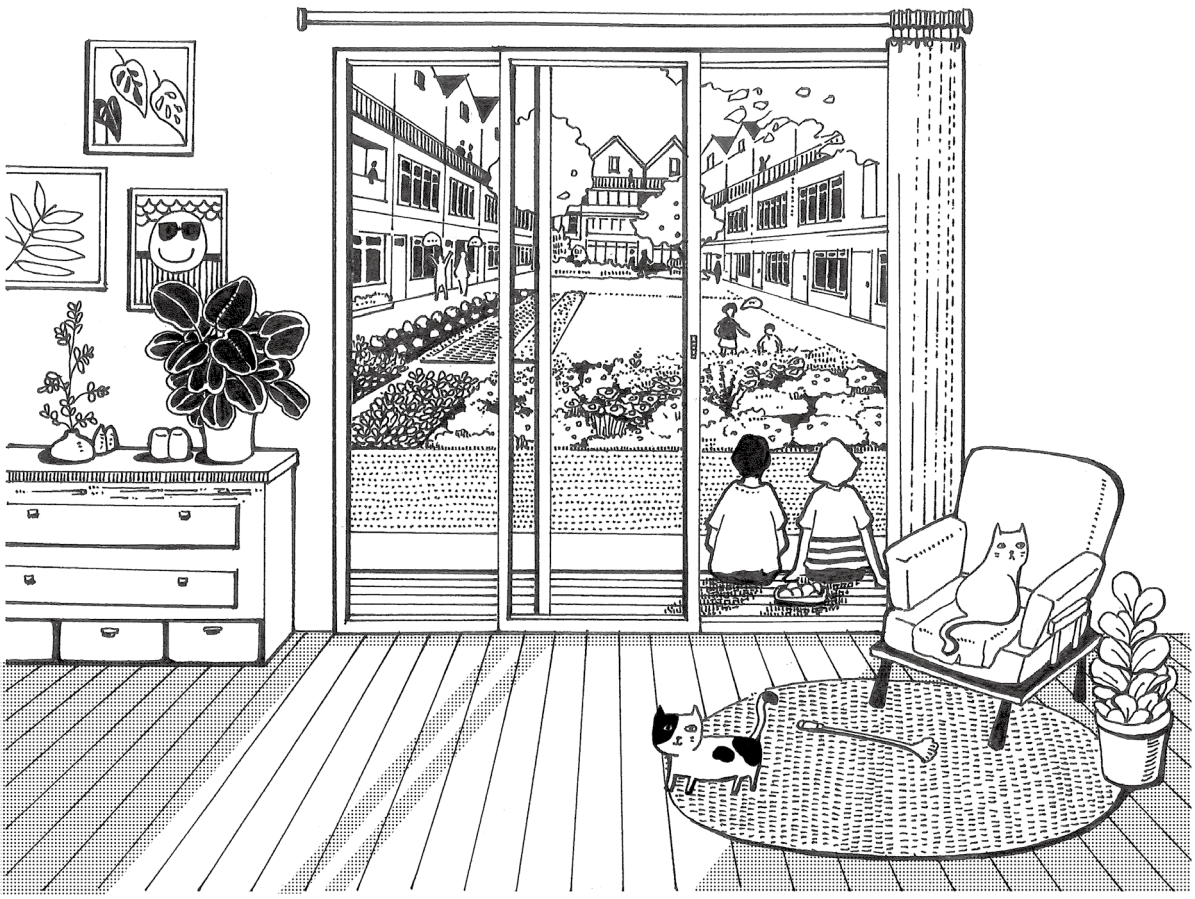
space with differernt functions

community share
food bartering



SPACE INSIDE BLOCK

The space is semi-public space shared with neighbors. Residents can discuss and organize the space with different functions. Different blocks can collaborate to create an intimate neighborhood atmosphere for interaction. Each block would house a certain activities and they can produce different products for community share or food bartering.



WISDOM OF SHARING PRIVATE COURTYARDS

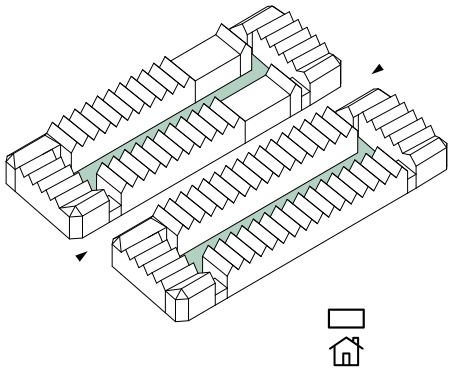
The sharing of private courtyards has many benefits. Every one just shares a small piece of land, but what obtains is far more than that, not only about a more open view of space, but also activating space for food harvest and other activities, encouraging social interaction with neighbors.

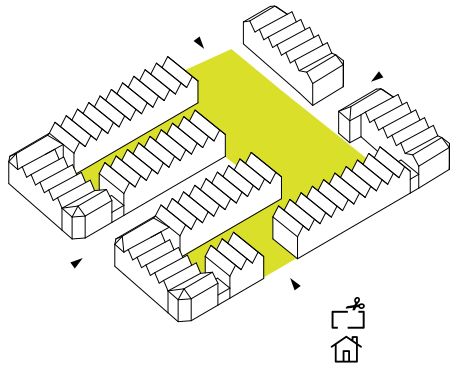
STREET IN-BETWEEN BLOCKS

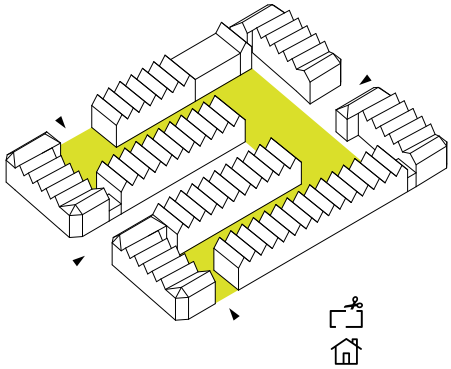
It should point out that utilizing the space in streets is determined by residents. Residents who interest in gardening can form gardening communities. With certain guidelines and regulations, the team can apply for lands and get support from neighborhood association to develop the street space for gardening. The street space in between the blocks is proposed to provide a safe zone for residents created by limiting the traffic, while preserving the bicycle connection.

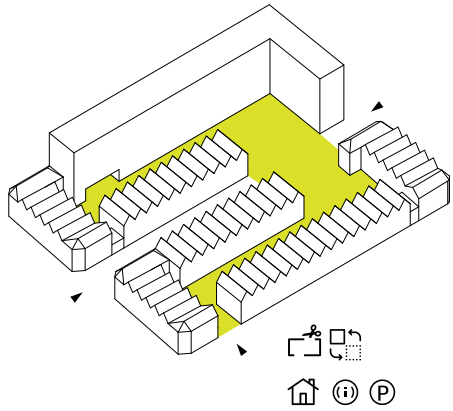
PROPOSED BUILDING TYPOLOGIES

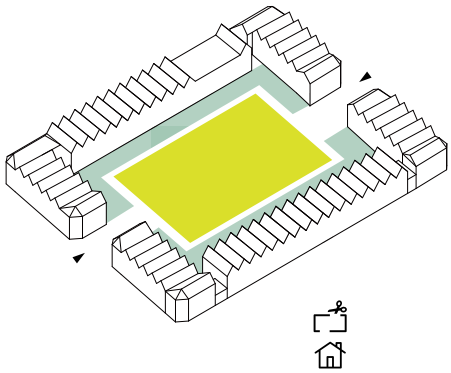
For the closed building block area, the basic intervention is to 'cut' the blocks to make it open. The main buildings are attached single-unit housing, which is only three floors. Considered the potential increasing population in the future, the followings are proposed building typologies based on the fabric. The proposal not only includes replacing the type into multi-units housing, but also accommodates increased programmatic demands. The levels of privacy will also vary according to different configurations.

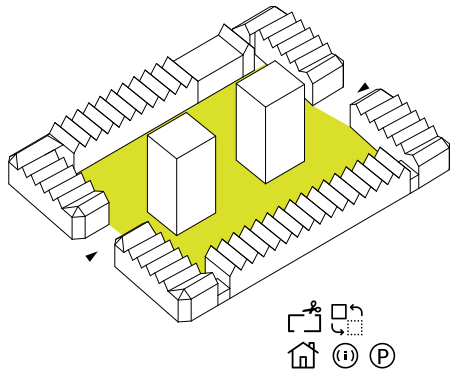












INTERVENTION

EXISTING SITUATION

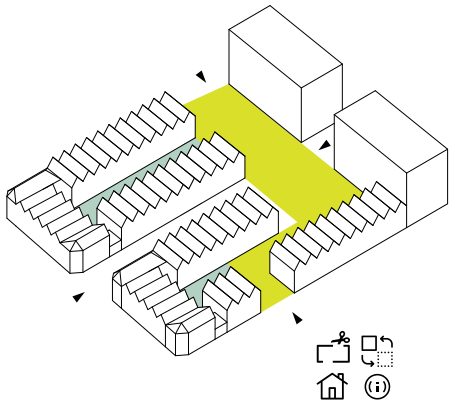
attached single-unit housing (3F)
with private inner courtyards

