CASE STUDIES

Vanessa Miriam Carlow, Chantal Karadag, Olaf Mumm,
Marie Scheer, Kristin Schöning, Ryan Zeringue

4.
PROTOTYPE I: Eydelstedt, a Disseminated Hamlet

4.1 Detached Houses
in the north of Eydelstedt

4.2 Historical and Listed Farm Buildings
testify to Eydelstedt's agricultural origins.

4.3 The Bargeriede River
cuts through Eydelstedt and is sometimes more, sometimes less accessible to all.

4.1. TOPOI Description

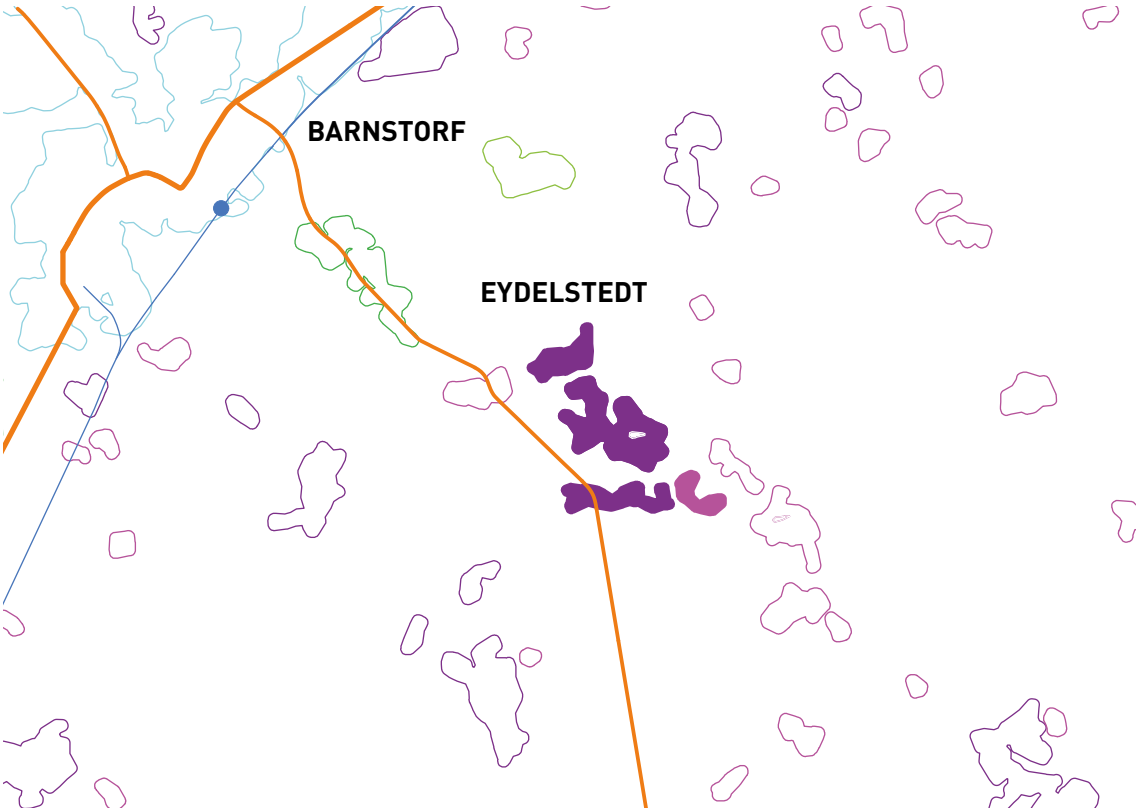
Eydelstedt is one of the 1,071 Disseminated Hamlets in our two study regions. Disseminated Hamlets are the second largest TOPOI group after the Disseminated Living Agri Hamlet, of which there are 4,283.
Eydelstedt has a population of approximately 250 people. It is part of the municipality of Barnstorf. Altogether, about 25,000 people live in Disseminated Hamlets in our two study regions. Most Disseminated Hamlets are located in the north-western study region of Vechta-Diepholz-Verden, including Eydelstedt.
Disseminated Hamlets are characterized by their high building density. They are dispersed throughout the territory, are located a long distance from train stations, and have a very low connectivity. Since no or only a few public transport options are available, they are primarily reached via individual mobility. On average, the nearest regional railway station is located 7 km from Disseminated Hamlets. They usually feature three different functions, including housing, but no retail. Disseminated Hamlets are usually surrounded by many other settlements.
Eydelstedt is a village. Spatially, it can be described as a rather dispersed accumulation of historical farm ensembles and newer residences, mainly single-family homes. Only few of the historical farms are still used as such. Today, most former farm buildings have been converted into residences or small business premises, such as hair salons or law offices. In the hamlets, single-family houses have been added to complement historical buildings. Overall, housing is the predominant function in Eydelstedt. Vacancies are not a phenomenon in the village. Besides the few existing small businesses, there is also an elementary school and a fire station. However, there is no grocery store, pub, or café.
The small river Bargeriede is the dominant landscape feature in Eydelstedt. West of Eydelstedt, it joins the larger river Hunte. According to a municipal regulation, areas along the Bargeriede are considered flood plains where construction is not permitted.
The main potential of Eydelstedt seems to be its remoteness and the beauty of the surrounding landscape. The scenic environment with a rich tree population, tree-lined avenues, and the two rivers offer a lush environment and many opportunities for outdoor activities. The building type of historical farm houses holds enormous potential for reuse. Housing and small-scale businesses are the dominant uses in the village. Accessibility by public transport is relatively low. There is an elementary school bus service eight times a day. The next train station is located in the neighboring larger settlement of Barnstorf and approximately 4 kilometers away.

Table 4.1 Attributes of the Disseminated Hamlet of Eydelstedt

A Area [ha]	12.31
C Compactness [%]	65
BD Building Density [buildings/ha]	6.24
OSR Open Space Ratio [%]	93
FR Functional Richness	5.25
PD Population Density [inhabitants/ha]	4.27
RSR Retail and Service Ratio [%]	1
AFR Agricultural Facilities Ratio [%]	14
SUD Settlement Units Density	35.75
PTC Public Transport Connectivity	1.75
PRTS Proximity to Regional Train Station [km]	4.32

Context

Eydelstedt represents the TOPOI type of Disseminated Hamlet. Altogether, the village comprises four settlement patches. It is located in the north-east of Lower Saxony in the administrative district of Diepholz. It belongs to the joint municipality *(Samtgemeinde)* of Barnstorf. This area is characterized by the large amount of Disseminated Hamlets and Disseminated Living Agri Hamlets. The Periurban Village of Barnstorf, which serves as the administrative center of the joint municipality, is located only 4 km from Eydelstedt. In Barnstorf, there is a train station, and several functions serving daily needs are also located there.



4.4 Legend

Node City
Node Town
Periurban Town
Small Exo Village
Disseminated Village
Agri Village

Periurban Village
Small Periurban Village
Exo Village
Disseminated Hamlet
Disseminated Living
Agri Hamlet

Exo Industrial Zone
Exo Satellite Town
Primary Road
Secondary Road
Railway Line
Railway Station

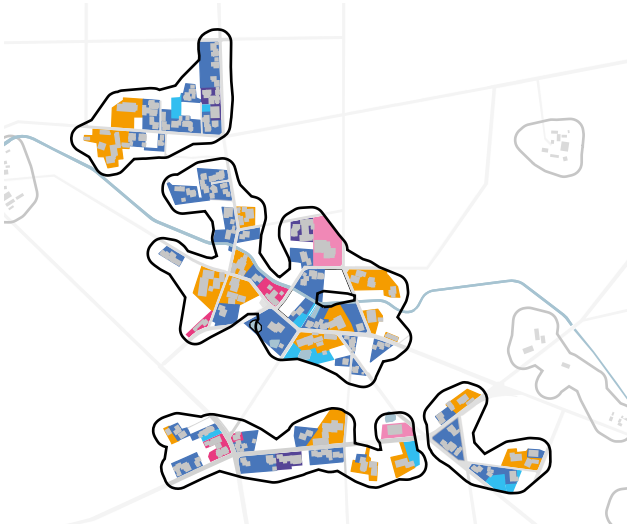
0.3 km

Land Zoning

Eydelstedt is embedded in a landscape dominated by fields used for monocultural farming, reflecting that agriculture is the function with the highest land use in the village, whereas most of the built-up land is used for residential purposes. The school and fire station are the only public buildings and serve as social anchors.

Building Age and Heritage

The oldest buildings are located in the central area of Eydelstedt. Two of the buildings pre-date 1859. Many other buildings date back to the period between 1860 and 1918 or 1919 and 1948 respectively. One building formerly used for agricultural purposes is under a preservation order. In a typical concentric pattern, new buildings have been added to the historical settlement structures that now form the center of Eydelstedt. Buildings in three outer settlement patches also belong to the village and were mainly developed in the 1950s and 60s. The school was built in the 1990s. A small cluster of single-family homes was developed around 2000 and later.



4.5 Legend

- Residential
- Industrial
- Commercial
- Public
- Leisure
- Agricultural + Forestry
- Traffic
- TOPOI boundary
- Water
- Buildings

4.6 Legend

- before 1859
- 1860 – 1918
- 1919 – 1948
- 1949 – 1957
- 1958 – 1968
- 1969 – 1978
- 1979 – 1983
- 1984 – 1994
- 1995 – 2001
- 2002 – 2009
- 2010 – 2015
- Heritage Site
- Water
- Buildings

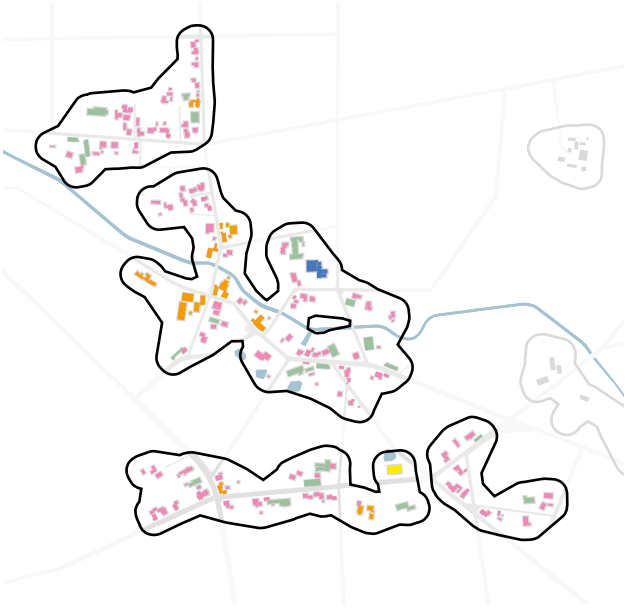
0.3 km

Building Types

The single-family house is the prevailing building type. There are several historical timber-framed buildings, some of which have been renovated to such an extent that their historical structure can no longer be recognized. There are also many farm buildings and stables in Eydelstedt, some of which have been converted to suit other uses, e.g., into office space or hairdressers.

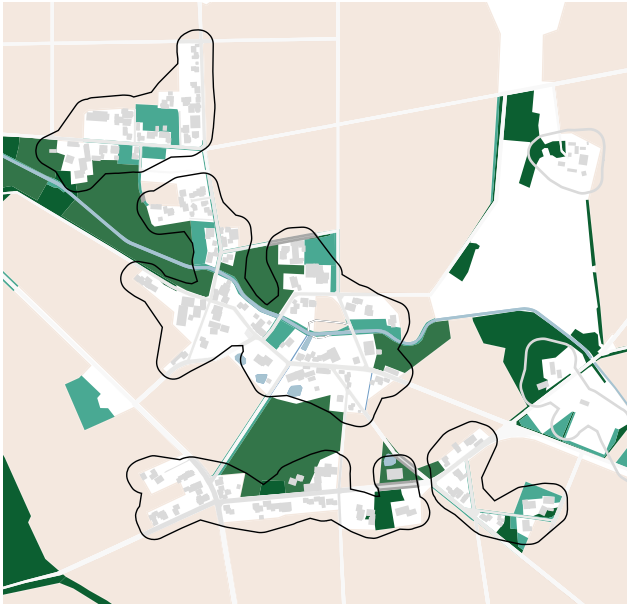
Green and Blue Infrastructure

Eydelstedt is not only surrounded by agricultural land but also by forests and meadows. The river Bargeriede flows through the village. It is a distributary of the river Hunte. North-east of the village is the Northern Wieting Marsh landscape conservation area (Nördliches Wietingsmoor). Other landscape conversation areas nearby are the *Großes Meer*, a lake in the south of Eydelstedt, and a forest west of Eydelstedt *(Eydelstedter Holz)*.



4.7 Legend

Single-family Houses		School	
Farm / Atrium Building		Water	
Barn		Traffic	
Fire Station		TOPOI boundary	—



4.8 Legend

Agriculture		Forest	
Park		Water	
Grass		Traffic	
Meadow		TOPOI boundary	—

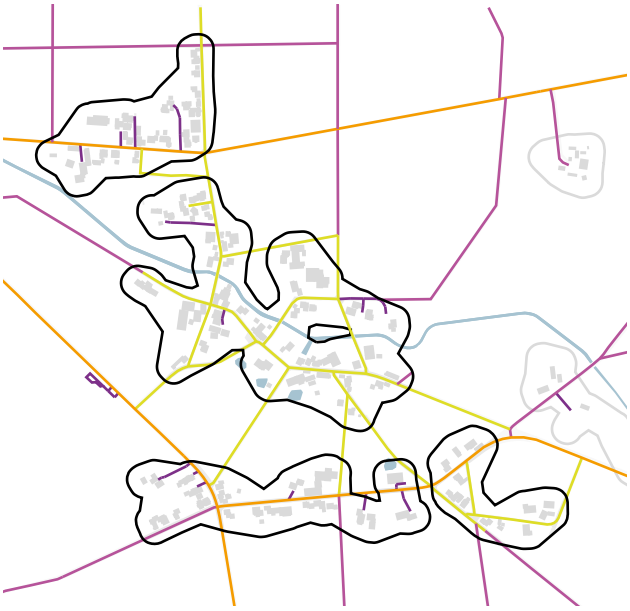
0.3 km

Street Network

The secondary road L344 directly connects Eydelstedt with Barnstorf, the administrative center of the joint municipality. Each of the four settlement patches that make up Eydelstedt is connected by a main road that also cuts through the settlement's core. Overall, the roads are in good condition.

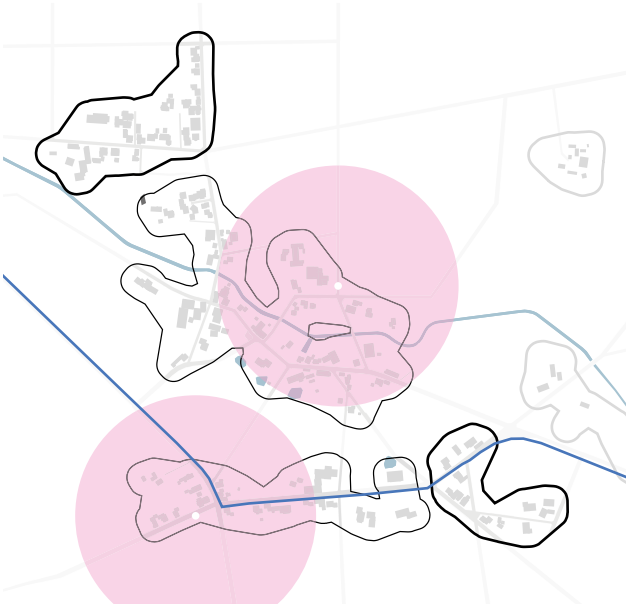
Public Transport

There are two bus stops in Eydelstedt that connect the village with Barnstorf and vice versa. One stop is located next to the school, providing a maximum of eight bus services per day, the other one is located in the south next to the old dairy, offering five services per day. A dedicated bicycle path runs along the primary road in the direction of Barnstorf.



4.9 Legend

Secondary Road
Tertiary Road
Residential Road
Access Road
Unclassified Road
Water
Traffic
TOPOI boundary



4.10 Legend

Cycle Lane
Bus Stop + 420m Radius
Water
Traffic
TOPOI boundary

0.3 km

4.2. Four Futures for Eydelstedt

We developed four scenarios for Eydelstedt and all the other sample municipalities. While the scenarios are equal in terms of their drivers, the way they develop spatially is, of course, different for each of the municipalities. However, each scenario follows a certain development logic.

Scenario A is called *Green Communities*. It is derived from a collaborative approach of living and working in dense settlement structures. Scenario B is called a *Planned Happy Future?*. Here, the focus is on the efficient use of land as a resource and the strengthening of rural and suburban spaces as against the urban cores in urban-rural agglomerations. Scenario C, *New Settlers*, demonstrates how spatial expansion can be steered in a more sustainable way than with laissez-faire approaches. The scenario *Communities Repurposed!* addresses the spatial and functional transformation of the different TOPOI types. Unlike other scenario approaches, all four scenarios are intended to present a desirable future, even though some seem to be more desirable and sustainable than others. All four scenarios follow a certain spatial logic in the way the community develops as a whole, in certain subareas or where transformation takes place.

Scenario A:

In *Green Communities*, the focus is on reusing the existing building stock and the densification of already built-up areas.

Scenario B:

In *Planned Happy Future?*, the existing building stock is upgraded in terms of energy efficiency, redeveloped and potentially extended. In this scenario, too, redevelopment areas are mainly found within today's settlement boundaries.

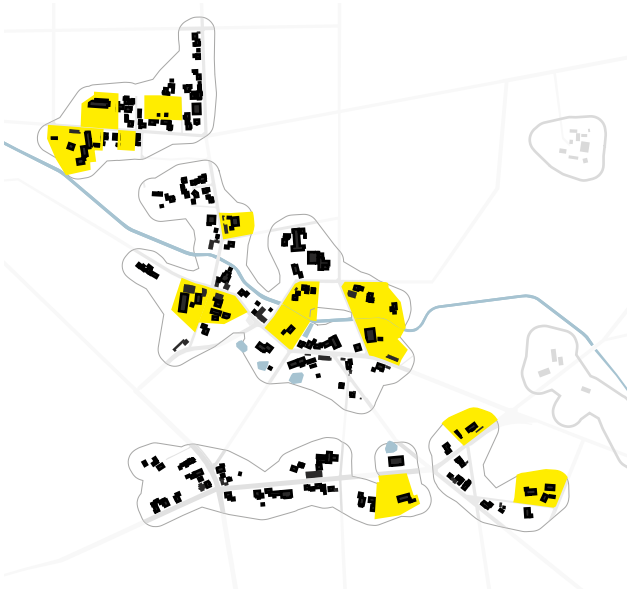
Scenario C:

In *New Settlers*, today's settlement boundaries are expanded to accommodate growth. This scenario is an exception as it allows new land consumption outside of existing settlement boundaries, whereby new developments must be committed to certain sustainability goals.

Scenario D:

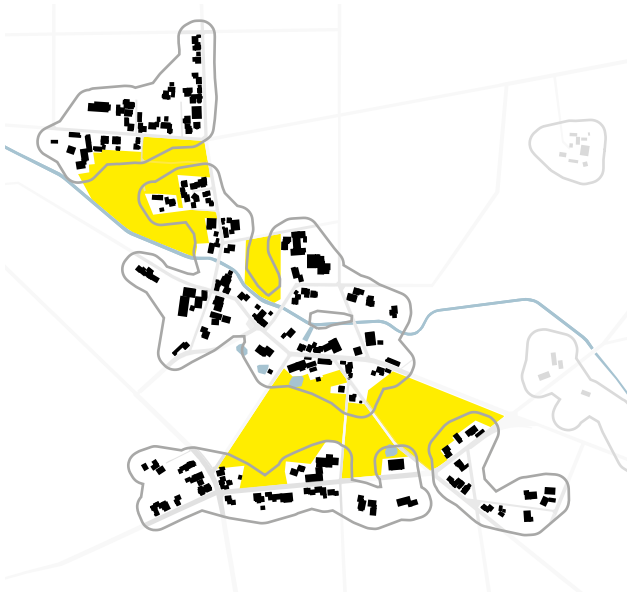
Communities Repurposed! is a scenario that investigates the redevelopment within existing settlement boundaries. In this case, however, preference is not always given to the preservation of the existing building stock.

Areas of Transformation

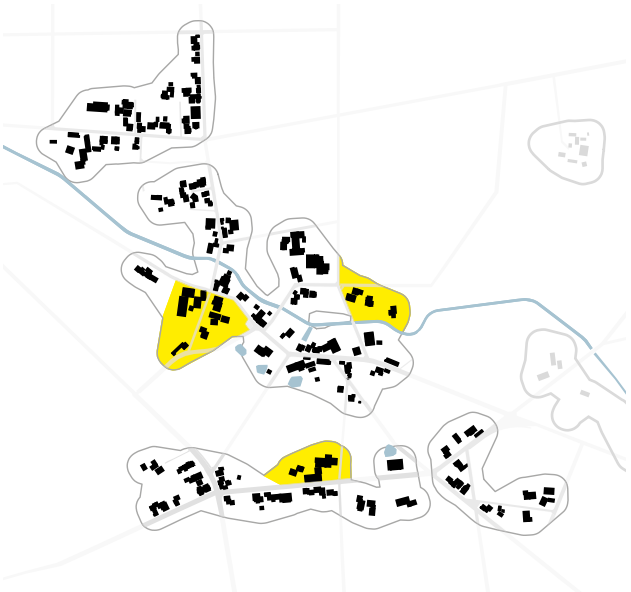


4.11 Scenario A: Green Communities

4.12 Scenario B: Planned Happy Future?



4.13 Scenario C: New Settlers

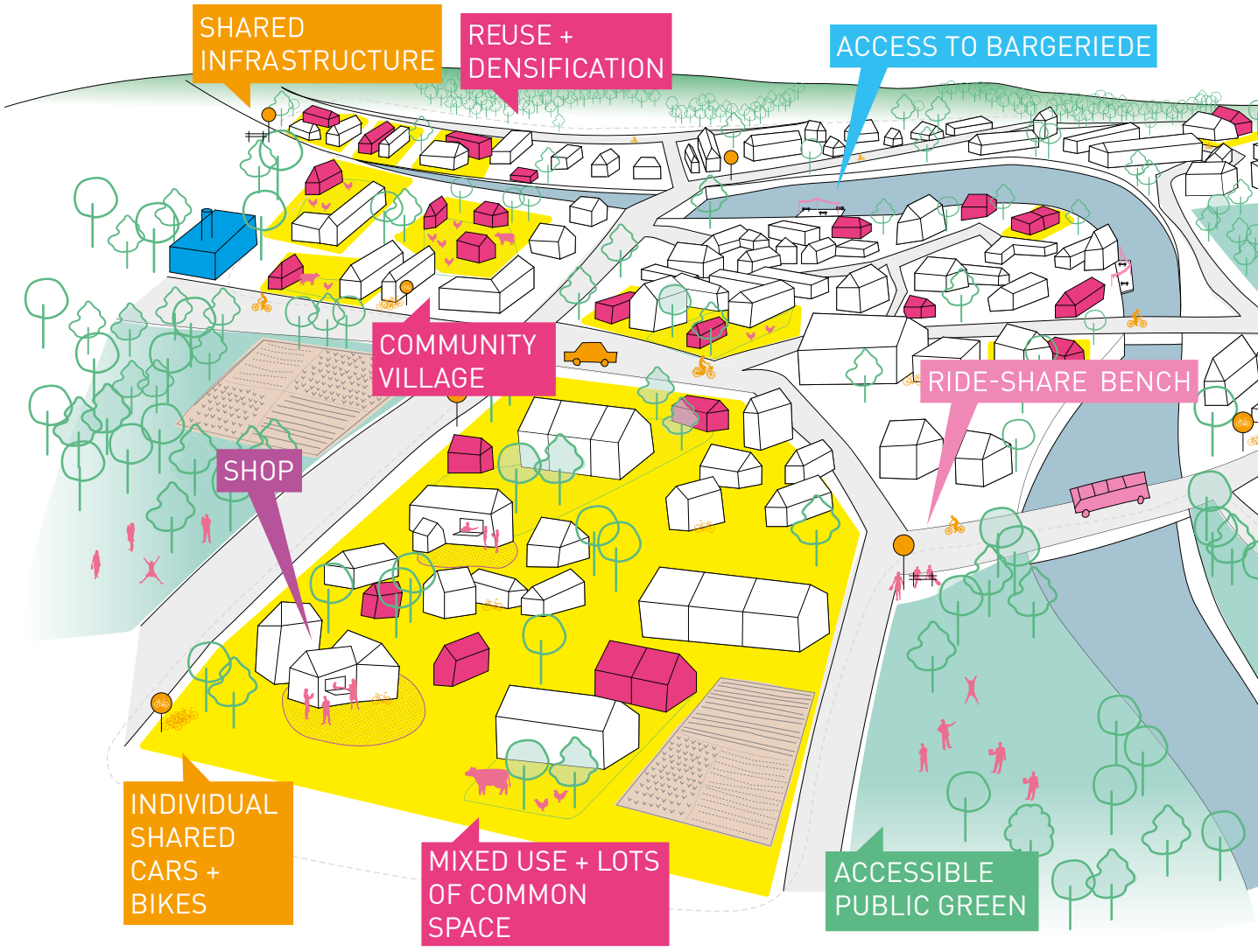


4.14 Scenario D: Communities Repurposed!

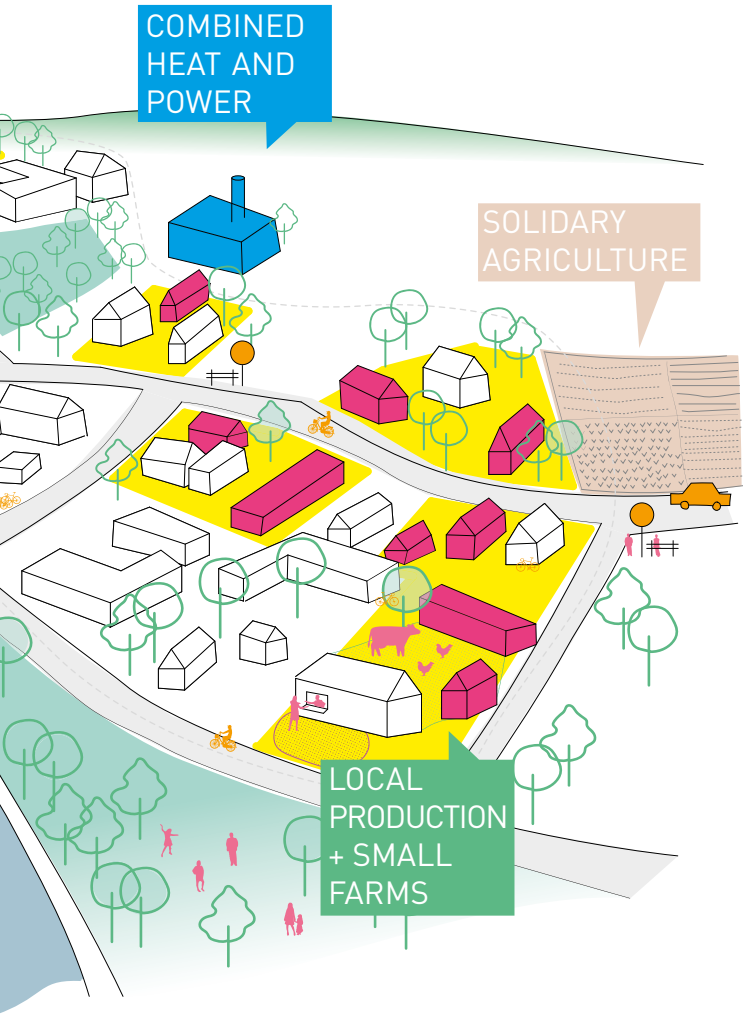
Legend

Areas of Transformation
Water
Traffic
TOPOI boundary
Buildings

4.3. Scenario A:
The Green Communities of Eydelstedt



4.15

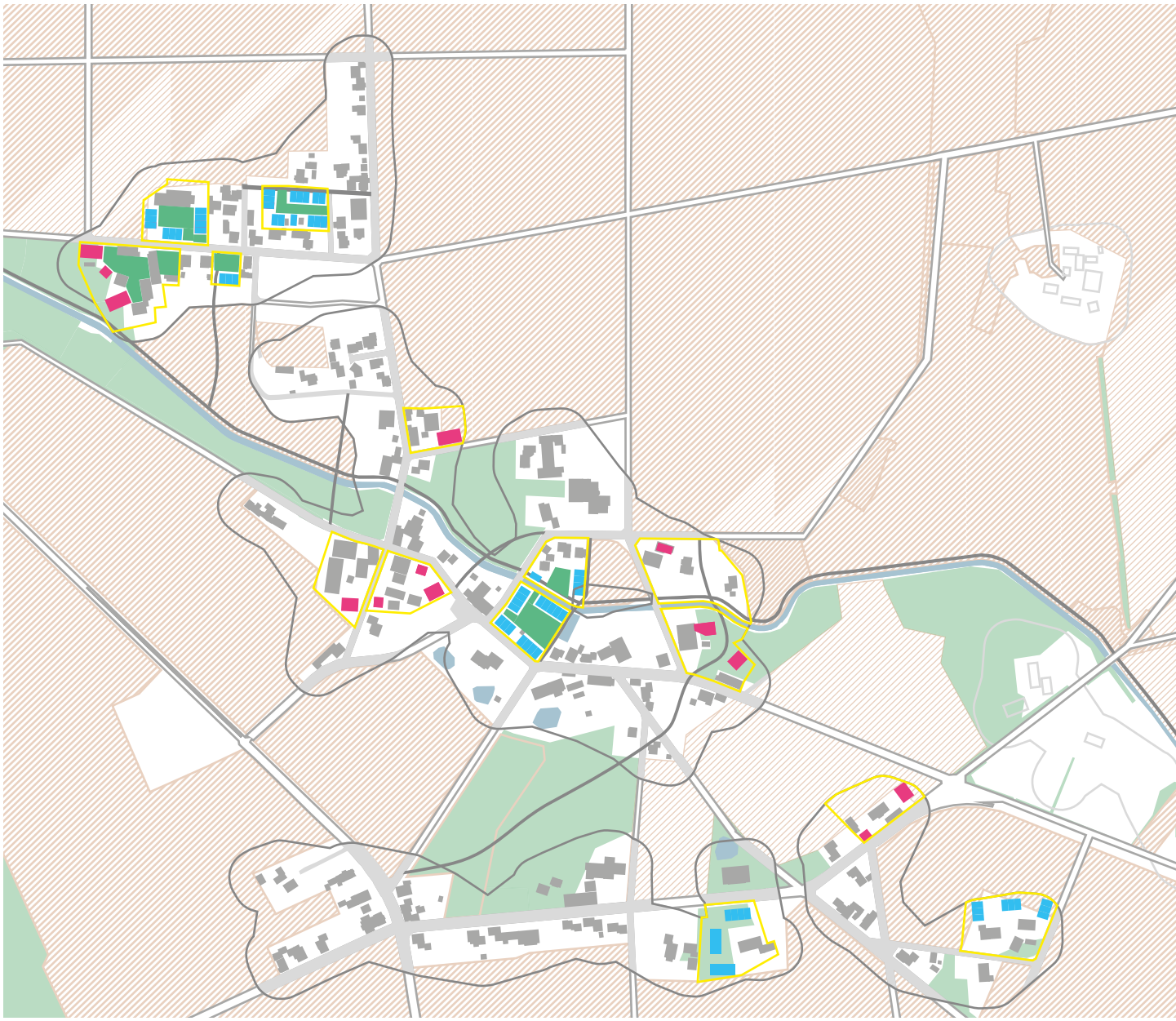


Dear residents of Eydelstedt,

My friend and I often argue whether her father's apple pie or the one from our farm café is the best in the world. Her father's pie is really good, but the fact that the apples for our cake are picked in our orchards, the butter and cream are produced in the village, the wheat is sown, harvested, and milled here, and the eggs are laid by our chickens, makes ours taste the best to me. Every morning when I leave our old farmhouse and walk across the communal yard to the barn to feed the chicken, I can already smell the scent coming from the new building that makes me look forward to the afternoon: when I am on my way to the school after work on the rented cargo bike to pick up my children and we then enjoy a delicious piece of apple pie together. Afterwards, my two children always play in the water playground at the Bargeriede or go to Erna's "Jungle Garden". Once a private garden, it has been open to all villagers for a few years now and is home to so many old species of trees and plants that it feels like you can discover something new every time you visit. The fact that there is always someone to keep an eye on the children gives me a great feeling of belonging to a special community. It also gives me the chance to quickly get some vegetables for dinner at the farm shop.

Best from the future!

Scenario A:
The Green Communities of Eydelstedt



4.16 Legend

New Building Type I
New Building Type II

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets

Green
Water
Agriculture

0.25
km

Building Types

The Green Communities scenario builds on the densification of already built-up areas to achieve a compact settlement structure and promote more sustainable lifestyles. In the course of densification, novel flexible forms of housing and sensible additions to existing buildings are created.

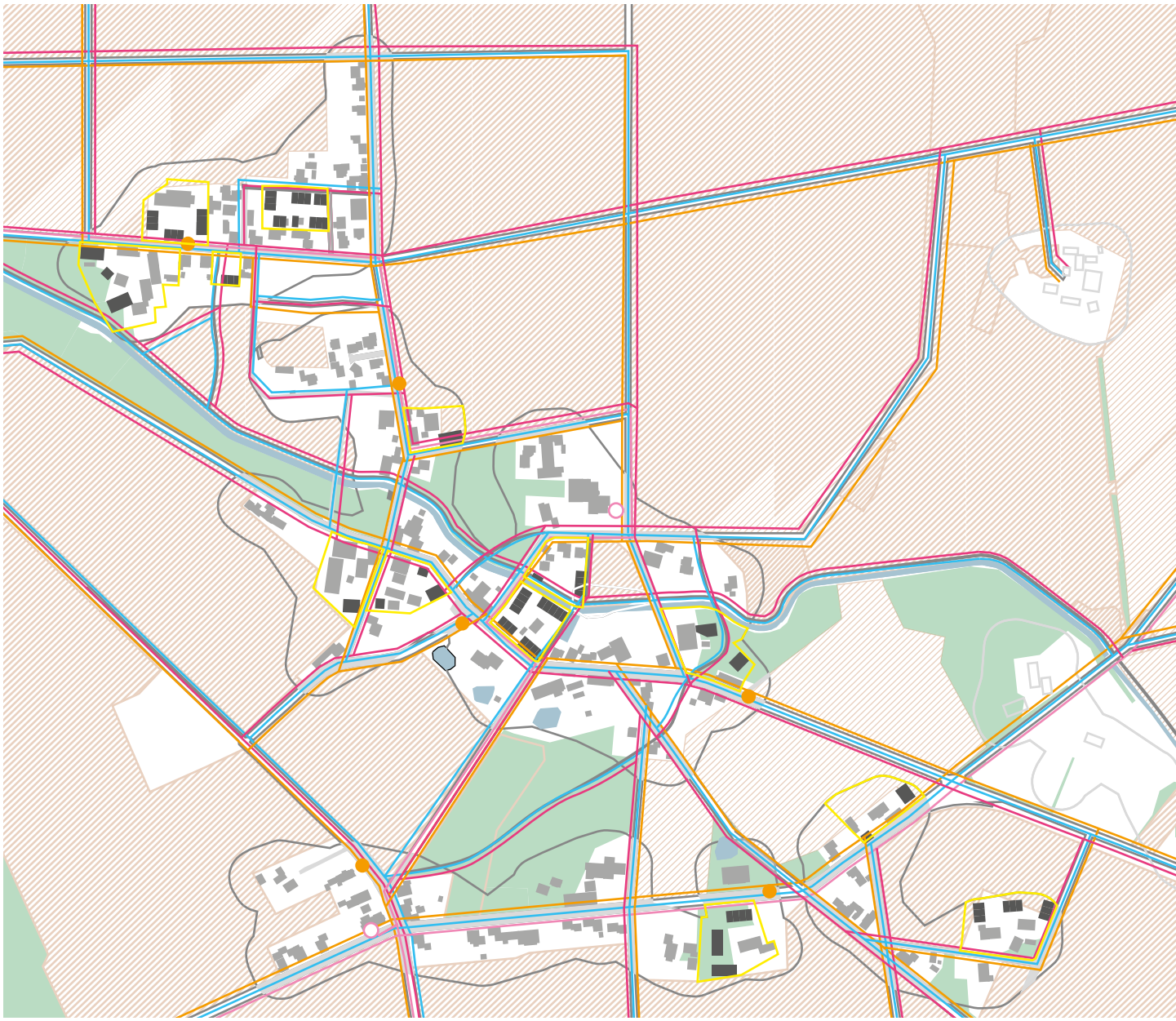
I. Community Village

The new building type of the Community Village transforms the perimeter block to a rural scale in terms of size and building height, openness and permeability, roof landscape and functions. In addition to the existing building stock of mostly single-family homes, barns, and stables or other buildings with agricultural use, the new buildings are arranged to form a common courtyard as the heart of the ensemble. The Community Village is designed to promote a mindset of sharing within the community by offering different and mixed functions, such as co-living, co-working, a community kitchen and repair café, classrooms and childcare, spaces for processing the common harvest, and other multifunctional spaces for the community in general. The Community Village type not only leads to an increase in functions useful for the entire village but also in population and building density.

II. Cooperative Farm

Cooperative Farm is a strategy targeting agricultural ensembles. The new building type is an individual and adaptable addition to existing buildings and can help lend a new identity. The Cooperative Farm concept enhances organic and solidary farming at a local scale. As a result, the renewed and transformed ensembles provide new opportunities in the village. Taking a closer look at Eydelstedt, there are a few buildings dedicated to farming that are in very good condition and others that are vacant. For the seven vacant ensembles, this type of transformation could be envisioned. Besides the use for organic and solidary farming, Eydelstedt also needs housing. To promote the liveliness of the village, other housing-related functions could be added to the courtyard buildings and include, for example, crafts shops, a bakery, or spaces for social uses such as a kindergarten, after-school care, or a neighborhood center.

Scenario A:
The Green Communities of Eydelstedt



4.17 Legend

Ride-share Bench
Existing Bus Stop
Bus Lane
Cycle + Hike Path
Cycle Lane
Car Lane

Pedestrian Lane
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
New Streets
Green
Water
Agriculture

0.25
km

Streets, Mobility, Public Space

In the *Green Communities*, walking and cycling are the preferred modes of transport. Furthermore, there is a dense network of self-organized sharing services for mobility. This includes shared vehicles, ride-share benches, where people can wait to be picked up by their neighbors, and shared charging stations for different types of vehicles. The street space is equally comfortable and safe for all users. The physical layout of the streetscapes is non-hierarchical.

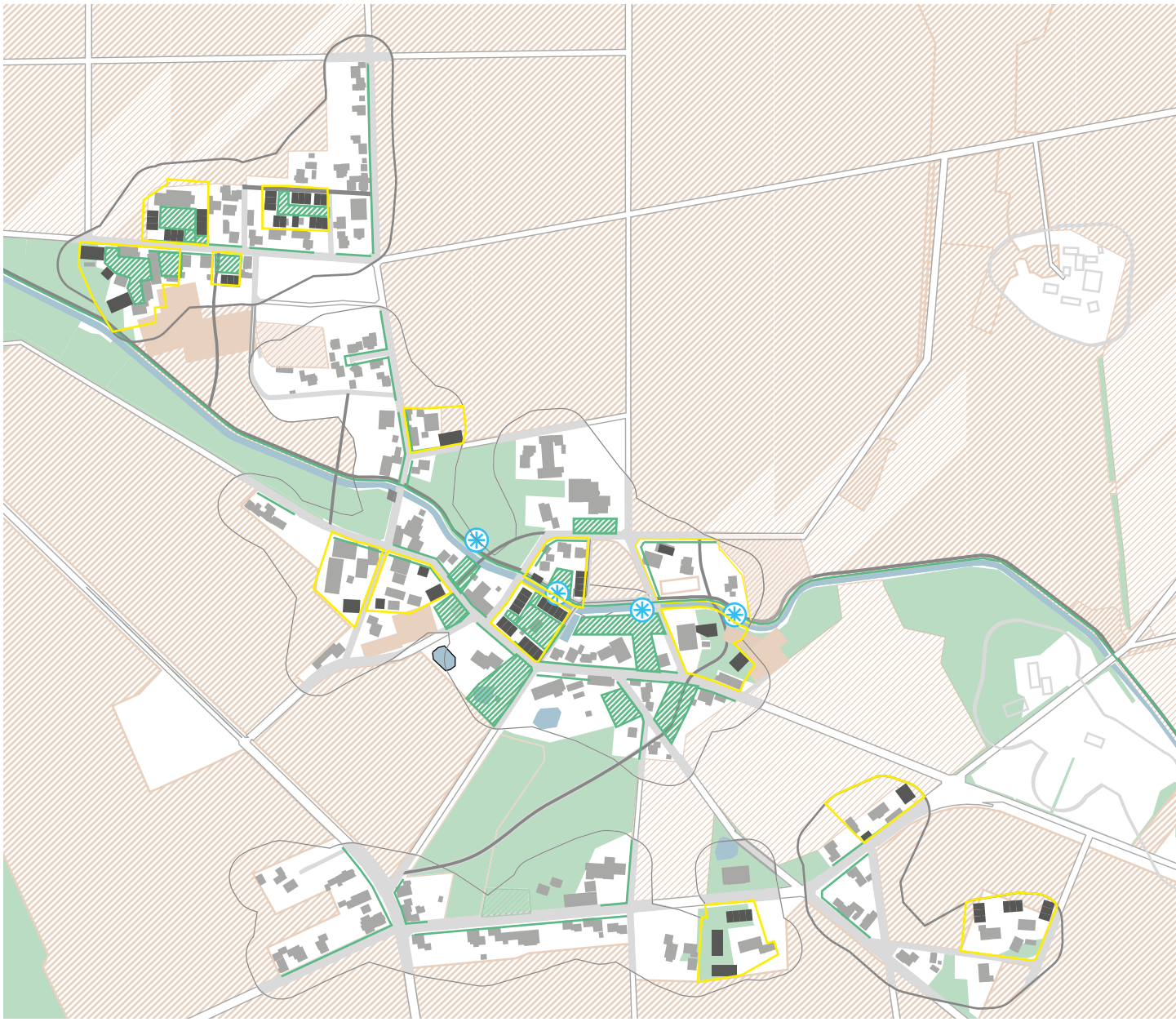
I. Ride-Share Benches

There are cars, bicycles, and cargo bikes that are co-owned and shared by the community. The *Green Communities* App was developed to facilitate sharing, and several ride-share benches are located on the edge of the village at the most frequented spots to allow for on-demand transport within Eydelstedt and to surrounding villages. These ride-share benches act as meeting points. Soon after their implementation, the citizens added other functionalities, such as a sharing station for books, seedlings, or excess produce from the community gardens.

II. Safe Streets

The streets are designed to serve everyone. Since there are no hierarchies among the different street users anymore, walking and cycling are safe and comfortable traffic modes. As a consequence of the non-hierarchical street layout, car traffic is considerably slowed down in the village. To ensure that especially children and the elderly can safely use the streets, there is a general speed limit of 30 km/h, and allowed speed is limited even further where there are many common spaces. Since this is the result of a bottom-up process, the residents of Eydelstedt have been organizing shared mobility and shared street space themselves. Interim and immediate measures, such as portable street furniture, temporary street greening, temporary streetlights or pop-up cycle lanes, are employed for this purpose.

Scenario A:
The Green Communities of Eydelstedt



4.18 Legend

Increase of Biodiversity
Extension of Public Green
Green Path
Access to Bargeriede
Organic Agriculture

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
New Streets
Green
Water

Agriculture

0.25 km

Green and Blue Networks

This scenario creates more easily accessible green spaces serving different user needs and the mitigation of climate change. The idea of an eatable city is being applied.

I. Access to the Bargeriede

Due to the shared use of land, both developed and undeveloped spaces around the small river of Bargeriede are now available to all. Opening the river to the public is reinforced by a public hiking trail along the Bargeriede. Other structural measures also improve the access to the water, including seating steps, platforms to take a rest, as well as other meeting points such as a shelter or a kiosk directly at the water.

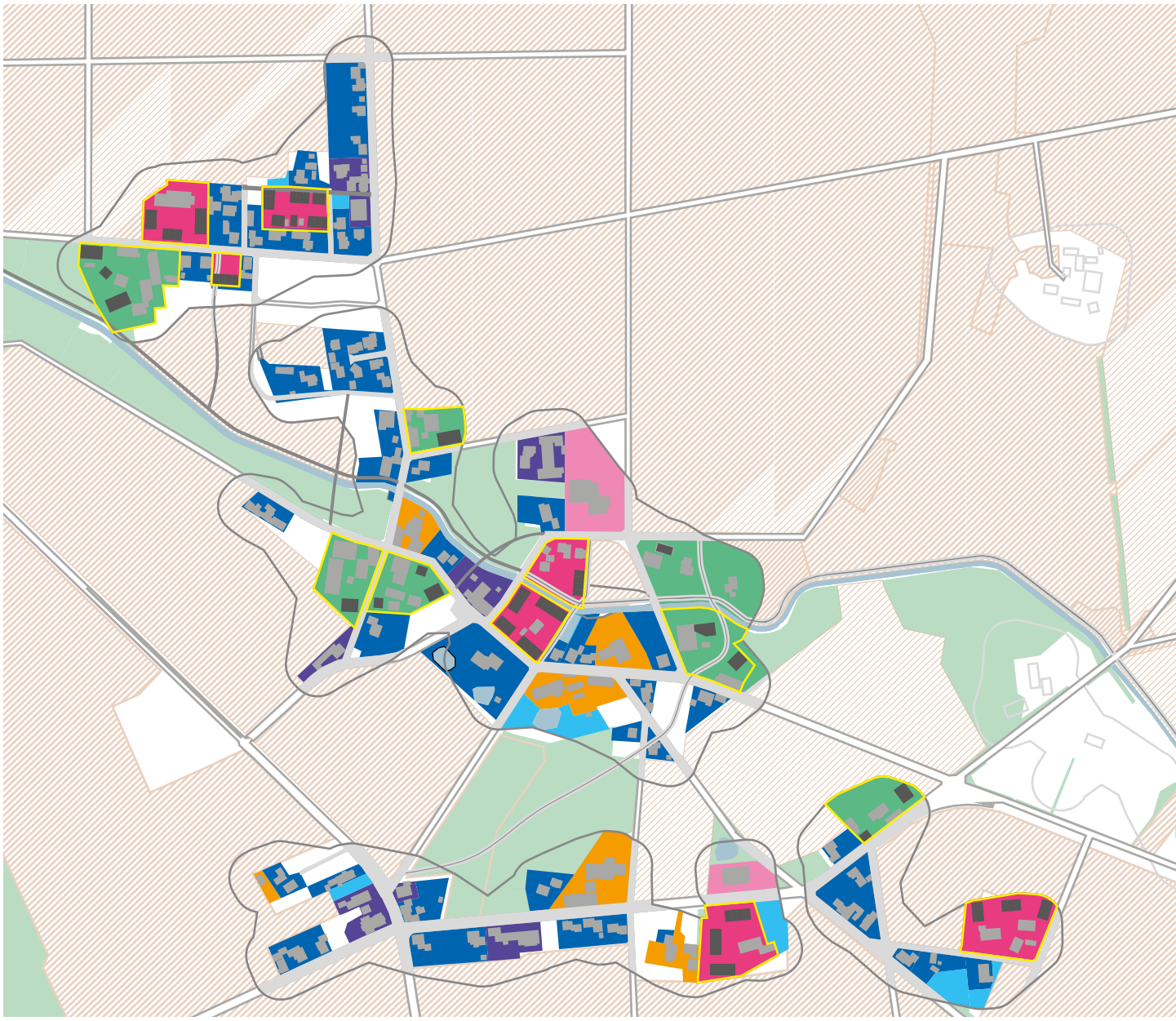
II. Solidary and Organic Farming

Cooperative farms have introduced new approaches to farming and consumption that protect the biodiversity of flora and fauna: solidary and organic farming. The driver behind this type of farming is to promote sustainable food production by respecting seasonality and locality in food consumption. This also leaves its mark on the landscape, which has seen a transformation away from large fields used for single-crop farming towards small and mixed fields that support mixed-crop cultivation. However, this type of food production needs a strong community that stands by the small farmers when there is a poor harvest due to floods, drought, or other disasters. The members, in Eydelstedt all residents, buy shares per season, thus giving the small farmers financial planning security by making monthly payments. In return, they have access to fresh, tasty, and organic produce right around the corner, all year round. This also gives rural honey a better reputation, as chemical fertilizers and pesticides are no longer used, which bees would otherwise transfer into the honey.

III. Common Green

Common green spaces are distributed throughout the villages and used in different ways. The centrally located TOPOS boasts a new orchard directly at the water. A newly laid out playground at the school comprises a wild bee meadow where previously only weeds grew. A meadow with benches directly at the small pond invites the villagers to meet and linger. In addition, more green spaces are created in the course of building densification. However, they are not only privately owned by the residents but are open to all people in Eydelstedt to provide different functions: in addition to a courtyard café, there is a barefoot path in one courtyard, honey bees are kept in another courtyard, which are looked after by one particular school class once a week.

Scenario A:
The Green Communities of Eydelstedt



4.19 Legend

Residential
Mixed Use
Industrial
Public Facilities
Leisure
Organic Agriculture
Forestry
Agriculture
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Open Space
Water

0.25 km

Functions

Everything for daily needs is available in the village and produced locally if possible. New forms of cohabitation and production lead to mixed-use buildings.

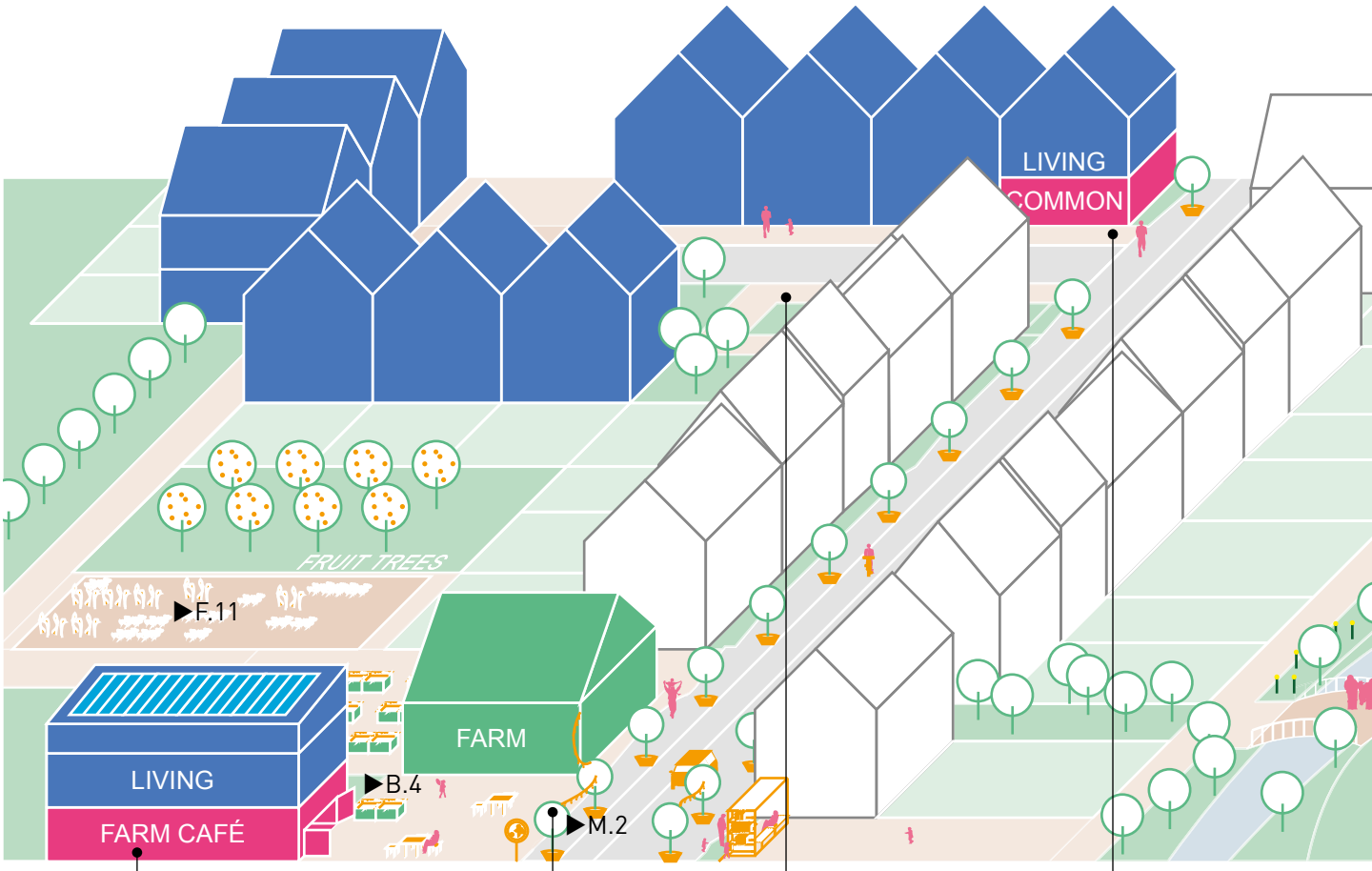
I. Local Food Production and Sales Point

With cooperative farming, some novelties have arrived in the village. There are several distribution points where residents can collect the harvested vegetables. These sales points are evenly distributed in the village, so that they can be reached on foot or by bicycle. Others are integrated into the farms. Some of these sales points also include a farm café or a petting farm for visitors. In this way, new places of encounter are created in the village for both residents and visitors. Once a year, a harvest festival is organized that attracts many people from outside the village.

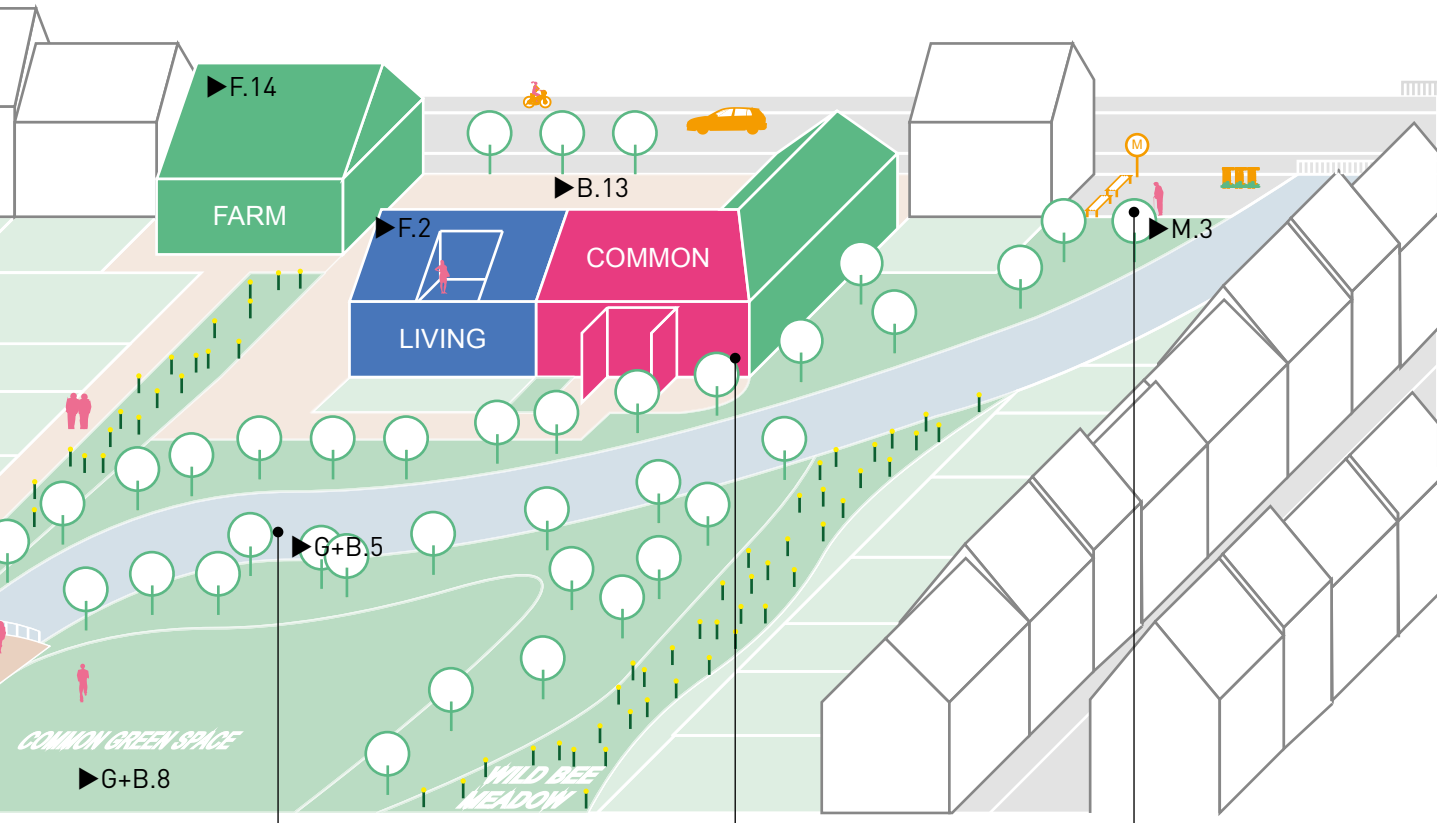
II. Cooperative Living

The new building type of the Community Village and also the Cooperative Farm introduce many innovations for Eydelstedt's community. Each housing project provides publicly usable spaces, such as kindergartens, youth centers, sport facilities, or even multifunctional venues. During the day, one room serves as a workshop; in the evening, movies can be watched there. Spaces can also cater for several uses at the same time. One example is the laundry café, where you not only go to get your clothes washed but also to meet friends and eat a delicious piece of cake with raspberries from the communal garden. This distribution of functions throughout the TOPOS creates many meeting places and also ensures that private retreats no longer take up so much space, as some rooms are simply opened up to public life. Visitors from larger cities find the village life so appealing that a little guest house will soon open.

