

A topographic map of the Wetzikon area, showing terrain contours and a dense urban layout. A dark grey rectangular overlay is positioned on the left side of the map, containing white text. The map shows a valley with a river or stream winding through it, and several clusters of buildings representing urban areas.

# Enhance Wetzikon

A concept for the future  
development



# Interdisciplinary Project Activity Fall 2023

## Enhance Wetzikon

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# Abstract

The aim of this work is to draw up a development strategy for the municipality of Wetzikon that outlines a vision for future development at an abstract level. Based on this vision, a concrete action plan is drawn up for a sub-area of Wetzikon, which shows how the area should develop in concrete terms.

As a first step, the authors of this report have examined the current state of Wetzikon. What are the municipality's strengths and weaknesses and what are the most urgent areas for action? It quickly became apparent that Wetzikon has experienced a very dynamic period of growth. Mainly due to its proximity to Zurich and the introduction of the S-Bahn, Wetzikon has developed into a conveniently located place to live for people who cannot find a reasonably priced apartment in Zurich. This is reflected in a lower median salary compared to Zurich or the Oberland region. The strong focus on Zurich also means that many people spend very little time in Wetzikon, making the center appear less lively. Overall, the area between the Reformed Church and Migros lacks quality of stay, which is not only due to the heavy traffic load, but also to the lack of design of the public space.

These findings lead to the realization that Wetzikon needs to become more attractive as a town, not necessarily in the sense that the influx of people will continue to increase, but that people will enjoy spending time in Wetzikon. This leads to the vision of a Wetzikon that is not only lively, inclusive and green, but also offers mobility for everyone. However, Wetzikon should not remain at a standstill, but actively manage future growth and continue to grow sensibly, both in terms of population and the number of jobs.

To illustrate how the consistent application of these five principles will affect Wetzikon's development, a package of measures was developed for an area from Migros to the industry in the north. A distinction is made between two variants: one construction program is designed with development in mind and actively shapes Wetzikon's future growth, albeit partly at the expense of agricultural land. The second construction program is conservation-based, focuses on the preservation of unsealed areas and, compared to the development-based program, is designed to be more restrained in terms of the depth of intervention of the measures.

The numerous measures include the development of the eight-hectare Buchgrindel site, the new Migros building, the exemplary development of inner-city densification potential at four locations, the relocation of the railroad station to Oberwetzikon, the introduction of a new train line and various new bus routes, the creation of new parks, the redesign of Bahnhofstrasse and the construction of a cycle path network. Not all measures are part of both construction programs, but will be allocated to one or both programs depending on their suitability.

In a further step, the two construction programs are evaluated and discussed on the basis of eight criteria. The aim here is not to identify a clear winner, but to determine which measures or which construction program is most likely to contribute to achieving the outlined vision. The evaluation clearly shows that the development-oriented building program can contribute more to an attractive city center overall. However, it is also clear that this program entails significantly more risks in terms of planning, political decision-making and implementation.

# Zusammenfassung

Das Ziel dieser Arbeit ist es, für die Gemeinde Wetzikon eine Entwicklungsstrategie zu erarbeiten, welche auf einem abstrakten Level eine Vision für die zukünftige Entwicklung skizziert. Basierend auf dieser Vision wird für ein Teilgebiet Wetzikons ein konkreter Massnahmenplan erarbeitet, welcher aufzeigt, wie sich das Gebiet konkret entwickeln soll.

In einem ersten Schritt haben die Verfasser dieses Berichts untersucht, in welcher Verfassung Wetzikon sich präsentiert. Wo liegen Stärken und Schwächen der Gemeinde, welches sind die dringendsten Handlungsfelder? Schnell hat sich gezeigt, dass Wetzikon eine sehr dynamische Wachstumsperiode hinter sich hat. Hauptsächlich durch die Nähe zu Zürich und die Einführung der S-Bahn entwickelte Wetzikon sich zu einem günstig gelegenen Wohnort für Menschen, welche in Zürich keine preislich akzeptable Wohnung finden können. Dies zeigt sich konkret in einem tieferen Medianlohn im Vergleich zum ZH oder der Region Oberland. Der starke Fokus auf Zürich führt auch dazu, dass viele Menschen nur wenig Zeit in Wetzikon verbringen und so das Zentrum nur wenig belebt wirkt. Insgesamt fehlt es dem Bereich zwischen der reformierten Kirche und dem Migros an

Aufenthaltsqualität, was nicht nur an der starken Verkehrsbelastung liegt, sondern auch an der fehlenden Gestaltung des öffentlichen Raums.

Diese Erkenntnisse führen zur Einsicht, dass Wetzikon als Stadt attraktiver werden muss, nicht zwingend in dem Sinne, dass der Zuzug von Menschen weiter zunimmt, sondern dass Menschen gerne Zeit in Wetzikon verbringen. Dies führt nun zur Vision von einem Wetzikon, das nicht nur lebendig, inklusiv und grün ist, sondern auch eine Mobilität für alle bietet. Dabei soll Wetzikon aber nicht im Stillstand verharren, sondern das zukünftige Wachstum aktiv steuern und mit Vernunft weiterwachsen, sowohl was die Bevölkerungszahl, aber auch was die Zahl der Arbeitsstellen betrifft.

Um zu illustrieren, wie sich die konsequente Anwendung dieser fünf Prinzipien auf die Entwicklung Wetzikons auswirkt, wurde für ein Gebiet von der Migros bis zur Industrie im Norden ein Bündel an Massnahmen entwickelt. Dabei werden zwei Varianten unterschieden: Ein Bauprogramm ist entwicklungsorientiert ausgelegt und gestaltet das zukünftige Wachstum Wetzikons aktiv mit, zum Teil aber auch auf Kosten von Landwirtschaftsland. Das zweite

Bauprogramm ist erhaltungsbasiert gestaltet, fokussiert auf die Erhaltung von unversiegelten Flächen und ist im Vergleich zum entwicklungsorientierten Programm eher auf Zurückhaltung bei der Eingriffstiefe der Massnahmen ausgelegt.

Zu den zahlreichen Massnahmen gehört die Überbauung des acht Hektar grossen Buchgrindelareals, den Neubau der Migros, die beispielhafte Entwicklung des Innenverdichtungspotentials an vier Standorten, die Verschiebung des Bahnhofs nach Oberwetzikon, die Einführung einer neuen Zuglinie und diversen neuen Buslinien, die Schaffung von neuen Parks, die Umgestaltung der Bahnhofstrasse und dem Bau eines Velowegnetzes. Nicht alle Massnahmen sind Teil beider Bauprogramme, sondern werden je nach Eignung einem oder beiden Programmen zugeteilt.

In einem weiteren Schritt werden die beiden Bauprogramme anhand von acht Kriterien bewertet und diskutiert. Das Ziel dabei ist nicht die Ermittlung eines klaren Gewinners, sondern die Ermittlung, welche Massnahmen bzw. welches Bauprogramm am ehesten zur Erreichung der skizzierten Vision beitragen kann. In der Bewertung zeigt sich klar, dass das entwicklungsorientierte

Bauprogramm insgesamt mehr zu einem attraktiven Stadtzentrum beitragen kann. Allerdings wird auch deutlich, dass dieses Programm deutlich mehr Risiken bei der Planung, politischen Entscheidung und Umsetzung mit sich bringt.



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# Introduction

What does the future hold for small towns within commuting distance of large economic centres? Are such towns destined to provide living space for the part of the population that cannot afford the expensive apartments in the big city? Why should the resident population spend any time at all in such cities? Truly gloomy prospects for many Swiss cities in the agglomeration, don't you think?

Perhaps not. In recent years, some cities have set out to reverse the trend with bold and innovative projects, to become independent of the all-determining big city and to position themselves as attractive and versatile places to live and work.

How is Wetzikon doing as a Zurich Oberland municipality with just under 26'000 inhabitants? What are the problems and challenges? What is the municipality already doing well today? And above all: How should the municipality develop by 2040? What goals should the municipality set itself, which transport systems can satisfy the growing need for mobility, how can the municipality satisfy the growing needs of residents for green spaces, leisure facilities, stores, and restaurants?

All these questions will be explored in this work and answers will be provided wherever possible. In the first part, the primary question is how Wetzikon presents itself today: What are the town's strengths and weaknesses, how is traffic handled, where do children go to school and adults go to work, and where can residents relax, spend their leisure time, and make new acquaintances?

In the second part, the project authors develop a vision for Wetzikon. The vision is divided into five key points that form a framework for future development. The objectives remain abstract so as not to anticipate any concrete measures.

In the third part, the objectives are now applied in concrete terms in a clearly defined area. The aim is to use concrete projects to show how the vision could be implemented, and what effects can be expected on people, institutions, and nature.

In the fourth part, the insights gained from the application will allow concrete recommendations to be formulated for the municipality of Wetzikon: Does the developed vision prove its worth? Which projects should be pursued further, and which should not? Where might adjustments to the vision or specific projects be necessary?

In a final part, the project authors reflect on their own role. What was done well, what was not? Did the working method prove successful and were concrete insights gained from the group dynamics? Which parts fit Wetzikon best? Could it be accepted by the local population, both socially and politically?

# Situation Analysis

I Robenhausener Riet



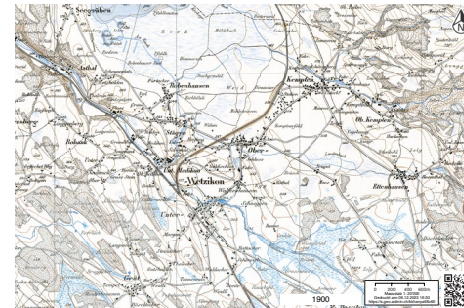
# Settlement Structure I

Wetzikon is a municipality located in the canton of Zurich, Switzerland. It was first mentioned in a document in 1044 as Weihenchovan. However, its history dates to the Roman times, with evidence of Stone Age burial mounds and later settlements of fishermen and farmers in pile dwellings at Robenhausen, which is also an UNESCO World Heritage Site (Stadtverwaltung Wetzikon, 2023; Swiss Coordination Group UNESCO Palafittes, 2023).

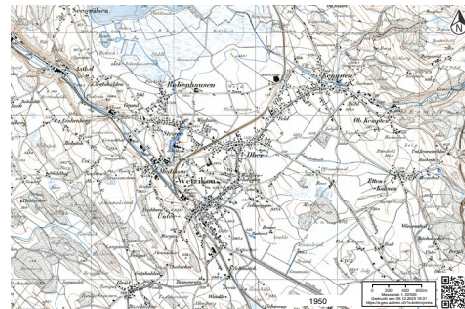
The settlement structure of Wetzikon emerged from the uncoordinated amalgamation of the communities of Kempton, Robenhausen, Oberwetzikon, Unterwetzikon, Ettenhausen, and Robank. Due to poor planned urban development in the past century, Wetzikon has evolved into a city without a proper center. The strong focus on motorized transportation hinders the development of a vibrant city center with pedestrian friendly streets and cultural vitality.



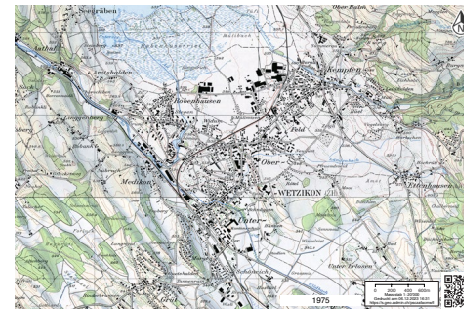
II Federal map 1864



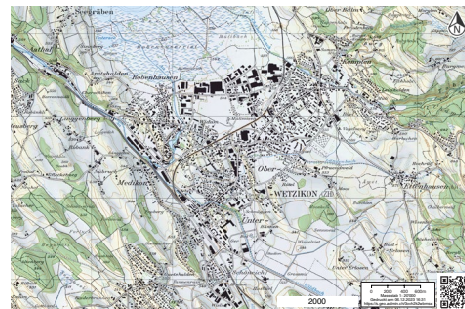
III Federal map 1900



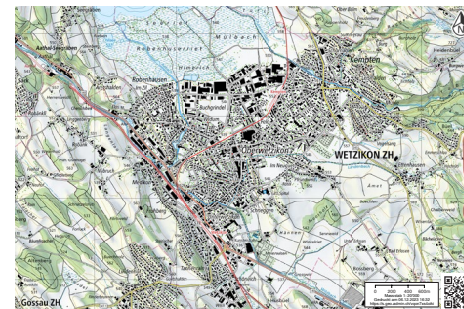
IV Federal map 1950



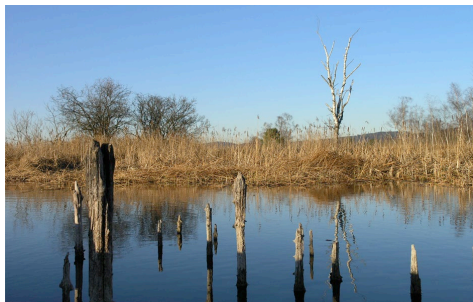
V Federal map 1975



VI Federal map 2000



VII Federal map 2020



VIII Pile builder housing in Lake Pfäffikon

0 600 1200 1800 m



In the map sections depicting figures (1864-2020; Swisstopo, 2023), one can clearly see how Wetzikon has evolved from small farming villages into a grown-together city.

Between 1950 and 1975 was a very high growth of the settlement area. Large industrial buildings were built in the northern part of Wetzikon. Along Bahnhofstrasse, city development extends from the immediate vicinity of the streets to inner areas. Over the past two decades, developments have gradually formed around Kempton, while the area on both sides of the main train station have become denser. Another strong growth can be observed between 2000 and 2020.

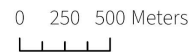
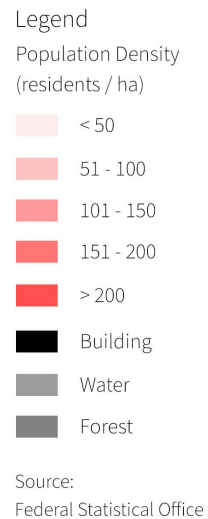


IX Old industry in Wetzikon

# Settlement structure II

The current settlement structure comprises a denser central area, which is characterized by mixed-use areas along the main axis. Another central element is the commercial and industrial zones, primarily located in the northern part and around the Wetzikon train station. Moving towards the outskirts of the settlement, population density decreases as the structure predominantly consists of single-family homes. The population density map illustrates a generally uniform population density across the settlement area, featuring a few clusters of exceptionally high density, notably in the Oberwetzikon region characterized by concentrated block developments and tall buildings.

The amalgamation of individual communities into a unified whole has resulted in a relatively loose settlement structure for the urban area, with numerous open spaces that can play a crucial role in future development.

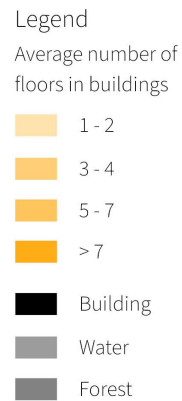


X Population density map

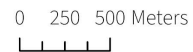
# Settlement structure III

The settlement structure is also influenced by the topology of the buildings. The building topology in Switzerland depends a lot on the existing building law. This means that we have in a specific building zone a similar building topology. In Wetzikon, these zone-specific similar building topologies can be found particularly in the newer block settlements, which are distributed throughout Wetzikon, and in the single-family dwellings on the outskirts of Wetzikon.

The city center along the Bahnhofstrasse has grown historically and has very different building typologies from small old houses to very high buildings. The number of floor map gives a little overview of the most common building typologies at different places.



Source:  
Federal Statistical Office



XI Number of floors in buildings map

# Landscape I

Wetzikon is a small town in the Zurich Highland's region, situated between Uster and Hinwil. Wetzikon covers an area of 16.81 square kilometers (ZH, 2023f). The landscape surrounding Wetzikon is predominantly rural and gently hilly. These hilly features were shaped by the melting of the Linth Glacier towards the end of the last ice age, resulting in the formation of drumlins through the deposition of glacial moraine material (Pro Natura, 2023). The drumlin landscape around Wetzikon is recognized as part of the Federal Inventory of Landscapes and Natural Monuments of national importance (BLN) (BAFU, 2017).

A prominent landscape element is the Pfäffikersee and its adjoining extensive wetlands. These two landscape features are of great importance for the biodiversity of the flora and fauna, as well as for the recreational needs of Wetzikon's population. They are also

nationally important and are designated as nature reserves (Naturschutzverein Wetzikon-Seegräben, 2023), thus receiving special protection.

In addition to its characteristic hilly terrain, the open areas outside the urban area bear a strong agricultural imprint. Alongside farmland, there are some orchard meadows that also contribute to Wetzikon's landscape. However, the agricultural imprint of the landscape around Wetzikon can be considered rather monotonous, as it contains numerous large, intensively used land parcels, and lacks agricultural structures such as tall trees or hedgerows.

	settlement area (%)	agricultural area (%)	forested areas (%)	non-productive land (%)
1985	25.9	44.1	17.2	12.7
1997	28.3	42.1	16.9	12.6
2009	31.4	39.1	16.6	13
2018	32.4	37.8	16.8	12.9

XII Land cover in Wetzikon



XIII Wetzikon Strandbadstrasse

## Land cover

The land cover in Wetzikon has undergone significant changes in recent decades. During this period, the proportion of settled areas relative to the total area increased at the expense of agricultural land. In contrast, the proportion of agricultural land as a percentage of the total area has decreased. Forested and non-productive areas have experienced minimal changes. This indicates that agricultural areas in Wetzikon are under considerable pressure, and there has been substantial sealing of valuable land over the past 40 years.

Fortunately, in recent years, this trend has somewhat slowed down. The increase in settlement areas between 2009 and 2018 was significantly slower than between 1985 and 1997.

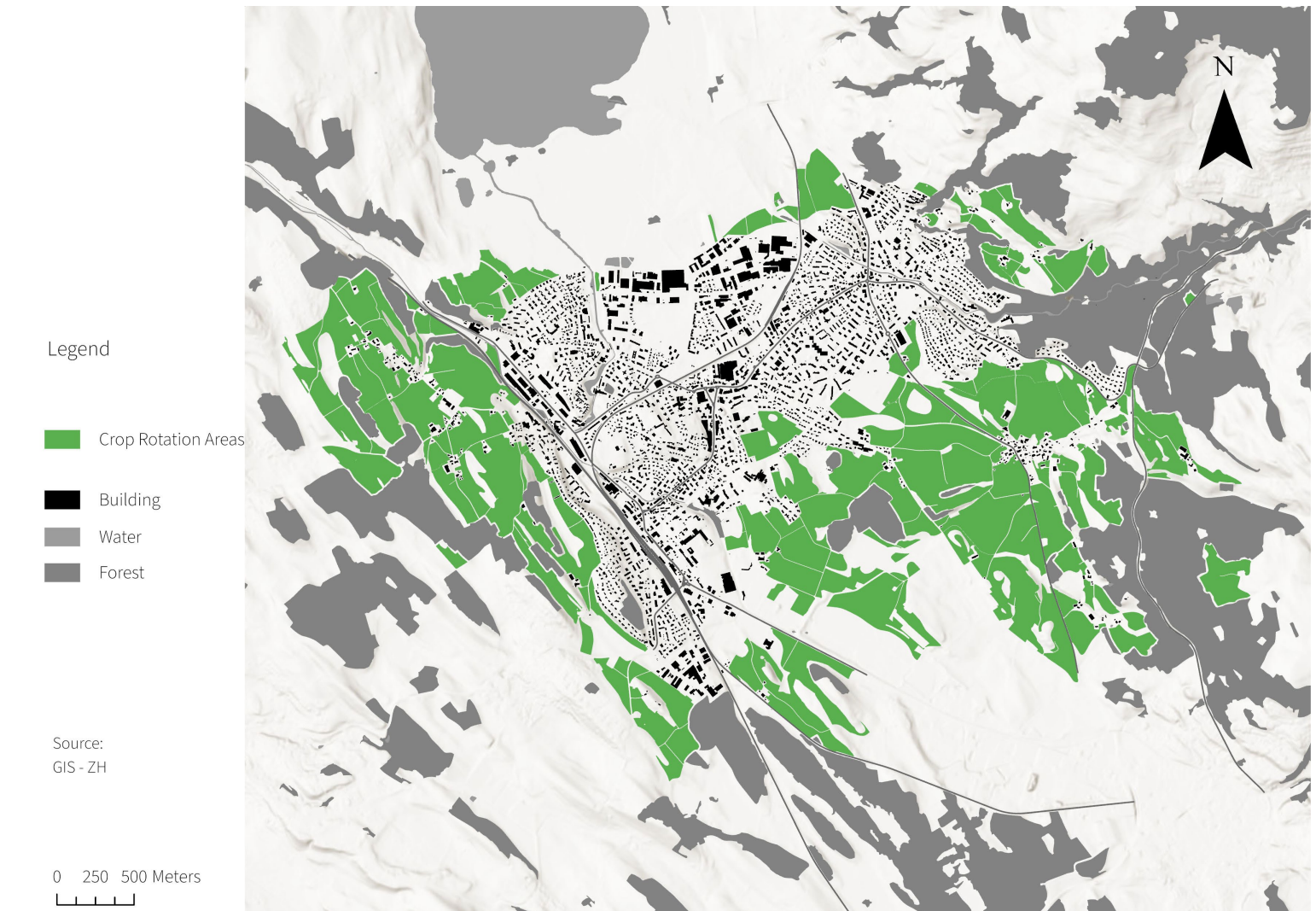
# Landscape II

## Crop rotation areas

Crop rotation areas are highly valuable for agricultural production, known for their excellent quality, and thus hold the potential for the highest yields (ARE, 2023a). In the area of Wetzikon, a significant portion of agricultural land is composed of crop rotation areas or is at least conditionally suitable for crop rotation, like we see in figure (crop rotation areas). Crop rotation areas are under special protection (ARE, 2023a).

## Green areas and city climate

Within the urban area of Wetzikon, there are still several larger parcels of land that have not been developed, and therefore could be considered as potential green spaces in the planning process. Open green spaces are also valuable for the microclimate regulation of the city. The open green map shows the largest open green spaces within the settlement area of Wetzikon. We can see on the heat map (XXXV), Wetzikon has some problems with the microclimate especially around the Bahnhofstrasse. This map shows the human perceived heat in the afternoon. The highest temperatures occur in areas with minimal greenery and extensive paved surfaces. Almost all the surfaces which show the highest temperatures in map XXXV are sealed. However, green spaces and



XIV Crop rotation areas map

urban greening measures conflict with the goal of urban densification, where these remaining open spaces within the city limits could be used for further

developments.

# Landscape III

In our analysis on map (Open green map) we can also see that the existing green areas are not connected. Connection of these multiple green spaces could be valuable to shape green corridors which are very important for biodiversity (Artmann et al., 2017) and cold ventilation corridors, which would further improve the climate situation (Min Son et al., 2022).


## Interpretation

The Swiss landscape concept sets clear quality targets for urban and peri-urban landscapes (BAFU, 2020). Wetzikon's potential lies primarily in preserving and incorporating the remaining green areas within the urban zone into the planning process. This can lead to valuable areas for regulating microclimates, enhancing biodiversity, and providing opportunities for recreation. Wetzikon possesses substantial areas designated for crop rotation, which are threatened by urban expansion and must be particularly considered in future planning. Currently, several problem areas have emerged, especially in terms of securing and developing green spaces, urban densification and enhancing the cityscape, and the development of a culturally vibrant city center.