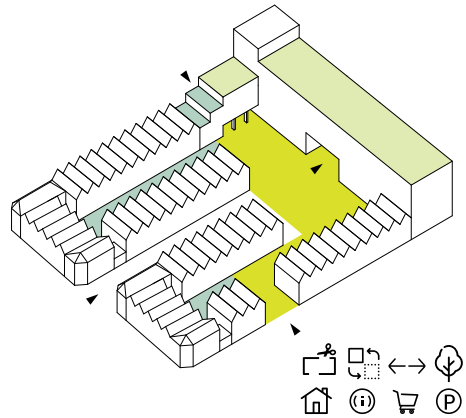
CUT REPLACE CONNECT GREEN ROOF

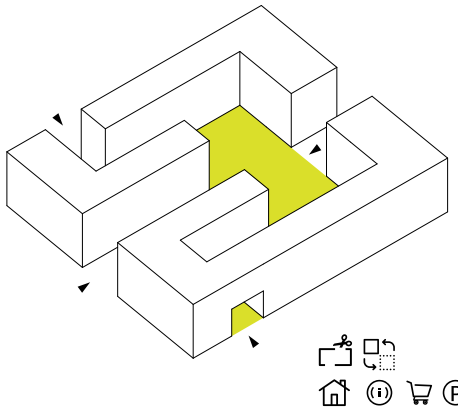
FUNCTION

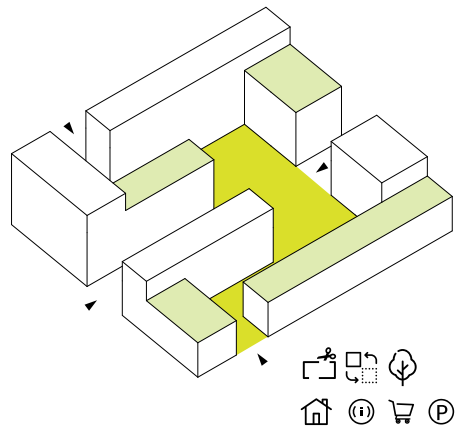
RESIDENTIAL SERVICES

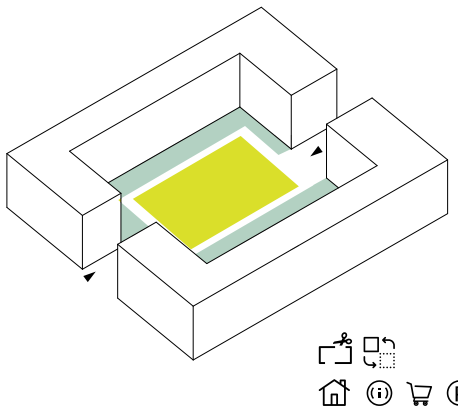
COMMERCIAL NEW PARKING SPOTS

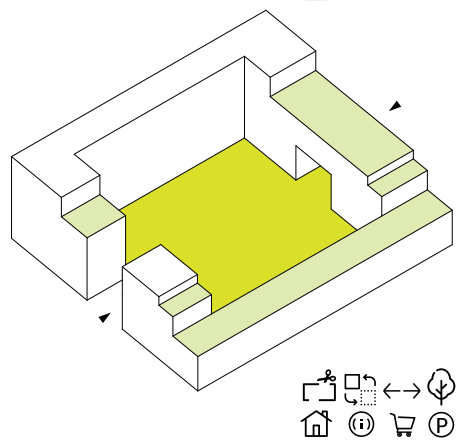












INTERVENTION

CUT

REPLACE

CONNECT

GREEN ROOF

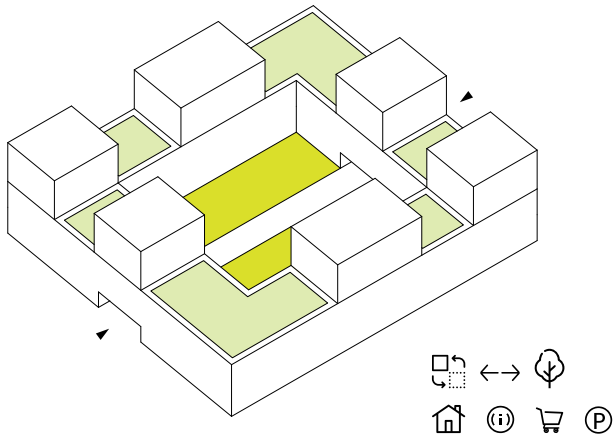
FUNCTION

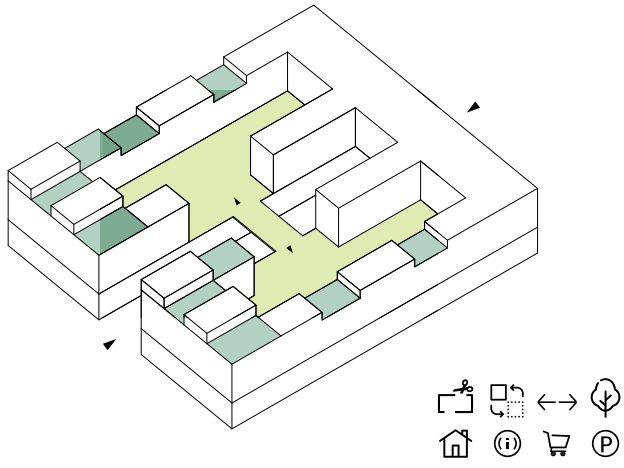
RESIDENTIAL

SERVICES

COMMERCIAL

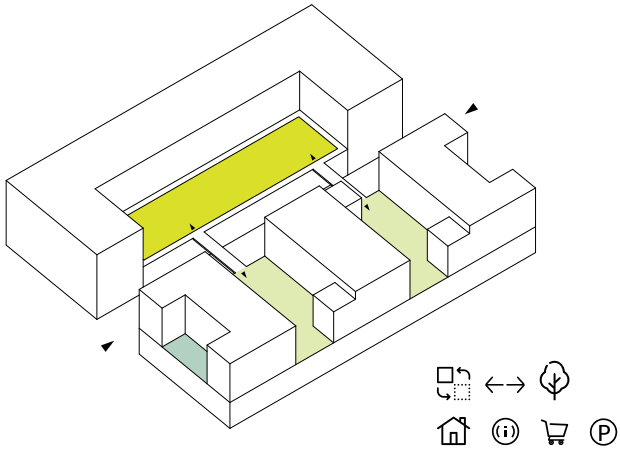
NEW PARKING SPOTS

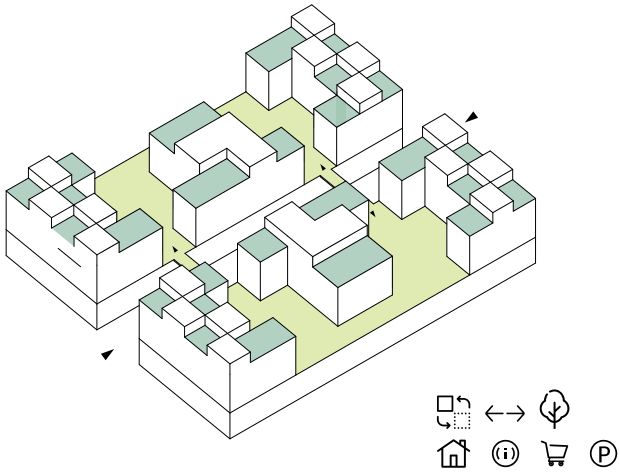




PRIVACY

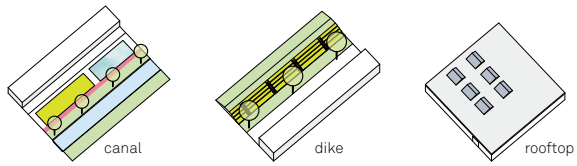
PRIVATE SEMI-PRIVATE SEMI-PUBLIC



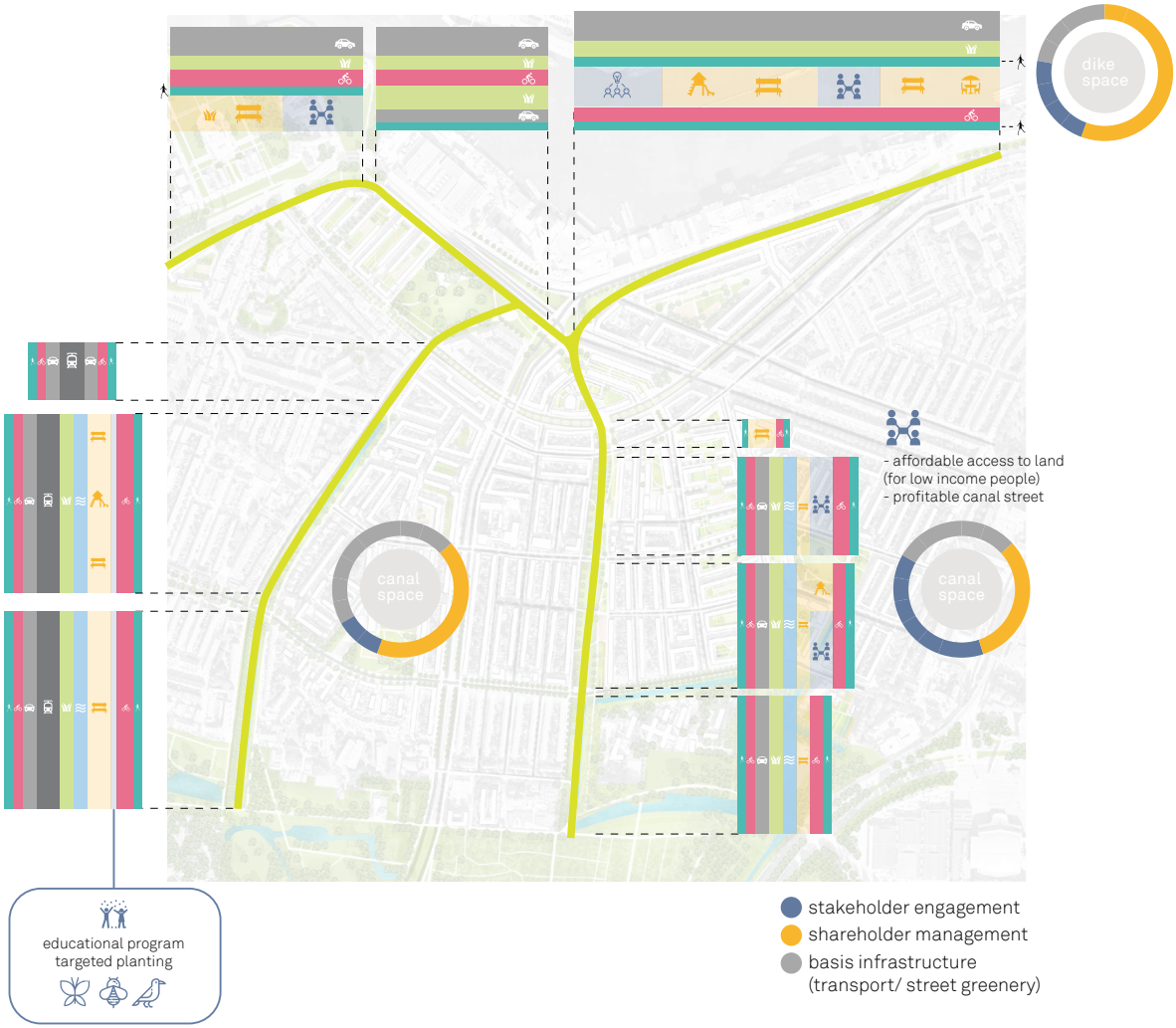


OPEN PUBLIC SPACE

STAKEHOLDER ENGAGEMENT



For open public space like canal, dike and rooftop space, the strategy is to solicit the public opinions about the activities and programs. Besides, 20-30% of the land will be distributed to interest stakeholders (communities, neighborhood association and educational institution) to develop and maintain the space.



stakeholders

neighborhood association
organize meetings & activities

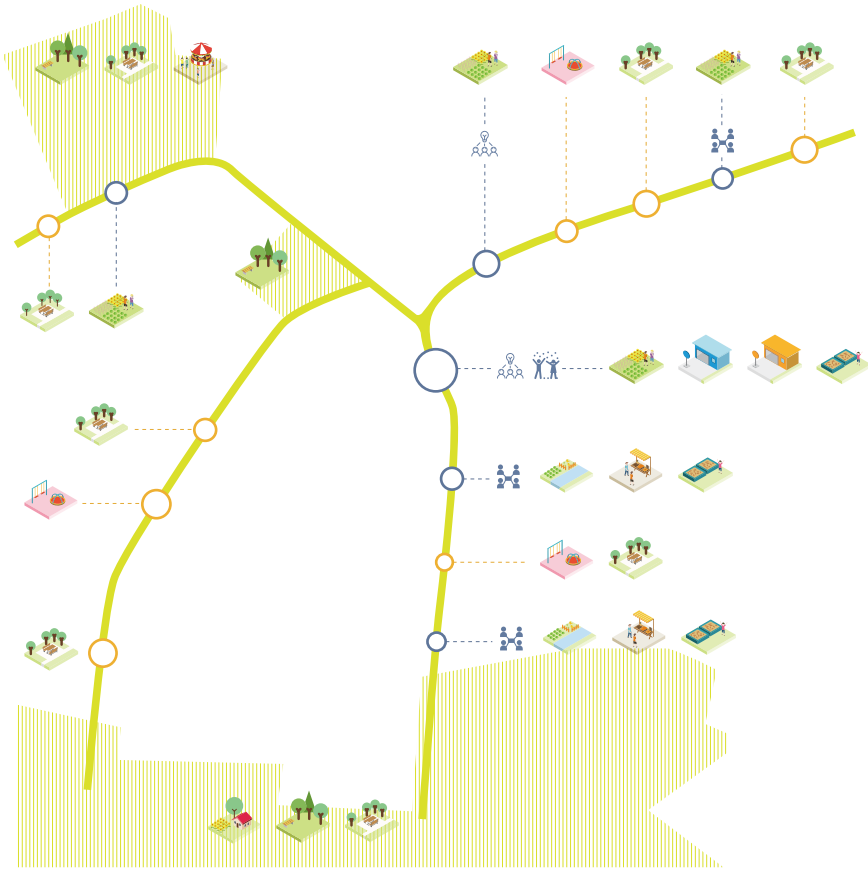
- affordable access to land
- (for low income people)
- profitable canal street
- neighborhood tour

NPO/NGO
volunteer-based

- activities and workshop
- healthy event/festival
- training section

NEARBY SCHOOLS
teachers and students

- programs for targeted-planting
- outdoor classroom
- activities and workshop



A variety of uses were introduced into the site, appealing to a range of resident needs and interests.

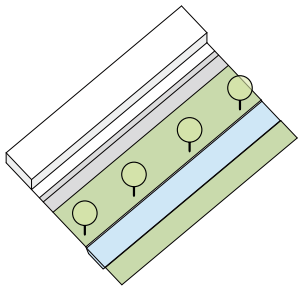
CANAL AS SEMI-PUBLIC SPACE

TOP DOWN --- BOTTOM-UP

SECTOR

public

TYPOLOGY



canal

ACTOR

municipality
traffic department
department of water management
residents/interest groups
NGO/NPO
neighborhood association

low intervention

high intervention

ORGANIZE

municipality
nearby schools
NGO/NPO
- educational programs
- targeting planting for impoving the existing vegetation to attract pollinators

ORGANIZE

top-down
municipality
traffic department
department of water management
- make space for rest areas and gardens (traffic limit & street surface improvement)
- strategy promotion for residents' ideas

mediation
neighborhood association
NGO/NPO
- in charge of certain land (management)
- conduct events and activities
- local leaders and coordinators

bottom-up
residents
interest groups
- apply for land use
- take part in activities

RULES

- maintain public space in a nice look

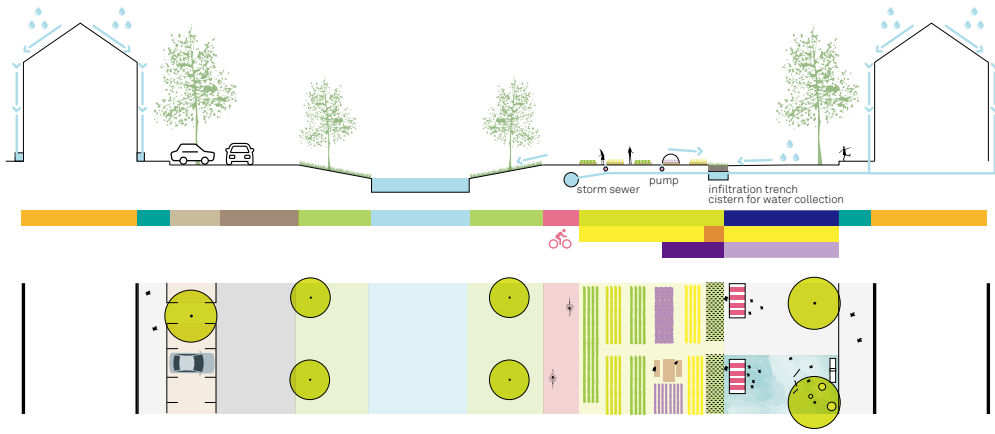
- allow for commercial uses (retail sales in certain time of a day)

- collaborate with educational and social programs, such as training sections and learning farm

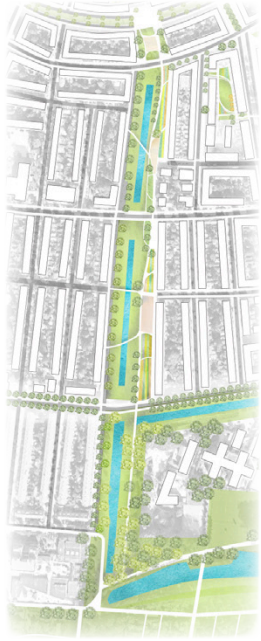
- pre-seeded vegetable garden for a whole season from May to October with different vegetables and flowers

CANAL AS PRODUCTIVE OPEN SPACE

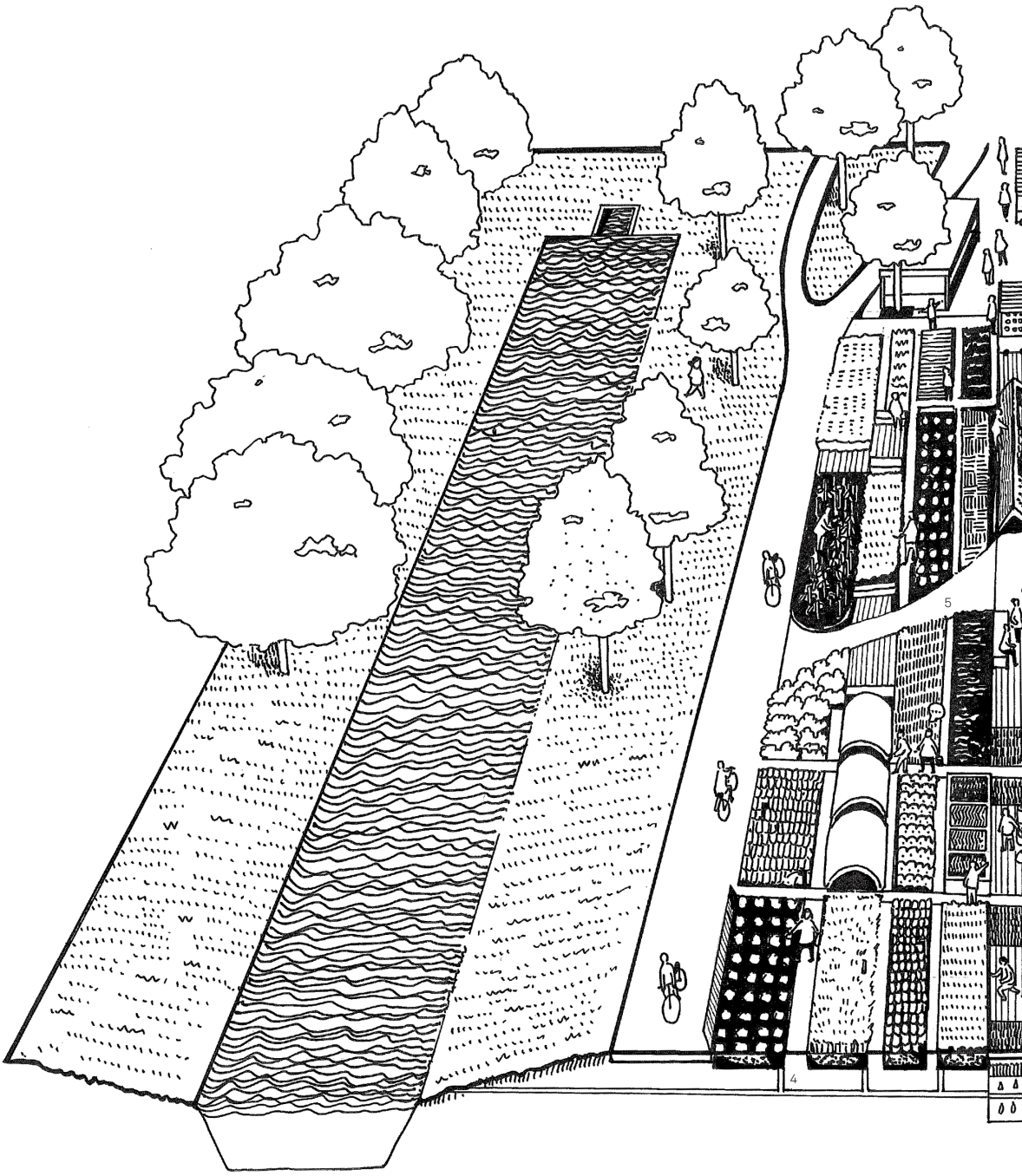
- section E



The canal (Lepelaarsingel) is the central corridor in this neighborhood, but the existing situation is underused. This area is proposed to be a productive open space – lands for low-income people to plant and playground for children. The project works with neighborhood association that leases the lands out to people in need. People who adopt the land can grow food for personal used or sale, but they also have an obligation to maintain the space. This street allows people to sell their own food directly. The project collaborates with experienced farmers that mentor the beginners to produce food in an organic way.