Scenario A:
The Green Communities of Eydelstedt



4.20

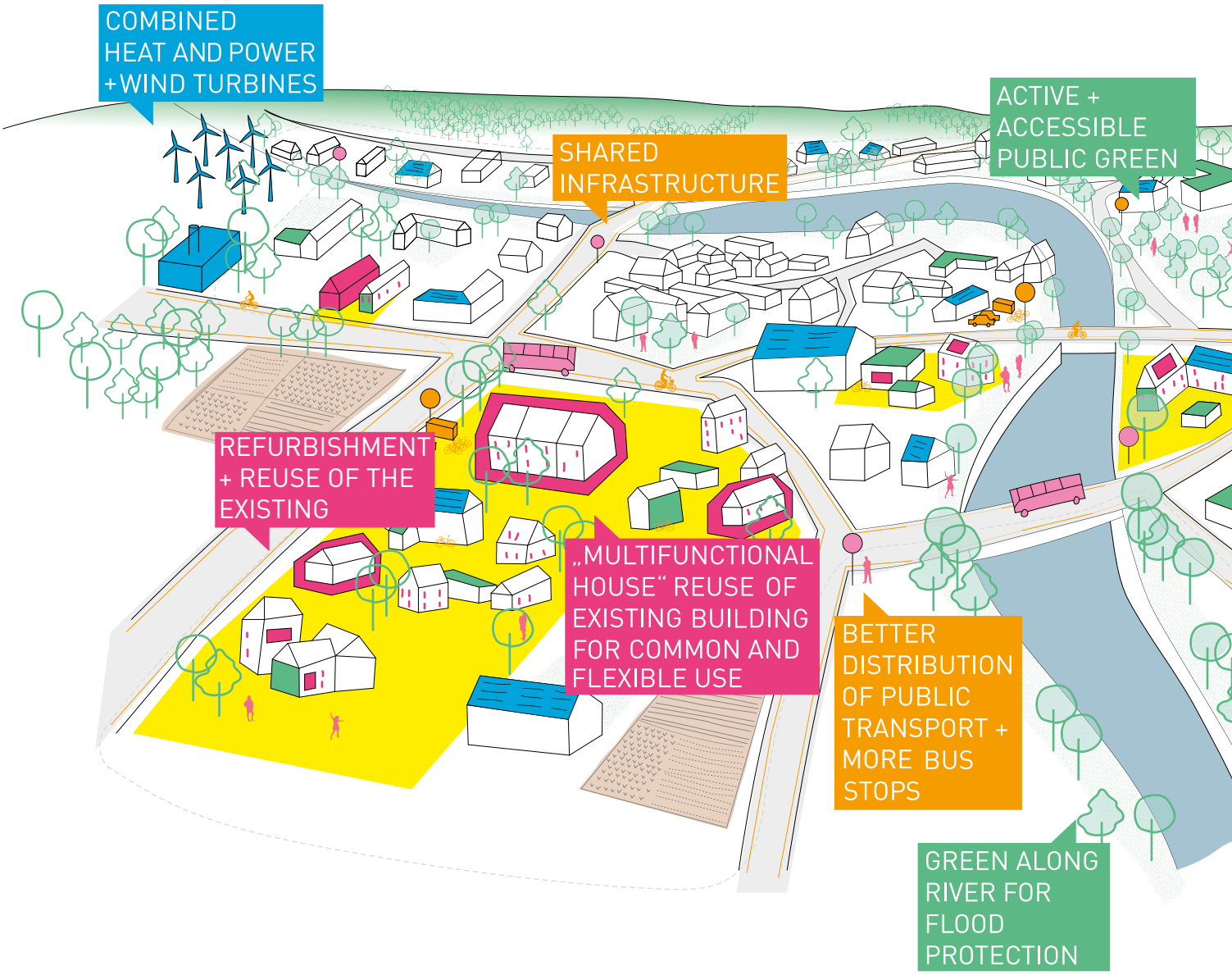


ACCESS TO BARGERIEDE

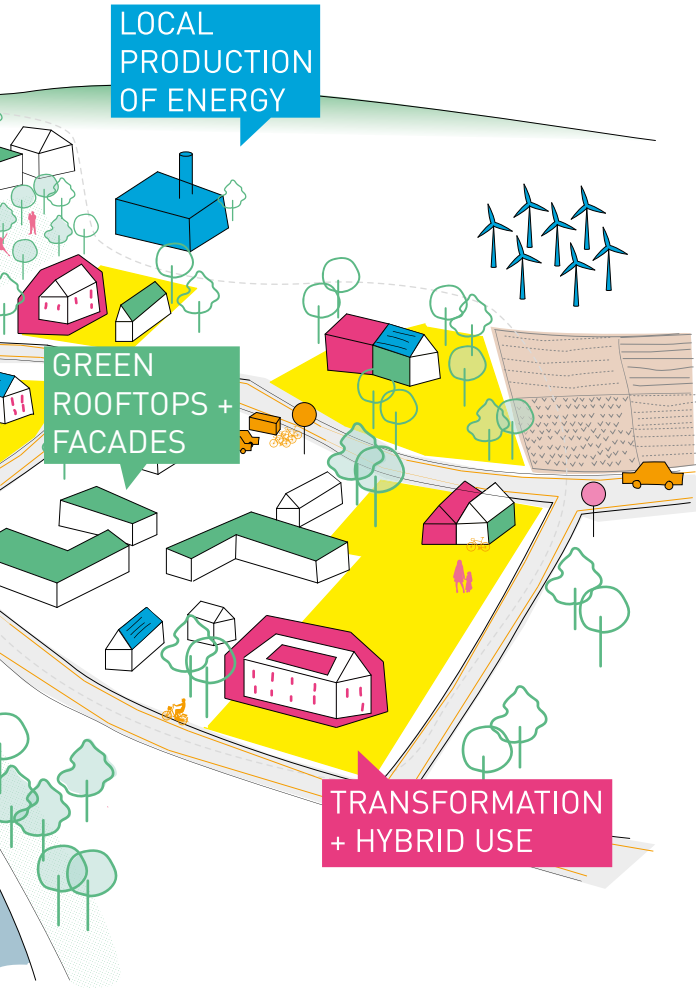
MIXED FUNCTIONS WITH COMMON SPACE

RIDE-SHARE BENCH

4.4. Scenario B:
A Happy Future Planned for Eydelstedt?



4.21

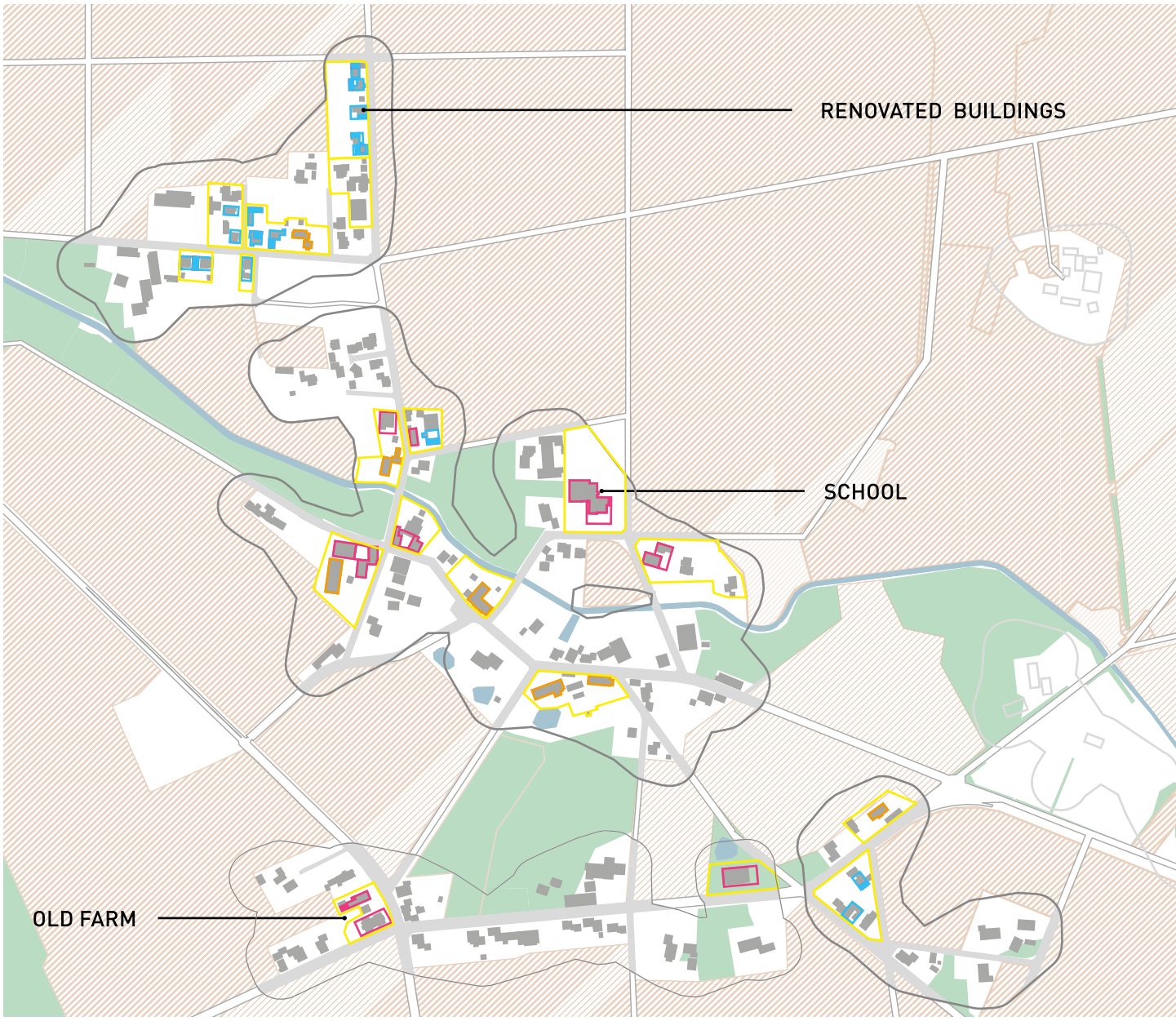


Dear residents of Eydelstedt,

I only come to Eydelstedt once a week, every Tuesday, to offer health services in the premises of the former bakery, which now serves as a multifunctional community center. I have to say, this village really has it all! The very idea of this multifunctional building is great: yoga for seniors on Monday and Wednesday mornings, gymnastics for children in the afternoons. Simultaneously, language courses take place in the other half of the building. On Tuesday, myself and another colleague from Barnstorf are working there. On Thursday, there are cooking courses on how to prepare regional fruit and vegetables, and on Friday you can take courses on basic computer knowledge and "how to handle a smart home". Saturday is the community baking day, in the course of which the old baker's oven is fired up. That's what I call good leisure and educational offers and, above all, an amazing reuse of the building! But even outside of these walls, I am always amazed by the village. All the great front gardens and gardens are not just nice to look at for visitors like me, but they are a real paradise for wild bees and other insects. The honey produced here can be bought directly on site, in a small village shop integrated into one of the mobility hubs. Here, I can sit on a ride-share bench and get a lift from someone with the same destination, or I wait for the bus. Or I can cycle along the beautiful cycle lane running parallel to the Bargeriede and the lush meadows next to it, which have been kept extra wide so that they can act as a buffer in the event of flooding. Besides flood protection, this layout is also advantageous because these areas are meanwhile used as an adventure trail, football field, for picnics or simply for picking flowers.

Best from the future!

Scenario B:
A Happy Future Planned for Eydelstedt?



4.22 Legend

New Building Type I
New Building Type II
New Building Type III

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets

Green
Water
Agriculture

0.25 km

Building Types

The *Planned Happy Future?* scenario focuses on the renovation and conversion of the existing building stock. This can include measures such as adding floors, the extension of buildings with an annex to accommodate more uses, or the refurbishment of buildings to increase the quality of the building stock and provide more living space within the existing village. Furthermore, the conversion of buildings is also investigated.

I. Thermohouse

This renovation strategy has more to offer than conventional facade insulation. By putting a new climatic envelope over the old buildings, they are preserved and renovated so as to increase their energy efficiency. The approach facilitates the improvement of the entire village scape and at the same time the creation of additional living space. The selection of the buildings is based on their building type and age: single-family houses built in the 1950s, 60s, 70s and later are perfect for this kind of transformation, since many of them require an upgrade of their energy performance. As we see on the map, there is a cluster of renovated buildings in the northern part of Eydelstedt that was mostly developed in the 1950s and 60s. With the Thermohouse method, buildings can be extended in length to provide more space for multigenerational living. The buildings are adapted to meet today's spatial requirements and do not have to be rebuild from scratch.

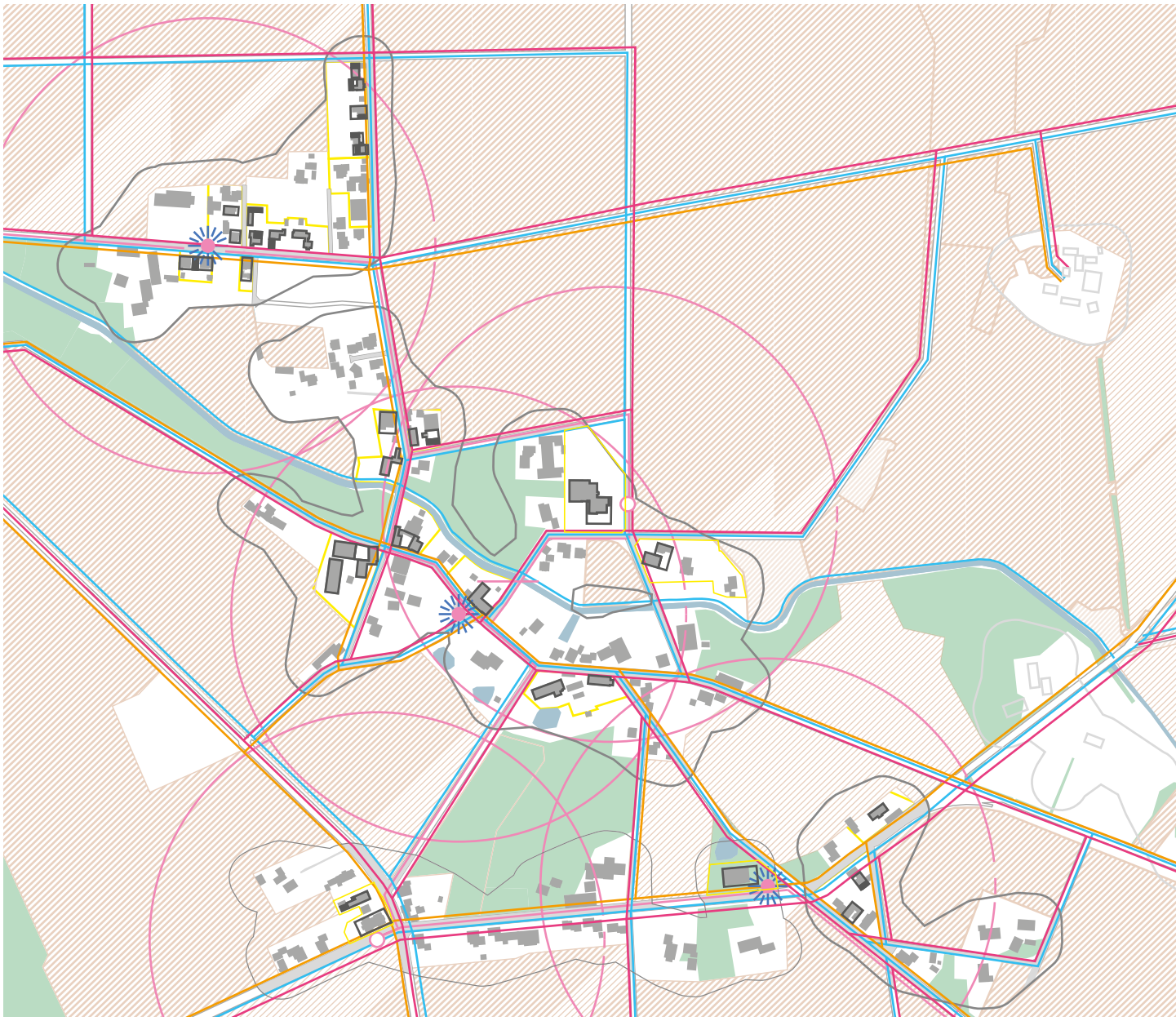
II. New Envelope, New Identity

The same approach is applied to public buildings. Due to the population growth in the village, there are more and more children, which means that the school has to grow, too! It is expanded and upgraded from an energy-saving point of view. A wooden extension and one with a glass envelope are implemented. The wooden annex accommodates a new classroom, whereas the glass extension serves as a new greenhouse for experiments and hands-on teaching. The two functions can also be combined. Using the Thermohouse method, existing residential buildings can also get an extension with public uses: a café, a small shop, or a multifunctional room – everything you wish for in Eydelstedt.

III. New Faces for Old Farms

As Eydelstedt is an agricultural village, there are many farms, stables, and barns. A half-timbered ensemble from 1842 is listed and has been converted into a residential building. Considering this example and keeping in mind the approach of conversion, energy-related renovation, and reuse, many of the other buildings once used for agriculture have development potential to the benefit of the village. Even though a barn appears to be a type of building not actually meant for living, it can be converted into a residential space with a few constructive interventions. It needs windows, an adapted floor plan, and the energy performance of the wooden facade has to be upgraded to create a comfortable indoor climate. To allow for a swift conversion of unused buildings, the building law is remodeled and building permissions are granted more quickly.

Scenario B:
A Happy Future Planned for Eydelstedt?



4.23 Legend

Existing Bus Stop
New Bus Stop
Bus Lane
Bus Stop Radius 420m
Hike Path
Car Lane

Cycle Lane
Pedestrian Lane
Mobility Hub
Transformation Area
TOPOS Boundary

Existing Buildings
New Buildings
Transformed Buildings
Existing Streets
New Streets

Green
Water
Agriculture

0.25 km

Streets, Mobility, Public Space

The *Planned Happy Future?* scenario focuses on the expansion of public transport. Mobility hubs are set up at strategic points in the most frequented places. Streets are geared more towards serving people than cars. They are considered common spaces accommodating different village functions and are used more equally by all participants.

I. Shared Streets, Safer Streets

In Eydelstedt, the street space is regarded as a shared public space for a wide range of different users. To make this possible, there is a maximum speed limit of 30 km/h throughout the village and clearly marked cycle paths and pedestrian walkways. In this way, the street can be used side by side and safely by everyone.

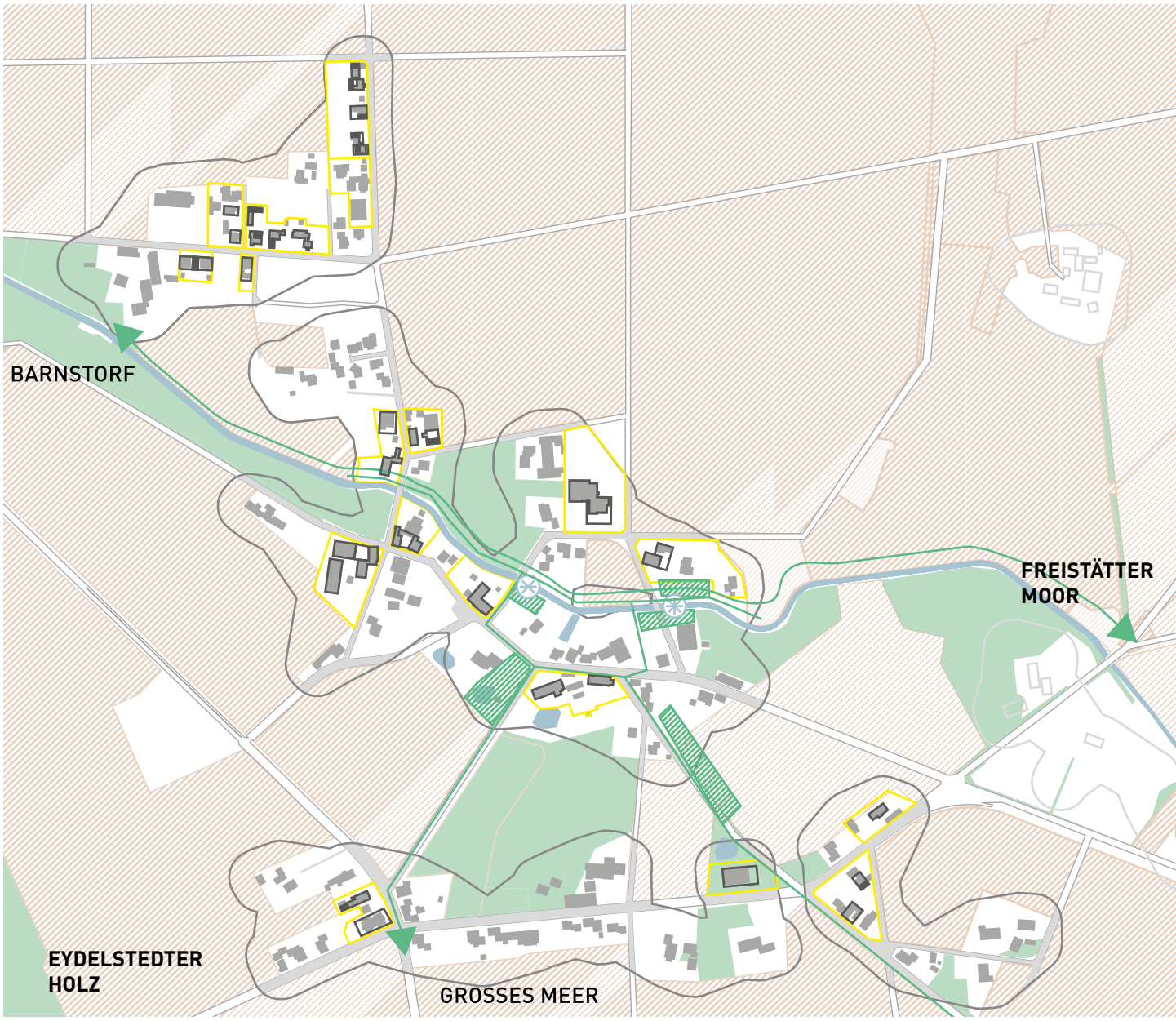
II. Better Distribution of Public Transport

For years there were only two bus stops in Eydelstedt: one located at the school and another one at the kiosk. In order to encourage residents, in particular the many children and young adults, to use public transport, both the frequency of bus services and the number of bus stops are increased. The positioning of the new bus stops has been decided on the basis of two criteria. Firstly, at the intersection of several streets and where there are buildings with public uses, and secondly, where bus stops are still missing to create an ideal five-minute-city network.

III. Mobility Hub 'S'

The new bus stops are an impetus for yet another development, so-called mobility hubs. For every new bus stop, a place is created where people can change from one mode of transport to another, where they can meet and enjoy certain services. The new Eydelstedt mobility hub at the new community center is an example. After her French course, Ms. Schmidt wants to visit her daughter in Barnstorf. She came to the course by electric bike, but cycling to Barnstorf is a bit too far for her. She therefore decides to park her bike at the mobility hub, where it can be charged, too. The bus line, which now serves this stop every two hours instead of twice a day, takes her directly to her daughter. In total, there are now three mobility hubs: one at the fire station, including a pick-up facility for parcels; a second mobility hub is situated between the refurbished residential buildings in the north, where many children live and where a letter box was installed; the third mobility hub is located at the new community center, so that citizens from the neighboring village find it easy to visit.

Scenario B:
A Happy Future Planned for Eydelstedt?



4.24 Legend

Joint Management
Green Connection
Flood Protection
Access to Bargeriede

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings

Existing Streets
New Streets
Green
Water

Agriculture

0.25 km

Green and Blue Networks

In the *Planned Happy Future?* scenario, the focus for the transformation of open spaces is on enlarging their functional variety and performance with a view to climate change mitigation strategies and enhancing their recreational value for the community. The aim is to provide more green connections inside the village and towards neighboring settlements. Furthermore, the greening of existing buildings is part of this scenario.

I. Green Connection

Eydelstedt is situated in the middle of agricultural fields, but there are some other green highlights in the vicinity, such as the Eydelstedter Holz, a little forest, the Großes Meer, a lake, and the marshland called Nördliches Wietingsmoor. To make these places more accessible, a new hiking trail with a total length of 15 km along the river Bargeriede connects Eydelstedt with these iconic landscapes. This creates a green connection that is also continued to Barnstorf. Hikers as well as cyclists can use the trail and either start in Eydelstedt or stop off at one of the newly renovated cafés.

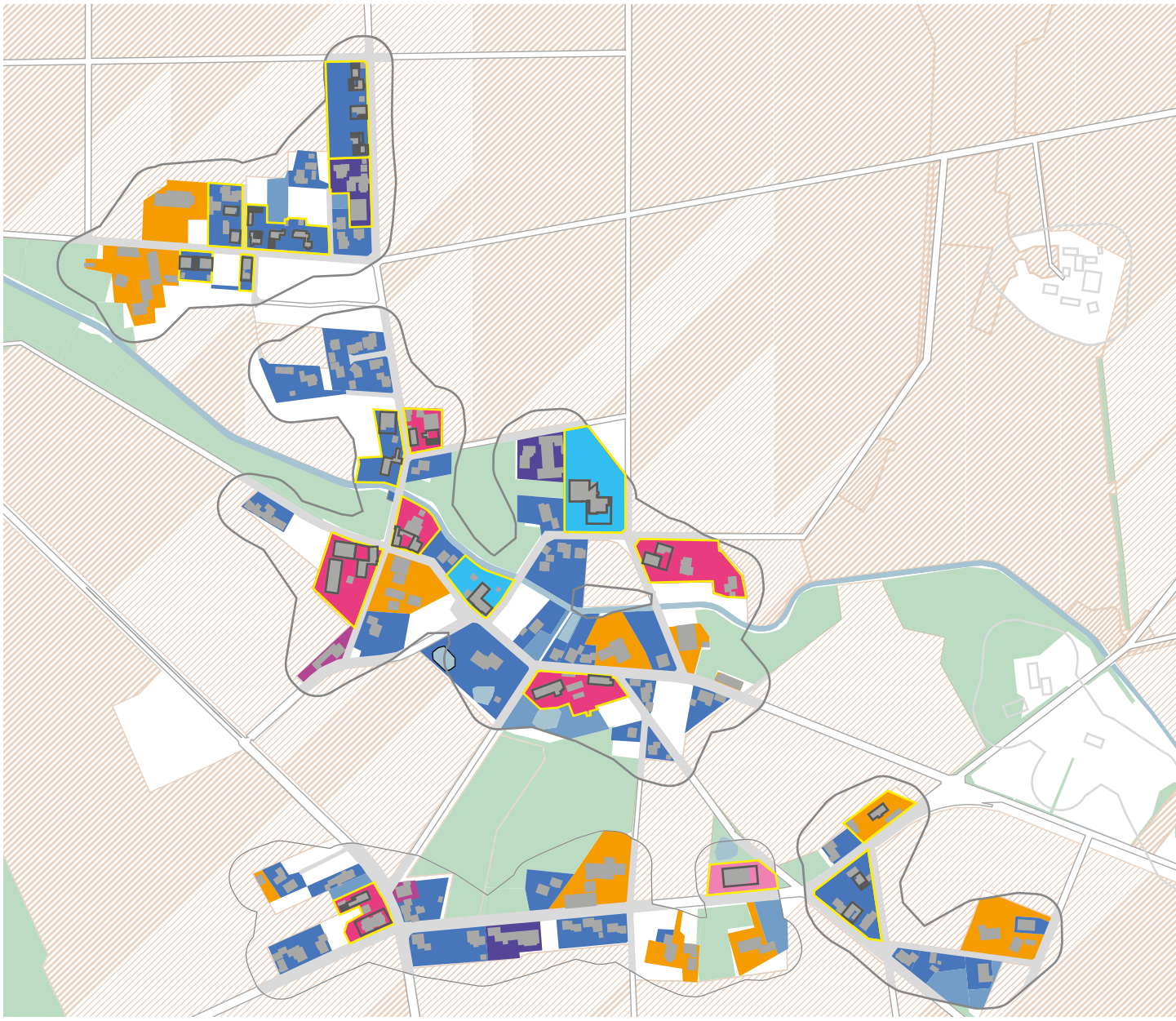
II. Flood Protection

Measures have also been taken to ensure that in future flood events the Bargeriede only overflows in places that are not used for agricultural or residential purposes. The primary measure for flood protection in Eydelstedt is the avoidance of soil sealing. In the medium-term, a renaturation of canalized areas will give the river even more space. Fortunately, more extensive measures such as the relocation of buildings or protective walls are not necessary at this point.

III. Infiltration Ditch

In order to counteract land sealing even further, the roads are provided with more permeable surfaces and, where space is already available, infiltration ditches. This will make it easier for rainwater to seep into the ground. The planting of pond plants along the ditches also contributes to biodiversity.

Scenario B:
A Happy Future Planned for Eydelstedt?



4.25 Legend

Residential
Mixed Use
Industrial
Public
Leisure
Commercial

Forestry
Multifunctional Use
Transformation Area
TOPOS Boundary

Existing Buildings
New Buildings
Transformed Buildings
Existing Streets
New Streets
Green

Water
Agriculture

0.25 km

Functions

In this scenario, the focus is on a mixture of different uses within one building or an ensemble. Production, consumption, and living are all combined in one place to reduce traffic and create synergies. Everything needed for daily use is located within walking distance. The buildings are multifunctional.

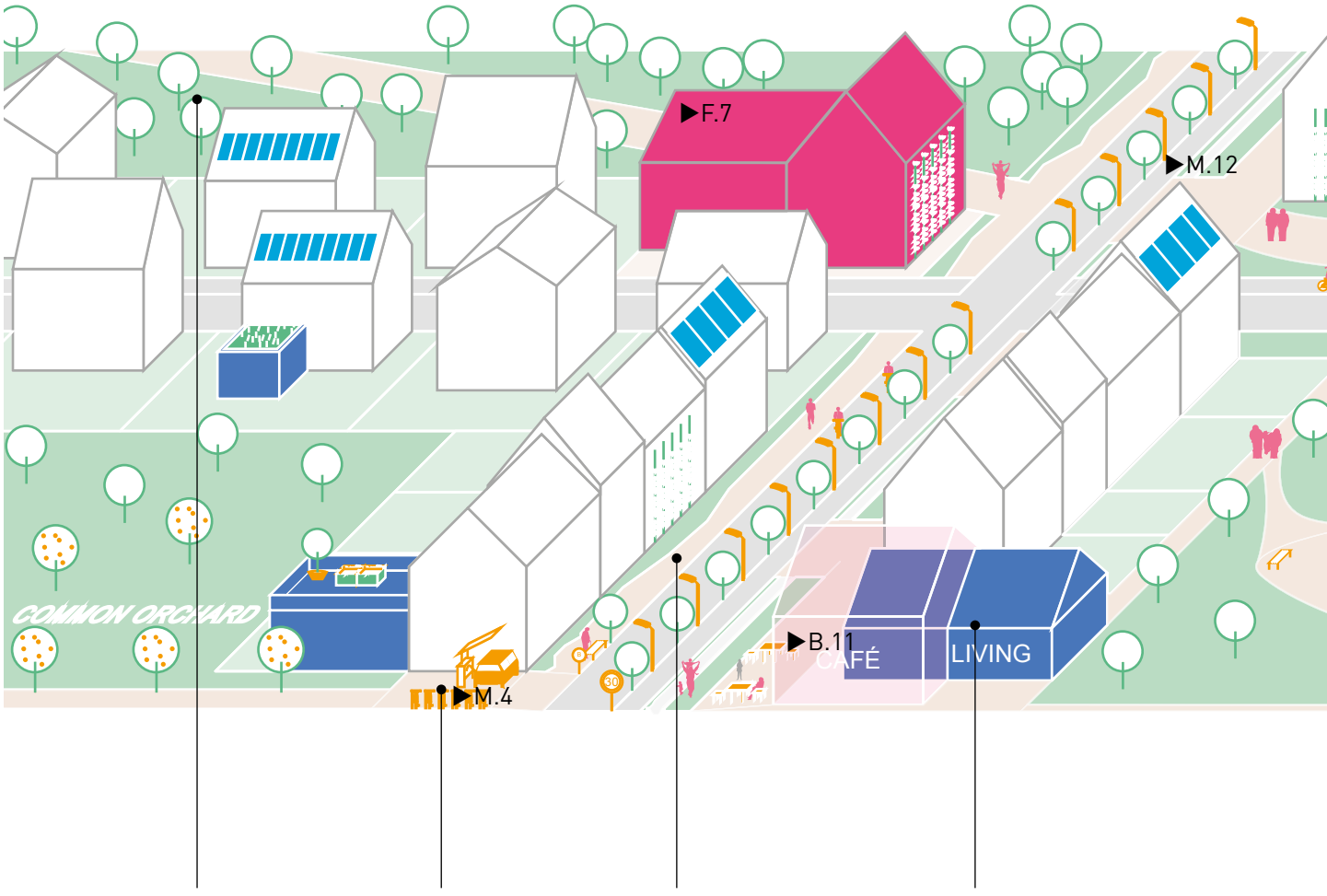
I. Multifunctional House

The former bakery in the middle of Eydelstedt is being converted into a multifunctional house. This means that multifunctional rooms are provided here, which can be used for cultural, social and other activities by the day or by the hour, as needed. Thus, the utilization of the house can be optimized, as it is hardly ever empty. On weekends, there are parties and celebrations. Especially for uses that were discontinued years ago, such as the village doctor or all the cultural offers, the possibility of allowing temporary use can bring those offers back or even create new ones.

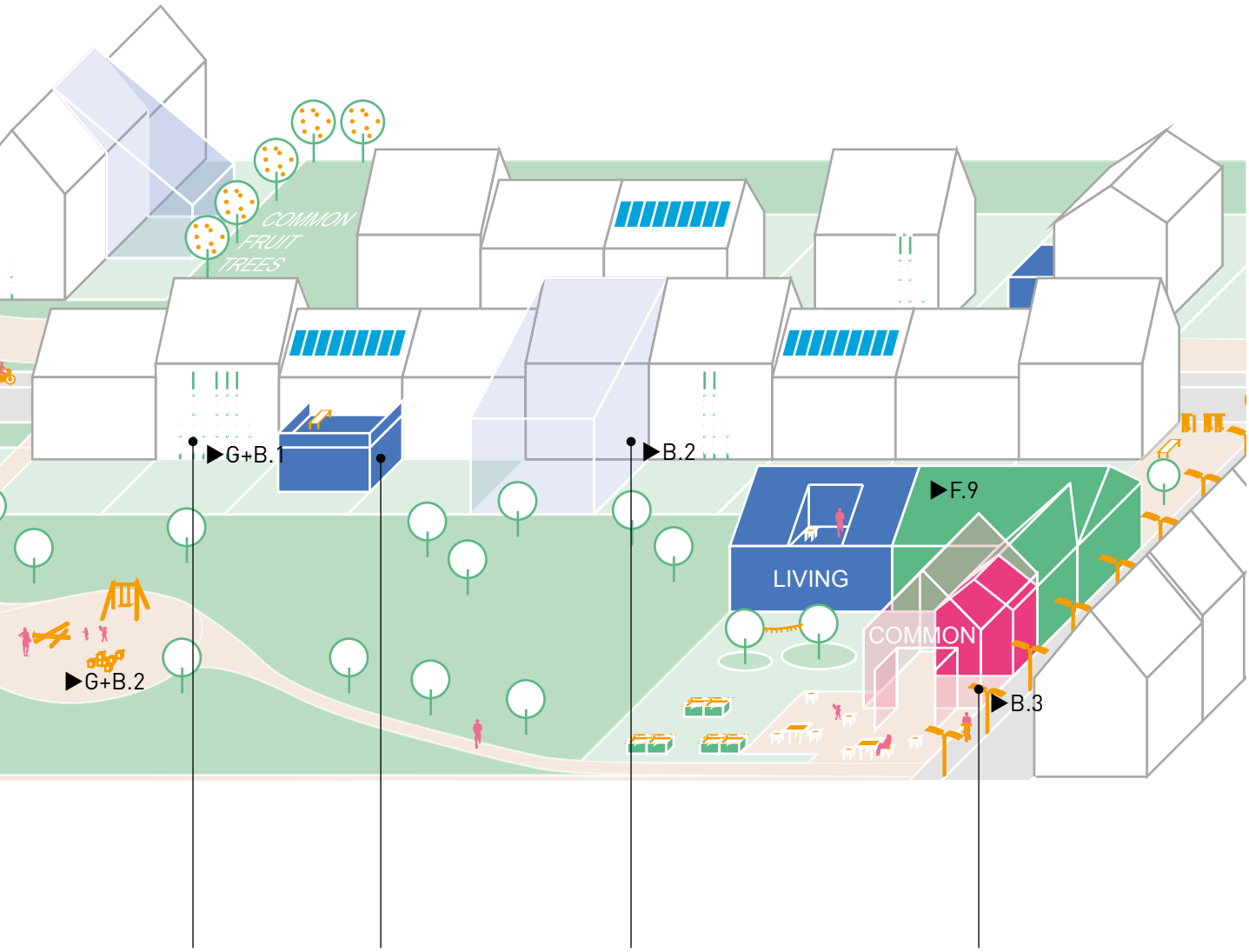
II. Shared Apartments for the Elderly

Some of the renovated buildings are not occupied by just one household but shared by several. An example of this is the concept of shared apartments for elderly people, who no longer want to or can live in their own homes and would still like to live in a community.

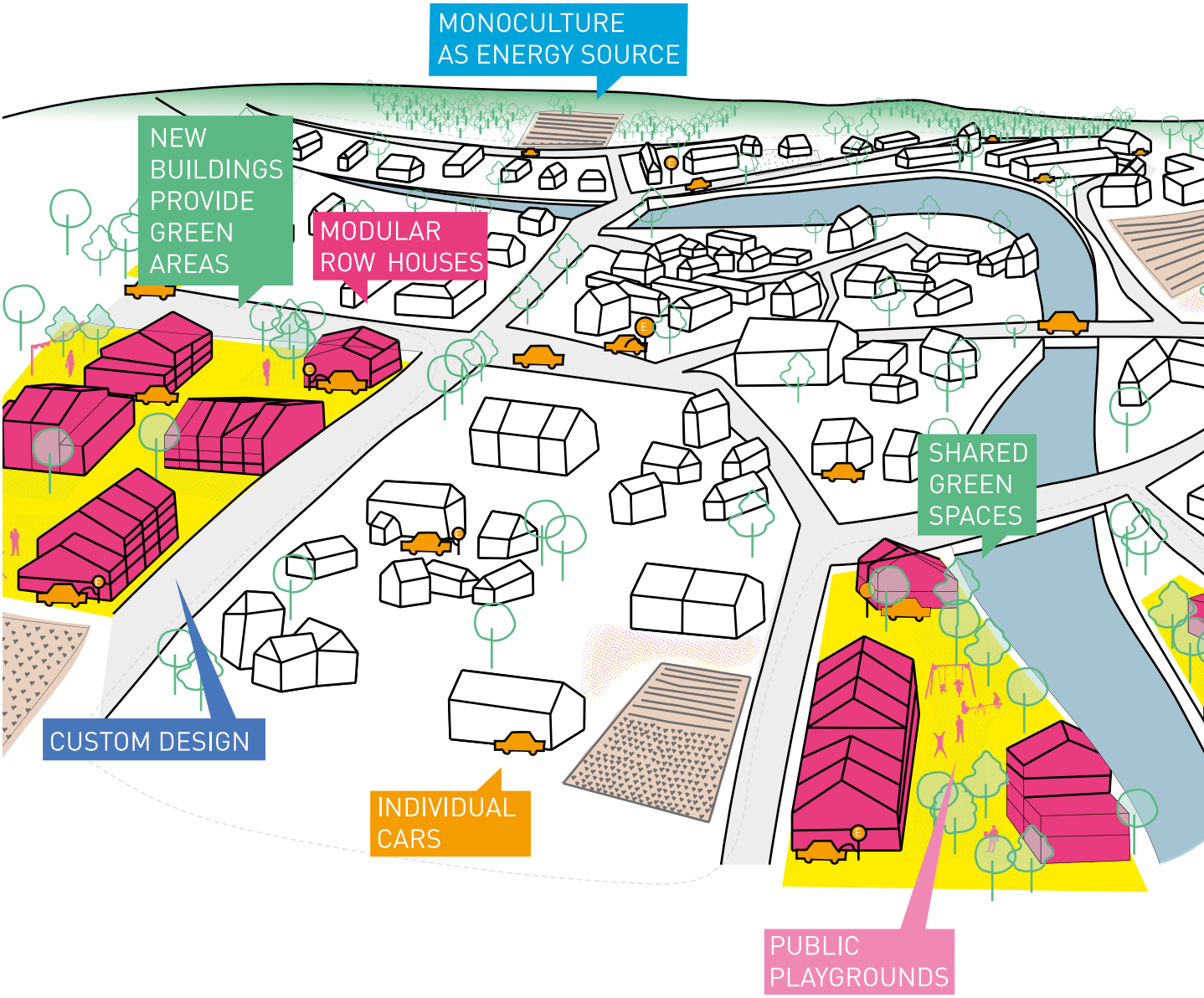
Scenario B:
A Happy Future Planned for Eydelstedt?



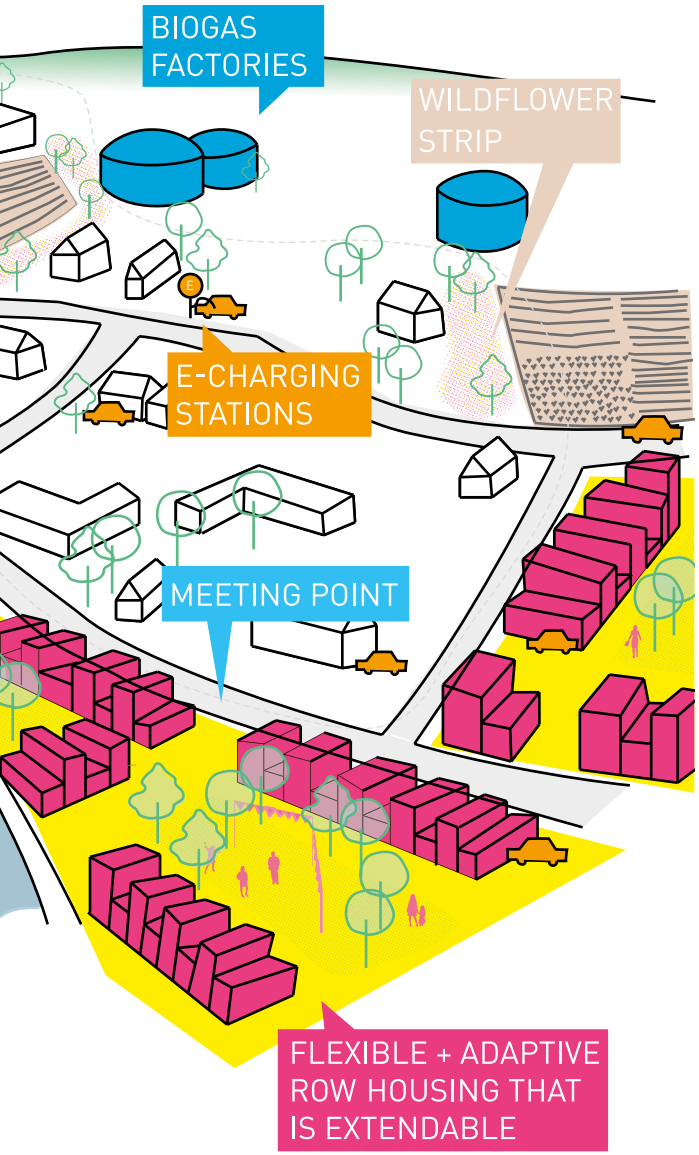
4.26


COMMON
FRUIT
TREES
▶G+B.1
▶B.2
▶F.9
LIVING
COMMON
▶G+B.2
▶B.3
GREEN FACADE
RENOVATION
AND EXTENSION
RENOVATION AND
ADDING AN ENVELOPE
UPGRADED OLD FARMS

4.5. Scenario C:
New Settlers in Eydelstedt



4.27

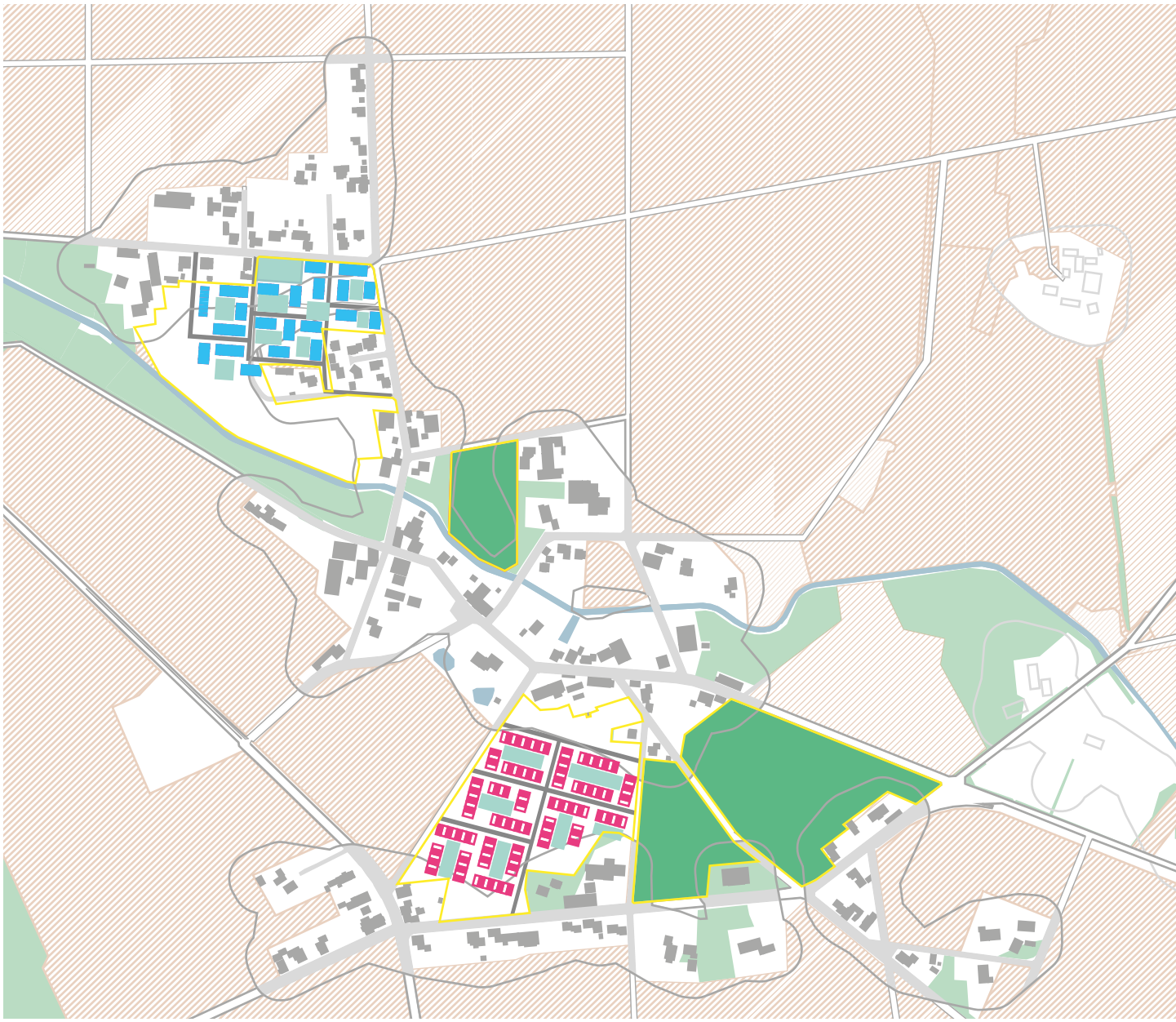


Dear residents of Eydelstedt,

It's nice to have a communal garden that serves as a multigenerational meeting point! Here in Eydelstedt, in our new row house, we enjoy all the advantages of owning our own home, yet without the disadvantage of having to take care of our own garden. Our children have the feeling of living at a playground. We enjoy evenings in the barbecue area. There is always someone who waters the plants, simply because we are a big neighborhood community, where people like to help each other. Whether it's doing gardening together, having a chat at one of the charging stations for our e-cars or at a neighborhood meeting over a delicious cup of coffee: you always meet someone you know. When I recently removed the seats from our car to transport a cabinet, Stefan, my next-door neighbor, offered his help – that's really worth a lot! And when we were on our way to Barnstorf, passing wildflower meadows and fields, he told me that he was very sceptic about moving into a row house. He remembered all the row houses from his childhood with very monotonous facades and gardens as small as towels. But our houses here in Eydelstedt are anything but boring and monotonous. The idea of a modular basic structure that can be expanded according to one's own ideas, budget, and needs has really led to great and diverse houses. I definitely had these concerns too, but as I said, it was not just the large community garden that convinced me in the end. I was also impressed by offers such as the mobile food and medical service for the elderly or people who are not mobile. Or the idea of non-hierarchical streets, so that you can let your children walk to school without worrying: these are strong arguments for moving here.

Best from the future!

Scenario C:
New Settlers in Eydelstedt



4.28 Legend

New Building Type I
New Building Type II
Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets
Green
Water
Agriculture
Prospective Expansion Area

0.25 km

Building Types

This scenario is the only one that deals with gentle growth outside the current TOPOS boundary in the form of compact, dense developments. There are sustainable specifications for energy standards and the choice of material. Modular systems allow for customization while cutting down costs and resource consumption.

I. Modular Row Housing

A new development area was planned to help create housing space for the increasing population. Strategically, the municipality decided to place this new settlement between the northern and the central settlement patches of Eydelstedt in order to merge them. This new and sustainably built development area with row houses connects the single detached houses from the 1950s and 60s in the north with the ones in the south dating from the 1990s and 2000s. People who wish to live here can design their house according to their needs by choosing between several types. This modular row house development boasts maximum energy standards and redefines the public space; there are only communal gardens, no private ones.

II. Self-Made Row Housing

Situated in the south-west of Eydelstedt's central area, the second new development area emerged. The building type used here is row houses that can be adapted to the needs of residents. In fact, the residents can change their new home themselves, since it is constructed as a bare-bones house. So, at the beginning the buildings all look the same, the load-bearing walls and ceilings, as well as the roof are finished, the shell is in place. The completion, however, is determined by the users, whether it's done in self-construction or with skilled workers is up to everyone. In that sense, individual wishes and requirements for the house can be implemented, but the prefabricated framework saves a lot of money. In this way, families can spend as much or as little as they want on the completion of their house.

Scenario C:
New Settlers in Eydelstedt

4.29 Legend

E-Charging Station
Car Lane
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Green
Water
Agriculture

0.25 km

Streets, Mobility, Public Space

Since Eydelstedt is growing and new land is consumed to accommodate it, this scenario brings with it an increase in traffic areas. However, the goal is to develop the community as sustainably as possible through careful planning. Water-permeable street surfaces contribute to that. The visual separation of lanes and roadside greenery make the streets safer.

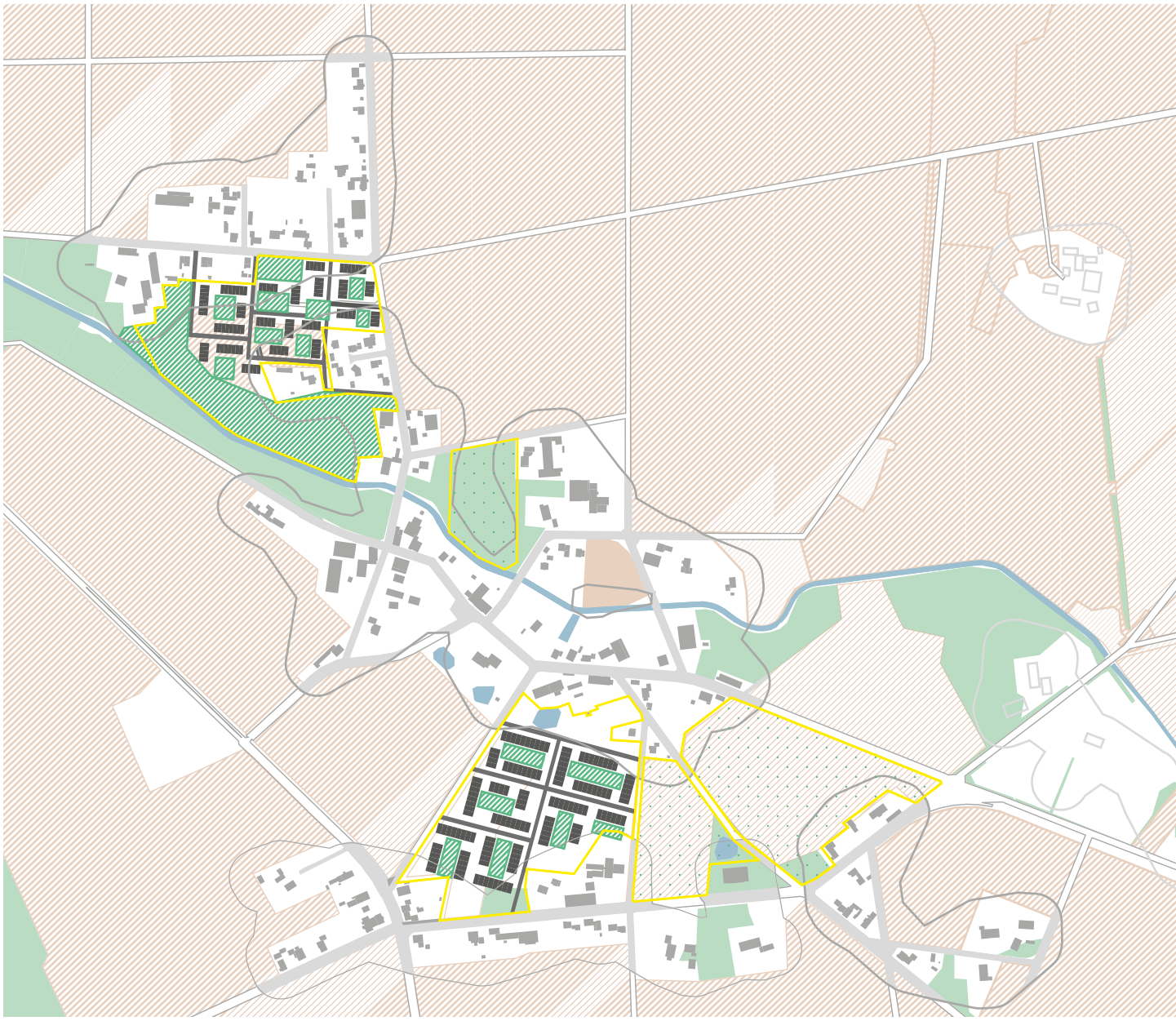
I. Sustainable Street Design

Since this scenario deals with the development of new housing areas, it also requires a sensitive, sustainable approach to traffic areas. From the beginning, roads are built so that there are no hierarchies among the traffic participants but allow for comfortable and safe mobility. To accommodate the increasing traffic volume, the street space is visually separated using different colors to indicate lanes for bikers, pedestrians, and micro-mobility users. In terms of material, the street surface is permeable to water, so that rain can be absorbed directly into the ground. As the two new neighborhoods in Eydelstedt are mainly residential, they only comprise shared spaces. Outside those shared spaces, a general speed limit of 30 km/h is set in the village. To avoid gridlocked traffic, there are no dead ends and hardly any traffic lights. Instead, roundabouts or the "right has right-of-way" principle organize the traffic.

II. Individual Mobility in a Sustainable Way

In Eydelstedt there is still a lot of private transport but only electric. To meet the demand, each newly built house has a carport with an electric vehicle charging station. There are solar panels on the roofs of all houses and carports for charging the electric vehicles. In addition, even more public charging stations are provided in the village so that all citizens can charge their vehicles.

Scenario C:
New Settlers in Eydelstedt



4.30 Legend

Shared Green
Organic Agriculture
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Green
Water
Agriculture
Prospective Expansion Area

0.25 km

Green and Blue Networks

In this scenario, the existing green spaces are maintained and upgraded, e.g., by adding new trees or by converting undefined green buffer zones into useful green spaces, such as gardens. Furthermore, there is a fixed maximum area of soil that can be sealed.

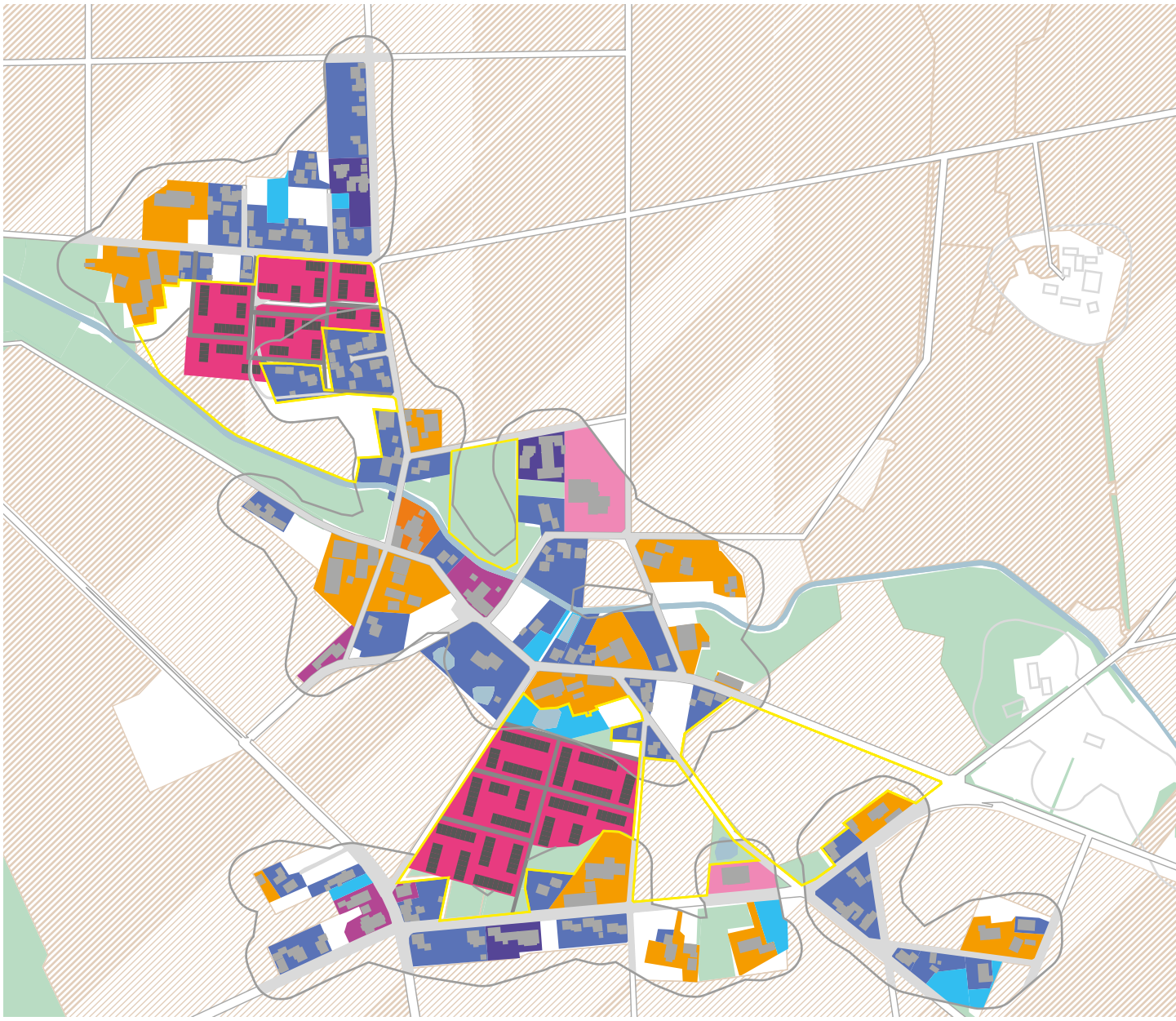
I. Shared Green

In the course of implementing the new neighborhoods, the many communal areas between the buildings are also greened to create community gardens, wildflower meadows, or places for children to play. These green spaces are semi-public and open to all residents of Eydelstedt. In that sense, unsustainable garden designs, such as stone gardens, are prohibited. In general, the strict sealing limits are observed in public and private spaces.

II. Green Buffer Zones towards Agricultural Areas

Overall, there is an increase in biodiversity due to the newly planned green spaces. One measure to realize this is the wildflower strip that works as a biodiversity buffer zone towards the agricultural land. This green strip aims to keep the food supply for insects as diverse as possible and thus offers a balance to monoculture.

Scenario C:
New Settlers in Eydelstedt



4.31 Legend

Residential
Mixed Use
Industrial
Public
Leisure

Forestry
Solidary and Organic Agriculture
Commercial
Transformation Area

TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets

Green
Water
Agriculture

0.25 km

Functions

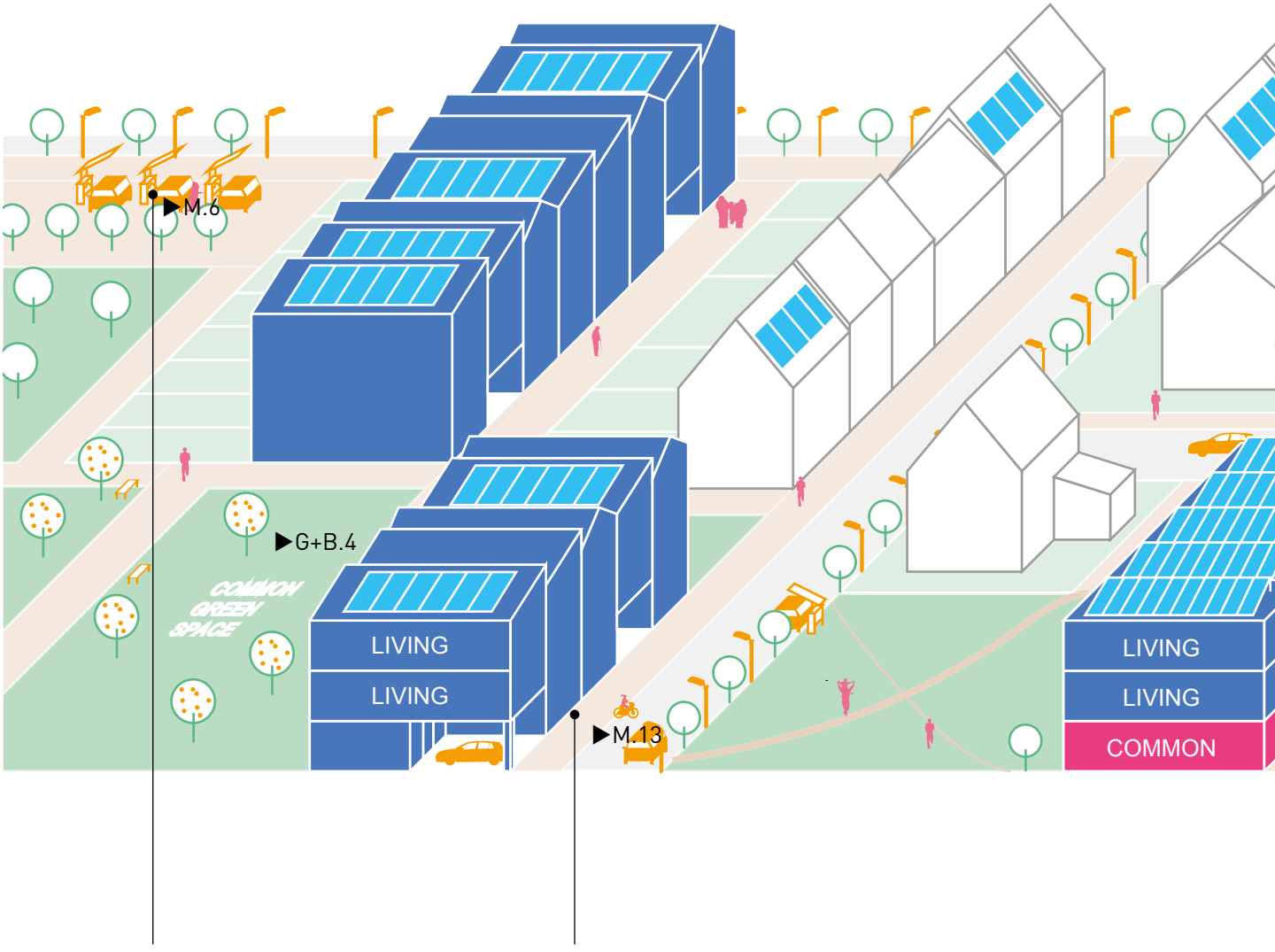
Not everything that the residents need on a daily basis is yet available in Eydelstedt. The villagers are still largely dependent on their cars. In addition, there are mobile service offers for elderly, very young, or mobility-impaired people.

I. Mobile Services for Food Supplies and Medical Care

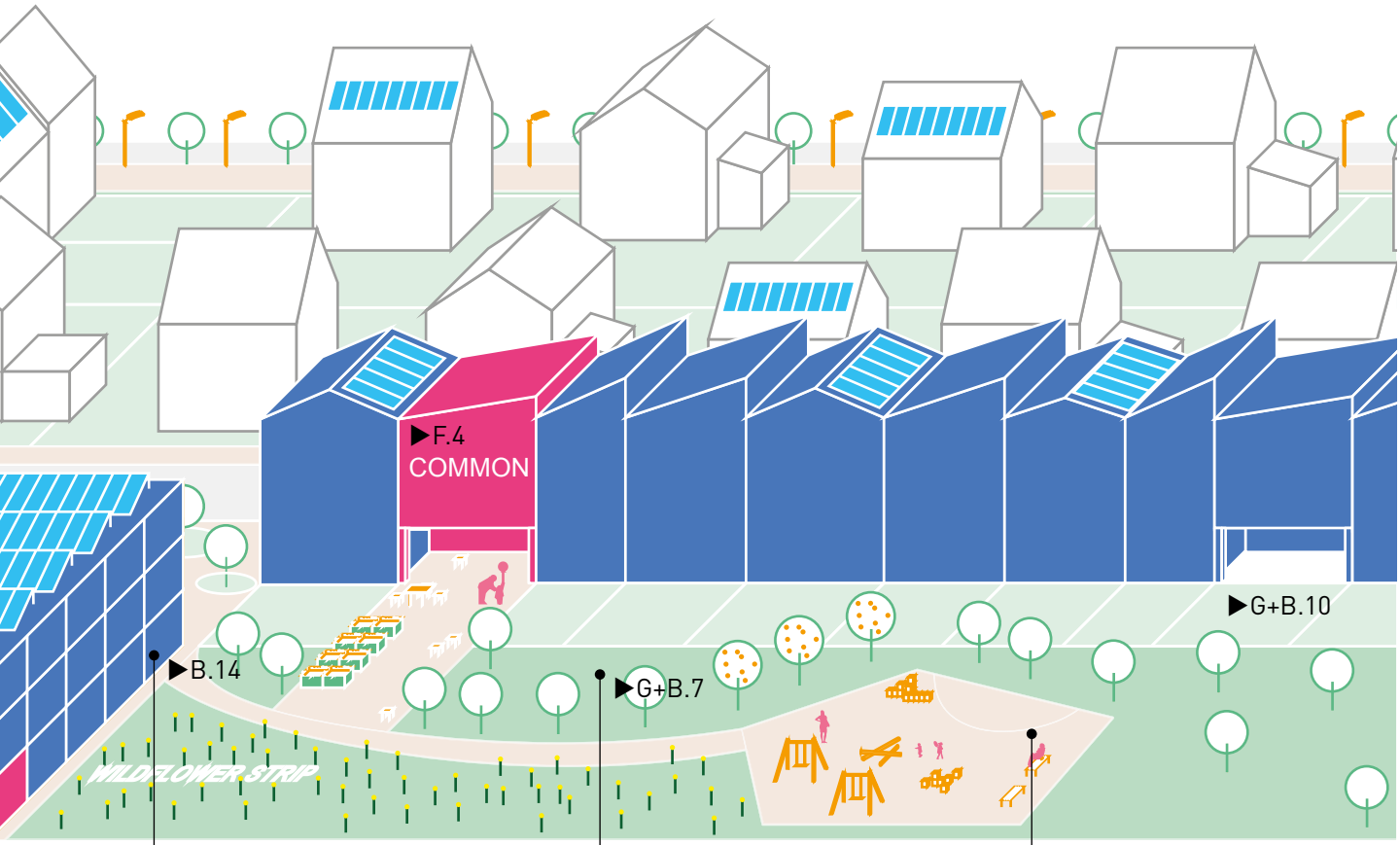
The continued use of cars keeps Eydelstedt in a position where there is no need for local supply, because everyone can reach Barnstorf and the closest local shopping center by car.