### Legend

-  Open Green
-  Building
-  Water
-  Forest

Source:  
Own selection

0 250 500 Meters  




XV Open green map

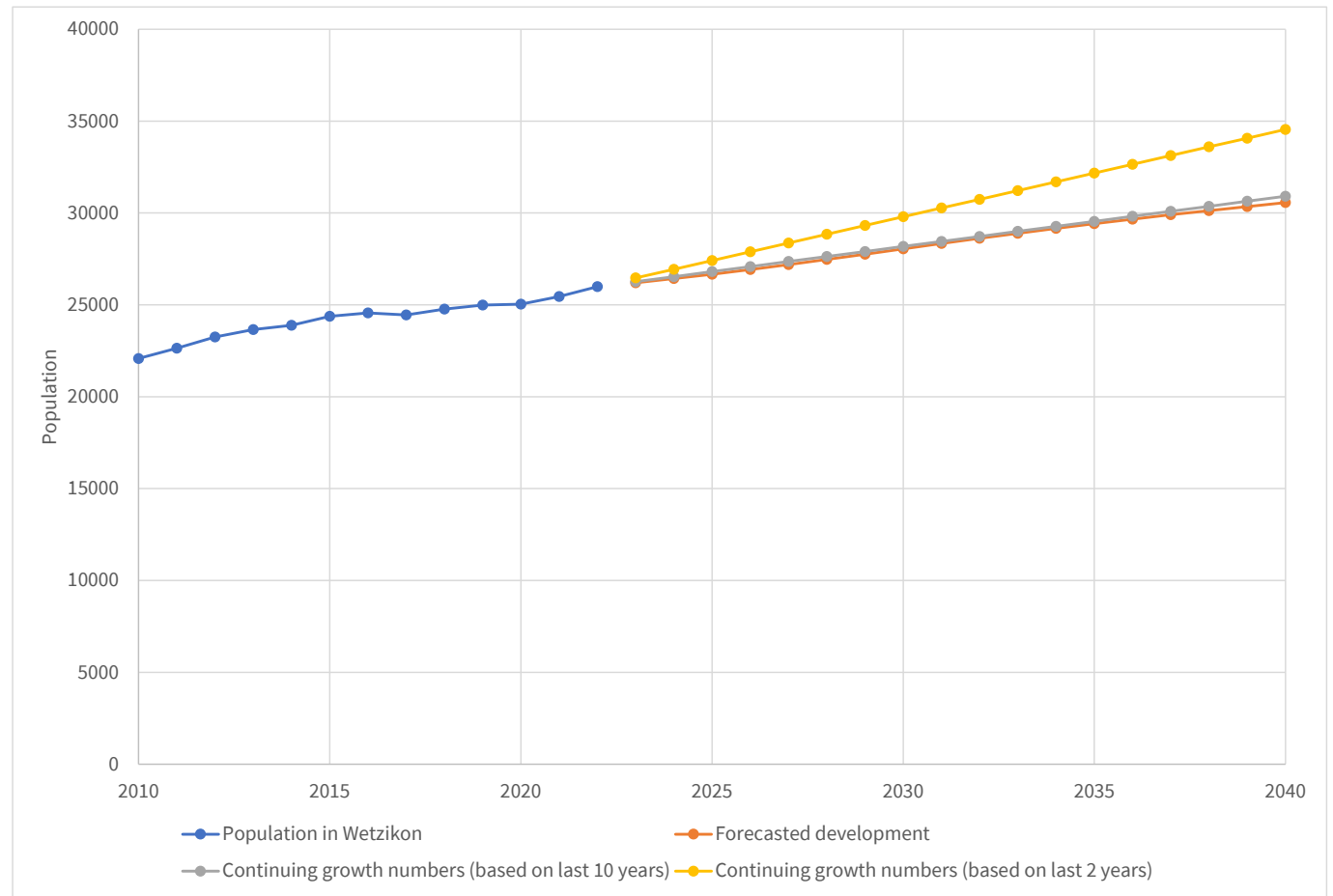


# Demographics I

In 2022, 25'989 people lived in the municipality of Wetzikon (ZH, 2023f). Of these, 7'079 people do not have a Swiss passport, which corresponds to a proportion of foreigners of 27.2%. This value is significantly higher than in the Oberland region, but comparable to the entire canton of Zurich.

## Population development

Compared to the canton and the Oberland region, the population increased above average by 2.1% in the previous year. In the last five years, growth has also been over-proportional compared to the region and the canton. (Statistisches Amt, 2023). The canton has published a population forecast for all regions of Zurich in 2020 (Statistisches Amt, 2022). If this forecast is applied proportionally to the municipality of Wetzikon, Wetzikon will grow by 4'576 inhabitants by 2040. Looking at historical trends, Wetzikon has grown faster than the canton or the region of Hinwil.



	Wetzikon	Oberland	ZH
Population	25'989	174'364	1'577'468
Percentage of foreigners	27.2	20.4	27.6
Percentage of population under 19 years old	20.2	20.4	19.7
Percentage of population over 65 years old	17.9	19.3	17.3
Population increase 1 year	2.1	0.9	1
Population increase 5 years	6.3	4.6	5.3

XVI Population development

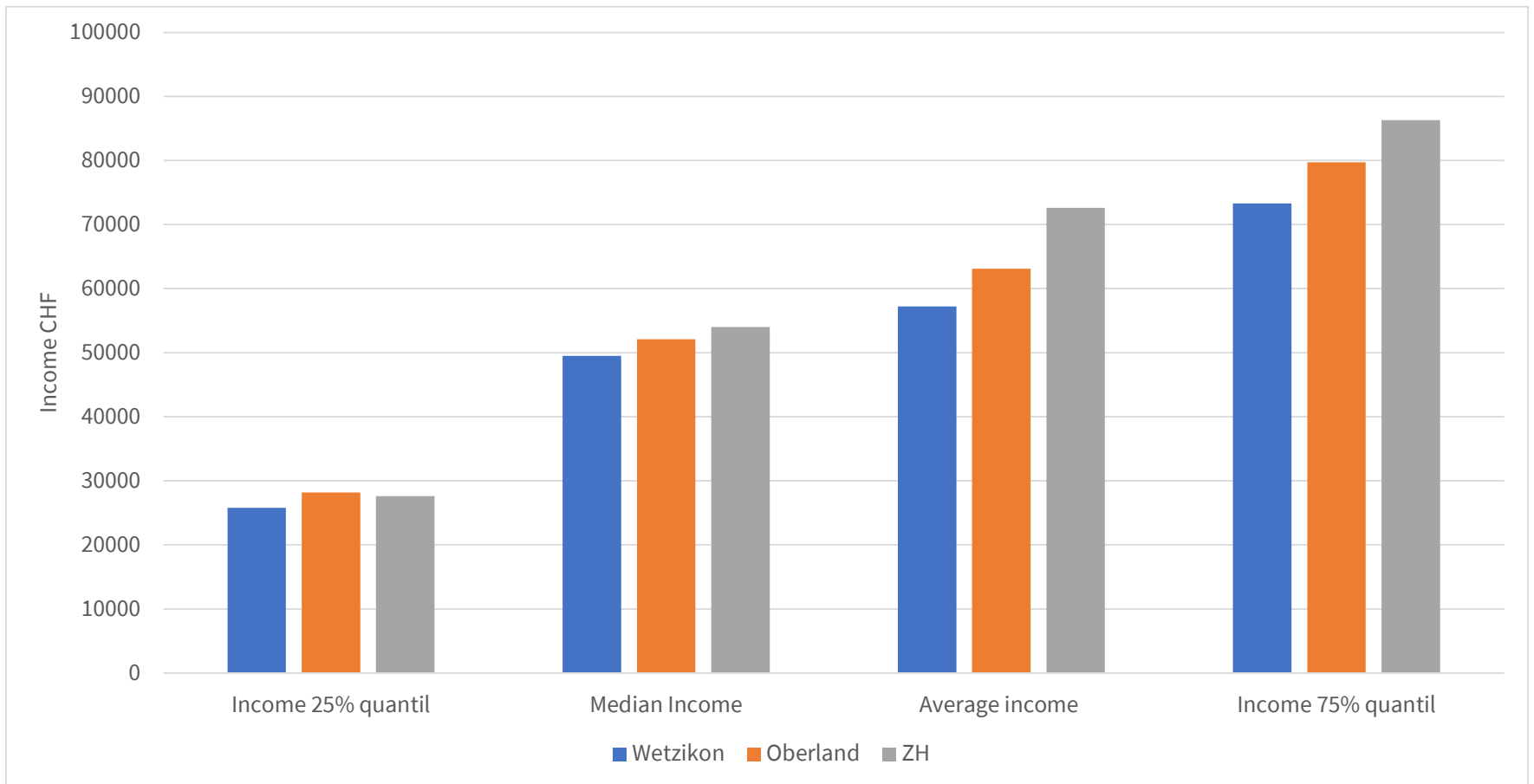
Based on the trend of the last 2 and 10 years, Wetzikon would grow by 4'923 and 8'559 inhabitants respectively. To simplify the assessment and future calculations, a rounded average of 6'000 new inhabitants by 2040 is used.

XVII Demographics table

# Demographics II

## Housing

There are 12'505 apartments in Wetzikon, of which 1'748 are single-family homes. The vacancy rate of 1.01% in Wetzikon is significantly higher than in the entire canton of Zurich (0.53%) but fluctuates strongly (ZH, 2023f). In Wetzikon, there is a building cooperative (Gemeinnützige Baugenossenschaft Wetzikon) that builds and rents out non-profit apartments, but the share of non-profit apartments in Wetzikon is still significantly lower (4.6%) than the cantonal average (9.9%) (ZH, 2023f).



## Income

The taxable income of natural persons is significantly lower than in the entire canton and the Oberland region. (ZH, 2023f)

## Building zones

The municipality of Wetzikon has 505.7 ha of building zones. Of these, 93.3%

are built. Per capita this corresponds to 188.5 m<sup>2</sup>. This leaves 33.8 ha of undeveloped building zones. (ZH, 2023f)

## Interpretation

The canton forecasts strong growth for the district of Hinwil and thus also for

Wetzikon until 2040. However, Wetzikon's growth in recent years shows that these expectations are quite justified. Nevertheless, there are some challenges for Wetzikon, especially the question of where to build the additional housing that is needed. There is not enough

XVIII Taxable income

zoned building land available and the densification in the existing settlement area creates additional challenges.

# Economy

Wetzikon is part of one most dynamic economic region in Switzerland (Wetzikon, 2023a) and has strong economic foundation with companies in various industries. Alongside Uster, Wetzikon forms the economic cluster in the Zurich Oberland (Wetzikon, 2023a) In recent years, the number of jobs in Wetzikon has increased, unemployment has decreased (ZH, 2023f). In 2022, the unemployment rate for people aged 15 to 65 was 2%, above the cantonal average of 1.8% (ZH, 2023i).

In 2021, there were 1'824 workplaces, resulting in 14'354 job opportunities in Wetzikon (ZH, 2023f). Over the years, Wetzikon has transformed from an industrial hub into a service-oriented tertiary sector center (Schuler, 2010).

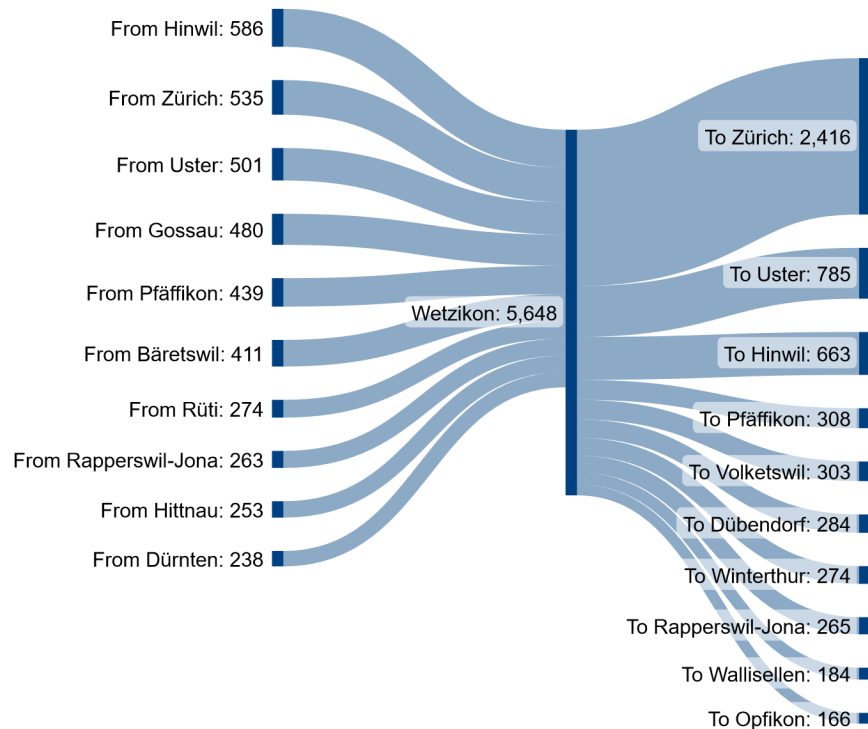
Wetzikon boasts a wide range of economic sectors, including services, retail, agriculture, manufacturing, and high-tech companies. This diversity contributes to the city's economic stability and diversification. Wetzikon is home to a mix of small and medium-sized

	Primary Sector	Secondary Sector	Tertiary Sector	Total
Number of employees	75	3369	10910	14354

XIX Number of employees

	Micro (0-9)	Small (10-49)	Medium (50-249)	Large (250+)
Number of companies	1612	179	30	3

XX Number of companies



enterprises, as well as larger corporation. The largest companies which have their headquarters in Wetzikon 2020 are Reichle & De-Massari AG, Elma Electronic AG and Opal Associates AG (ZH, 2021).

## Commuters to and from Wetzikon

Commuting movements between Wetzikon and other areas significantly shape the traffic dynamics. Figure X offers a look at the ten primary commuting routes to and from Wetzikon. The most substantial movement into Wetzikon comes from Hinwil, while the predominant outflow is directed towards Zurich. The top ten destinations contribute to a total outflow of 5,648 commuters.

XXI Commuter analysis

## Interpretation

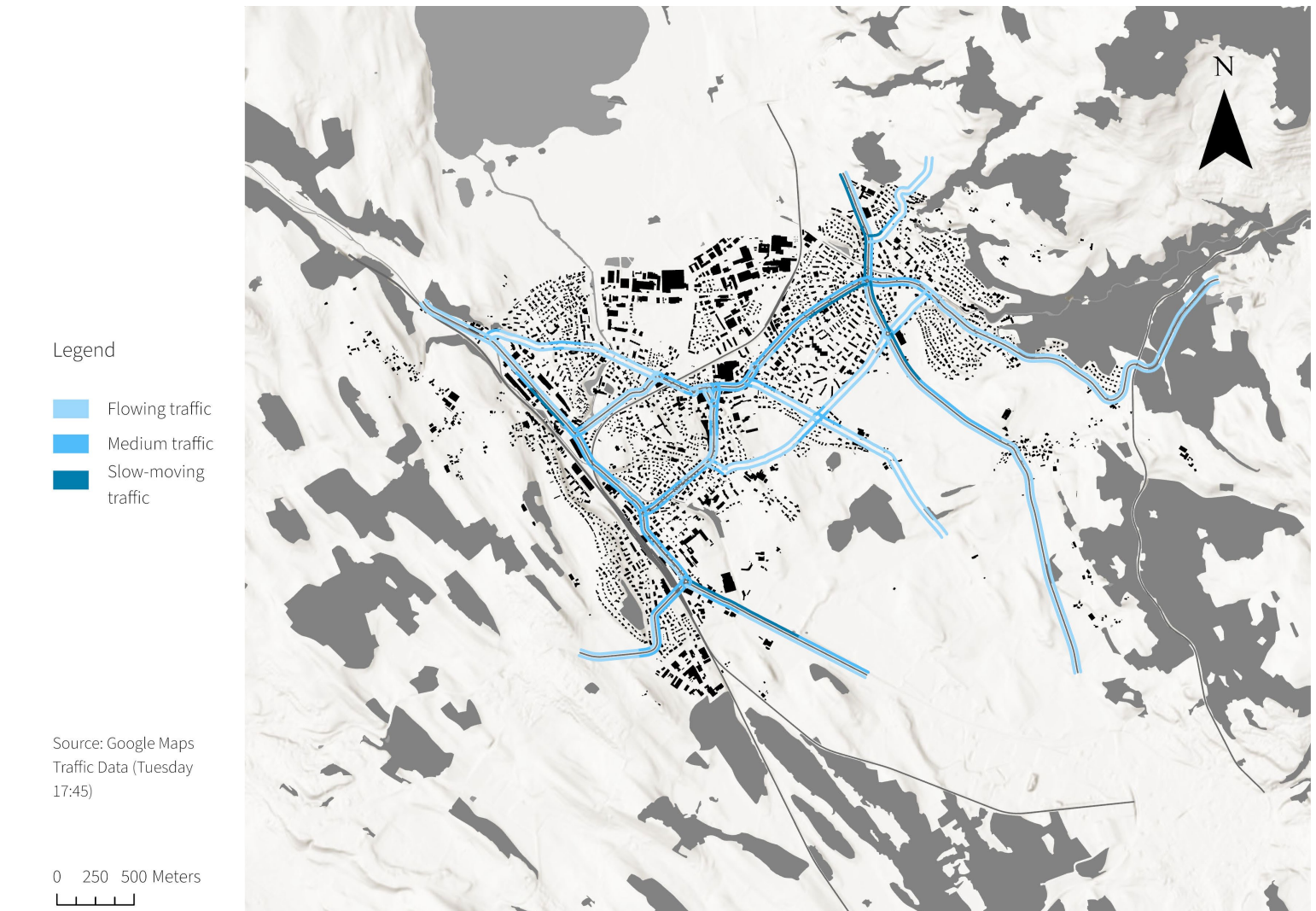
Overall, the situational analysis indicates that the economy in Wetzikon is robust and offers potential for further growth and development. For the future, it could be significant that Wetzikon's economy continues to demonstrate innovation. Considering the establishment of companies in the renewable energy sector might be advisable. Wetzikon is currently highly car-oriented, and the city area is congested with traffic. For urban development, it would be beneficial to coordinate spatial planning and economic development in a way that encourages as many Wetzikon residents as possible to both work and live within the city.

# Motorized Individual Traffic

Wetzikon is crossed by two major roads. The western part is crossed by the national road Zürcherstrasse/Rapperswilerstrasse and the eastern part by the Hinwilerstrasse/Pfäffikerstrasse. Connecting the two and running north-south is the Bahnhofstrasse, which then continues as Tösstalstrasse to Bäretswil. The rest of the city is well served by municipal roads. Special mention should be made of Usterstrasse, which was converted into a 30 km/h zone in 2022 (Wetzikon, 2022c).

Due to the missing section of the A15 motorway, all traffic from Uster towards Hinwil must cross Unterwetzikon. This puts a lot of pressure on this road as well as its junctions and causes traffic jams at rush hour. To combat this, the Rapperswiler-/ Schwändistrasse traffic light has a metering function and generates backlogs. To ensure that public transport is not affected by the backlog, a bus lane has been implemented there.

Solving the traffic problems by addressing and improving the overall situation is critical. Many of the known problems in the city are consequences of high traffic volumes. The delayed buses, the low attractiveness of the center and the general quality of life are all related to this topic. After the rejection of the west



XXII Traffic analysis map

bypass due to the protection of the wetlands, Wetzikon has examined numerous measures in recent years to improve the traffic situation in the center

and in Unterwetzikon. The measures are mainly aimed at additional infrastructure measures to relieve the center (Wetzikon, 2023b).

# Public transport I

Wetzikon has a comprehensive public transport network, with 4 railway lines connecting Wetzikon with Uster, Zürich, Rapperswil, Hinwil and Pfäffikon ZH and 12 bus lines, connecting the neighboring regions and the internal neighborhoods. The busses and trains are well connected in Wetzikon station. (SBB, 2023)

Insufficient frequency and number of services

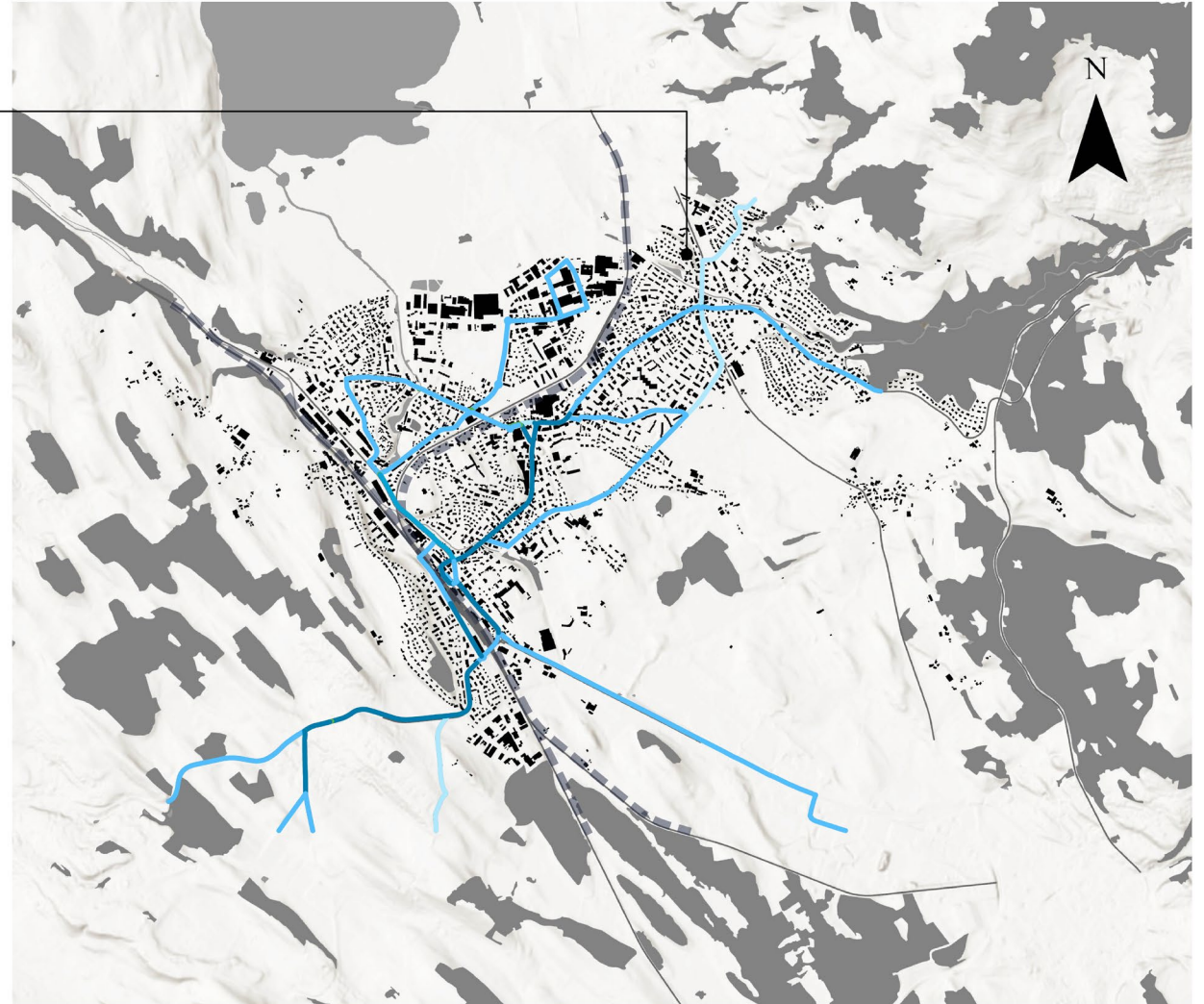
## Legend

Total frequency of bus per hour on the path

- 8-16
- 4-7
- 1-3

Source:  
GIS-Browser - Kanton  
Zürich

0 250 500 Meters



XXIII Bus service map

# Public transport II

## Delays

However, congestion situations and thus time delays for the buses occur at the Ochsenkreisel and the Bahnhofstrasse / Zürcherstrasse intersection (VZO, 2023). Since a reliable transfer from the bus to the train is crucial, larger buffer times must be planned than necessary. This increases travel times and decreases the efficiency of public transport network. Additionally, due to the limited stopping edges at Wetzikon station, bus lines must share these edges, further contributing to logistical challenges and potential delays.