The drawing indicates a process - after the intervention of canal there are reasons that attract more people coming. There grows the need for other activities and collaboration with local businesses. The ground floor of the residential building can be transformed as a space for café, restaurants and stores. The outside changes lead to the open of the inner courtyards; the mono-use residential space becomes a mixed use place. The changes provide a measurable economic and social return on investment to both local businesses and residents.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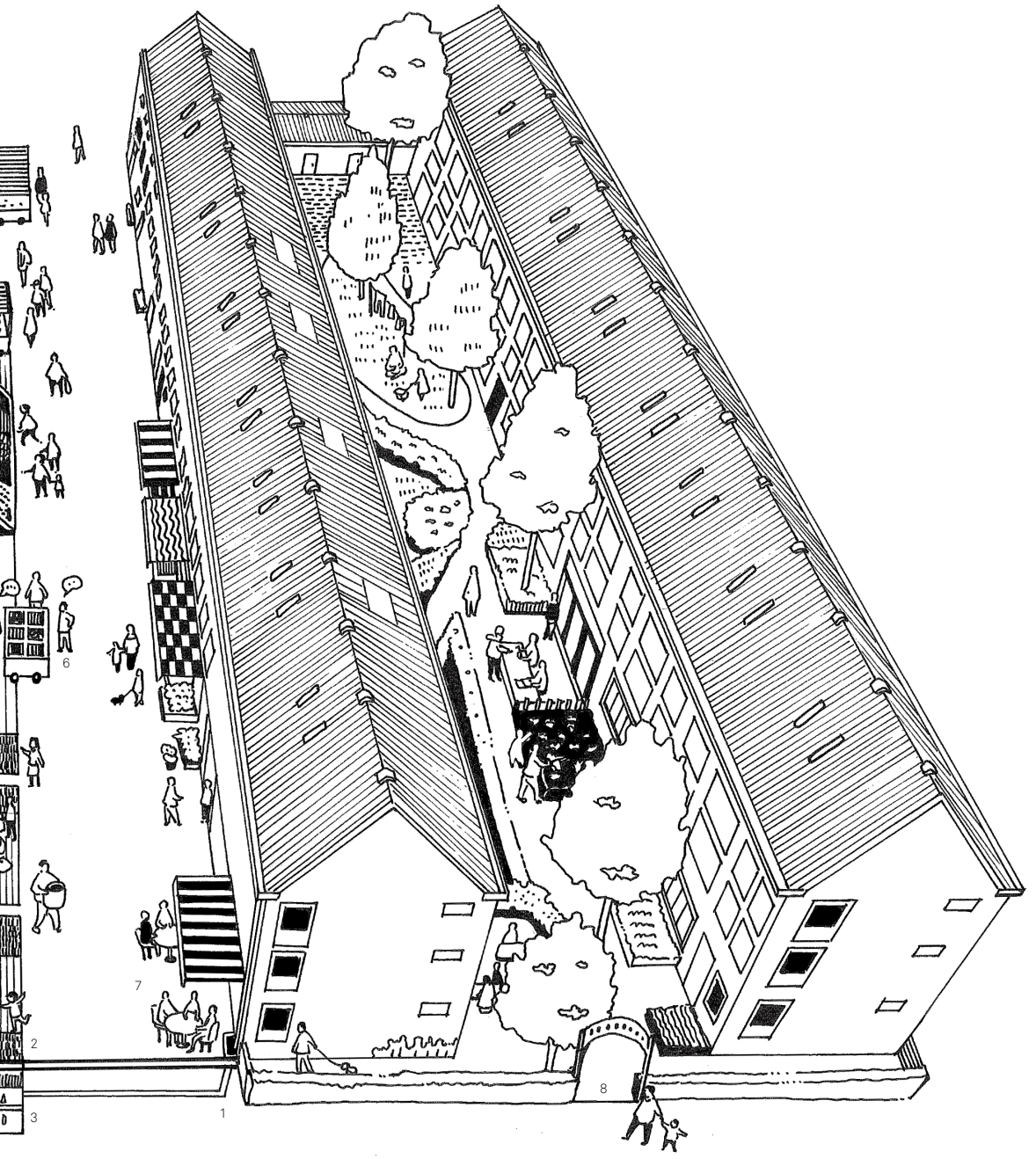


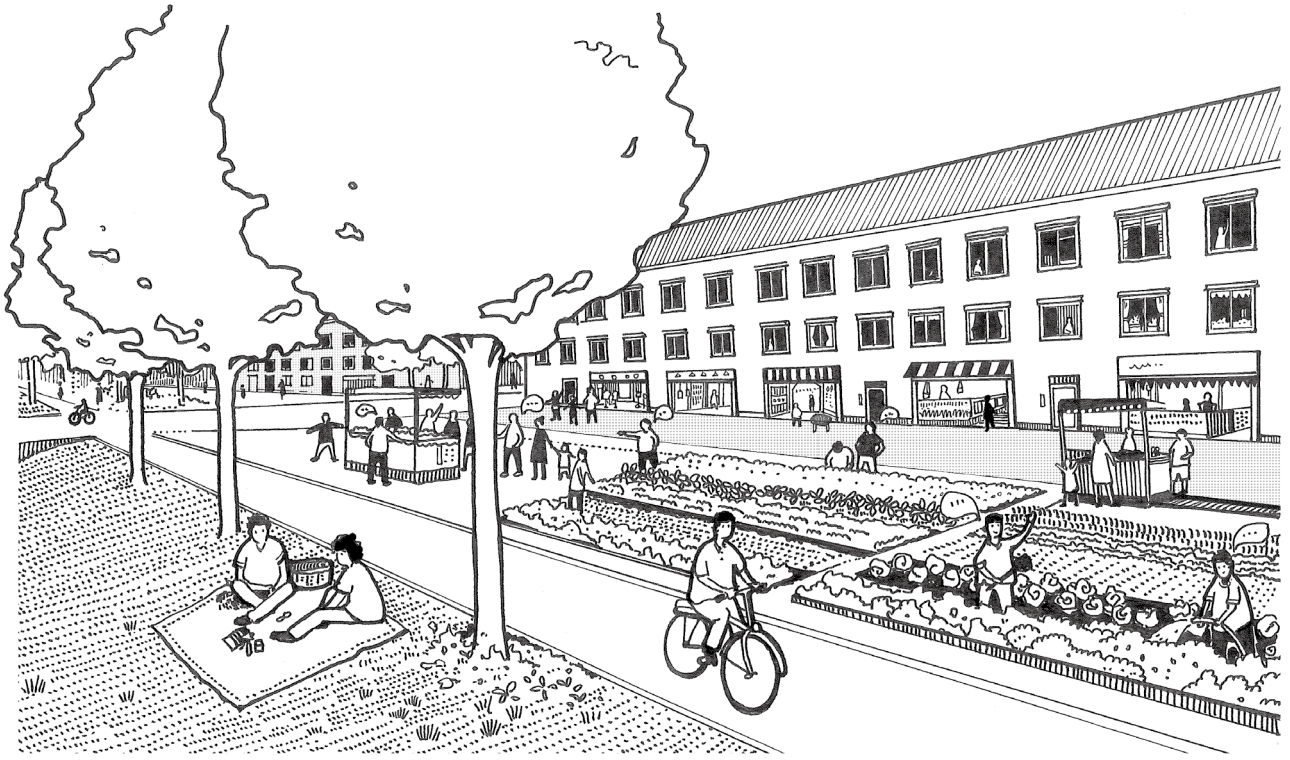
The drawing zooms in one part of the canal.

1. collect rain water from rooftop
2. infiltration trench - filter & collect
3. underground cistern - storage
4. irrigation - water supply
5. productive space
6. direct sale on street
7. local businesses - store/cafe/restaurant
8. inner courtyard as open territory

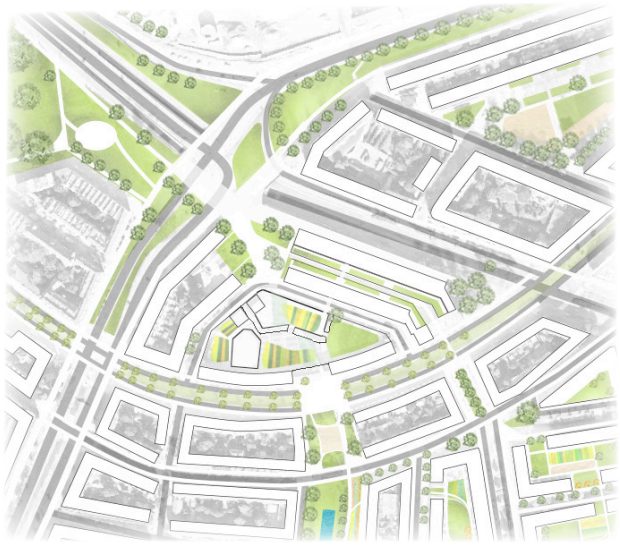
Mentoring beginners

Direct sale on street

Collaborate with
local businesses

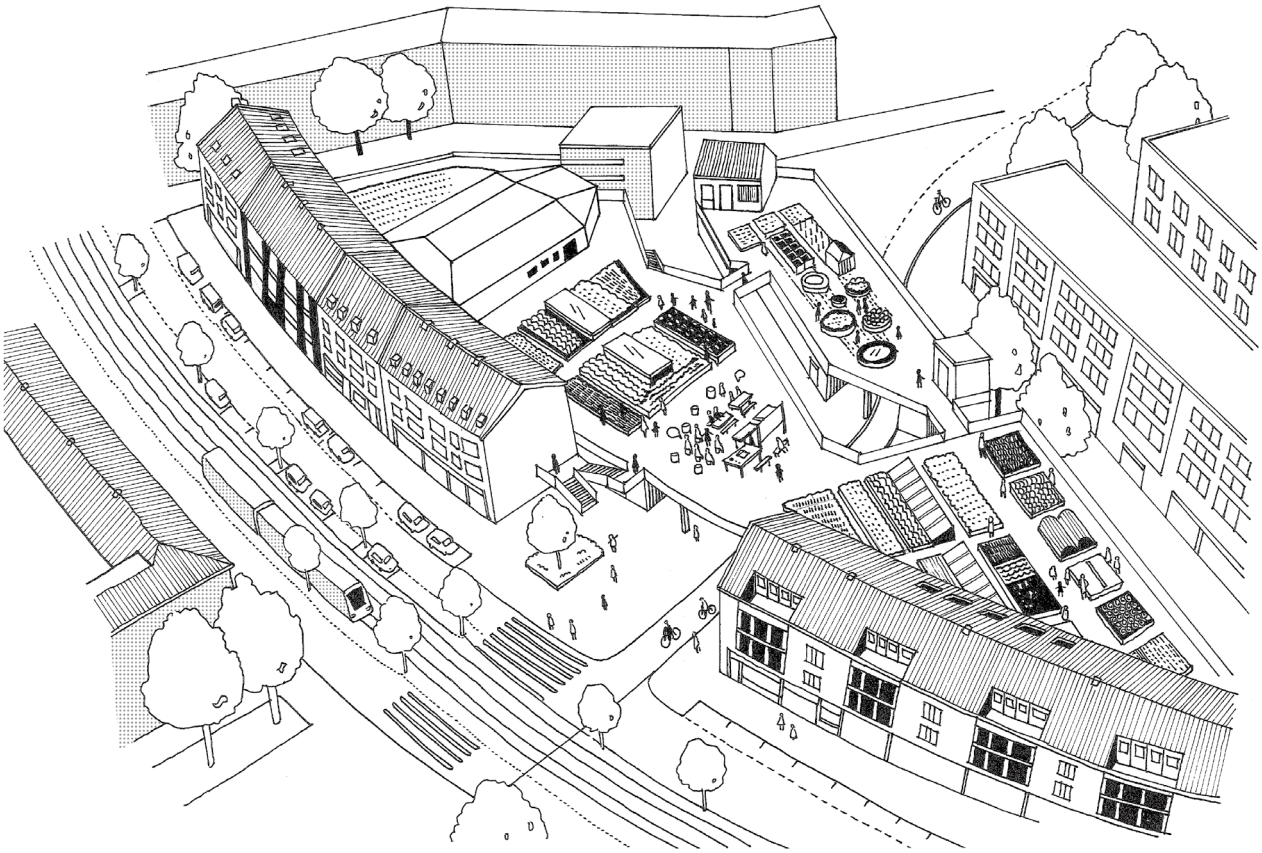


ROOFTOP FARM + STORAGE & RECYCLING SPACE



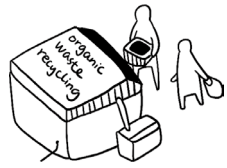
This area is the missing link between dike and canal. The inner building is a one-floor structure, which contains a car inspection, garage and stores (analysis-page.234). The area is isolated from the surrounding, leading the business into a bleak image. The idea is to open up the enclosed area by removing parts of buildings and reconnect with the surrounding, while at the same time enhance and redevelop the rooftop structure. The garage would be relocated and part of the ground floor would be open as passage for connection, as well as space for food storage, waste-recycling.

The rooftop structure will be space for farming and meeting, which will be a place providing lectures, training and employment opportunities for the residents, but also educational programs for children. The place is considered to be information access spot. The rooftop farm collaborates relevant communities and organizations with the nearby schools, providing courses as well as after-school programs. The programs not only promote food-related knowledge, but also integrate with art and recycling workshop, and other interesting activities.