The two new residential areas reinforce this development, as there are no shops. However, the elderly and non-mobile residents of the TOPOS need to be looked after. Either they are taken care of by their families or they use the possibility of a mobile local supply. Once or twice a week, either a food truck comes to Eydelstedt or the mobile medical service of the Red Cross. This van is more or less a mobile treatment room and is equipped with all the necessary instruments. The locations for this mobile service are in the middle of Eydelstedt by the old bakery and in front of the fire brigade. If necessary, the doctor also visits a sick person at home or the mobile food service delivers the ordered food directly. Furthermore, a mobile library visits the village once a month.

Scenario C:
New Settlers in Eydelstedt



4.32

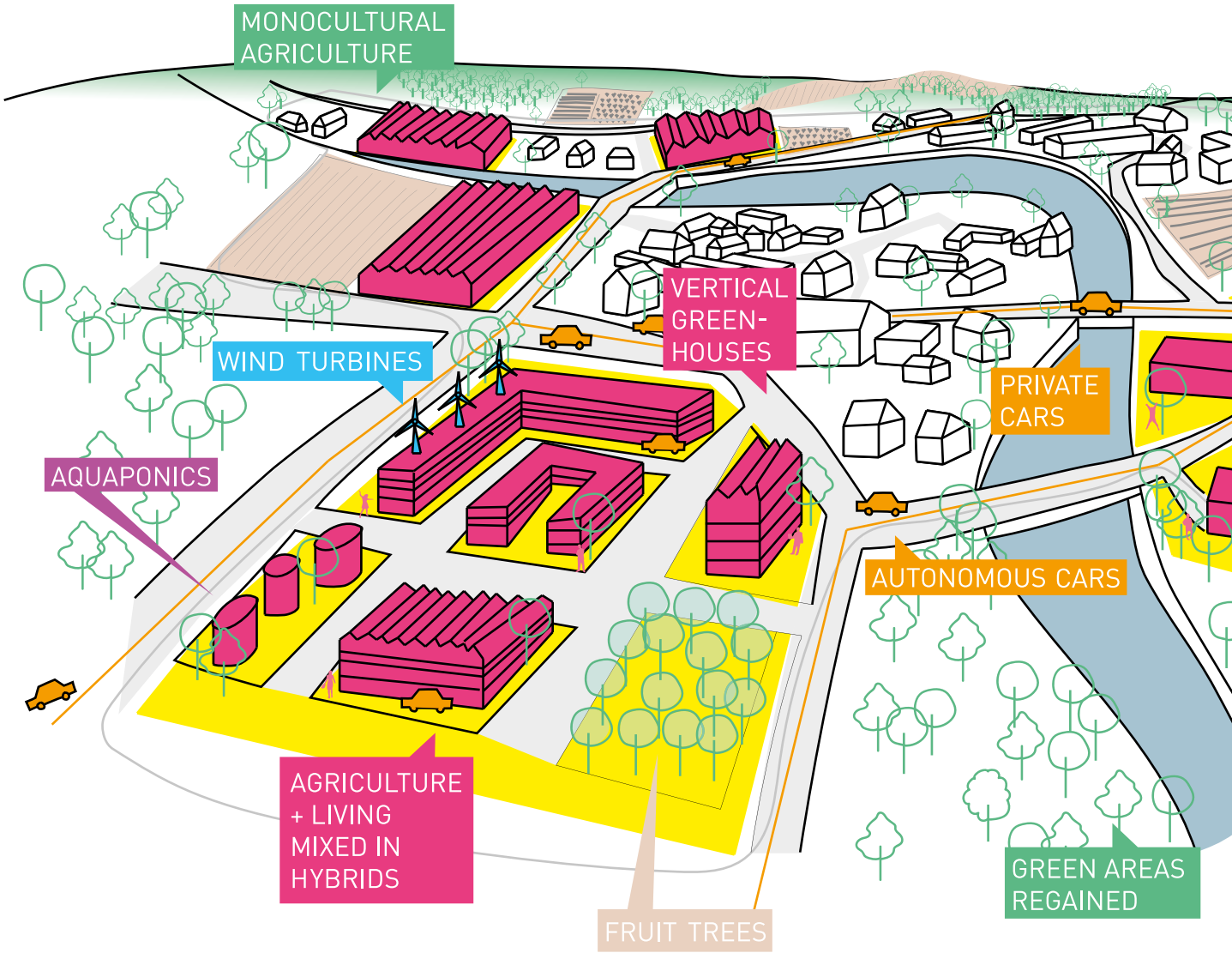


MODULAR ROW HOUSE

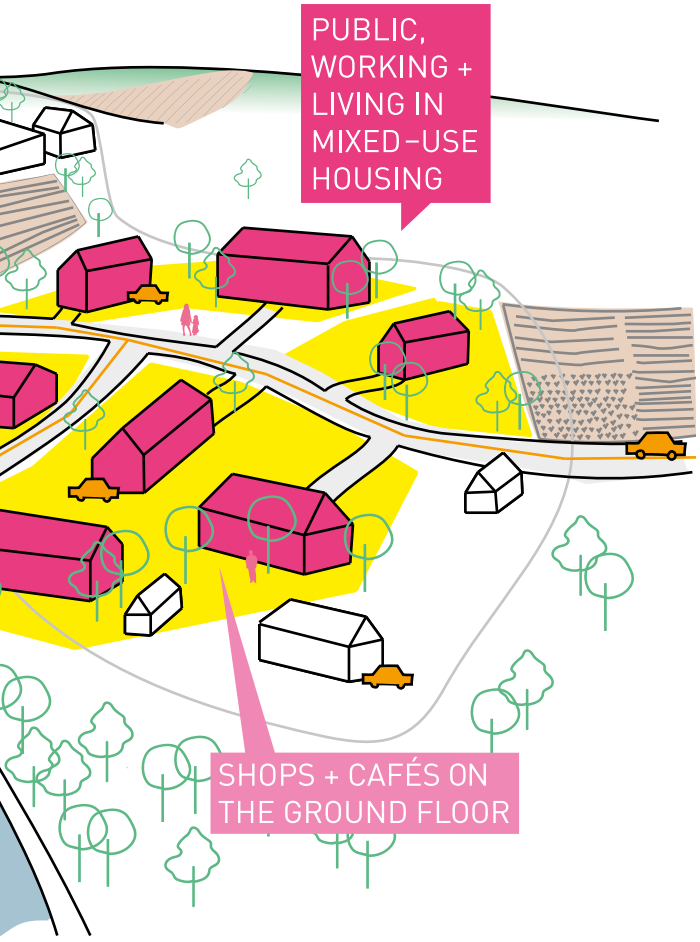
MEADOW ORCHARD

PLAYGROUND

4.6. Scenario D:
Eydelstedt Repurposed!



4.33

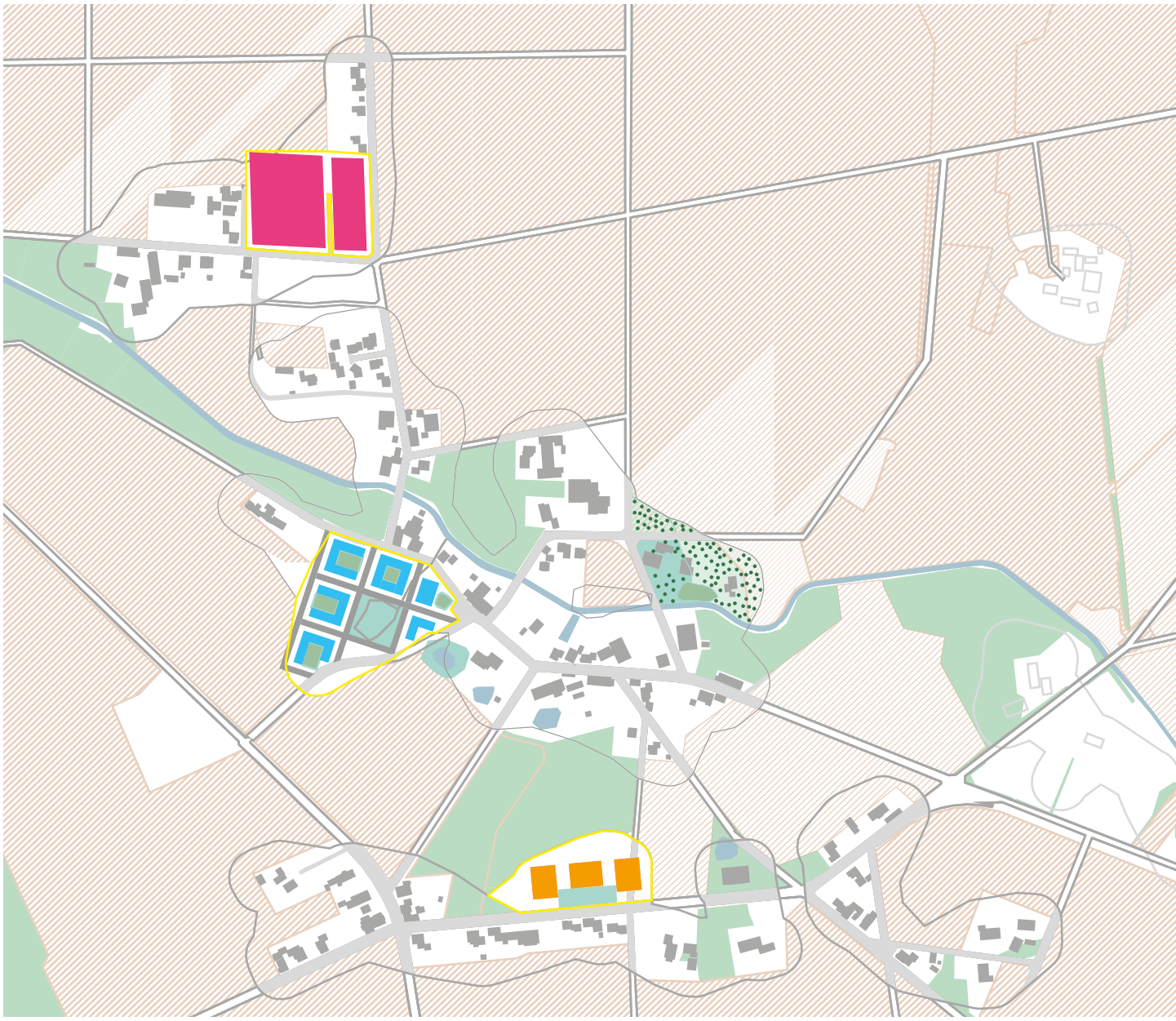


Dear residents of Eydelstedt,

And here I am, back in the village where I was born 50 years ago and spent the first 18 years of my life. When my boss in Hamburg asked me: "Jürgen, how would you like to leave Hamburg for a while and move to a village – to Eydelstedt in Lower Saxony? I really think you might be interested in our new project of starting up and managing one of the most innovative aquaponics farms in the country," I wasn't yet convinced. But she had caught my attention. "You'll also get the nicest flat on the rooftop of our new production building, with the best view and the shortest possible way to your workplace." I got intrigued, because in my home village, not only a new aquaponics farm was to be built but a whole new productive neighborhood. With vertical greenhouses, where people can buy our produce in a shop on the ground floor, which has been grown on the levels above, and with nice apartments on the top levels. For my whole life as a mechanical engineer, I had dreamed of hybrid types of buildings with a wide variety of uses that were to work together synergistically. All integrated into the existing structure of an old village, which had, of course, changed in recent years due to demographic and agricultural changes. And yet, I could hardly imagine the old half-timbered houses next to the most modern production facilities. Or an autonomous bus that would take me and my co-workers or neighbors to the railroad station in Barnstorf? Eydelstedt without the kilometers of surrounding rapeseed fields? Without the one, but always empty bus stop? It was unimaginable to me – but I was pleasantly surprised!

Best from the future!

Scenario D:
Eydelstedt Repurposed!



4.34 Legend

New Building Type I
New Building Type II
New Building Type III
New Trees
Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets
Green
Water
Agriculture

0.25 km

Building Types

The focus is on transforming areas with obsolete functions. New housing estates are being built with contemporary types of detached houses that function either as self-sufficient units or as part of productive neighborhoods. The plots formerly used for agricultural functions are transformed to accommodate new uses.

I. Productive Rooftop

This building type is located in the south of Eydelstedt along the main road. These new buildings have a hybrid use, from working and living to food production. They function like a vertical village, where most daily needs can be satisfied. The stacking of different uses can achieve synergies. For example, the waste heat from the lower floors can be used for heating the greenhouses; during the day the waste heat comes from the offices and at night from the flats. Another synergy is that the vegetables produced upstairs are used by the whole community and sold on the ground floor, so that no long-distance deliveries are necessary.

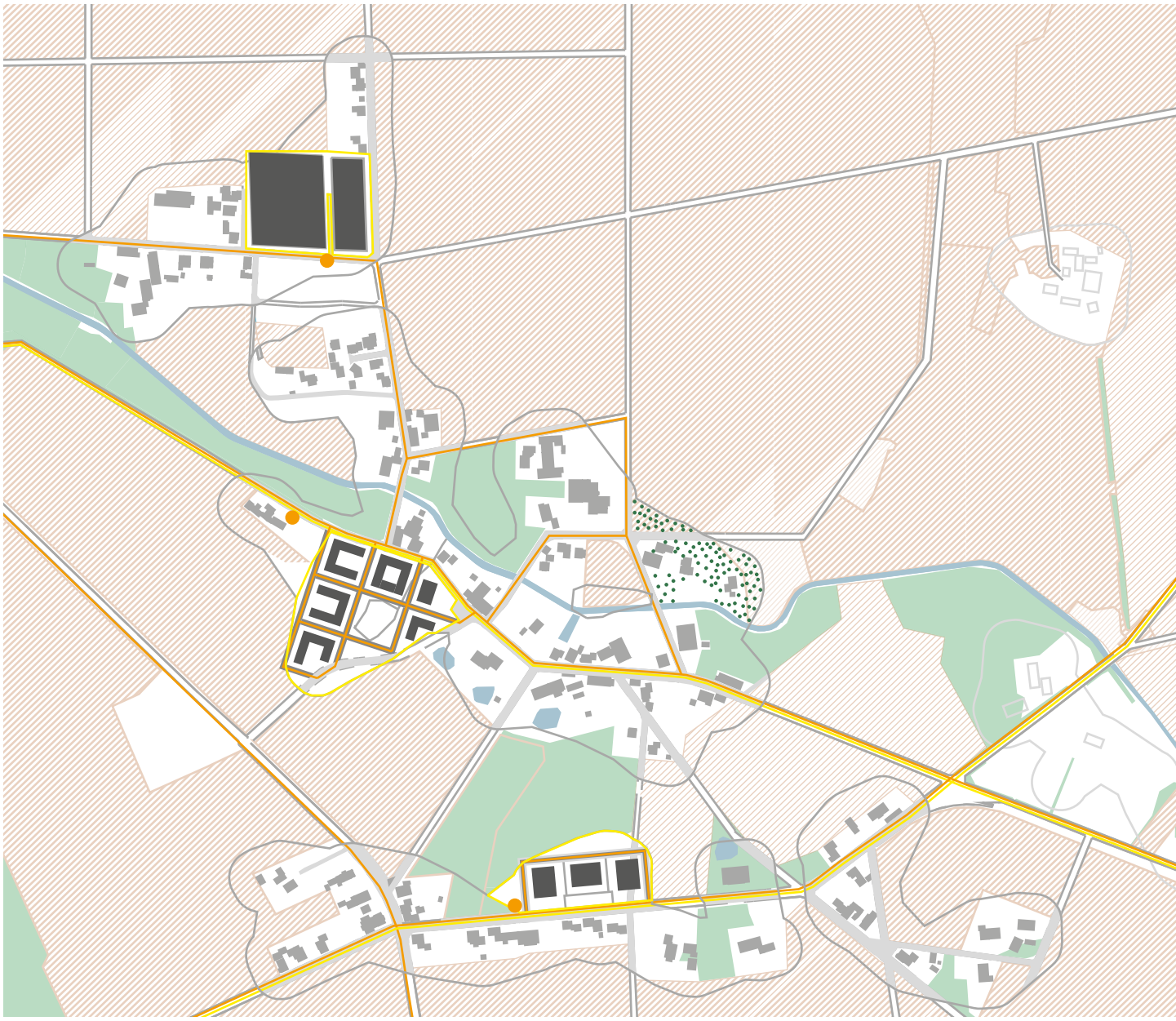
II. Productive Neighborhood

The productive neighborhood is located in the center of Eydelstedt. The industrialized and fully automated production of food or other goods is organized on a reduced footprint in the village. Tomatoes, cucumbers, lettuce, and much more are grown in large, stacked greenhouses and sold directly next door in the vegetable auction hall. There are also aquaponic facilities and buildings that are used to generate energy in the village. The proposed building types are as diverse as the urban production: the L-shaped building, the point, and the courtyard building. The building close to the former bakery has a larger footprint than the others, because it is the main greenhouse for vegetables. Each floor is dedicated to a different crop type, e.g., tomatoes, salad, or cucumbers, so that the technical equipment can be adapted to the needs of the respective plant species. The ground floor accommodates the local sales point and the delivery area, so that autonomous vehicles can pick up the goods and transport them directly to the residents or to other recipients outside the village.

III. Large Greenhouses

The ongoing regional change relates to the way agricultural production is carried out. There is a marked shift from traditional farming on large fields to vertical farming or farming in greenhouses. New methods are applied so that agricultural production in the region around Eydelstedt will continue. In this way, higher yields can be grown on a smaller area. The efficiency of vertical greenhouses allows more output to be achieved on a smaller footprint. Therefore, several additional greenhouses are built in Eydelstedt, two of which are located in the northern part of the village. This makes it possible for the community to withstand structural changes in the agricultural sector and to avoid any economic losses.

Scenario D:
Eydelstedt Repurposed!



4.35 Legend

Autonomous Car Lane
Main Street
E-Charging Station
New Trees
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Green
Water
Agriculture

0.25 km

Streets, Mobility, Public Space

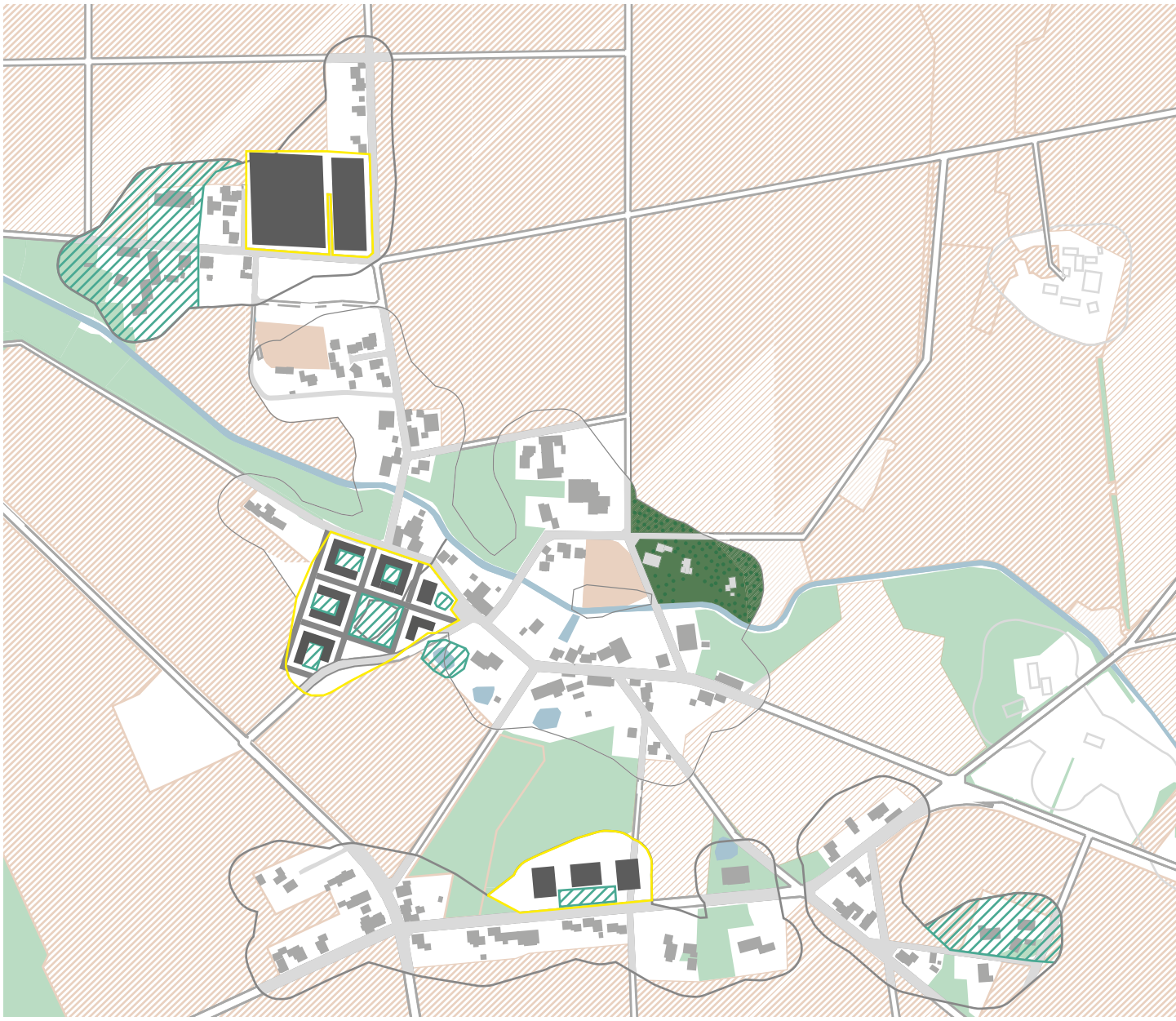
Different types of vehicles drive autonomously along a loop with various charging and rental stations. The new neighborhoods are car-free settlements but allow loading, unloading and different services to enter. They also provide barrier-free access.

I. Autonomous Vehicles

In this scenario, a large part of motorized mobility is based on autonomous vehicles. The three new development areas are connected by a dedicated route for pedestrians, bikes, and autonomous vehicles. Thus, the transport of goods in Eydelstedt and the surrounding areas is locally emission free; and due to the automatized procedure, the traffic volume is drastically reduced. In addition, public transport is organized with autonomous buses, again to minimize emissions and enable smooth traffic flow and frequent service.

With electric vehicles comes a higher demand for charging stations. In Eydelstedt, these stations are located in the new development areas.

Scenario D:
Eydelstedt Repurposed!



4.36 Legend

Shared Green
Organic Agriculture
New Green Area
New Trees

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.25 km

Green and Blue Networks

The large open spaces between the buildings are more productively used for growing vegetables or are otherwise activated. This contributes to a variety of different publicly accessible spaces. All new buildings are provided with green roofs or facades.

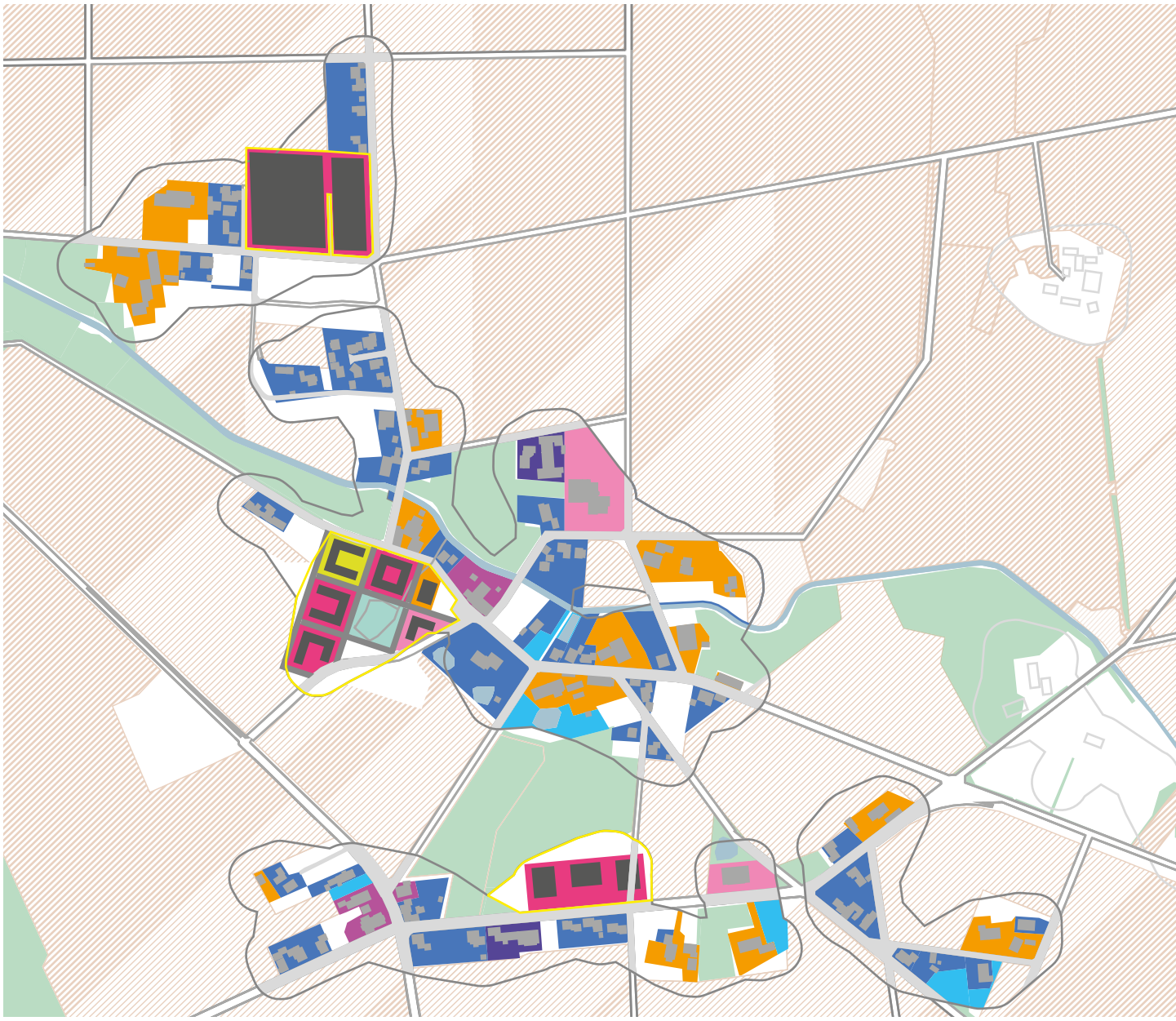
I. Nature Reclaims Abandoned Areas

Due to the overall structural change in rural areas and in Eydelstedt, some buildings are no longer used. These plots, such as the one on the eastern edge of Eydelstedt, are being reclaimed by nature. Thus, saplings are planted to grow a forest north of the Bargeriede, which will increase biodiversity in Eydelstedt and enrich the green spaces for the residents. The formerly farmed fields around Eydelstedt are also changing. Since less land is needed for agricultural production, the areas previously used intensively are being restored to their natural condition and are turning into marshland, meadows, forests, or heaths.

II. Green Facades and Rooftops

Each new building has a greened rooftop, if it has a flat roof, and a green facade to enhance the biodiversity within the village, to support a livable micro-climate, and to increase the building performance. A green facade, for example, contributes to the natural cooling of the building in summer. A greened roof becomes a new habitat for a variety of plants and hence for numerous bees and other insects or animals. Food is produced and flowers are grown, while rainwater is retained and used productively.

Scenario D:
Eydelstedt Repurposed!



4.37 Legend

Residential
Mixed Use
Industrial
Public
Leisure

Forestry
Solidary and Organic
Agriculture
Commercial
Energy

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.25
km

Functions

Since agriculture undergoes a restructuring from mono-crop farming to vertically organized food production in modern greenhouses, Eydelstedt, too, is facing a transformation. New hybrid buildings emerge that contain spaces for food production, sales, co-working, for leisure activities, and even housing.

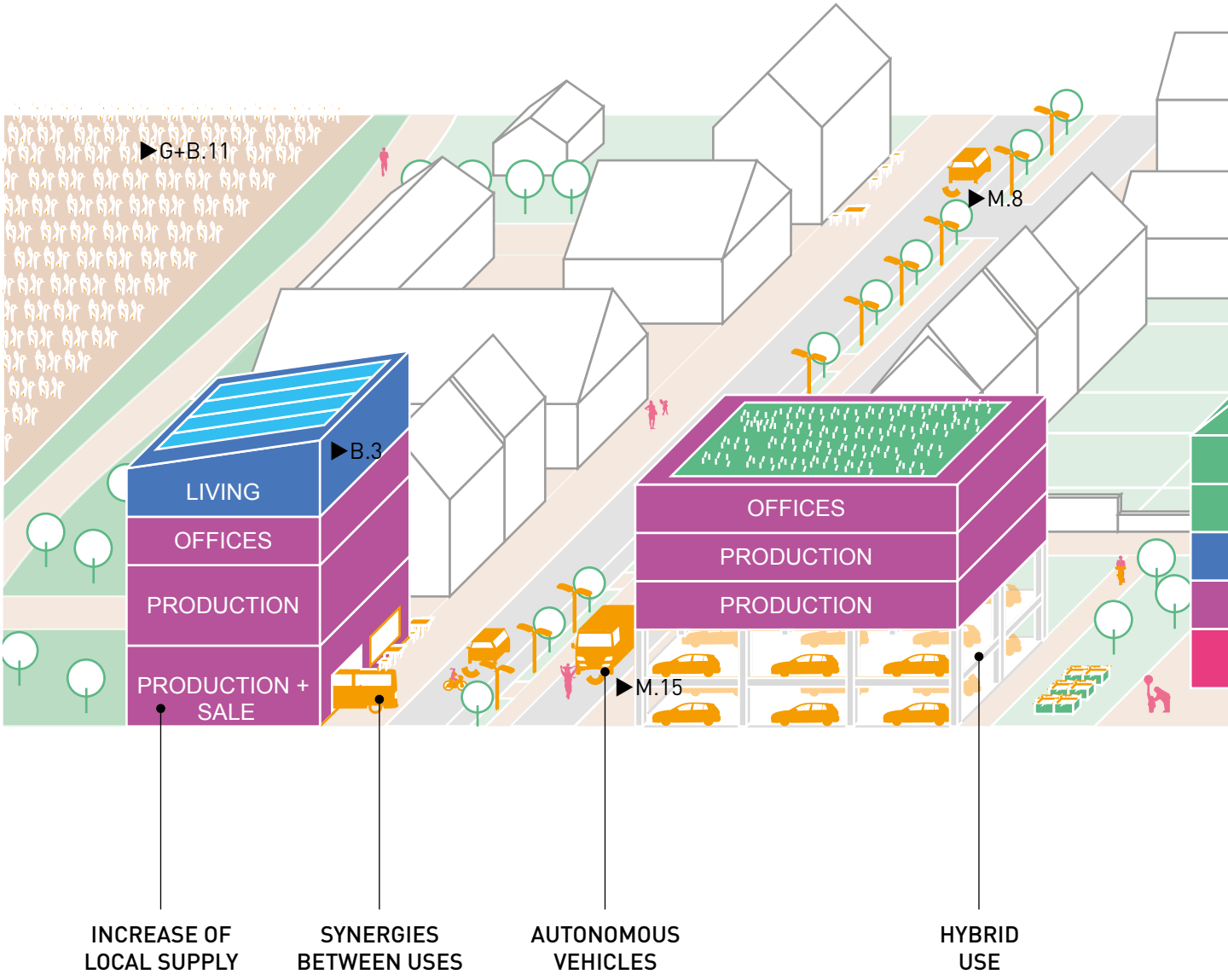
I. Aquaponics

New production techniques offer the possibility to grow certain fruit and vegetables with the help of the circular aquaponic method. This method combines the rearing of fish or other aquatic animals with food production. The nutrient-rich water from the fish tanks is fed to the plants, which are thus not only watered but also receive valuable nutrients through the addition of bacteria. The excess water can flow back into the fish tanks via hoses, closing the circle. With this method, high-quality food can be produced on significantly less space with almost no emissions.

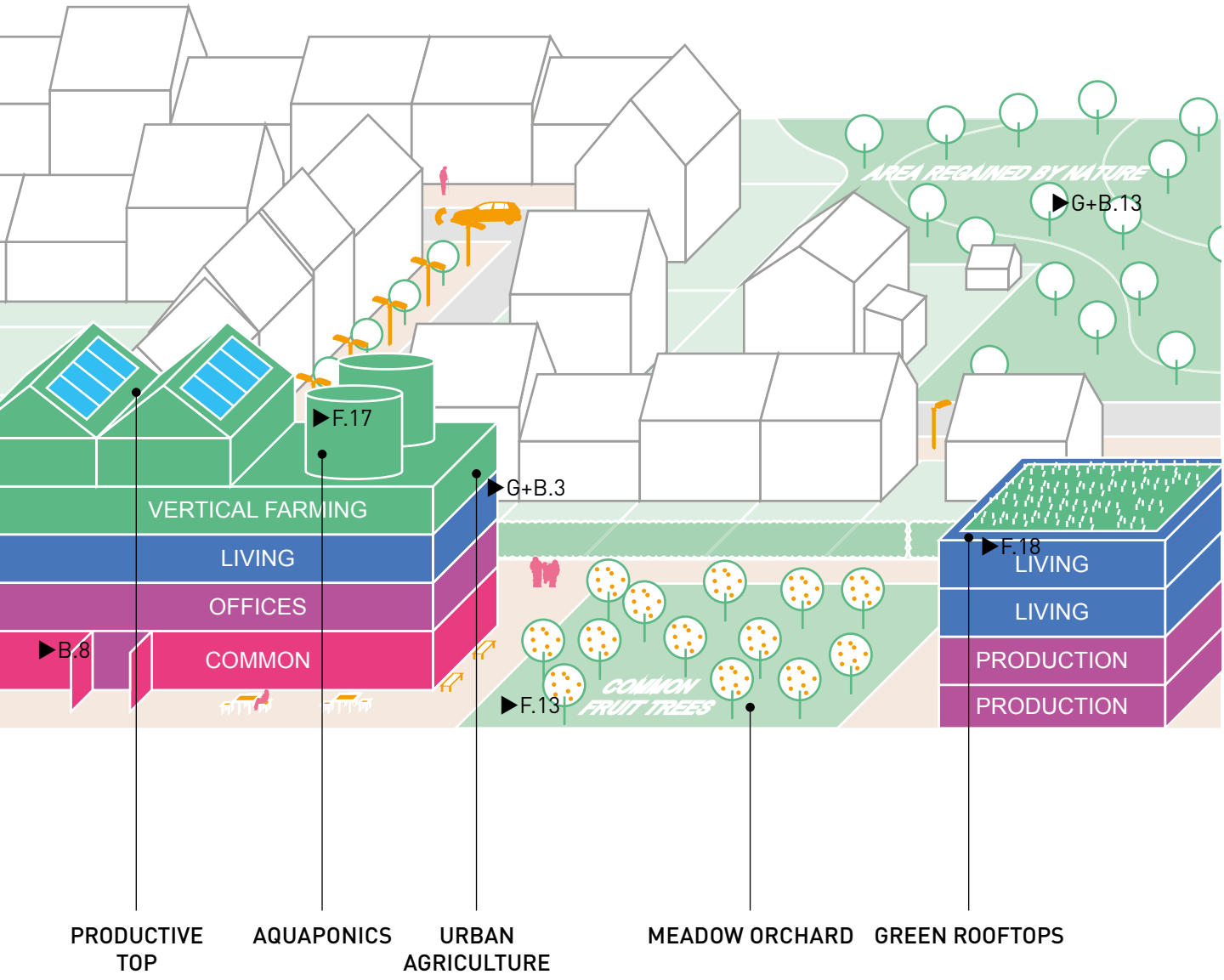
II. Hybrid Use

The new Productive Neighborhood or Productive Rooftop building type allows for hybrid building uses, contributing to a more vibrant village life. The ground floor zones are used for public purposes such as a café or a shop selling the produces grown on the upper floors, a kindergarten, or other necessary functions. In addition to this contribution to public life, synergies are also created between the various uses in the building, e.g., the use of waste heat for heating the greenhouses, or the use of geothermal energy via the foundations of the buildings.

Scenario D:
Eydelstedt Repurposed!



4.38


AREA REGAINED BY NATURE
▶G+B.13
▶F.17
VERTICAL FARMING
LIVING
OFFICES
COMMON
▶B.8
▶G+B.3
▶F.13
COMMON FRUIT TREES
▶F.18
LIVING
LIVING
PRODUCTION
PRODUCTION
PRODUCTIVE TOP
AQUAPONICS
URBAN AGRICULTURE
MEADOW ORCHARD
GREEN ROOFTOPS

5.
PROTOTYPE II:
Detmerode,
an Exo Satellite Town

5.1 Center of Detmerode
The shopping center of the Exo Satellite Town is nearby and easily accessible for the residents.

5.2 Detmerode Residential Area
There are different types of housing in Detmerode.
Here on Geschwister-Scholl-Ring, row houses are lined up.

5.3 Living in the Green
Detmerode offers many green spaces such as meadows and parks in close proximity to the apartment buildings.

5.1. TOPOI Description

Typically, large housing estates of the 1960s and 1970s, the so-called Exo Satellite Towns, are found at the edge of larger cities. And so is Detmerode, a district of Wolfsburg that was planned and built in the 1960s, and is currently undergoing social and spatial transformation. Detmerode is one of nine Exo Satellite Towns in the two study areas with a joint total of roughly 45,000 inhabitants.

Detmerode has a population of around 7,000 and is located southwest of the inner city of Wolfsburg. With roughly 123,000 inhabitants, Wolfsburg is the fifth largest city of the Federal State of Lower Saxony and one of the few cities newly founded in the twentieth century in Europe. Today, Wolfsburg is mainly known for the headquarters of Volkswagen AG – one of the world's largest car producers. The city was founded in 1938 by the Nazi Regime to provide homes to workers involved in the production of the "Kraft durch Freude Wagen" (German for "Strength Through Joy" automobile) in Fallersleben. However, some parts of Wolfsburg date back to the thirteenth century. After the end of World War II and the liberation from the Nazi Regime, the city experienced considerable and rapid growth. New districts were added and the public infrastructure was further developed. Today, Wolfsburg presents itself as an urban archipelago with very diverse neighborhoods separated by landscape, splendid public buildings, and the so-called *Autostadt* (German for "Car City"), a large theme park focusing on cars.

Detmerode is a typical 1960s satellite town. It has a characteristic mix of modernist high-rise buildings, slab-shaped buildings and also bungalows that are situated in green surroundings. It was built on the modernist ideals of a car-based development and shows the typical separation of urban functions. The first generation of residents typically consisted of families of people working for VW. Detmerode has a little mall, which offers convenience goods and services. The district is surrounded by the recreational areas of the Detmerode Forest (Detmeroder Wald) and the Lake Detmerode (Detmeroder Teich).

Detmerode shows typical features of Exo Satellite Towns, which usually have a relatively high population density compared to other TOPOI settlement types. Public transport connections are poor and the distance to a regional railroad station is relatively long, exceeding 5 km. Due to their proximity and transport connections to Periurban Towns, such as the center of Wolfsburg, Exo Satellite Towns can be considered as their suburban developments. The predominant function of Exo Satellite Towns is housing. However, Exo Satellite Towns still have a high functional diversity.

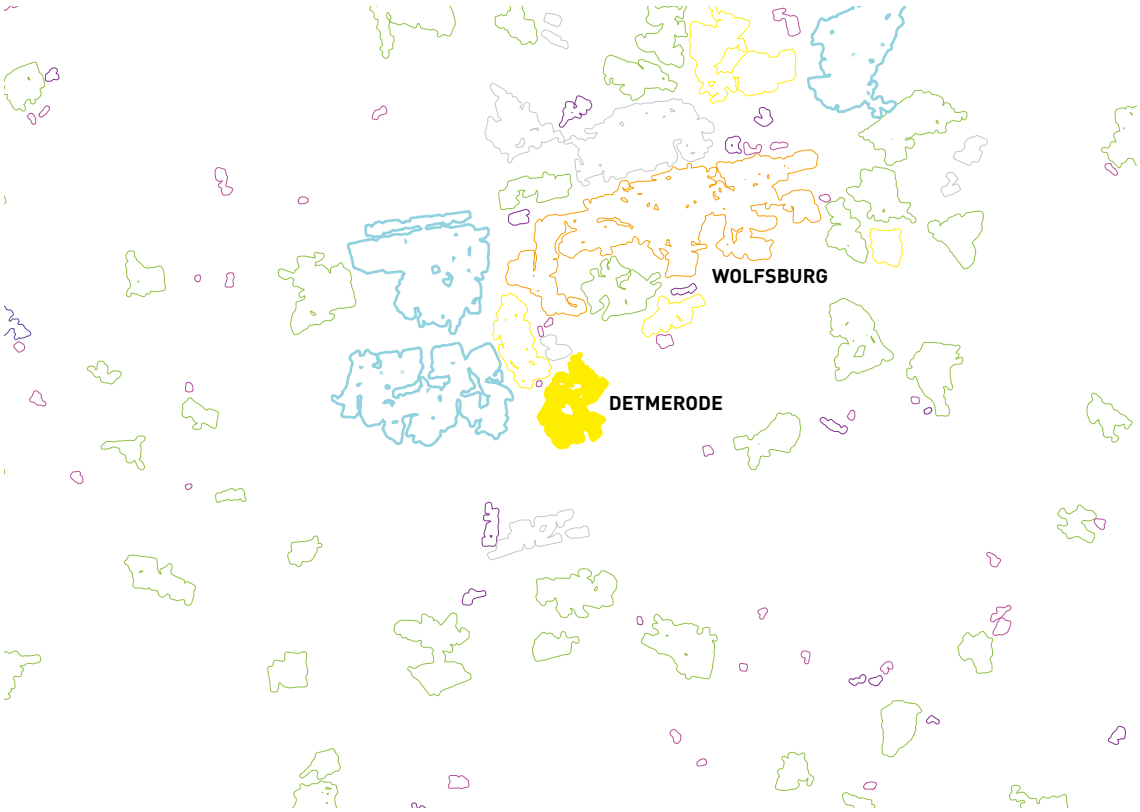
In Detmerode, the greatest challenges of the last decades have been the deteriorating building stock and demographic change.

Table 5.1 Attributes of the Exo Satellite Town of Detmerode

A Area [ha]	145.79
C Compactness [%]	53
BD Building Density [buildings/ha]	10.94
OSR Open Space Ratio [%]	84
FR Functional Richness	7
PD Population Density [inhabitants/ha]	49.67
RSR Retail and Service Ratio [%]	2
AFR Agricultural Facilities Ratio [%]	0
SUD Settlement Units Density	14
PTC Public Transport Connectivity	11
PRTS Proximity to Regional Train Station [km]	5.46

Context

Detmerode is a district of the city of Wolfsburg in the east of Lower Saxony. It is located south of Wolfsburg, where several other Exo Satellite Towns can be found. The closest railroad station, Wolfsburg central station, is 5.5 km away, the next larger city Braunschweig is 24.3 km away.



5.4 Legend

- Node City
- Node Town
- Periurban Town
- Small Exo Village
- Disseminated Village
- Agri Village
- Periurban Village
- Small Periurban Village
- Exo Village
- Disseminated Hamlet
- Disseminated Living
- Agri Hamlet
- Exo Industrial Zone
- Exo Satellite Town

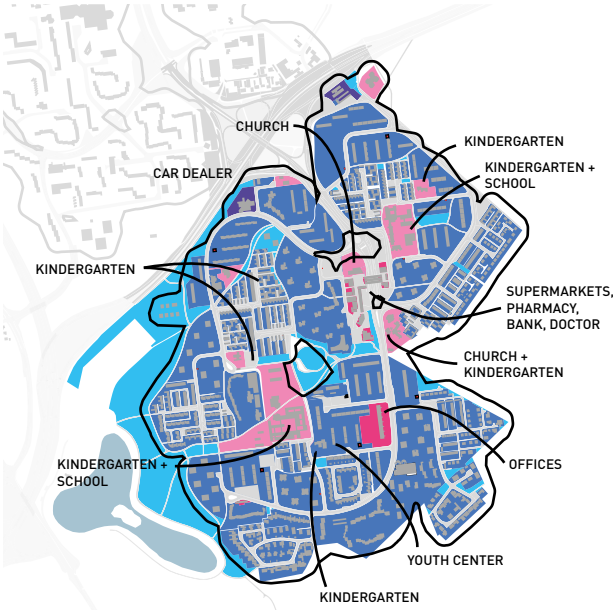
0.9 km

Land Zoning

In Detmerode, many different functions are available. However, the principle of separation of uses was applied in planning the district. There is a commercial center around which the housing estates are located. In these residential areas and also between them, there are schools and kindergartens, as well as green areas for leisure activities, which serve as connecting elements.

Building Age and Heritage

There are three heritage sites in Detmerode. Two of them are churches located in the center. St. Stephen's Church (Stephanuskirche) was designed by Alvar Aalto in the 1960s and is still in use today. St. Raphael' Church was built following an architectural competition won by Toni Hermanns. The ensemble including the parish building, kindergarten, and library is a listed monument. The third heritage building is a kindergarten located north-east of Detmerode. This brick building was planned by Hans Scharoun. Like most buildings in Detmerode, it was also built in the 1960s.



5.5 Legend

- Residential
- Industrial
- Commercial
- Public
- Leisure
- Traffic
- TOPOI boundary
- Water
- Buildings

5.6 Legend

- before 1859
- 1860 – 1918
- 1919 – 1948
- 1949 – 1957
- 1958 – 1968
- 1969 – 1978
- 1979 – 1983
- 1984 – 1994
- 1995 – 2001
- 2002 – 2009
- 2010 – 2015
- Heritage Site
- Vacant Building
- Water
- Buildings

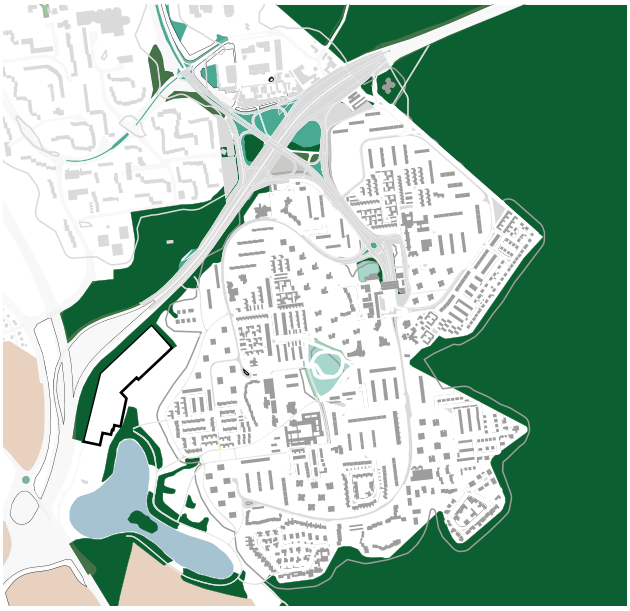
0.4 km

Building Types

Following the original master plan, there are many different types of multi- and single-family houses that were intended to ensure a certain social mix. Detached houses, row houses, and courtyard houses in bungalow style are situated on the outer edge of Detmerode, while the center is marked by high-rises and numerous slab-shaped buildings. There are also many detached tower blocks, so called *Punkthäuser* (German for point houses), which, like the other types, represent the modernist ideal of providing buildings filled with air, light, and sun.

Green and Blue Infrastructure

Detmerode is embedded in between the Detmeroder Forest in the east and a green corridor with the Lake Detmerode in the west. It is almost entirely surrounded by open landscape. Within the TOPOS, there is the larger *Bürgerpark* (German for citizens' park) right in the center and many additional green spaces between the buildings.



5.7 Legend

- Row Houses
- Highrise
- Multi-family Houses
- Single-family Houses
- Public
- Perimeter Block
- Church
- School
- Point House
- Water
- Traffic
- TOPOI boundary

5.8 Legend

- Agriculture
- Park
- Grass
- Meadow
- Forest
- Water
- Traffic
- TOPOI boundary

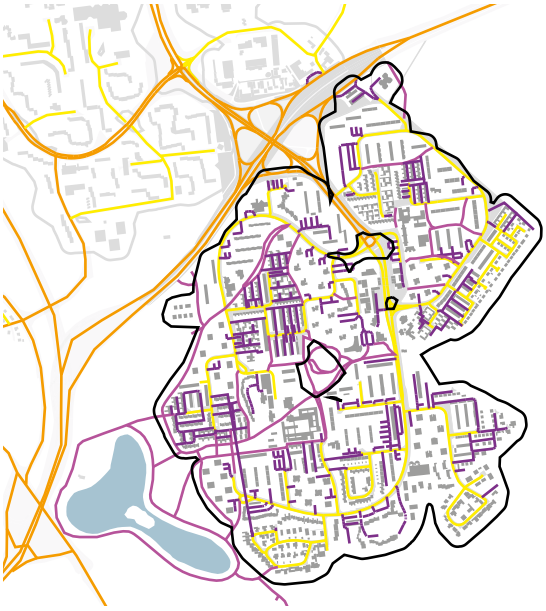
0.4 km

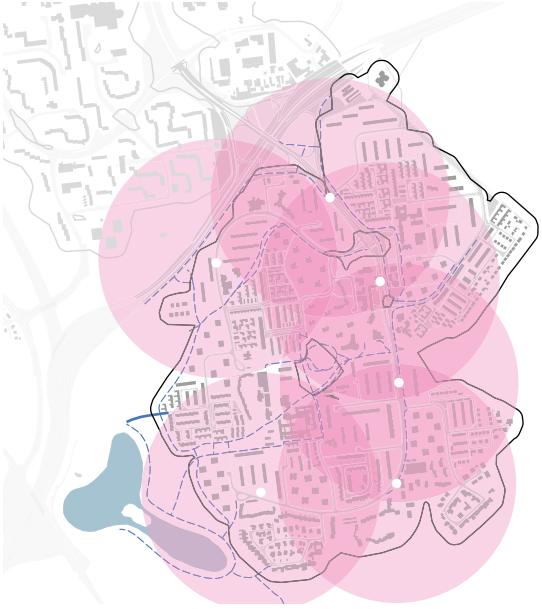
Street Network

Detmerode is located right on the A39 highway that connects the cities of Braunschweig and Wolfsburg. The inner city of Wolfsburg is only 5.3 km away. The main access road has the shape of a half loop and forms the backbone of the development. It runs almost through the whole district, but then unexpectedly ends in a cul-de-sac. Many smaller streets connect the different areas of Detmerode with the main road.

Public Transport

There are six bus stops along the main road connecting Detmerode with the surrounding districts and the inner city of Wolfsburg. These bus stops are served at least 7 and at most 18 times per hour. There is a direct bus connection to Wolfsburg central station. Several cycle lanes pass through Detmerode, both parallel to the roads and into the green areas.





5.9 Legend

Primary Road
Secondary Road
Tertiary Road
Residential Road
Access Road
Unclassified Road
Water
Traffic
TOPOI boundary

5.10 Legend

Cycle Lane
Bus Stop + 420m Radius
Water
Traffic
TOPOI boundary

0.4 km

5.2. Four Futures for Detmerode

We developed four scenarios for Detmerode and all the other sample municipalities. While the scenarios are equal in terms of their drivers, the way they develop spatially is, of course, different for each of the municipalities. However, each scenario follows a certain development logic.

Scenario A is called *Green Communities*. It is derived from a collaborative approach of living and working in dense settlement structures. Scenario B is called *Planned Happy Future?*. Here, the focus is on the efficient use of land as a resource and the strengthening of rural and suburban spaces as against the urban cores in urban-rural agglomerations. Scenario C, *New Settlers*, demonstrates how spatial expansion can be steered in a more sustainable way than with laissez-faire approaches. The scenario *Communities Repurposed!* addresses the spatial and functional transformation of the different TOPOI types. Unlike other scenario approaches, all four scenarios are intended to present a desirable future, even though some seem to be more desirable and sustainable than others. All four scenarios follow a certain spatial logic in the way the community develops as a whole, in certain subareas, or where transformation takes place.

Scenario A:

In *Green Communities*, the focus is on reusing the existing building stock and internal densification.

Scenario B:

In *Planned Happy Future?*, the existing building stock is upgraded in terms of energy efficiency, redeveloped and potentially extended. In this scenario, transformation areas are mainly located within today's settlement boundaries.

Scenario C:

In *New Settlers*, today's settlement boundaries are expanded to accommodate growth. This scenario is an exception as it allows new land consumption outside existing settlement boundaries, whereby new developments must meet certain sustainability criteria.

Scenario D:

Communities Repurposed! is a scenario that investigates the redevelopment within existing settlement boundaries. However, preference is not always given to maintaining the existing building stock.

Areas of Transformation

5.11 Scenario A: Green Communities

5.12 Scenario B: Planned Happy Future?

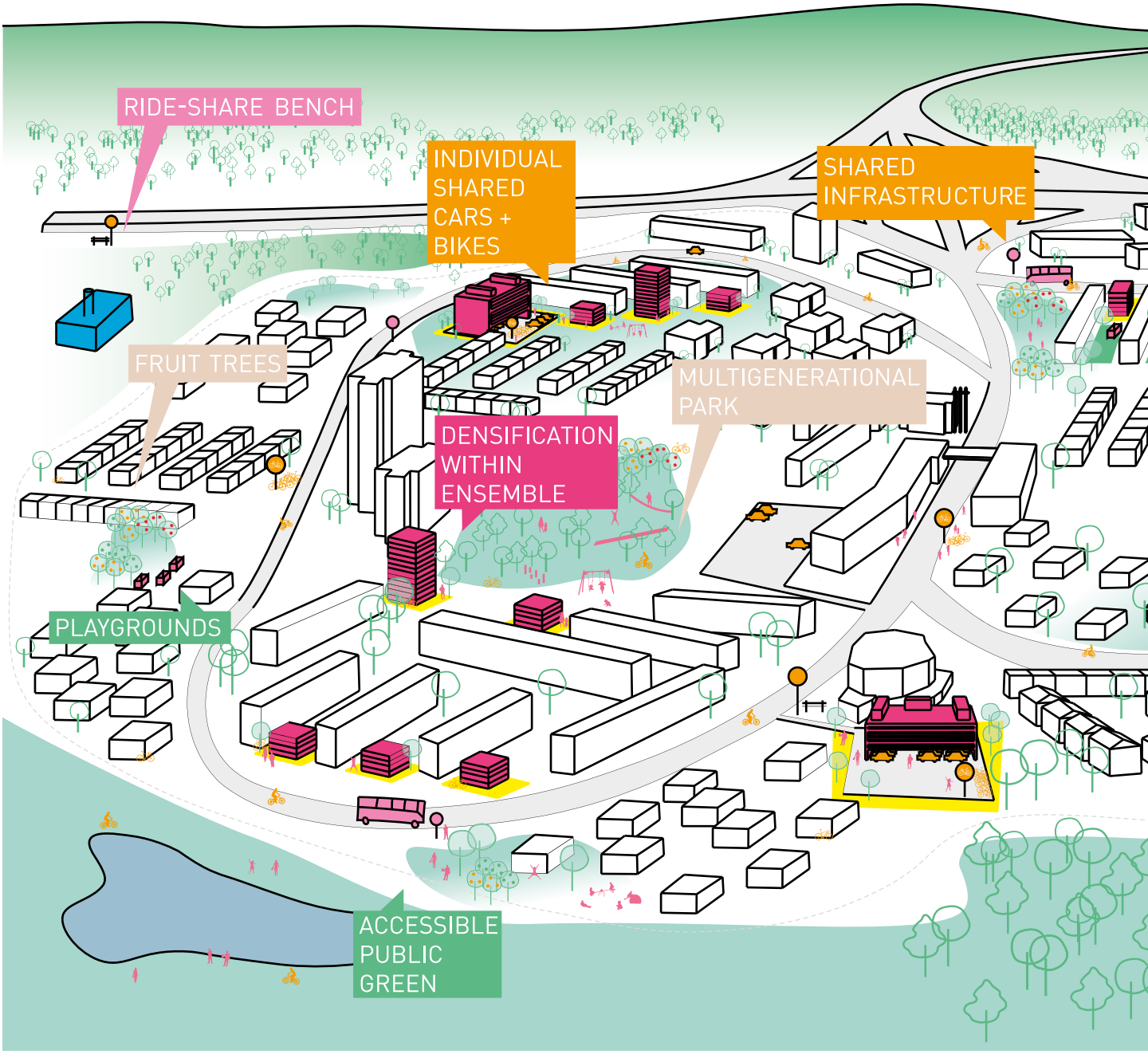
5.13 Scenario C: New Settlers

5.14 Scenario D: Communities Repurposed!

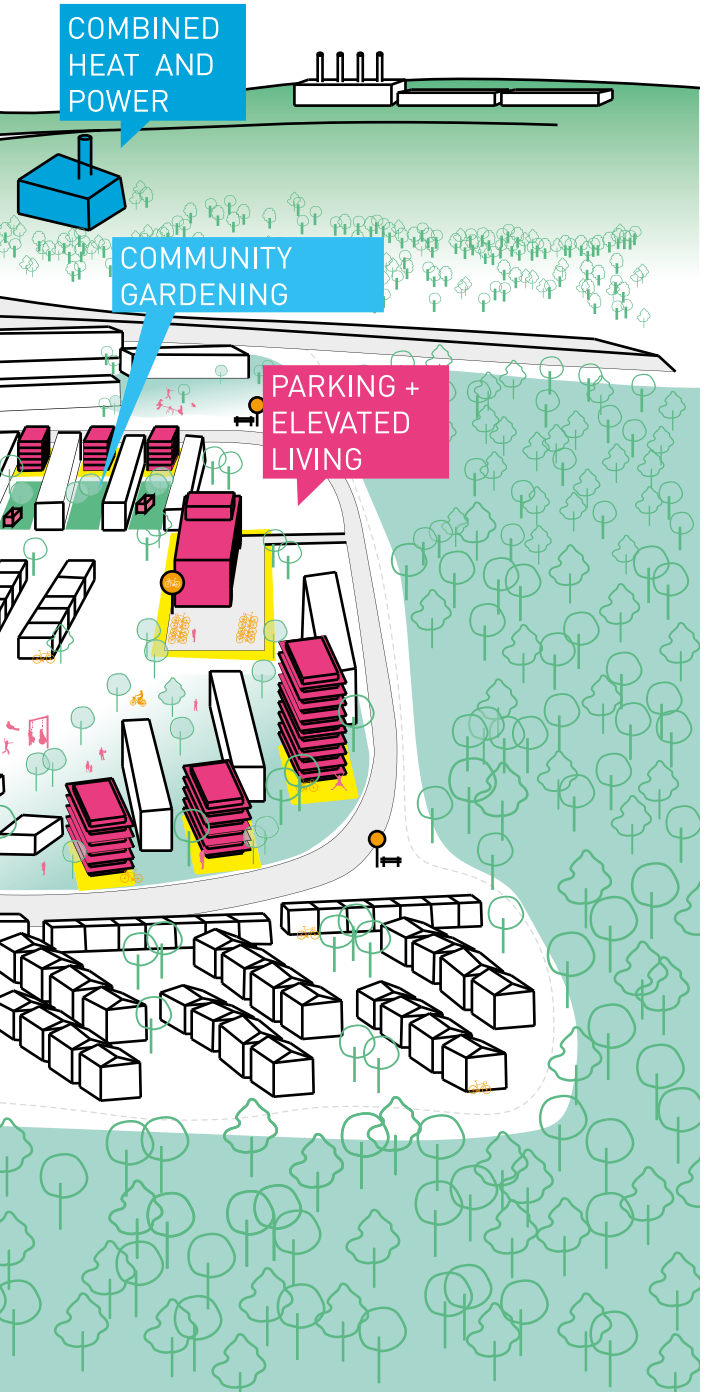
Legend

Areas of Transformation
Water
Traffic
TOPOI boundary
Buildings

5.3. Scenario A:
The Green Communities of Detmerode



5.15

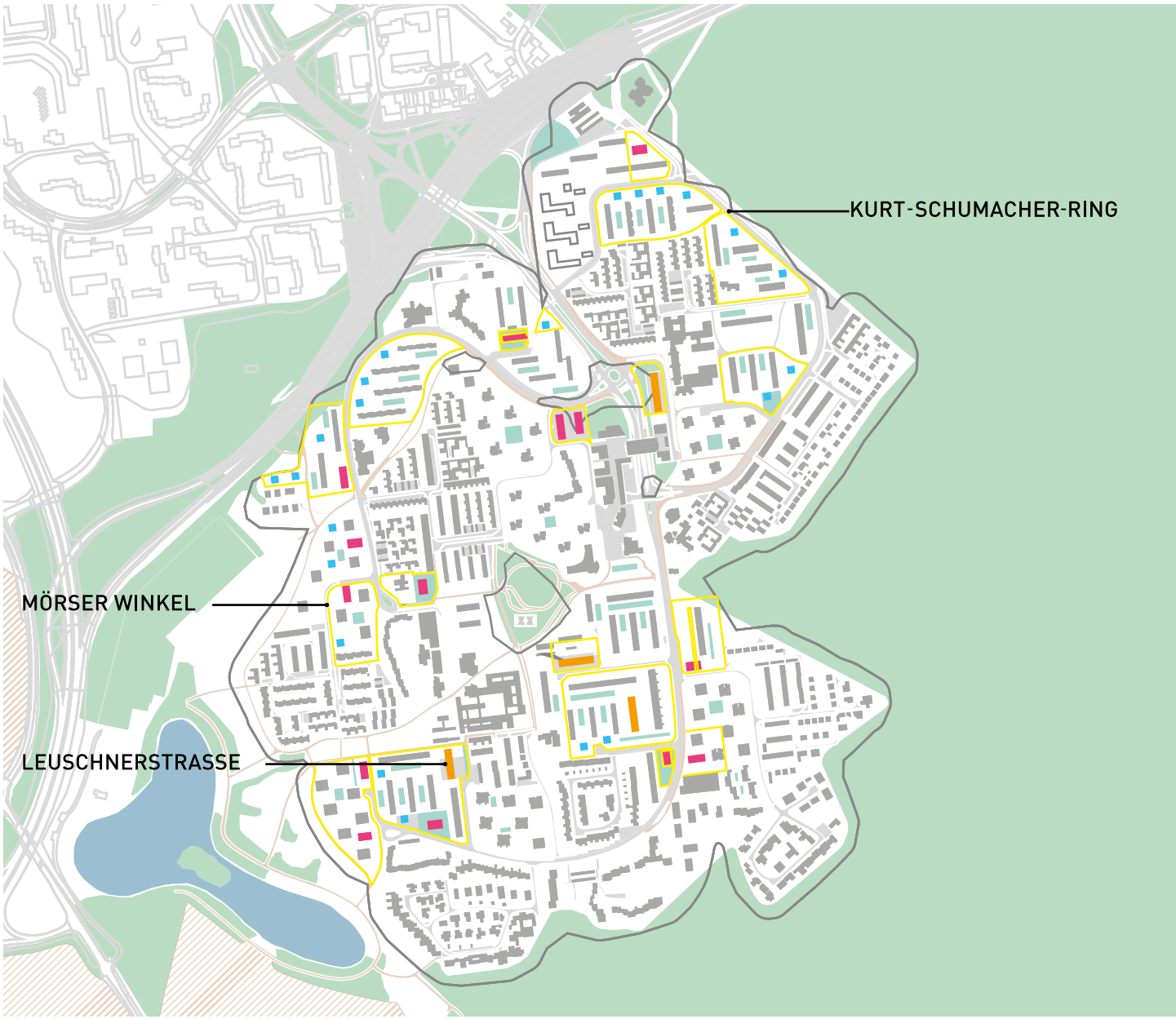


Dear residents of Detmerode,

On particularly beautiful days like these, I always ask myself: why didn't I follow my mother's advice and move back to Detmerode earlier? So much has changed since I grew up in this modernist neighborhood! When I took my daughter Elsa to the kindergarten this morning, I made a little excursion to the orchard, picked my breakfast and then walked on to the office. It's just so nice how these four places – home, kindergarten, orchard, and workplace – can be reached so quickly and easily on foot or by bike. While I am taking this little morning break, the shared cargo bike is parked outside charging, or maybe it's being used by someone else to quickly pick up groceries. If I want to borrow another one later, I can also have a standard bike equipped with an infant seat. Then we can go for a ride to the lake or to the Bürgerpark, where Elsa can play in the sand with one of the many children her age, who also live in the neighborhood. While she is playing, I can do some exercises using the sporting equipment placed right next to the sandbox. Usually, the lady with the coffee cart is passing by in the afternoon. It's really great to have a park so close to our house that caters to all generations. I'm sure we'll meet my mother, Elsa's grandmother, there as well. Then we can walk home together and harvest some mangold in the shared household garden for dinner! But do I have any cream? Oh, I am sure someone in the house will have some and if not: the shop on the ground floor certainly can help.