Inpunctuality due to traffic congestion

### Legend

Punctuality

- higher than 90%
- lower than 90%

Source:  
puenktlichkeit.ch

0 250 500 Meters



XXIV Bus punctuality map

# Public transport III

## Public transport quality classes

Wetzikon's bus coverage is good, even though the majority of residents live in a public transport quality class of C or worse.

Considering the expected large increase in population in the coming decades, the existing services will not be able to fully accommodate the demand in the future (VZO, 2023). Improvements are necessary.

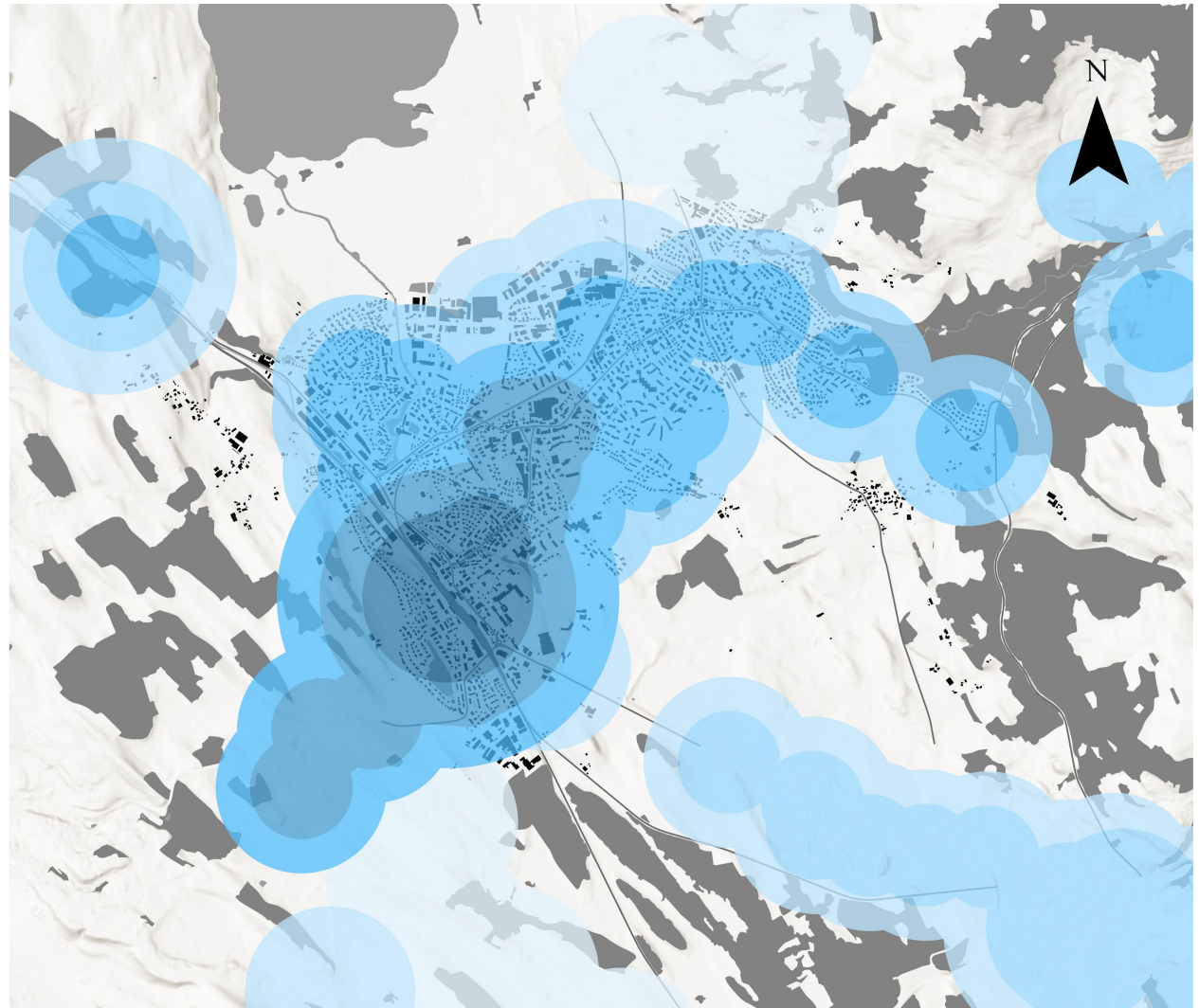
### Legend

Public transport quality class (A the best)



Source:  
GIS-Browser - Kanton  
Zürich

0 250 500 Meters



XXV Public transport quality class map

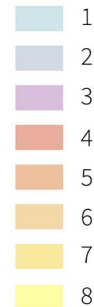
# Pedestrian traffic

The pedestrian traffic infrastructure in Wetzikon is well developed. Most of the roads have sidewalks which are generally 1.80 to 2.50 meters wide and are structurally set back from the road (Swisstopo, 2023). They are designed to be barrier-free, i.e., there are no major height transitions to overcome, which is important for use with baby carriages, wheelchairs, and walkers. Crosswalks are frequent along the streets, especially at all major intersections. However, there are also sections of road close to the center where there are no crosswalks for more than 240 meters (Swisstopo, 2023). The crosswalks are usually not equipped with traffic lights with the exception of those at the traffic light-controlled intersections.

The pedestrian traffic potential map for Wetzikon shows that the area between Wetzikon train station and the center of Kempten as well as the center of Robenhausen has a high potential for pedestrian traffic (GIS ZH, 2023). This is due to both the higher building density, the presence of public transportation, and the higher density of services. Outer neighborhoods have a significantly reduced potential for pedestrian traffic.

## Legend

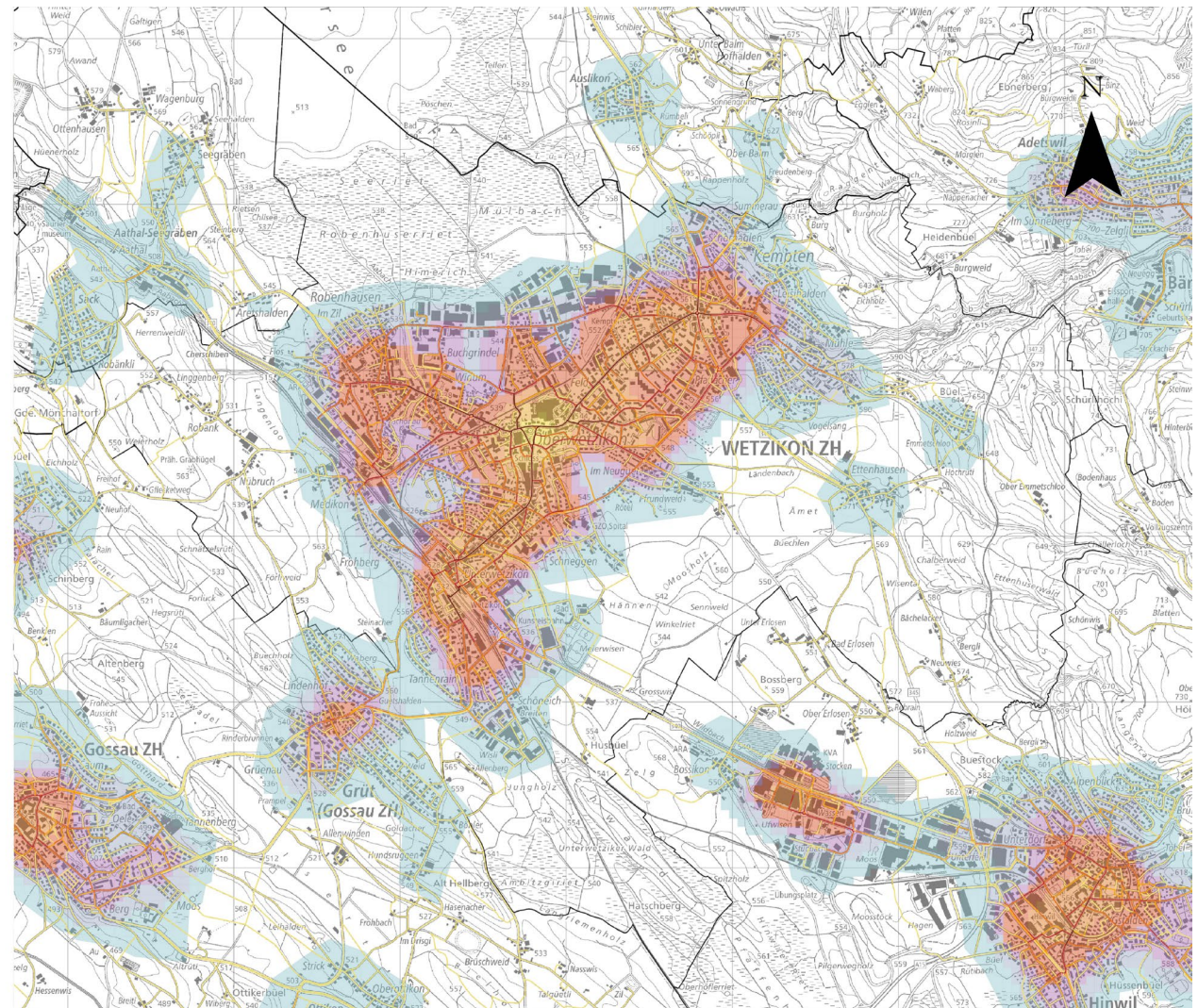
Plot potential  
(8 the highest)



Road potential  
(5 the highest)



Source:  
GIS-Browser Kanton Zürich



XXVI Pedestrian potential map

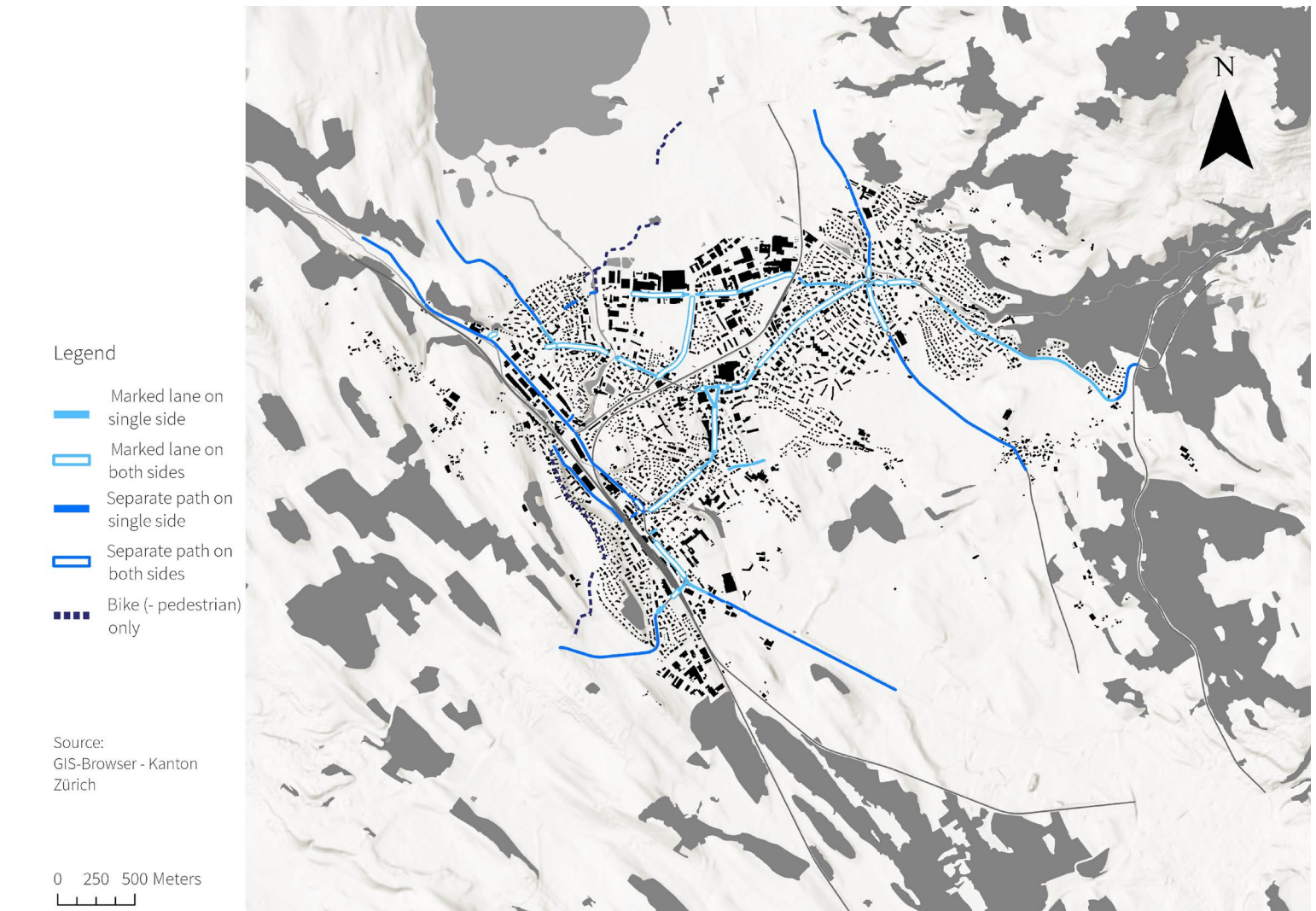


# Bicycle traffic

Wetzikon only has cycle lanes on the busiest roads, mostly on the arterial roads to the surrounding municipalities (GIS ZH, 2023). On-site observations showed that at many intersections, for example at the junction between Bahnhofstrasse and Zürcherstrasse near the train station, there are no dedicated bicycle lanes and bicycles must merge into the busy traffic. The bicycle lanes are narrow in many places, at just 1.50 meters (Swisstopo, 2023). Combined with the heavy traffic, especially with the many trucks crossing Wetzikon, the perceived safety is very low.

## Interpretation

Wetzikon has a well-developed pedestrian network and good accessibility by foot for many neighborhoods. During the on-site visit particularly problematic was the noise along Bahnhofstrasse, which significantly restricts the quality of stay. Due to the size of Wetzikon, some neighborhoods can only be reached by bus or bicycle and not on foot from the station or the city center. For many, however, cycling is not a viable alternative, as the existing infrastructure is perceived as unsafe. Cycling is also only partially suitable for traveling to surrounding communities, as despite the good infrastructure between communities, the infrastructure in Wetzikon



XXVII Bicycle infrastructure map

remains unsatisfactory.

Based on these observations, there is a need to expand the bicycle network

within the municipality to improve the accessibility of peripheral neighborhood. A high level of objective and subjective safety is needed to persuade

people to use bicycles in everyday situations.

# Leisure

Located on Zurich highlands and near the Pfäffikersee, Wetzikon has a high quality of natural landscape, and hiking or cycling is an important leisure activity. The daily leisure facilities are primarily concentrated in the city center, the train station, and the Kempten area, including restaurants, bars, cafés, cultural facilities, sport facilities and open spaces.

With the population growth and the possible transformation of the city center, more leisure facilities need to be implemented. Also, the city lacks the “neighborhood-level” of leisure services. Residents need to spend leisure time in the city center, as within some neighborhoods, there are not sufficient spaces for people to stay and attend activities, which also increases the travel time for leisure activities.

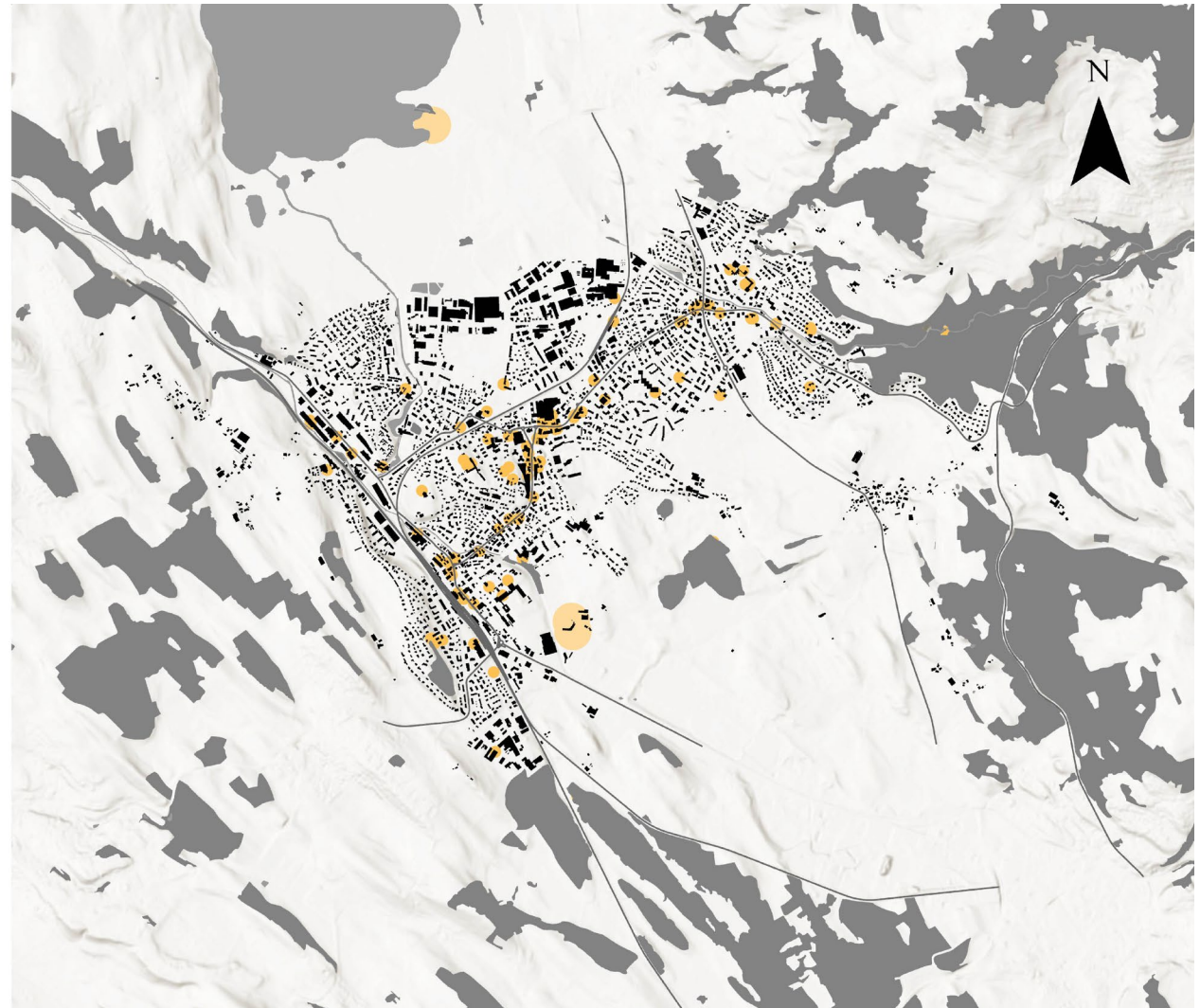
A trail of community gardens is being built in Wetzikon since 2017, one of them being the Färberwiese. This kind of public space offers residents a place to spend their leisure time in the vicinity of their residence (IG Färberwiese, 2023).

## Legend

- Leisure facility
- Large leisure plot

Source:  
Open Street Map

0 250 500 Meters  
└───┬───┬───┘



XXVIII Leisure facilities map

# Education

The spatial distribution of the schools and kindergartens in Wetzikon is good. The class sizes in these educational facilities range from 19 to 23 students, with a slight increase as students grow older (Schulverwaltung Wetzikon, 2023).

For students with different abilities, aged from 4 to 20, Heilpädagogische Schule Wetzikon provides specialized education (Schulverwaltung Wetzikon, 2023). It also offers a unit for integrated special education in mainstream schools, ensuring inclusive learning environments.