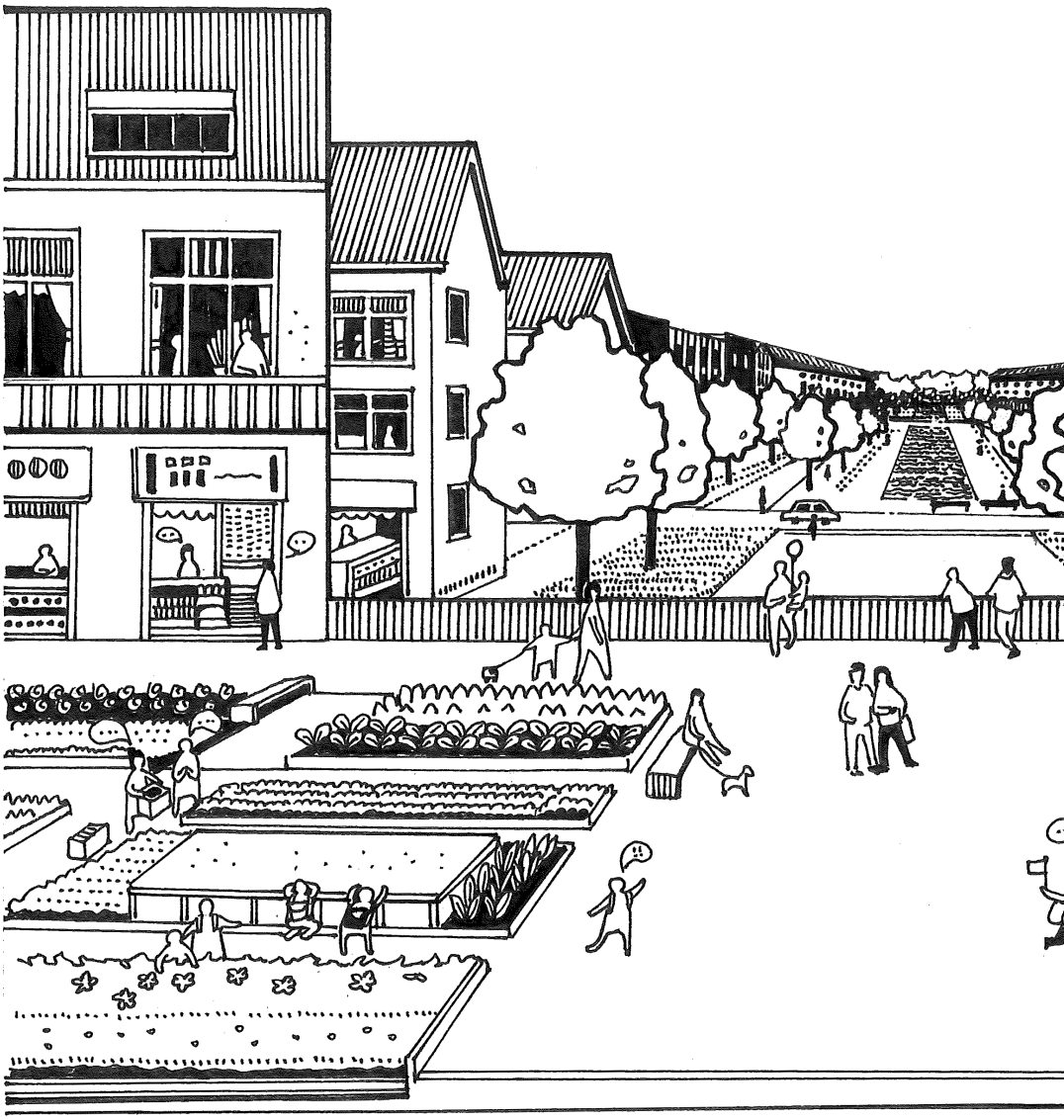
training section
and workshop

educational programs
for children



organic waste
recycling

food storage

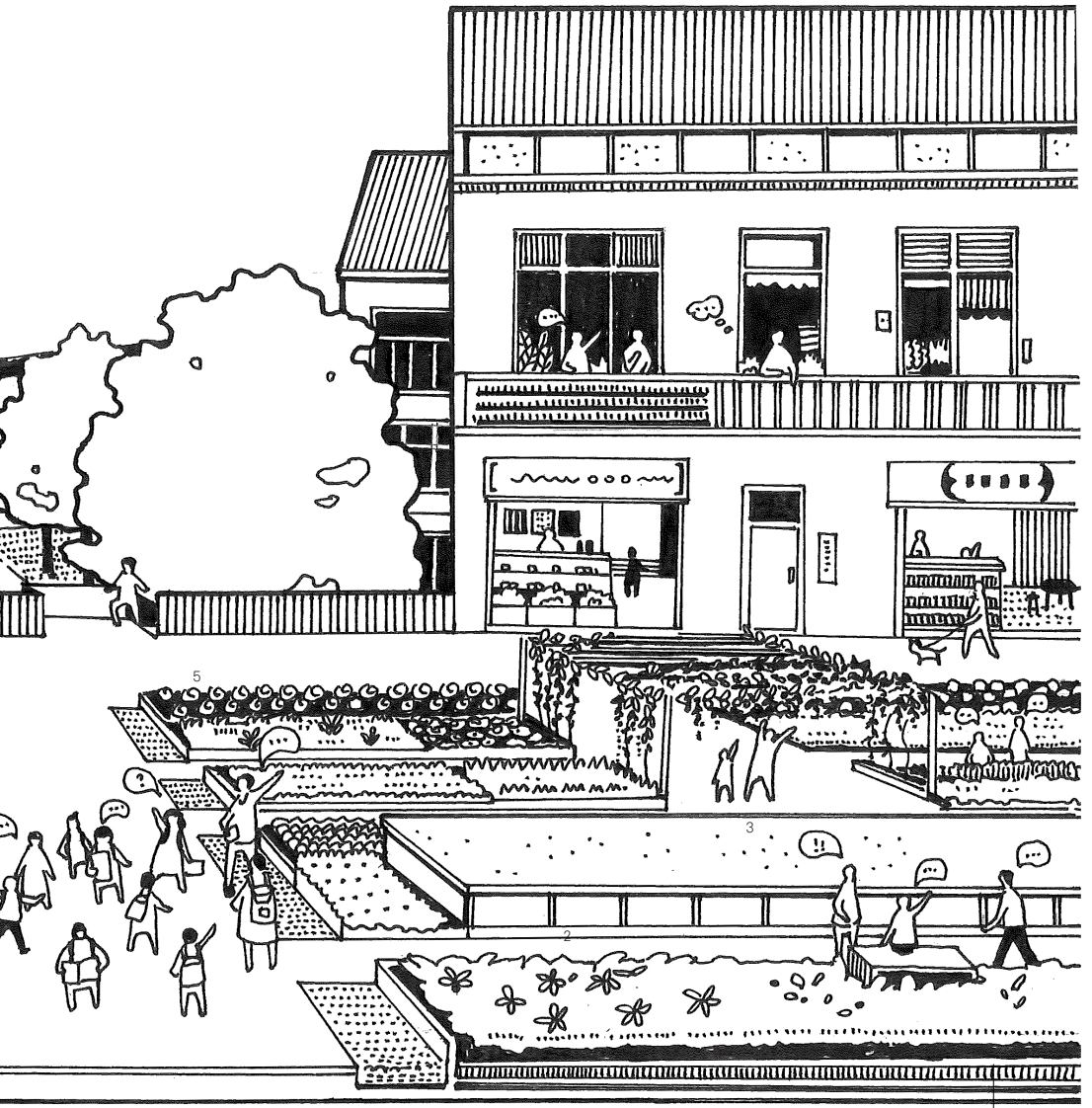


ROOFTOP AS A NEW PLATFORM

The activation of the rooftop also increase number of groceries and other local retail opportunities both on groundfloor and first floor. The rooftop becomes a platform for various activities, providing visual connection of canals, Zuiderpark and Maashaven.

The drawing zooms on the rooftop view

1. enhanced rooftop structure
2. roof ventilation
3. rack for plant climbing
4. first floor stores
5. outdoor stairs
6. canals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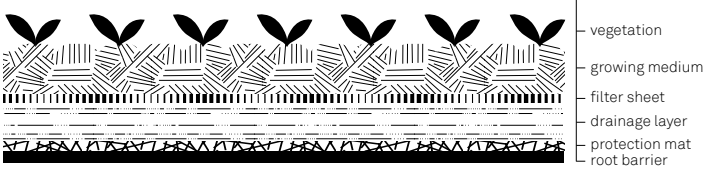
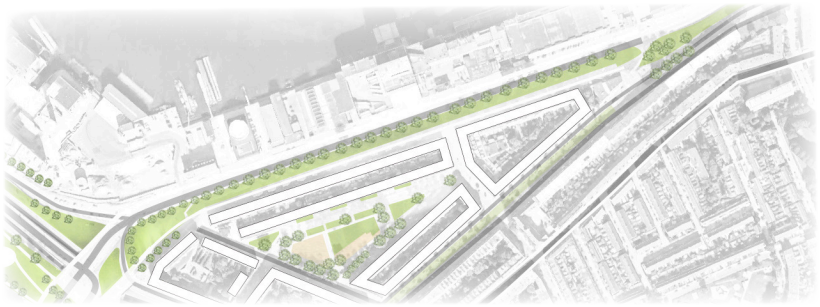

vegetation
growing medium
filter sheet
drainage layer
protection mat
root barrier

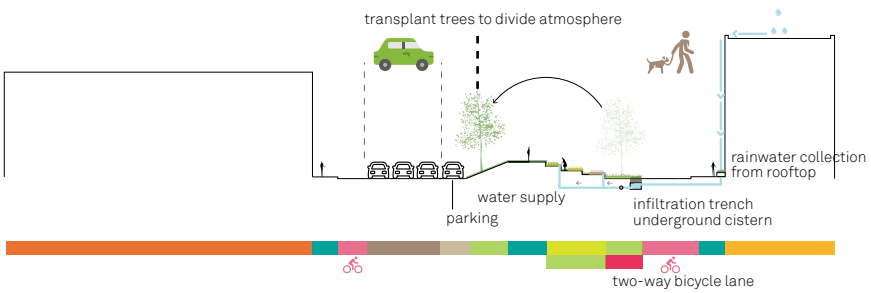
DIKE FOR MULTIPLE ACTIVITIES

- section D



The city dike locates at the edge of the site. Many commuters walk along this street to the metro station. On both sides of the dike, the outer dike area is a large-volume vehicular road, but the inner part is parking space and one-way road. The idea is to preserve the high-volume vehicular road, convert the low volume traffic into two-way bicycle lane, and transform the inner dike into an open and gathering place. Trees will be transplanted to divide the atmosphere between traffic and public space.

As an open public space, the dike does not only serve for local residents, but also face to the citizens and visitors. As a long linear space, the intervention of dike is the combination of different programs that encourages the flexibility to host different activities. People can walk both on dike or street, without disturbing by cars. The street has potential to be lined with stores whose business would be enhanced by the flow of pedestrians past their doors. Besides walking and biking, the area serves as community garden, playground, space for rest and gathering. It can also be converted into event space. Portable planters can be relocated to release space; bicycle lane can be altered into space for markets, exhibition and outdoor performance, which has flexibility for different features.



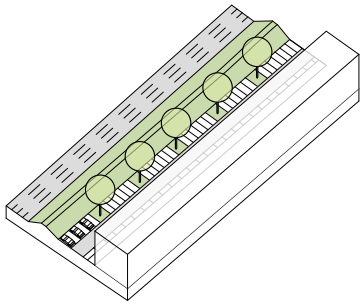
DIKE AS PUBLIC SPACE

TOP DOWN --- BOTTOM-UP

SECTOR

public

TYPOLOGY



dike

ACTOR

municipality
traffic department
department of water management
residents/interest groups
NGO/NPO
neighborhood association

(When the strategy was promoted, there would be two ways to set up the project: bottom-up initiation and top-down initiation. The actors will function as different roles. The scheme will be shown on the following pages.)

RULES

- limit the vehicular traffic during a certain period of time for ensuring the safety of the activity area

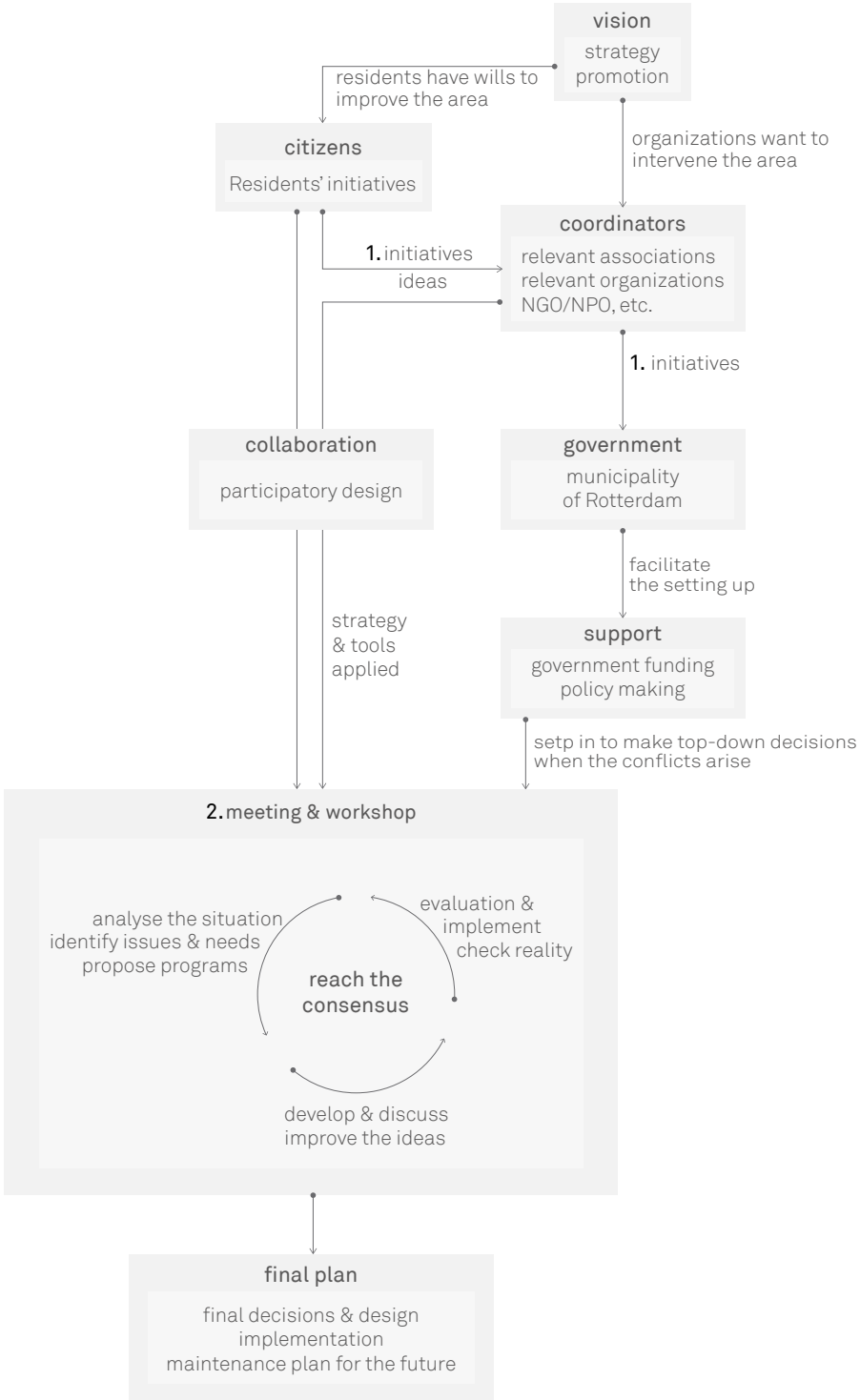
- ensure the continuity of the street and dike