Best from the future!

Scenario A:
The Green Communities of Detmerode



5.16 Legend

New Building Type I
New Building Type II
New Building Type III

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
Green

Water
Agriculture
Recreation

0.4 km

Building Types

This scenario focuses on the densification of already built-up urban areas. The aim is to maintain a rather compact settlement structure despite population growth. In the course of densification, flexible forms of housing and sensible additions to the existing buildings are created.

I. Car-Parking Combined with Elevated Living

Like many large housing estates of the 1960s, Detmerode has some typical modernist features: a strong separation of housing and other functions and a traffic concept largely relying on motorized traffic. Therefore, many parking spaces, garages, and car-related infrastructures can be found all over Detmerode. Especially in between and around the slab-shaped buildings, a lot of space is dedicated to parking. In this scenario, these already sealed surfaces can become building plots for new forms of housing. For example, the existing car park at the end of Leuschnerstraße provides space for more than 100 cars. The building design proposed on this site is a raised row building to combine the existing function as a parking lot with the new functions of housing and roof terrace. The building is supported by pillars, thus creating an open space underneath the building. This space is now dedicated to car parking, but can easily be adapted to accommodate other uses, such as bike parking, storage space for buggies, roofed outdoor areas for barbecues or table tennis.

II. Careful Densification

Detmerode, like other settlements of the Exo Satellite Town type, is defined by the large amount of publicly accessible open spaces. In the course of densification, the number of new buildings should be carefully calibrated to preserve as many of these open spaces as possible. The *Punkthaus* – a tall building with a relatively small footprint – is very suitable for this purpose. Between the slab buildings, e.g., on the streets Kurt-Schumacher-Ring and Mörser Winkel, we suggest adding such *Punkthäuser* to complement the existing buildings in terms of their scale and housing types. The ground floor is not used for living but rather for social, shared, or commercial uses that serve the district. This strengthens the community aspect in the entire neighborhood, especially because the new buildings activate the surrounding open spaces, reinterpret them, and offer new possibilities for recreation and play.

Scenario A:
The Green Communities of Detmerode

5.17 Legend

Existing Bus Stop
New Bus Stop
Bus Lane
Bus Stop Radius 420m
Car Lane

Cycle Lane
Ride-share Bench
Pedestrian Lane
Transformation Area
TOPOS Boundary

Existing Buildings
New Buildings
Existing Streets
Green
Water

Agriculture
Recreation

0.4
km

Streets, Mobility, Public Space

This scenario is based on a dense network of self-organized vehicle sharing services. This includes ride-share benches and public charging stations. The street space is no longer organized hierarchically and is equally safe for all users.

I. Streets without Hierarchies

The car-oriented planning approach has resulted in roads that are exclusively designated for car use. Therefore, it is difficult for all other participants to use the roads safely and comfortably. To counteract this unfair allocation of street space, the lanes for cars are narrowed and the allowed speed reduced accordingly. In addition, lanes for all types of traffic participants, including cyclists, scooter drivers, and pedestrians, are introduced. There is no longer any hierarchy in the open street space. Additionally, the streets become safer by installing motion-sensitive streetlights. To avoid barriers in public spaces, streets are planned according to universal design principles.

II. Streets as Shared Open Spaces

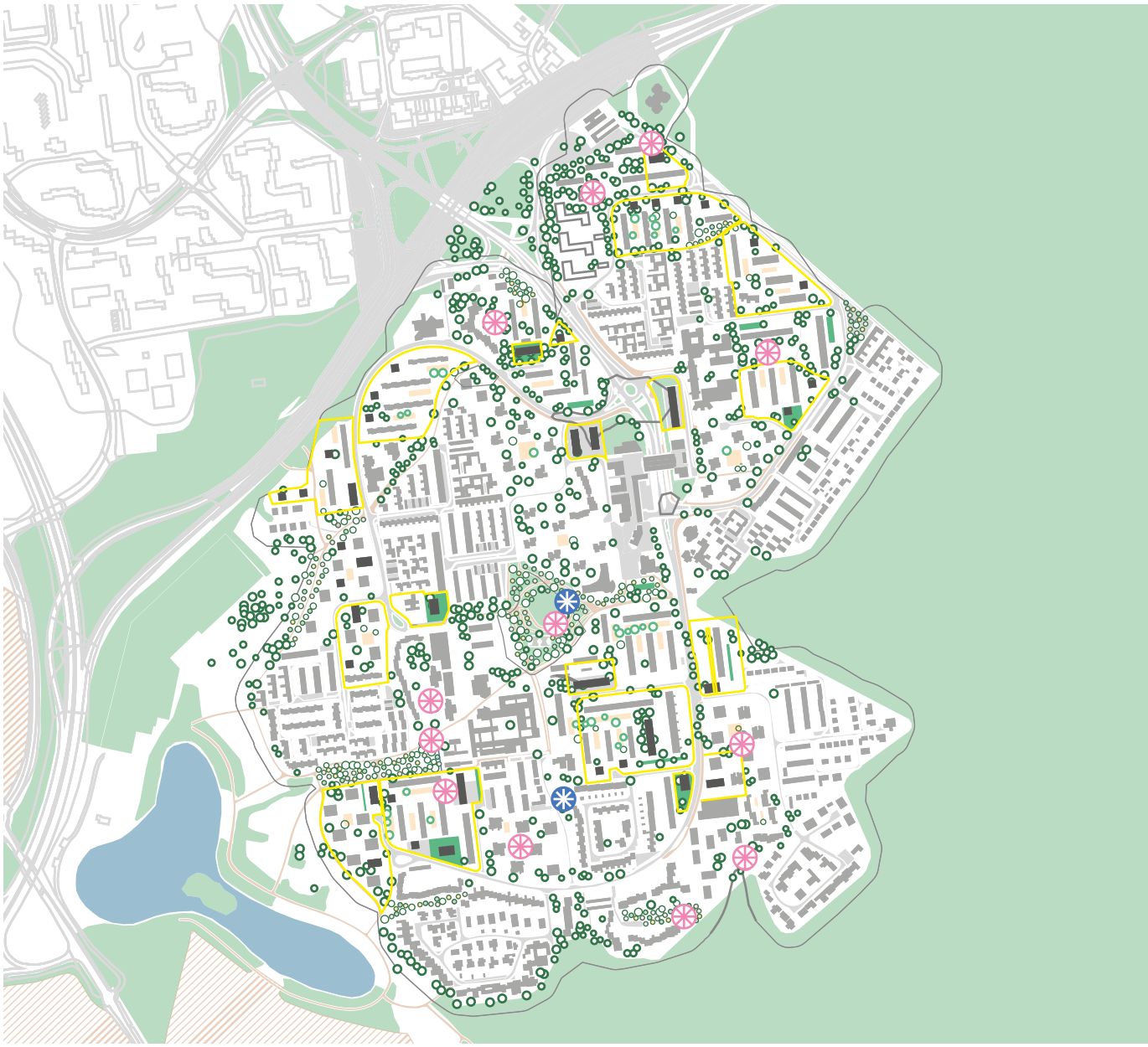
In order to allocate the street space equally among all types of traffic participants – more people, less cars – some interventions are made – by the people for the people – with immediate measures. One initiative makes a strong case for more street greenery to improve the air quality and to provide shading. Another initiative builds street furniture in a collaborative process with children and young people. This action does not only foster the cohesion of the community, but it also increases the acceptance for slowing down traffic and creates meeting points. Furthermore, some of the streets are turned into shared spaces.

III. Sharing System and Ride-Share Benches

Along the main streets Kurt-Schumacher-Ring and Theodor-Heuss-Straße, five ride-share benches are installed, where people can sit and wait for drivers to give them a lift. This new infrastructure is supported by a community app that offers different services for self-organization. Since the system is so successful, the ride-share benches are soon becoming fixed places in the community, where other services like a sharing station for books or seedlings from the community gardens are also offered. New meeting points for the community emerge within the formerly monotonous street space. Supported by the app, the citizens run a well-organized sharing system including cars, bikes, cargo bikes, e-scooters, and machinery, but also neighborhood activities and after-school child care.

Since this scenario is based on cooperation between the different neighborhoods, the system is operated on demand. Whenever someone is leaving Detmerode, he or she passes a ride-share bench to see if someone needs a ride.

Scenario A:
The Green Communities of Detmerode



5.18 Legend

- Increased Biodiversity
- Tenant Gardens
- New Green Spaces
- Development of Tenant Gardens
- Existing Playgrounds
- Fruit Trees
- Existing Trees
- Transformation Area
- TOPOS Boundary
- Existing Buildings
- New Buildings
- Existing Streets
- Green
- Water
- Agriculture
- Recreation

0.4 km

Green and Blue Networks

This scenario creates larger and more easily accessible public green spaces accommodating different uses for different users. The ideas of an edible city are also being applied.

I. More and Better Access to Green Open Spaces

Detmerode has a relatively high open space ratio of 84%, describing the area that is not sealed. Today, most of the green areas consist of undefined and highly underused spaces between buildings, greened clearances, and street greenery. There is a large potential to activate previously underused open spaces by carefully adding new buildings at their edge or functions such as playgrounds, tenant gardens, urban gardens, or community meeting places. With these interventions, the open spaces become more lively and vivid, increasing the overall livability of Detmerode. Ideas for how to use the green spaces are collected and discussed via an app. In the community committee, it is discussed which green measures are implemented within the framework of the available participatory budget.

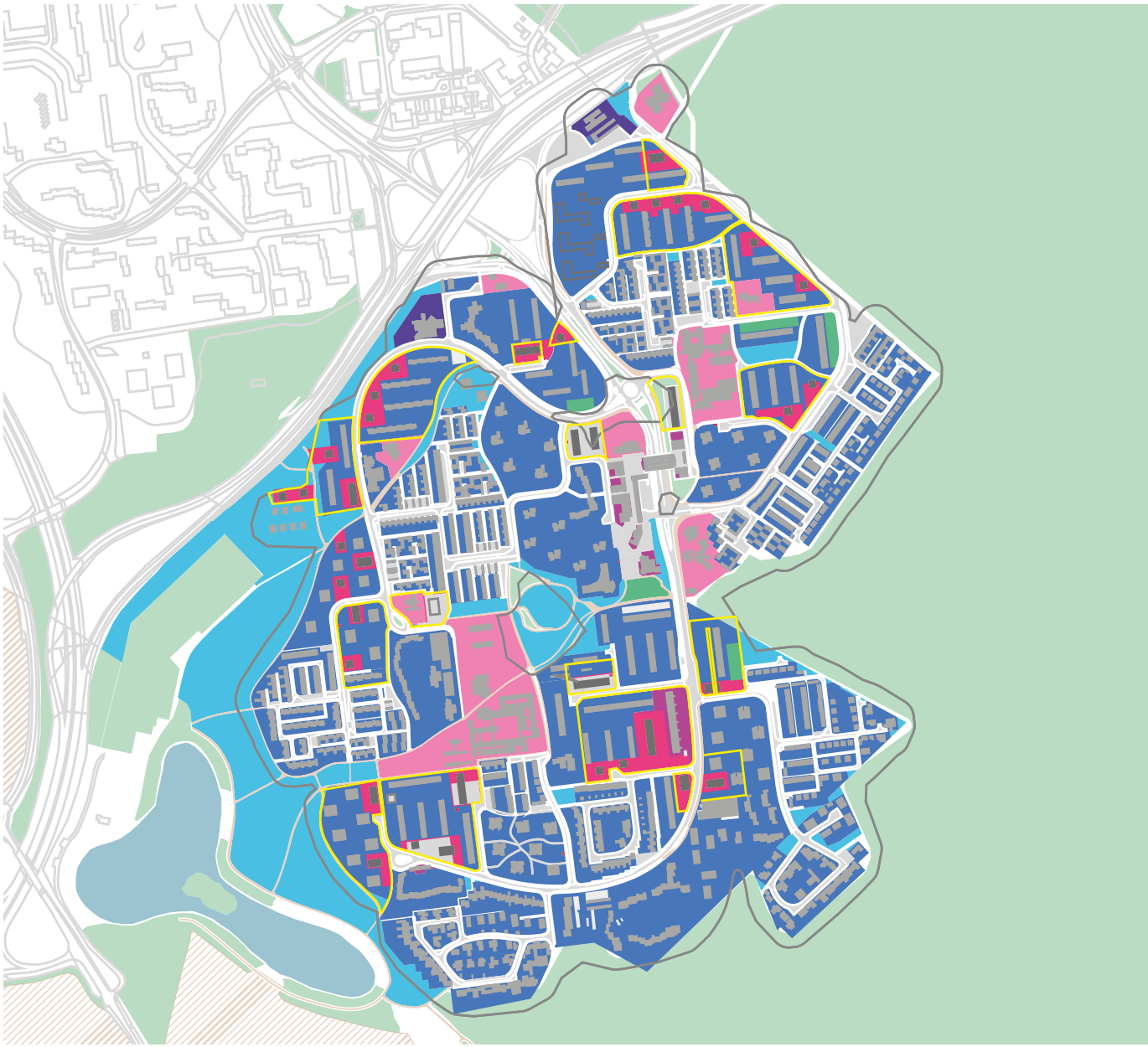
II. Tenant Gardens and Fruit Trees

At Kurt-Schumacher-Ring, directly opposite of the new building *Kurt 2.0*, the replacement of the iconic highrise of *Stufenhochhaus*, new buildings with a small footprint are planned. Along with this increase of the building density, the open spaces in between the existing slab-shaped buildings are remodeled and tenant gardens are implemented. This promotes the communal aspect of gardening together, but also plays an important role for local food production. Furthermore, it reduces the need to go somewhere by car to buy food that has been transported over long distances. The planting of fruit and nut trees, for example in addition to the existing trees between Mörser Winkel and John-F.-Kennedy-Allee, further supports the idea of the edible city.

III. Multigenerational Park

The existing *Bürgerpark* in the center of Detmerode is transformed into a multigenerational park. Different activity options for people of any age and physical condition are implemented here: a boule court for the elderly, a fitness park with a trampoline for the middle-aged, youth, and kids, a bike repair stand, and outdoor chess are just some examples. This activation brings people together and invites them to use the park at different times of the day. The renewed *Bürgerpark* also offers space for improving the green networks in Detmerode through planting new trees or shrubs. Moreover, a water playground is added for children.

Scenario A:
The Green Communities of Detmerode



5.19 Legend

Residential
Mixed Use
Industrial
Public
Leisure

New Green Spaces
Commercial
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
Green
Water
Agriculture
Recreation

Transformation Area

0.4
km

Functions

Everything required to cover the daily needs of the inhabitants is now available and, where possible, produced in Detmerode. New forms of cohabitation and production lead to a mixture of uses within buildings.

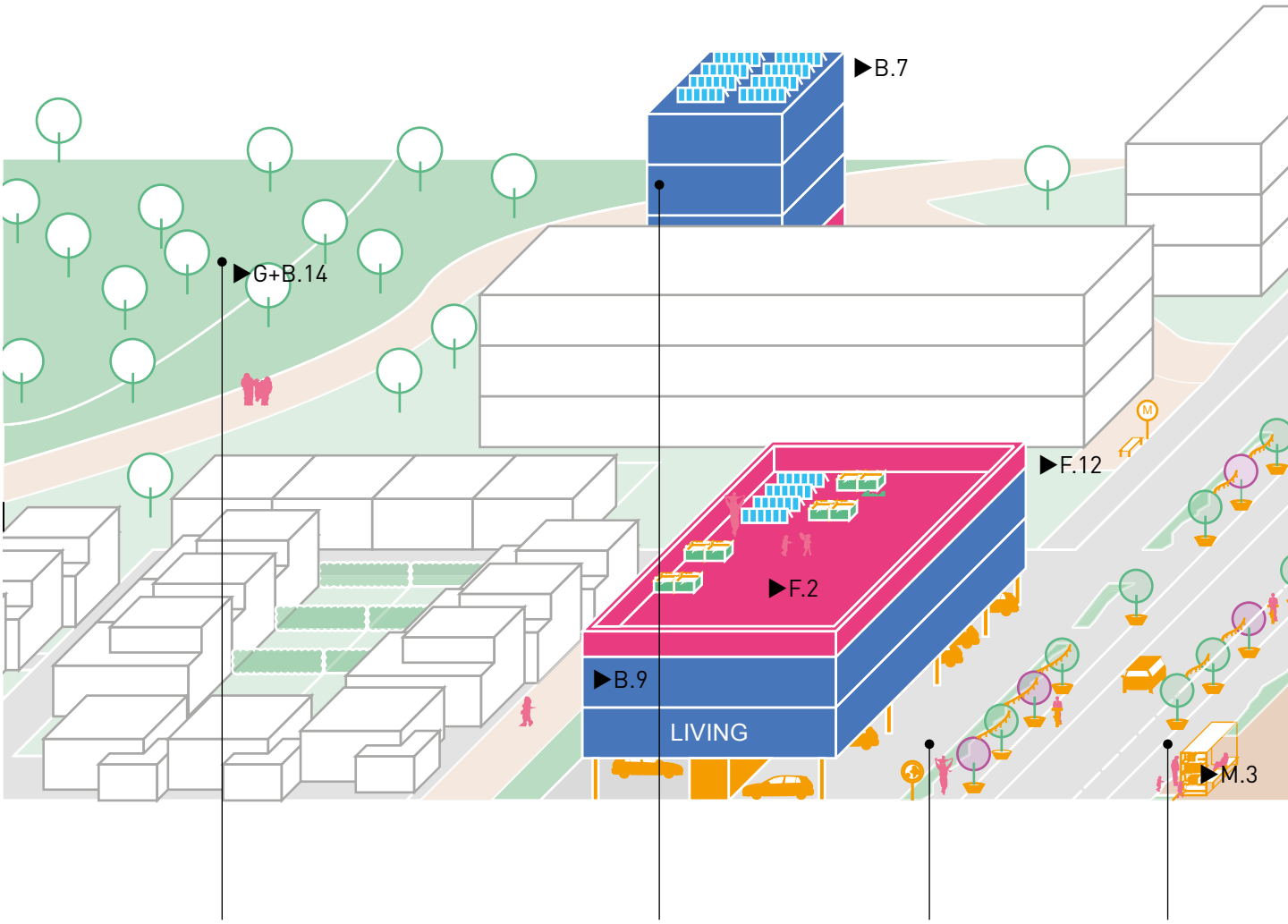
I. Mixed-Use and Common Spaces

Densification also offers the opportunity to test new forms of living, working, and co-habitation in Detmerode. This scenario focuses on hybrid buildings with different possible uses, e.g., the buildings at the end of John-F.-Kennedy-Allee. The ground floor is open to the general public and accommodates a wide variety of uses, ranging from a shop selling locally produced vegetables to guest apartments, a senior citizens' club, or a new play group. In addition, the open spaces between new and existing buildings are activated and made more accessible by providing shared uses. Raised beds, playground equipment, or outdoor fitness gadgets create intergenerational meeting points.

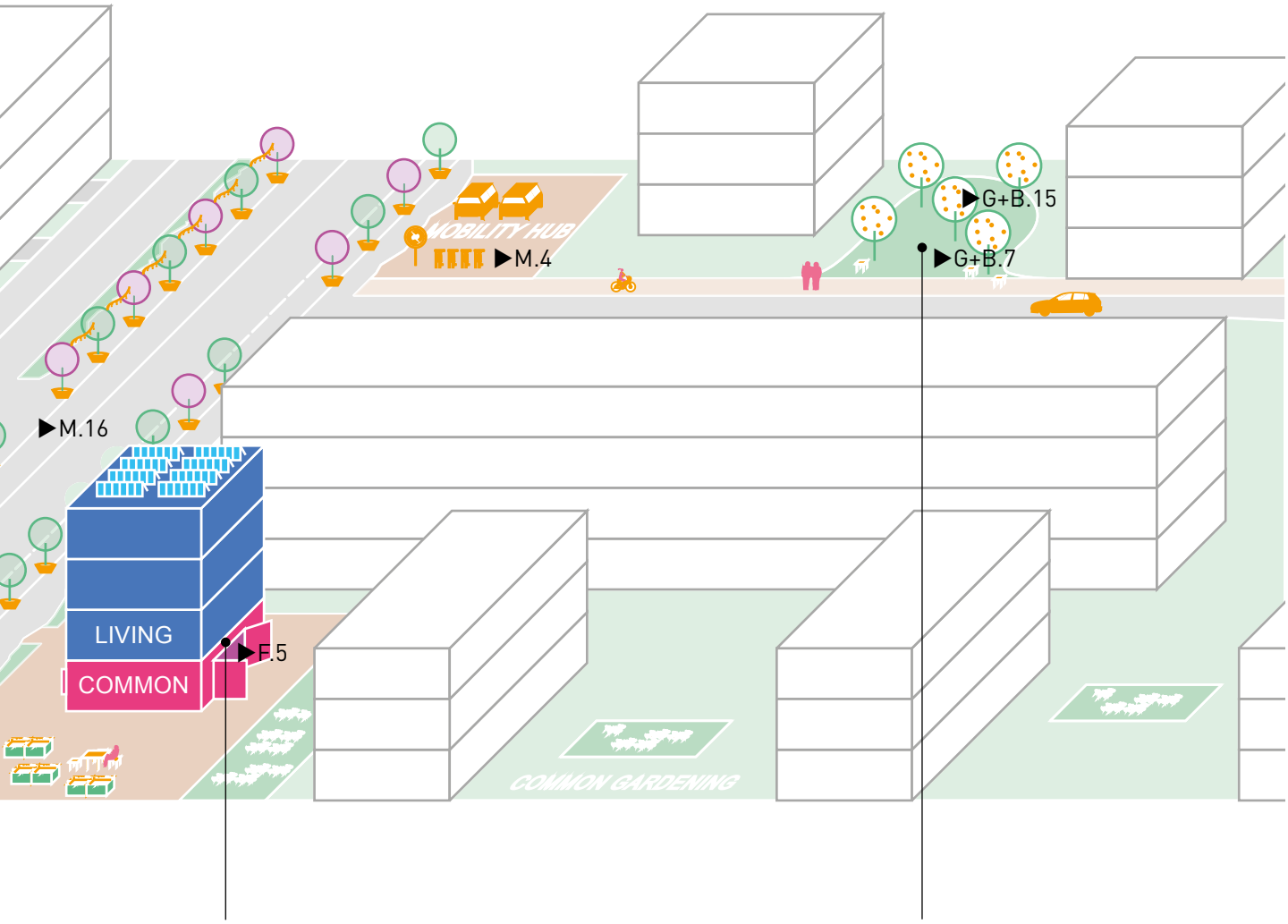
II. Local Production and Daily Needs

Due to the tenant gardens, a large part of the vegetables required can be grown on site by the residents themselves. Thanks to the fruit trees and bushes, the same applies to local fruit demand. Nevertheless, small grocery stores are evenly distributed across Detmerode.

Scenario A:
The Green Communities of Detmerode



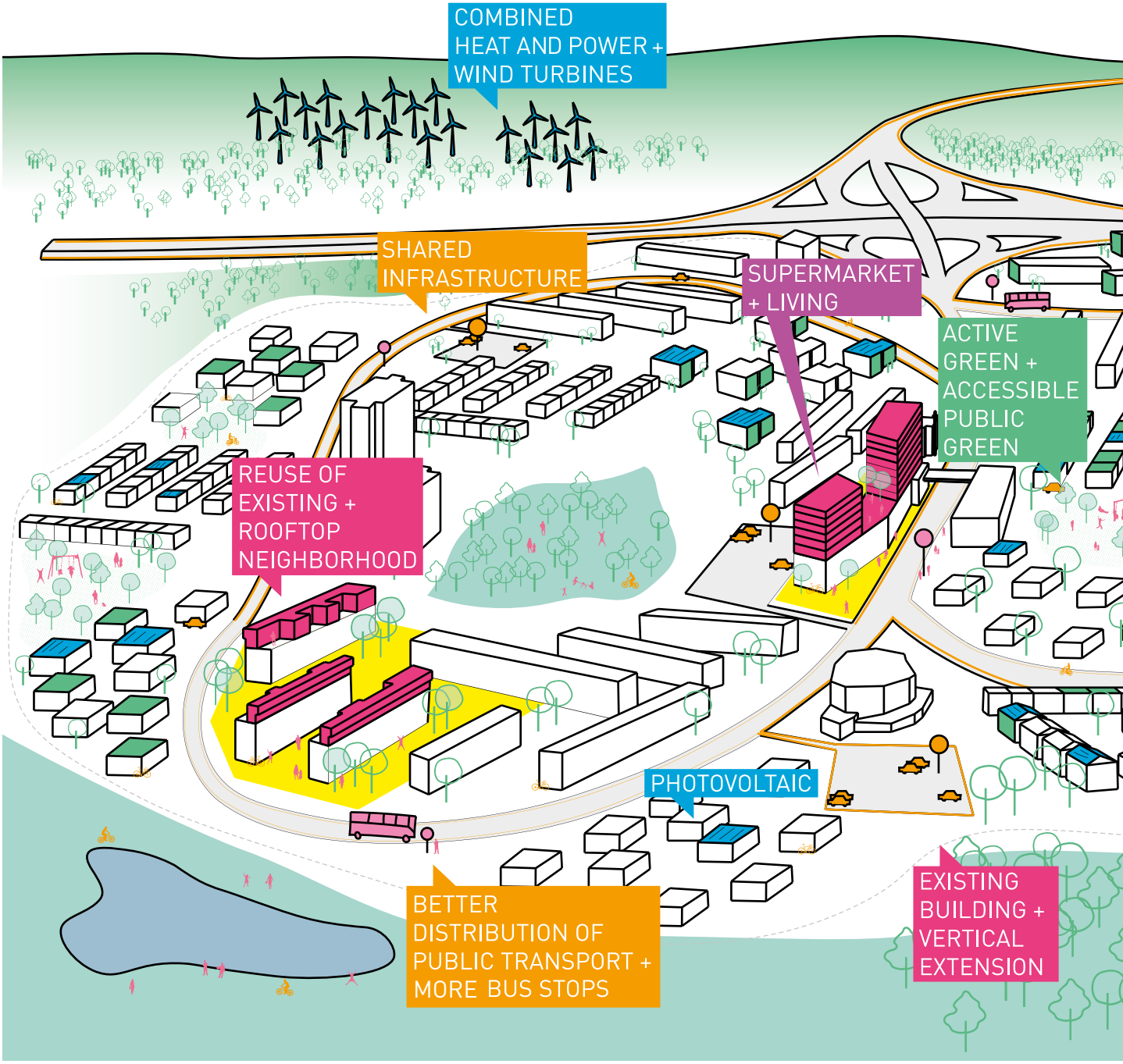
5.20



DENSIFICATION OF THE PERIMETER BLOCK DEVELOPMENT

MEADOW ORCHARD

5.4. Scenario B:
A Happy Future Planned for Detmerode?



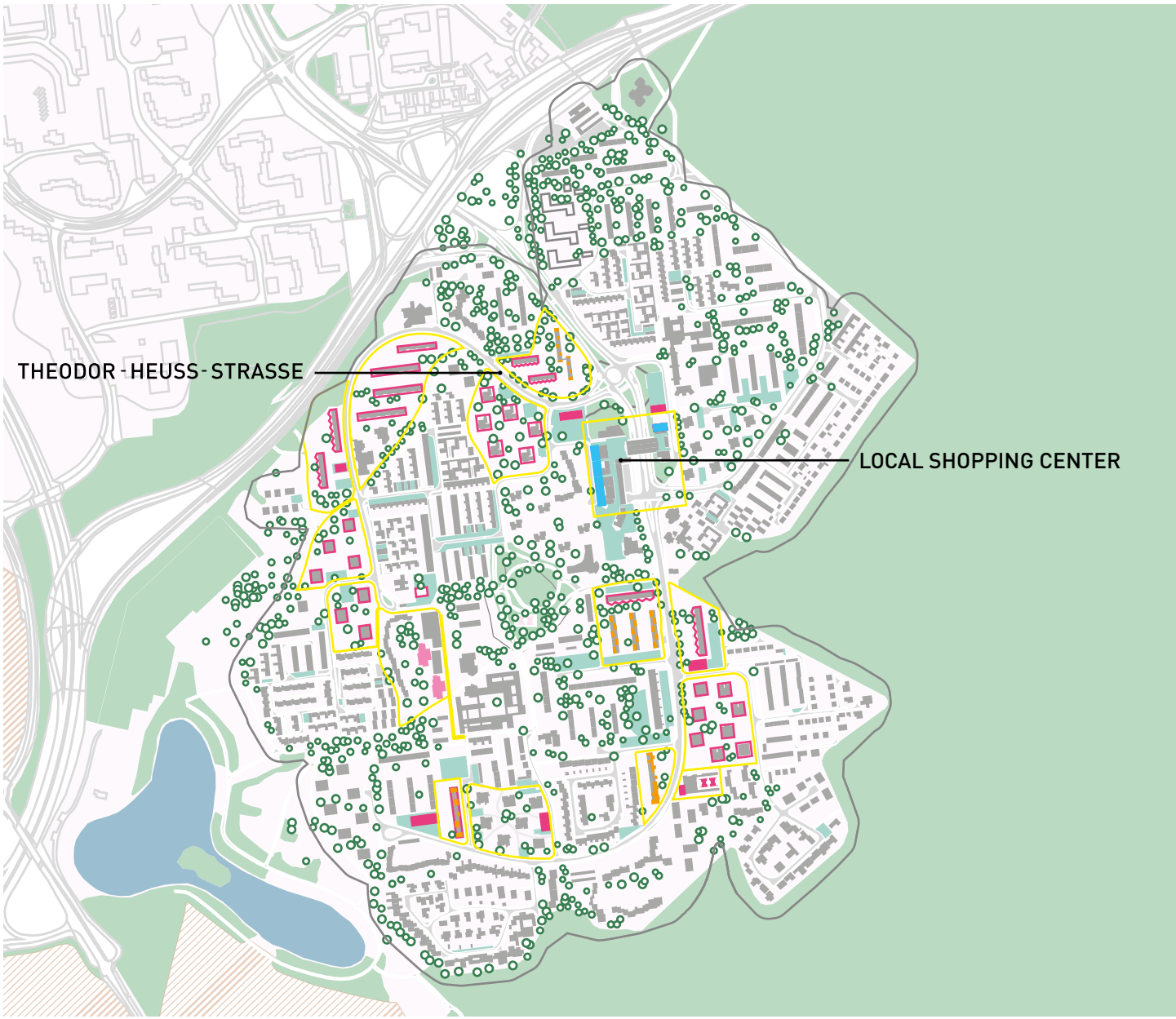
5.21

Dear residents of Detmerode,

"Oh, Daddy, come quickly! Look at the colorful bird in our birdhouse!" was the first sentence I heard my son say this morning. Since we set up a birdhouse as a drinking and feeding station in addition to our insect hotel and all the wildflowers in our front garden, taking a look out of the window is the first thing we do in the morning – each and every member of my family. Sometimes we even manage to spend a minute in our garden together before our daily routines begin and we all go our separate ways. My daughter gets on the bus that takes her to school right outside our front door. Thanks to super safe cycle lanes and speed limits throughout the neighborhood, my son can already cycle to school on his own, even though he is only 8 years of age. And my wife only has to walk down a few floors and ends up directly in the supermarket where she works, since we life in an apartment that was built on top of the existing supermarket. Only I have a longer way to get to my workplace – the car factory. First, I walk to the mobility hub around the corner to meet Frank and Linda. We've recently started sharing a car to go to work, as we mostly work the same shifts anyway. The contrast between leaving green and reduced-traffic Detmerode and entering the city of Wolfsburg is always extreme. Whether along the streets or on roofs and facades, there are plants everywhere in Detmerode. Unsurprisingly, my parents still marvel at the insect, plant, and bird diversity we have here every time they come to visit us via the forest footpath from Rabenberg.

Best from the future!

Scenario B:
A Happy Future Planned for Detmerode?



5.22 Legend

New Building Type I
New Building Type II
New Building Type III
New Building Type IV
Existing Trees
Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
Green
Water
Agriculture

0.4 km

Building Types

To increase the quality and energy efficiency, this scenario is dedicated to the renovation and conversion of the existing building stock. This can include the addition of floors, the extension of an existing building with an annex or a core refurbishment to increase the quality and amount of living space. Transformation is also a possibility.

I. Retail + X

The local shopping center is located in the heart of Detmerode. This location can be explained by the historical separation of urban functions. Since people were expected to move around by car anyway, no need was seen for providing a series of small shops within walking distance. Today, the center is still intact with lots of shops next to a church, and some offices. This is the perfect starting point to enrich the location with another function, as more housing is desirable here. Most of the supermarkets are single-storey buildings with a flat roof. In this scenario, we are dealing with the existing building stock, which we try to densify and transform, and we suggest a new mix of retail and other uses. The site is redeveloped to combine a discounter type of supermarket with up to four floors of housing on top, so that the footprint stays the same but the density is considerably increased.

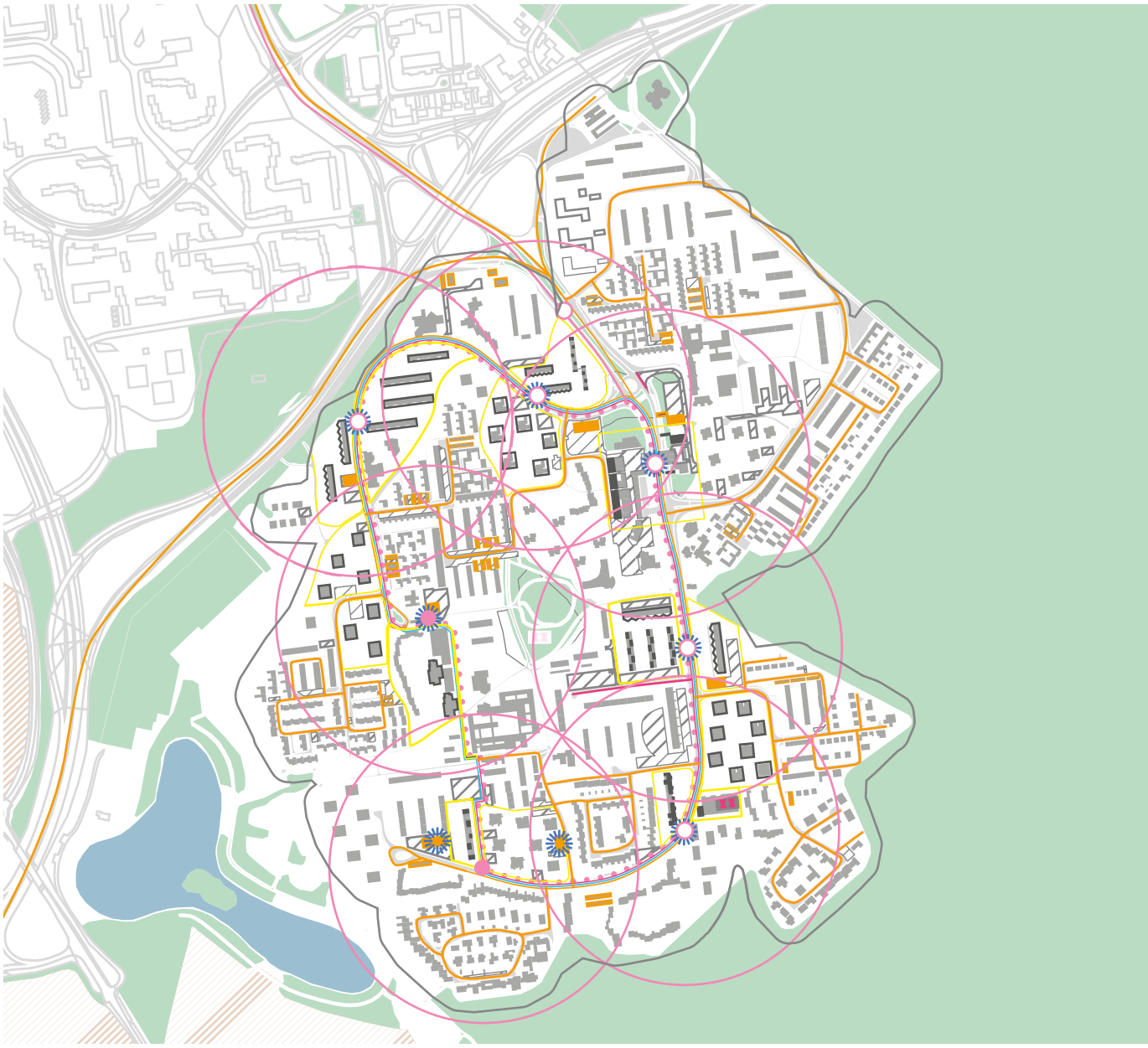
II. Upcycling the Existing

In Detmerode, most of the buildings date back to the 1960s to 70s. Some have been renovated in recent years, but some are still in a rather mediocre condition in terms of appearance and energy consumption. This offers a possibility to improve the quality of apartments by extending them with, for example, winter gardens or balconies. The existing building structure remains unchanged, whilst the shell is renewed, as with the two north-south oriented slab-shaped buildings to the north of Theodor-Heuss-Straße. This measure also enables the installation of an elevator to provide barrier-free access.

III. Vertical Extension and Common Rooftop

This intervention involves the same building type but offers a different approach. Here flat roofs are the focus, since they allow the vertical extension of the existing building by one or two floors. Lightweight and prefabricated modular housing elements are delivered ready-for-use and lifted onto the existing building. The spaces between the extended and newly added buildings can be designed together with and for everyone; they will be accessible not only to the new residents but also to those who have lived there all their lives. The shared rooftops can increase the identification of residents with their neighborhood.

Scenario B:
A Happy Future Planned for Detmerode?



5.23 Legend

- Existing Bus Stop
- New Bus Stop
- Mobility Hub
- Bus Lane
- Bus Stop Radius 420m
- Car Lane
- Cycle Lane
- Ride-share Bench
- Pedestrian Lane
- Transformation Area
- TOPOS Boundary
- Existing Buildings
- New Buildings
- Transformed Buildings
- Existing Streets
- Green
- Water
- Agriculture

0.4 km

Streets, Mobility, Public Space

This scenario focuses on the expansion of public transport. Mobility hubs are set up all around the main streets. Streets are designed to accommodate the needs of pedestrians and cyclists rather than those of cars. They are seen more as common spaces, shared equally by all traffic participants.

I. Mobility Hub and Expansion of Public Transport

Detmerode is transformed into a five-minute city, where daily needs, the access to schools, open spaces, and daily goods are located within a five-minute walk from a public transport stop. In order to enhance the accessibility of Detmerode, eight mobility hubs are set up along the main streets, John-F.-Kennedy-Allee and Theodor-Heuss-Straße, where electric cars, bikes, cargo bikes, and scooters can be rented and charged. One of these hubs is situated at the old car park between John-F.-Kennedy-Allee and Am Finkenhaus. The mobility hubs integrate an existing or a new public transport stop. At the same time, they become meeting points for socializing, since additional services, such as a café, kiosk, or market stand, are added to the rather simple use of changing modes of transport.

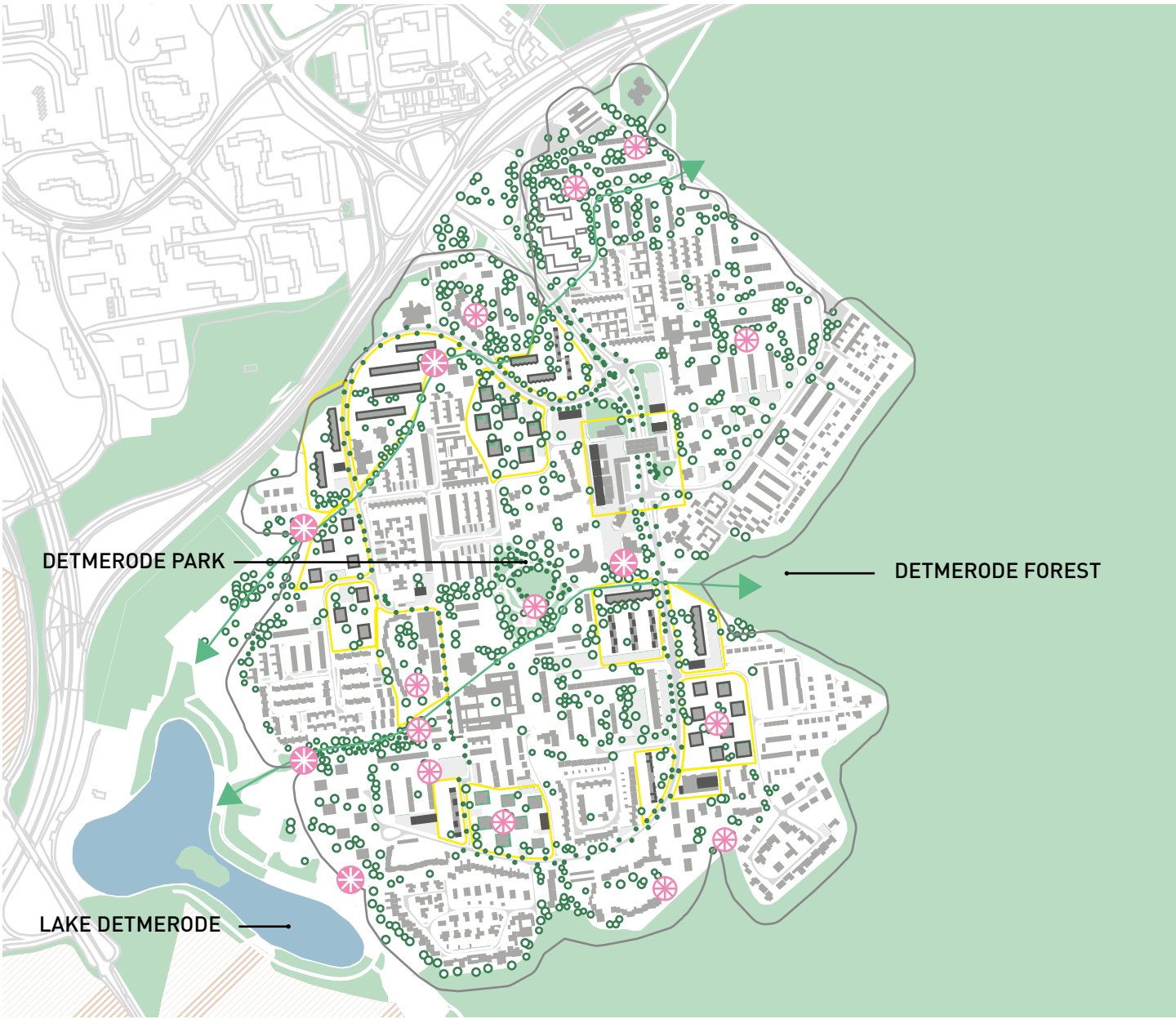
II. Better Streets, Safer Streets

Car-sharing is increased, entailing considerable social impact. The streets are no longer car-friendly but are more adapted to the human scale. All streets are redesigned so that each mode of traffic has its own lane to move around safely. In addition, streetlights are installed, greenery is planted along the streets, and the different lanes are color-coded to clearly designate street spaces. Especially along the main streets John-F.-Kennedy-Allee and Theodor-Heuss-Straße this has a high impact on the general atmosphere of Detmerode. Streets are no longer only a connection from one destination to another but are also seen as a space for communication and encounter.

III. Public Loop

The existing streets Theodor-Heuss-Straße and John-F.-Kennedy-Allee almost form a ring road that connects the small neighborhoods of Detmerode with each other and with the center of Wolfsburg. A continuous loop is created to increase walkability and cycling comfort.

Scenario B:
A Happy Future Planned for Detmerode?



5.24 Legend

Hiking Path
Existing Playgrounds
New Playgrounds
Existing Trees
New Trees

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings
Existing Streets

Green
Water
Agriculture

0.4 km

Green and Blue Networks

An aim of this scenario is to increase the functional variety of the various open spaces. From the larger scale, where green spaces are connected into a network, to the small scale, where existing buildings are turned into green buildings.

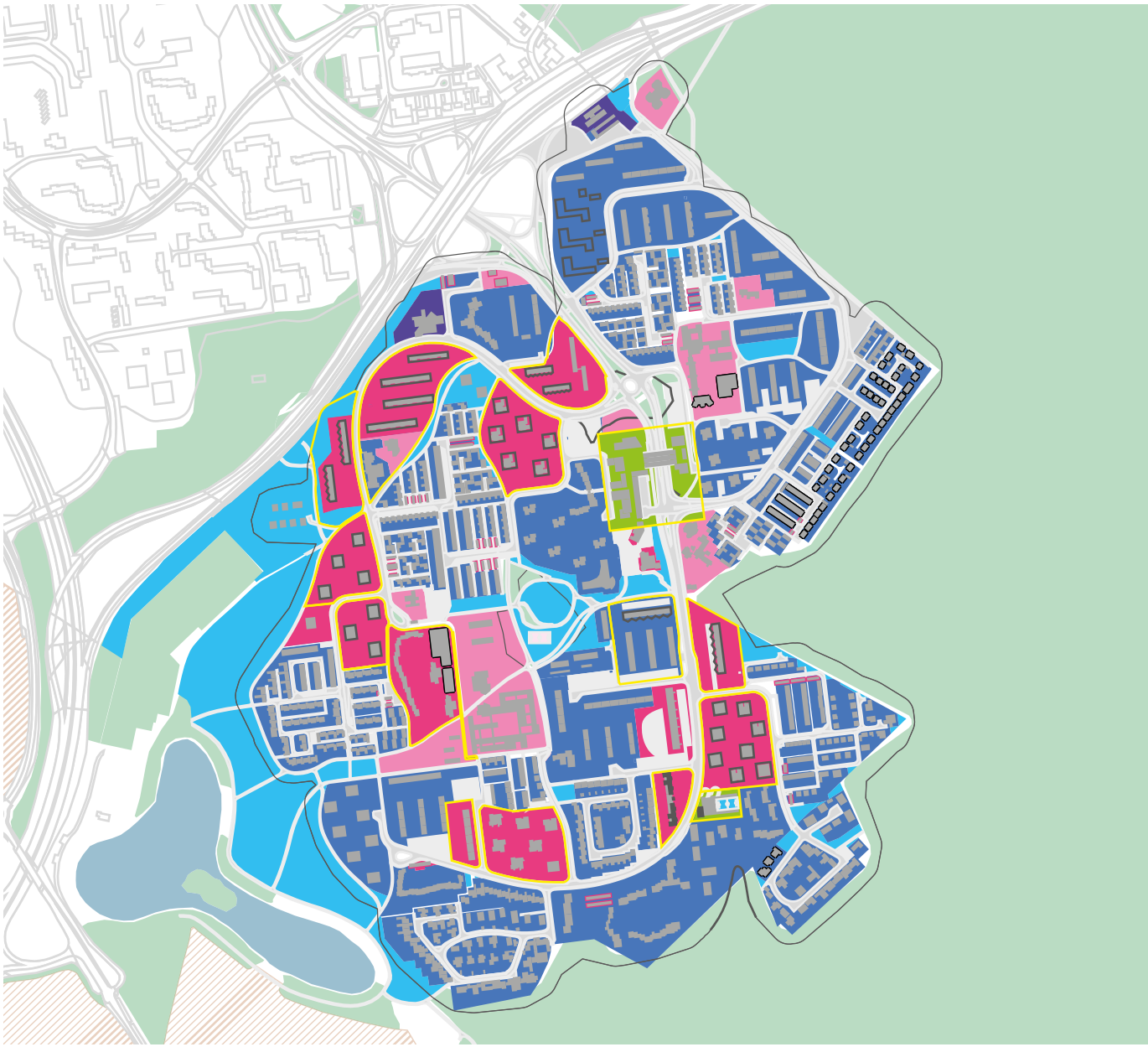
I. Green Rooftops, Facades, and Front Gardens

The reconfiguration from grey to greened rooftops is an efficient measure to increase rainwater retention and biodiversity. Furthermore, many of the facades are greened to improve both their energy efficiency and their biodiversity and microclimate. For that purpose, different climbing facilities for various plants are integrated. In addition, the front yards are no longer "grey" stone gardens but green spaces and become a paradise for bees due to all the new wildflowers.

II. Regional Green

Many new hiking trails improve the connectivity of Detmerode to its immediate surroundings and to nearby towns and settlements. One of these green connections links the Lake Detmerode in the west via Detmerode to Wolfsburg's city center. Another one connects the lake with the Detmerode Forest in the east. In addition, new trees and shrubs are planted and new playgrounds are developed along these paths.

Scenario B:
A Happy Future Planned for Detmerode?



5.25 Legend

Residential
Mixed Use
Industrial
Public
Leisure

Transformed Buildings
Multifunctional Use
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
Green
Water
Agriculture

Transformation Area

0.4
km

Functions

This scenario focuses on a mixture of different uses within one building or ensemble. Production, consumption, and living are all combined in one place. Everything needed for daily use is within walking distance. The buildings are multifunctional.

I. Urban Production and Transformation

The old parking deck south-east of John-F.-Kennedy-Allee is repurposed as a multifunctional building. Due to its proximity to one of the mobility hubs, it is particularly easy to reach. The ground level is now used for urban production and manufacture. A showroom and shop are added in a new building directly next to the production hall. This new building comprises four floors to allow for the integration of other functions such as offices. Additionally, the rooftop of the old parking deck is turned into a public bar with a café for relaxing, benches for reading, or a running track for being active.

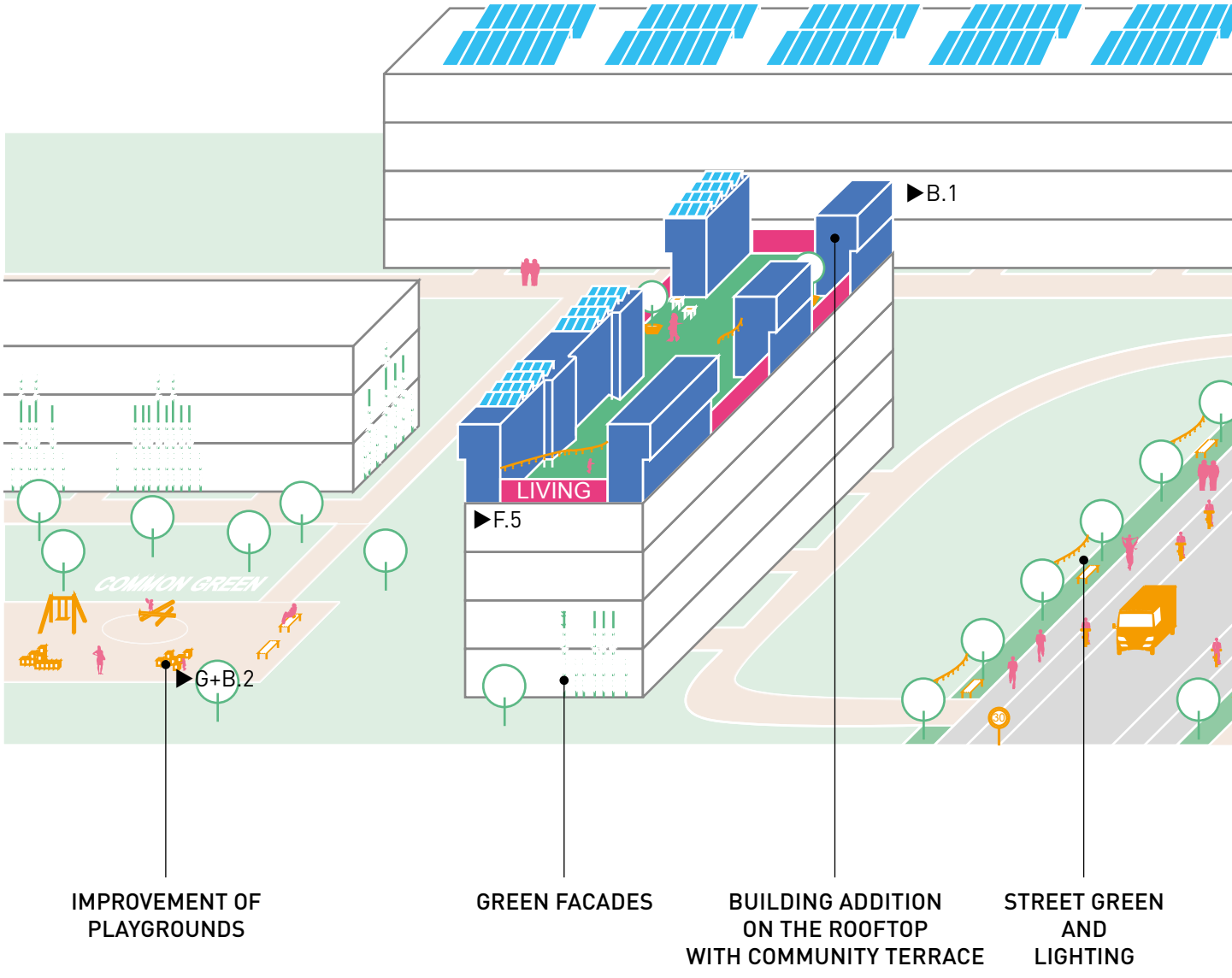
II. Local Supply within Walking Distance

All shops for daily needs are within walking distance. There are many small shops offering local products. The mix of uses within one building results in short distances between them and makes it possible to accomplish several errands in a short time. People can watch their new glasses being made in the urban factory. They can try them on while catching some sun in the factory's rooftop café, and then pay for the glasses in the factory shop in the same building. The café shop also offers local food, and vegetables can be found in a small greengrocer's shop nearby.

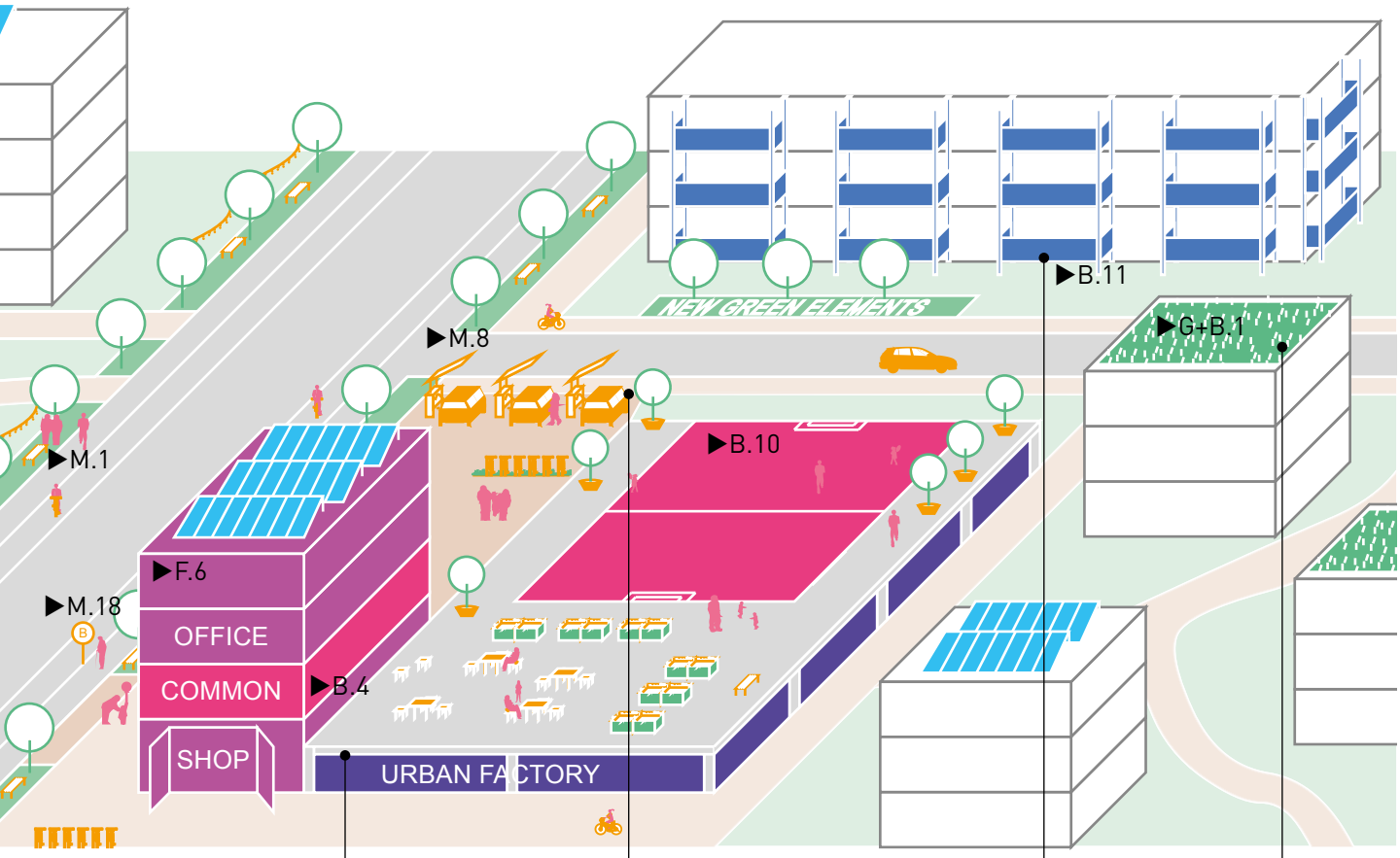
III. Multifunctional Houses

What is happening in the church when no Mass is celebrated? Or with the school when classes are done for the day? Monofunctional buildings are transformed into multifunctional ones. In the evenings, the school premises are turned into an adult education center offering language or computer courses. The same applies to the church facilities: on Mondays, the specialist doctor from Wolfsburg's city center can hold her consultation here; on Tuesdays, a yoga course can take place in the same location; and on Wednesdays to Fridays, the rooms can serve as a gym for the kids of the adjacent kindergarten. In the future, there will be no vacant buildings.

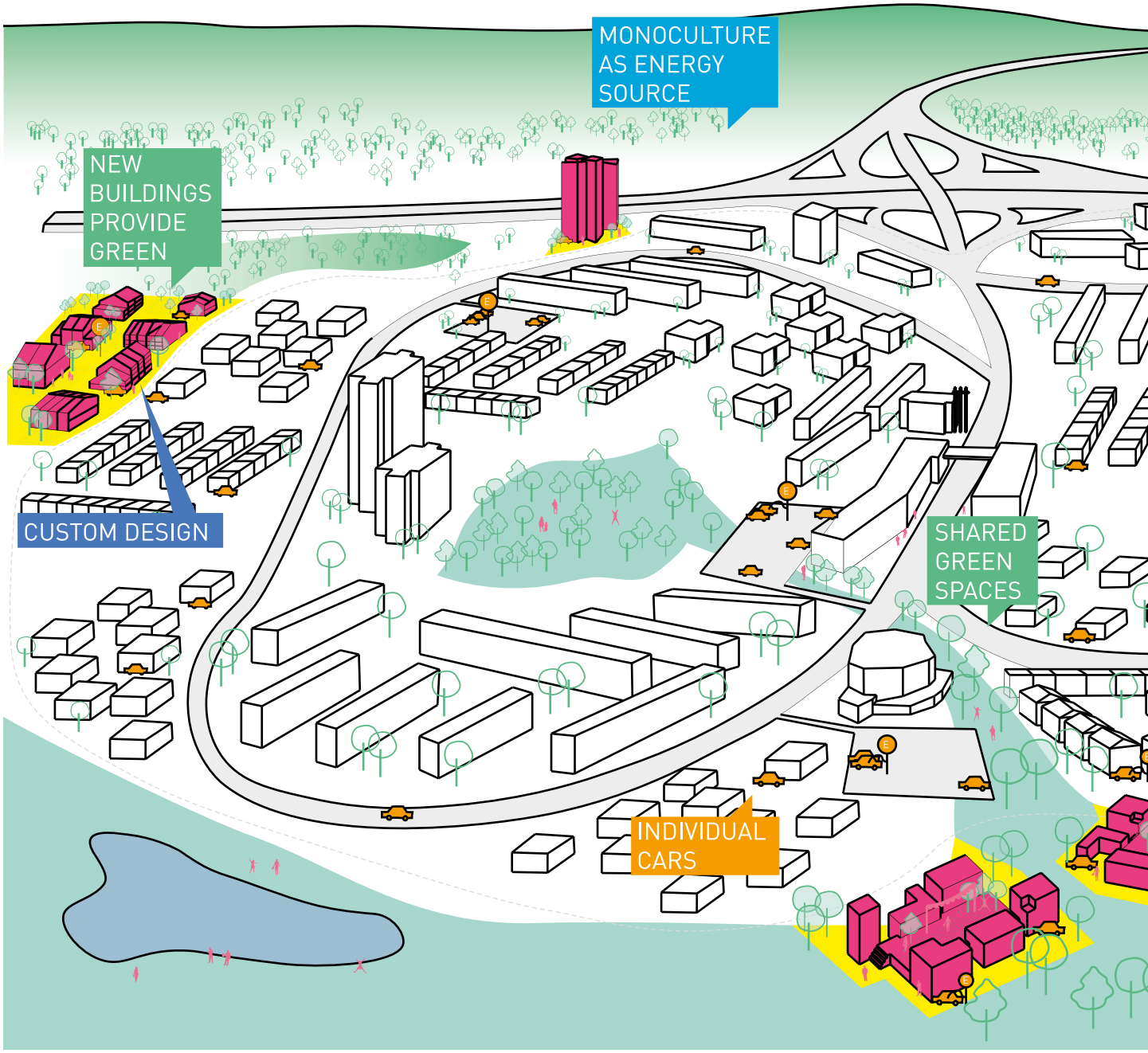
Scenario B:
A Happy Future Planned for Detmerode?