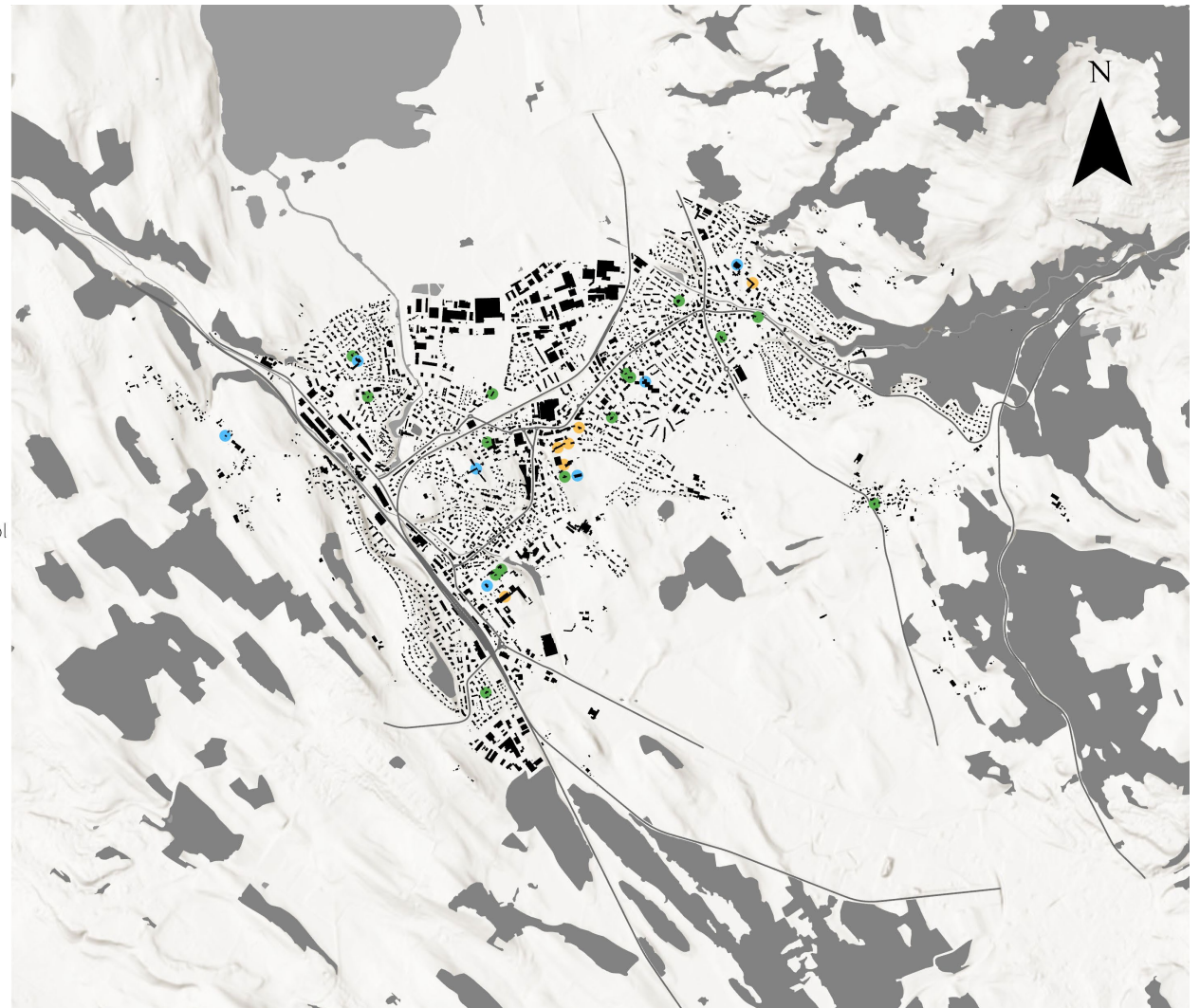
Additionally, Rudolf Steiner School Zürcher Oberland is a private school in Wetzikon that serves students from kindergarten to high school. It offers an independent educational alternative while remaining interchangeable with the public school system. (Rudolf Steiner Schule Zürcher Oberland, 2023).

## Legend

- Kindergarten
- Primary School
- Secondary School
- Building
- Water
- Forest

Source:  
School administration  
Wetzikon

0 250 500 Meters  
└───┬───┬───┘



XXIX Education facilities map

# Health and Energy I

## Health

The Gesundheitsversorgung Zürcher Oberland (GZO), the hospital in Wetzikon, is an important regional healthcare provider. It does not only serve the community of Wetzikon, but also all twelve other communities (“GZO Spital Wetzikon,” 2023). With around 900 employees in 2021 (GZO Spital Wetzikon, 2021) it is one of the largest employers in Wetzikon. The expansion currently under construction will ensure that sufficient capacity is available for the region in the future.

In addition, multiple general practitioners provide good health care in the city. Most of them are located on or near the central axis of Bahnhofstrasse, but a few also offer more local access.

## Heating

Wetzikon currently does not use any district heating. However, a district heating pipeline from the KEZO in Hinwil is planned (ZH, 2023). Additionally, the ARA also has potential to be used as a district heating source. If used correctly, most of the city could be heated with waste heat from KEZO and ARA, with only parts of Kempten requiring other heating methods (EBP, 2022).

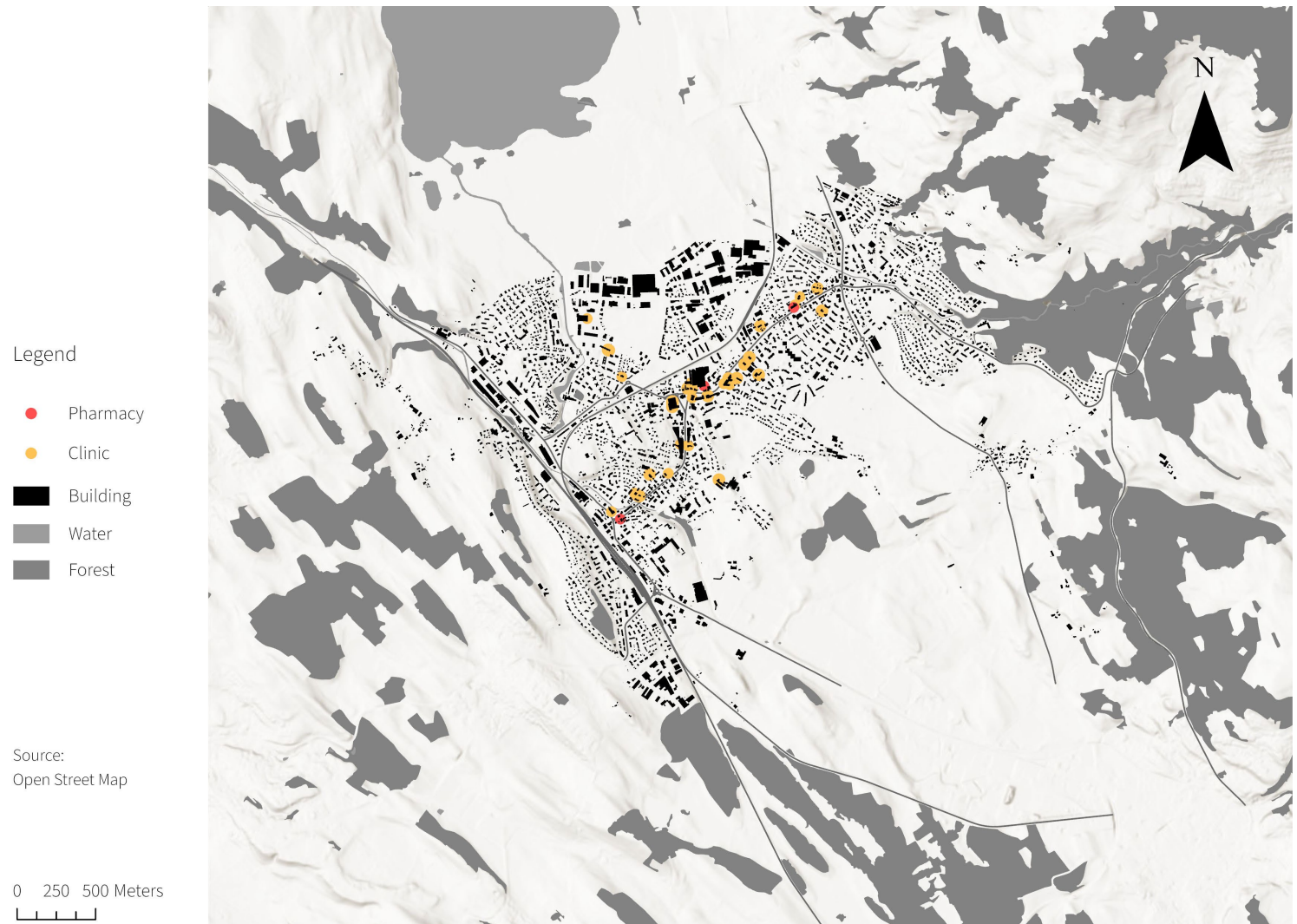
## Gas

Wetzikon is connected to the gas

network through pipelines coming from Gossau, Hinwil and Uster. There are four pressure reducing and measuring stations in Unterwetzikon located in

the new municipal maintenance depot with 13 additional ones spread around the city. The total gas usage is around 120 GWh per year for 2078 end users

(Stadtwerke Wetzikon, 2022), which accounts for 58% of all the heating needs (EBP, 2022).



XXX Health infrastructure map

# Energy II and Infrastructure

## Electricity

Responsible for the electricity in Wetzikon are the Stadtwerke Wetzikon. The city uses 110 GWh of electricity every year (Stadtwerke Wetzikon, 2022). The community is connected to the grid through a substation in the neighbourhood of Schöneich with 65 further transformer stations spread around the city. A high-voltage power line runs along the western border of the municipality. Electricity is also generated within Wetzikon by several photovoltaic systems installed on the roofs of buildings (Bundesamt für Energie BFE, 2023). Two small hydropower plants provide additional electricity to Wetzikon, one is located along the river Aabach close to the ARA, the other one is located close to the border to Bäretswil in the Chämtnerwald.

## Recycling facilities

Wetzikon has a well-developed recycling network. The non-recyclable waste is taken to the Zürcher Oberland waste incineration plant (KEZO) in Hinwil. It is the only such plant in the region and supports 36 communities with waste incineration (Kehrichtverwertung Zürcher Oberland, 2023).

## Interpretation

The health, recycling, and energy infrastructure in Wetzikon is well developed. The proximity of the KEZO waste

incineration plant and the ARA sewage treatment plant offer unique opportunities for the use of district heating. The city has recognized this potential and is

XXXI Recycling facilities map

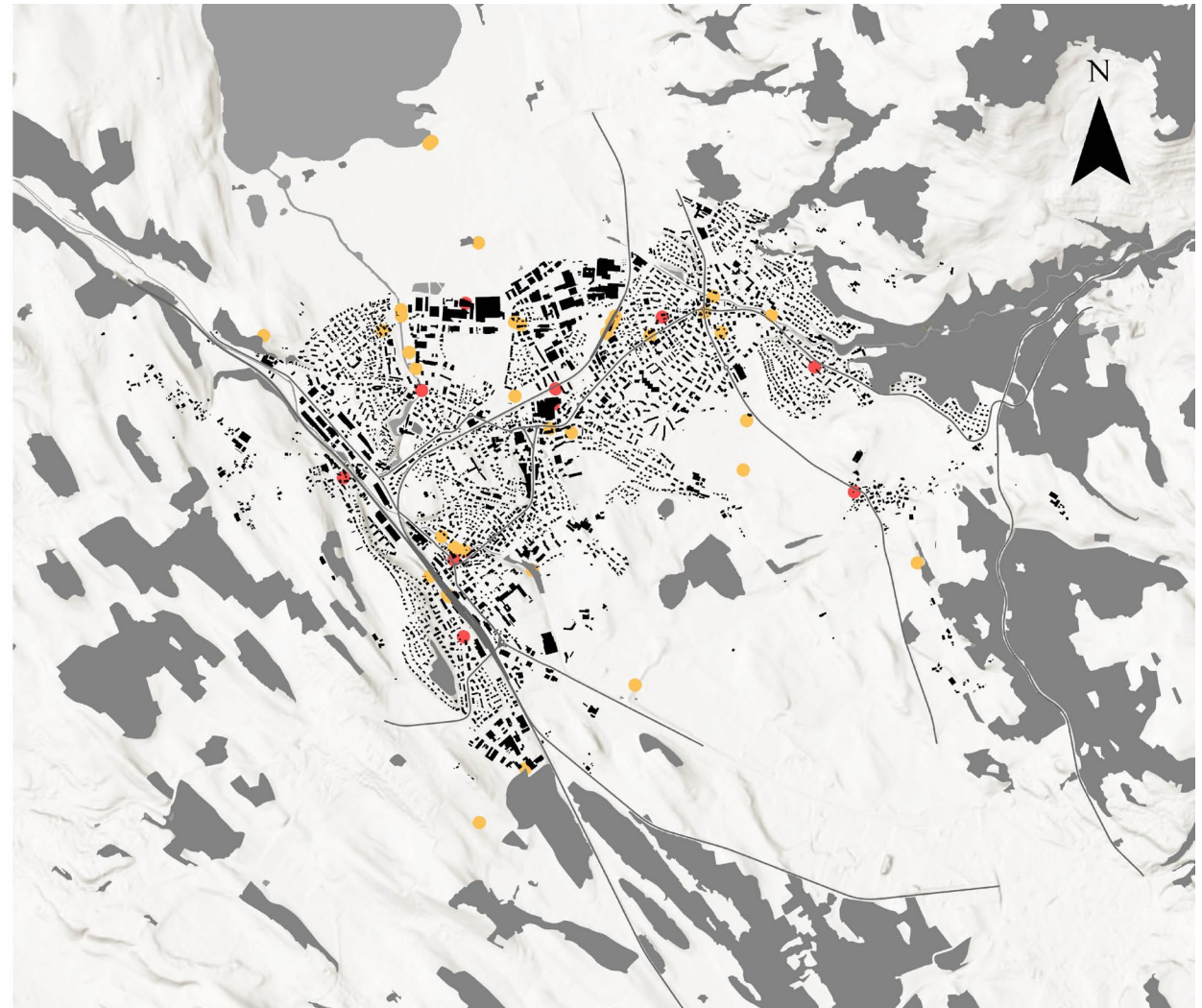
trying to exploit it. So, nothing stands in the way of more sustainable heating.

### Legend

- Recycling point
- Waste basket

Source:  
Open Street Map

0 250 500 Meters  
└───┬───┬───┘



# Future Development

In the strategic plan of the canton of Zurich two big things are proposed as future developments. On the one hand it's closing the gap of the A15 highway as well as the expansion of the railway line to Pfäffikon to two tracks (ZH, 2023b). The proposed highway consists of the construction of a 4-lane highway (2 each direction) between the junction Uster-Ost and the Forchautobahn at the junction Ottikon. An alternative route is being studied, which would follow the current national road from Wetzikon to Hinwil by means of tunnels. The railway expansion consists of upgrading to double track, except in the wetlands of national importance.

Additionally, the Westtangente is still represented in the Richtplan, despite the canton renouncing the idea due to moor protection (ZH, 2021). Alternatives are currently being developed.

While not inside of Wetzikon the double track expansion from Aathal to Uster will have an impact on Wetzikon as well. It is part of the federal government's 2035 expansion plan. Thanks to the expansion, another S-Bahn line will run and the number of connections to Zurich will increase to eight per hour (SBB, 2023).

## Smaller projects

Additionally, multiple smaller projects are planned. These include a cargo handling facility in Schöneich, the new construction of district heating pipeline from the KEZO including a watercourse revitalisation, as well as the extension of the hospital, which is currently under construction.

The Strategic Plan continues to envisage Wetzikon as a regional center. The further development as a regional center for living and working as well as a sports and event center is planned. In addition, development of the town center of Oberwetzikon with a connection to the suburban railway involving Unterwetzikon.

## Regional structure plan

In addition to the planned projects mentioned in the cantonal strategic plan, in the regional strategic plan, a few additional planned projects are being described. One of them is a planned flood retention basin in the Prudendweid region. A new bus terminal is also being proposed. The location and the surrounding area is currently being assessed (Stadt Wetzikon, 2023). The expansion of the current bicycle network is planned all around the city.



XXXII Traffic circle Betzholz



XXXIII Wetzikon Bahnhofstrasse

# Development Strategy

## Vibrant

- People oriented street space
- A thriving city center
- A lively neighborhood

## Green

- De-sealing
- Planting green
- Make use of the open space

## Mobility for everyone

- Safe
- Accessible
- Human centered
- Environmentally friendly

## Inclusive

- Housing in well-accessible areas
- Inclusively designed street space
- Community activity center

## Future oriented

- Provide space for people
- Provide jobs for people
- Inward development

The five development goals are created in order to enhance Wetzikon's attractiveness and make it more pleasant to live in. The aim is to ensure that the residents of Wetzikon are increasingly able to take care of their needs in Wetzikon and are happy to do so in this town.

This has several advantages. On the one hand, a revitalization of the center leads to an increase in attractiveness and thus to a further increase in use. On the other hand, reducing commuting distances leads to a reduction in traffic emissions, which also has a positive effect on the attractiveness of the center.

These two positive feedback loops should be used to strengthen the center of Wetzikon and make it more economically attractive for commercial enterprises.



# Vibrant

Wetzikon should be a lively city, a city in which the citizens like to stay and spend their time. For this purpose, the residents of Wetzikon and the surrounding communities should find all necessary services and facilities in Wetzikon. People should explore new tastes in innovative restaurants, make new acquaintances in cozy cafés, try out new leisure activities and enjoy outstanding music. In doing so, Wetzikon should consciously establish an independent offering. The goal is to convince as many as possible to live out and enjoy life in Wetzikon. We want to achieve this by focusing on the following points:

## People oriented street space

Streets are for the people, so they should be designed that way. People expect a pleasant street space, a street space in which they enjoy spending time. The redesign of streets should be consistently oriented towards this principle. Roads should be safe for everyone. This is reflected in new street cross-sections that are oriented to the needs of all users, harmonized and reduced speeds, and recreational opportunities.

## A thriving city center

The city center should be transformed into a thriving one. At the very least, the conditions should be created for the

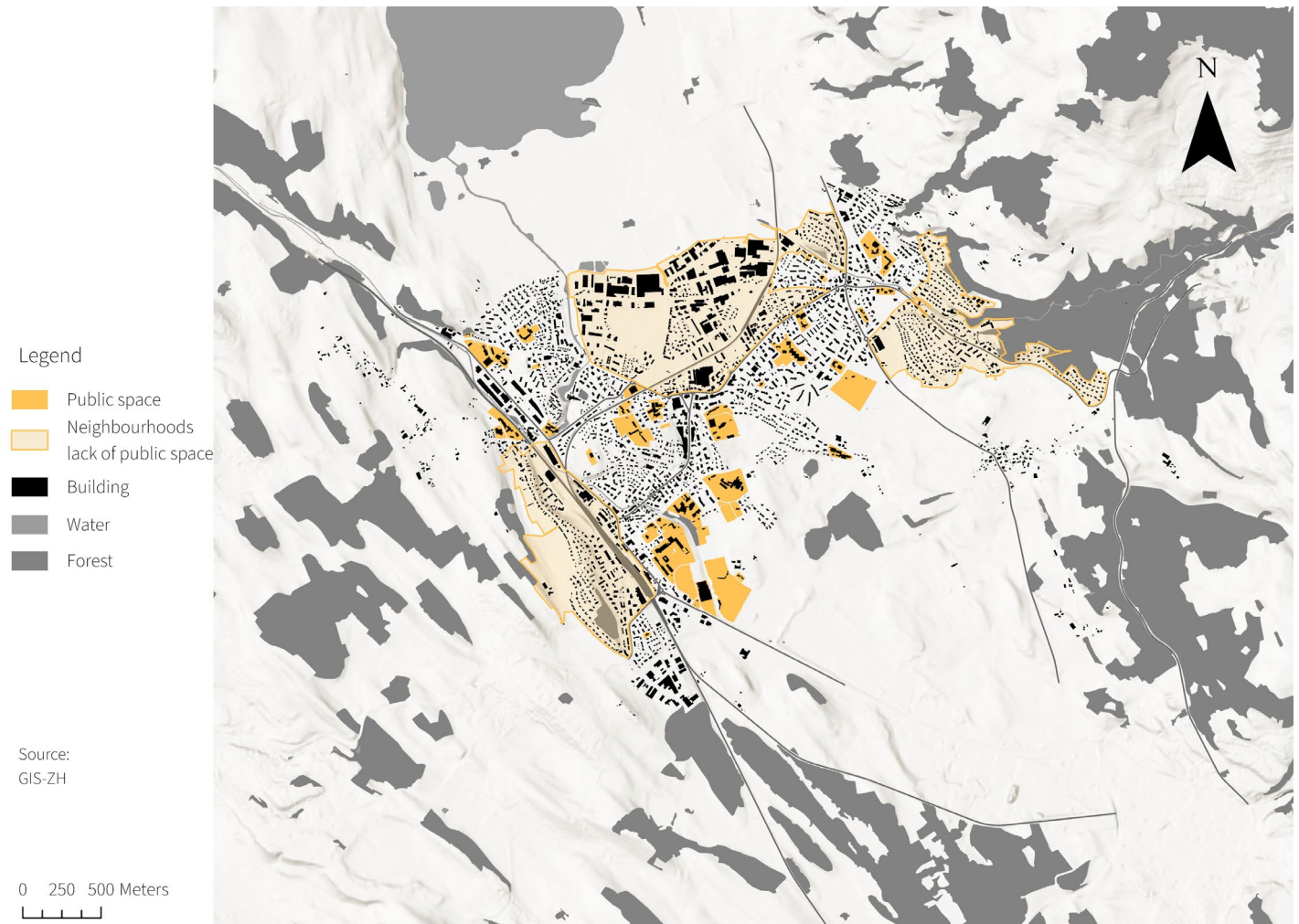
city center to be revitalized. To achieve this, there needs to be a wide range of attractive offerings, such as restaurants, cafes, shopping stores, recreational opportunities, event spaces or sports facilities. This leads to social interactions

and thus to a revitalization of the city center.

## A lively neighborhood

Not only should the city center be revitalized, but also more life should take

place in the neighborhoods. This can be achieved with playgrounds, meeting facilities for young people, parks, squares and community gardens.



XXXIV Public spaces map

# Green

Wetzikon should become a green city. Green cities have numerous advantages in times of climate change. Green cities store water, improve the microclimate, reduce the temperature within the city and increase the quality of living. In addition to the benefits for people, green cities also offer major benefits for biodiversity and thus the preservation of flora and fauna.

## De-sealing

De-sealing is one of the most important measures to bring additional green into cities. Sealed surfaces heat up faster, retain it and do not store water. In many cases, greening is only possible if the asphalt surfaces have been de-sealed. Wetzikon has a lot of sealed surfaces in the city center so there is a huge potential for de-sealing and improving the climate situation.

## Planting green

Trees, bushes, plant beds as well as green facades and roofs store water, cool the environment and increase the quality of living. People like to be surrounded by plants. Trees are also important to store CO2-emissions.