- designated by different programs
flexible for various activities & events

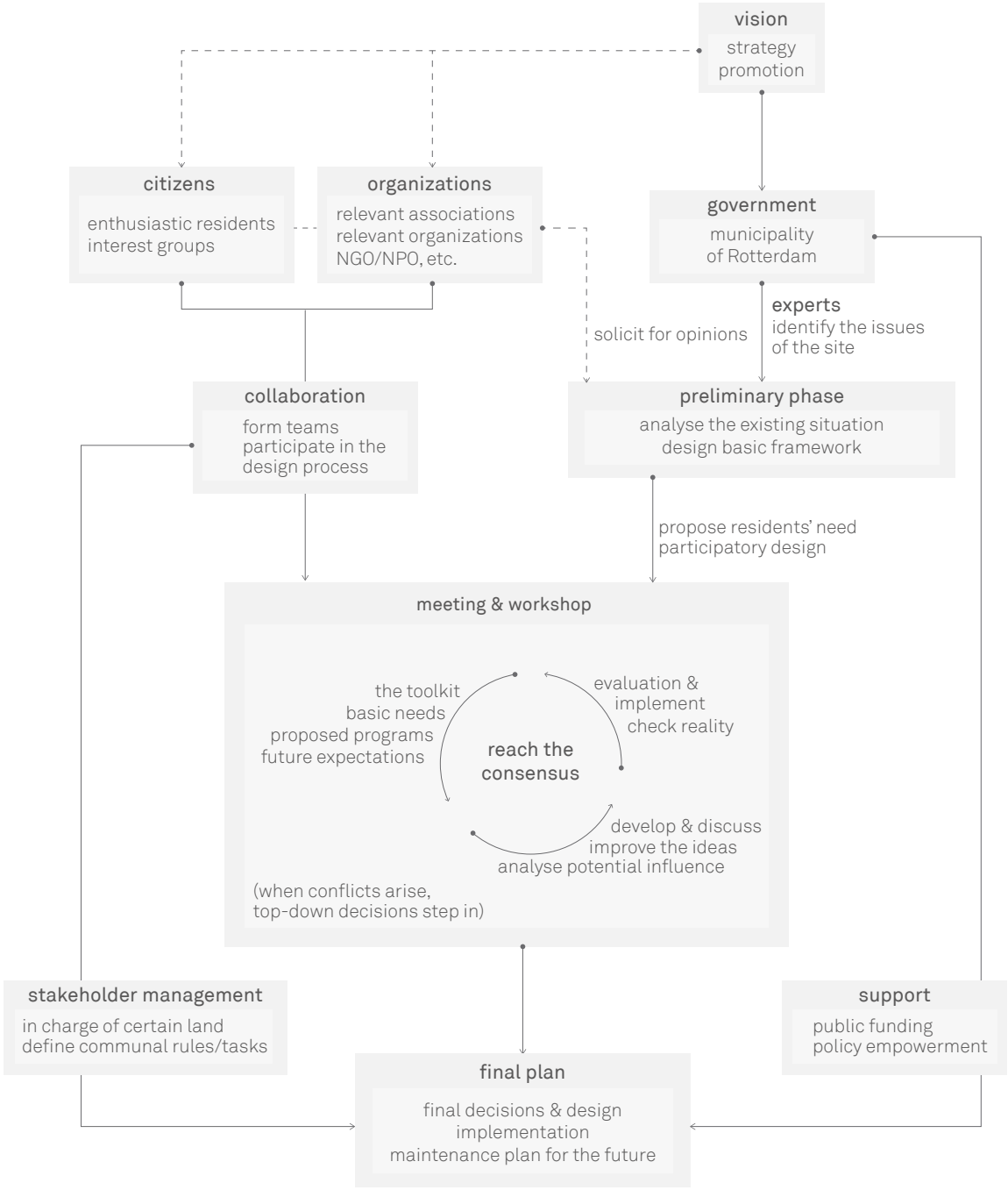
- maintain community gardens in a nice look

- pre-seeded vegetable garden for a whole season from May to October with different vegetables and flowers

bottom-up initiation



top-down initiation



SITEPLAN OF THE DIKE

0 10 20 50 100m

A. COMMUNITY GARDEN
B. AMPHITHEATRE
C. PLAYGROUND
D. REST AREA
E. PRESERVED PARKING SPACE
F. BICYCLE PARKING SPACE

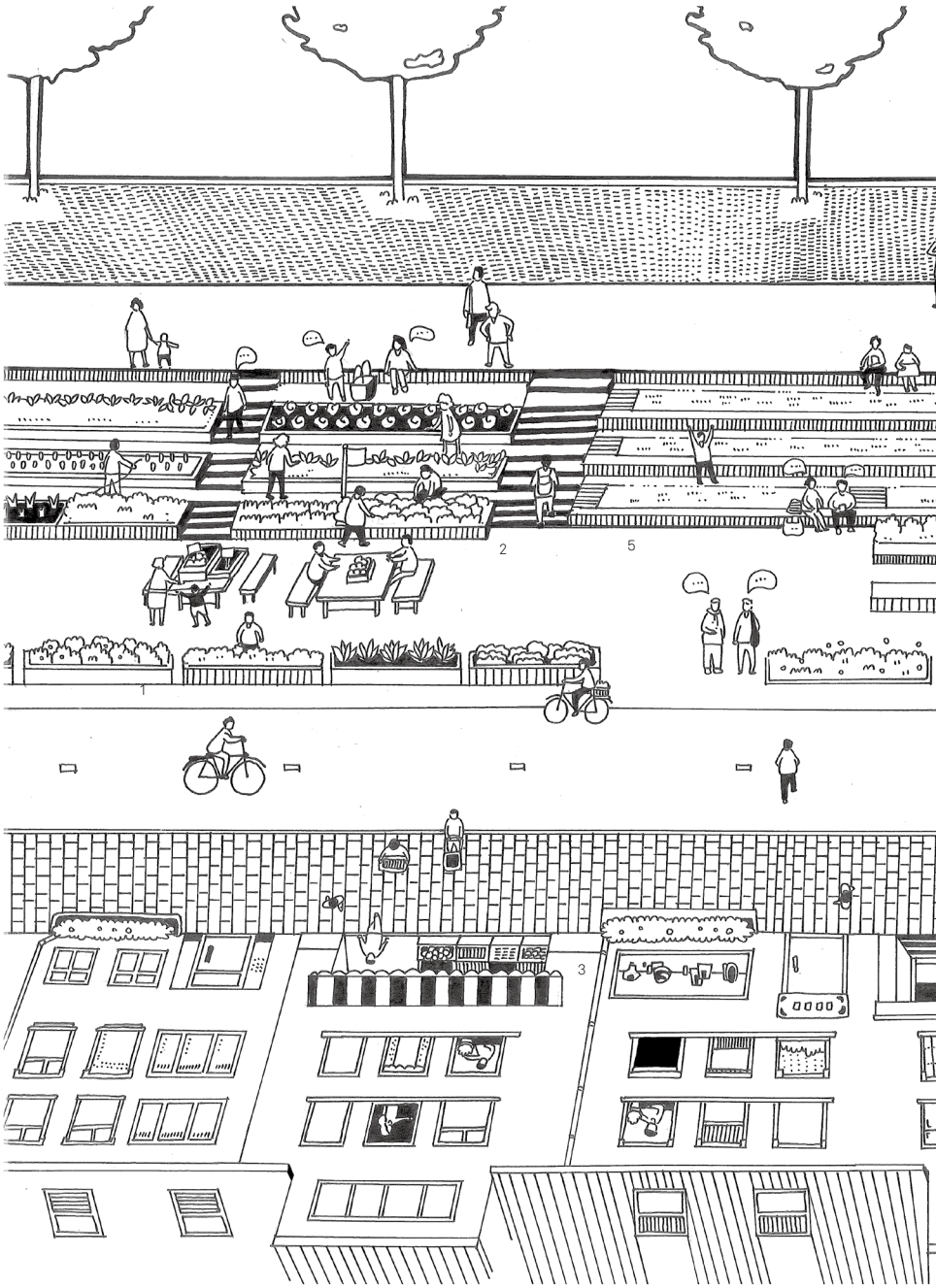
A. COMMUNITY GARDEN

B. AM

PHITHEATRE

C. PLAYGROUND

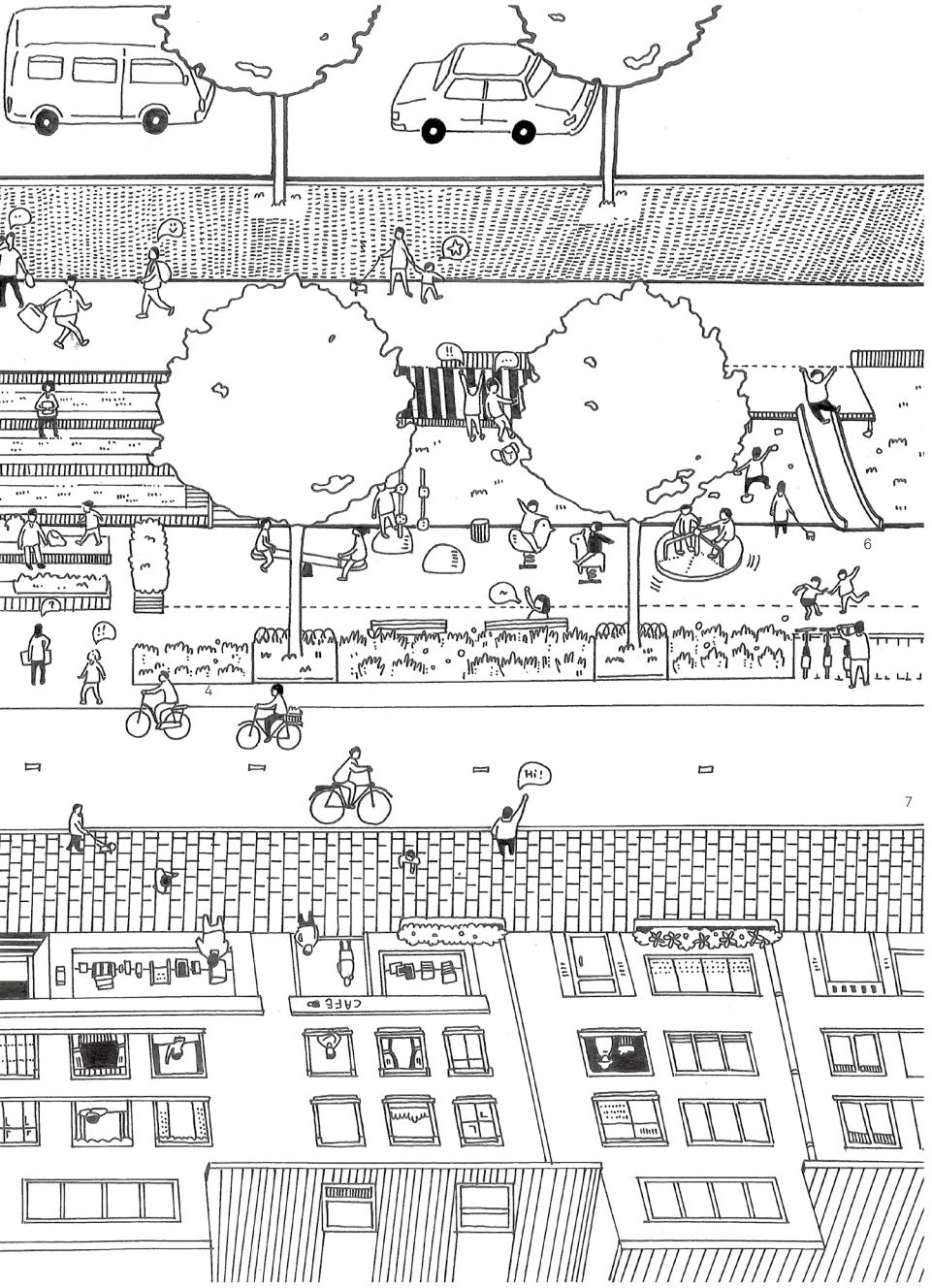
D. REST AREA

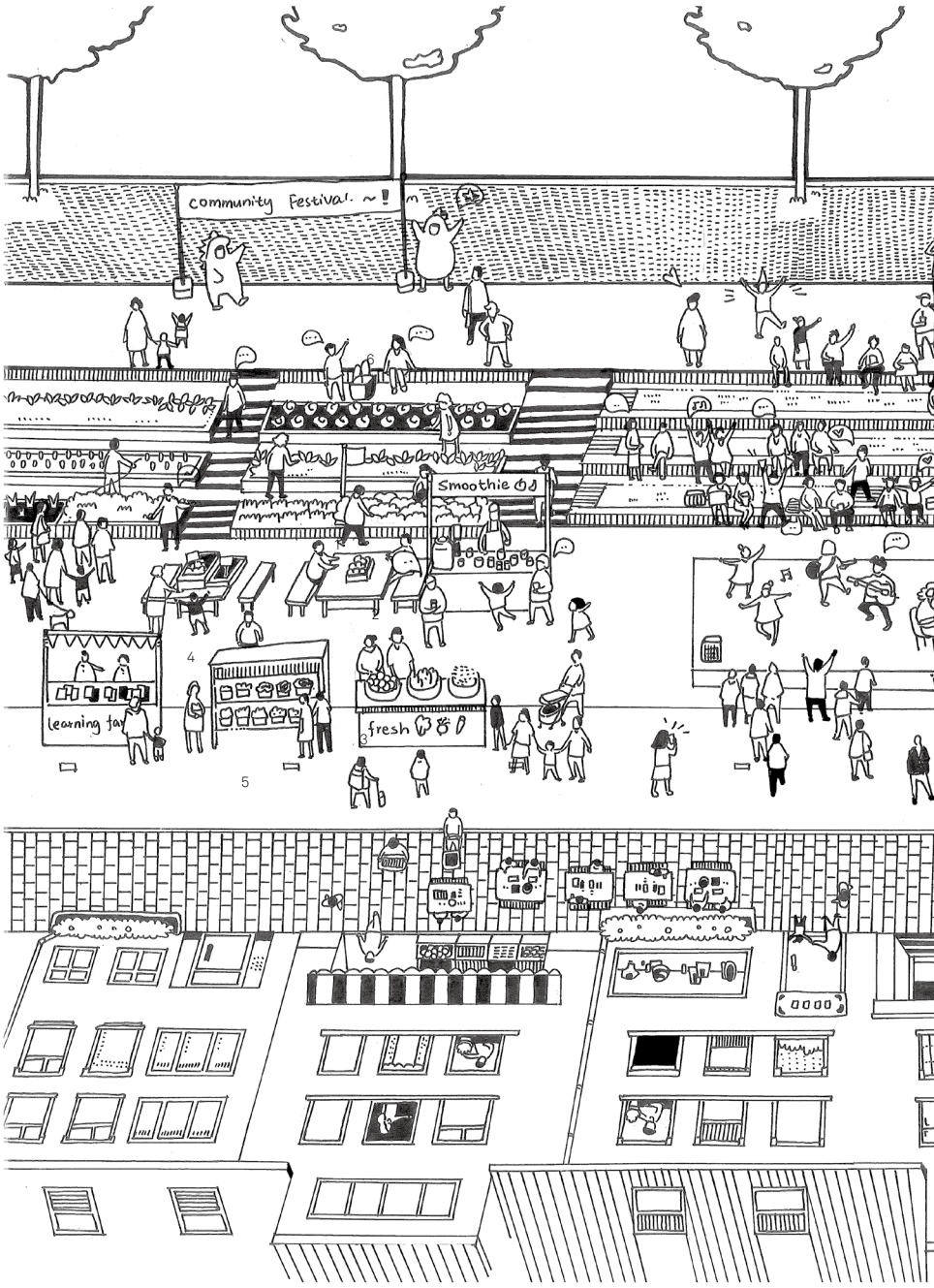


DIKE FOR MULTIPLE ACTIVITIES

The drawing zooms in one part of the dike.