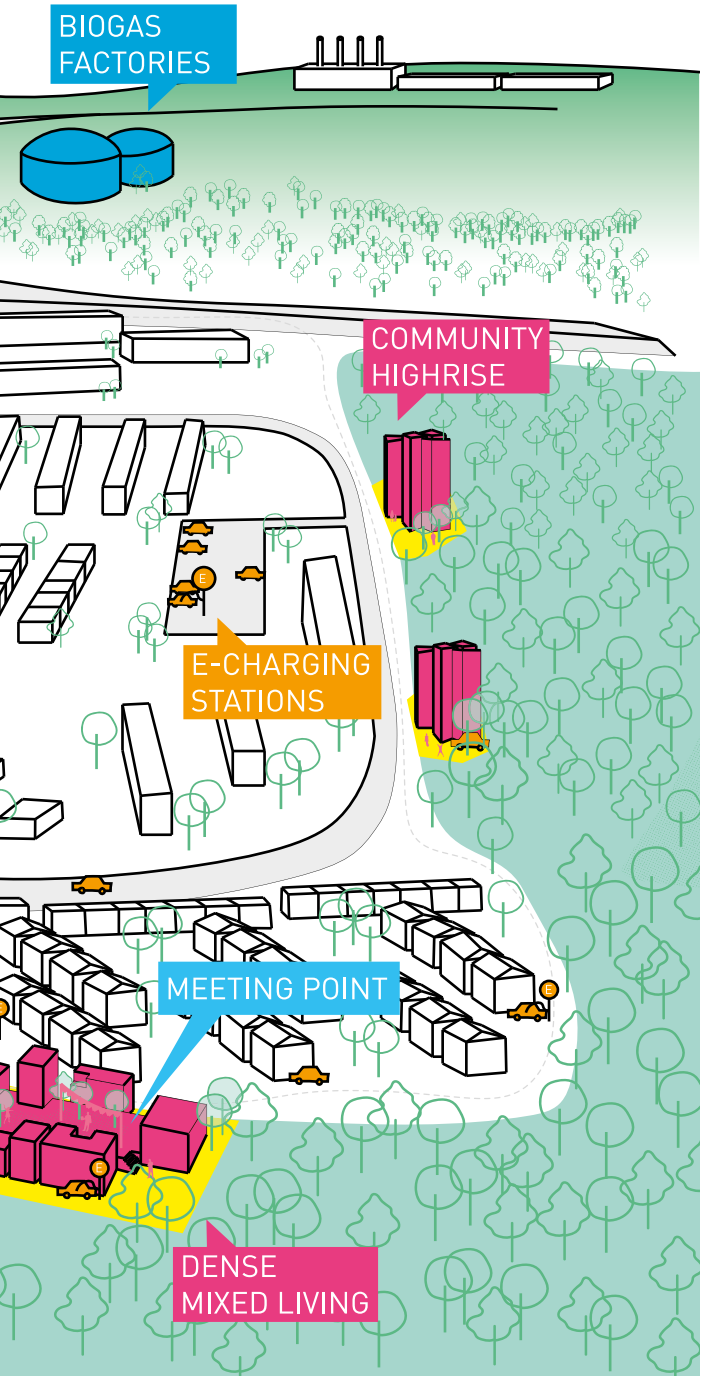
5.26


NEW GREEN ELEMENTS
▶M.8
▶M.1
▶M.18
▶F.6
OFFICE
COMMON
SHOP
▶B.4
▶B.10
URBAN FACTORY
▶B.11
▶G+B.1
URBAN FACTORY AND COMMON USE
MOBILITY HUB
RENOVATION AND EXTENSION
GREEN ROOFTOPS

5.5. Scenario C:
New Settlers in Detmerode



5.27

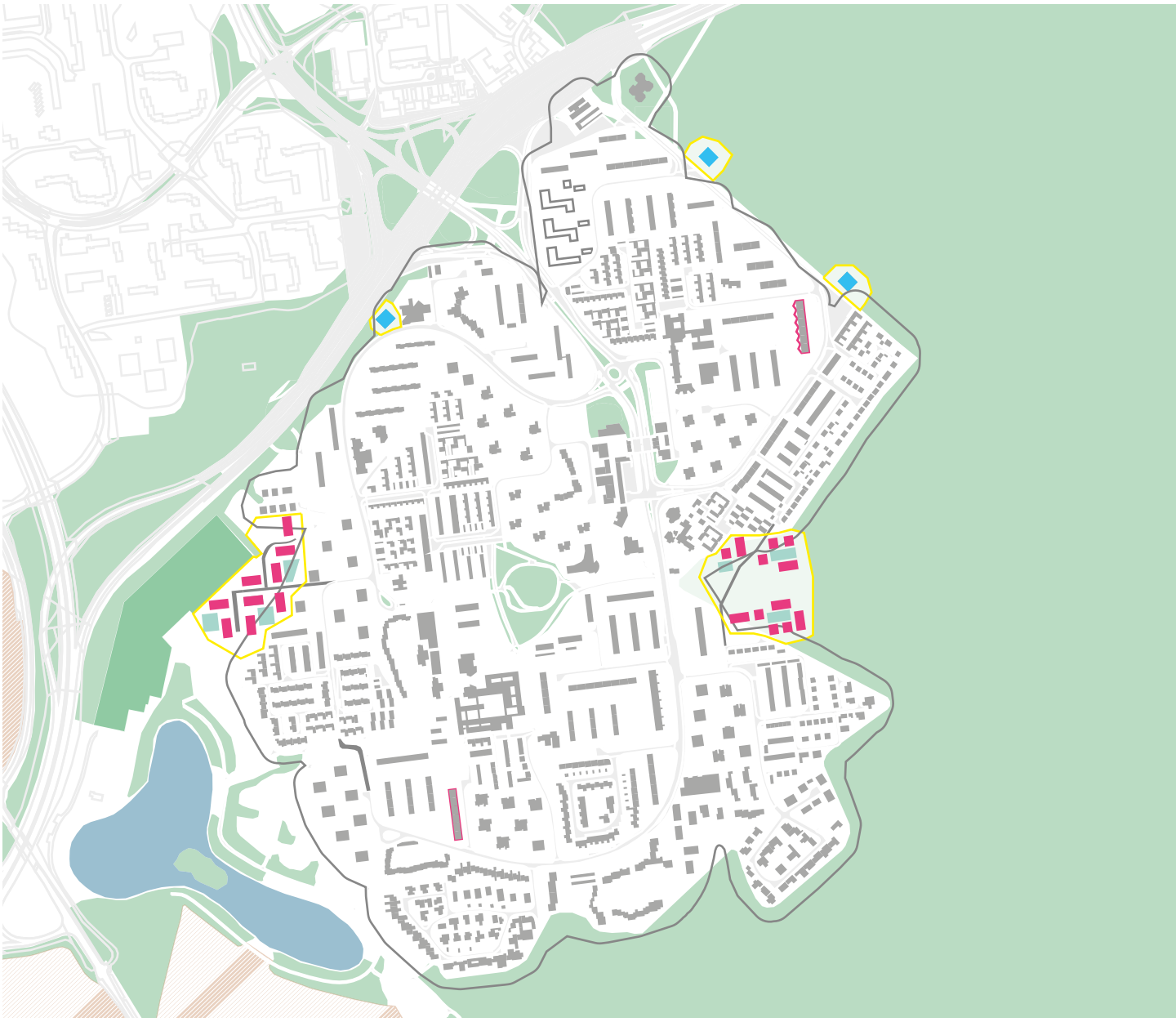


Dear residents of Detmerode,

"Bright flat with balcony on the 12th floor in a green environment." That was all the advertisement said and we thought: Do we really want to live on the 12th floor? Today we can say: yes, we do! The decision to move within Detmerode and out of our old detached single-family house after our children had moved out was a really great one! Besides the fantastic view with the forest on one side and the St. Stephen's Church on the other, we enjoy the great amenities of our high-rise building. There are shared terraces on every second floor, some of which come with outdoor kitchens for spending time together. There are rooms that we can rent for our children when they come to visit, and my personal highlight are the community gardens around our new home. Here, whoever is interested can grow vegetables, and there is always someone who feels responsible for watering! And when we harvest more than we need, we just take it to the local greengrocery around the corner. The storekeeper told me recently that he now also delivers his goods within Detmerode with his e-car twice a week to supply elderly and mobility-impaired people. He also told me that there are other services depending on demand. For example, a doctor or a physiotherapist visits once a week. That sounds great to me!

Best from the future!

Scenario C:
New Settlers in Detmerode



5.28 Legend

New Building Type I
New Building Type II
New Building Type II +

Transformation Area
TOPOS Boundary
Existing Streets
New Streets

Green
Water
Agriculture

0.4 km

Building Types

New Settlers is the only scenario that envisages gentle growth outside the current settlement boundary in the form of compact, dense developments. The new developments are built to meet high energy standards and use sustainable building materials. Modular systems allow for the cost-efficient construction of much-needed housing providing flats of different sizes.

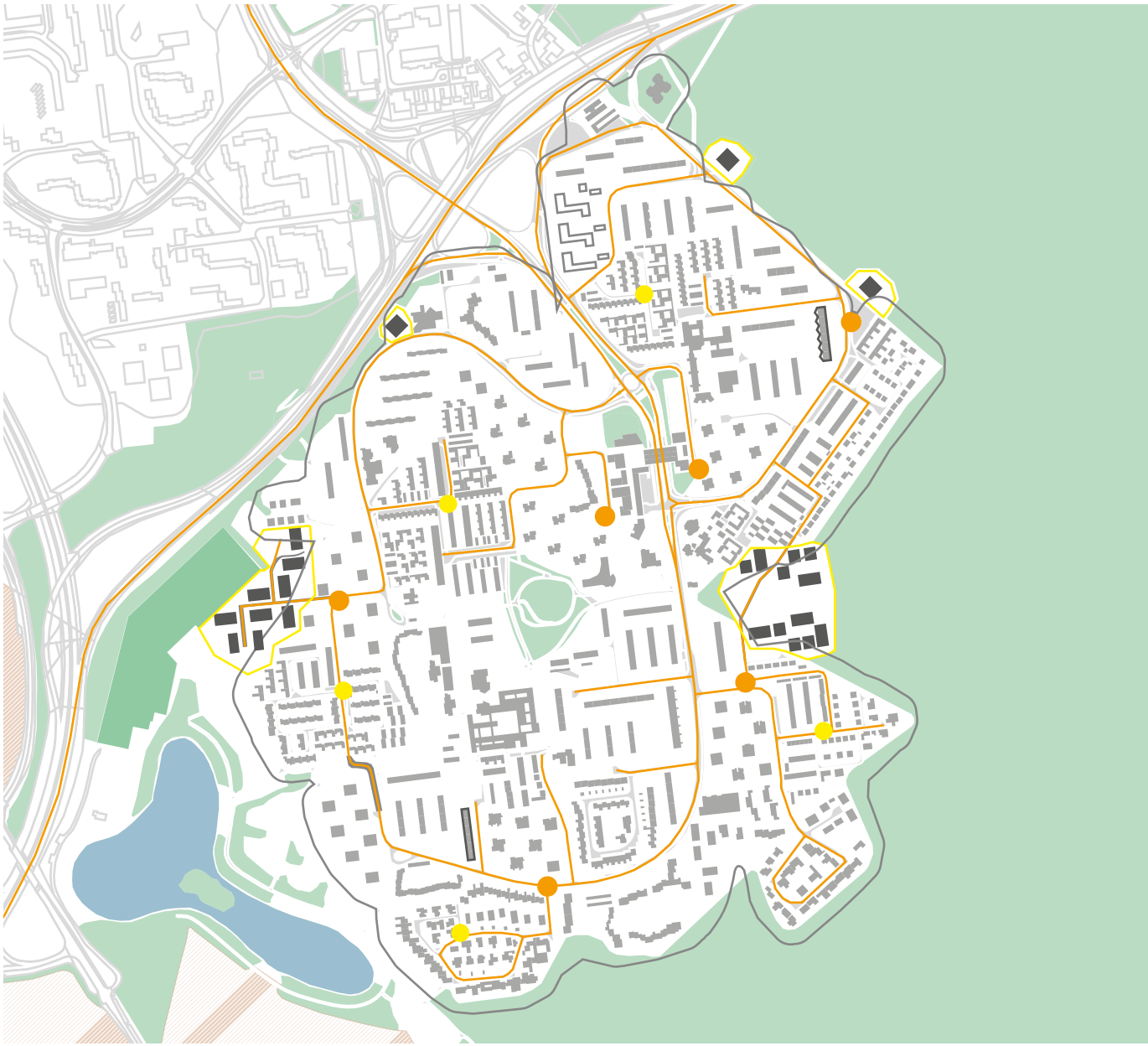
I. Pointy High-Rise

The new high-rise buildings are located at the edge of Detmerode, rounding off the district's settlement structure. Accordingly, high-rises with up to 12 floors can be envisioned. The lobby is the central meeting place for the residents. From here, communal spaces such as laundry rooms, rentable guestrooms, and a terrace can be accessed. The outdoor space is reserved for communal uses, e.g., for gardening or playgrounds, barbecue areas, or places to linger.

II. Mixed and Dense Living

The new quarters of Detmerode are compact and combine new forms of living, housing, and working. Hybrid building types are grouped around a shared deck that offers space for parking, building services, and utilities on the ground floor. The shared courtyard on the first floor serves as a market and meeting place. Public facilities and shops for daily needs are adjoining it. The floors above provide different kinds of apartments for various types of living, from traditional to shared and cluster apartments. An emphasis is placed on the use of renewable materials.

Scenario C:
New Settlers in Detmerode



5.29 Legend

E-Charging Station
Car Lane
Mobile Services /
Mobility For Elderly

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.4
km

Streets, Mobility, Public Space

This scenario entails an increase in traffic areas, which are designed to be as sustainable as possible through careful planning. Permeable street surfaces, the visual separation of lanes, and roadside greenery make the streets safer.

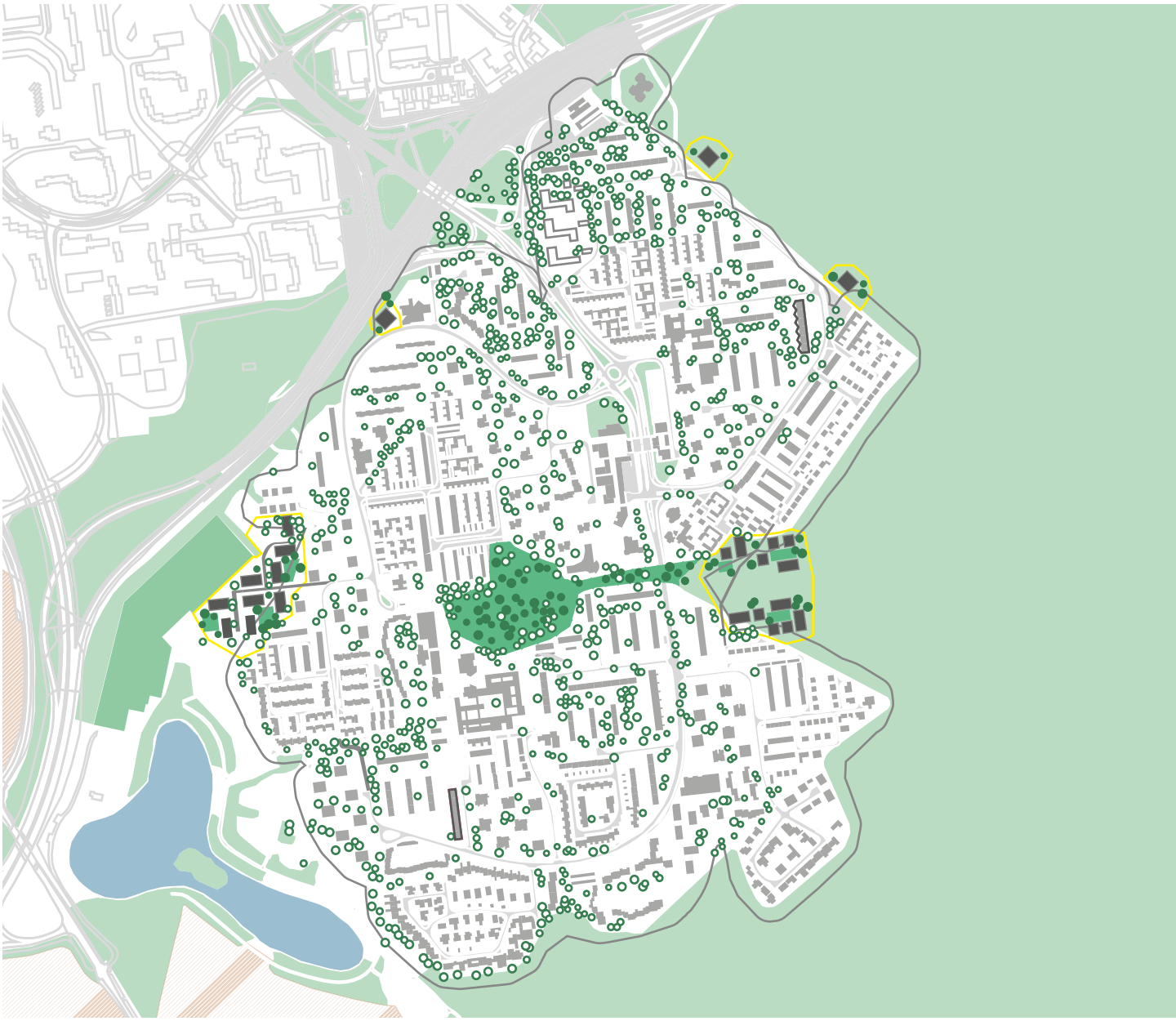
I. Sustainable Street Design

As this scenario envisages a slight increase in traffic areas, these are implemented following sustainability principles. The street surface is partially water-permeable. An additional infiltration system allows the rainwater to naturally seep away. In addition, lanes for the different traffic participants are visually separated, e.g., through colors and other markings. This clearly structures the streetscape, thus making it safer for all users.

II. Individual Mobility the Sustainable Way

The residents of Detmerode are still dependent on using their own car every day. The majority of these cars are electric, which is why the need for charging stations has increased. The six new public charging stations for all types of e-vehicles are placed all along the main streets of Detmerode. In addition, there is the possibility to use a special transport service, which can be useful for elderly people in particular, depending on their individual needs. To support this, different pick-up locations are set up in Detmerode.

Scenario C:
New Settlers in Detmerode



5.30 Legend

Community Gardens
Existing Trees
New Trees

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.4
km

Green and Blue Networks

In this scenario, the existing green spaces are upgraded, e.g., by adding new plants or by converting underused green buffer zones into productive green spaces. In addition, a fixed maximum amount of sealed areas is allowed throughout the district. The community accepts and monitors sustainability standards.

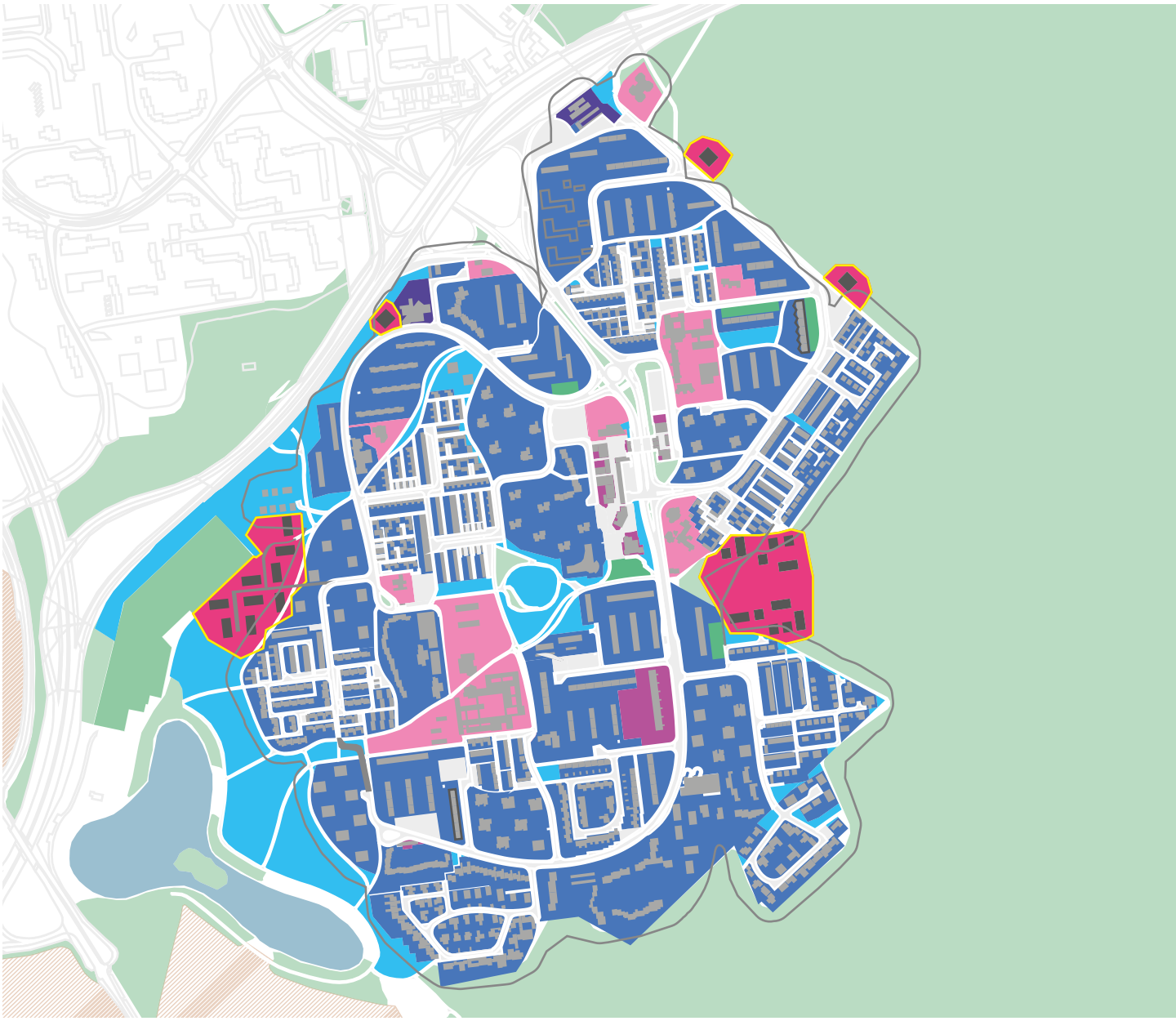
I. Maintenance of Green Spaces

Detmerode already has a large proportion of green spaces. However, often underused, these spaces are to be strengthened and upgraded. The existing trees are supplemented by a minimum number of new ones. This applies in particular to the areas where new buildings and housing estates are being developed. Here, communal gardens are created for growing vegetables and fruit. Greened clearances are taken care of by the community and turned into productive areas.

II. Fixed Ratio of Grey and Green Areas

In order to prevent gardens and front gardens from subsequently turning into "grey" areas, it has been precisely specified – and also monitored – how much area may be sealed and how much may not. Thus, front gardens become a paradise for birds with a wide variety of plants and bushes for nesting and feeding. All new buildings receive intensive roof and facade greening.

Scenario C:
New Settlers in Detmerode



5.31 Legend

Residential
Mixed Use
Industrial
Public
Leisure

New Green Spaces
Commercial
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings

Existing Streets
New Streets
Green
Water
Agriculture

Transformation Area

0.4 km

Functions

Everything for day-to-day needs is available in Detmerode. There are supplementary mobile services for elderly or mobility-impaired people.

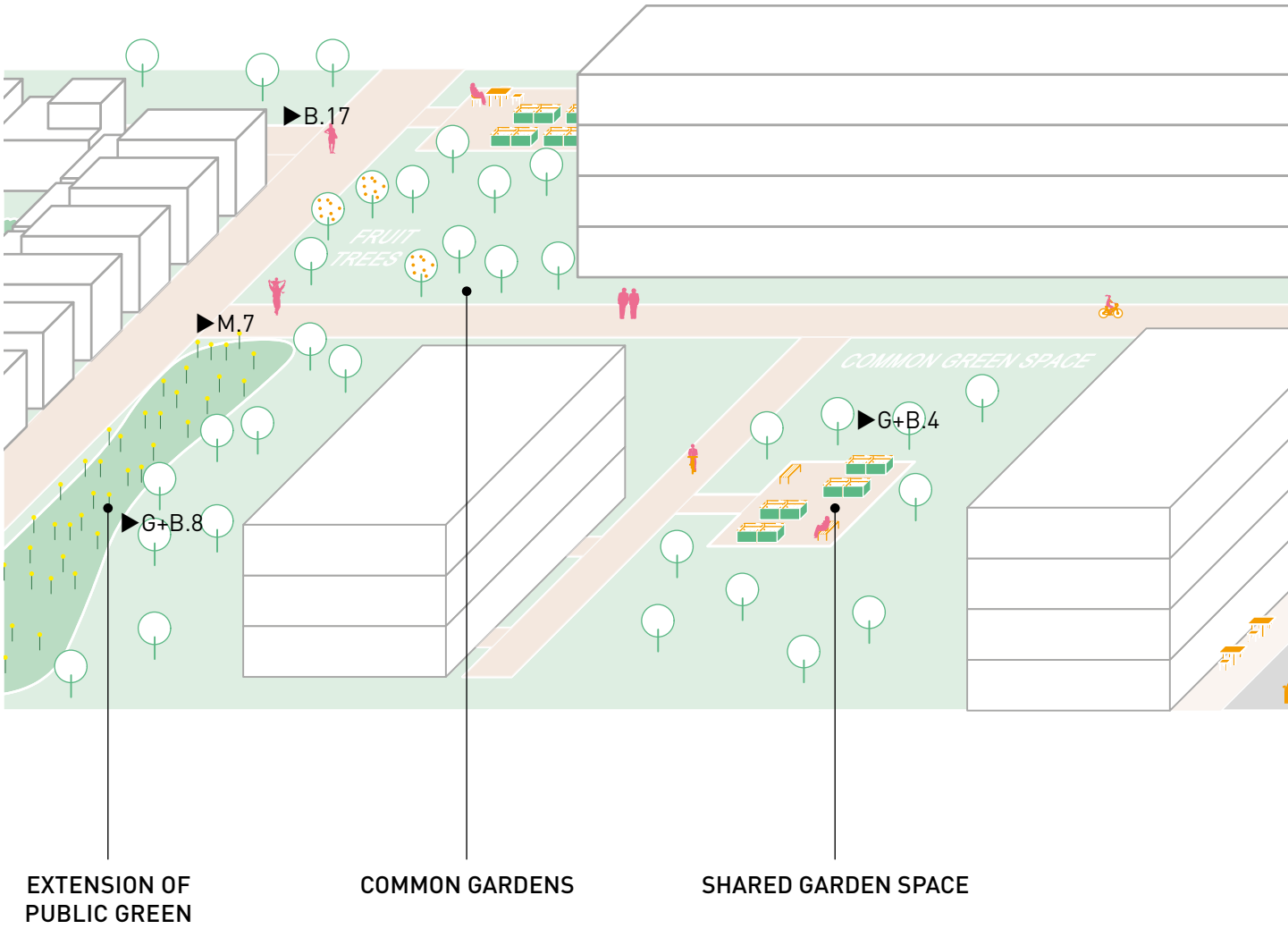
I. Dense Mixed Living

Most of the newly built apartments are located at the edge of Detmerode. To increase livability of each neighborhood, each building supports different uses. In addition, there is a broad variety of apartment types: from one-room studio to three-room flats, co-housing, and cluster apartments. The latter is basically a shared flat that also accommodates the desire for more privacy. Residents have their individual space, e.g., a bedroom, a bathroom, or kitchen, but there are also many communal spaces that allow them to get together with the other residents. To keep resource consumption as low as possible, the size of each private flat is kept to a minimum. Furthermore, there are many public uses on the ground floor, such as a communal kitchen, guest apartments, a kindergarten, or a neighborhood library. These functions enrich each of the three new development areas.

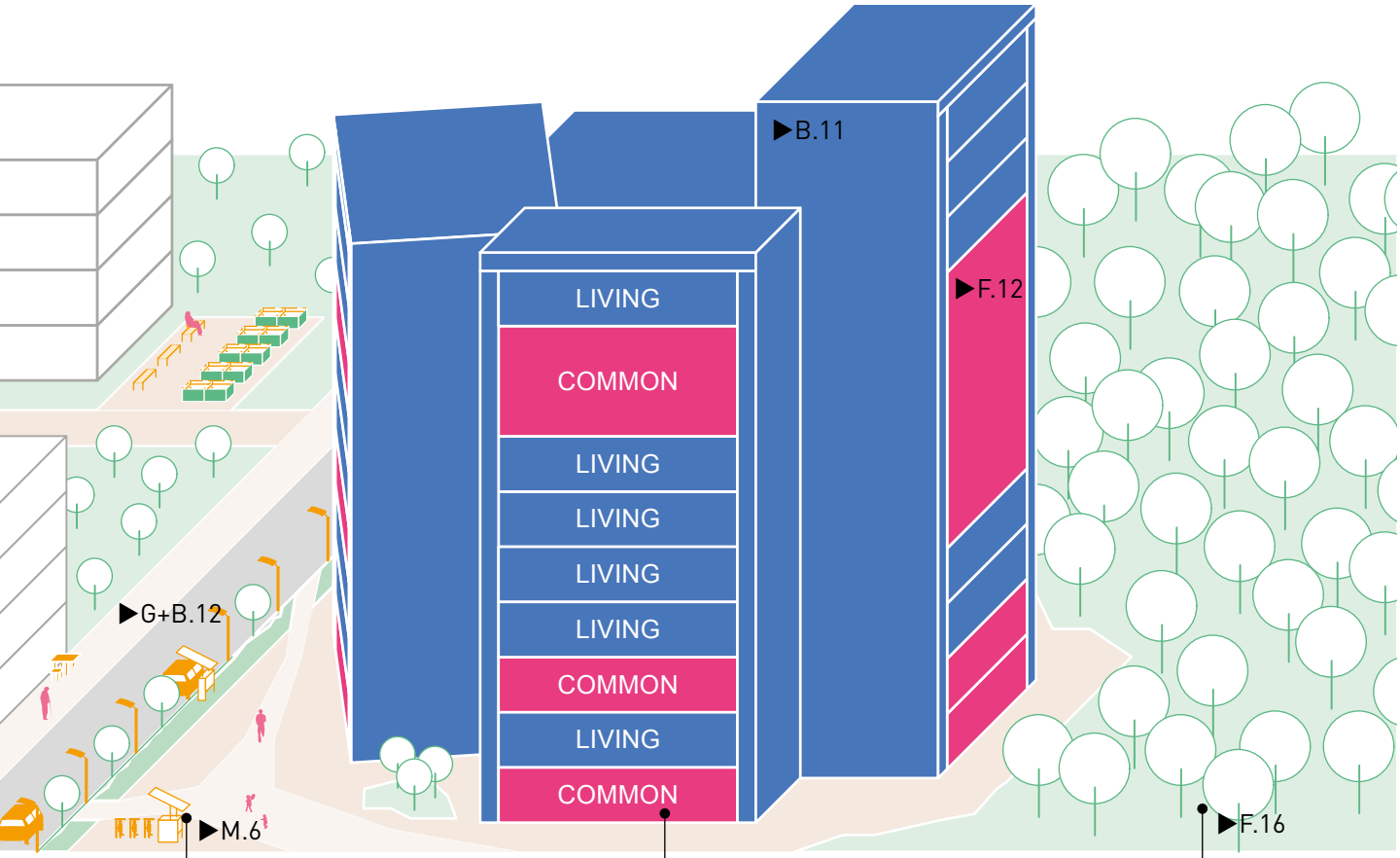
II. Local Supply

Each new district comes with a small local commercial center. One shop offers everything to satisfy day-to-day needs and what cannot be grown in the residents' own urban garden. Since the harvest is very rich, the produce can be distributed across the TOPOS. There is the attempt to create a five-minute city with special care for elderly or mobility-impaired people. To this end, a mobile supply service is installed for delivering harvested produce to each home in need of this special offer.

Scenario C:
New Settlers in Detmerode



5.32

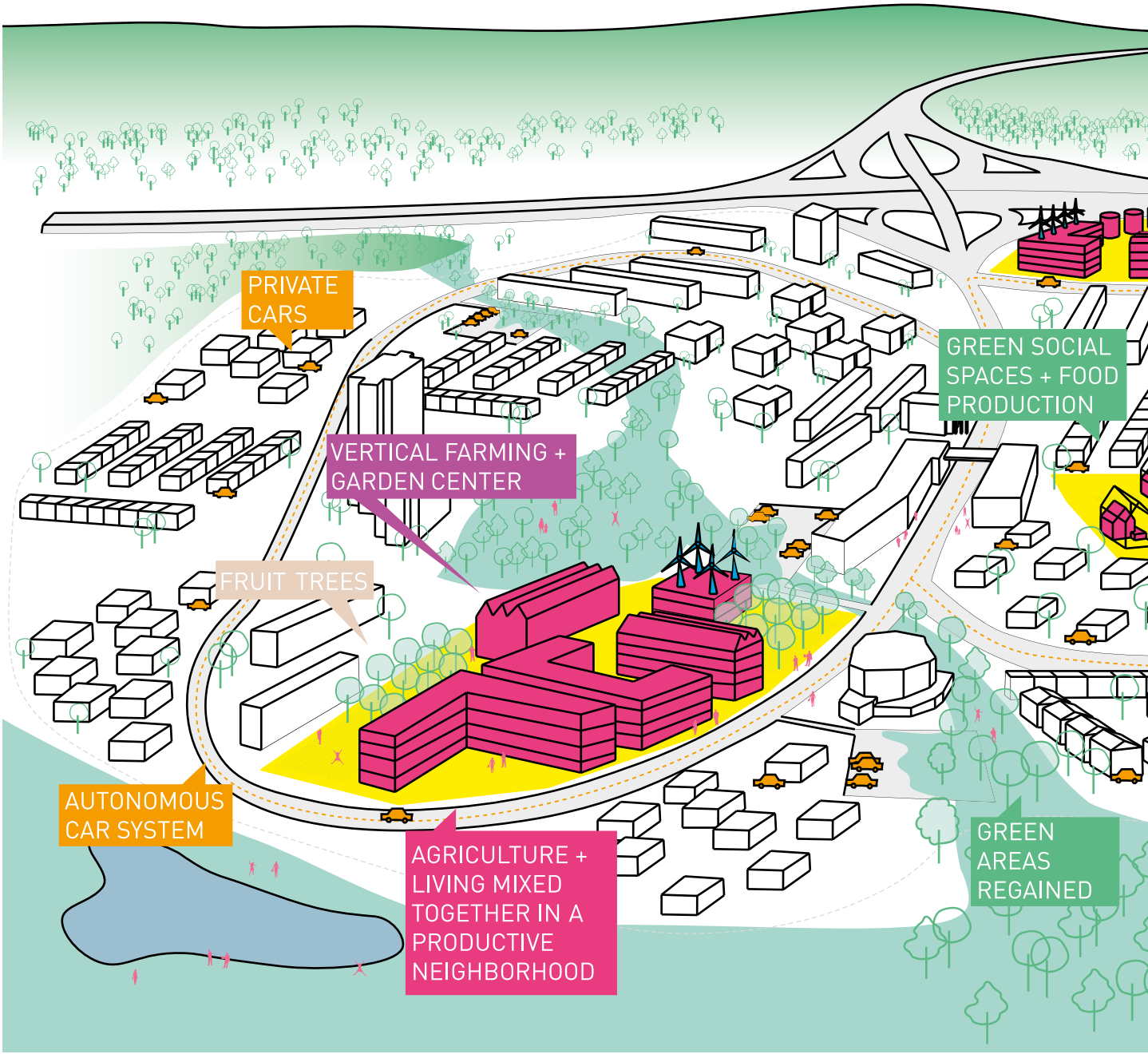


E-VEHICLES AND CHARGING STATION

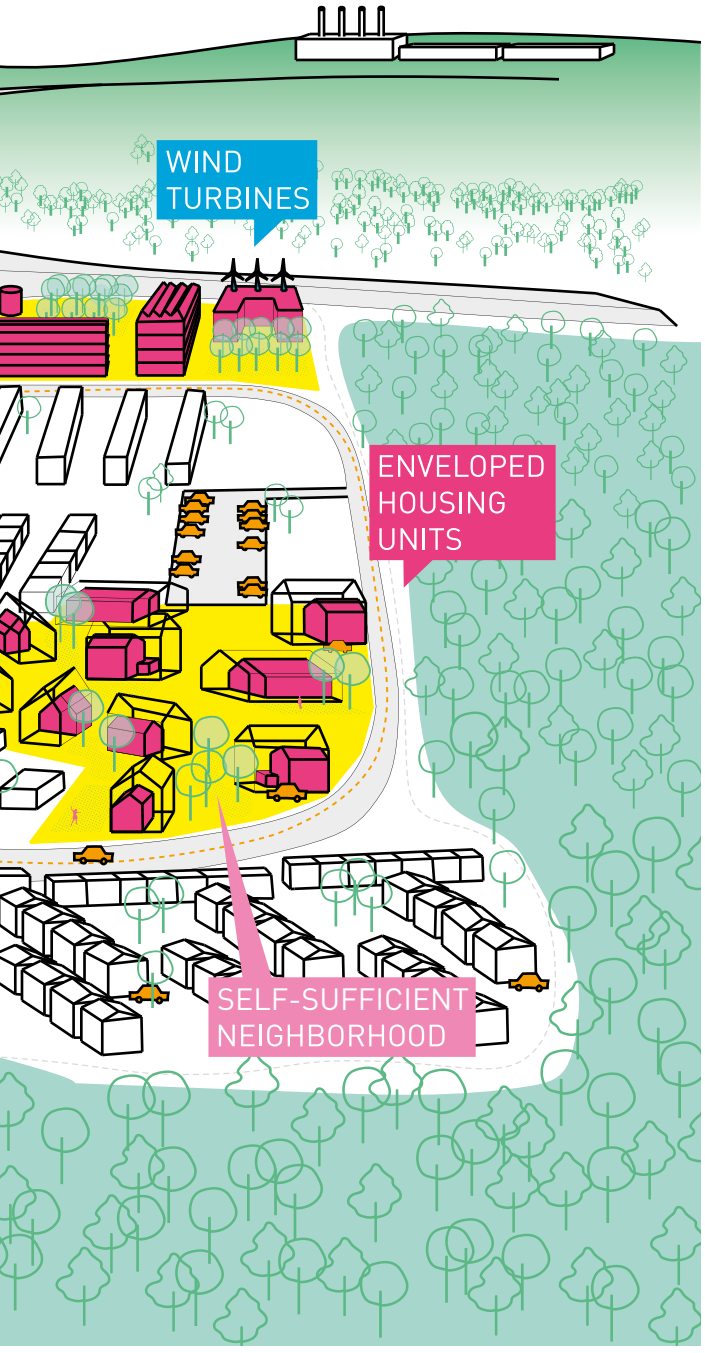
HIGH-RISE WITH RESIDENTIAL COMMON SPACES

MONOCULTURE

5.6. Scenario D:
Detmerode Repurposed!



5.33

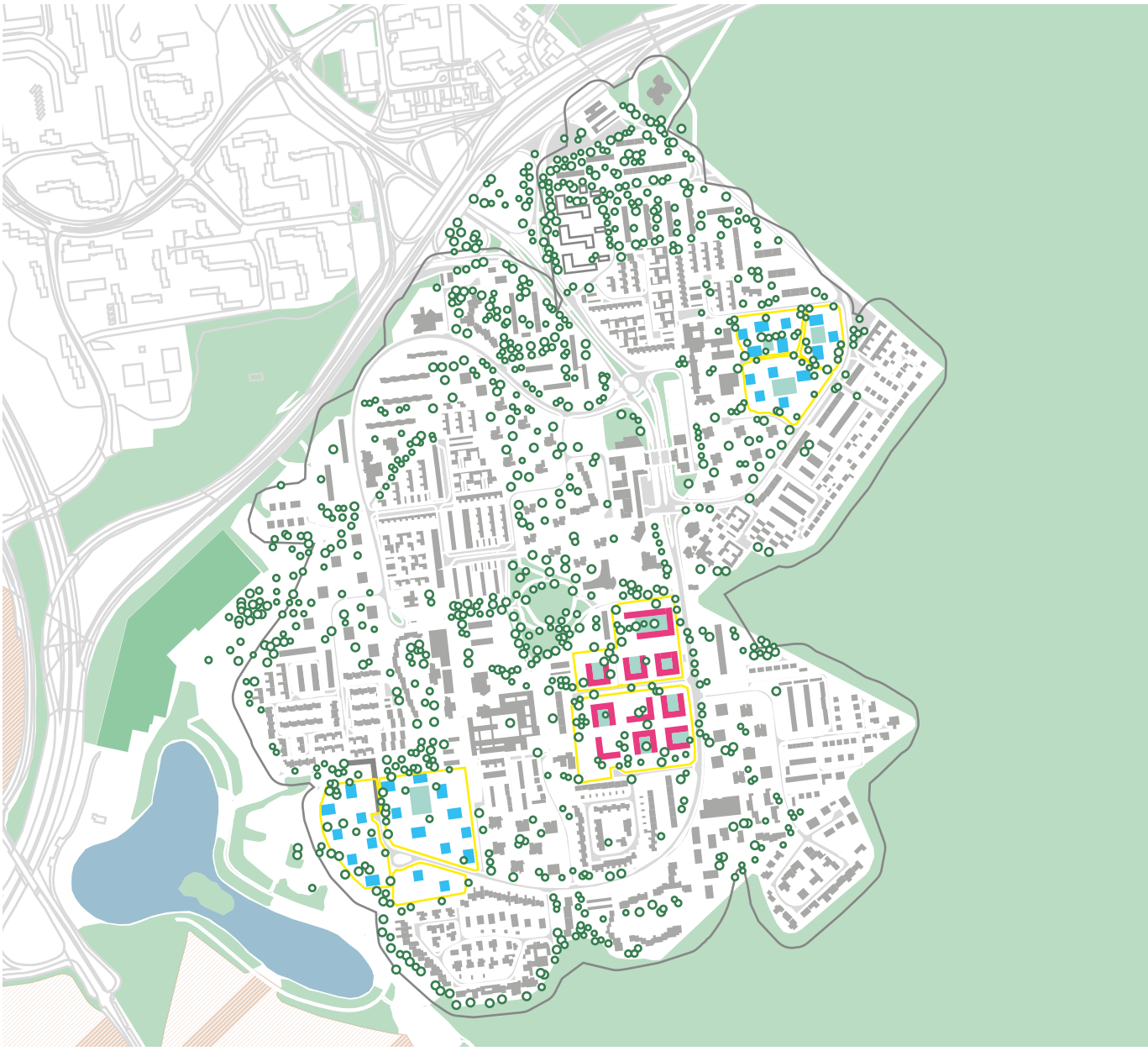


Dear residents of Detmerode,

By now I've already got used to being picked up by a self-driving bus in the immediate vicinity of my home every morning. But picking a melon from my own greenhouse in the summer is still quite strange, even after living in Detmerode for almost three years. A residential building covered with a second skin made of glass to use the energy it emits for growing fruit and vegetables? You have to come up with that first! To be honest, I was rather skeptical about all this technology at the beginning. Vertical agriculture instead of the old familiar fields that you can walk along? I couldn't imagine it at all. Multi-storey buildings for growing tomatoes, lettuce, and cucumbers? But now it's no longer a walk in the fields in the evening, but a walk through our productive neighborhood. There are lifts in the buildings that take you past sales rooms and production floors, up to beautiful green roofs. There are beehives and wildflowers, which can be picked and mixed into the salad that you can enjoy in the communal barbecue area. However, the view from the six-storey building is, of course, the highlight. From here, you can overlook the whole place – you can make out the old structures with the courtyard and row houses, see the new energy-self-sufficient settlements and the productive neighborhoods, and you can only guess from the overgrown areas what this place must have looked like before.

Best from the future!

Scenario D:
Detmerode Repurposed!



5.34 Legend

New Building Type I
New Building Type II
Existing Trees

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets

Green
Water
Agriculture

0.4
km

Building Types

In this scenario, the focus is on the transformation of areas with obsolete functions. New housing estates are being built with modern types of detached houses that function either as self-sufficient units or as productive neighborhoods.

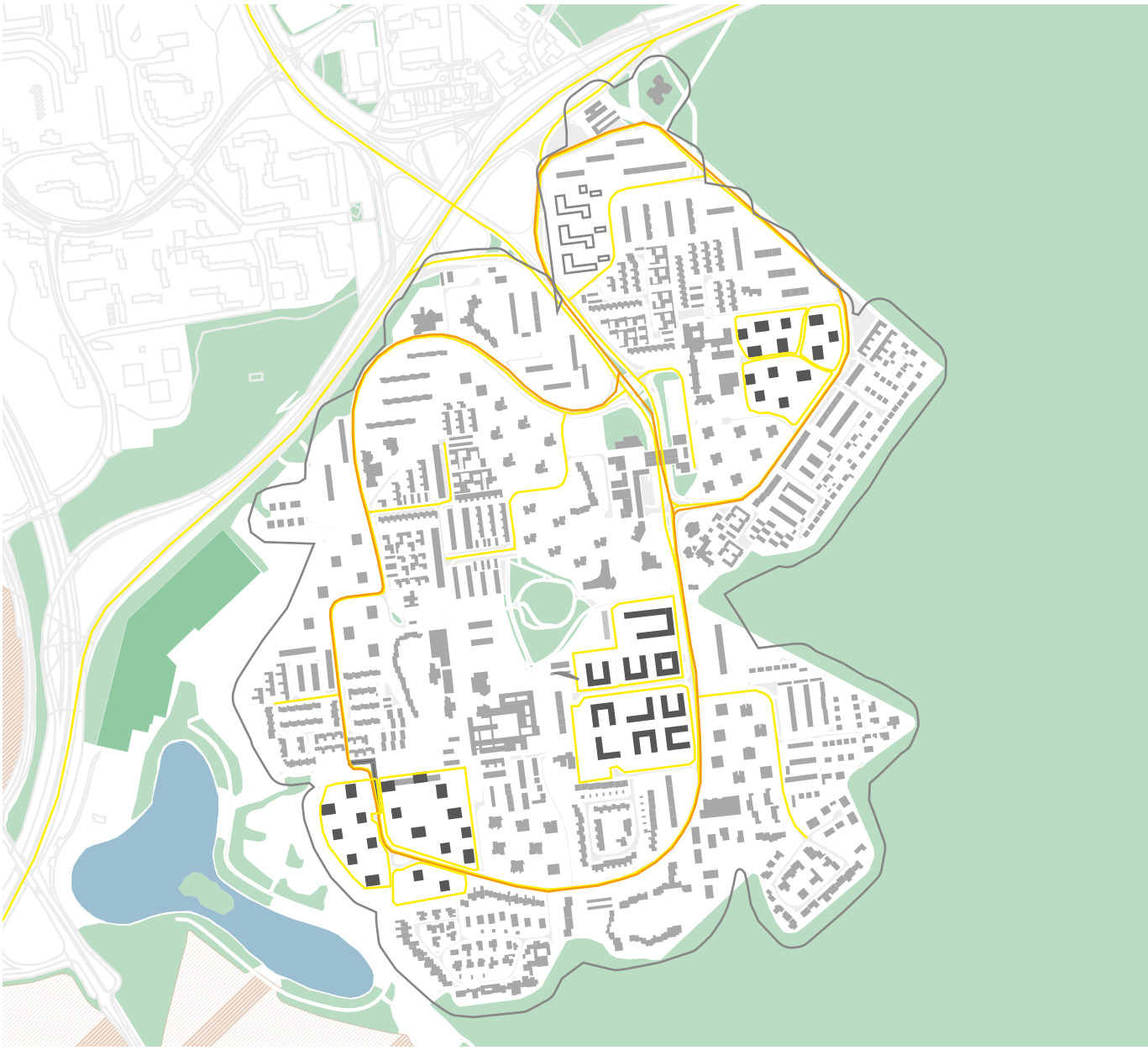
I. Self-sufficient Neighborhood

A self-sufficient and compact new neighborhood is created within Detmerode's existing boundaries. There is a variety of modular housing units, all planned as detached houses but varying in size. What they all have in common is a second shell made of glass, so that users can benefit from the greenhouse effect. There is a variety of modular row houses of different sizes. They all have a greenhouse, which enables the residents to grow different fruit and vegetables all year round. In addition to these private cultivation areas, these new neighborhoods include communal agricultural areas and orchards, as well as public facilities for all daily needs. These can be places for local food production but also places for work or leisure.

II. Productive Neighborhood

This scenario highlights the consequences of a restructuring of agriculture and also assumes a population shrinkage. Accordingly, some of the existing buildings are redeveloped, thus opening up the possibility of a productive neighborhood with an industrialized and fully automated production of food or other goods on a reduced area in Detmerode. The new settlements combine hybrid types of buildings, with spaces in between used for energy production or mixed uses combining leisure activities and production. On a reduced footprint, buildings are created for a wide variety of uses that complement each other. On the ground floor, tomatoes are sold that are grown on the floor above. The levels further up provide spaces for production and office work, while the top floor, with the most beautiful views, accommodates apartments.

Scenario D:
Detmerode Repurposed!



5.35 Legend

Autonomous Car Lane
Main Street

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.4
km

Streets, Mobility, Public Space

Cars drive autonomously along a loop with various stops for charging and picking up passengers. A wide variety of vehicles can be rented, too. The new neighborhoods are car-free settlements but offer zones for picking up and dropping off people, for loading and unloading, and for barrier-free access.

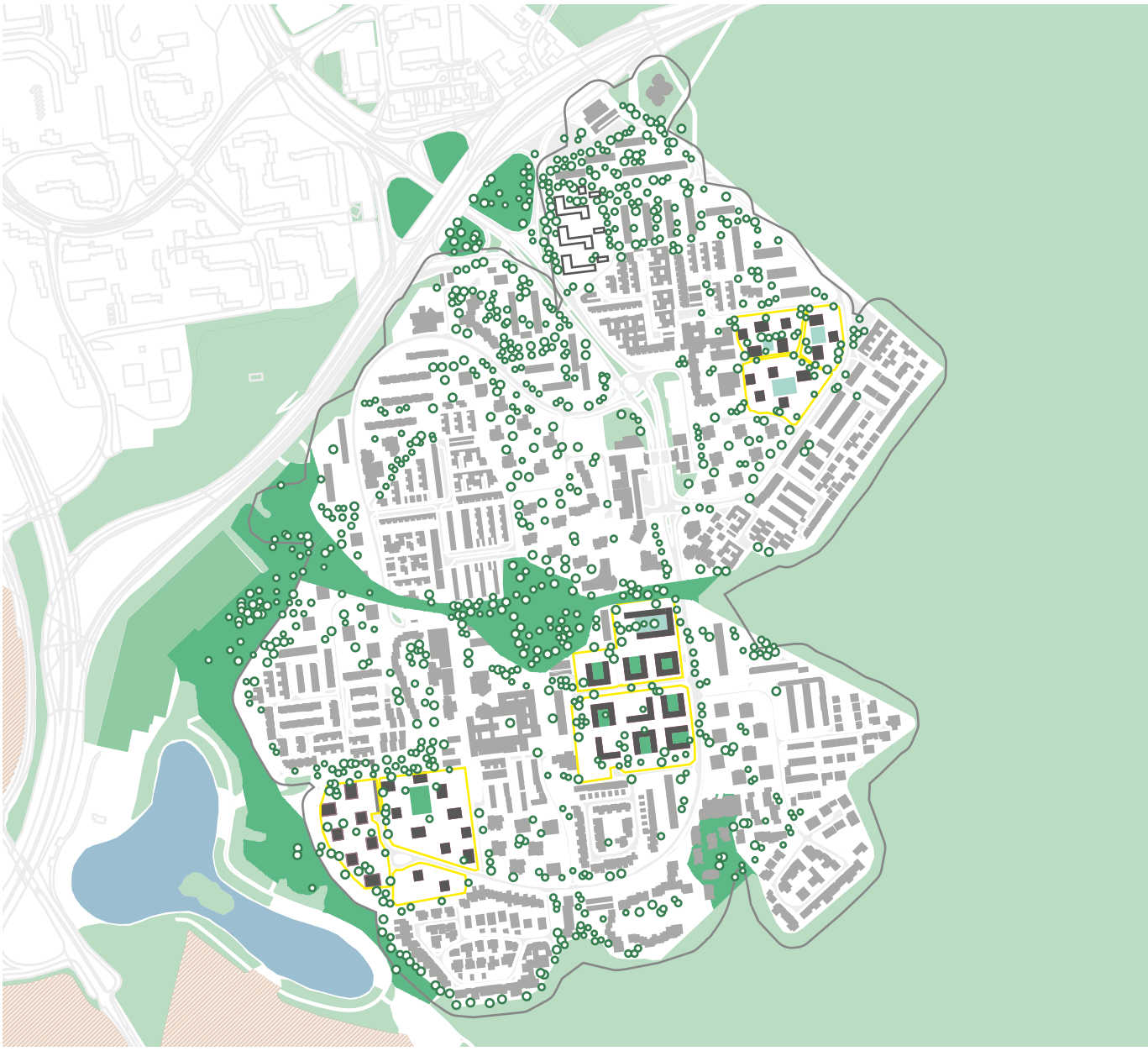
I. Autonomous Loop

In extension of today's street network, a new street in the form of a loop is built to connect the two main streets John-F.-Kennedy-Allee and Theodor-Heuss-Straße and thus improve overall connectivity within the town. This loop is equally dedicated to self-driving cars, pedestrians, and cyclists. Along the loop, five new charging stations for electric cars, bikes, and scooters are installed, which can be used by both residents and visitors of Detmerode. These are located in the immediate surroundings of public facilities, so that the charging time can be used for a visit to the playground, doing sports, shopping, or having a cup of coffee.

II. Car-free Neighborhoods

The new housing estates are car-free but provide barrier-free access for unloading, emergency vehicles, or handicapped people. There is a central parking lot in each settlement from where residents can walk to their homes. Nevertheless, small electric vehicles are allowed – parcels are delivered via small e-vans. Goods are also transported with such vehicles from one factory to another.

Scenario D:
Detmerode Repurposed!



5.36 Legend

New Green Spaces
Community Gardens
Existing Trees

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets

New Streets
Green
Water
Agriculture

0.4
km

Green and Blue Networks

The large spaces between the buildings are used for growing vegetables or are otherwise upgraded, thereby creating a variety of different public spaces. All new buildings are provided with green roofs or facades.

I. Green Common Spaces and Food Production

The new neighborhoods feature communal green areas for growing vegetables and fruit. In addition, park-like areas are laid out and planted with fruit trees, but can also be used for leisure activities. These fruit, leafed, and coniferous trees are planted throughout Detmerode, but especially around the *Bürgerpark* and in the area around the Lake Detmerode.

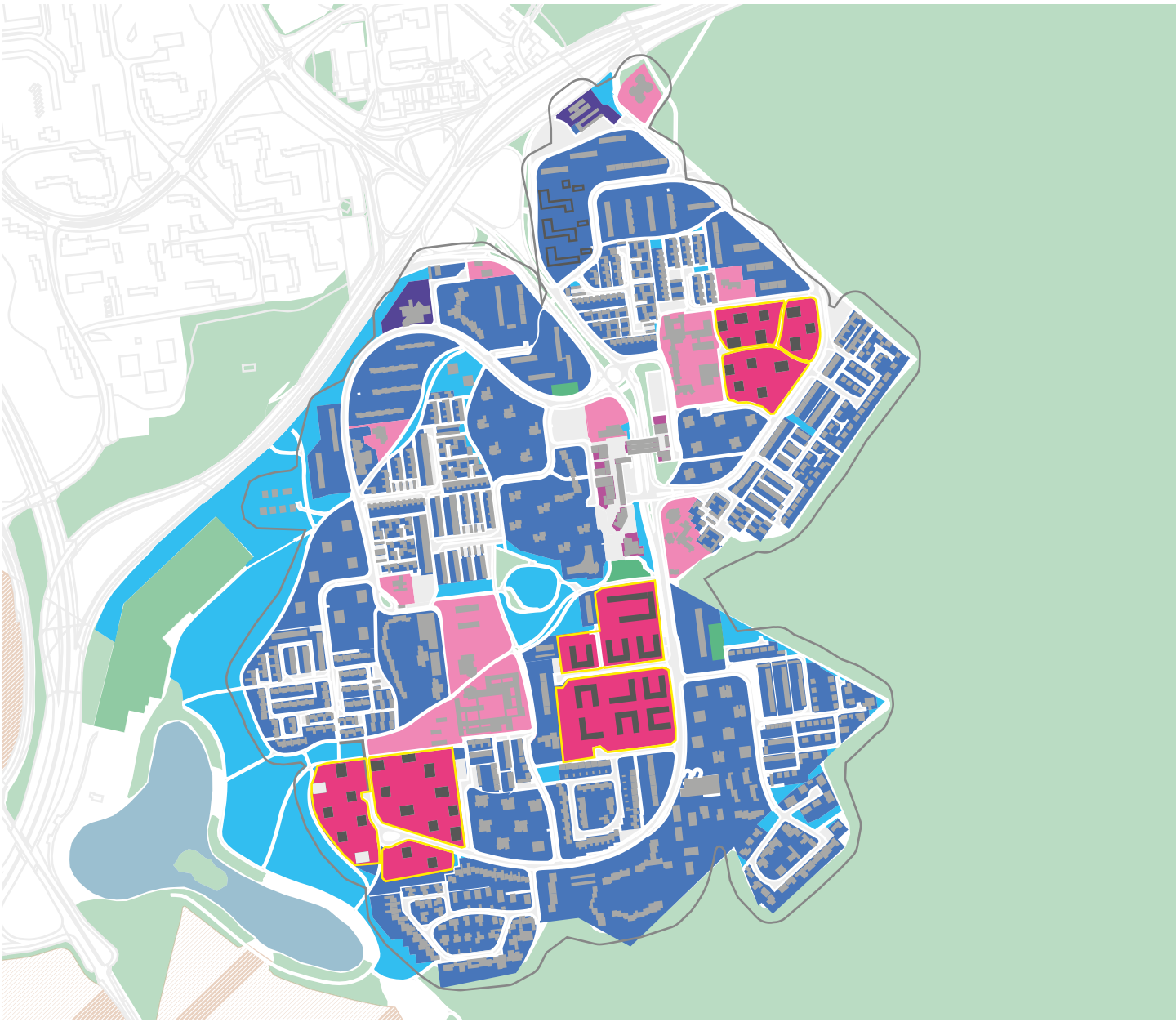
II. Green Facades and Rooftops

All new buildings have intensively greened roofs or are even designed so that vegetables, herbs, or fruit can be grown there. Thus, the roof areas not only supplement local food production but also become high-quality meeting points for residents and help retain rainwater. Furthermore, the existing roofs terraces are redesigned and equipped with green elements. The same applies to existing facades and the facades of new buildings. They are planned as additional areas for vertical greenery or PV harvesting.

III. Nature Reclaims Abandoned Areas

As a result of the profound structural change in society and severe population shrinkage, several wastelands have emerged in Detmerode. Since there is no need to transform all of these areas into new housing districts, some have transformed naturally – nature has reclaimed the abandoned spaces. New habitats for animals have emerged without human intervention. One of these areas is located at the edge of the productive neighborhood. The overgrowth has created diverse green oases for animals in the town center, which are in stark contrast to the high-tech world surrounding them.

Scenario D:
Detmerode Repurposed!



5.37 Legend

Residential
Mixed Use
Industrial
Public
Leisure

New Green Spaces
Commercial
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
New Streets
Green
Water
Agriculture

Transformation Area

0.4 km

Functions

Agricultural land has undergone complete restructuring from formerly mono-crop cultivation to new forms of farming. In this scenario, food production is organized vertically in modern greenhouses and in close proximity to communities. New hybrid buildings offer areas for shops, co-working spaces, or leisure activities.

I. Hybrid Uses

Most new buildings are conceived as hybrid buildings with a mix of different functions. While vegetables are grown on the first and second floors, they are prepared and sold on the ground floor. There is space for offices and distribution on the third floor. Co-working and multifunctional spaces can adjoin these areas. On the floors above, people can live in various ways: alone, in a co-housing project, or as families. The flexible structure of the new buildings allows a variety of floor plan options.