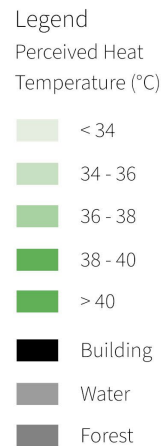
## Make use of the open space

Wetzikon already has numerous green spaces. However, these are not always designed in such a way that people

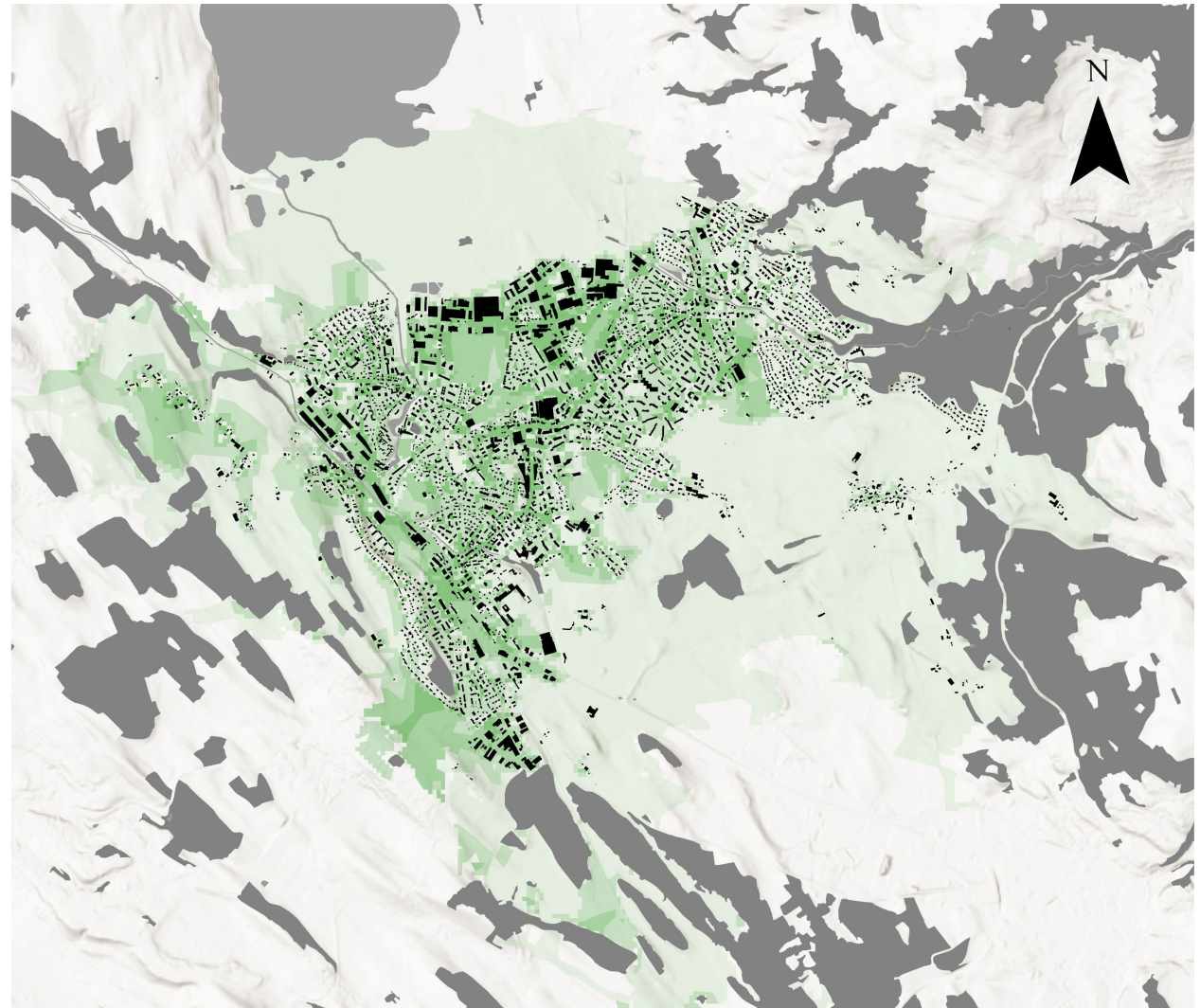
enjoy spending time there. To change this, they should be opened for people, benches should be installed, and regular activities should take place.

Another problem is the disconnection of the several green spaces in Wetzikon. On one side it is very important for the biodiversity that the green spaces are

connected and on the other side this is also more convenient for the users of green spaces.



Source:  
GIS-ZH



XXXV Perceived heat map

# Mobility

Mobility enables participation in social and economic life. Therefore, everyone should have access to mobility, no matter how old or young, how mobile or impaired. Today, the availability of mobility is distributed very differently, underage, old, physically or mentally impaired as well as poor people have a very difficult access to cars and thus in many places to mobility in general. Many of these people depend on other people or other means of transport, which are also not available in every case or are associated with reduced safety. Therefore, when planning mobility, we want to consider all means of transportation according to their individual strengths and rely on the most efficient and environmentally friendly means of transportation in each case.

## Safe

All people should be able to take care of their needs safely, both in terms of perceived and measured safety. To increase safety, the speed between road users should be harmonized, bike lanes should be separate, and intersections should be unbundled.

## Reliable

Public transportation must be reliable to meet everyday needs. This includes high availability and punctuality, a

good frequency, and well-coordinated connections.

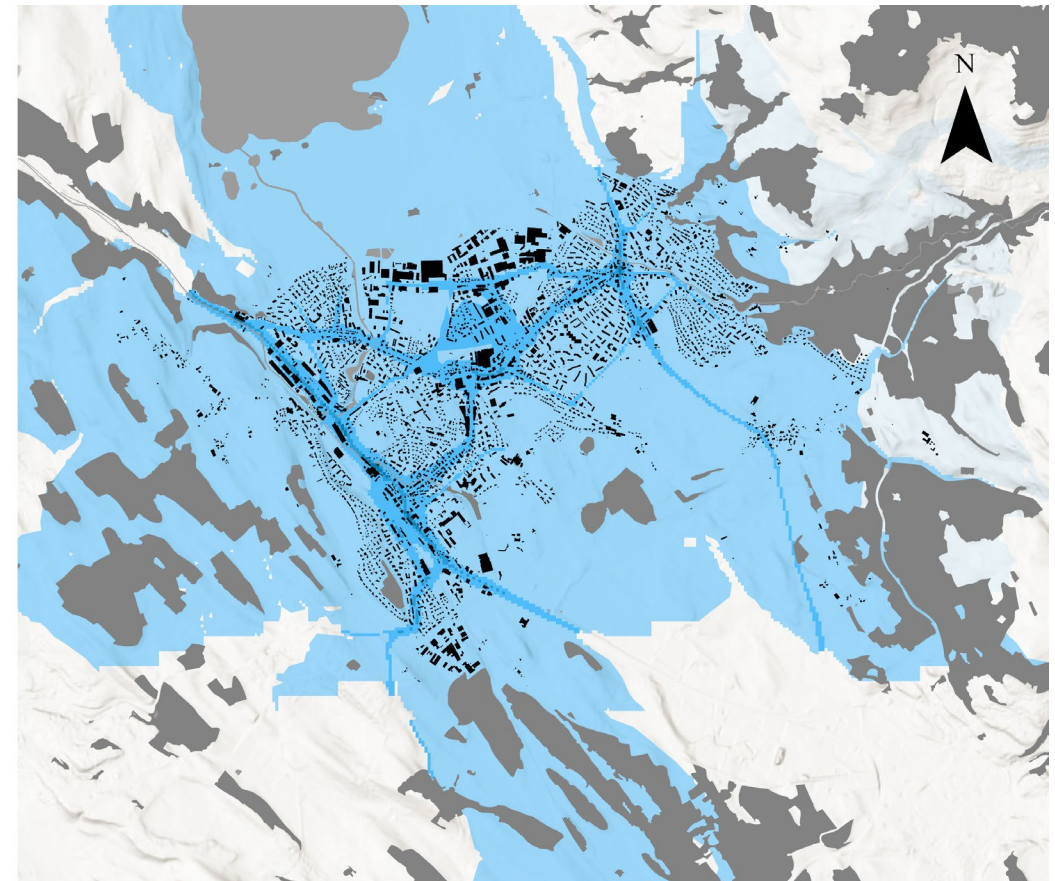
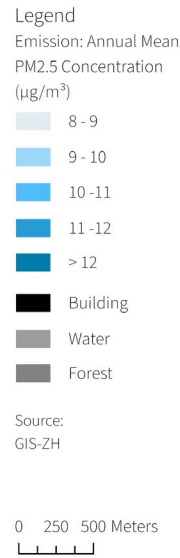
## Accessible

Access to public transportation should be open to everyone. This means that stops must be designed to be accessible, all neighborhoods must be served by public transport and the distance between stops must be short.

The infrastructure for bicyclists and pedestrians must be built in such a way that it can be used by as many people as possible. This includes, for example, lowered sidewalk edges, frequent crosswalks, and bike lanes structurally separated from road traffic.

## Human centered

Mobility should serve all people and have as little harmful effects on others as possible. Especially in cities and densely populated areas, the positive effects of car traffic are poorly balanced



XXXVI Emission map (partial matter 2.5)

with the negative effects on residents. Mobility should be designed in such a way that all people, regardless of their age, limitations, economic opportunities or preferences, can participate in social and economic activities.

## Environmentally friendly

Whenever possible, transport should

be CO<sub>2</sub>-neutral, space-saving, low-emission, and resource-saving. Some modes of transport, such as cycling, public transport and walking, are better suited to this than cars. However, the harmful effects of car traffic can also be reduced with appropriately designed roads and alternative propulsion systems.

# Inclusive

Cities should be built for everyone, regardless of age, income, origin, intelligence, family situation or health. Large cities as centers of attraction therefore exhibit strong inequalities. While mainly wealthy people live in the city center, poorer people settle mainly in outer neighborhoods or in the surrounding communities. Wetzikon, as a city relatively easy to reach from Zurich, is experiencing increasing pressure on available housing. To ensure the social mix of the city and enable easy participation for all, we focus on inclusivity in urban design.

## Housing in well-accessible areas

Affordable housing should also be available in locations close to the city center. When distributing these apartments, care will be taken to ensure a social mix. For older people, apartments should be created that allow the greatest possible autonomy and a self-determined life. Apartments for families should also be created that accommodate the specific needs of children, such as nearby playgrounds and kindergartens.

## Inclusively designed street space

A large part of the street space will be reserved for pedestrians. In the design, attention will be paid to sufficient shade

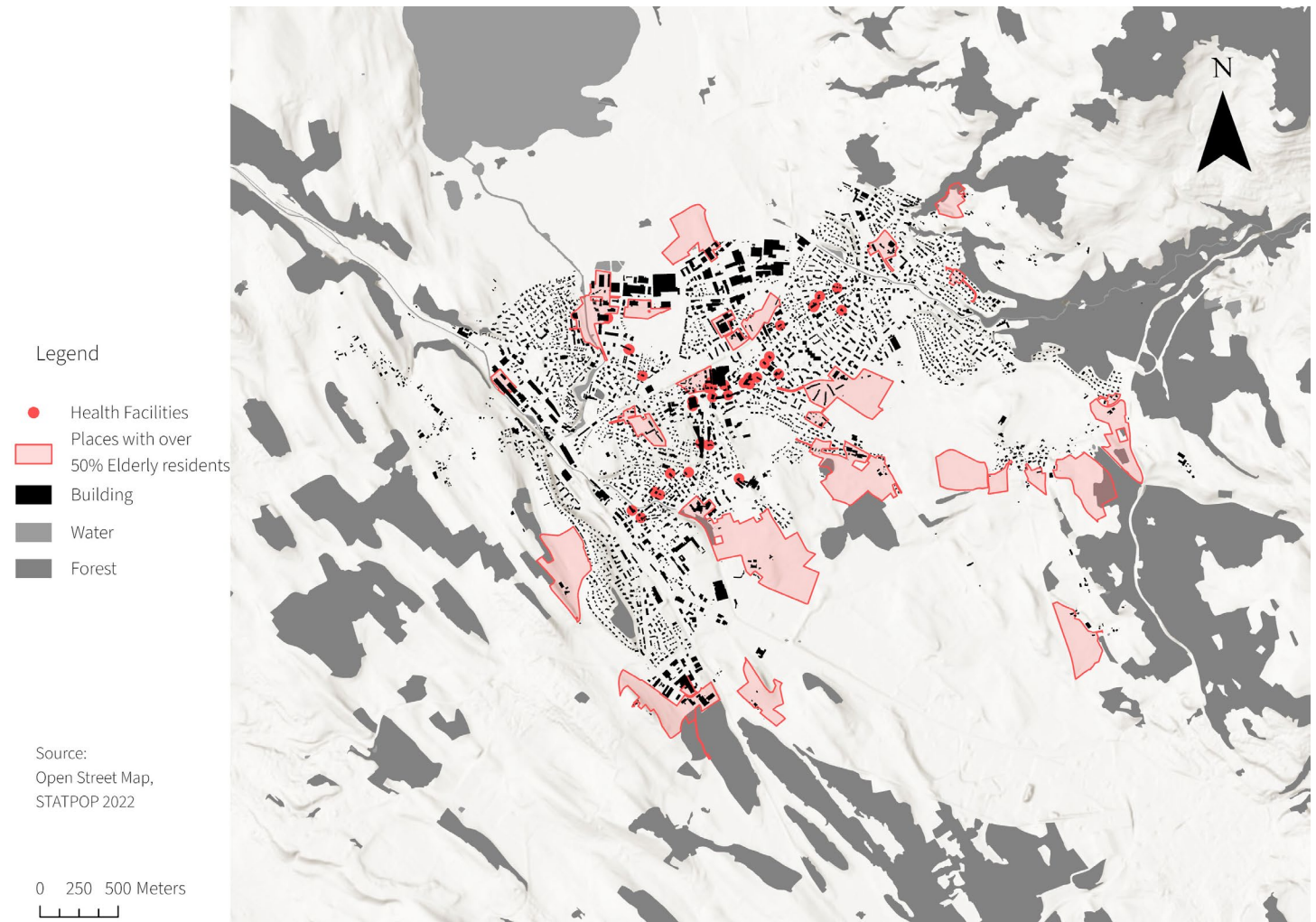
as well as sufficient benches. The street space should also be made safer for the blind by providing tactile guidance throughout. For children and all other road users, a strong safety benefit will

be achieved by lowering the speed limit.

## Community activity center

Community activity centers will be

built in the neighborhoods and the city center, offering shared experiences such as language courses, lunches, workshops or sports activities.



XXXVII

Inclusive analysis map

# Future oriented

Wetzikon's development should not remain at a standstill, because the pressure on existing apartments continues to increase (ZH, 2023f) and thus the rent prices would also rise continuously. This also runs counter to the goal of social mixing. New apartments must therefore be created to permanently relieve the housing market. However, the labor market in Wetzikon should keep pace with this development to enable Wetzikon residents to find a job in their community of residence.

## Provide space for people

In Wetzikon, apartments for at least 6000 additional residents are to be created by 2040. These apartments are to be built mainly in central locations with good public transport connections. The apartments are to be built in different price categories and sizes to meet all needs. The floor area per person is to be set slightly below the current average to make economical use of the available space.

## Provide jobs for people

To keep in line with the development of the population, 1700 additional jobs are to be created in the municipality by 2040. These jobs are to be located primarily in existing industrial or commercial areas.

- Legend
- Places with potential of inner development
  - Owned by Wetzikon
  - Owned by others
  - Building
  - Water
  - Forest

Source:  
raum+, Gemeinde  
Wetzikon

0 250 500 Meters



XXXVIII Future potential map

## Inward development

Wetzikon has not claimed any additional building zones in recent years. Due to the crop rotation areas and the moor

protection areas, a further increase is limited. Therefore, the existing building zones in Wetzikon are to be further developed and densified to accommodate


the additional living and working space.

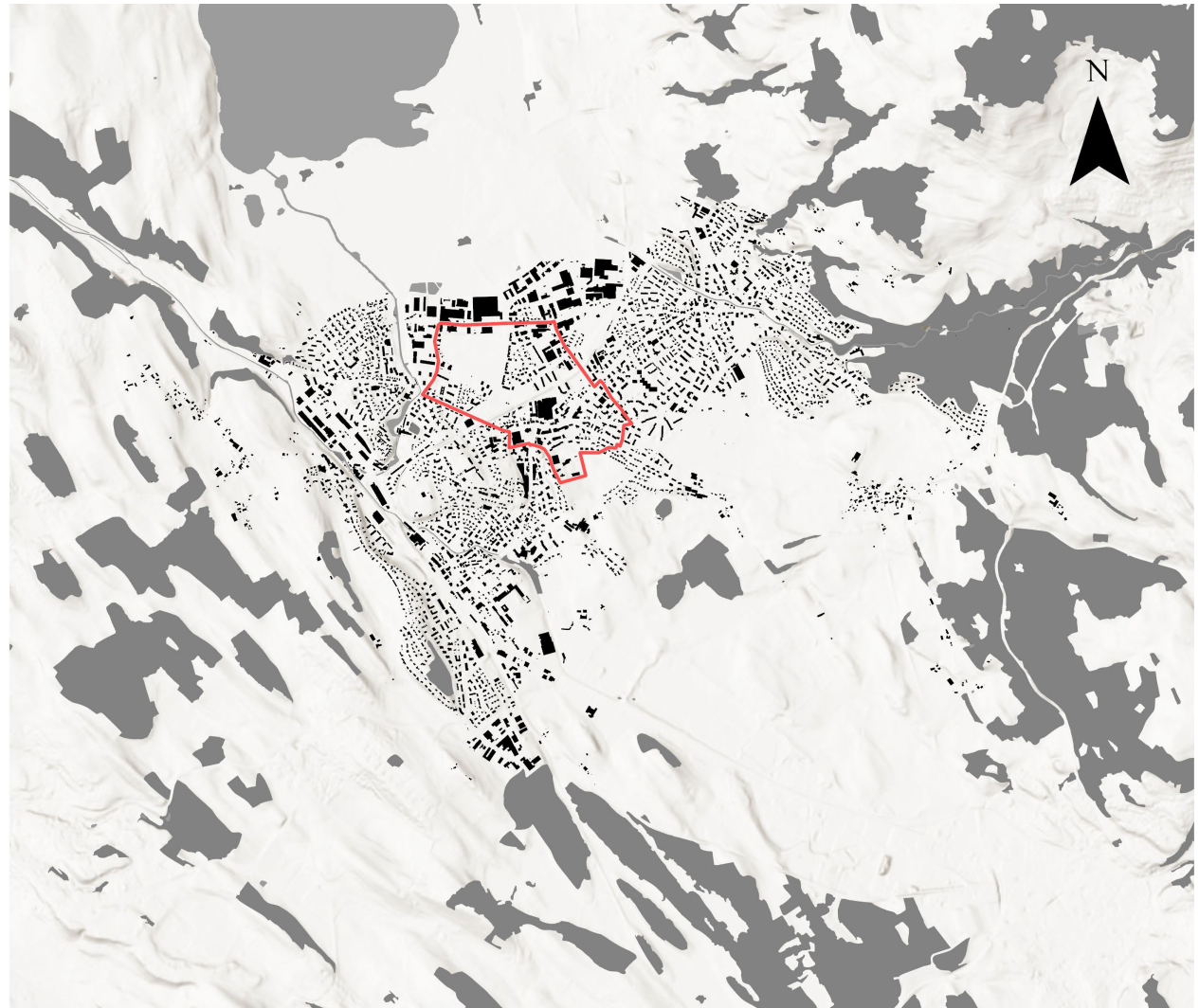
# Focus phase

The chosen focus area is located around the center of Oberwetzikon and includes Migros, the Egg school, the Reformed church, the Buchgrindel area and parts of the industrial area to the north. This area was chosen because the development of the town center is of great importance in the development strategy, and this should be reflected in the choice of focus area. The selected focus area also makes it possible to show the planned development in new development areas as well as to utilize existing inner city development potential.

## Legend

-  Focus area
-  Building
-  Water
-  Forest

0 250 500 Meters  





XXXIX Focus area map Wetzikon

XL Focus area map Oberwetzikon →

Legend

 Focus area

 Building

0 25 50 100 Meters  




# Intervention programs

Based on the development strategy, it is now time to apply the ideas and visions in a concrete project. The objectives of the development strategy are consistently considered in all decisions. However, not all objectives always point in the same direction; sometimes they are contradictory and, if applied without reflection, lead to suboptimal solutions. This can be illustrated in concrete terms by the incompatibility of the population development objective with the soil de-sealing objective. To take this contradiction into account and to have a better basis for decision-making, two intervention programs are now presented, which represent two different approaches: A conservation-based approach and a development-oriented approach.

The development-oriented approach takes a bolder approach and accepts that it is more difficult to implement and that it requires more land. The conservation-based approach is more cautious, places a stronger emphasis on the conservation of undeveloped land and gives greater weight to political and social feasibility when selecting individual projects. The following table provides an overview of which individual projects are included in which construction programs.

The two maps with the interventions for the development oriented approach and conservation oriented approach are visible on the next two pages and desc

Project	Development oriented Program	Conservation oriented Program
Development project Buchgrindel	X	
New school Buchgrindel	X	
Expansion of school Egg		X
Development project Färberwiese	X	X
Development project Nordstrasse	X	X
Inward development projects	X	X
Reconstruction project Migros	X	X
Car-free city center	X	
Single-lane main axis		X
Minimal parking lots	X	
Standard parking lots		X
PT prioritization	X	X
New railway station	X	
New bus lines	X	
Bicycle rent system	X	X
Bicycle network	X	
Green ribbon	X	
De-sealing	X	X
Planting green	X	X
Green park	X	X

XLI Intervention table



# Green field development Buchgrindel

XLII Intervention map  
development oriented program

The Buchgrindel reserve zone is the main development area in the focus area. By far the most additional inhabitants can be accommodated in this area, but the interventions also require major interventions in unzoned agricultural land. The development of the Buchgrindel reserve zone is therefore only part of the visionary development program.

## Rezoning

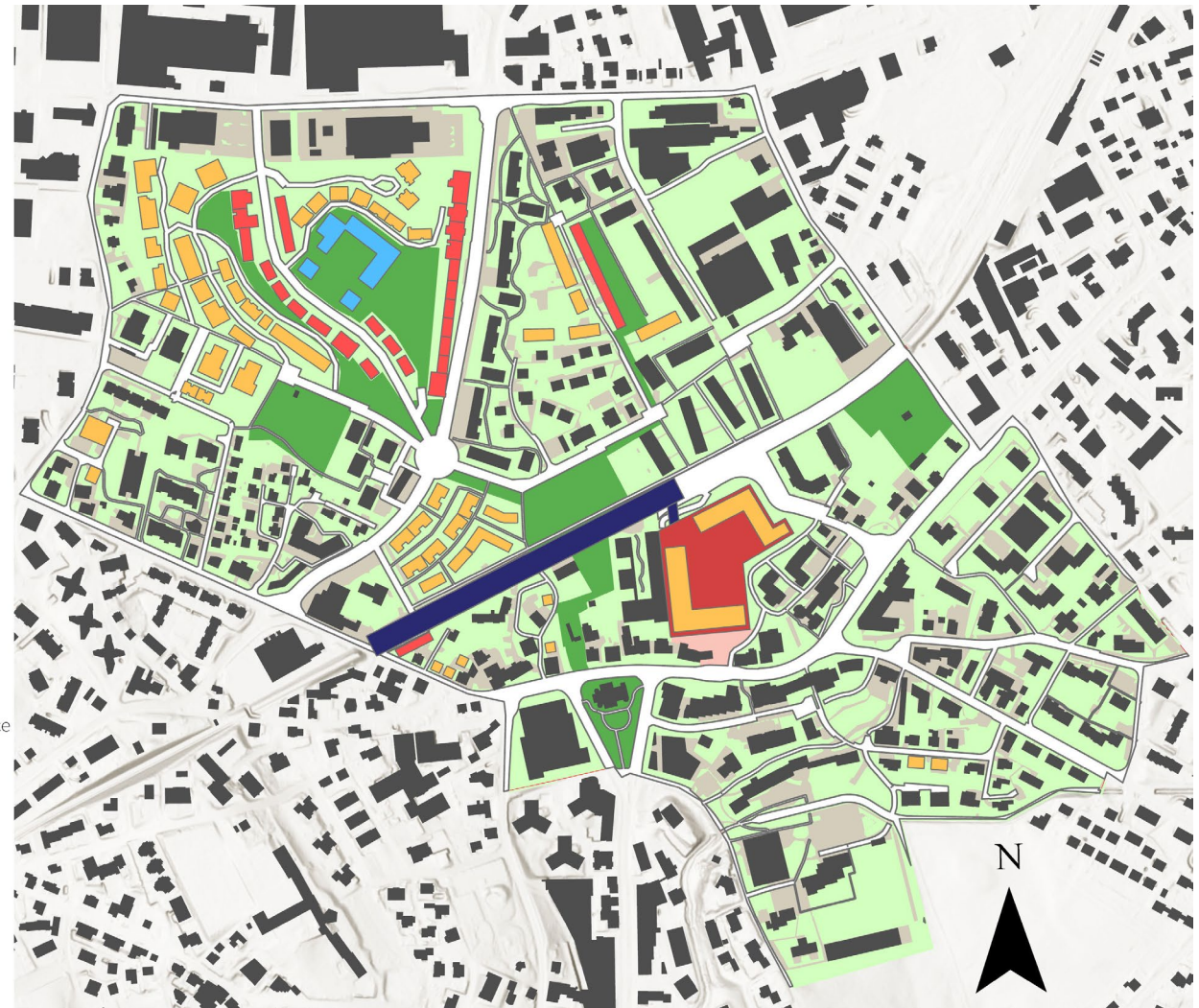
The Buchgrindel reserve zone is currently still undeveloped and classified as a reserve zone in accordance with the municipal land use plan. In the municipal and cantonal structure planning, the Buchgrindel reserve zone is classified as a settlement area respectively as a residential, mixed and commercial area (ZH, 2023b) (Wetzikon, 2023). As reserve zones are not considered building zones in the canton of Zurich, they must be zoned accordingly to be considered building zones (ZH, 2023c). The criteria for zoning are set out in Art. 15 of the Spatial Planning Act. Building zones must meet the following criteria: (CH, 2019)

- Not exceed demand for 15 years
- Support spatial planning objectives
- Preserve crop rotation areas
- Protect nature and landscape
- Suitability for development
- Necessary despite mobilization of internal usage reserves
- No fragmentation of cultivated land
- Legal availability
- Implementation of the requirements of the structure plan

### Legend

- residential
- mixed use
- commercial
- new school
- train station
- public park
- private green
- recreational space
- sealed space

0 25 50 100 Meters



Based on the population forecast for Wetzikon, there is a clear need for additional living space. The development is to be completed within the 15 years planned. The project supports the goal of creating compact settlements and steering settlement development inwards, as all the plots around the reserve zone have already been built on. The special requirements for the development also ensure a high level of structural and landscape quality. The development of 7.6 hectares of agricultural land cannot be avoided under the given conditions and the expected population growth. The identification of internal development potential within the focus zone has shown that otherwise not enough new housing could be created. As the reserve zone is not classified as a crop rotation area, no compensation area needs to be found. Due to the intensive cultivation of the area, the expected impact on nature and biodiversity is low; studies have shown that biodiversity in urban areas is generally higher than in agricultural areas (Turrini and Knop, 2015).