1. portable planters
2. terraced in-ground beds for food growing
3. groundfloor store/cafe/restaurant
4. infiltration trench - collect rainwater
5. terraced seating
6. playground
7. two-way bicycle lane

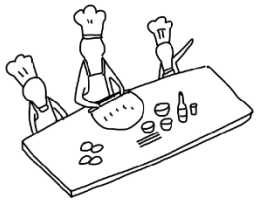

6
4
7
Hi!
CAFE



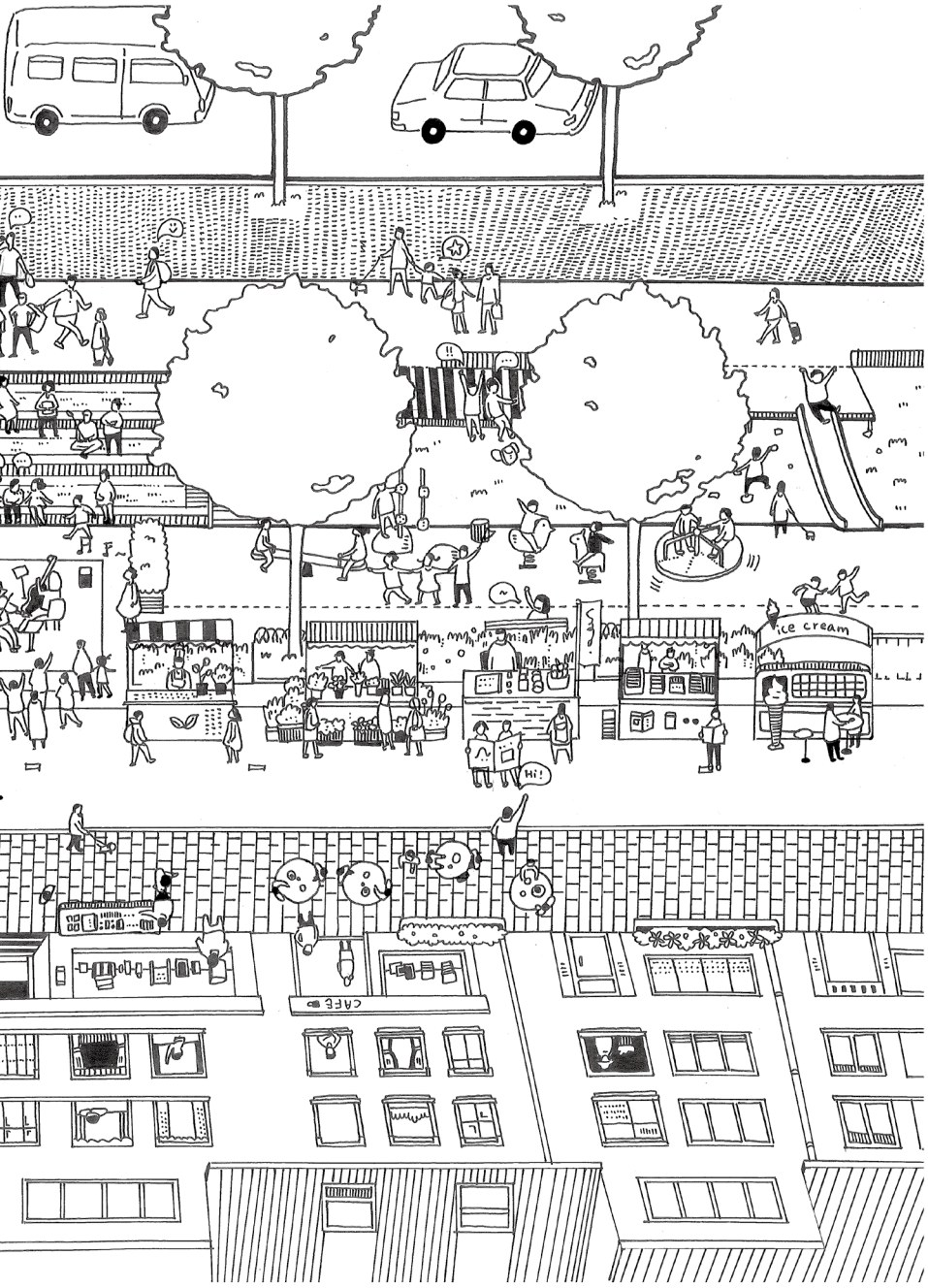
The drawing shows the dike is converted into space for events.

1. terraced seating as amphitheatre space
2. performance area
3. bicycle lanes is converted into market space
4. relocate portable planters to release space
5. street open for different uses
6. decoration on dike