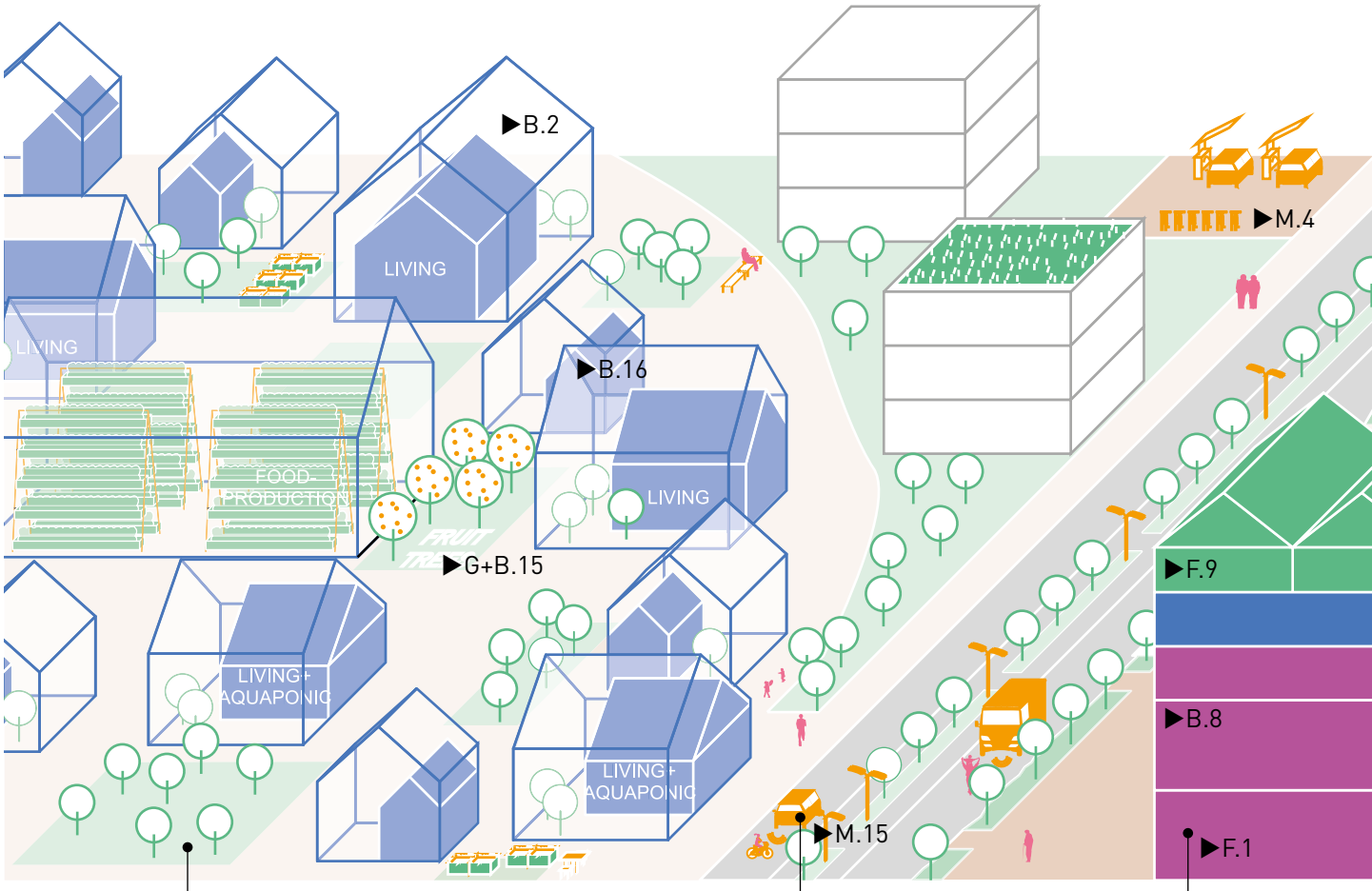
II. Urban Production

The change in people's consumption patterns leads to new production processes. Local production allows the output or remains of certain manufacturing processes to become the input of others, so that overall resource consumption can be reduced.

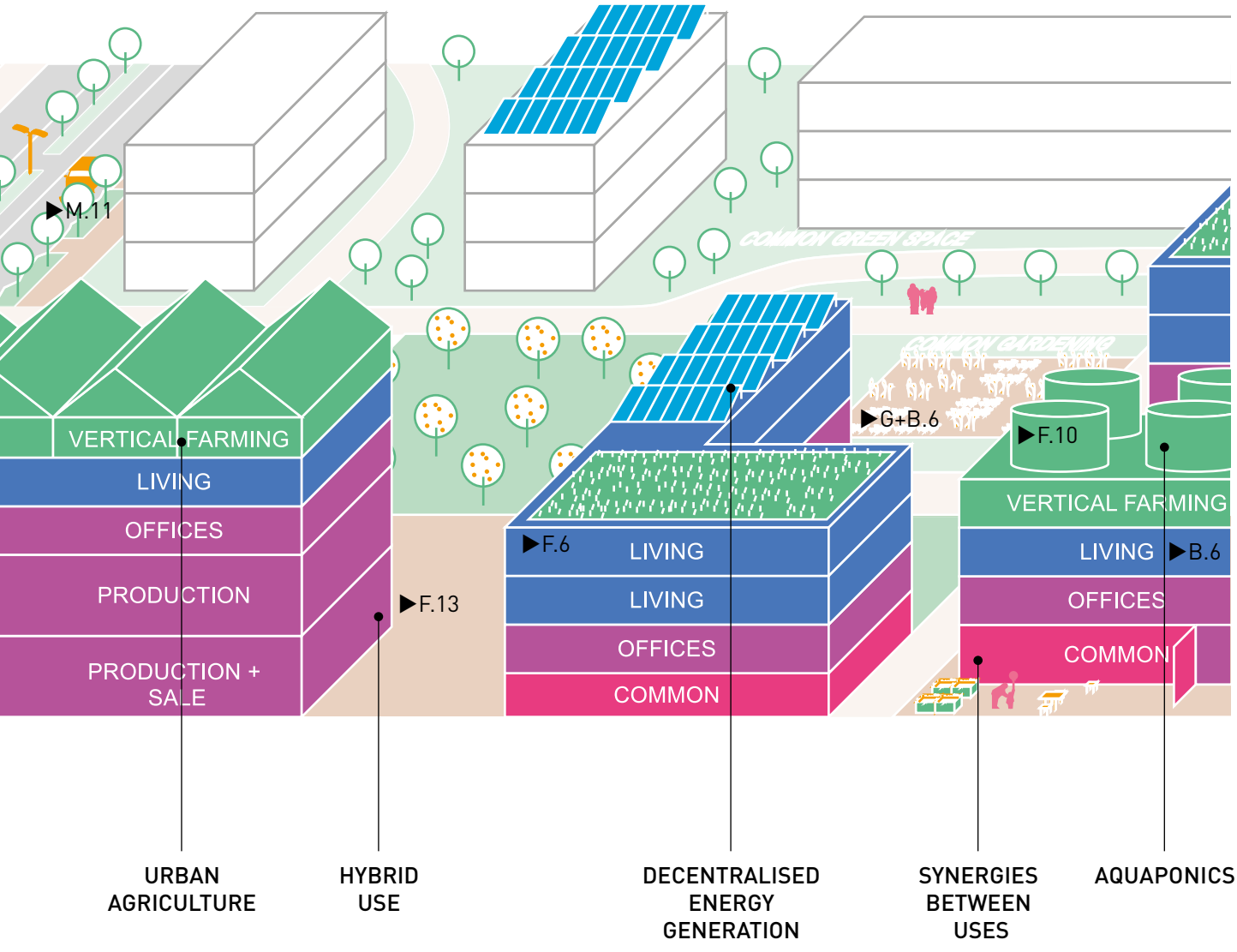
III. From Traditional to Vertical Agriculture

The agricultural areas are undergoing a change from land-consuming monocultures to land-saving cultivation methods in modern greenhouses. Thanks to high-tech and efficient cultivation processes, a large part of the food required locally can be produced on site. What is not consumed locally can be transported to surrounding towns by train.

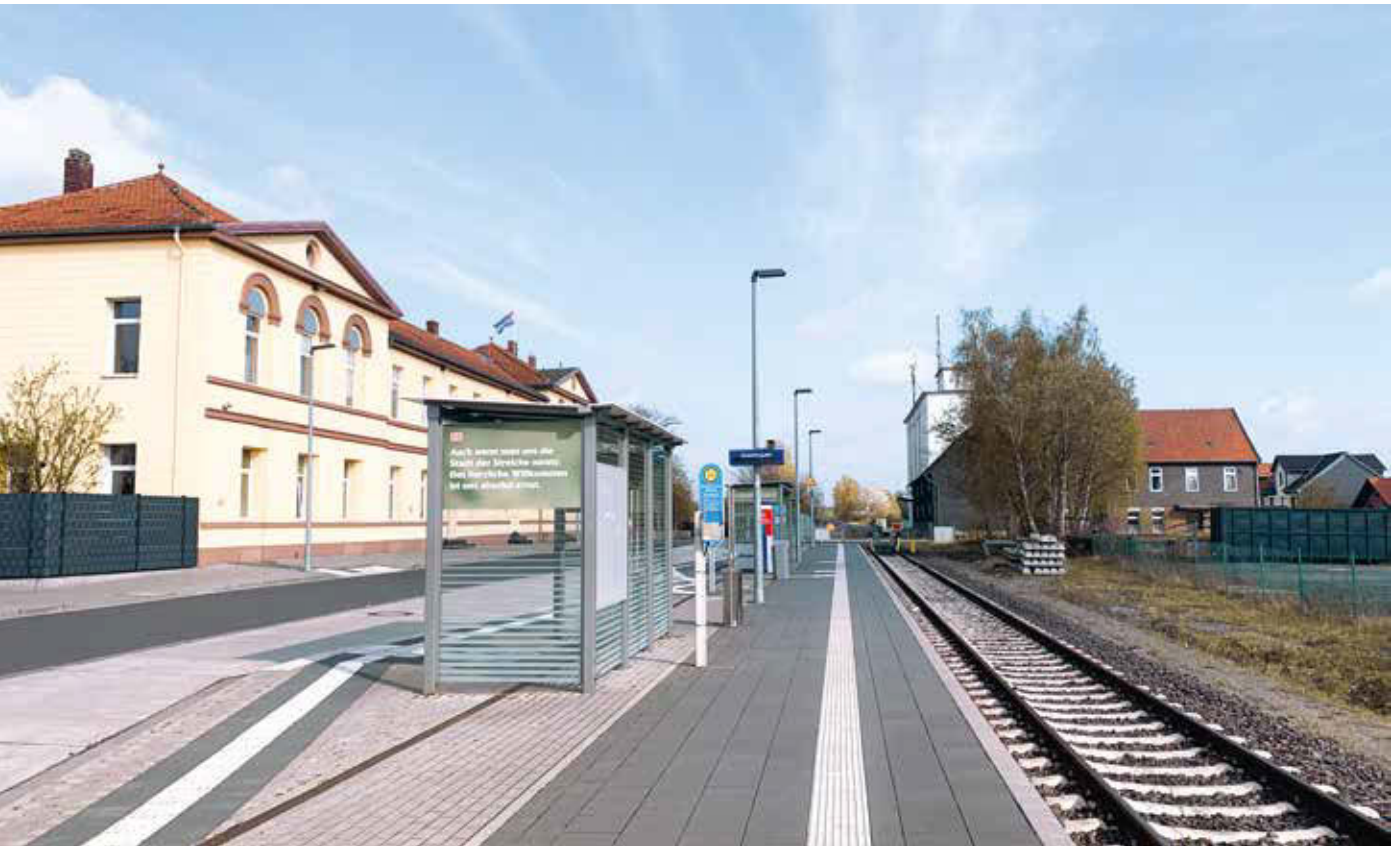
Scenario D:
Detmerode Repurposed!



5.38


▶M.11
COMMON GREEN SPACE
VERTICAL FARMING
LIVING
OFFICES
PRODUCTION
PRODUCTION + SALE
▶F.13
▶F.6
LIVING
LIVING
OFFICES
COMMON
▶G+B.6
▶F.10
VERTICAL FARMING
LIVING
▶B.6
OFFICES
COMMON
URBAN AGRICULTURE
HYBRID USE
DECENTRALISED ENERGY GENERATION
SYNERGIES BETWEEN USES
AQUAPONICS

6.
PROTOTYPE III: Schöppenstedt, a Periurban Village



6.1 Schöppenstedt Railway Station
Mobility hub and the connection to Braunschweig

6.2 Schöppenstedt Market Square
Centrally located in the village and with access to the river Altenau

6.3 Schöppenstedt Old Town
The heart of the village is characterized by its half-timbered houses for living and commerce.

6.1. TOPOI Description

By discussing Schöppenstedt, we want to take a detailed look at a Periurban Village. Periurban Villages are characterized by a relatively high ratio of retail spaces and a high functional variety. With an average distance of 1.7 km to the nearest regional train station, its accessibility is very high in comparison to other settlement units. This means that from a Periurban Village, regional train stations can be comfortably reached on foot or by bike. In general, the connectivity by public transport is almost as high as that of Periurban Towns. Compared to all other village types, however, Periurban Villages are the least compact.

Although our classification calls it a "village", Schöppenstedt is actually a small town with a population that just recently exceeded 5,000 inhabitants in its administrative boundaries. Schöppenstedt is the seat and administrative center of the municipality of Elm-Asse, named after the two scenic hill ranges Elm and Asse. Schöppenstedt has a traditional center with a market square and town hall, a bank, shops, and restaurants. Schöppenstedt has a train station: a regional train stops here once every hour. The area around the station forms a second center with several supermarkets. Furthermore, many businesses are scattered throughout the settlement, and there is a small industrial area located in the western part.

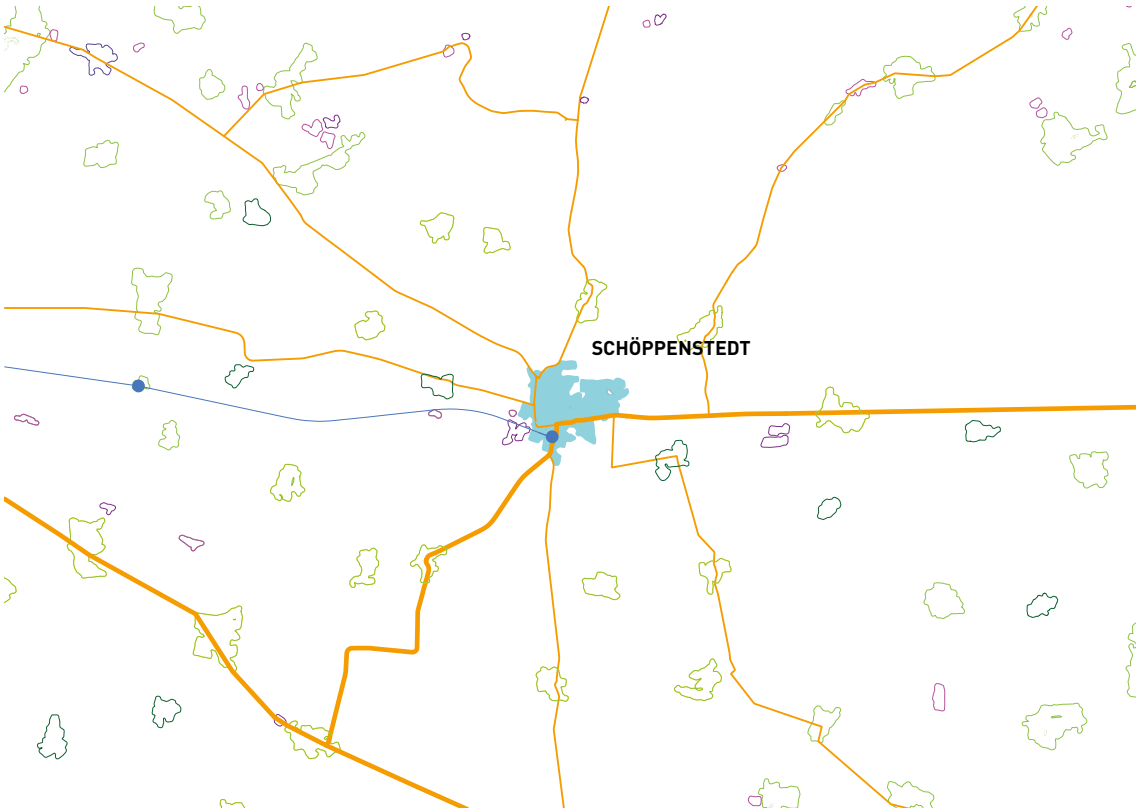
There are 42 Periurban Villages in our two study regions, 30 in the eastern and 12 in the western study region. A total of around 200,000 people live in these Periurban Villages.

Table 6.1 Attributes of the Periurban Village of Schöppenstedt

A Area [ha]	211.17
C Compactness [%]	45
BD Building Density [buildings/ha]	15.04
OSR Open Space Ratio [%]	83
FR Functional Richness	8
PD Population Density [inhabitants/ha]	19.88
RSR Retail and Service Ratio [%]	8
AFR Agricultural Facilities Ratio [%]	2
SUD Settlement Units Density	8
PTC Public Transport Connectivity	30
PRTS Proximity to Regional Train Station [km]	1.01

Context

The Periurban Village of Schöppenstedt is located in the east of Lower Saxony in the administrative district of Wolfenbüttel County. It belongs to the joint municipality of Elm-Asse and is actually the seat of the joint municipality. The nearest highway, the A2, is located to the north-east. There is a railway station in town and the federal road B82 runs through the municipality. The Node Town of Wolfenbüttel is located 18.5 km from Schöppenstedt and can be reached via a federal road along which many Exo Villages are located.



6.4 Legend

- Node City
- Node Town
- Periurban Town
- Small Exo Village
- Disseminated Village
- Agri Village
- Periurban Village
- Small Periurban Village
- Exo Village
- Disseminated Hamlet
- Disseminated Living
- Agri Hamlet
- Exo Industrial Zone
- Exo Satellite Town
- Primary Road
- Secondary Road
- Railway Line
- Railway Station

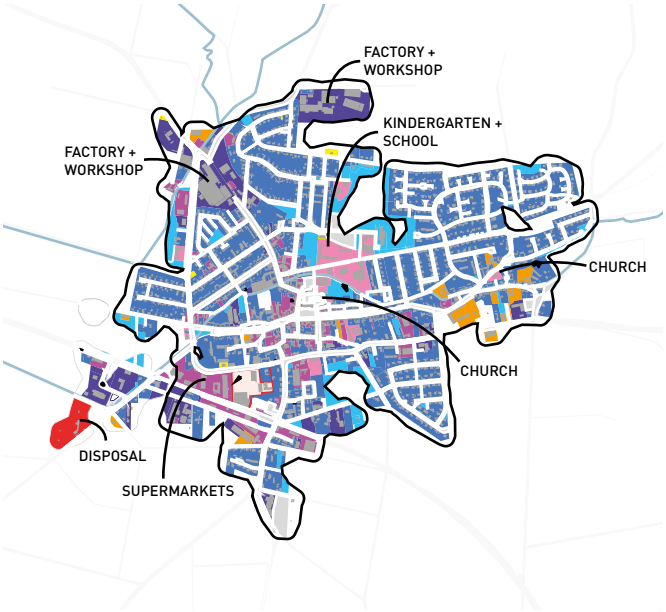
0.9 km

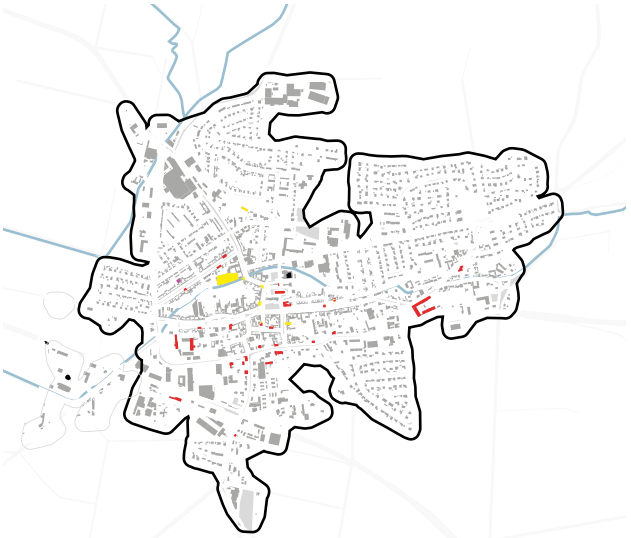
Land Zoning

Residential use dominates the village, even though there are commercial and industrial areas, for example, at the railway station and at the edge of the village. In addition to residential use, shops, a church, a town hall, the municipal administration, a museum, and a school are located in the town center. As a counterpoint to the historical center, a new retail park was built some years ago next to the railway station, which caters to the daily needs of the local residents. Due to its advantageous location, it also serves communities nearby.

Building Age and Heritage

There are several listed buildings, most of which are located in Schöppenstedt's center. Some of them are public buildings, such as the two churches and the train station, some are farm buildings, such as the Küblingen Manor or the barn on Kapellenstraße. Most of the monuments are, however, historical residential buildings. In addition to these protected buildings, many vacant buildings can also be found in the town center, some of which are still in good condition, while others are on the verge of dilapidation.





6.5 Legend

- Residential
- Industrial
- Commercial
- Public
- Leisure
- Agricultural + Forestry
- Supply
- Disposal
- Traffic
- TOPOI boundary
- Water

6.6 Legend

- before 1859
- 1860 – 1918
- 1919 – 1948
- 1949 – 1957
- 1958 – 1968
- 1969 – 1978
- 1979 – 1983
- 1984 – 1994
- 1995 – 2001
- 2002 – 2009
- 2010 – 2015
- Heritage Site
- Vacant Building
- Water
- Buildings (construction dates not available)

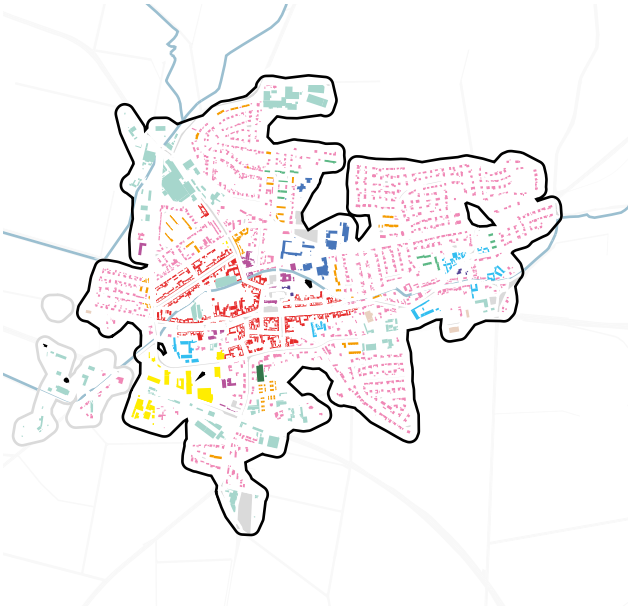
0.5 km

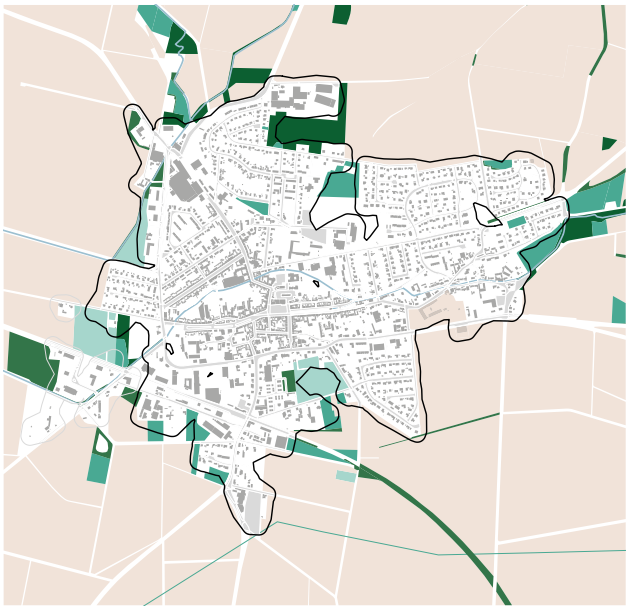
Building Types

The way different building types are distributed across the village indicates its phases of growth. In the village center, traditional half-timbered houses with yards and perimeter developments can be found, whereas many detached houses and slab-shaped buildings are located in the outskirts, which suggests that these represent more recent developments.

Green and Blue Infrastructure

Schöppenstedt is located in the northern Harz foreland (Harzvorland) with its tree-topped hilly landscape. The Elm is a range of hills rising up to an altitude of 323 meters, which is part of the Elm-Lappwald Nature Park. The Asse, also a hilly landscape with elevations of up to 234 meters, is a landscape conservation area with a mixed broadleaf forest. It has become known as an interim storage site for nuclear waste. Schöppenstedt is largely surrounded by agricultural land.





6.7 Legend

- Slab
- Perimeter Block
- Multi-family Houses
- Single-family Houses
- Public
- Retail
- Church
- School
- Greenhouse
- Barn
- Factory
- Water
- Traffic
- TOPOI boundary

6.8 Legend

- Agriculture
- Park
- Grass
- Meadow
- Forest
- Water
- Traffic
- TOPOI boundary

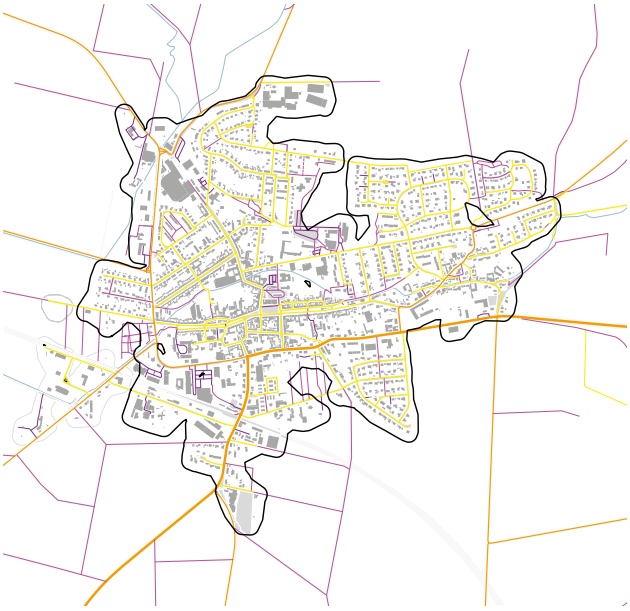
0.5 km

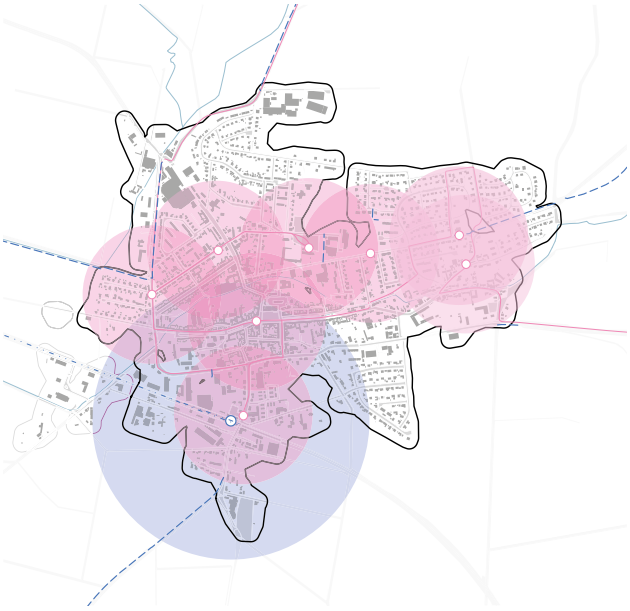
Street Network

The main road runs directly through the town and connects Schöppenstedt with the larger centers of Wolfenbüttel and Schöningen. It also serves as a feeder road to the A2 highway. In addition, several country roads cross the town. Many of the historical buildings are situated along the old main road that runs through Schöppenstedt's center. In addition, many residential streets are distributed across the village.

Public Transport

The railway station is located on the southern edge of the village. The train takes passengers to Braunschweig. Until 2007, Schöppenstedt was not a terminus but a destination on the way to Schöningen. Today, these tracks are disused and the line is served by a bus. There are eight bus stops, which are very well distributed around the town, creating a dense network. The bus stops here every hour between 6 am and 9 pm.





6.9 Legend

- Primary Road
- Secondary Road
- Tertiary Road
- Residential Road
- Access Road
- Unclassified Road
- Water
- Traffic
- TOPOI boundary

6.10 Legend

- Cycle Lane
- Railway
- Bus Stop + 420m Radius
- Train Stop + 600m Radius
- Water
- Traffic
- TOPOI boundary

0.5 km

6.2. Four Futures for Schöppenstedt

We developed four scenarios for Schöppenstedt and all the other sample municipalities. While the scenarios are equal in terms of their drivers, the way they develop spatially is, of course, different for all of the municipalities. However, each scenario follows a certain development logic.

Scenario A is called *Green Communities*. It is derived from a collaborative approach of living and working in dense settlements structures. Scenario B is called *Planned Happy Future?*. Here, the focus is on the efficient use of land as a resource and the strengthening of rural and suburban spaces as against the urban cores in urban-rural agglomerations. Scenario C, *New Settlers*, demonstrates how spatial expansion can be steered in a more sustainable way than with laissez-faire approaches. The scenario *Communities Repurposed!* addresses the spatial and functional transformation of the different TOPOI types. Unlike other scenario approaches, all four scenarios are intended to present a desirable future, even though some seem to be more desirable and sustainable than others.

Scenario A:

Green Communities focuses on the densification of the built-up area to promote a compact settlement structure. Schöppenstedt develops into a collaborative community that is characterized not only by cooperative housing but also by shared mobility. The center has been revitalized.

Scenario B:

Planned Happy Future? deals with the existing building stock and its energy-related upgrade and renovation, and with the conversion of the existing housing stock. With the re-activation of the railroad to Schöningen, public transport in Schöppenstedt is being improved even further to a five-minute town.

Scenario C:

New Settlers is the only scenario that involves growth outside the current settlement boundaries. For Schöppenstedt, three new development areas are proposed, which are built in accordance with strict sustainability criteria, e.g., the greening of roofs or facades and the installation of photovoltaic systems. Mobility focuses on electric vehicles.

Scenario D:

Communities Repurposed! implicates the complete conversion of land currently used for industrial or commercial purposes. The proposed conversion also questions the nature of production and the impact of digitalization and automatization on the small towns and villages of the future. Hybrid buildings offer a lot of space for new forms of urban production, as well as for living and the provision of energy. Autonomous vehicles are replacing the numerous trucks and changing the street space into a livable place for all.

Areas of Transformation

6.11 Scenario A: Green Communities

6.12 Scenario B: Planned Happy Future?

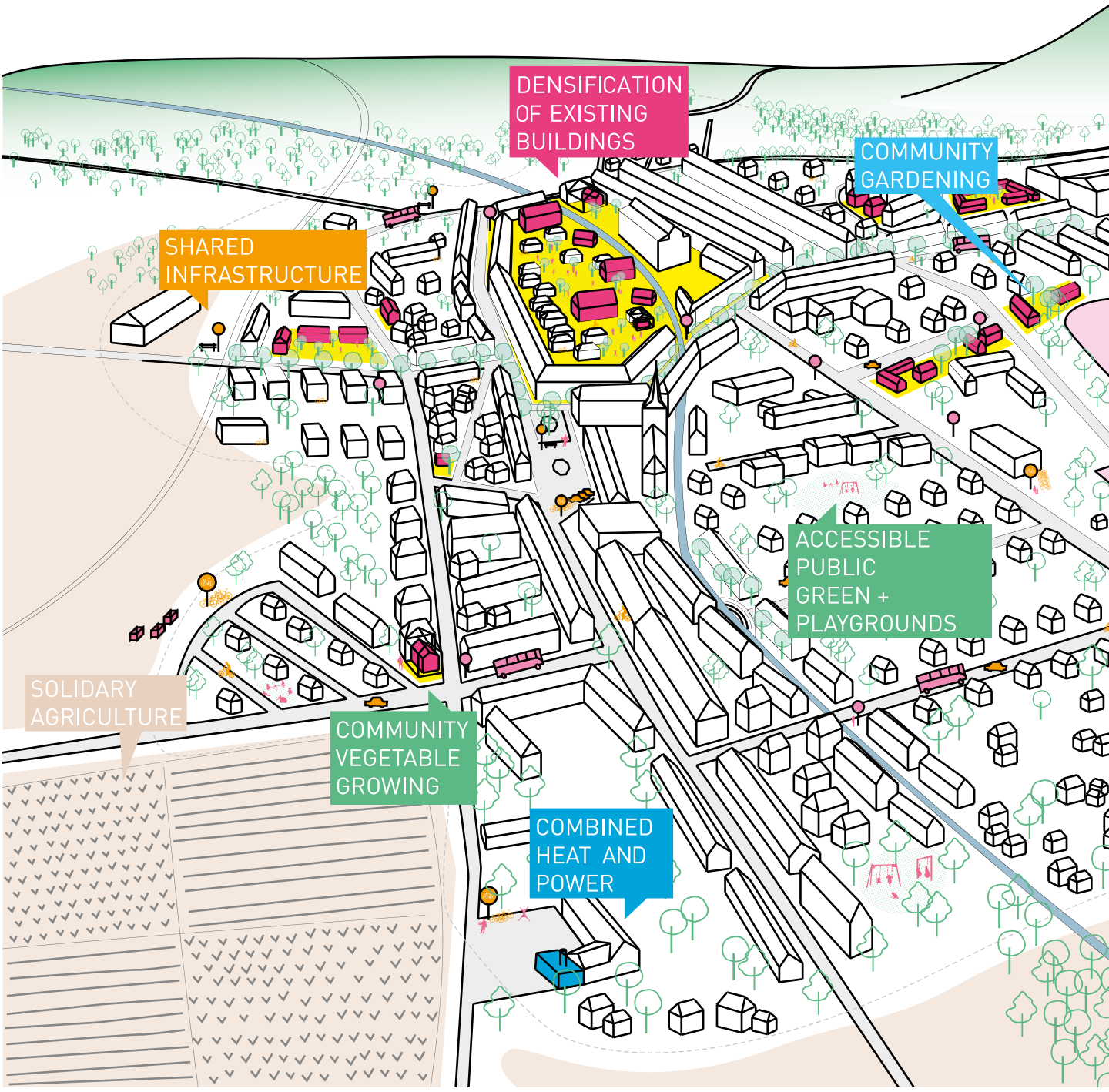
6.13 Scenario C: New Settlers

6.14 Scenario D: Communities Repurposed!

Legend

Areas of Transformation
Water
Traffic
TOPOI boundary
Buildings

6.3. Scenario A:
The Green Communities of Schöppenstedt



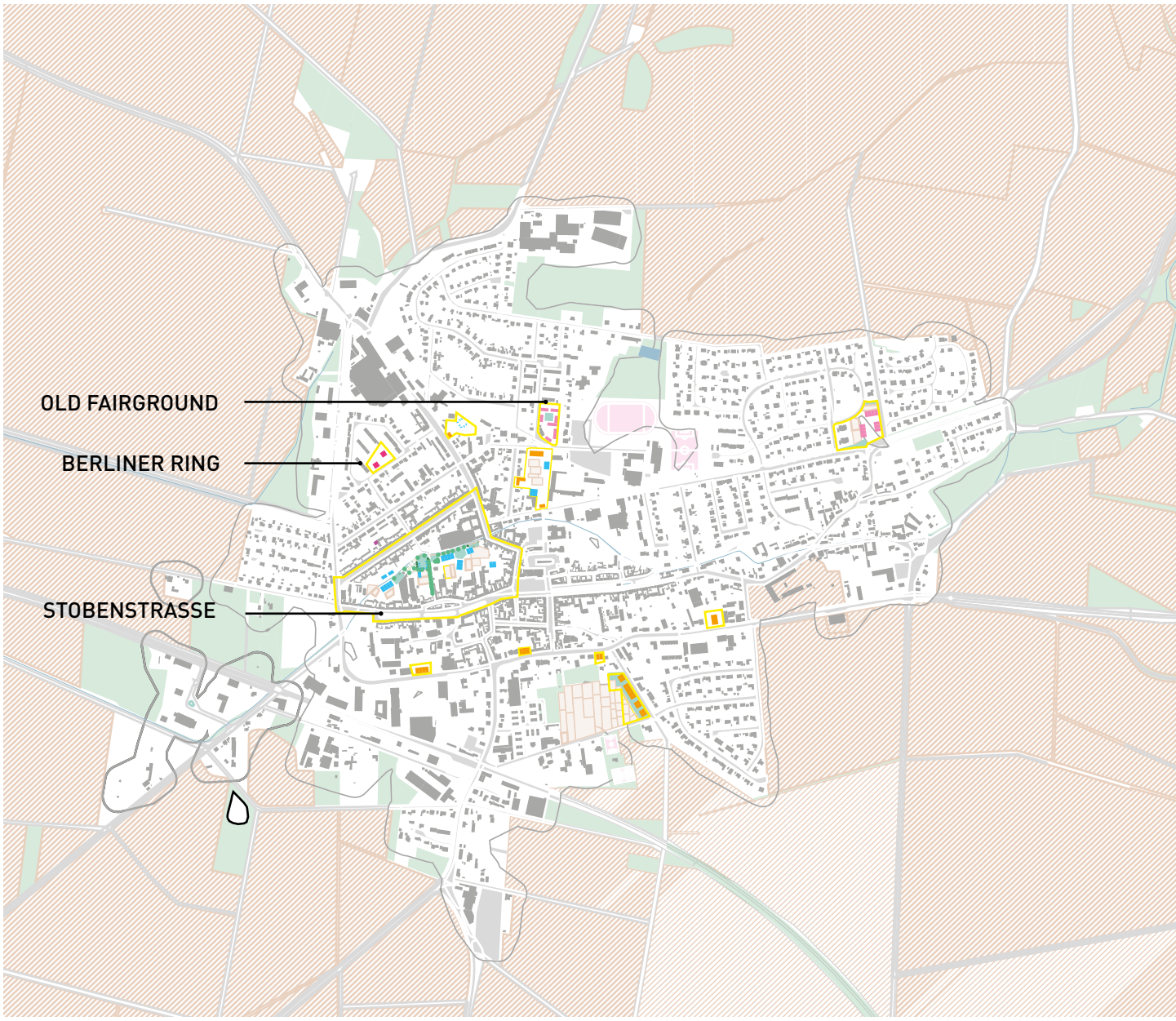
6.15

Dear residents of Schöppenstedt,

Even in the summer heat, the compact and green town on the Elm is always worth a visit. As I walk through the town, the tree-lined streets offer me many shady spots to linger. I love to walk through this town. The path along the Altenau is my favorite. You can cool your feet in the water and snack on the many cherry trees along the way. For a few years now, my aunt has been living in a new apartment building right in the old town. The half-timbered building was reinterpreted, and sustainable and local materials were used in the construction. The wood comes from the Elm, the straw from the farm in Sambleben. On the ground floor there is an open kitchen where the house community cooks for their neighbors. Most of the food on the menu comes from the communal garden in the backyard. My aunt has her own flat, which is not very big, but it is quite sufficient for her, as she likes to use the many communal spaces in the house, such as the open kitchen with shared living room and the library. This weekend, there was still a place for me in the shared guest room that can be rented. At the ride-share bench in Wolfenbüttler Straße, I was looking for a new book to exchange mine with and had a nice chat with a man who lives in one of the new buildings on Berliner Ring. He raved about the new playground, which is not only a great place for children but also a new meeting place for the residents. Of course, my aunt knows my new acquaintance. Here in Schöppenstedt, almost everyone knows everyone, and so I also got offered a lift back home on Sunday, because Franz is visiting his daughter in Berlin. However, I don't know yet if I already want to go back to the noisy capital on Sunday. Maybe I'll extend my holiday a bit.

Best from the future!

Scenario A:
The Green Communities of Schöppenstedt



6.16 Legend

New Building Type I
New Building Type II
New Building Type III
New Building Type IV

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
Green

Water
Agriculture

0.5 km

Building Types

This scenario directs primary attention to the densification of already built-up areas with the aim of achieving a compact settlement structure. In the course of densification, flexible forms of housing and sensible additions to the existing buildings are created.

I. Densification of a Historical Building Ensemble

Within the triangle created by the streets Stobenstraße, Bansleber Straße and Wolfenbüttler Straße, many historical buildings can be found. Traditionally, these are grouped around a shared courtyard and also have several annexes along the site boundary that combine residential buildings with small barns or old workshops. The parcels of land are usually very long and narrow and stretch all the way to the Altenau river, which flows directly through the town center. Most of the historical buildings are in good condition and worth preserving. However, a look at the land cadaster of the historical plots of land and buildings revealed several vacant sites. Targeting densification is thus possible here. However, alongside densification we also suggest enriching existing uses by addressing, for example, cooperative organic agriculture, new concepts for communal living, and new meeting points along the Altenau.

II. Selective Densification between the Slab-Shaped Buildings

Between the row houses along *Berliner Ring*, we suggest buildings with a small footprint to complement the existing development. The new buildings correspond with the height of the existing ones. They will bring new mixed uses to the area, such as small retail units, child care facilities, cafés, or atelier spaces, especially on the ground floor. Along with the structural addition, the green areas are being upgraded, too.

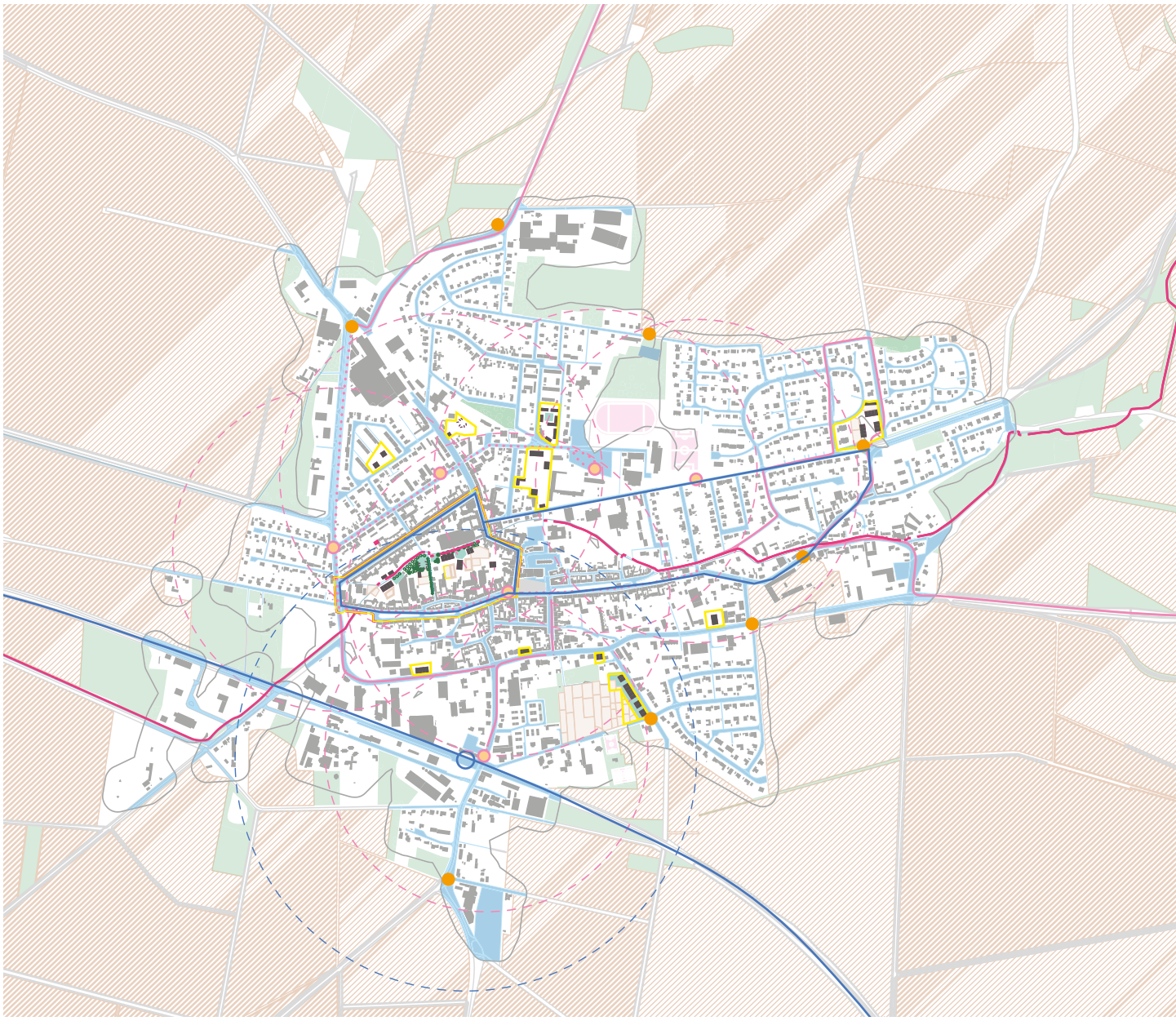
III. Courage to Close the Gap!

There are many gap sites in the historical building stock of Schöppenstedt. These can be developed to integrate new buildings into the existing structures. With these new buildings, new forms of living can be introduced to Schöppenstedt and new communal functions can be added, for which we suggest a special approach to ground floor areas. These could be organized so that the more communal areas, such as the community kitchens, play groups for children, repair cafés, or small shops, are located at street level. The streetscape in front of the new buildings is also regenerated. These transformations present a high potential for returning the residential function to the town center.

IV. Land Recycling

Why designate agricultural land as building land, when there are a lot of wonderful vacant plots directly in town? The exemplary plot of the old fairground (Schützenplatz) is located north of Schöppenstedt's center in close proximity to the school and the outdoor swimming pool. The next bus stop is only 200 meters away, so that all daily amenities can be conveniently reached by public transport, on foot, or by bike. The design for this plot integrates the existing buildings and divides the public space in public and semi-public areas. The new residential buildings offer shared and communal spaces along with public uses such as a kindergarten and a small public library.

Scenario A:
The Green Communities of Schöppenstedt



6.17 Legend

- Bus Stop + Ride-share Bench
- Bus Stop Radius 420m
- Ride-share Bench
- Bus Lane
- Hike Path
- Shared Space
- Railway Station
- Railway Station Radius
- 600m
- Cycle Lane
- Railway
- Transformation Area
- TOPOS Boundary
- Existing Buildings
- New Buildings
- Existing Streets
- Green
- Water
- Agriculture

0.5 km

Streets, Mobility, Public Space

This scenario is based on a dense network of self-organized vehicle sharing services. This includes ride-share benches and public charging stations. The street space is not organized hierarchically and is equally safe for all users.

I. Individual Vehicles and Ride-Share Benches

Since most citizens are organized in a collaborative community that tries to reduce their CO_2 emissions by means of sharing, a sharing system has been installed for individual vehicles, including cars, bicycles, cargo, and e-bikes. A community app helps to organize the different offers. On the edge of Schöppenstedt and along the main street, several ride-sharing points have been set up as an addition to the existing bus stops. These benches are part of the private vehicle sharing system and complement public transport. Another function that can be combined with the ride-share benches is a communal bookshelf or a swap meet for books, so that these spaces develop into public meeting points within Schöppenstedt.

II. Reduction of Parking Lots

The current organization of the main streets Stobenstraße, Markt and Jasperstraße is very car-friendly. There are many parking spaces along the street. Due to the thoroughly planned sharing system, not as many cars exist and not as much space for parking is needed anymore. Therefore, the *Green Communities* scenario proposes a conversion of these existing parking areas into spaces for people. Meeting points with street greening, such as trees that provide shade, plant boxes with herbs or vegetables, as well as benches or seating areas are increasing considerably. These interventions have a positive impact on the town center because they provide public spaces with a human scale. Residents are more likely to stay and use the street not only as a passageway, but for a stroll, for meeting people, or simply as a place to spend their lunch break.

III. Streets Are for Everyone

To introduce streets of equal value for every traffic participant, streets must be accessible to everyone. Therefore, Schöppenstedt's committed inhabitants propose a cycle lane and a designated pedestrian path across town, more crosswalks, lowered walkways, and a general speed limit of 30 km/h.

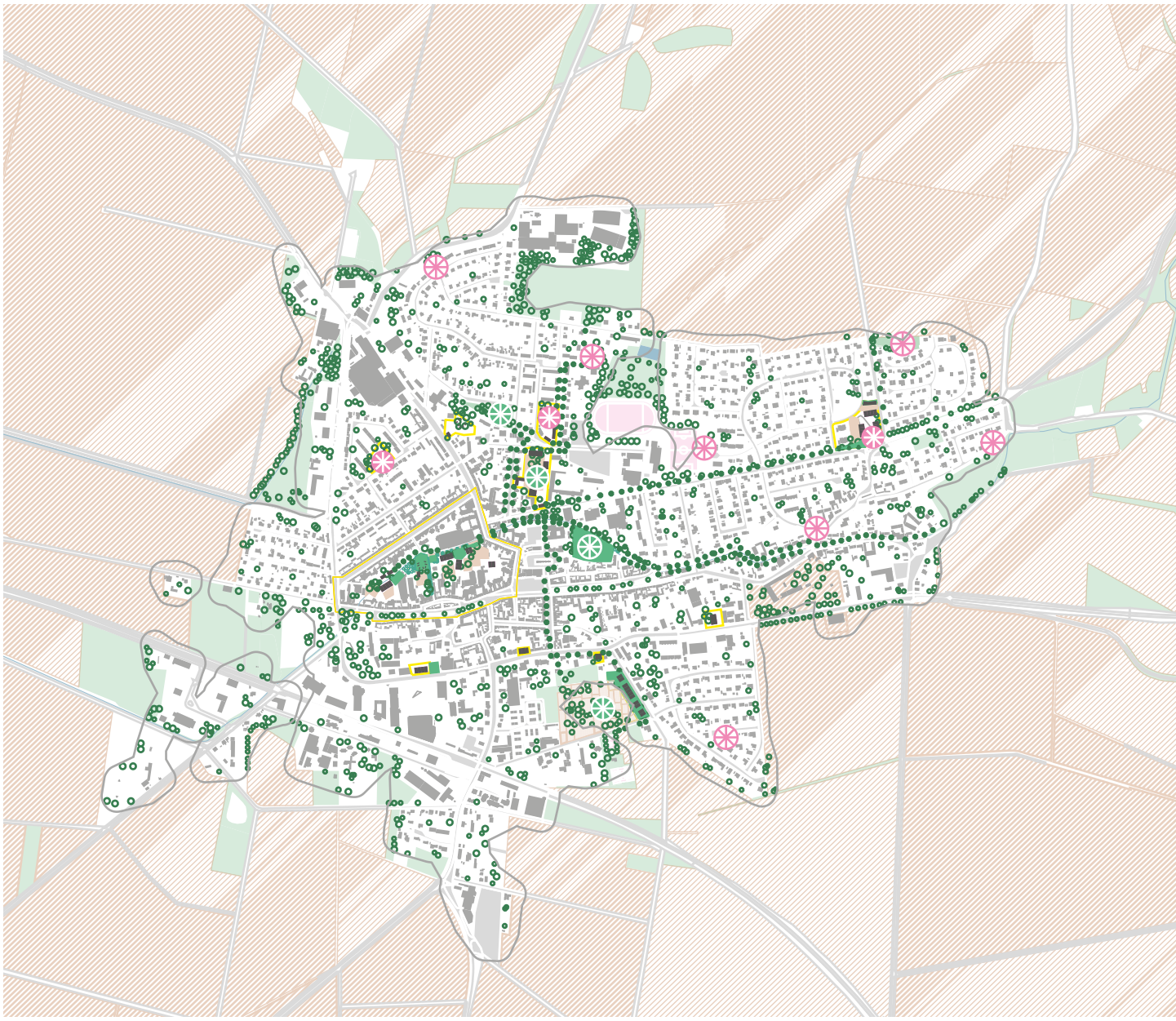
IV. Hiking Path

The existing path along the Altenau river is expanded to make it more visible and tangible within the town. The hiking path improves walkability, connects the eastern to the western part of town, and helps regain access to the water.

V. Street Greening and Streetlights

Street greenery, such as portable trees or flower boxes, divide the streets equally into lanes for pedestrians, bikes, and cars. This enhances the safety for each participant and increases the quality of stay, so that streets are regained as livable urban places and are no longer seen as just a connection between different places. Temporary street greening and streetlights can be immediate measures and do not require long-term planning. Temporary streetlights increase both the quality of stay and the safety for the participants, especially at night and in the darker seasons. In Schöppenstedt, these measures start in the town center and are then implemented throughout the community.

Scenario A:
The Green Communities of Schöppenstedt



6.18 Legend

New Green Spaces
Common Used Green
Additional Playgrounds
Existing Playgrounds
Allotment Gardens

Fruit Trees
Green Network
Existing Trees
Transformation Area
TOPOS Boundary
New Trees

Existing Buildings
New Buildings
Existing Streets
Green
Water

Agriculture

0.5
km

Green and Blue Networks

This scenario creates more easily accessible public green spaces catering to the varying requirements of different users. The idea of an edible city is being applied.

I. Community Gardening
The newly emerging green areas mainly serve recreational purposes. Some of them are used as spaces for community gardening, where residents striving for a certain degree of self-sufficient food supply can lay out new vegetable patches. Moreover, the inhabitants re-activate the allotment gardens *Am Krähenfelde* located in close proximity to the town center, which were in a very poor condition and highly underused. This re-activation opens up the allotment gardens to the general public.

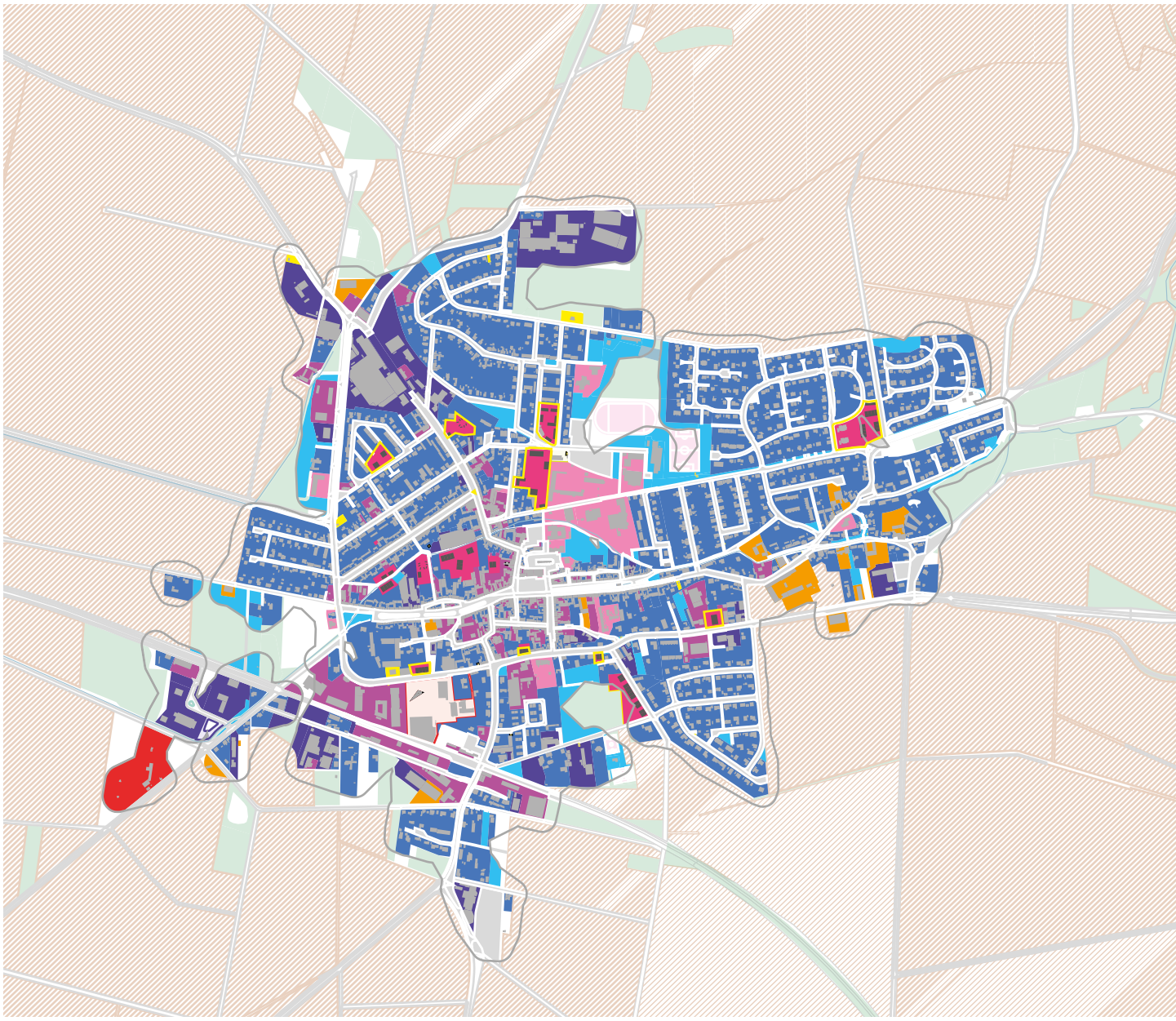
II. Improved Playgrounds
Currently, there are seven playgrounds in Schöppenstedt. The open spaces around the newly constructed buildings are upgraded with new offers for children and teenagers.

III. Access to the Altenau River
In addition to the extension of the hiking path, other measures to improve the accessibility of the river are applied. The church garden is opened to the community, and the central area of the historical part of town becomes accessible to everyone.

IV. Edible City
Wherever public greenery is activated, new fruit trees are planted for Schöppenstedt to become an edible city. The same applies for the new community garden *Am Krähenfelde*. For this approach to work well, it needs dedicated people to take over responsibility for this project. Other than that, the edible city can create jobs for gardeners, strengthen cohesion and the awareness for collaborative projects.

V. Connection between Green Spaces
A visual network between all the (green) public spaces is created. Trees are planted along the streets, providing a visual connection between old and renewed open spaces. In this way, residents and visitors can easily orientate themselves by following the markings.

Scenario A:
The Green Communities of Schöppenstedt



6.19 Legend

Residential
Mixed Use
Industrial
Public
Leisure
Commercial
Sports + Recreation

Supply
Disposal
Forestry
Transformation Area
TOPOS Boundary

Existing Buildings
New Buildings
Existing Streets
Green
Water

Agriculture

0.5
km

Functions

Everything for daily needs is available and, if possible, produced in the village. New forms of cohabitation and production lead to mixed-use buildings.

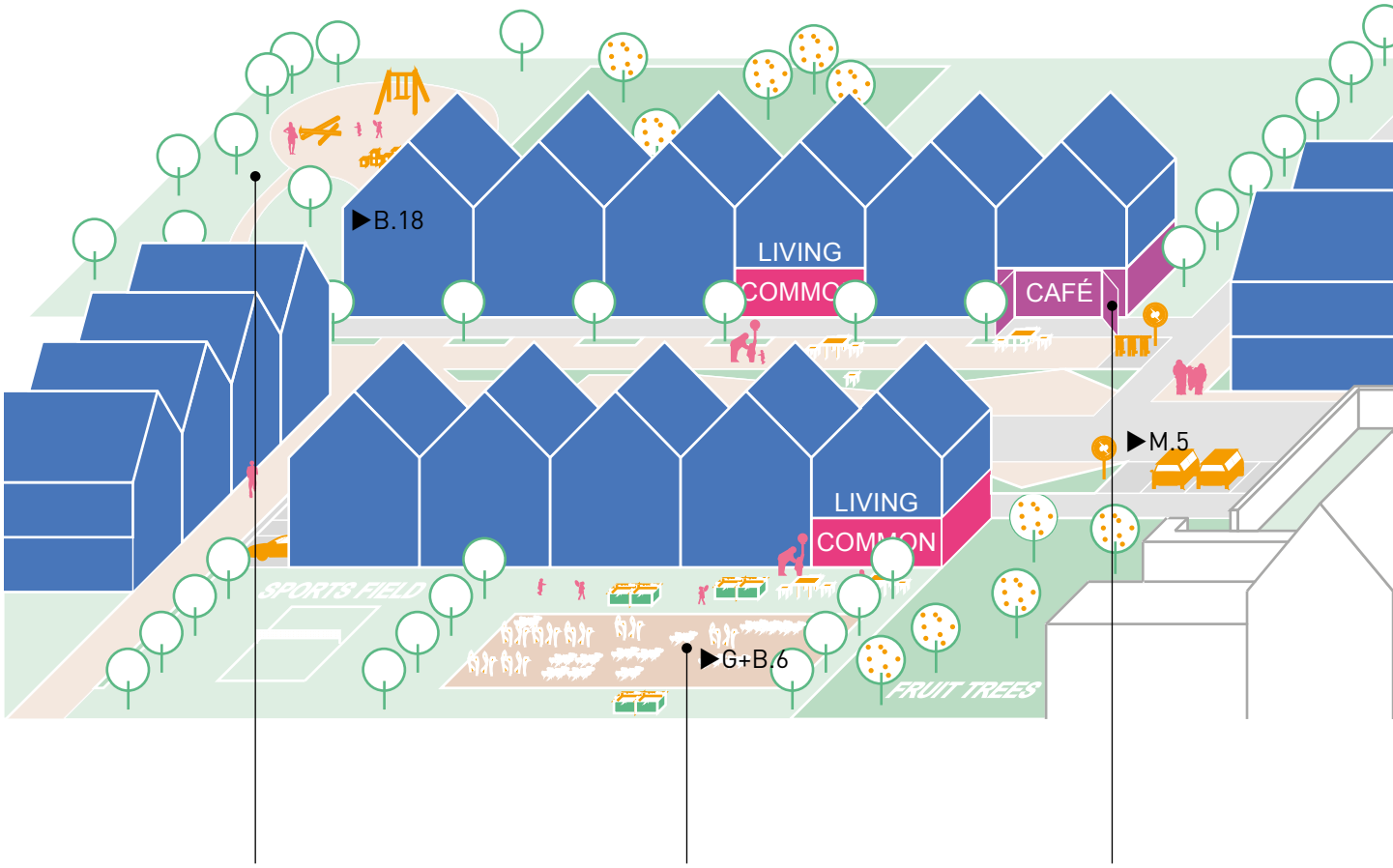
I. Mixed-Use and Common Spaces

In the course of densification, flexible forms of living and hybrid building types arise. With fewer needs for commuting, new forms of working are emerging and flexible office spaces are being created. Due to the strong neighborhood, there are a wide variety of public uses on the ground floor of the new buildings, e.g., a new shop with products directly produced in Schöppenstedt, a kindergarten, and a repair café.

II. Cooperative Living

Each renovated and new building is conceived under the aspect of cooperative living, with less private spaces and more sharing. This has many aspects. In the new housing projects, the space as a resource is allocated differently, resulting in many shared and communal areas, such as the open kitchen or the repair café. Material resources are also treated carefully, resulting in many shared objects, such as tools, bikes, gardening equipment, all of which are stored in a fully equipped workshop and available to the whole community. The resource of time and care is also organized differently, especially through helping one another in everyday life, cooking for all the kids, reading session with elderly neighbors and the youngest, or organizing the upcoming village event.