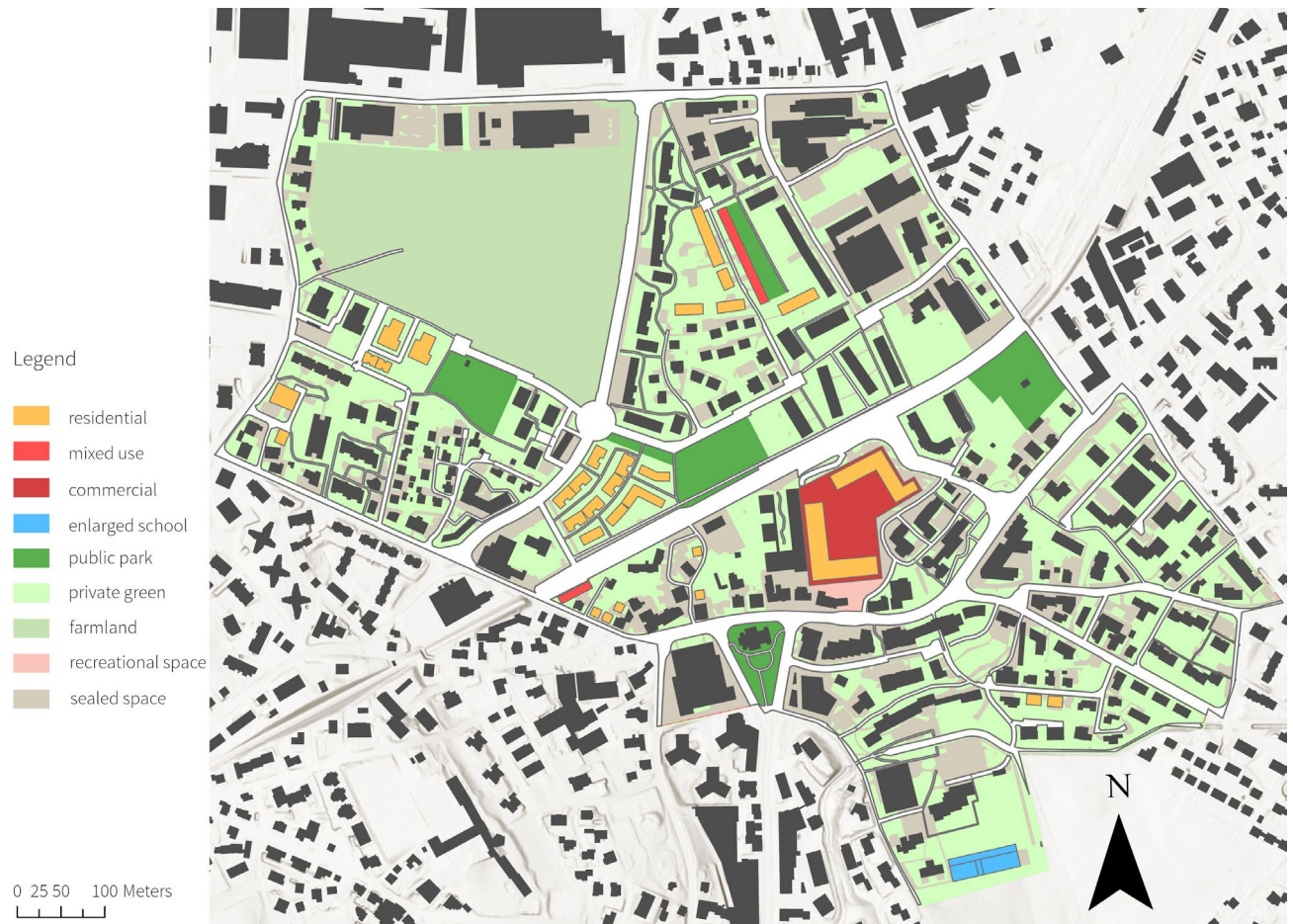
Taking all these criteria into account, rezoning seems possible. The rezoning needs approval from the city parliament of Wetzikon (Wetzikon, 2022a). The question now arises as to whether

a rezoning to a core zone or a residential zone with commercial facilitation should be chosen. The densest development that is possible in the residential zone in Wetzikon is the WG3.3 zone, in which a building mass ratio of 3.3 m<sup>3</sup>/m<sup>2</sup> is permitted (Wetzikon, 2015b). As the planned structure has a

building mass ratio of 4.42, rezoning to a WG3.3 zone alone is not possible and would have to be combined with a design plan. As a design plan is planned anyway, this does not appear to be a problem. In principle, rezoning to a core zone is also possible, but this would run counter to the municipal structure plan,

XLIII Intervention map  
conservation oriented program

which envisages residential, mixed, and commercial use for the area (Wetzikon, 2013). In order not to come into conflict with the requirements of the structure plan, this option is not considered further.

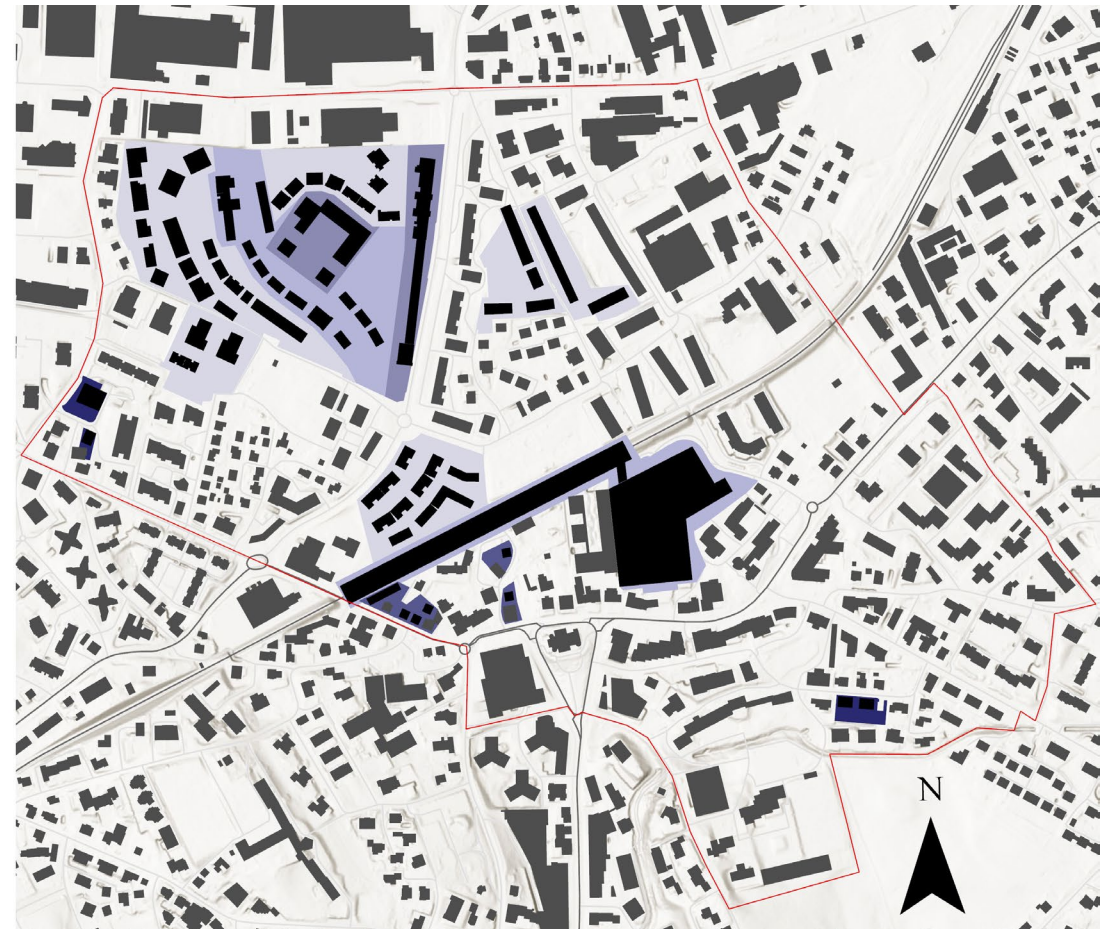


# Planned implementation

Several options are conceivable for the realization of this large-scale development. In principle, a public and a private developer as well as an integral development or a subdivision of the site into several plots can be considered. Various options are also possible for the type of land acquisition. On the one hand, the municipality could buy up the entire reserve zone from the existing landowners, reorganize it and sell it on to the private or public project sponsors. On the other hand, the municipality can also lease the area to the project sponsor under building rights. The plots in the reserve zone currently belong to various landowners, including 22% of the municipality of Wetzikon (Wetzikon, 2023d). Due to the diverse ownership structure of the site, after the rezoning the municipality should first buy up and combine all the plots that are not yet owned by the municipality. In a second step, the municipality will cover the site with a design plan, which is described in detail below. Due to the size of the area to be built on and the planned phasing, the site will then be divided into several plots, including for the school and the various construction stages shown on the map.

All plots, except for the school plot, will be handed over to a developer for

50 years, who can develop and use the plot in accordance with the design plan. Both private and public residential developers are eligible as investors. Cooperatives such as the local Wetzikon housing cooperative will also be considered in the selection process. When selecting investors, the aim is to find investors who agree with the fundamental direction of the project. Once the building rights contract expires, the plot will revert to the municipality. The municipality is obliged to pay compensation for the building development. An architectural competition will then be held for each plot to ensure a high level of architectural and urban development quality. In addition to architects and representatives of the



XLIV Year of intervention map

municipality and investors, the jury for the competition will also include delegates from the dialog forum to ensure that the interests of residents and the population of Wetzikon are represented. The detailed forms of participation are described below. The architectural competitions must primarily adhere to

the specifications of the design plan and the current building standards. In addition, the developer will have to define the specifications for the competition in more detail at a later stage.

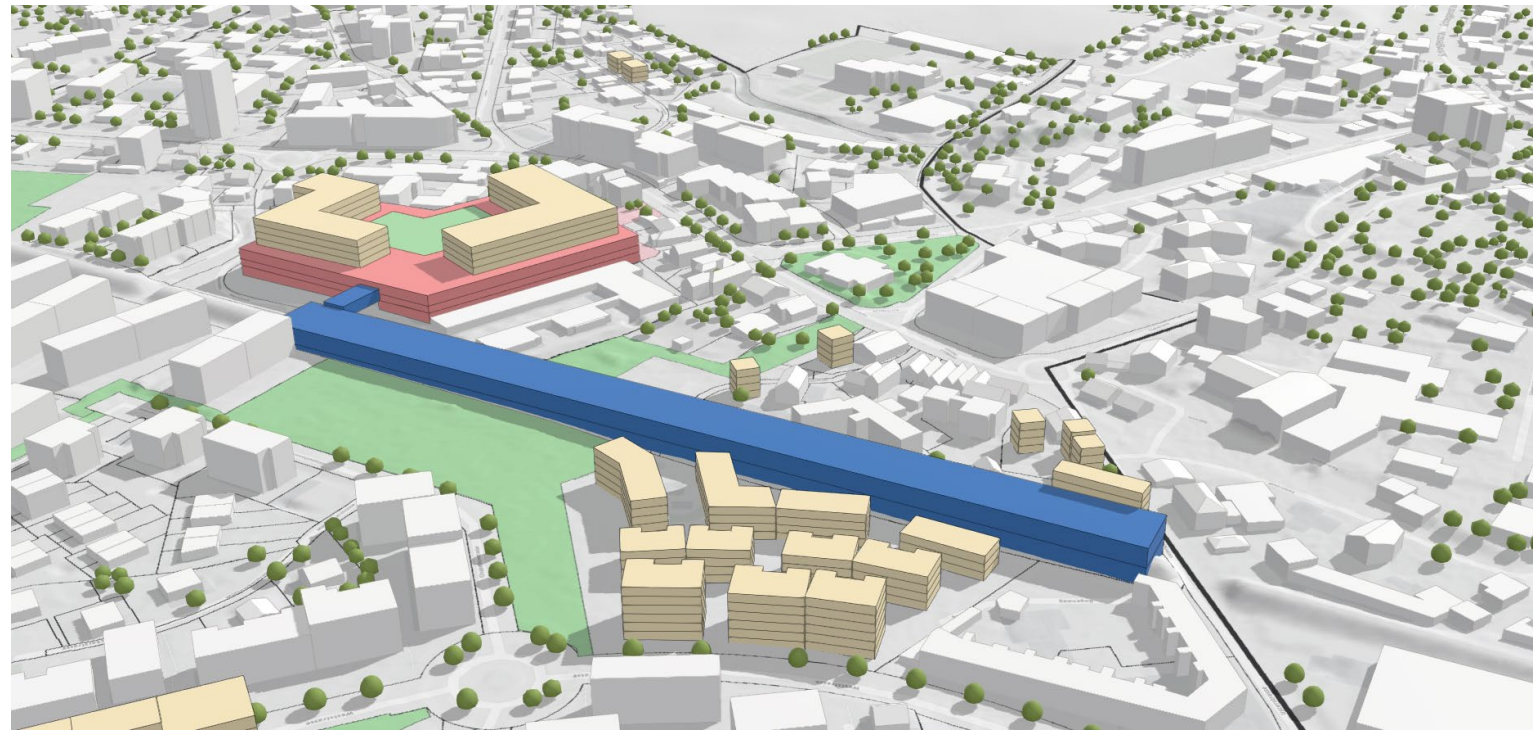
# Design plan

A design plan defines special building regulations for a specific area that deviate from the building and zoning regulations. The design plan can define numerous aspects of the future development. This can include not only provisions on the size and location of buildings, but also on their use. Design plans allow deviations from cantonal and municipal building regulations. Design plans can be of both public and private nature. As there is a high level of public interest in high-quality development in this project and the municipality has numerous interests in the development of this site, a public design plan should be established. (Schneeberger, 2023).

Numerous design plans have already been issued in Wetzikon, including for the Widum area. The Widum private design plan stipulates that a further design plan must be issued for the Färberwiese site, but no provisions have been made for the Buchgrindel site (Wetzikon, 2004).

The Buchgrindel design plan, based on previous design plans of the municipality of Wetzikon, comprises the following chapters (Wetzikon, 2015a):

- Development with the specification of building areas, building



XLV 3D Visualisation  
Relocation of railway station

- mass, total height and number of storeys, underground buildings, and open space corridors.
- Utilization with regulations on residential, commercial, and school use as well as the distribution of rents and apartment sizes.
- Outdoor space with provisions on the qualitative and quantitative requirements for green spaces and other areas as well as the intended use of the outdoor space (public,

semi-public or private).

- Design with requirements for the overall effect of the buildings and the outdoor space, as well as the competitions to be held for buildings and the outdoor space.
- Access with regulations on underground garage access and the location, cycle paths and footpaths, the number of a parking spaces and the mobility concept.

- Supply/disposal with specifications on noise protection, sustainable energy use, waste disposal, deliveries to stores and water use.
- Phasing with a description of the sequence of stages for buildings and exterior design.

# Concrete design plan for Buchgrindel

The map shows the building plots, the dimensions of the buildings, the use of the outdoor space, the underground parking garage and its access, the delivery areas for the stores and a possible phasing.

On the entire Buchgrindel site, 52 buildings will be constructed. The maximum construction volume of all buildings, except for the school, must not exceed 350,000 m<sup>3</sup>. The buildings are generally six storeys high; for mixed-use buildings, the first floor must be kept free for public-oriented sales and service businesses. Underground garages, basements and supply infrastructure may only be built under buildings and roads so as not to impair the growth of trees. The underground garage is expected to be built parallel to Weststrasse with an entrance in the northern area. A supply tunnel will be built under the central road, which will be used to supply the shops and for waste disposal.

## Utilization

The buildings are mainly intended for residential use, but the first floor of all mixed-use buildings can also be used for retail and service-oriented uses. If required, office use can also be provided on the second floor of these



buildings. A mix of retail outlets, restaurants, cafés, body-related services, medical practices, and co-working

spaces should be created on the first floor. Event rooms and places for neighborhood get-togethers should also be

XLVI Detailed design plan Buchgrindel  
made possible. At least 50 service businesses are to be in the perimeter.

## Apartment mix

A mix of 2.5-, 3.5-, 4.5- and 5.5-room apartments will be created for residential use. The number of rooms per apartment and the size of the apartments will be distributed according to the following table.

The distribution is based on the Glattpark and the apartment size on the Kalkbreite estate (Allgemeine Baugenossenschaft Zürich, 2023) (Tagesanzeiger, 2019). The rental price per apartment corresponds to the average rental prices in Wetzikon (ImmoMapper, 2023). To allow the investor a certain amount of leeway, no rent limits are set for 20% of the apartments. Rent for 60% of the apartments should not surpass 120% of the average rent in Wetzikon, while for the remaining 20%, it should not exceed 90% of the average rent. To ensure that the living space is used efficiently, a clause is added to the rental agreement to ensure that the occupancy rate is adhered to when moving in. To make it easier to move into smaller apartments, for example after the children have moved out, the right to move into smaller apartments at the previous price per square meter is stipulated. This helps to keep the large apartments available for families. Around 20% of the apartments are intended for older people and such

No of rooms	2.5	3.5	4.5	5.5
No of people	1	2	3	4
Share (space)	25%	25%	35%	15%
No of flats	288	234	276	102
Size [m <sup>2</sup> ]	65	80	95	110
Rent	1484.-	1826.-	2169.-	2511.-

with care needs. Depending on requirements, care services can be booked in these apartments to ensure that people can stay in their own homes for as long as possible. Special attention is paid to accessibility when furnishing and designing these apartments.

## Green space

The green space on the site is divided into three parts. The areas enclosed by the school will be used primarily by the school. Extensive sports facilities, playgrounds, a recreation area, and lawns are to be created in this area. Trees are to provide sufficient shade. With the design, emphasis is placed on making these areas accessible to the public if school operations are not disturbed. The large, open areas are primarily available to the public as parks. With a mix of lawns, meadows, planted areas, water features and trees, the parks are designed in a variety of ways to ensure a high quality of stay on the one hand and

XLVII Apartment distribution table

to enable a high level of biodiversity on the other. Some of the areas close to the houses are available to residents as gardens, but some can also be used as communal gardens. These private and semi-public green spaces are characterized by restricted access and greater privacy.

## Design standards

High standards are set for the design of the development. This is characterized by a variety of building shapes, roof structures, façade designs, materials, and colour schemes. Large glass façades should be avoided due to the reflections and sound-amplifying properties. In addition to the architectural specifications, attention must also be paid to energy-efficient and resource-conserving materialization. Recycled concrete, wood or bricks could help to reduce the CO<sub>2</sub> intensity of the buildings. Sealing of the ground should be

kept to a minimum. This includes ensuring that the central road and all paths are permeable to water. The surface water from the buildings is also returned to the ground in infiltration areas.A

## Accessibility

Great importance is attached to the accessibility of the new urban quarter. The district is mainly accessed via Weststrasse and Hedi-Lang-Strasse. From the intersection of these two roads, a road runs diagonally through the development area to Motorenstrasse in the north. This road can only be used by buses and bicycles. There are two bus stops before and after the school, which are served by the rerouted 857 and 869 bus routes. There are no other roads above ground; all other buildings are accessed by wide paths that can be used by bicycles. A parking garage is planned below the buildings to the east, which will contain the planned 223 private parking spaces as well as the Mobility rental station with a capacity of 30 parking spaces. For details concerning the methods to reduce the number of parking lots, please check the appendix. Access to the parking garage will be in the northern part of Weststrasse and will affect the development area as little as possible.

## Emission reduction measures

Thanks to the car-reduced development, noise protection is largely unproblematic. Nevertheless, some measures need to be implemented, particularly along Weststrasse. In the houses along this road, bedrooms and living rooms should face west. Reducing the speed limit to 30 km/h can further reduce emissions. Noise avoidance and mitigation measures should also be taken as a precaution along the central street in the district. Here too, living rooms and bedrooms should generally be located away from the road. Measures must also be taken to reduce the noise from restaurants and cafés in the evening.

## Energy use

The district should meet the highest standards of sustainability. This includes the extensive use of photovoltaics on the roofs and on the façades. Heat pumps will primarily be used to cool and heat the district, storing the excess heat from the buildings in a geothermal probe field in the ground in summer and using it for heating in winter. It should also be clarified whether a connection to the district heating network of the Hinwil waste incineration plant makes sense.



XLVIII 3D Visualisation  
development oriented program

## Supply

The stores will be supplied via a central supply tunnel beneath the central street and a logistics area in the underground car park. This means that logistics can be completely decoupled from surface use. Waste is disposed via numerous recycling stations, which are available in all basements and can also be emptied via the supply tunnel.