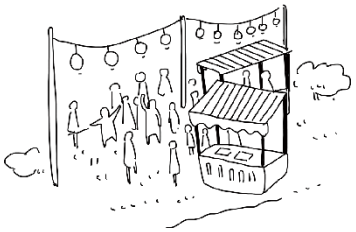
community garden
with portable planters



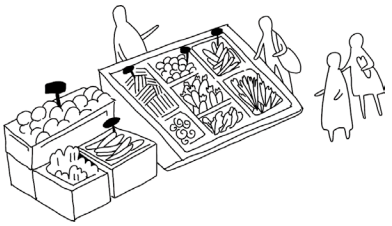
temporary outdoor kitchen



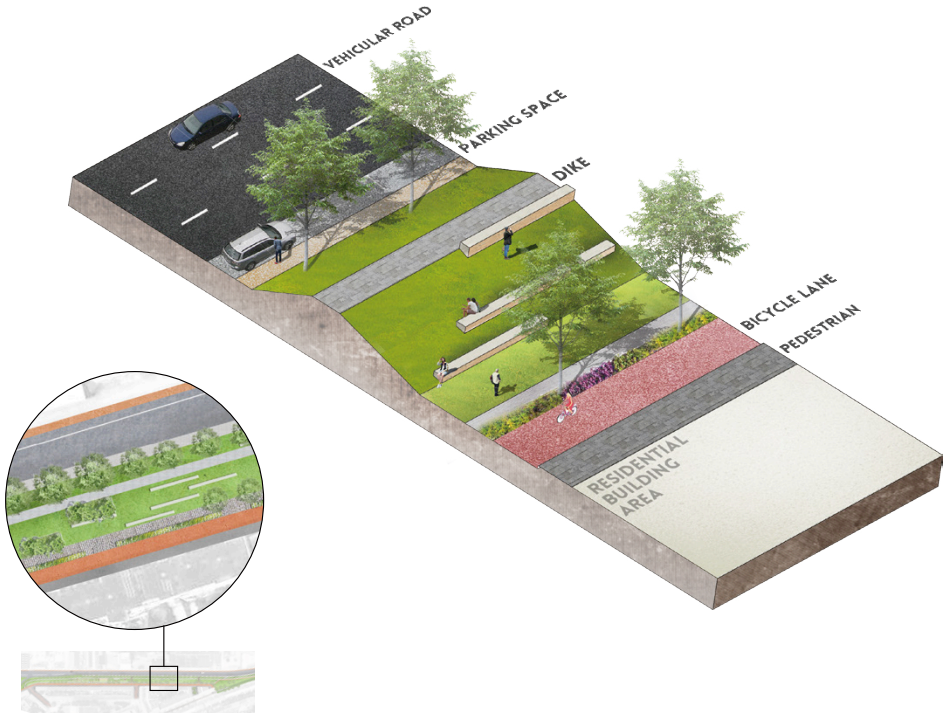
play space

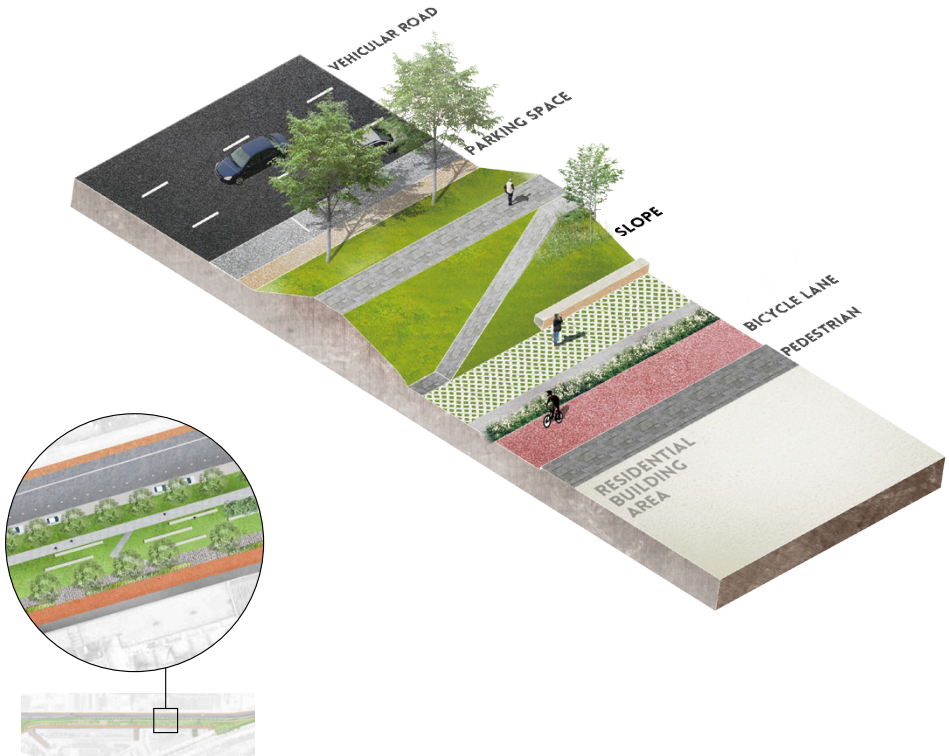


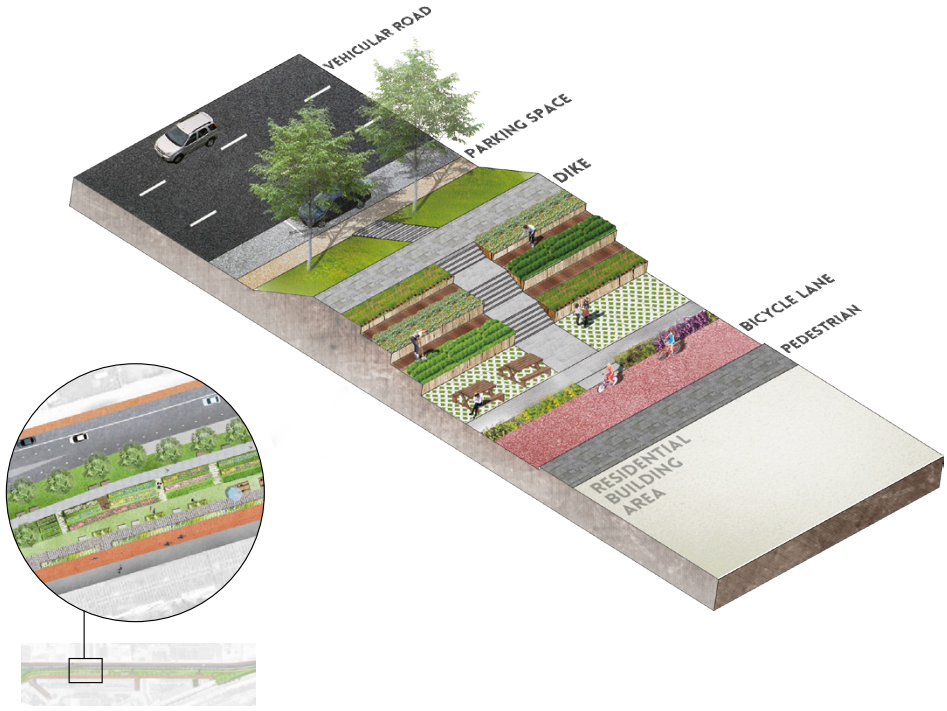
event space



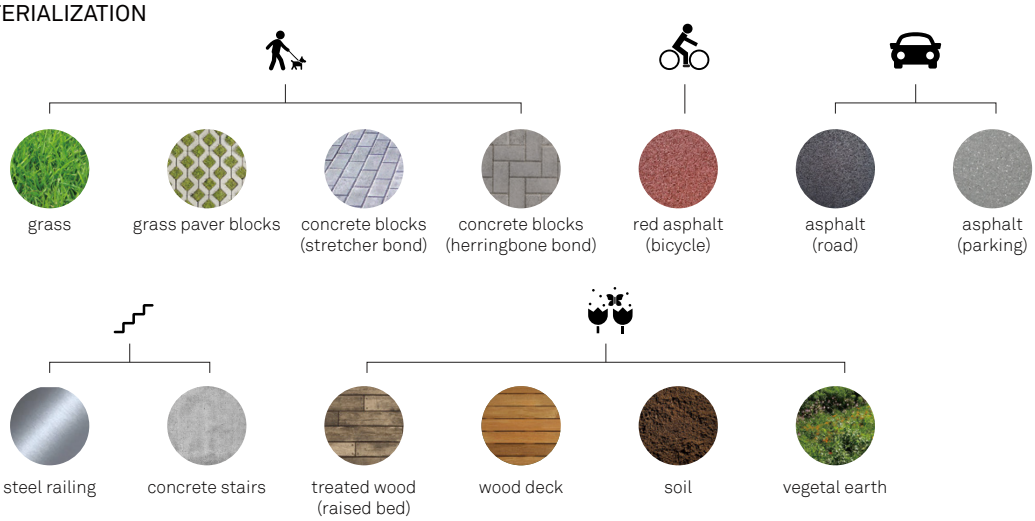
market space


VEHICULAR ROAD
PARKING SPACE
DIKE
BICYCLE LANE
PEDESTRIAN
RESIDENTIAL BUILDING AREA


VEHICULAR ROAD
PARKING SPACE
SLOPE
BICYCLE LANE
PEDESTRIAN
RESIDENTIAL BUILDING AREA



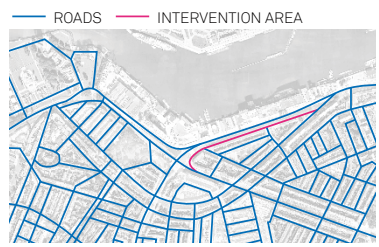
MATERIALIZATION

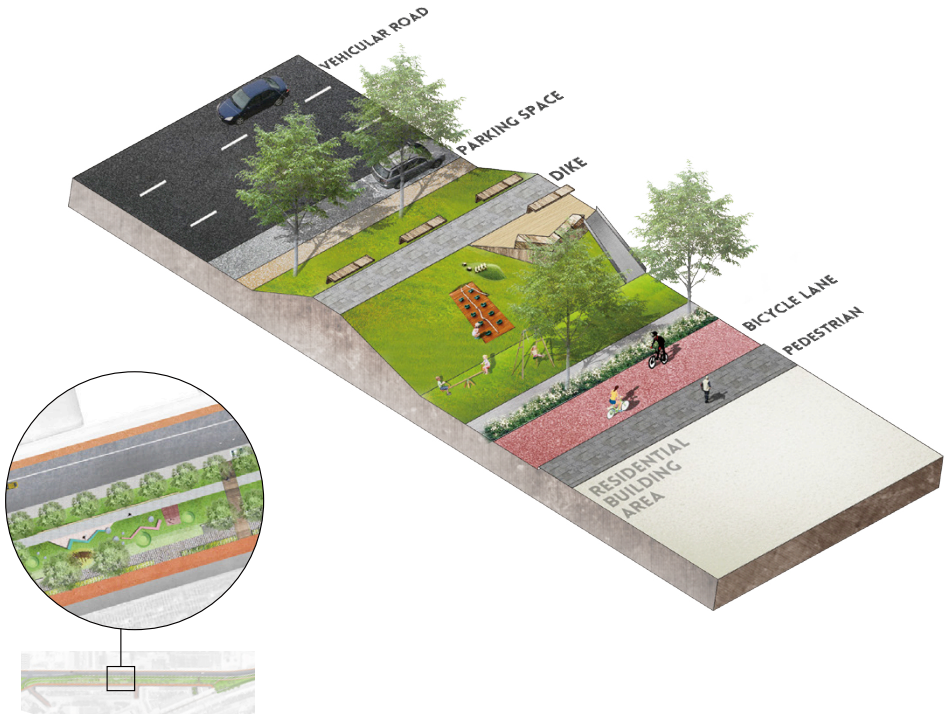


FURNITURE

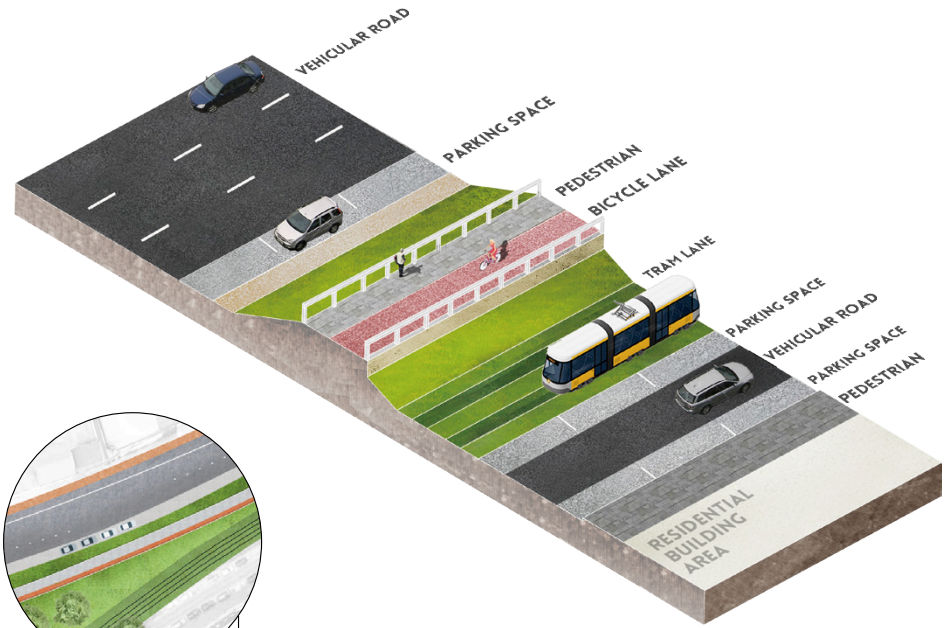
LIMIT THE VEHICULAR TRAFFIC

In order to make space for activities and ensure a safe and comfortable environment, the parking spots inside the dike are taken away and the vehicular traffic is limited during 7am to 9pm. The space remains the vehicular connection for necessary uses (such as fire lane, delivering goods, etc.), and there are other alternative roads for cars. In addition, the reduction of the parking space would not lead to the lack of parking spots because the existing situation are overcapacity (around 75 dwellings, 170 parking spots, occupied by less than 1/3 in daily time), which can be easily arranged to the nearby parking space. Also, the parking space outside dike area and the public transportation are still remained.





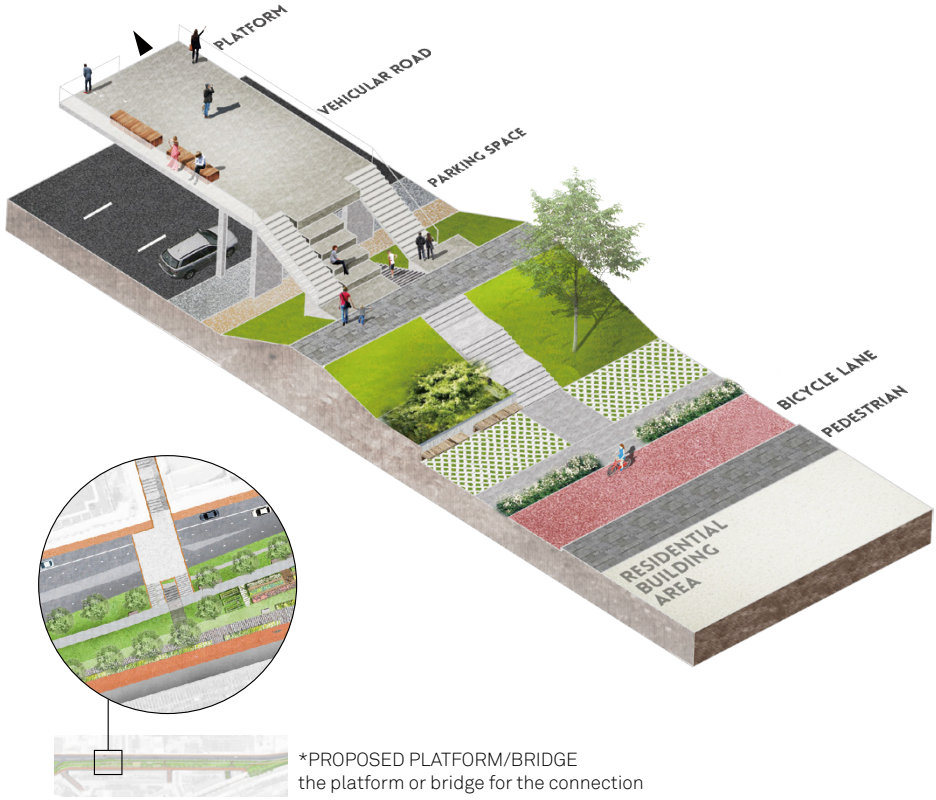
PROPOSED PLAYSPACE



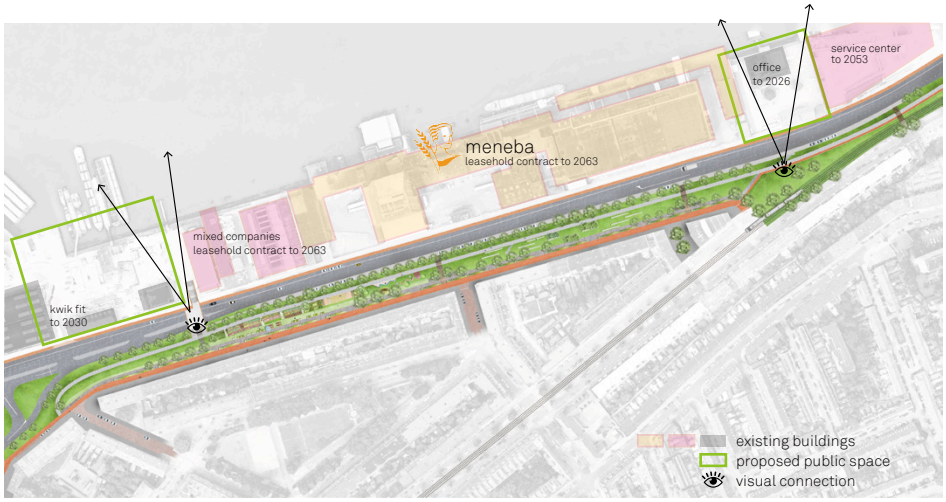
PRESERVED PUBLIC TRANSPORT

*FUTURE DEVELOPMENT - MORE POSSIBILITIES

For now the project focuses on the dike area, which is easily implemented without considerable investment. It will have positive influence in terms of spatial qualities and socio-spatial improvement. On the other hand, the intervention provides the possibility for the future to connect with the outside dike area – Maashaven harbour, which is occupied by factories and garages (industrial area) at this moment blocking the views to the harbour. The main buildings in the outside dike area will be there for more than 40 years due to the leasehold contracts. The future transformation will be gradual.



*PROPOSED PLATFORM/BRIDGE
the platform or bridge for the connection



7. CONCLUSION

Although the graduation project started from urban agriculture in the beginning, it proposes a multifaceted design for the outcome – urban agriculture is going to be integrated as part of the project, not the whole project. The strategy tries to provide a new way of developing green network for Rotterdam Zuid.

It seems that when talks about urban agriculture; an image of food productive land comes into everyone's mind. I believe the term 'urban agriculture' is more meaningful and can be enriched in different ways, not only about space for food growing or gardening, but also about creating a setting for that indirectly. After some hesitation, I still decided to keep the name 'Foodbanism' as the title of the project. Though it is not accurate, it implies the process of doing my graduation project. Foodbanism is a kind of metaphor. We try to create a better environment for food growing in the city, but things are always related. During this process we already benefit from multiple aspects. I hope this project can inspire people who read it.

The attempt is to reconfigure the relationship between urban context and landscape, especially the redevelopment of the leftover or neglected space. The project includes strategies and a series of spatial tools. The generality of the tools is also important, based on the former categorization of the typology. It contains flexibility, which has possibility to be adapted in the city according to different urban forms. The toolbox redevelops from the spatial types and enhance their features. It is not a fixed design; I believe it has potential to generate unexpected design by others.

On the other hand, it is not a general process of intervention. Inspired by urban agriculture that everyone can join, the strategy and tools should be involved citizens in the design process in a democratic level. The

project aims to encourage the citizens to care for their living environment. They can even initiate and implement the small-scale projects themselves, from the private to the collective level. The strategy and tools play a role in facilitating citizens. Though some process other actors will participate, such as housing association, residents still take the lead. For the large-scale projects, the top-down actors direct the main process, but opinions from the bottom-up level are critical. In this way the design can be accustomed to the needs and interests of citizens. Different actors can contribute into this process. This process might take times to work out because balancing between different needs and reaching consensus sometimes are difficult. However, what will be intervened and improved are not just spatial qualities, but also social connectivity. As the urban project, involving citizens is essential. We have to admit conflicts might happen, but the sense of ownership and responsibility will be also developed. The project provides for citizen and city collaboration.

In this project, the ecological effect of the healthy green network is the part that I discuss less. I pointed out that the healthy green network would have positive influence on the aspects of pollination and biodiversity, and there was the close relationship between urban pattern and ecological function. However, this could take years to make a deeper research, in terms of data collection, assessment, governance and management. In addition, if the project aims to promote the ecological vision and strategy to the citizens that they can more easily understand how to implement, it should be put forward a series of indicators, standards and methods for measurement. For a ten-month graduation project, I recognized this part is missing. But as a long-term vision, I believe the healthy green network will influence the city in a sustainable way.

The project should contain the flexibility according to the uncertain and changing urban context. For me, this project is more related to a framework rather than a final spatialized design. The relationship between landscape and urbanity is an interesting topic to discuss and explode for now and the future, in terms of multiple dimensions and the complexity of everyone's life.

To be honest, I never thought that the outcome of the graduation project would be like this in the beginning of the research. I had many struggles during the research and design process, and I believed that the research process push me to somewhere else that I didn't familiar with, at least not an edible garden. However, I am glad that with the outcomes of both the research and design and I challenged myself in a very limited period. To be continued in the future...

8. APPENDIX.1
ACTORS IN ROTTERDAM ZUID

Municipality

Gemeente Rotterdam

Housing Association

WOONSTAD ROTTERDAM

woonbron

Neighborhood Controls

BUURT BESTUURT

Relevant Organiazations

Opzoomer Mee Foundation

CultuurWerkplaats Tarwewijk

CULTUURWERKPLAATS TARWEWIJK

Foundation DOCK Charlois

De kracht van wij samen

DOCK

Transition Town Rotterdam

Transition Rotterdam Town

NPO-Rotterdamse Munt

Rotterdamse Munt

lokale kruiden met eigenwaarde

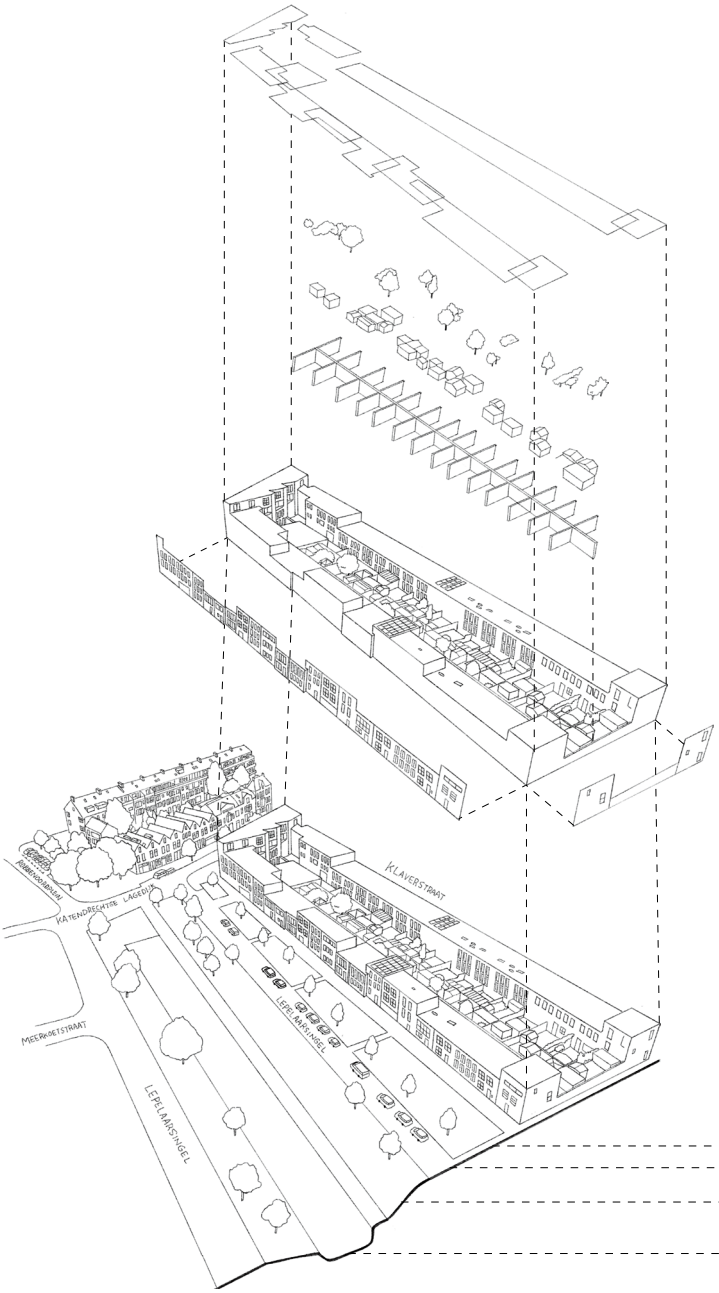
Association-Eatable Rotterdam

EETBAAR ROTTERDAM

Rotterdamse Oogst foundation

R'damse OOGST

APPENDIX.2
BUILDING ANALYSIS



ROOFTOP
This area is the combination of flat and sloped roofs. Flat roofs provide the potential for multiple uses.