Scenario A:
The Green Communities of Schöppenstedt

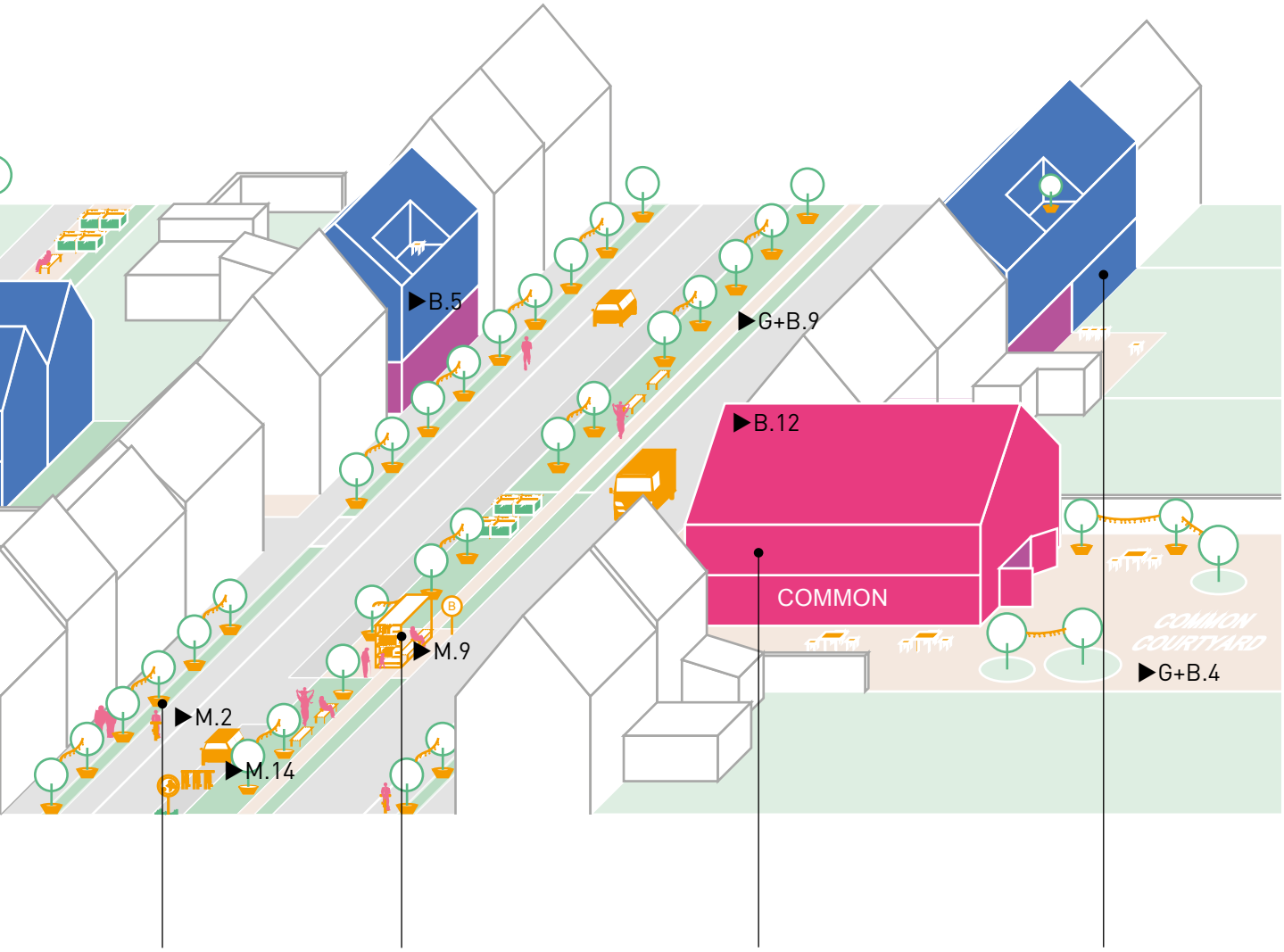


IMPROVEMENT OF PLAYGROUNDS

COMMON GARDENING

DENSIFICATION OF THE PERIMETER BLOCK DEVELOPMENT

6.20



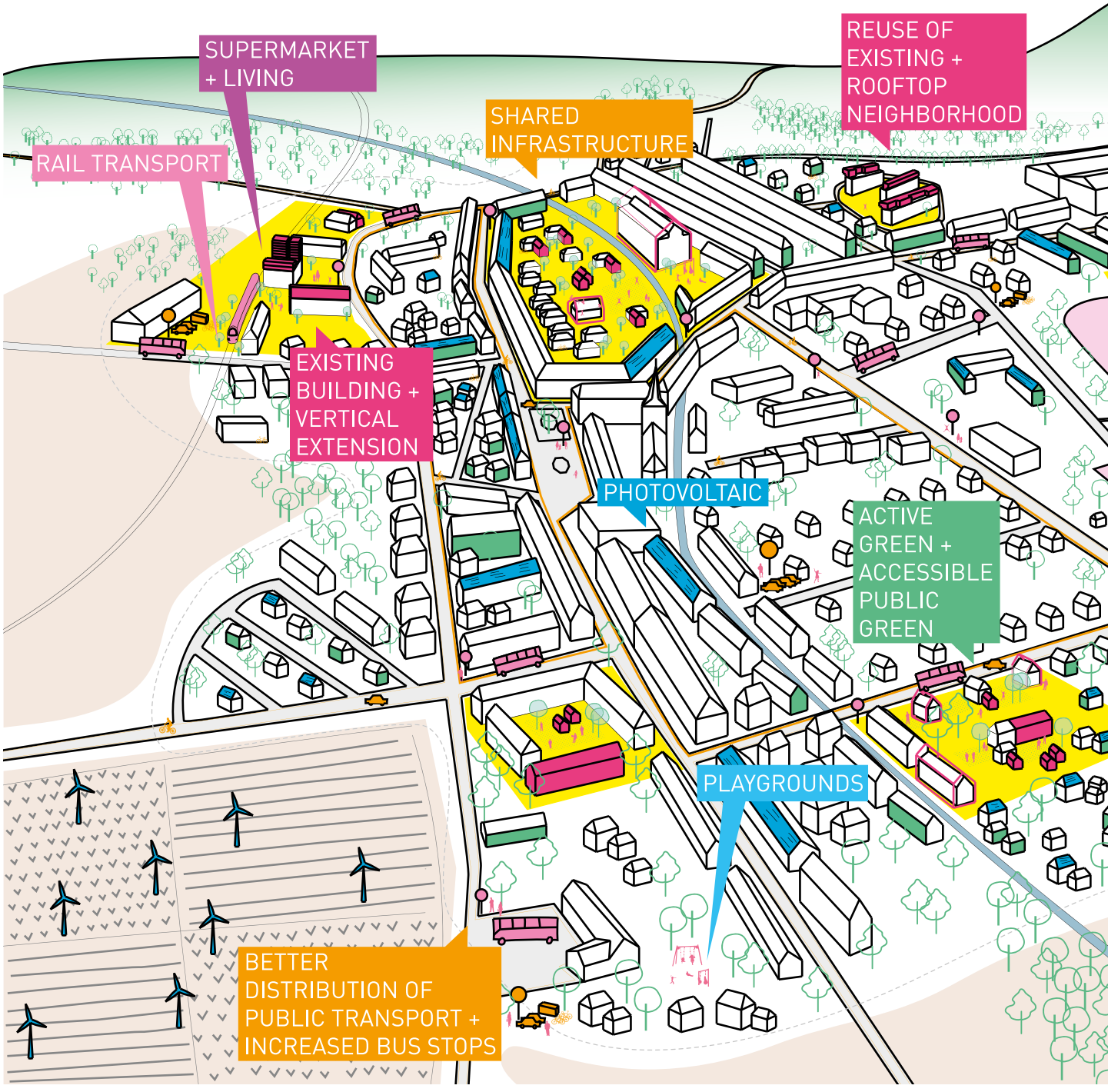
TEMPORARY STREET GREEN AND STREET LIGHT

BUS STOP LIBRARY

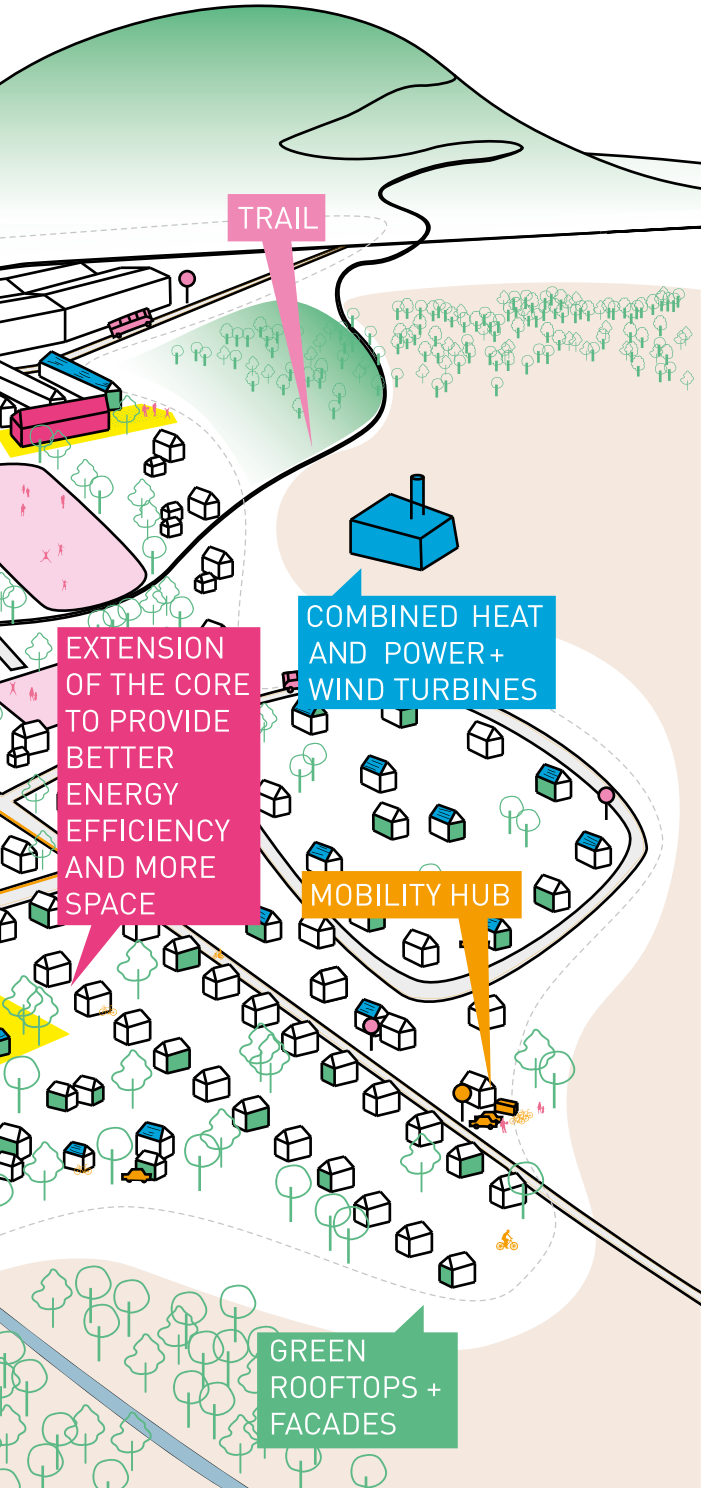
LIBRARY

DENSIFICATION BETWEEN BUILDINGS

6.4. Scenario B:
A Happy Future Planned for Schöppenstedt?



6.21

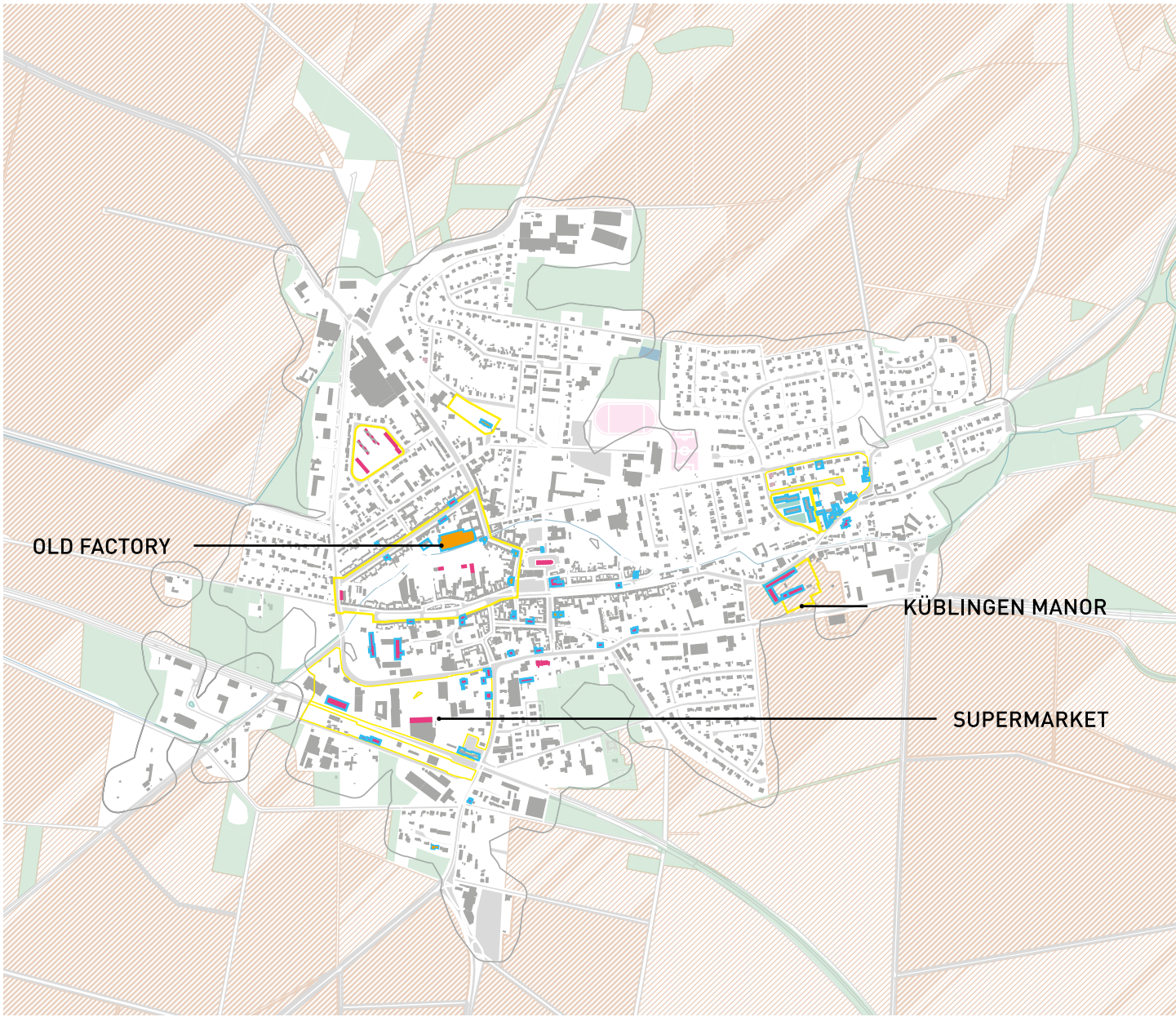


Dear residents of Schöppenstedt,

We've been looking for a house like this for ages – an energy-saving, renovated old building with an extension, so that there's enough room for our whole family. We urgently needed more living space, but we also wanted to choose our new home so that we would conserve resources as much as possible. Building a new house would have consumed to many resources. Of course, we also benefited from the city's subsidy program, which favors renovations and building conversions over new buildings. I am so excited to see what life will be like in Schöppenstedt. On one of our first visits, we got to know some of the great projects and places that have been renovated in Schöppenstedt. We strolled through the old town center along the Altenau river, hardly making any progress because we were constantly amazed by the green diversity all over the town. Due to lack of time, we unfortunately couldn't explore more and, for example, follow the sign to the *"Wanderweg Elm"* hiking path. But as soon as the first boxes are unpacked, we will definitely make up for it. The little shop on the ground floor of our neighbor's house seems to be the perfect starting point. There are all those little showrooms and garage sales that I am very keen to explore. And who knows, maybe I end up renting such a place for my jewelry production? Apparently, there is a community app that brings together shop owners and craftspeople like me. Maybe Lisa knows more about it. We met at the fruit stand at the mobility hub *"An der Bleiche"* when she was returning a borrowed e-bike after finishing a cycling tour through the *Lappwald* forest. I will visit her and take the opportunity to have a look at Küblingen Manor.

Best from the future!

Scenario B:
A Happy Future Planned for Schöppenstedt?



6.22 Legend

New Building Type I
New Building Type II
New Building Type III
Renovation
Transformation Area

TOPOS Boundary
Existing Buildings
Existing Streets
Green
Water

Agriculture

0.5 km

Building Types

This scenario is dedicated to the renovation and conversion of the existing building stock. This can include the addition of floors, the extension with an annex, or complete gutting and redevelopment to increase the quality and create more living space within the existing building stock. Conversion is another option.

I. Vertical Extension

Some single-family houses are not only renovated to increase their energy efficiency but also extended. This means that there is no need to build a new house in case the family grows. The same principle can also be applied to other building types such as the slab-shaped buildings. Where the possibility for vertical extension exists, it opens up the opportunity to create more living units on the same building footprint and also more common spaces. The newly laid out roof garden would be open to all residents, thus improving the overall quality of living. The supermarket close to the central station presents another opportunity for densification within the existing settlement. Due to its flat roof and the very central location, this building is also suitable for a vertical extension.

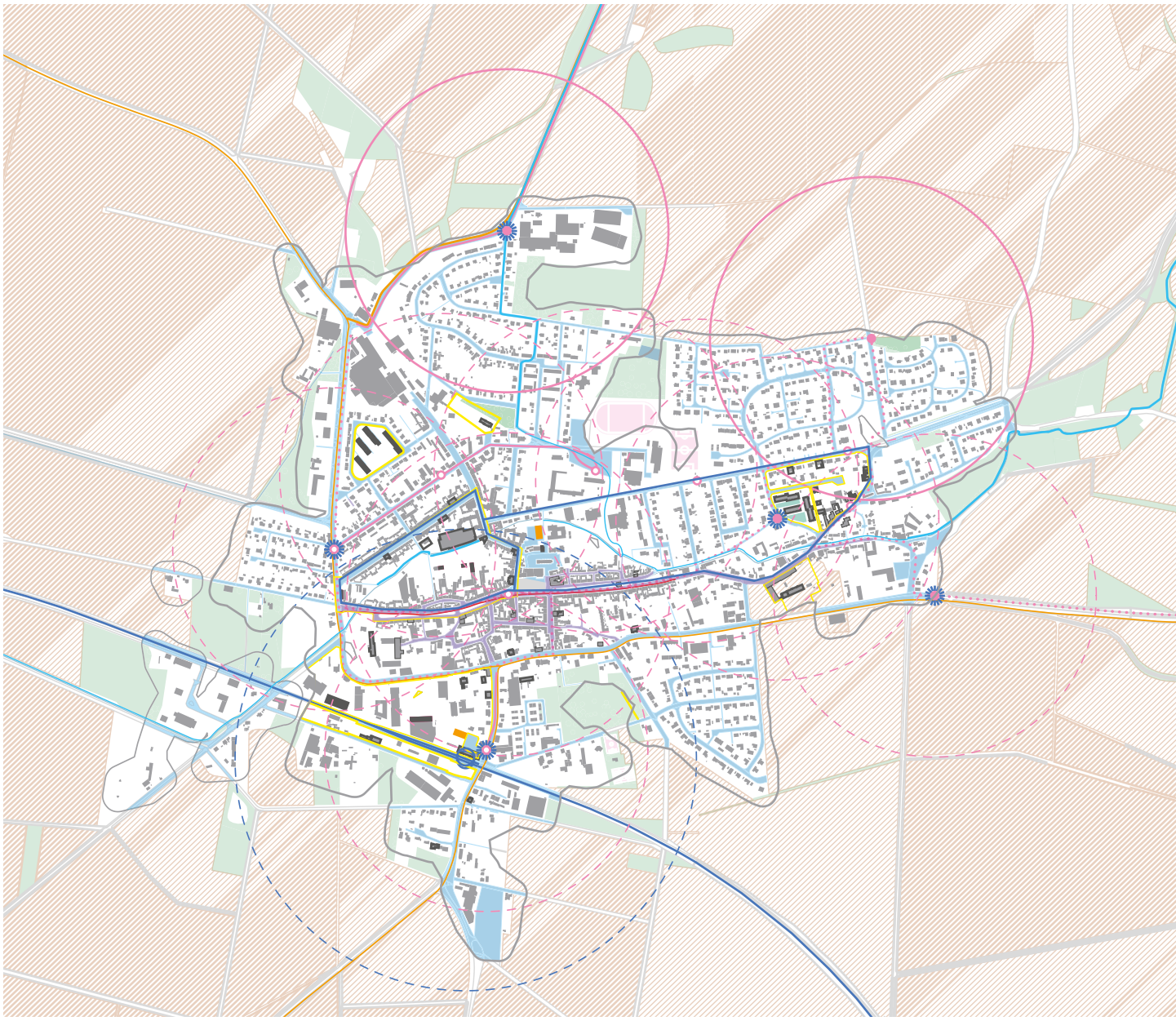
II. Heritage as Potential

To illustrate this building strategy, we focus on one building site: the old Küblingen Manor. All other listed buildings are being renovated in accordance with the preservation order. The Küblingen Manor has been thoroughly renovated and is now home to a varied residential community of several generations. Part of the building ensemble is available to guests as a temporary residence, which is why the building has a superregional relevance. The ensemble is located at the edge of Schöppenstedt, so the task of creating a new entrance to the town center can be addressed in the scope of this renovation, for example, by adding a public function to the adjoining open space.

III. From Industrial and Commercial to Living

The abandoned old factory in the village center was renovated to improve its energy efficiency and converted into living space by adding large roof windows and new walls to create additional rooms and to separate flats. The side wings accommodate individual living units, whereas the central space of the factory can be used for common areas. This would also offer the opportunity for cluster living as one new form of housing. The former northern railway station was thoroughly refurbished and converted, too. A new start-up moved in and offers spaces not only to its own employees but also to external people, since many employees are working remotely nowadays.

Scenario B:
A Happy Future Planned for Schöppenstedt?



6.23 Legend

- Existing Bus Stop
- New Bus Stop
- Bus Stop Radius 420m
- Bus Lane
- Shared Space
- Car Lane
- Car Park
- Car Free Centre
- Railway Station
- Railway Station Radius 600m
- Cycle Lane
- Railway
- Mobility Hub
- Reactivated Railway
- Traffic Reduced Zone
- Transformation Area
- TOPOS Boundary
- Existing Streets
- Existing Buildings
- New Buildings
- Transformed Buildings
- Green
- Water
- Agriculture

0.5 km

Streets, Mobility, Public Space

This scenario focuses on the expansion of public transport. Mobility hubs are set up all around main streets. Streets are oriented more towards people than towards cars and seen as a space catering equally to the needs of all traffic participants.

I. Reactivation of the Railroad

The existing railroad line is reactivated and improved in terms of frequency so that there is a direct connection from Schöppenstedt via surrounding villages to Braunschweig and to Schöningen. Stops in small villages along the railroad are restored, too. In this scenario, the reactivation of the railroad supports the regional public transport system and can be a sustainable alternative to the use of private cars. It is also possible to use the line for cargo trains and thus activate the flow of goods between Schöppenstedt and the Braunschweig region.

II. Pedestrian-Friendly Town Center

Schöppenstedt's old town with Stobenstraße, Markt, and Jasperstraße is traffic-reduced to minimize noise emissions, improve the air quality, and re-scale the town center back to human dimensions. This change makes a lot of space available for a wide variety of new uses. The former parking lots are transformed into pocket parks; the sidewalks are lowered to the same level as the former road surface, so that the street as a whole becomes walkable. The cycle lane is visually separated. Only small and low-speed electric vehicles are used as means of transport. However, exceptions exist for moving, providing barrier-free access, or for the delivery of goods to the small shops.

III. Smart Distribution of Bus Stops

The number of bus stops is increased to implement the principle of the five-minute city, so that every point of interest in terms of local supply can be reached within a five-minute walk from a public transport stop. In detail, this means that three new bus stops for autonomous buses are set up in Schöppenstedt. In addition, the frequency with which the stops are served is increased.

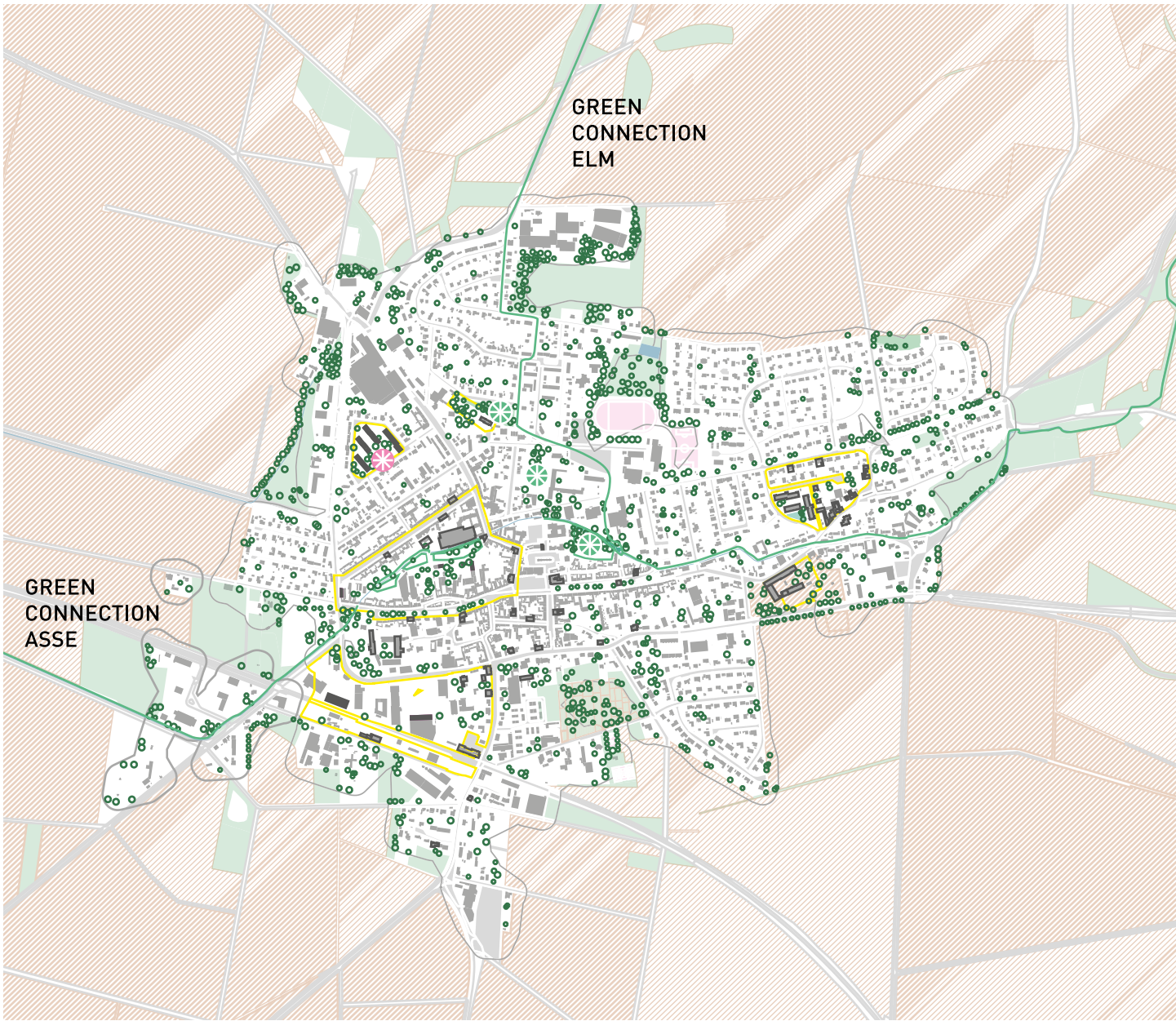
IV. Mobility Hub

There are several mobility hubs, where citizens can switch from bicycle to car, from bus to bicycle, or from walking to cargo bike. To minimize the mono-functionality of mobility hubs, we suggest to add a new public use, e.g., bakery, post office, or fruit shop on the ground floor of these facilities, along with parking places for bikes and e-charging stations. The size of the mobility hub can vary. The hub at the train station might be larger, whereas the one located at the eastern entrance of Schöppenstedt might be smaller and could be integrated into the existing bus stop. Although installing a bicycle stand or a charging point for e-cars is only a small intervention, the impact is much greater.

V. Better Streets, Safer Streets

In Schöppenstedt, the street space is designed as a public space for a wide range of different users. To make this possible, a speed limit of 30 km/h applies throughout town and there are clearly marked cycle paths and pedestrian walkways. In this way, the street can be used side by side and safely by all.

Scenario B:
A Happy Future Planned for Schöppenstedt?



6.24 Legend

Flood Protection
Common Used Green
Additional Playgrounds
Allotment Gardens
Green Connection

Existing Trees
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Transformed Buildings

Existing Streets
Green
Water
Agriculture

0.5 km

Green and Blue Networks

The main interventions regarding green and blue structures in this scenario are aimed at increasing the functional variety of green spaces. Furthermore, an overall green concept connects Schöppenstedt to the surrounding, and existing buildings are converted into green buildings.

I. Green Rooftops and Facades

Each of the newly renovated buildings features a green rooftop and at least one green element is added to the facade to enhance the biodiversity in the town and support a livable urban environment. The green facades can contribute to the natural cooling of the buildings during summer. The green rooftop becomes a new habitat for a variety of plants, bees, and other insects.

II. Activation of Green Spaces and Flood Protection

There are many underused green spaces in the city, e.g., the park at the north station or the church yard in the center. These green spaces are opened up for public use to create livable spaces and meeting points for the inhabitants and to maintain biodiversity within the town. Furthermore, several areas are designated along the river for flood protection. In case of a flood with a medium probability (return period of 100 years), these are the areas that are very likely to be flooded, so a meadow or other planting are suitable measures to minimize the extent of floods.

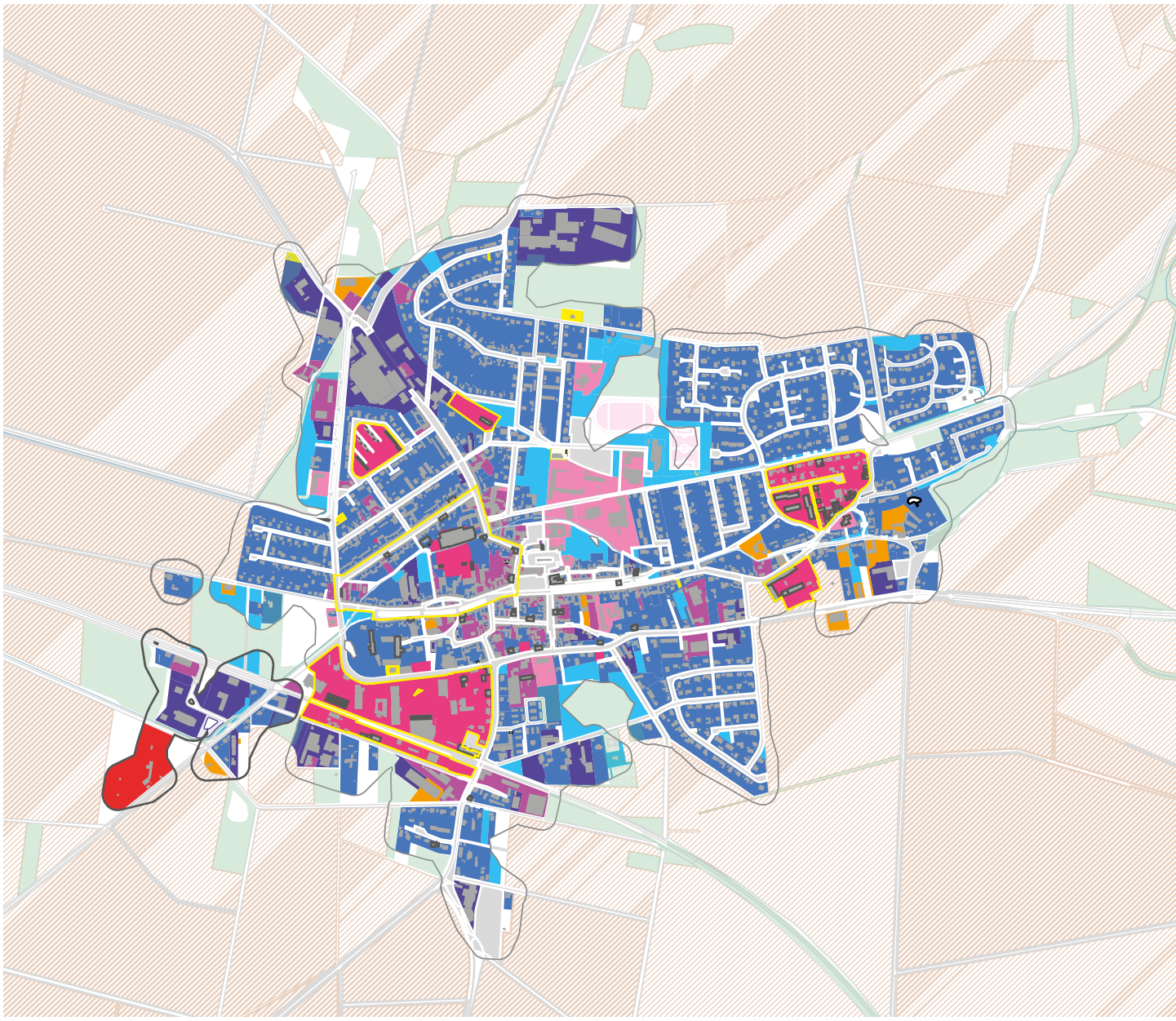
III. Green Connection

Schöppenstedt's proximity to the hills of the Elm is striking. To connect to this valuable green space, a new hiking path is created. The path runs along the small river Sauerbach, through Sambleben, and further upstream to the Elm hills. In Schöppenstedt, the new hiking path connects to the river and continues along the Altenau, so that a hiking trail is also created in the city.

IV. Opening the Altenau River in the Town Center and Infiltration Ditches

At the moment, in the center of the town, parts of the river are canalized underground. In order to improve the quality of stay on the market square and in the surrounding area, the Altenau river will be reopened and several seating possibilities will be created along its course. In addition, an infiltration ditch will run parallel to the street to allow better drainage of rainwater.

Scenario B:
A Happy Future Planned for Schöppenstedt?



6.25 Legend

- Residential
- Mixed Use
- Industrial
- Public
- Leisure
- Commercial
- Sports + Recreation
- Supply
- Disposal
- Agriculture + Forestry
- TOPOS Boundary
- Transformation Area
- Existing Buildings
- New Buildings
- Transformed Buildings
- Existing Streets
- Green
- Water
- Agriculture

0.5 km

Functions

In this scenario, the emphasis is on providing a mix of different uses within one building or an ensemble. Production, consumption, and living are all combined in one place. All amenities needed on a day-to-day basis are within walking distance. Most buildings are designed to be multifunctional.

I. Activation of Vacant Spaces

There are several empty buildings in the center of Schöppenstedt. Some of them are used temporarily for flea markets or as exhibition spaces. Picking up on this idea, the municipality of Schöppenstedt has created an online platform where shop owners and other interested entrepreneurs from the crafts, trade, creative, or small business sector can connect and apply for shop, office, and studio spaces that will be made available in these buildings. The new tenants take over the renovation and in return the rent is reduced by 50% in the first year. Rent on trial can also be offered here. Thus, vacancies in the center can be transformed into spaces of opportunities for the involved inhabitants.

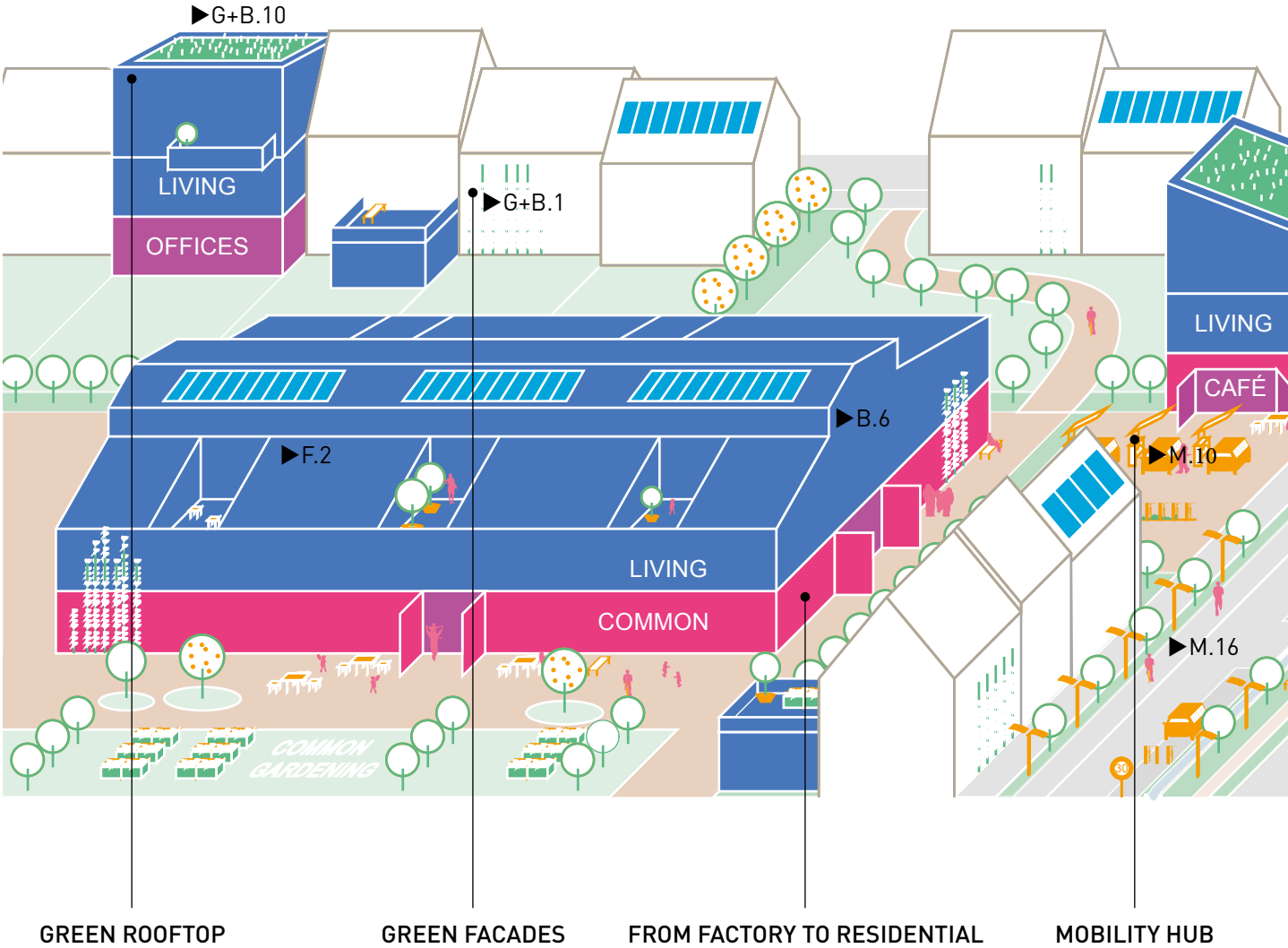
II. Co-Working

The supermarket close to the station is another location for an intervention. The building extension could provide co-working spaces, as this location is particularly convenient for commuters. Novel ways of use could also be considered for vacant buildings in the town center. How about renting out these spaces on a daily or monthly basis, so that they can be used flexibly? The old, empty bakery is being converted into a multifunctional house that offers a variety of workspaces catering to different needs. The doctor can hold her consultation hours here, there is a playroom for children, a room for computer courses, and offices.

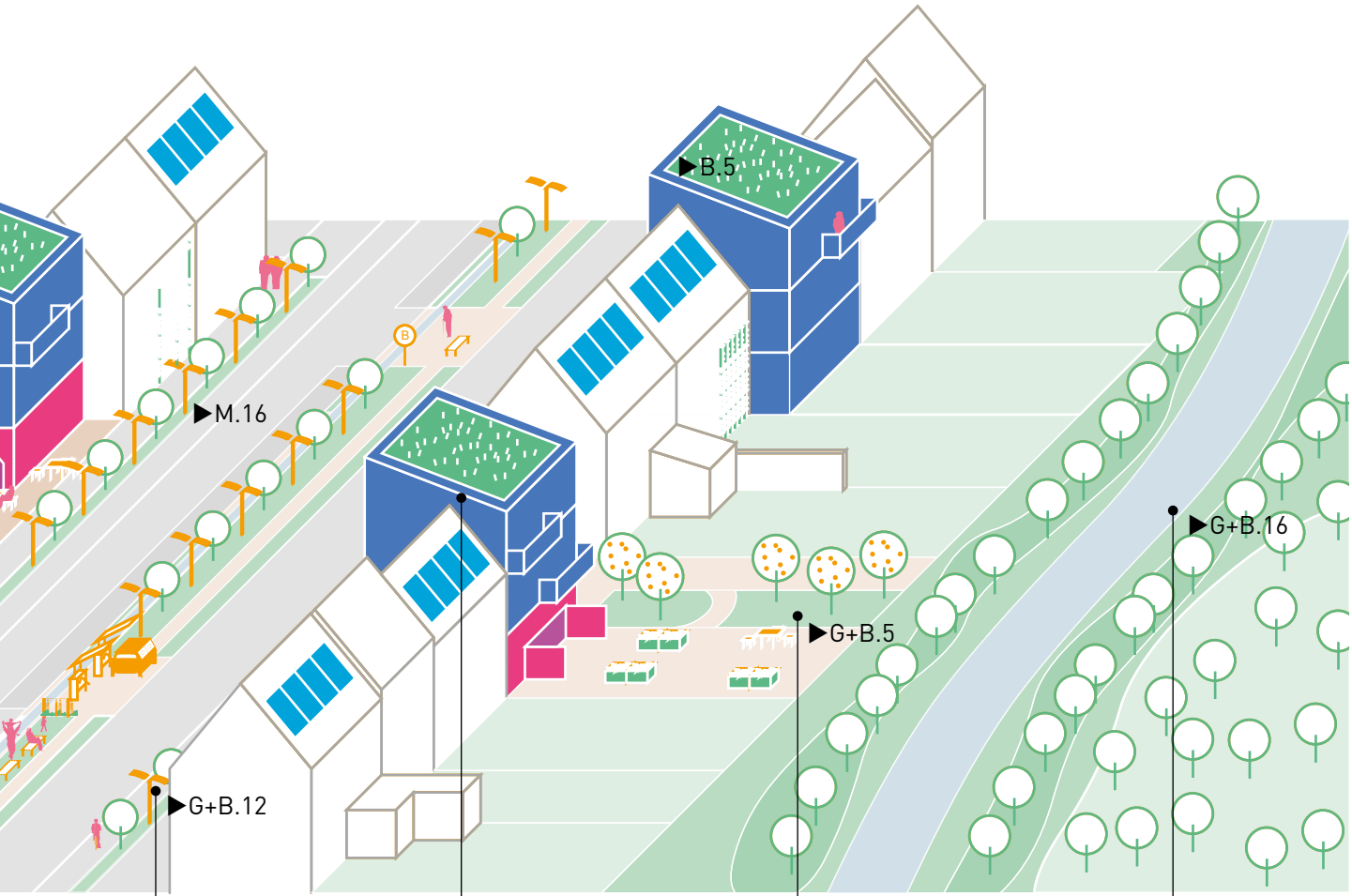
III. Temporary Use of Buildings

The consideration of multi-coded spaces is a relevant aspect in this scenario, so is the temporary use of buildings and other methods to avoid vacancies. For example, how can we rededicate the school to another use after school hours? How can we avoid that large office spaces remain empty at times of unexpected closures? To start on a small scale, multifunctional public buildings will be introduced in Schöppenstedt. For example, the school is converted into a yoga studio after classes, cooking classes are offered in the kindergarten, or the administrative building becomes an adult education center after the office hours – depending on what the people of Schöppenstedt need most.

Scenario B:
A Happy Future Planned for Schöppenstedt?



6.26



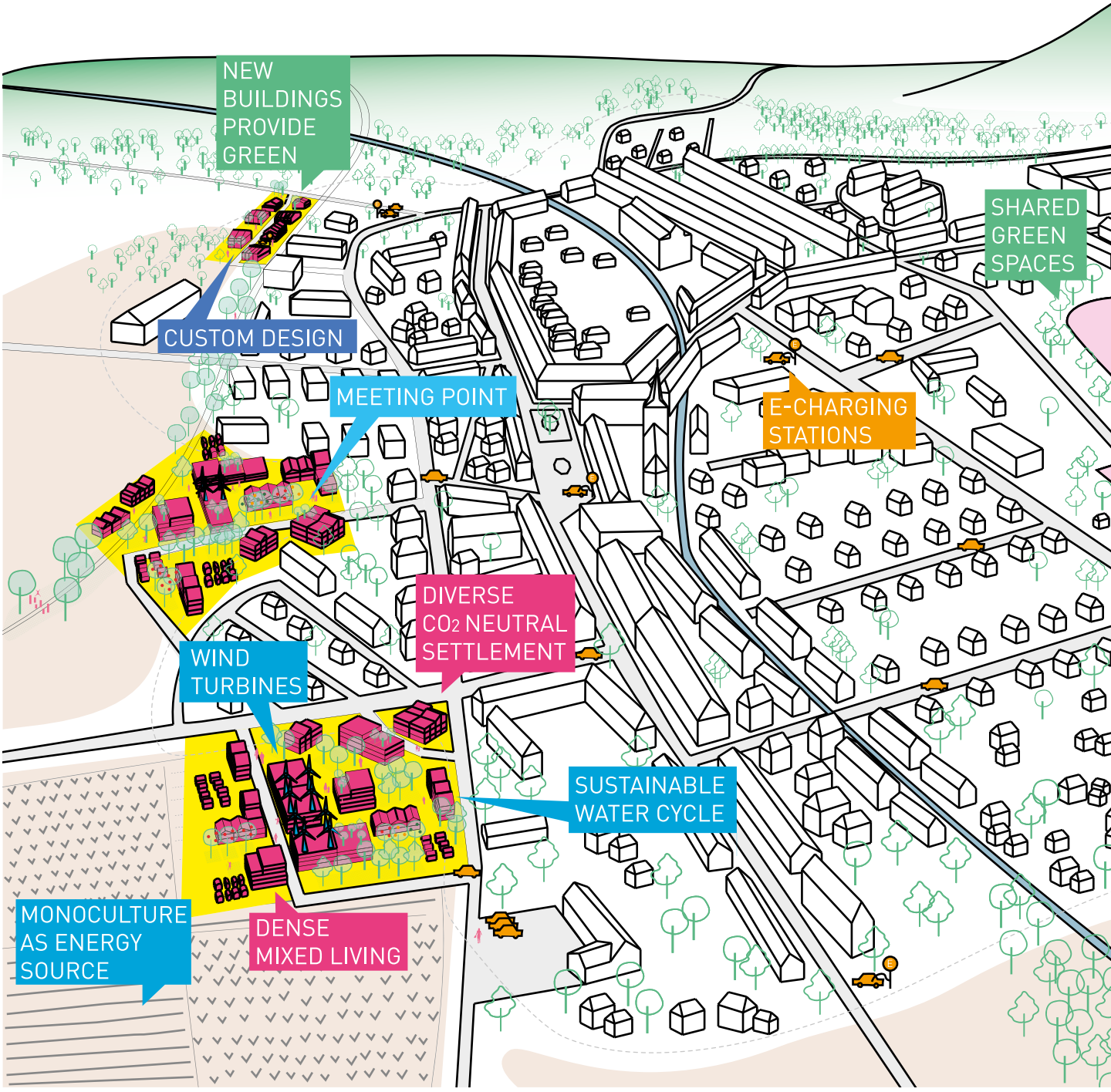
STREET GREEN AND LIGHTING

RENOVATION AND EXTENSION

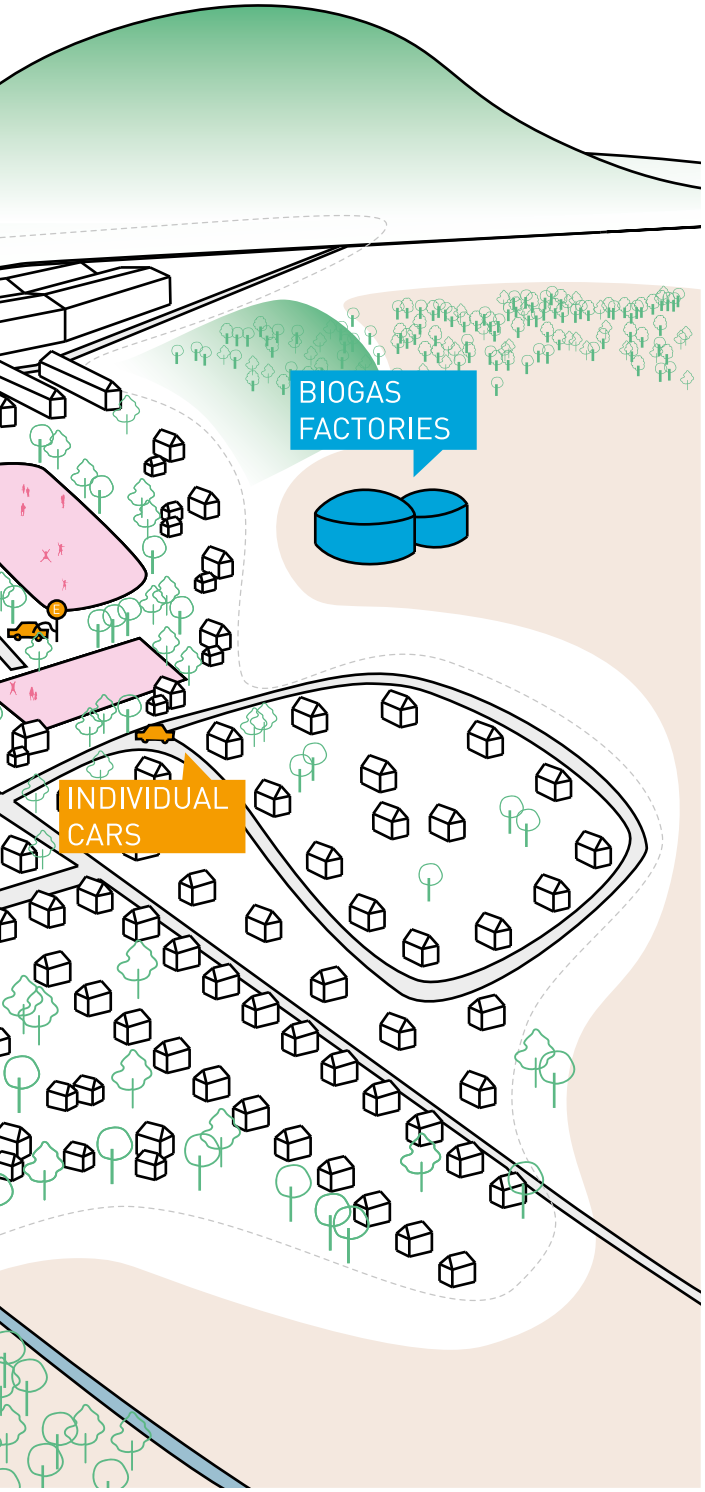
OPEN ACCESS TO THE ALTENAU

FLOOD PROTECTION ALONG THE ALTENAU

6.5. Scenario C:
New Settlers in Schöppenstedt



6.27

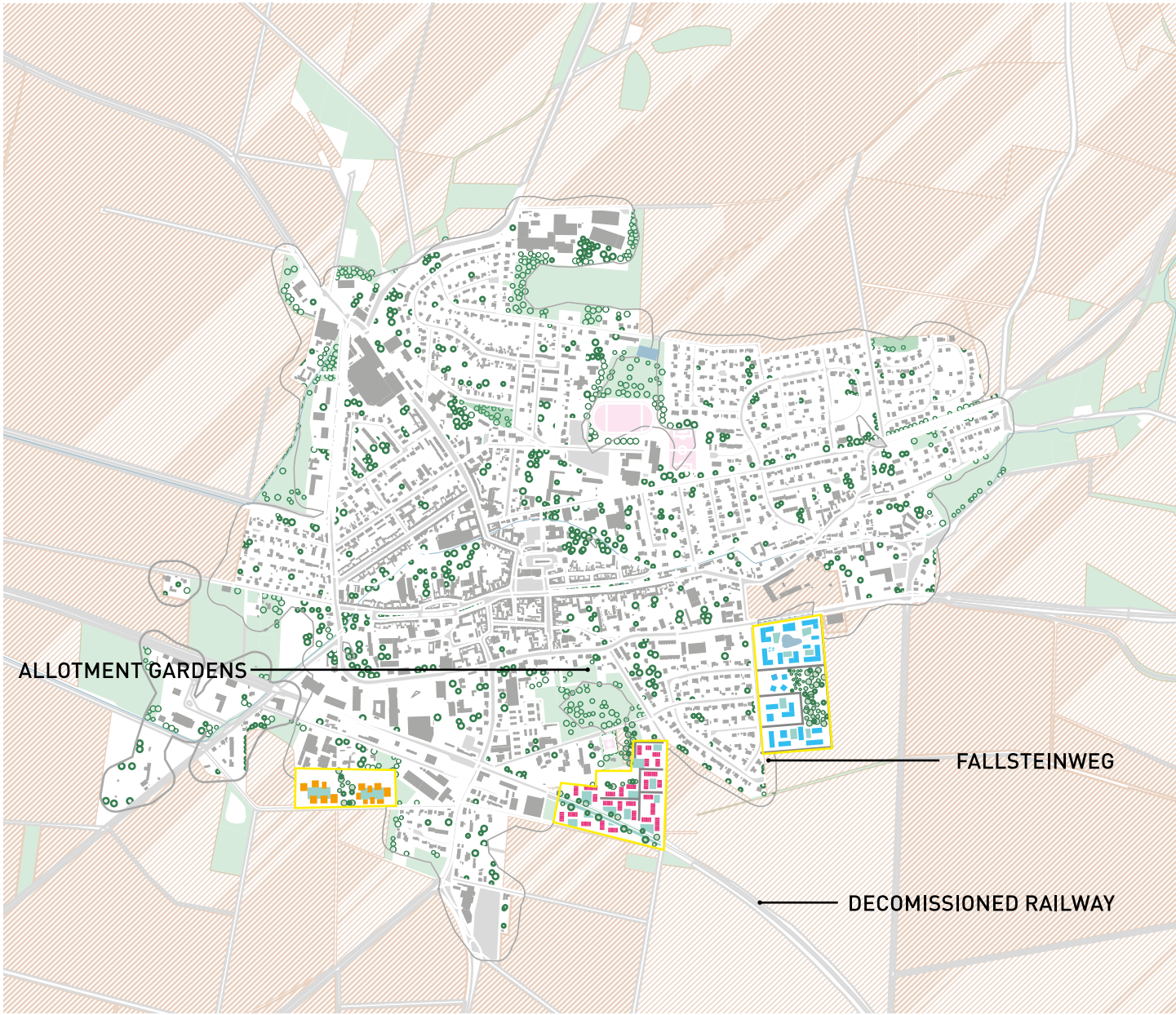


Dear residents of Schöppenstedt,

"I'm going to pick some lettuce leaves for my sandwich!" That's what I heard my son shout this morning before school. I have to be honest, I never thought he would say something like that! When we moved from Braunschweig to Schöppenstedt two years ago, it was mainly my girlfriend and I, who were very enthusiastic about the new ecovillage – but not exactly our children: "We don't want to leave – what are we supposed to do there? There's nothing that's fun for us," they said back then. Today, a regular day looks like this: in the morning, we fill our lunchboxes with fruit and vegetables from the community garden, get on our bikes and ride through the barrier-free town center. Free of traffic jams, we get to school safely and quickly – unlike in the big city back then. And why does the way home take so long? "Well, first I stopped to pick a bouquet of flowers for you. Then I met Lotta and we went to the playground in her neighborhood. And then we got hungry and went to the plum tree in the community garden – and that's why I'm only home now." That's the answer I often get. And when there is no time to idle away in the afternoons, it's because there is a meeting of the children's nature conservation society, basketball training, or the children are picking up their mothers after work in the town center and make a detour to the public swimming pool. Fortunately, despite the many new housing developments on the outskirts, the old town center is not dead, contrary to all predictions. Many small entrepreneurs have found new jobs here, including my friend Hellen, who works in a company dedicated to sustainable and regional tourism!

Best from the future!

Scenario C:
New Settlers in Schöppenstedt



6.28 Legend

New Building Type I
New Building Type II
New Building Type III
Existing Trees
Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets
Green
Water
Agriculture

0.5 km

Building Types

This scenario is the only one that combines a gentle growth outside the current TOPOS boundary with compact, dense, and sustainable construction. Sustainability specifications are made regarding energy standards of buildings and the choice of materials. Modular systems allow for the cost-efficient construction of different types of flats serving diverse needs.

I. Ecovillage: New Building Sites Guided by Sustainable Principles and Circular Economy

The site for the new ecovillage is located in the south-east of Schöppenstedt. Situated at the village boundary, it blends in with the existing buildings and extends the existing street structure along the street *Fallsteinweg*. The new neighborhood is designed according to sustainability principles. There are different types of buildings, from row houses to *Punkthäuser* to greenhouses. Different flat sizes and layouts allow for a mix of new residents. In terms of circular economy, the new district has a circular water system and supplies itself with energy using solar collectors, combined heat and power (CHP), and geothermal energy. All new buildings are designed with a closed-loop system in mind. The buildings are made of renewable materials such as wood, straw, or clay and are also built to ensure the reuse or recycling of all materials used.

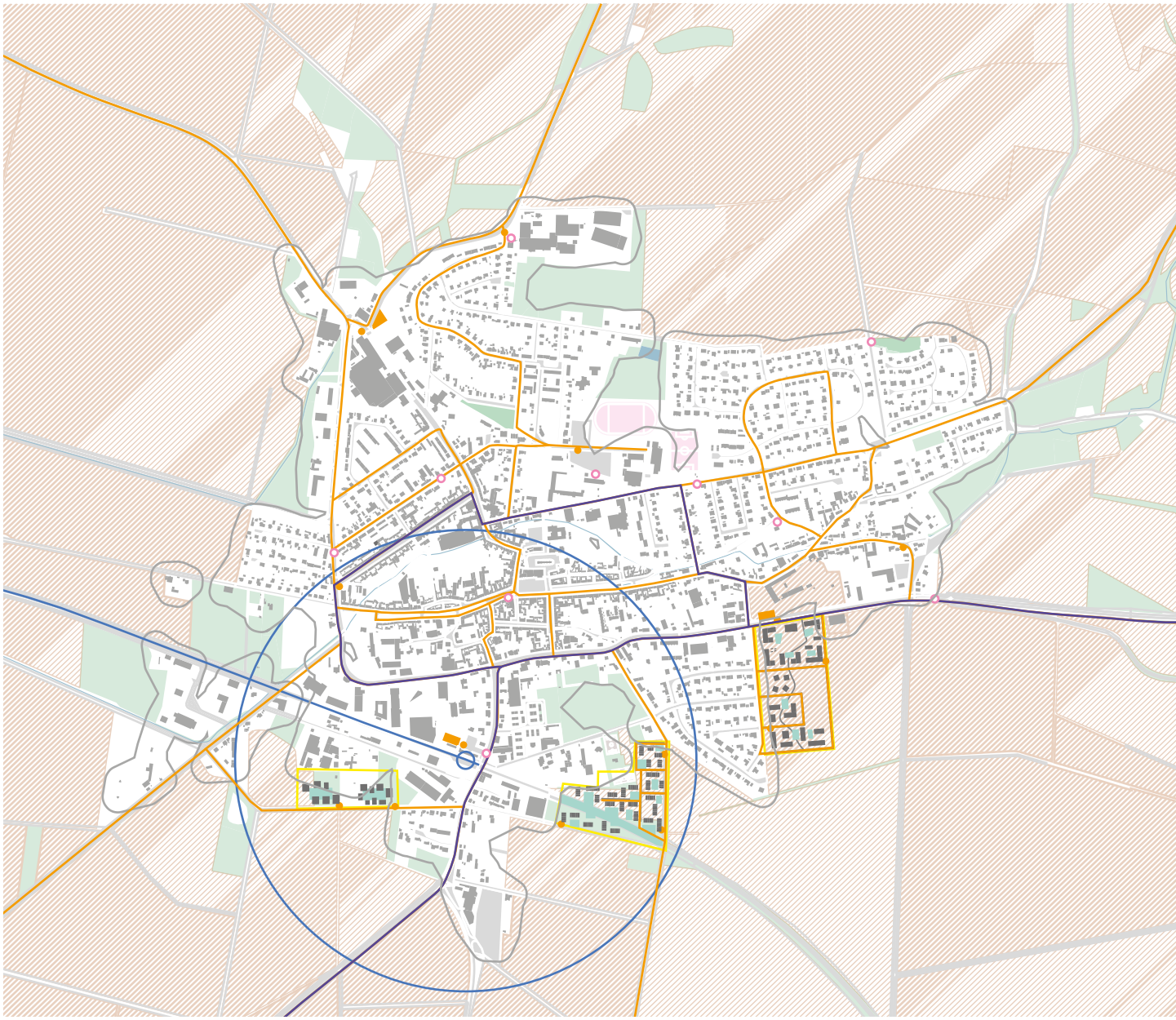
II. Modular Row Houses

Located east of the train station, this new building complex sits between an arterial road on one side and agricultural land on the other. The existing buildings mainly accommodate industrial uses with few vacancies, with some single-family homes sprinkled in between. A sports facility and allotment gardens are located in the north of the site. The decommissioned railroad that runs diagonally through the development area forms an important green axis. The new building type consists of row houses with a contemporary design. People can choose one of several basic types and personalize their home to meet their preferences and needs. The modular row houses come with an energy-plus standard and redefine the public space. This new neighborhood only features shared gardens, no private ones.

III. Mixed and Dense Living

South of the station, adjoining the commercial area, two new building units are planned. In contrast to a traditional perimeter development, this new building type consists of individual buildings that are arranged around a communal, elevated courtyard, underneath which joint infrastructure and technical facilities can be placed. Projections and recesses, openings between the buildings that work as entrances to the inner courtyard, and variations in building height contribute to the block's varied appearance. The units are demand-oriented and adaptable to the needs of the new residents. As with the row houses, a modular system enables the inhabitants to make the required adjustments and provides the framework for individual designs.

Scenario C:
New Settlers in Schöppenstedt



6.29 Legend

E-Charging Station
Car Lane
Existing Bus Stop
Railway Station
Railway
Railway Station Radius 600m
Bypass Cars
Car Park
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Green
Water
Agriculture

0.5 km

Streets, Mobility, Public Space

This scenario entails an increase in traffic areas, which are designed to be as sustainable as possible through careful planning. Permeable street surfaces, the visual separation of lanes, and roadside greenery make the streets safer.

I. Sustainable Street Design

Since this scenario envisages new development areas, it allows a new type of street design in terms of layout and materials used. The newly built roads are efficient and laid out without dead ends to ensure a steady traffic flow. In addition, they are designed with all road users in mind and include a visual separation of the road space, for example, through differently colored lanes for cyclists, pedestrians, and motorized road users. The road surface is permeable to water, so that rain water can be absorbed in the ground. This makes the roads both safer for all users and more environmentally friendly.