## Construction staging

The Buchgrindel development will be built in several stages from south-east to north-west due to the construction logistics conditions and as to reduce the vacancy rate. The exact sequence can be seen on the map.

# School

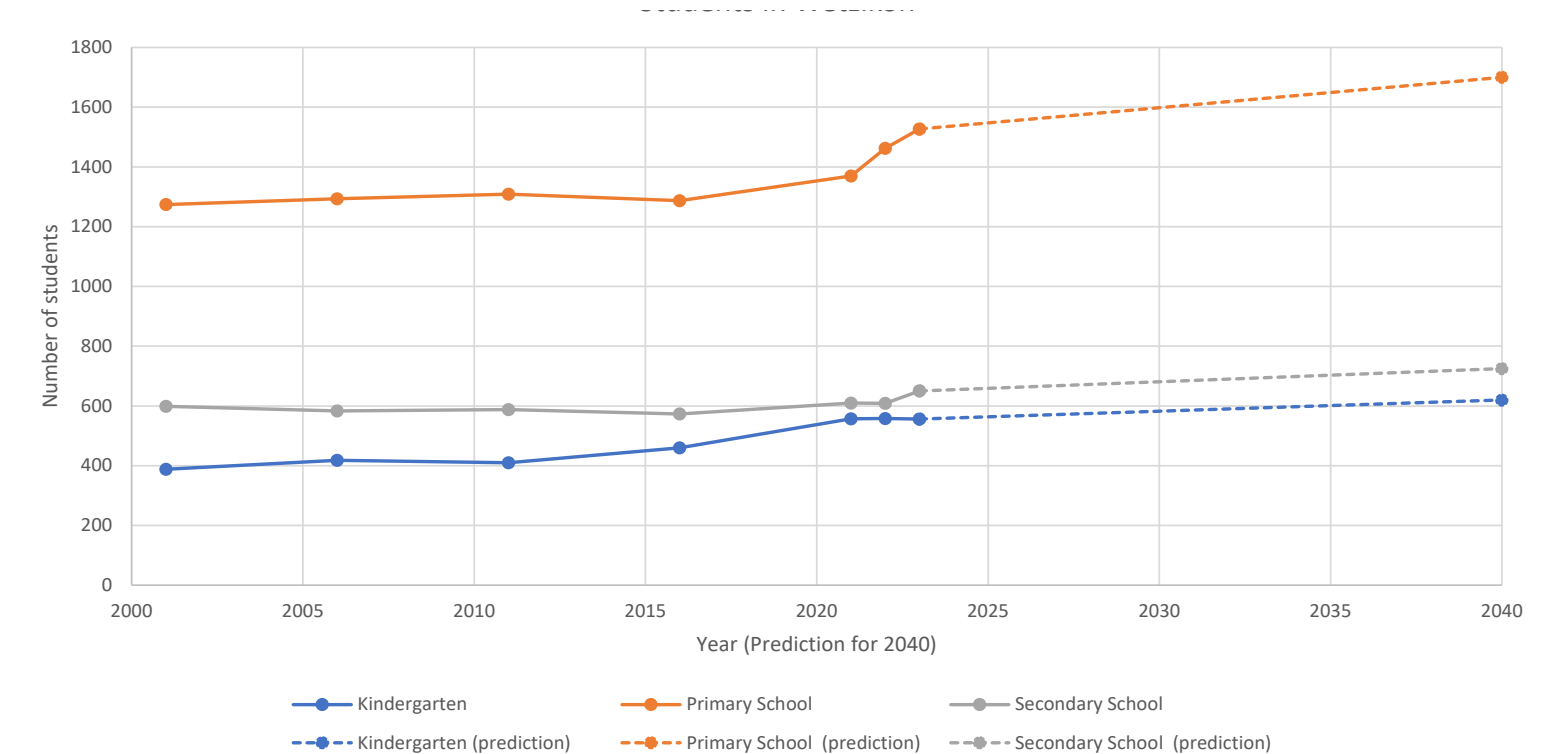
Due to the rapidly growing population and the resulting increase in the number of children, a new school building also needs to be built on the Buchgrindel site.

## Development of students

This diagram shows the expected increase in student numbers if only the additional population from all measures of the development-based construction program are considered (ZH, 2023e). It is assumed that the number of students will develop in line with the population. This is confirmed, among other things, by the fact that the planned apartment size distribution of the newly built apartments roughly corresponds to that of the existing buildings (ZH, 2023f). Based on these figures and if class sizes remain the same, 4 additional kindergarten classes, 9 primary school classes and 4 upper school classes will be required (BfS, 2023a).

## Number of rooms

To create reserves and increase flexibility in school space planning for the municipality of Wetzikon, classrooms for 6 kindergarten classes, 12 primary school classes and 6 upper school classes are to be built in the school. In addition to the classrooms, there will also be arts and crafts studios, recreation facilities,



a dining hall, a multi-purpose auditorium, group rooms, and staff facilities. The exact construction program for the school can be found in the appendix. An area of 5'400 m<sup>2</sup> is required for the school and a further 2'200 m<sup>2</sup> for the sports halls. This results in a required floor area of 7'600 m<sup>2</sup>. The school building has a floor area of 2'400 m<sup>2</sup> and can therefore accommodate all rooms with a three to four storey construction. The two sports halls are housed in the

north-western wing.

The U-shape of the building allows for the creation of a large area in the middle with various sports and play facilities for the students.

XLIX Student development plot



# Participation

Due to the major impact of the development on the neighbourhood and the entire community, current and future residents should be involved in the planning of the development in a participatory format. A dialog forum is to be set up that is open to all interested parties. The dialog forum will be active throughout the entire planning and construction period and will be involved by the municipality in as many processes as possible. Specifically, the dialog forum will be involved in the development of the design plan. In the architectural competitions, the dialog forum will have the right to delegate a representative from its own ranks to the jury. This representative has the task of representing the position of the dialog forum as competently as possible and safeguarding the interests of current and future residents of Wetzikon.



L Detailed design plan focus area

# Färberwiese

The Färberwiese is an area to the northwest of the railroad station that is already partially built on. Until a few years ago, the western third was used by a commercial enterprise (Swisstopo, 2023). In the meantime, however, this part of the meadow has been developed with a dense perimeter block development. In the central area, the municipality plans to build the temporary Migros building while the shopping center is being renovated. As the redevelopment is expected to last until 2030, a follow-up development is possible from 2031 at the earliest.

A private design plan was issued for the Widum area in 2004, which includes a design plan obligation for the Färberwiese (Wetzikon, 2004). In the western area, a private design plan was approved by the municipal council in 2018 (Wetzikon, 2018). A similar design plan is required for the central area. This private design plan is strongly based on the 2018 design plan and the design plan for the Buchgrindel area, particularly regarding residential use, design, use of green spaces, access and emission regulations. A 70% reduction in parking spaces is also planned for the development-oriented construction program, which does not apply to the conservation-oriented program, as the



LI Situation map Färberwiese

lack of additional bus lines and the lack of the train station means that the conditions for public transport accessibility are not met.

Five- to six-storey buildings are to be constructed in the middle Färberwiese area, which are to be connected to the existing building lines of the

development in the western area. The exact number and size of the building plots can be seen on the map.

# Nordstrasse

There is a vacant, already zoned building plot in the Nordstrasse area. The regulations correspond to the WG2.9 zone, which means that a building mass ratio of 2.9 m<sup>3</sup>/m<sup>2</sup> is permitted (Wetzikon, 2015b). According to the building and zoning regulations of the municipality of Wetzikon, it is possible to deviate from these specifications if the minimum plot area is 6000 m<sup>2</sup>, no fossil fuels are used for heating, the heating requirement does not exceed 70% of the cantonal regulations and a close-knit network of footpaths and cycle paths is created.

In this case, the building mass ratio can be increased by 15% to 3.335 m<sup>3</sup>/m<sup>2</sup> (Wetzikon, 2022a). This should be utilized wherever possible to ensure a high building density. However, as no design plan is planned for this development site, no further specifications can be made regarding design, development, and use. This also means that the number of parking spaces could only be reduced in both development programs if the developer explicitly requests this.



LII Situation map Nordstrasse

# City center I

Migros opened in Oberwetzikon in 1981 (Wetzikon, 2023). Migros soon became the highest-selling store in the region. A major remodeling project was carried out in 1999. As customer needs evolved, the need to redesign the supermarket grew. Migros announced in 2017 that it would rebuild the shopping center, but no legally binding building permit has yet been issued, as Migros and the municipality of Wetzikon are in dispute with the Swiss Transport Club (VCS) over the number of parking spaces. The Zurich Building Appeals Court (Baurekursgericht) has ruled in favour of the VCS (Wetzikon, 2023).

## New strategy for Migros

This delay should be used as an opportunity to adapt the planning to the objectives of the development strategy. Migros is to be positioned as a meeting point and town center. This requires careful planning of the open spaces, in particular the square between Bahnhofstrasse and the entrance as well as the connection between Migros and the Buchgrindel area. The relocation of the train station should be used to create several new and wide passageways under the rail line. The shopping center will also have a direct connection to the platform.



LIII Detailed design plan city center

# City center II

The new building is to serve three different uses. An arcade with numerous stores, service outlets, snack stands, cafés and market stalls, is to be created on the first floor. The arcade is accessible from the north and south. The southern entrance leads onto the square facing Bahnhofstrasse, while the northern entrance leads under the track to the Färberwiese and the Strandbadstrasse, from where the development areas can be reached in just a few minutes. The supermarket is located on the second floor. From the supermarket level, a bridge leads directly to the new train station to make it as easy as possible to reach Migros by environmentally friendly means of transport. From the third floor upwards, there will be residential use with a smaller footprint. A rooftop garden will be created between the residential buildings, which is only open to residents and serves as a boundary between public and private use. The apartments have separate and secure access from the shopping center.

## Building regulation

The shopping center is currently located in the center zone (ZA) (Wetzikon, 2015b). In this zone, there is no restriction on the number of buildings. However, to give the municipality of Wetzikon more leeway in the co-design of



LIV 3D Visualisation city center

the buildings and the development, a design plan obligation for this area is to be issued in the building and zoning regulations. This allows the municipality to exercise its right of participation throughout the entire process of drawing up a private design plan. This private design plan is partly based on the specifications of the design plan for the Buchgrindel site, particularly regarding

residential use, design, use of green spaces, access and emission regulations. Additional provisions are to be made for the connection between the railroad and the shopping center as well as the public areas. Migros must ensure a high quality of stay in the public areas. This can be achieved with benches, tables, trees, and appropriate planting.

# Inward development I

## Usterstrasse

On Usterstrasse, a parking lot with approx. 45 parking spaces and a parking garage with approx. 8 parking spaces will be converted to create a larger and smaller new building with four and three storeys respectively (Swisstopo, 2023). The existing zone is a W2.8 residential zone (Wetzikon, 2015b). The two new proposed buildings achieve a building mass ratio of 3.07 m<sup>3</sup>/m<sup>2</sup>, which means that the stricter regulations for site overbuilding (Arealüberbauung) would also have to be applied here, but the minimum plot area is not given

here, so the building mass of these buildings must be further reduced, which is not really in the spirit of determined densification (Wetzikon, 2022). It is therefore proposed that the minimum plot area in the BZO be halved to 3'000 m<sup>2</sup>.

LV Situation map Usterstrasse



## Zentrum

Some existing gaps between buildings are also to be filled in the center in the immediate vicinity of Migros and historically significant buildings; details can be found on the map. It should be noted that a design plan is mandatory for the entire area (Wetzikon, 2015b). Smaller buildings with fewer storeys are planned here in order not to impair the character of the district and to further develop it in a meaningful way. Their design should be based on the existing buildings. The demolition of a commercial building without replacement will

also counteract the increasing sealing and strengthen the green axis between the center and Buchgrindel.

LVI Situation map Zentrum



# Inward development II

## Turnhallenstrasse

A building is to be added to an existing construction site on Turnhallenstrasse. A new building was erected on the neighboring plot a few months ago. Due to the permitted building density of 1.6 m<sup>3</sup>/m<sup>2</sup>, only small buildings would be possible here too (Wetzikon, 2015b). It is therefore proposed that the area be rezoned to residential zone W2.4 to achieve a higher building density.

## Strandbadstrasse

In the Strandbadstrasse area, a development of twelve existing detached and semi-detached houses is to be replaced in favor of a higher-density development. As these plots are owned by many different landowners according to the land register, densification is difficult (ZH, 2023d). For this reason, a private design plan in accordance with Section 85 of the Planning and Building Act with a declaration of general applicability is to be chosen as the planning

instrument (CH, 2022). The design plan can be declared generally binding if the owners of two thirds of the required land have agreed to the design plan (ZH, 2023a). To accommodate the lengthy process, the development is not planned to be realized until 2034. According to the BZO, the development is currently in a residential zone with a building density of 1.6 m<sup>3</sup>/m<sup>2</sup> (Wetzikon, 2015b). Thanks to the design plan, rezoning is not necessary, but the area can also be rezoned to a residential zone 2.8 as part of a general BZO revision. The proposed

design plan is very similar to the design plan for Färberwiese. However, mixed-use is also permitted in some of the buildings to allow the establishment of service businesses on the first floor.

LVII Situation map Turnhallenstrasse



LVIII Design plan Strandbadstrasse

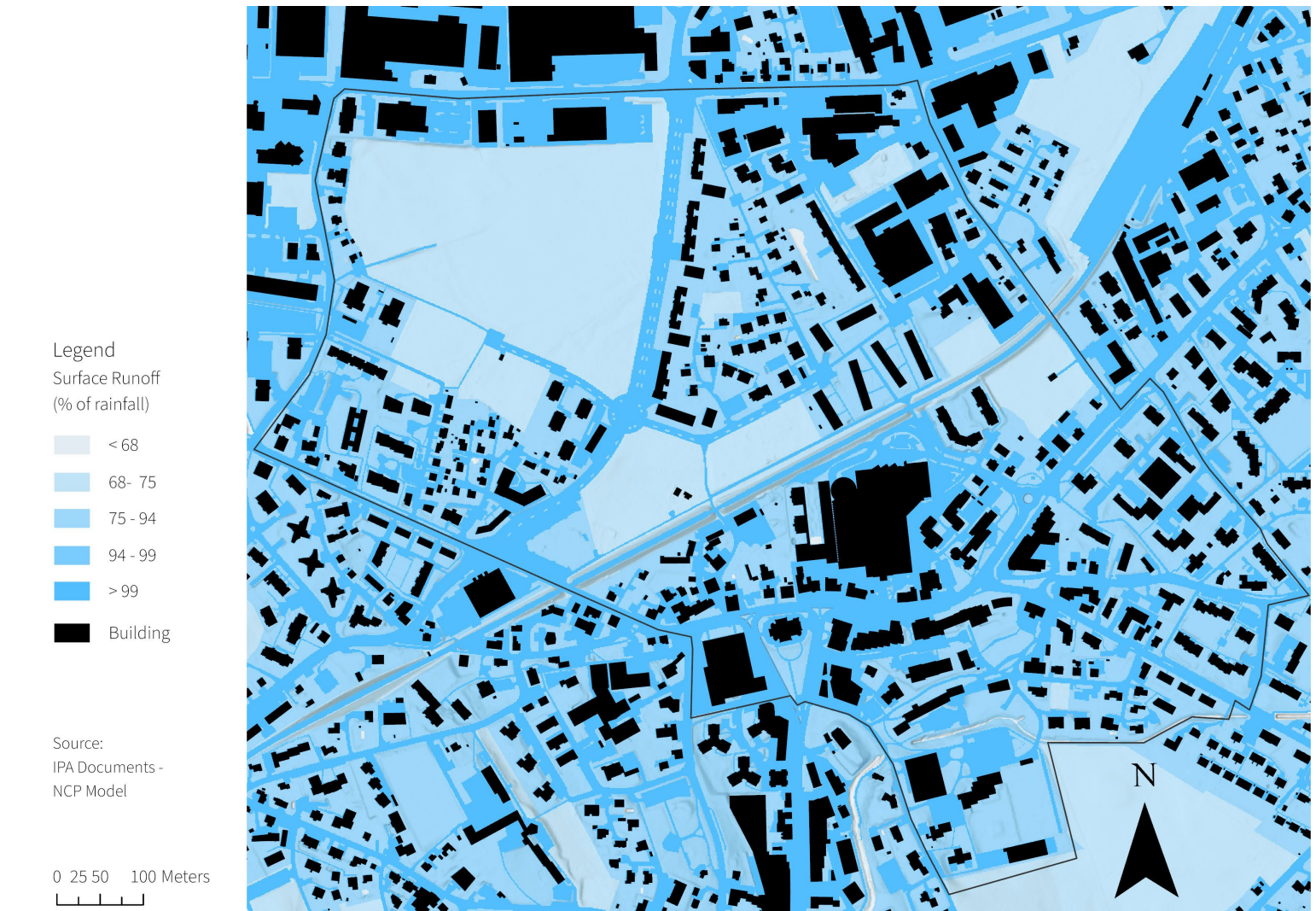


# Green Projects

The redesign of the green space is intended to maintain and promote the quality of life and respond to the climatic changes of the future. As already defined in the development strategy, the new creation and redesign of the green space is based on 3 measures: The de-sealing of sealed surfaces, the planting of tree, as well as the creation and further development of open spaces into green areas to create public parks. The project authors have recognized numerous areas with great potential for improvement, particularly in our focus area. The measures relating to green space are closely linked to the other planned urban development and traffic measures in the focus area. The redesign of the green space has a positive impact on the vibrant inclusive and future orientated strategies. The following sections contain explanations of the measures in our focus area.

## De-sealing

De-sealing is the central measure for the development of green spaces. De-sealing sealed surfaces alone leads to many positive effects. The most important effect is the restoration of soil functions, such as soil serving as a habitat for flora and fauna, as well as the storage and infiltration of water. This is particularly important in densely populated



LIX Surface runoff map

areas to minimize the risk of flooding. A slight risk of flooding is indicated in the cantonal hazard map, especially in our focus area along Bahnhofstrasse (GIS

ZH, 2023). Climate regulation is also positively influenced by de-sealing, as water stored in the soil cools through evaporation, and desealed areas heat

up less than black asphalt, depending on the material used (Mission B, 2023).



De-sealing can be considered the central measure in the green space domain because opening the soil surface allows the natural properties of the soil to regenerate. Thus, it is a prerequisite for further green measures, such as tree planting.

In our focus area, numerous areas are sealed, especially in public spaces. The de-sealing strategy is based on the sealing map, derived from the runoff rate of the surface. These runoff data were modeled using the provided NCP model. See map (share of sealed areas).

The runoff map and the perceived heat align in many locations. This, in turn, demonstrates that sealed surfaces lead to increased temperatures, emphasizing the importance of minimizing sealing for the urban climate.

In the figure, it can be observed that the most significant PET heat stress in our focus area is primarily in the central public space along and around Bahnhofstrasse, as well as in the industrial areas north of Bahnhofstrasse.

### Greening on de-sealed areas

To ensure that unsealed areas can contribute significantly to the urban climate, they must be greened. Greening also has a substantial impact on

temperature (transpiration, shade, etc.). Trees with large crowns are particularly crucial where unsealing is not feasible, such as in the street areas where

vehicles travel. In such areas, the large crowns of trees provide shade, contributing to a pleasant climate.



LX Perceived heat map

For the two programs: conservation-oriented and development-oriented, we have defined different objectives for the expansion of de-sealing.

### Conservation oriented program

In the conservation-oriented program, the planned expansion of de-sealing is smaller. The main goal here is to deseal areas most affected by warming and sealing. Additionally, attention was given to the ownership of the areas during the definition process. De-sealing perimeters were generously expanded for municipally-owned areas. These conditions are intended to keep costs as low as possible and ensure that the planned measures can be implemented in the medium term. Furthermore, the area in front of Migros was integrated into the conservation-oriented program because there are plans to demolish Migros in the near future, allowing de-sealing to be integrated into this construction process. The parcels directly in front of Migros are owned by the city of Wetzikon, making this area additionally interesting for de-sealing. The following map excerpt shows the extent of the de-sealing measures in conservation oriented programme with focus around the Bahnhofstrasse. The total area of de-sealing measures in the conservation-oriented strategy is approximately

14'000 m<sup>2</sup>, including the road surface. Complete de-sealing and subsequent planting are not possible on the road surface because it must accommodate vehicle traffic. An alternative solution is recommended for the roadway,

suggesting a solid surface that allows as much water infiltration as possible. This could be, for example, a permeable paving or a permeable asphalt surface. The NCP model analysis has shown that between 92% and 99% of precipitation

LXI De-sealing map  
conservation oriented program

runoff occurs in the planned de-sealing perimeter, indicating urgent need for de-sealing due to nearly complete soil sealing in this area.




### Development oriented program

In the development-oriented program, additional areas are included beyond those designated in the conservation-oriented program, focusing on reducing temperatures and regenerating soil properties. Cost-effectiveness and ease of implementation are less of a concern in the development-oriented program, which aims to identify opportunities for longer-term implementation. The perimeter, especially along and around Bahnhofstrasse, is generously expanded to include private properties. This, combined with enhancing the attractiveness of the city center around Migros and along Bahnhofstrasse, aims to create a pleasant and sustainable environment. Additionally, generously sealed areas in the industrial sector northwest of our focus area are addressed, where high temperatures are evident in the PET map.

The total de-sealing perimeter in the development-oriented program is approximately 76'W000 m<sup>2</sup>, including road surfaces that require a permeable solid covering. The NCP analysis within the development-oriented program perimeter has shown that a significant portion of this area is heavily sealed, with runoff rates varying between 73% and 99%.

Legend

 Desealed area

0 25 50 100 Meters  




LXII De-sealing map  
development oriented program

In the development-oriented program, the objective is to achieve a de-sealing of approximately 30% of the currently sealed area. This aims to minimize the adverse effects of additional sealing in the reserve zone and, as previously mentioned, alleviate the climatic conditions in Wetzikon's areas heavily affected by warming. Presently, the NCP analysis indicates that around 500,000 m<sup>2</sup> of our focus area is sealed, considering all areas with a minimum runoff rate of 80% as sealed. Despite extensive measures, the goal of de-sealing 30% of the currently sealed area has not been met. With an approximate desealed area of 76'000 m<sup>2</sup> in the development-oriented program, we achieve a reduction of about 15%. A substantial portion of the currently sealed area is occupied by buildings, which naturally cannot undergo de-sealing. If we focus solely on the sealed areas without buildings in our target zone, which is approximately 370'000 m<sup>2</sup>, the implementation of the development-based program would result in a de-sealing of about 20% of the total area.

### De-sealing measures

The implementation of the planned de-sealing requires precise planning of measures at the respective locations. Initially, the old surface must be

removed and disposed of, often involving significant effort. Subsequently, the subsoil needs to be prepared to allow water infiltration. Depending on how the desealed area will be used, the surface must be designed differently. Areas frequently traversed or walked upon require a solid permeable covering, such as porous asphalt (Stadt Zürich, 2020). Parking spaces, for instance, can be desealed using gravel turf or grass grid stones. While pedestrian and cycling paths, as well as public spaces, are often not completely sealed, further reduction in sealing is possible. In urban areas, besides these functional spaces, many areas do not require sealing or paving. An example of such areas is referred to as residual spaces (Naturama Aargau, 2019). Typically, these residual spaces are sealed for simplicity, and it is essential to completely deseal and plant these areas.