VEGETATION
Not everyone loves gardening. Some people just use the courtyard for storaging. The vegetation in the building blocks is fragmented, which can only be appreciated by owners.

TOOL HOUSE
Due to the segregation, every compartment has a private tool house. These houses occupy large space.

COMPARTMENT
The courtyard is divided into various compartments. The space is segregated to small rooms for private use, no collective space.

BUILDING
Many buildings in this area have strong inward-facing characteristic and lack of variety.

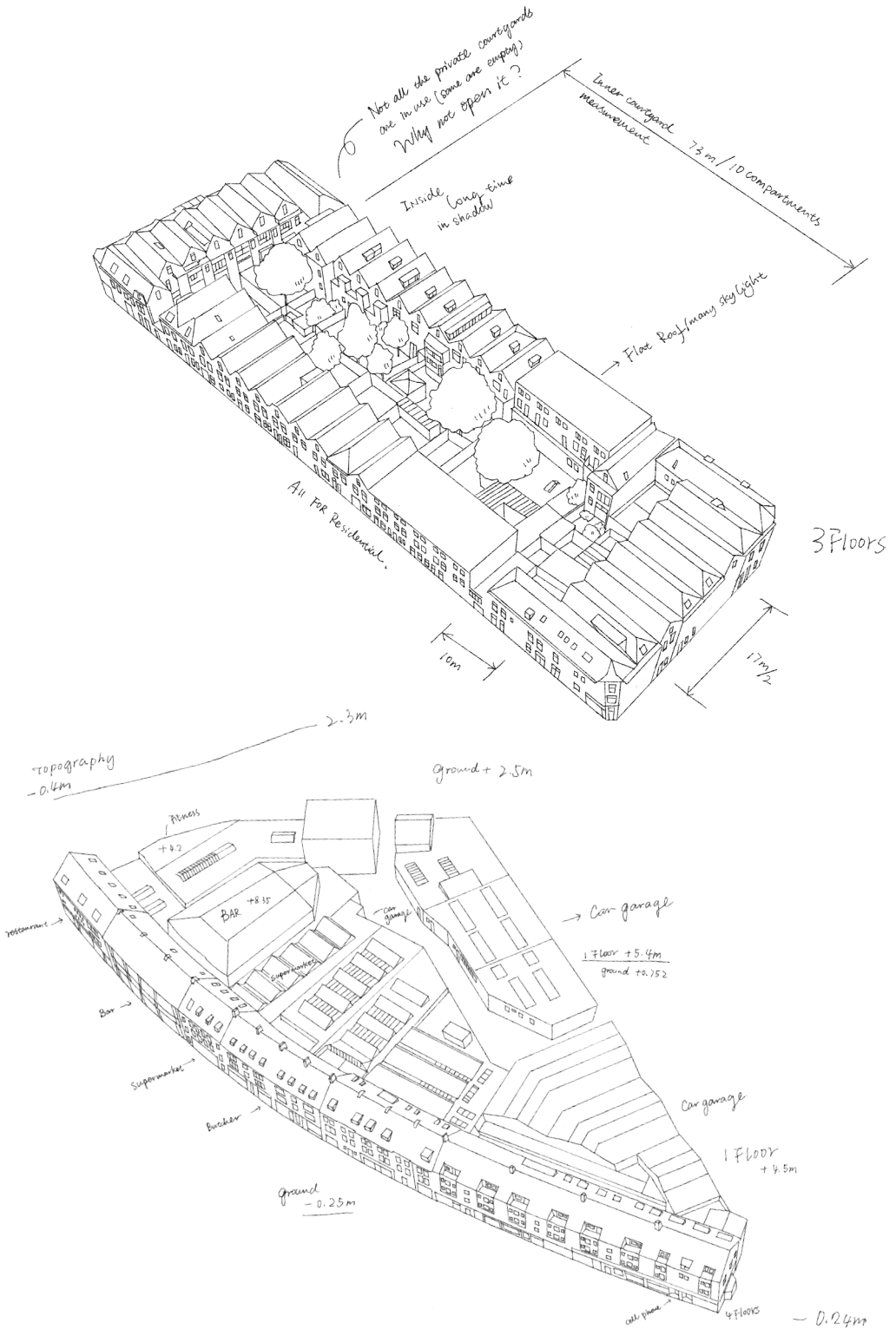
FACADE
The building creates a long stretch of flat surface.

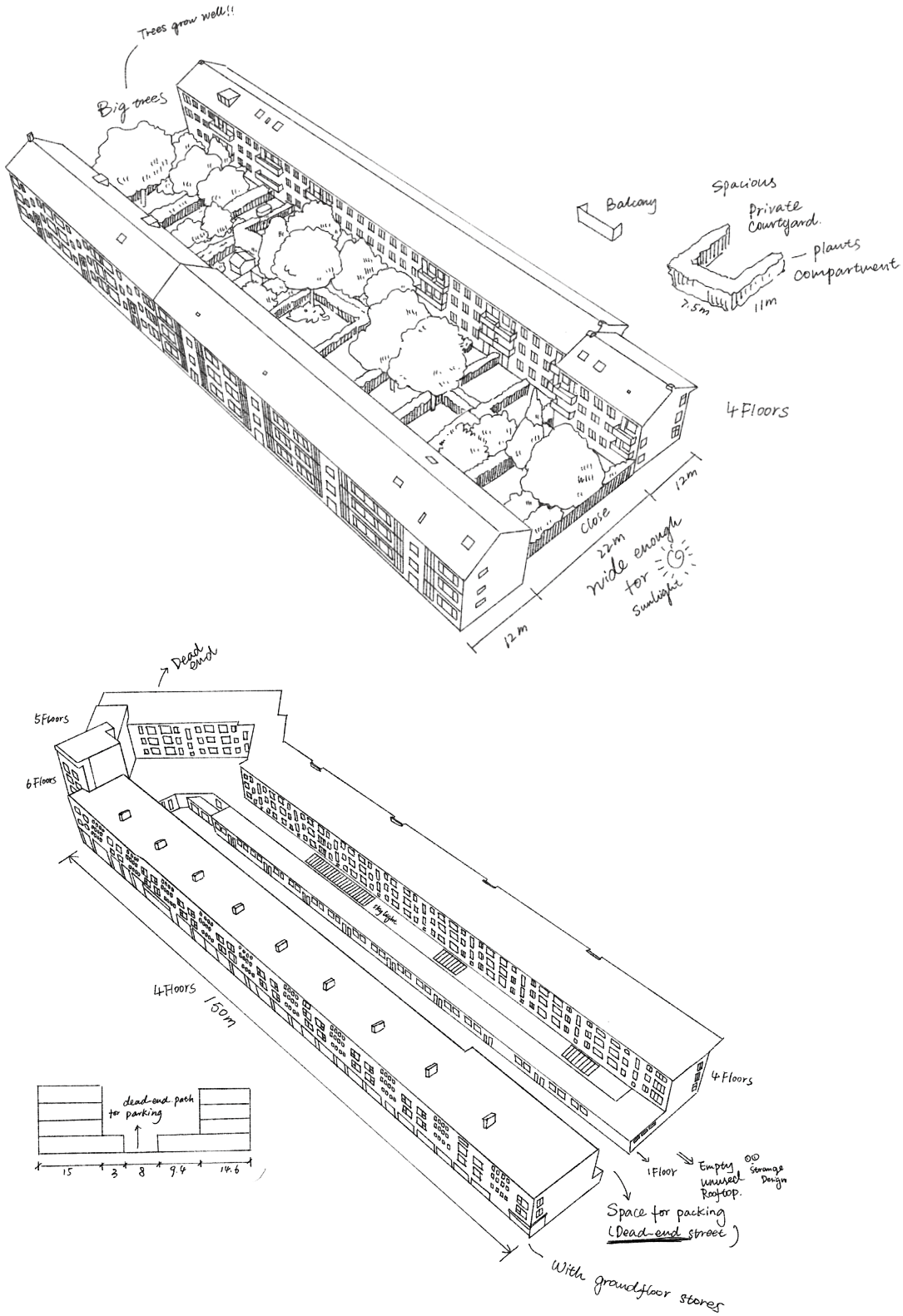
GREEN SPACE ALONG STREET
Plots of geometric grassland are arranged along the street between pedestrians and cars. No other attractions to give reasons to stop and enjoy.

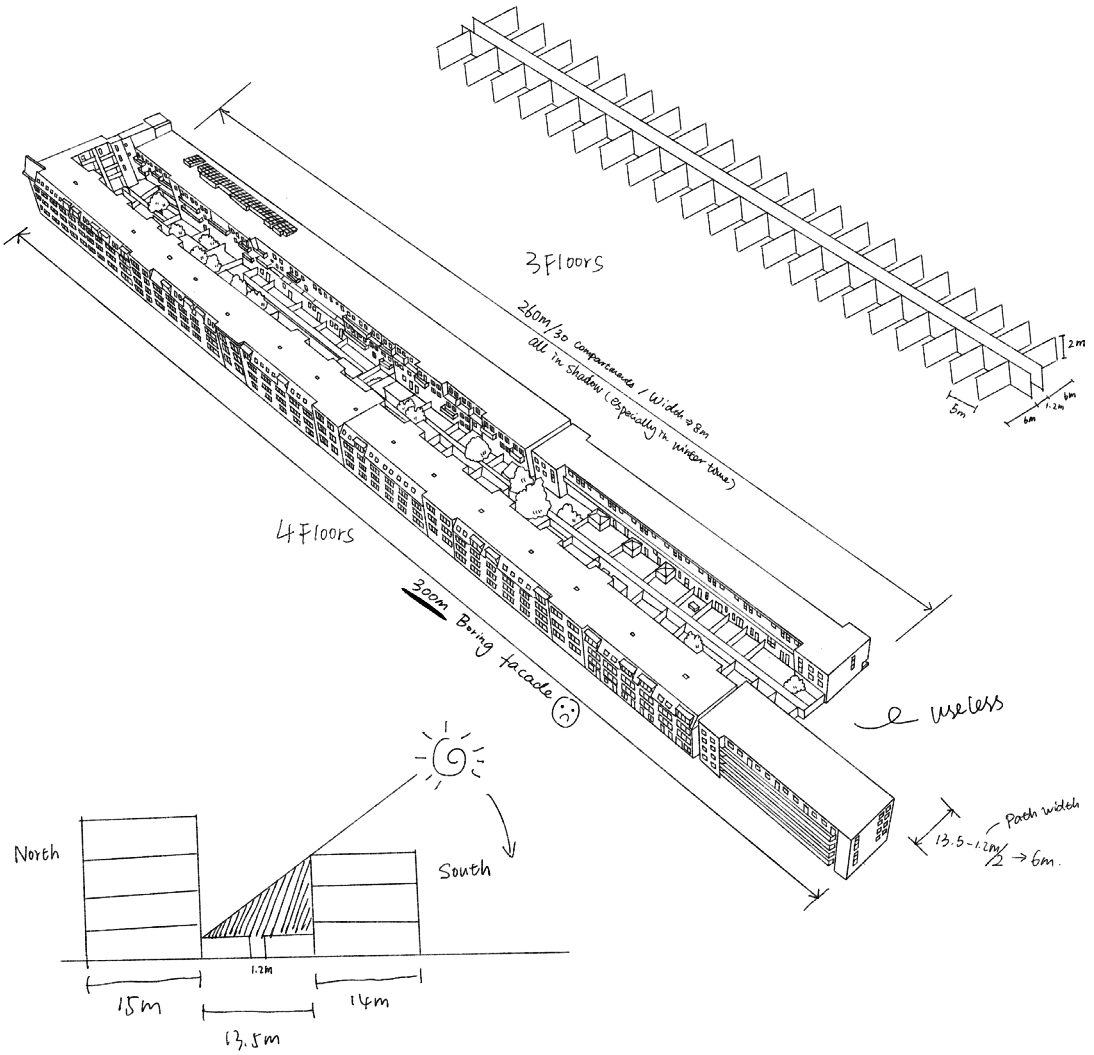
STREET
Also cars parking space for residents.

GREEN SPACE ALONG SINGEL
This space is seperated by vehicle streets, difficult for people to get in. The scene is monotonic.

SINGEL
The canal space is neglected by people.


Not all the private courtyards are in use (some are empty) Why not open it ?
Inner courtyard measurement 73m / 10 compartments
Inside (long time in shadow)
Flat Roof/many skylight
All for Residential.
3 Floors
10m
17m/12
2.3m
topography -0.4m
ground + 2.5m
Fitness
+4.2
BAR +8.35
Restaurant
Bar
Supermarket
Bakker
Car garage
1 Floor +5.4m
ground +0.752
Car garage
1 Floor
+4.5m
ground -0.25m
cell phone
4 Floors
-0.24m


Trees grow well!!
Big trees
Balcony
Spacious
Private Courtyard.
Plants compartment
7.5m
11m
4 Floors
12m
close
22m
wide enough for sunlight
12m
Dead end
5 Floors
6 Floors
4 Floors 150m
dead-end path for parking
15
3
8
9.4
14.6
4 Floors
1 Floor
Empty Unused Rooftop.
Storage Design
Space for packing (Dead-end street)
With groundfloor stores


3Floors
260m/30 compartments / Width 8m
All in Shadow (Especially in winter time)
4Floors
300m Boring facade
useless
Path width
13.5-1.2m/2 → 6m.
North
South
1.2m
15m
14m
13.5m

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