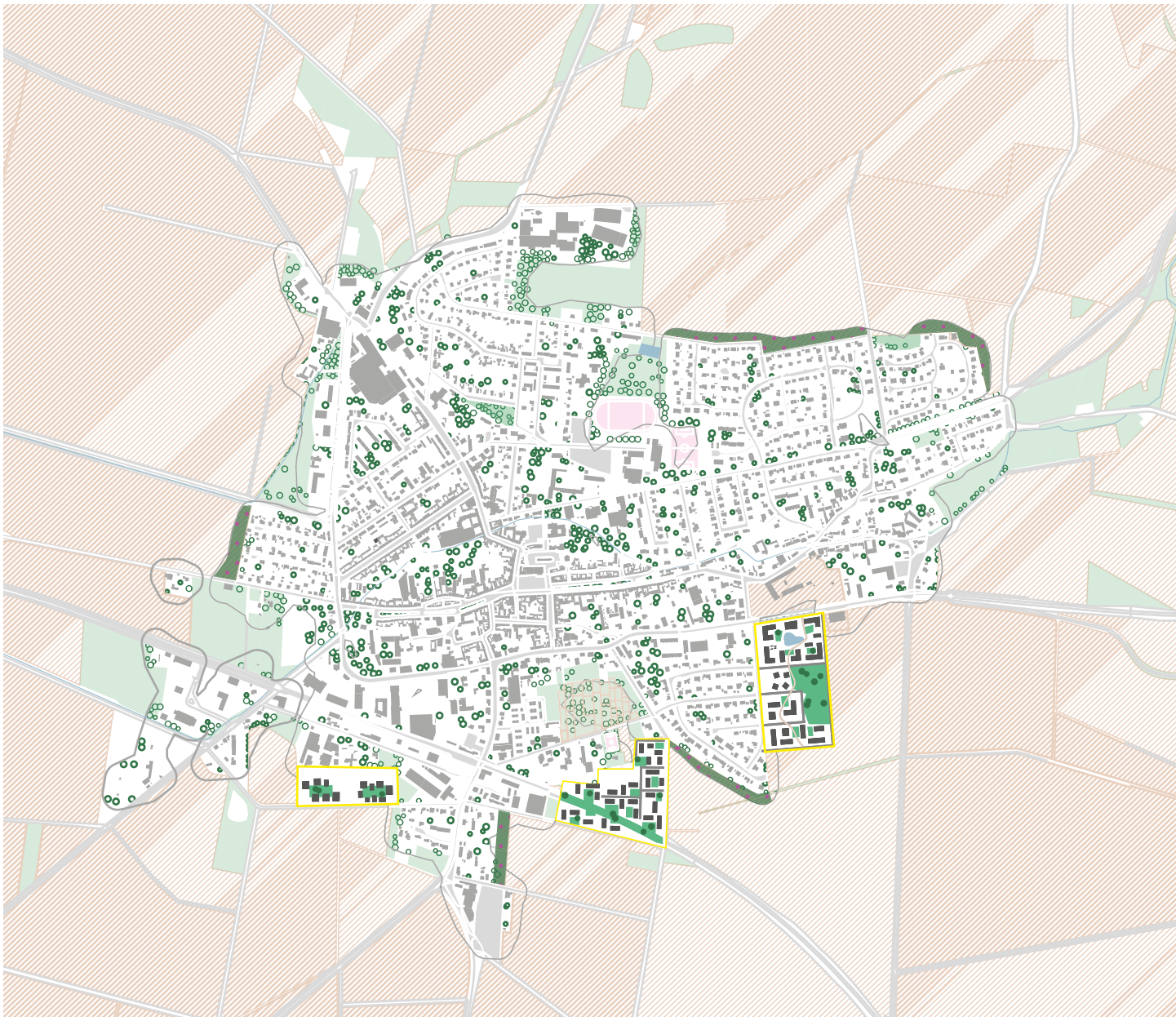
II. Charging Stations for E-Cars

In the course of construction works, charging stations for electric vehicles are installed primarily at the mobility hubs for arriving motorists and at the most frequented streets; every new building is equipped with its own wallbox. In addition, five new charging stations are distributed across the town, some of them next to an existing bus stop.

III. Bypass for the Town Center

Even though sustainable private transport is encouraged in this scenario, motorized traffic should not run directly through the center. To make this possible, three parking lots are planned in walking distance to the town center: one next to the railway station, another one close to the industrial area, and the third one at the western edge of the town center. Furthermore, a new bypass road is constructed to avoid heavy traffic in the center, which allows the transformation of historical streets and preservation of their human scale.

Scenario C:
New Settlers in Schöppenstedt



6.30 Legend

Community Gardens
Wildflower Meadow
Existing Trees
New Trees
Allotment Gardens

Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets

Green
Water
Agriculture

0.5
km

Green and Blue Networks

In this scenario, the existing green spaces are maintained and upgraded, e.g., by adding new trees or by converting undefined green buffer zones into useful and productive green spaces. In addition, a regulation limits the maximum area that can be sealed.

I. Shared Green

There are many green spaces in the three new development areas, some of which are private, but most are shared. A new community park in the ecovillage is located at the edge of this new neighborhood, connecting the built area with the adjoining agricultural land. The old railroad track runs through the new neighborhood with modular row houses. It becomes a new green axis with many functions, e.g., by providing spaces for communal gardening and a track for inline skating or scooter riding.

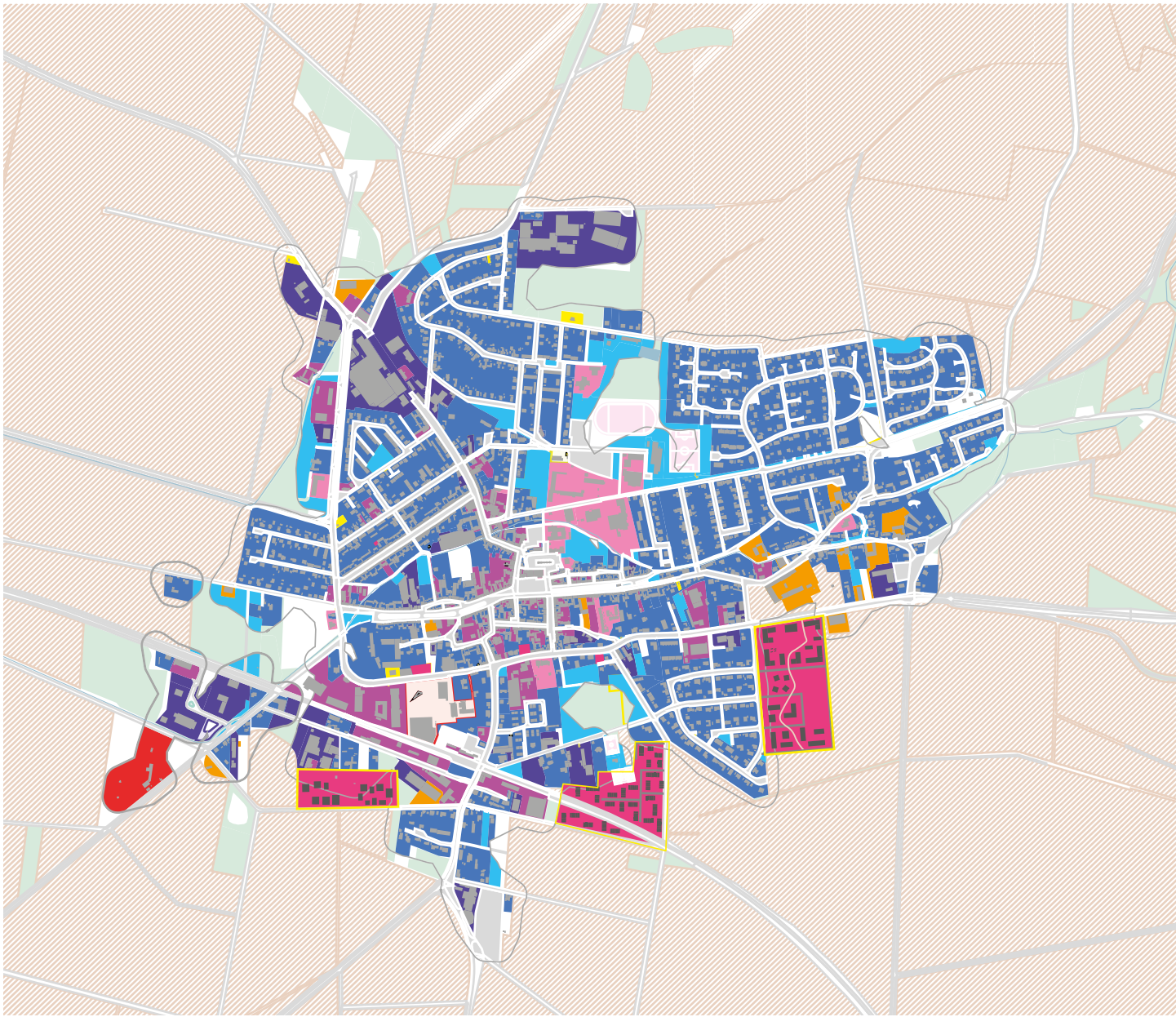
II. Circular Water Systems

The newly developed settlements also offer the opportunity to integrate circular water systems. The aim is to reuse as much rainwater as possible in order to minimize fresh water consumption. Rainwater can be easily used for rinsing and irrigation. In order to relieve public sewers and sewage systems during heavy rainfall, water is in such events collected in open water bodies and subsequently released into infiltration swales where it seeps directly into the ground.

III. Green Buffer Zones towards Agriculture

Overall, biodiversity increases due to the newly planned green spaces. Another measure are wildflower strips that work as green buffer zones between the new residential areas and the agricultural land. These green strips provide a diverse food supply for insects and compensate monoculture farming.

Scenario C:
New Settlers in Schöppenstedt



6.31 Legend

Residential
Mixed Use
Industrial
Public
Leisure
Commercial
Sports + Recreation

Supply
Disposal
Forestry
TOPOS Boundary
Transformation Area

Existing Buildings
New Buildings
Existing Streets
New Streets
Green
Water

Agriculture

0.5
km

Functions

Everything that is needed on a daily basis is available on site. Mobile services support elderly or mobility-impaired people.

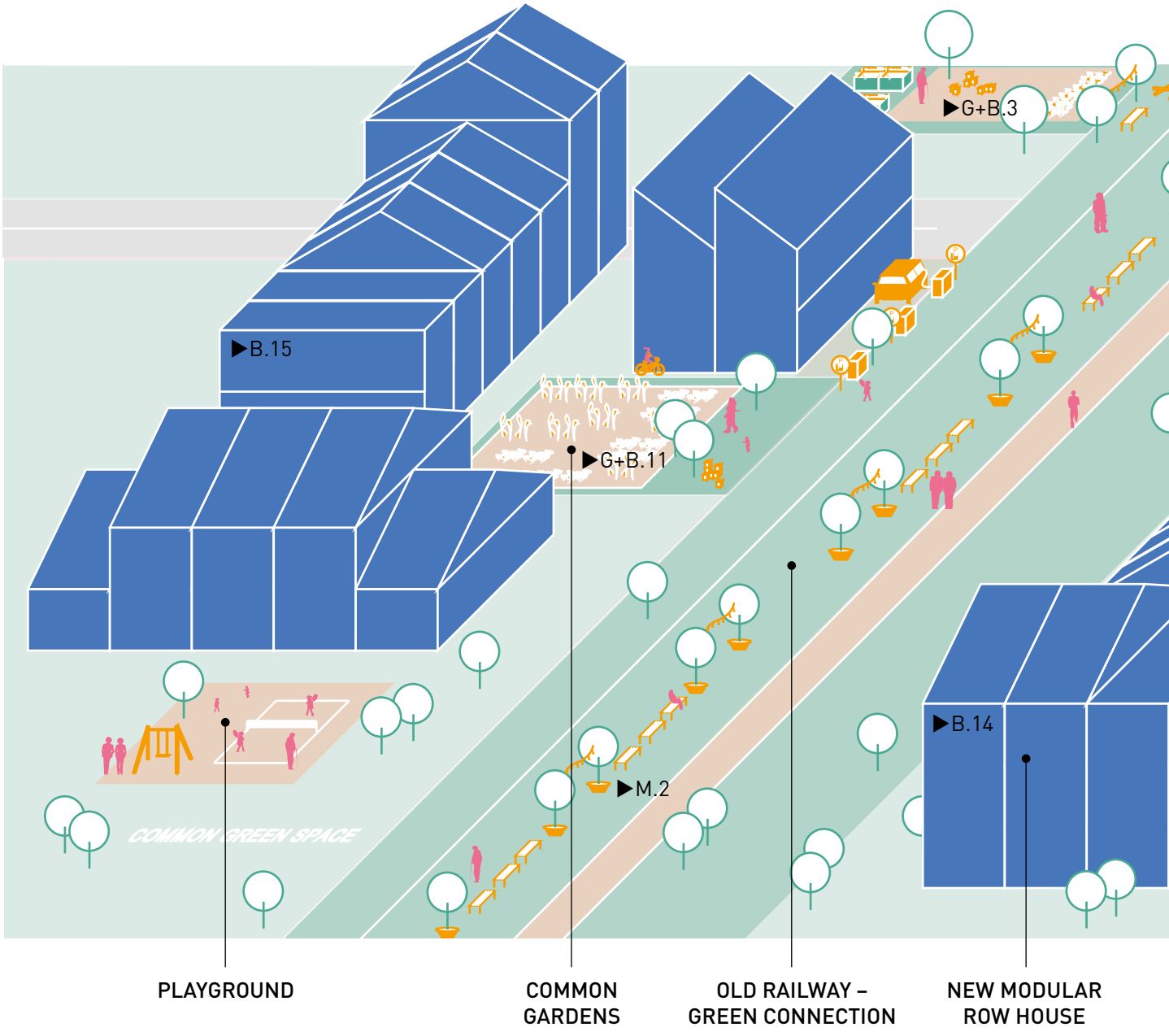
I. Dense Mixed Living

The new buildings types allow for flexible and individual floor plans, which help to avoid the phenomenon of the empty nest, which is what single-family homes can become after the children move out. The new urban design increases the building density in Schöppenstedt. Nevertheless, the balance between high density and a livable environment is maintained. Due to the increase in residents, there are also more social institutions. A new primary school, which is located in the ecovillage, three new child care facilities, and three facilities for multigenerational living enrich the range of services in Schöppenstedt.

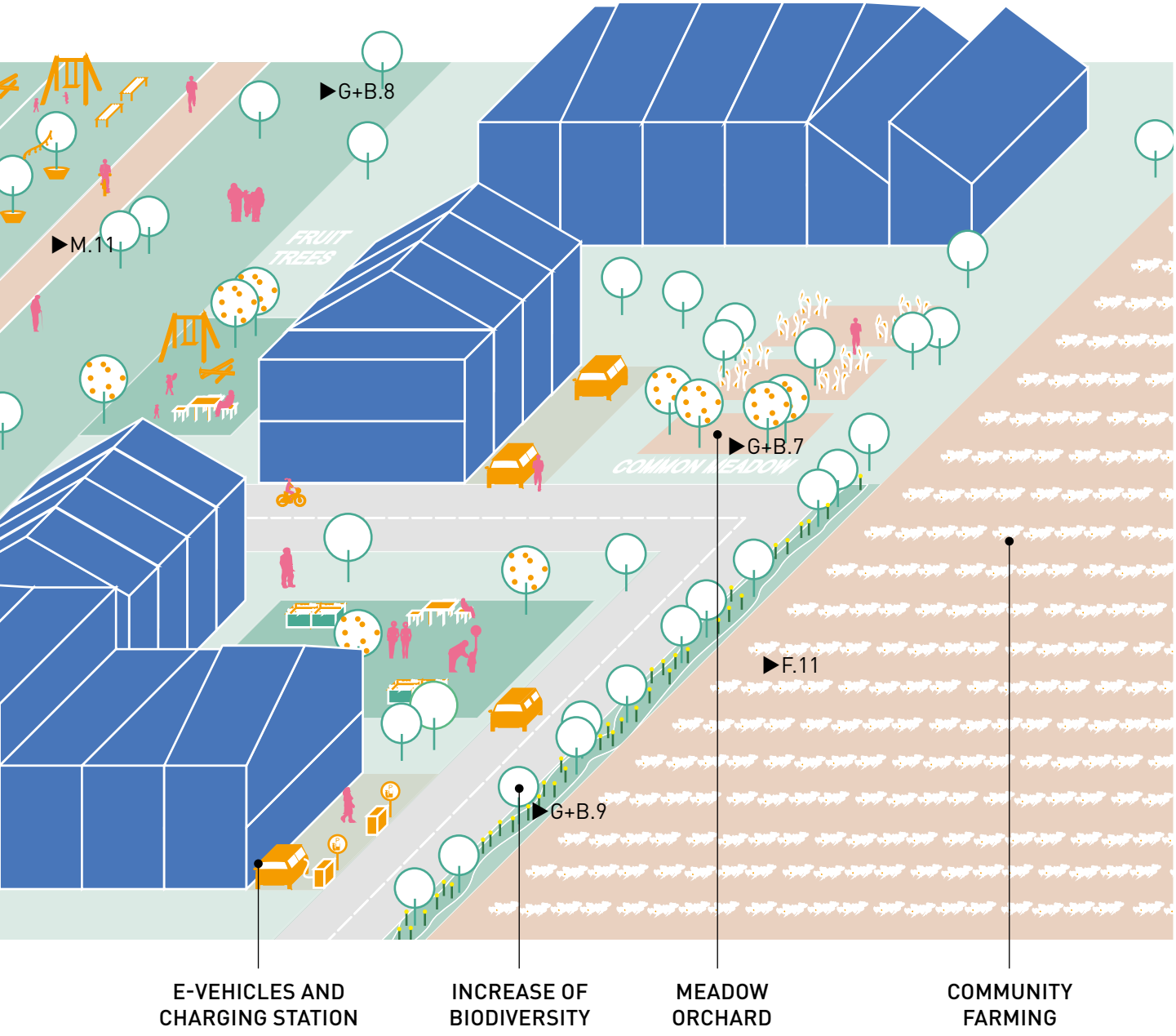
II. From the Donut to an Active Center!

Even though citizens of Schöppenstedt were concerned that the town center would lose its function due to the many new housing estates on the outskirts, a development also known as the donut effect, these fears and worries have not come true. Today, Schöppenstedt again has a very lively town center, which offers many new uses besides retail: there are spaces for associations, small businesses have found a new centrally located home due to favorable rents, and there are two new kindergartens directly in the center.

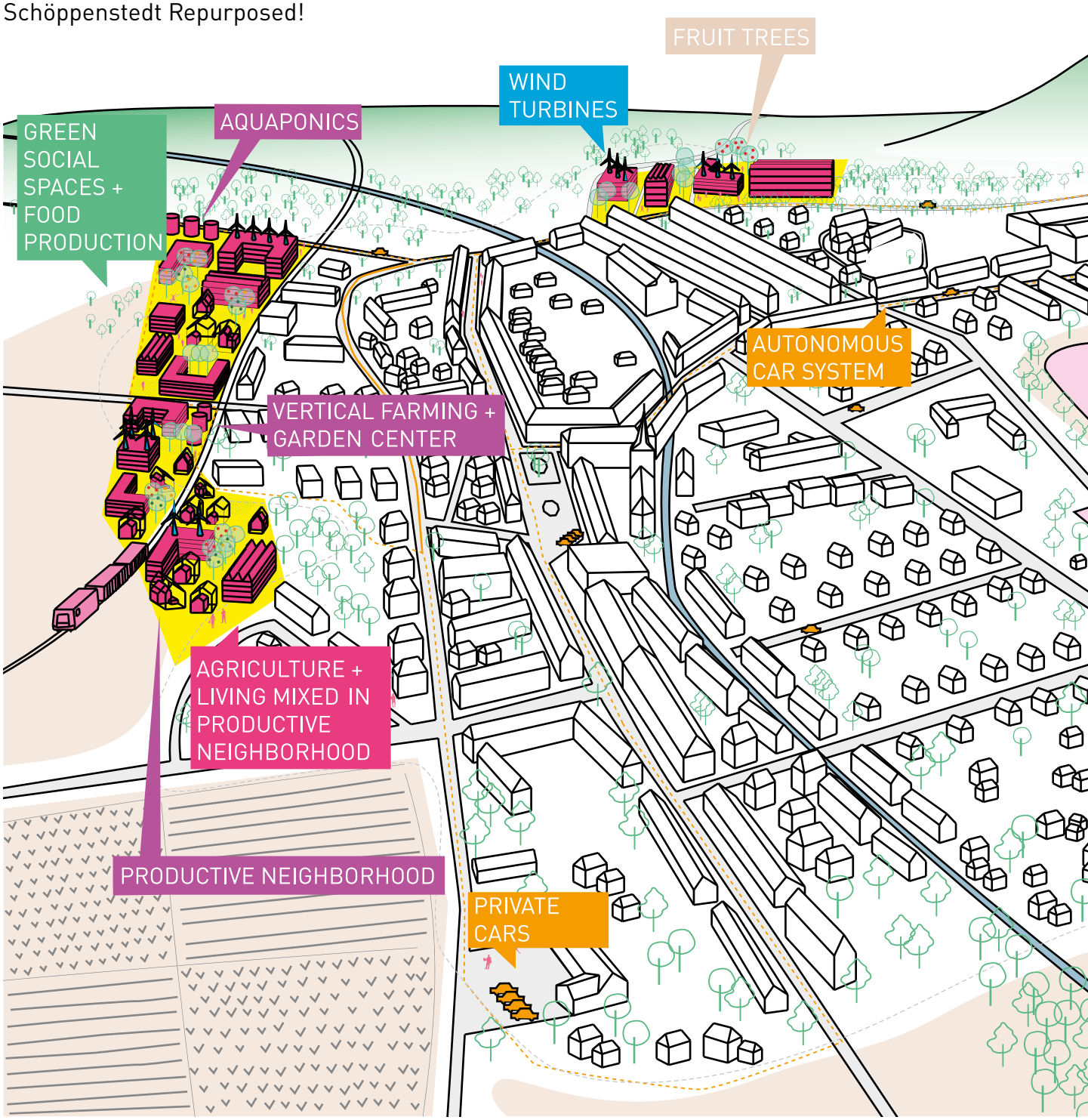
Scenario C:
New Settlers in Schöppenstedt



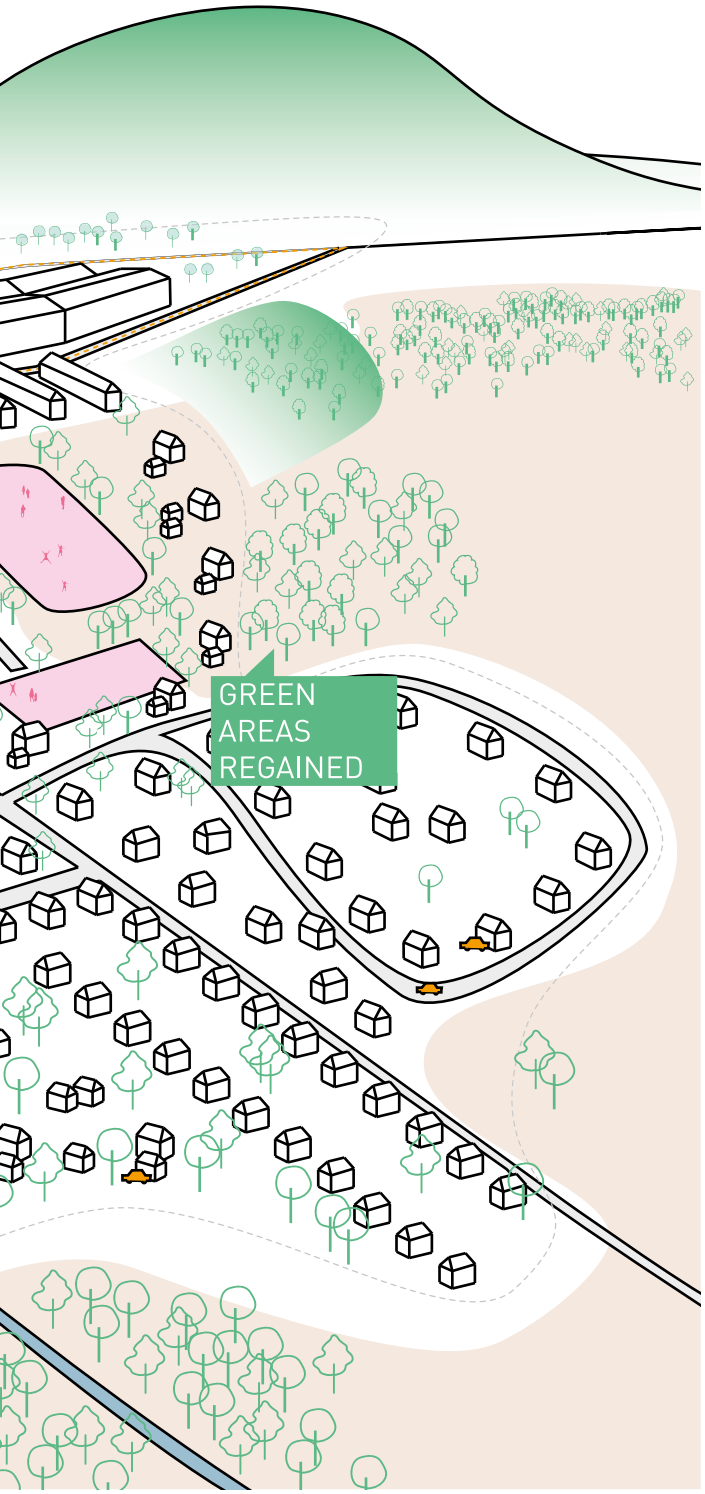
6.32


▶G+B.8
▶M.11
FRUIT TREES
▶G+B.7
COMMON MEADOW
▶F.11
▶G+B.9
E-VEHICLES AND CHARGING STATION
INCREASE OF BIODIVERSITY
MEADOW ORCHARD
COMMUNITY FARMING

6.6. Scenario D:
Schöppenstedt Repurposed!



6.33

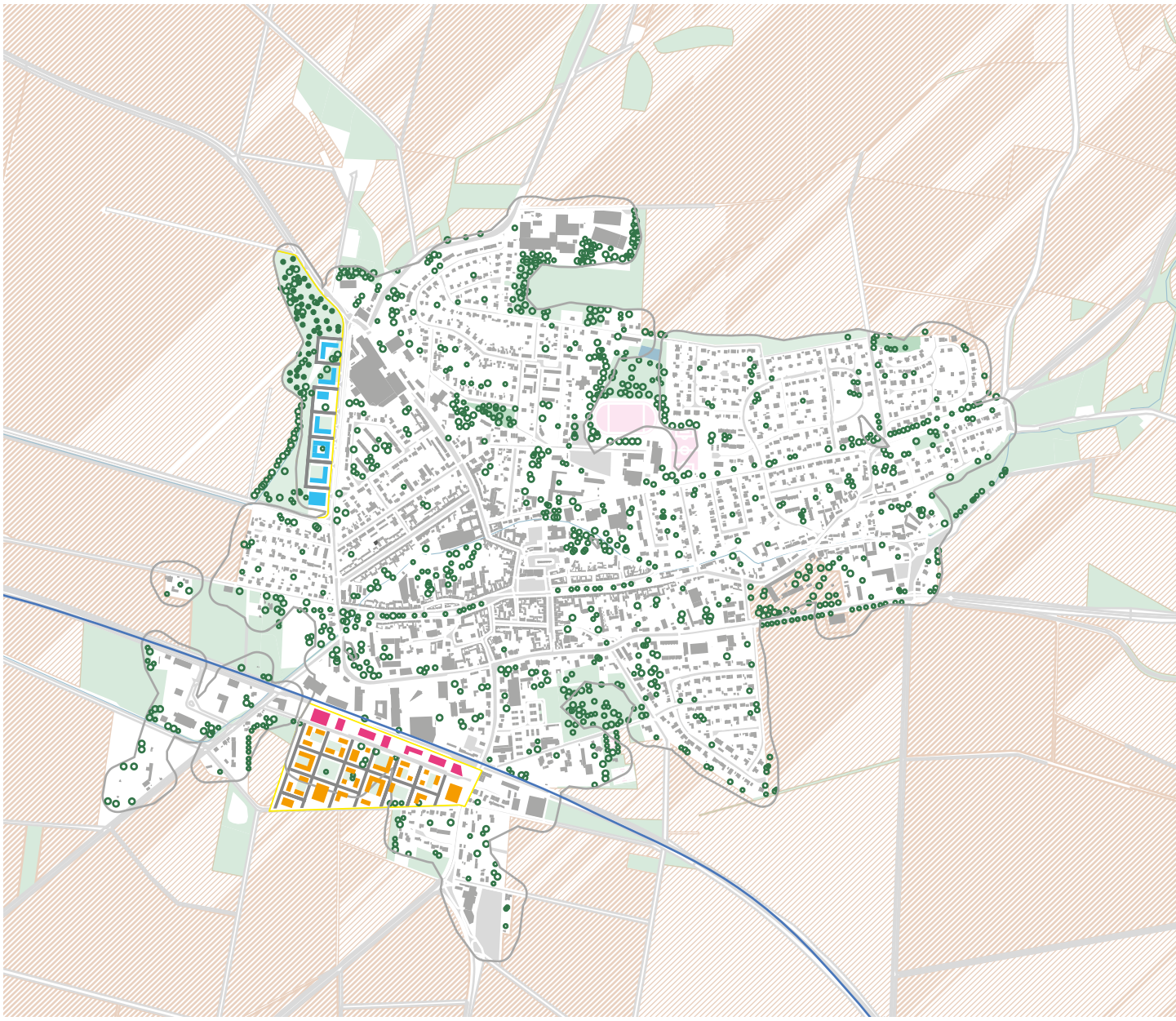


Dear residents of Schöppenstedt,

Ten years ago, I would never have thought that I would one day commute from a big city to a much smaller place to work. Tomorrow, I will start my new job in one of the most modern vertical greenhouses in Germany – in Schöppenstedt. The town really made the right choices when they decided 25 years ago to reactivate the old railroad line and increased the frequency of train services. That must surely have been the starting point for new, innovative companies to gradually settle there. Now I can choose between five different departure times in the morning, and the journey takes 15 minutes. I only have to walk five minutes from the train station along redesigned, safe streets to get to my new place of work. On the day of my job interview, I jumped on an autonomous bus outside the company premises, which took me directly to the car-free, beautifully preserved town center. The ride was really exciting. I noticed some areas that looked almost overgrown, although more or less in the center of town. A stark contrast to all the new businesses and innovative technologies all around. What I also really like is that the productive strip is located right next to the centrally located train station, and that people still live there. This shows that with the help of clever and sensitive planning, it is possible to reconcile these functions that were still considered contradictory only 25 years ago. Schöppenstedt is a very livable town today! Who knows, maybe one day I will move to Schöppenstedt despite the quick commute. Maybe move in together with girlfriends in one of the new self-sufficient housing estates? Harvesting my own vegetables all year round right outside my own front door? I'll be sure to tell my friends what sustainable, forward-looking, 21st-century living is like in the country side.

Best from the future!

Scenario D:
Schöppenstedt Repurposed!



6.34 Legend

New Building Type I
New Building Type II
New Building Type III
Existing Trees
New Trees

Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets

Green
Water
Agriculture
Railway

0.5
km

Building Types

The focus of this scenario is on the transformation of areas with obsolete functions. New housing estates are being built with modern types of detached houses that function either as self-sufficient units or as productive neighborhoods.

I. Productive District

The transformation area at the north-western outskirt of Schöppenstedt features several building types that replace the outdated former industrial buildings. This mix of building types is also reflected in the variety of uses they accommodate. Not only is the manufacturing industry represented, but also the agricultural industry, as can be seen by the exemplary building located in the south of the plot. Its rather large footprint is necessary since vegetables are grown here and a greater building depth is more efficient. Each floor is used to cultivate a different crop type, e.g., tomatoes, lettuce, or cucumber, so that the technical equipment can be adapted to the needs of the respective plant species. The ground floor accommodates the local sales point and the distribution, so that autonomous vehicles can pick up the produce and take it directly to the central station for onward transport. The adjacent building mainly serves residential purposes. However, on the ground floor there are workshops for the production of goods, e.g., sunglasses or furniture. Due to the hybrid building uses, synergies between the different uses frequently occur. For example, the waste heat from the greenhouse can be used to heat offices in winter.

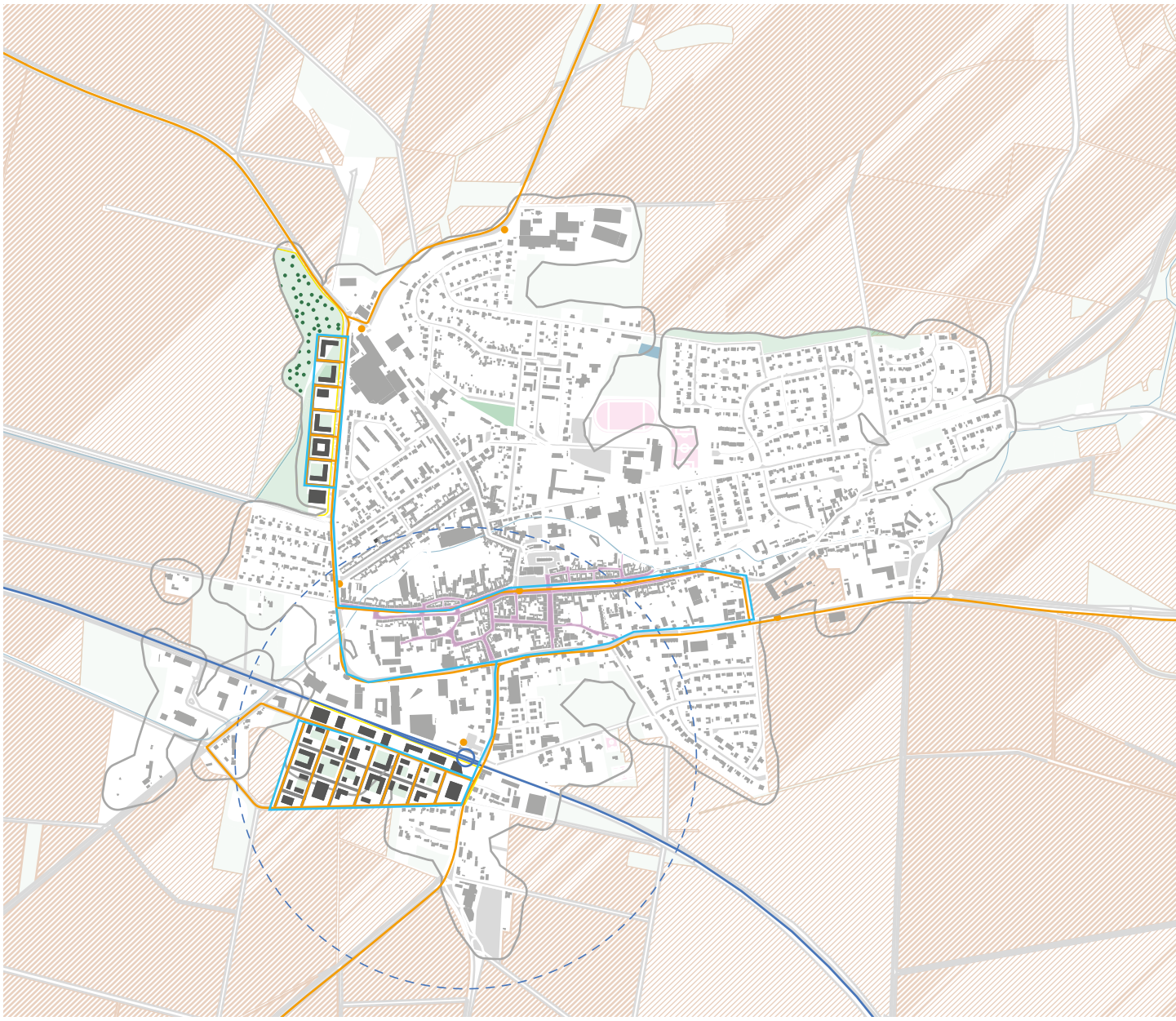
II. Productive Strip

The reactivation of the derelict railroad line is an initial step of the station district redevelopment. Former halls and sheds will be demolished, as they can no longer fulfil their function. Instead, a new productive strip is being created. New types of urban production can be tested in hybrid and flexibly usable buildings. Even though the location allows for high-emission production (noise, exhaust fumes), the focus is on future-oriented, climate-neutral industries. The buildings are energy-plus certified and the materials used are climate-neutral and recyclable. The goods produced here can be transported directly from the station via cargo trains.

III. Self-Sufficient Neighborhoods

Located south of the productive station, a self-sufficient neighborhood is being created. Besides its self-sufficiency in terms of energy generation, the main feature of this new settlement is food production in greenhouses. The new hybrid buildings combine living and farming. A second glass envelope is put around each building, which generates a microclimate conducive for vegetables to thrive. It also ensures a pleasant climate in the residential units thanks to solar heat gains in winter, shading elements and vertical greenery in summer, and a passive heating and cooling system.

Scenario D:
Schöppenstedt Repurposed!



6.35 Legend

Autonomous Car Lane
Railway Station
Railway
Railway Station Radius 600m
Autonomous Bus Route

Car Free Centre
Transformation Area
TOPOS Boundary
Existing Buildings
New Buildings

Existing Streets
New Streets
Green
Water
Agriculture

New Trees

0.5 km

Streets, Mobility, Public Space

Autonomous cars drive along a loop with various stops for charging and renting a wide variety of electric vehicles. The new neighborhoods are car-free settlements but allow loading and unloading, as well as entry to provide barrier-free access.

I. Reactivation of Railroad Line

The reactivation of the railroad line plays an essential role in the urban metabolism of this scenario. Besides the resumption of public rail transport between Braunschweig and Schöningen, freight traffic is also of particular importance. The roads will be relieved of trucks and the space thus gained can be made accessible to people. The new productive station will benefit from this reactivation as it will be expanded to include a logistic center.

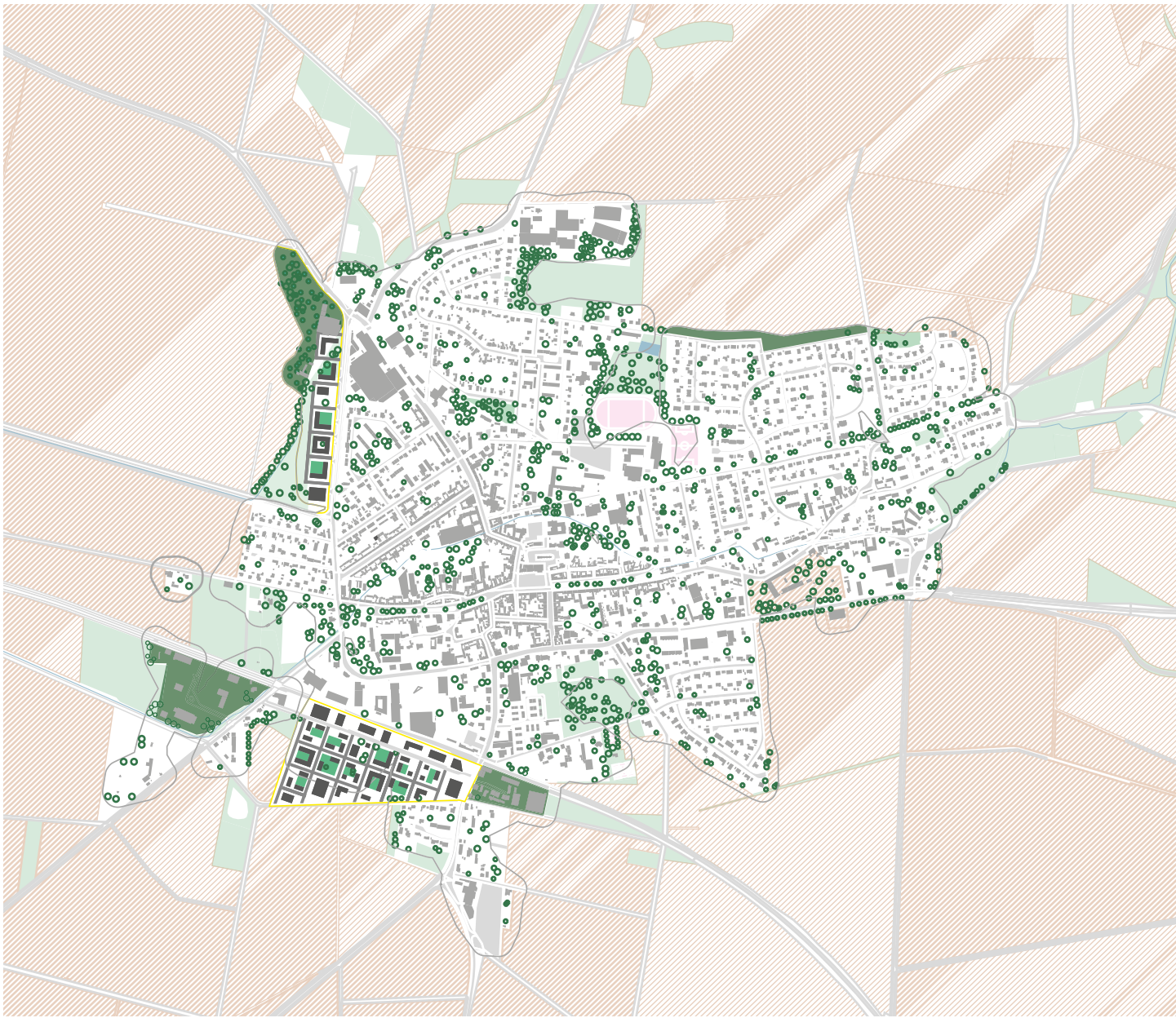
II. Autonomous Vehicles

In this scenario, mobility focuses on autonomous vehicles. There is a connection between the two productive neighborhoods that only autonomous vehicles are allowed to use. Ultimately the transport of goods in Schöppenstedt is emission-free. Due to an automated procedure, the overall traffic flow is not disturbed. Moreover, public transport is organized with self-driving buses, again to minimize emissions and to allow a smooth traffic flow.

III. Car-Free Town Center

To contribute to a more livable town, the municipality restricts the use of cars in the center to deliveries and people in need, like the elderly or handicapped. Moreover, only electric and self-driving vehicles are allowed – including public transport. This results in a positive transformation of the public space towards being more pedestrian-friendly. The parking lots are repurposed. By planting new trees, the streets become greener and all in all a new meeting place for the people of Schöppenstedt.

Scenario D:
Schöppenstedt Repurposed!



6.36 Legend

Community Gardens
Existing Trees
Transformation Area
TOPOS Boundary
Existing Buildings
Existing Streets
New Streets
New Buildings
Green
Water
Agriculture

0.5 km

Green and Blue Networks

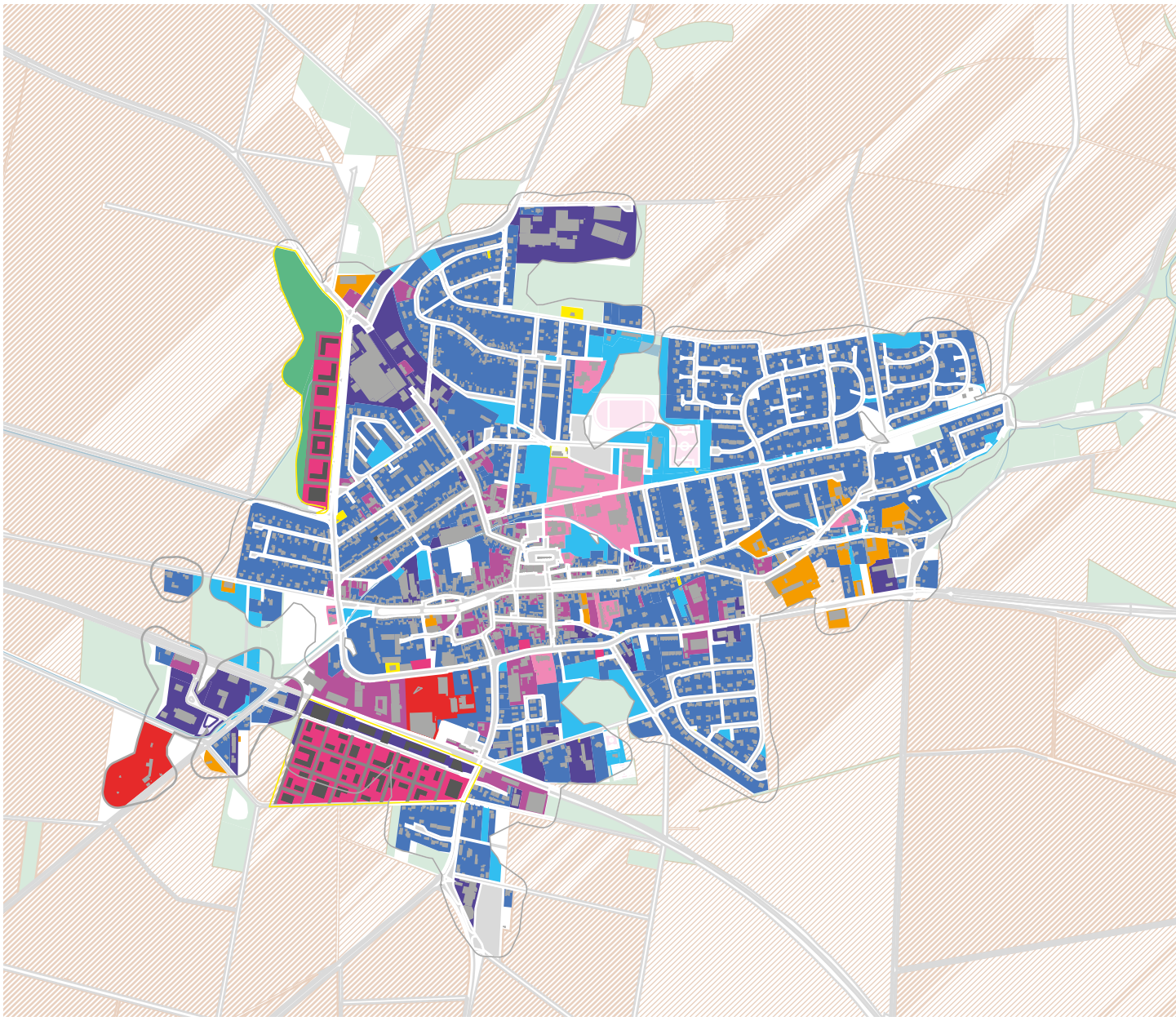
Large spaces between the buildings are used for growing vegetables or are otherwise upgraded to create a variety of different public spaces. All new buildings are provided with green roofs or facades. Several abandoned parcels of land have been reclaimed by nature.

I. Green Common Spaces and Food Production
Green common spaces play an important role in the development of the new districts. Some of the buildings are organized in such a way that a communal green courtyard is created, not only for residential but also for office buildings. These shared green spaces become valuable public areas that improve livability and provide a biodiverse environment.

II. Green Facades and Rooftops
Each new building has a green rooftop and a green facade to enhance the green within the town and a livable urban climate. The green facade, for example, contributes to the natural cooling of the buildings in summer, whereas the green rooftops become a new habitat for a variety of plants, bees, and other animals.

III. Nature Reclaims Abandoned Areas
Structural change has created brownfield sites in Schöppenstedt. There is no need to transform all of them into building land. Instead, some of these areas have transformed naturally as nature reclaimed them. In this way, new habitats for animals are created without human intervention. One of these sites is located at the edge of the transformation area of the productive neighborhood, others are located next to the train station. Through this overgrowth, wild green spaces are developing that can potentially become green oases in the center of the town and contrast with the high-tech world.

Scenario D:
Schöppenstedt Repurposed!



6.37 Legend

Residential
Mixed Use
Industrial
Public
Leisure
Commercial
Sports + Recreation

Supply
Disposal
Forestry
Overgrowth
Transformation Area

TOPOS Boundary
Existing Buildings
New Buildings
Existing Streets
New Streets
Green

Water
Agriculture

0.5
km

Functions

There is a complete restructuring of agricultural land. Departing from monocultural farming, production is now organized vertically in modern greenhouses. These hybrid buildings offer places for sales, co-working, and for leisure activities.

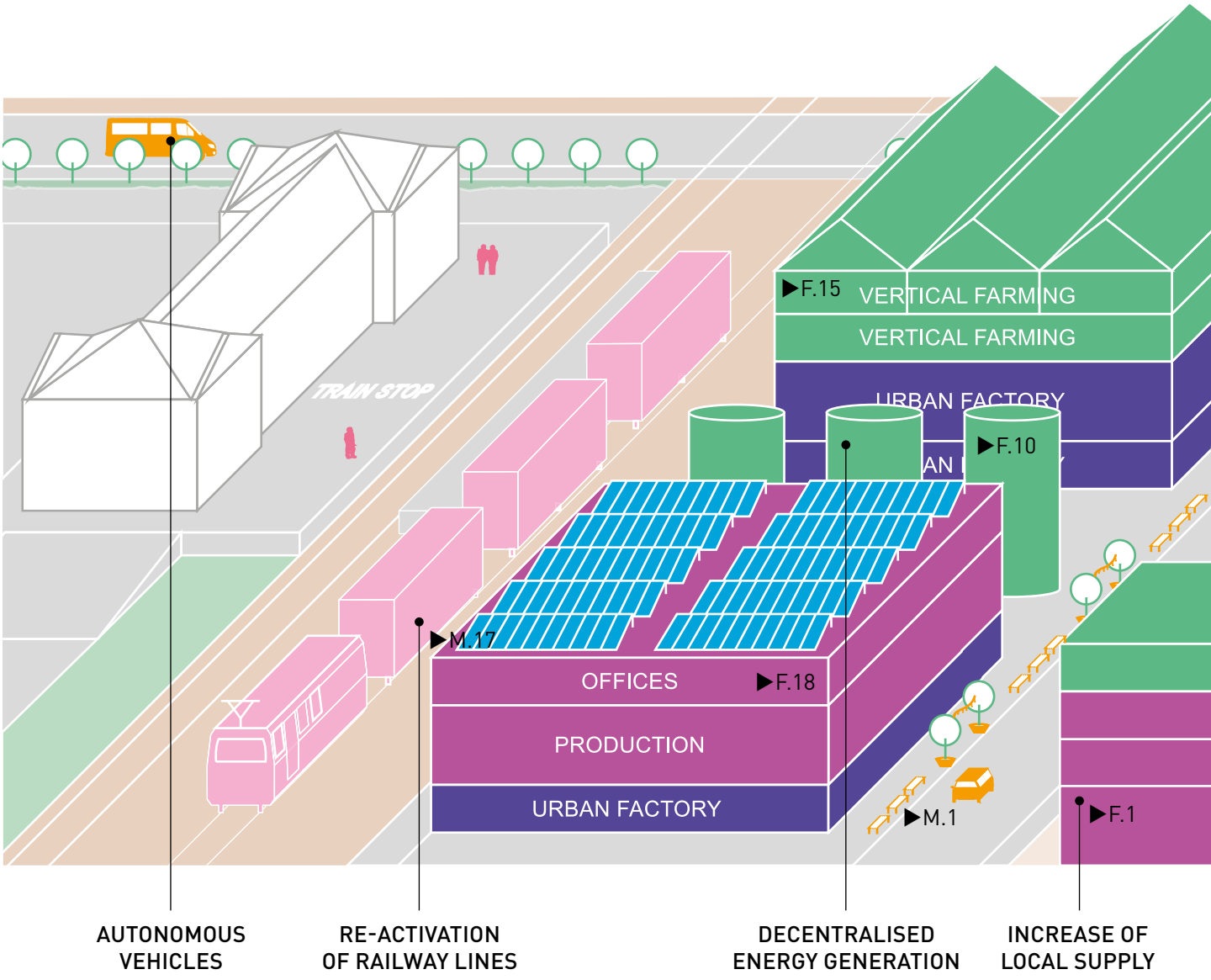
I. Industrial Production and Urban Agriculture

New productive neighborhoods are on the rise. New production techniques and technological progress allow for the co-location of housing and urban manufacturing in close proximity. Since production emits fewer emissions, synergies between living and production, e.g., in terms of energy or materials flows, can now be leveraged. The area around the train station in particular is teeming with new urban production start-ups, since goods can be transported directly from here. Urban agriculture has also settled in Schöppenstedt. Vertical greenhouses produce vegetables from the region all year round, by far exceeding Schöppenstedt's own needs. Advances in technology are becoming manifest in this area: there is a great deal of experimentation, for example, with aquaponics. Another example: in the office building right next to the train station, waste heat from the offices is used to heat the cultivation areas for vegetables that are integrated into the building. In this way, an overall positive energy balance can be achieved.

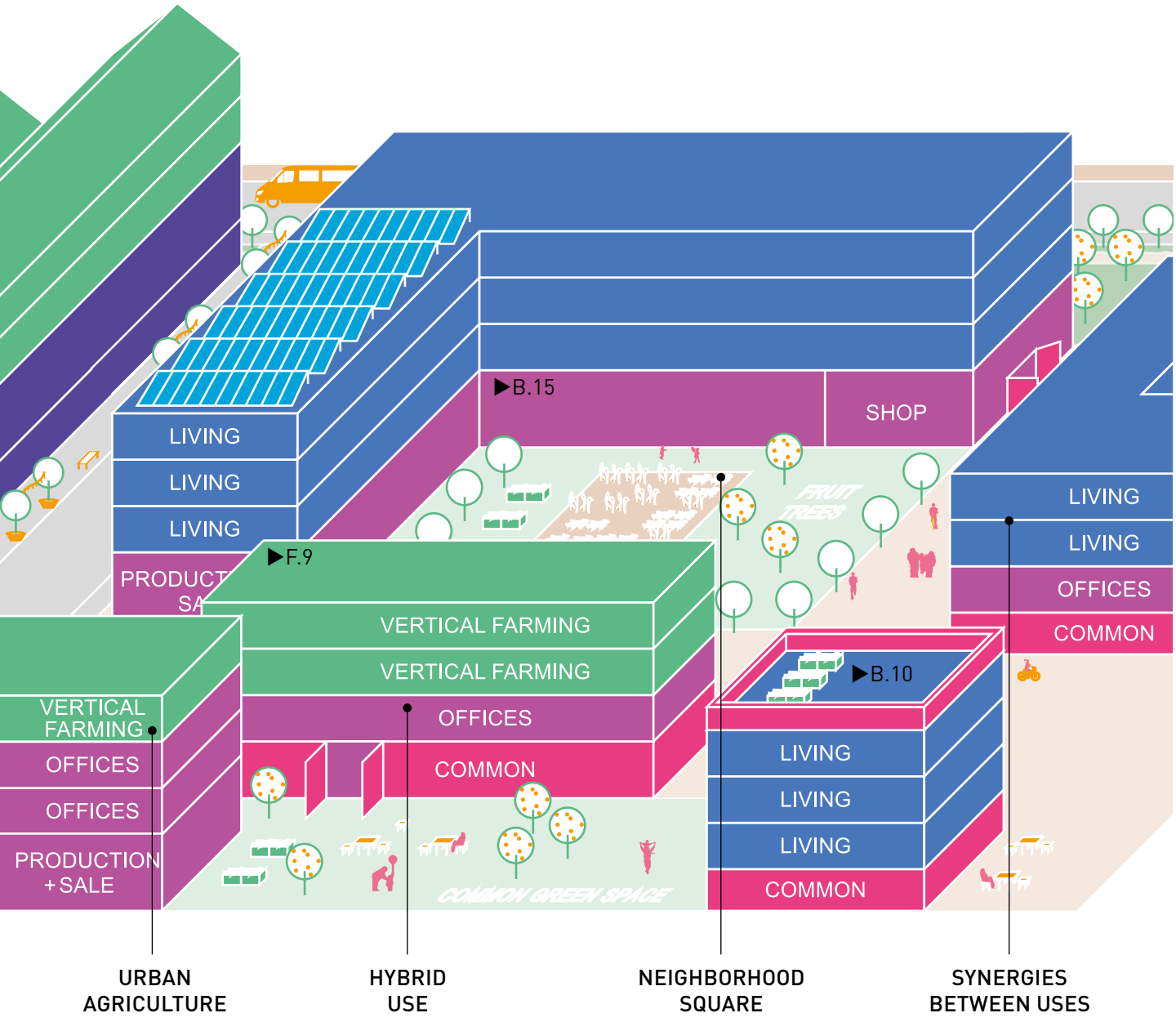
II. Hybrid Spaces and Mixed Use

Most ground floor areas of the new buildings have a public use. The buildings in the new productive neighborhood south of the railway station also offer amenities to the local residents. There is a coffee shop that is combined with a bicycle sharing station. The restaurant uses vegetables that are produced on top of the building with the help of aquaponics. On the first floor, a new start-up that manufactures eyeglass frames has found a new working environment, and on the second floor, another start-up producing customized furniture is happy about the possible synergies it can benefit from in the wood cluster. On the upper levels, new apartments are offered to meet the increasing housing demand in Schöppenstedt.

Scenario D:
Schöppenstedt Repurposed!



6.38


LIVING
LIVING
LIVING
PRODUCT
SA
▶F.9
▶B.15
SHOP
FRUIT TREES
LIVING
LIVING
OFFICES
COMMON
VERTICAL FARMING
VERTICAL FARMING
OFFICES
COMMON
VERTICAL FARMING
OFFICES
OFFICES
PRODUCTION + SALE
▶B.10
LIVING
LIVING
LIVING
COMMON
COMMON GREEN SPACE
URBAN AGRICULTURE
HYBRID USE
NEIGHBORHOOD SQUARE
SYNERGIES BETWEEN USES

7. Discussion and Evaluation of the Scenarios for the Three Prototypes Eydelstedt, Detmerode, and Schöppenstedt

Throughout the development of the scenarios for the three prototypes of Eydelstedt, Detmerode, and Schöppenstedt, we had the opportunity to discuss our work with representatives of the municipalities, mainly mayors, chief planning officers, or planners working in the responsible planning departments. After the finalization of the scenarios, we conducted semi-structured interviews with those aforementioned political and administrative representatives. We presented all of the four scenarios for each of the municipalities in detail. In addition to what the local experts considered desirable, unrealistic or interesting, we were also curious to learn whether the scenario technique itself was considered helpful in thinking about the future development of their community. While the results cannot be considered representative, the findings are nevertheless interesting. Here we present which topics were important to our local stakeholders, and which less.

7.1. Eydelstedt

Throughout the development of the scenarios for Eydelstedt, we had the opportunity to discuss the results with the mayors of the village and the joint municipality as well as the chief planning officer. Our ideas were well received. There was a clear preference stated for the scenarios *Green Communities* and *Planned Happy Future?* as the most desirable scenarios for the village and entire municipality. At the time of writing, some ideas that can be found in the *Green Communities* scenario are well underway or already implemented in Eydelstedt or surrounding villages, according to the mayors' information. For example, there is a co-housing project for senior citizens, and a solidaric farming project also already exists. The riverbanks are now legally protected from construction and shall henceforth serve as flood plains in the recently adjusted zoning plan (Flächennutzungsplan) to avoid negative effects of flood events for the municipality, as suggested in the scenario *Planned Happy Future?*. However, there was skepticism towards constructing playgrounds, since the village children are used to playing in natural surroundings.

However, what is considered a barrier for a more holistic and sustainable development of the rural community is the fact that private owners are currently not willing to sell or develop their land. Accordingly, more innovative communal housing or other projects are not to be expected in the near future. In this sense, our interlocutors are of the opinion that the degree to which the administration can act as an engine for innovation and positive change is limited.

However, the recent and ongoing pandemic has noticeably increased the populations' interest in more conscious, more sustainable and healthier lifestyles with healthy food and more local opportunities for physical activities. An increasing interest in activities such as jogging, cycling, gardening can be observed, and community farming is on the rise. Yet, the administration feels it has limited resources and cannot really support or organize many new projects that would be desirable for the community. They have to be initiated by the community itself, which also emphasizes the validity of the *Green Communities* scenario. With the citizen forum (Bürgerforum), the municipality has a regular format addressing issues of social cohesion and community concerns, which are important for rural communities in general.

Being confronted with scenario thinking for the first time, the mayors and chief planning officer emphasized the opportunity to use scenarios in the communication with their citizens. They are also regarded as practical in serving as guidelines and motivation for decision makers in politics and administration.

For policy makers, scenarios could have the advantage of providing an outside view. Often times it seems that the willingness of citizens to accept and even promote certain changes increases if measures are proposed from outside the administration or politics.

7.2. Detmerode

We had the opportunity to discuss the scenarios for Detmerode with the chief planning officer of Wolfsburg. Like the scenarios for Eydelstedt, they were generally well received. The opportunity to use scenario planning to engage with citizens about the question of how we want to live together in the future was emphasized. In that sense, the scenario approach would offer a new pathway next to the classic planning procedures.

To the chief planning officer, it seemed productive to show different positive and optimistic scenarios that all entail desirable elements and to avoid dystopias. As such, the scenarios presented could be useful to stimulate imagination and ideas and to give citizens a different perspective on the existing situation. While holistically, the scenarios integrate very different topics, the elaboration of ideas on the building scale seems more sophisticated to our interlocutor. For a car-friendly district like Detmerode, it could have been helpful to also illustrate the ideas for a sustainable future mobility in more detail, the chief planning officer emphasized.

Like in Eydelstedt, some of the concepts the different scenarios suggest are already implemented or are awaiting implementation. One example are the fruit trees that are currently being planted together with an environment organization. Existing neighborhoods are densified by carefully adding new buildings. New housing types are integrated that are diversifying the housing stock. Several buildings have been renovated. The idea of using wintergardens as thermal insulation of new or existing buildings was also discussed within the municipal administration together with housing corporations, but discarded for cost reasons. Recently, one large building has been demolished, which kind of corresponds to the scenario *Communities Repurposed!*. It seems to be very unsustainable to demolish an existing building entirely and to build a new one on the same plot. Yet, here the expected costs for refurbishing the existing building much outweighed the construction of the new one. However, ultimately this also opened up the opportunity to build a new mobility station in that area.

All in all, both the presented scenarios and the method of scenario planning seem advantageous and promising for the exchange with citizens and in producing more innovative planning results.

7.3. Schöppenstedt

Like for the other municipalities, we also had the opportunity to discuss the scenarios for Schöppenstedt with the mayor and representatives of the local administration. Whereas for Eydelstedt and Detmerode the scenarios were received rather positively, the representatives of Schöppenstedt were more reserved and more critical. How is it possible to look so far into the future, when daily business is taking up so much time and energy of the people working in the municipal administration?

Instead of going into detail about their preferences, the representatives expressed their wish that we should host another workshop so that more people from Schöppenstedt, in particular citizens from outside the administration, could participate and take in the different ideas in greater detail. Moreover, the representatives wished that the scenarios were less abstract and easier to imagine for non-experts. However, the potential to use scenarios in engaging with people was clearly seen and appreciated. It also seems that scenarios could be very helpful when applying for different subsidy programs, since long-term strategic goals or pitfalls could be identified beforehand. One remark concerned the scale of the scenarios. For Schöppenstedt, it is focusing on only one of the many settlement patches that altogether form the municipality. A more holistic scenario approach for the entire municipality could have been more fruitful.