### Constraints of de-sealing

De-sealing incurs costs. Frequently, the construction measures are extensive, involving the use of machinery to break the ground, transport away the old materials, and deliver new materials such as humus or drainage material. In urban areas, there are often additional constraints of limited space, further escalating the costs of these measures.



LXIII De-sealing a front yard

Another crucial aspect is the disposal of excavated materials, such as asphalt or concrete debris. The costs, therefore, vary significantly depending on the initial conditions and the type of materials involved. To encourage private property owners to deseal their plots, various measures are being implemented. For instance, financial incentives are employed, where in many cities, a portion of the costs associated with de-sealing and greening is subsidized. Another financial incentive involves the setting of wastewater fees; these fees increase with the presence of more sealed

surfaces. Conversely, wastewater fees can be reduced if additional green roofs, facades, or de-sealing projects are implemented. Public awareness is crucial and can be achieved through campaigns promoting such measures or by supporting collective initiatives, such as the „Asphaltknackerinnen“ (Plan Biodivers, 2023). Providing expertise on how to carry out de-sealing is another integral component to specifically promote desealing efforts.

# Planting green and open green parks

Planting in urban spaces has many crucial positive impacts on the local climate and, consequently, the quality of life in the city (Umweltbundesamt, 2017). Plants, especially trees, contribute to cooling the urban climate by providing shade. Additionally, trees and other plants release water through transpiration, leading to cooling through the extraction of heat energy from the surrounding air (Kanton Zürich, 2022). Trees are considered the most effective means of lowering temperatures in the city and can reduce ambient temperatures by up to 10°C in Central Europe (Tagesanzeiger, 2021).

## Greening desealed areas

Existing green spaces, especially newly desealed areas, must be greened to maximize the positive effects of green spaces and desealed areas. Besides climatic improvement, additional greening can promote biodiversity. Planting various native species creates habitats for different organisms. In addition to selecting native plants, it is essential that the chosen plants are suitable for the location and can grow in the long term. Planting must be adapted to various conditions such as drought, heat, pollutants, and limited space in the root zone. Future impacts of climate change should also be considered.

These constraints make it necessary to sometimes resort to non-native species that can better cope with changing conditions. This is especially true for street trees in urban centers, such as along Bahnhofstrasse, where conditions for trees can be extreme. To unleash the positive effects of green infrastructure, it is crucial that plants can thrive, especially considering the changing climatic conditions in the future. For this reason, we recommend the Silberlinde, originating from Southeast Europe, as the street tree for Wetzikon. The Silberlinde can effectively handle drought and high temperatures (Waldwissen, 2023). Another important criterion is the size of the tree crown, which is central for providing shade and, consequently, temperature reduction along Bahnhofstrasse. This criterion is also met, as the tree achieves a crown diameter of approximately 15-20 meters (Baumschule Horstmann, 2023).

Furthermore, the Silberlinde has a rapid growth rate, leading to a swift implementation of temperature reduction measures (Waldwissen, 2023). The Silberlinde can also serve as a vital food source for bees and bumblebees (Waldwissen, 2023).

In our focus area, we aim to generously plant trees on all green spaces.



LXIV Silberlinde

The streets and squares along Bahnhofstrasse should ideally be fully covered by the tree canopies, ensuring an ample amount of shade. A Silberlinde, in its mature state, covers an area of approximately 176 square meters with a crown diameter of 15 meters. Using this as a criterion for tree planting, the following calculations emerge for the two programs.

## Conservation oriented program

The planned desealed area is approximately 14,000 square meters, including the street area on Bahnhofstrasse. Although the street surface is desealed with a permeable covering, trees cannot be planted on the roadway. However, the street area can be covered in the long term with the expansive tree canopy. Theoretically, in

the conservative-oriented program, the planting of approximately 79 trees is possible on the desealed areas. In addition to the trees on the desealed areas, there will be additional trees in the open green parks. In the current state, there are hardly any trees in the future open green parks (e.g., Färberwiese).

In the open green parks, we plan for a less densely planted tree landscape compared to along Bahnhofstrasse. If half of the trees are planted, this would mean one tree is planted per 352 square meters. In the conservative-oriented program, we have an open green park area of approximately 19,000 square meters, meaning approximately 54 additional trees will be planted. In total, approximately  $79 + 54 = 133$  trees will be planted in the conservative-oriented program.

#### **Development oriented program:**

In the development-oriented program, applying the same theoretical calculation as before, with a newly desealed area of approximately 76,000 square meters, we would have around 432 new trees. The desealed area in the development-oriented program is much larger, meaning a significant portion of our focus area would transform into a forest. Therefore, we recommend planting approximately half of the trees, which equates

to about 352 square meters per tree, or approximately 216 trees. The open green parks also have a much larger area in the development-oriented program, approximately 31,000 square meters. Using the same calculation of 352 square meters per tree to ensure sufficient open spaces between the trees, this results in approximately 88 newly planted trees in the open green parks. In total, in the development-oriented program, approximately  $216 \text{ trees} + 88 \text{ trees} = 304$  trees will be planted.

The newly planted tree population should be mixed and not consist solely of Silberlinde trees. Nevertheless, this calculation provides an initial reference for the number of trees to be planted in both programs.

The existing trees in our focus area will be preserved and complemented by the newly planted trees, creating a blend of new and older trees. The calculations are more of a theoretical nature. Ultimately, depending on the location, decisions on whether a tree can be planted are individual and may vary. Other factors, such as the presence of underground structures or utility lines, also play a role. These factors are often present in dense urban areas and significantly limit the space for tree roots in the ground.



#### **Conclusion green interventions**

LXV Bicycle path in a park

The various proposed measures aim to ensure that Wetzikon remains and becomes an attractive living space in the future. These measures are intended to expand and promote the ecosystem services provided by nature. This way, people can benefit extensively from nature when they provide the necessary conditions, such as the desurfacing of sealed areas. The implementation of these measures will incur high costs and involve a lengthy planning process. Private property owners will also be affected by these measures, and their interests must be taken into account. Nonetheless, to achieve the greatest possible impact, it is important

that these measures can be implemented on private properties as well. Therefore, incentive systems should ensure that private property owners have an incentive to implement these measures. Measures involving significant construction interventions and costs cannot be implemented overnight. Hence, the proposed measures, especially in the development-oriented program, should be considered more medium to long-term.

# Transportation – Projects

Bahnhofstrasse is currently dominated by car and truck traffic. The quality of life in the center is low due to the high emissions, and the fragmentation effect of the road is high. There is also a lack of safe and efficient cycling infrastructure between Unterwetzikon, Oberwetzikon and Kempten. These challenges led to the development of two packages of measures to increase the attractiveness of Bahnhofstrasse.

## Bicycle network

The cycle network between the surrounding villages and Wetzikon is already very well developed and there are also good cycle paths along Zürcherstrasse. As the cycle lanes on Bahnhofstrasse are only narrow and are not considered safe by many people, it is a matter of urgency to create safe cycle paths along Bahnhofstrasse. The exact implementation is explained below. A connection from the center to the Buchgrindel area is also important for its accessibility and will be implemented as part of the planned new station construction. Other necessary gaps in the cycle path network, for example along Hinwilerstrasse and Pfäffikerstrasse, are not located in this study area.



## Redesign of Bahnhofstrasse – development-oriented program

Bahnhofstrasse will be closed to cars and trucks in both directions between the church and the Pappelstrasse traffic circle. On the remaining sections of Bahnhofstrasse, a 30 km/h speed limit will be implemented. Bicycles and buses will still be allowed to drive through the center. The road space in the closed section will be upgraded with high quality materials and partially unsealed.

According to our VISUM simulation, the closure of the road will result in a significant reduction in car traffic along the entire Bahnhofstrasse, which will improve accessibility and safety for bicycles. Due to the speed reduction and the lower volume of traffic, mixed use for bicycles and cars is possible (Eberling, 2023). The closure will improve the punctuality of buses, as the time lost at the Ochsenkreisel traffic circle and at the junction in Unterwetzikon

LXVI Sketch of Bahnhofstrasse development oriented program

according to the VISUM model will be almost eliminated. For motorized traffic, however, the closure will lead to a shift to Spitalstrasse, Motorenstrasse and Weststrasse, which will now have to bear a large proportion of the additional traffic. To prevent the additional traffic from becoming unbearable for residents, a general reduction in the number of cars is necessary.

## Redesign of Bahnhofstrasse – conservation-oriented program

Bahnhofstrasse will be closed in the north-south direction for almost its entire length between the Weiherstrasse junction and the Stationsstrasse junction. A 30 km/h speed limit will be implemented on Bahnhofstrasse. The reduction of one lane will provide sufficient space to introduce structurally separated cycle paths in both directions. The cycle path in the north-south direction will be three meters wide and signposted as a combined cycle and bus lane to ensure access to the center by bus. De-sealing measures will also be possible. Thanks to Stationsstrasse, north-south traffic can bypass the closure via Motorenstrasse and Weststrasse. The impact on Spitalstrasse is far less than with a full closure. For the city center, however, this option also means less congestion relief.

### Bike rental system

Bike rental systems can have a major impact on bicycle use in a city (Xinwei, 2020). For this reason, a bike rental system that is compatible with the Publi-bike system in Zurich is to be set up in Wetzikon and the surrounding municipalities. To this end, numerous rental stations need to be set up in Wetzikon, the locations of which can be seen on



LXVII Sketch of Bahnhofstrasse conservation oriented program

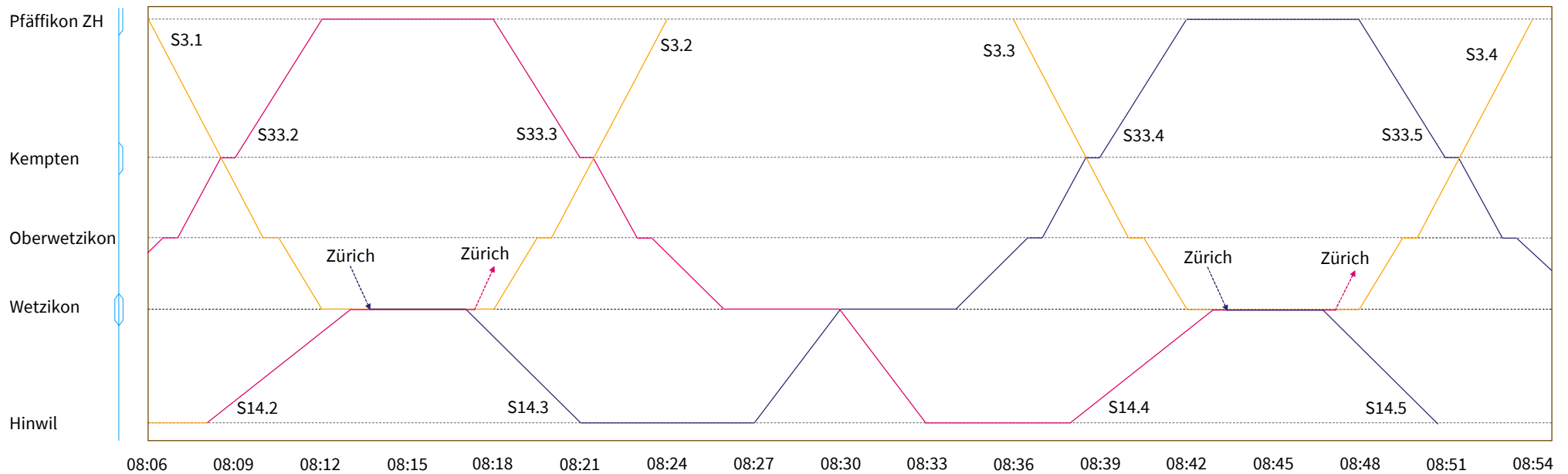
the map. The locations will be offered at schools, transport hubs, shopping centers, leisure facilities and evenly distributed throughout the industrial and residential areas. The aim is for all residents to find a rental station within 300 meters. By linking up with the surrounding municipalities and the city of Zurich's rental system, incentives are also offered to increase the number of journeys between municipalities by bike or e-bike.

### Relocation of the railway station

The location of the two railroad stations in Wetzikon is not ideal for providing access to the city center around Migros. Due to the planned strengthening of the city center as well as the strong development of the Buchgrindel area, the Färberwiese and the inner densification, there is an additional need for public transport access in this area. For the conservation-oriented program, the train station will not be moved; for the

development-oriented program, train services at the station in Kempton will be reduced and a new station will be built 720 meters to the southwest. This will significantly improve access to the city center. However, trains currently only run every half hour, which hardly contributes to a strong modal shift effect. For this reason, the relocation of the station will also see the introduction





of a new railroad line running from Hinwil via Wetzikon and Oberwetzikon to Pfäffikon ZH. This line increases the frequency between Wetzikon and Oberwetzikon to 15 minutes and provides fast connections to Uster, Rapperswil and Zurich thanks to the efficient connections in Wetzikon. In addition, a new link will be created between Pfäffikon ZH and Hinwil, which can help to reduce car journeys between these two municipalities.

### Double-track expansion

As part of the project planning, it must be checked whether the relocation of the station can be realized with the planned double-track expansion. Although this is provided for in the Canton of Zurich's structure plan, it is not included in the federal government's sectoral transport plan (ZH, 2023b) (ARE, 2022a). The BAV's evaluation of possible infrastructure measures does not mention this double-track expansion either (BAV, 2018). For this reason, this report is based solely on the assumption that the new stop will be built.

### Realisation

The planned timetable is documented in the graphical timetable above and can be run on the existing infrastructure. There is no urgent need for further double-track measures. The punctuality of the existing trains is above 95%, so the risk of delay transfer is small and if needed the reserves are high (Gutweiner, A. 2023). The costs of the new station will be financed via the railroad infrastructure fund as part of the next expansion stage (AS45). The station will be built between the Usterstrasse underpass and Migros. The platform with

### LXVIII Graphical timetable plot

a length of 310 meters will be accessed by stairs and ramps from Usterstrasse, Strandbadstrasse and the future shopping center. To improve the accessibility between Migros and the city center on one side and the Buchgrindel area and Färberwiese on the other, the Strandbadstrasse underpass will be widened considerably so that the railroad line will be located on a bridge over a length of 50 meters.

### Additional bus lines

The implementation of the development projects will greatly increase the demand for mobility. To calculate the additional demand, the additional inhabitants were allocated to the VISUM demand districts. This alone results in a population increase of 146% for the VISUM district of Wetzikon-Nordwest. Considering the current demand data for MIT and public transport, Wetzikon's motorization rate, the parking spaces to be built and the associated maximum motorization rate and the resulting modal split for the development area, it is possible to calculate the number of additional trips (ZH, 2023f) (ZH, 2023g). For the Wetzikon-Nordwest district, this results in an increase in MIT trips of 22% and in public transport trips of 345%.

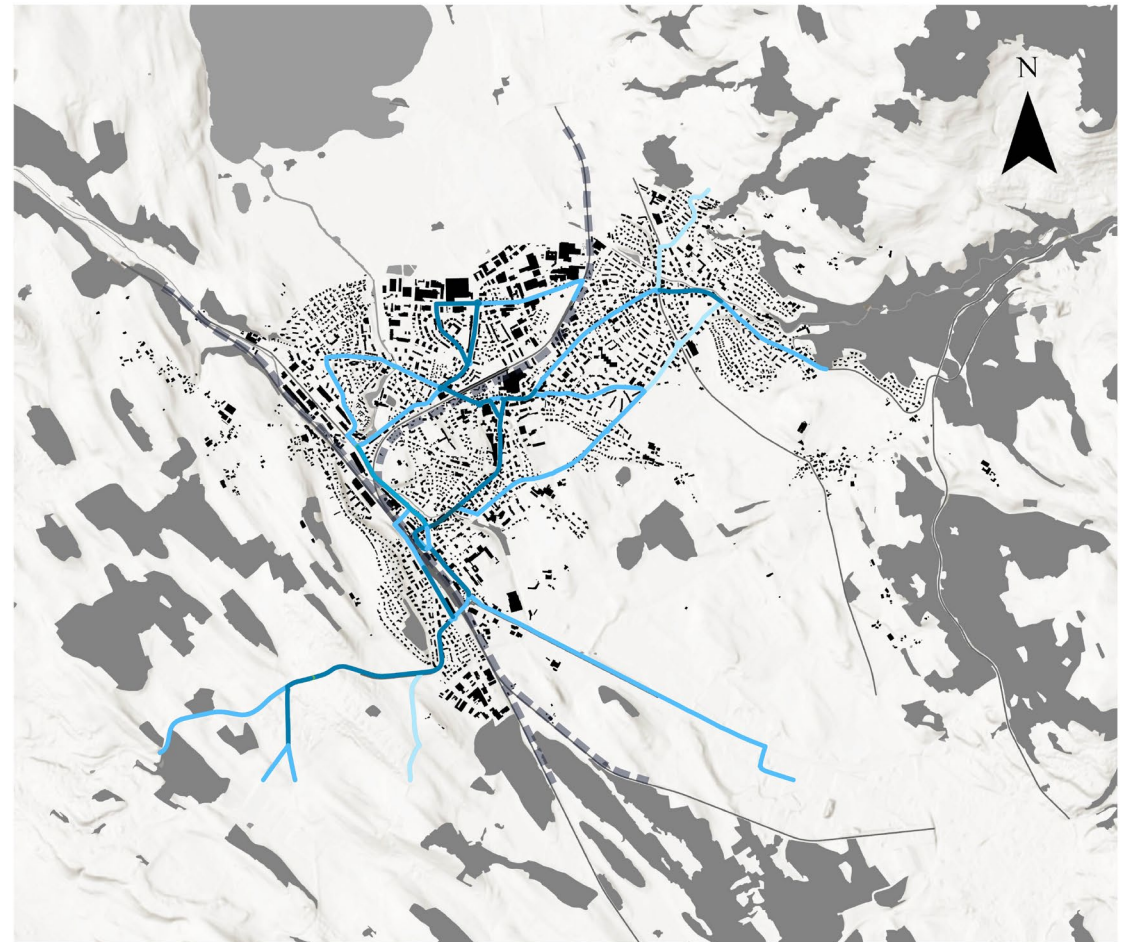
In addition to the relocation of the train station, this will also require an increase in the frequency of bus lines and the introduction of new bus lines as well as the extension of existing bus lines. To this end, route 856 is to be increased to a continuous quarter-hourly service, the evening departures are to be extended until 22:00 and the route is to be extended to the former Kempten railroad station to guarantee access to this area. Line 857 currently only runs as far as the Zentrum stop. In future, this

line is to be extended to the traffic circle at Färberwiese. A continuous quarter-hourly service is also planned here. To provide direct access to the Buchgrindel area, line 869 from Hinwil is also to be extended from Wetzikon station to the Motorenstrasse/Weststrasse traffic

circle to provide a direct and fast connection for people with limited mobility.

All bus stops except the stops at main station will be moved from the side of the street to the car lanes used by the cars. This will increase the speed of the

bus during peak hours and congestion, as cars need to wait behind the stopping busses.







LXIX New bus service map

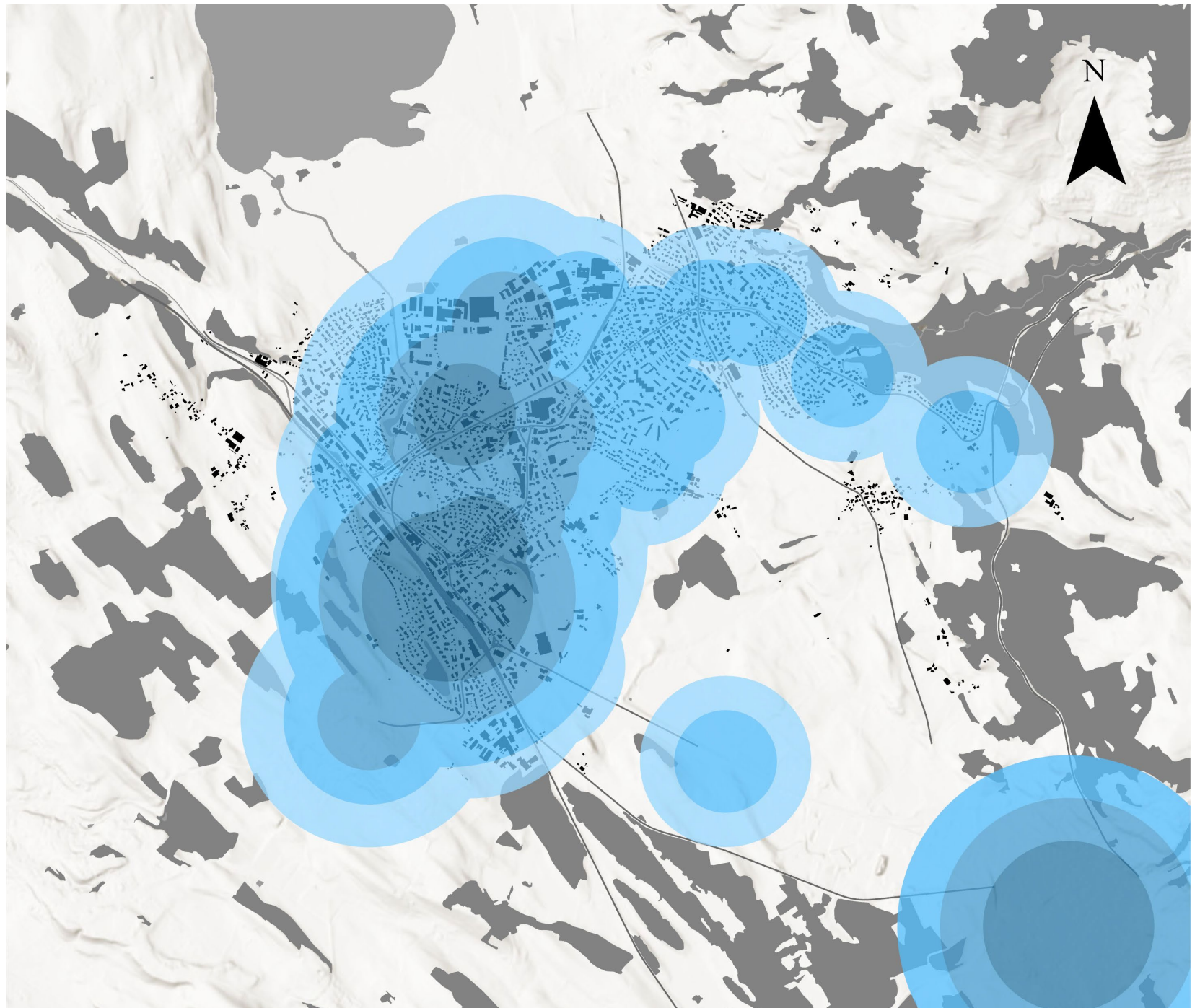
LXX New PT quality class map →

Legend

Public transport quality class (A the best)

-  A
-  B
-  C
-  D

0 250 500 Meters  



LXXI 3D Visualisation  
development oriented program



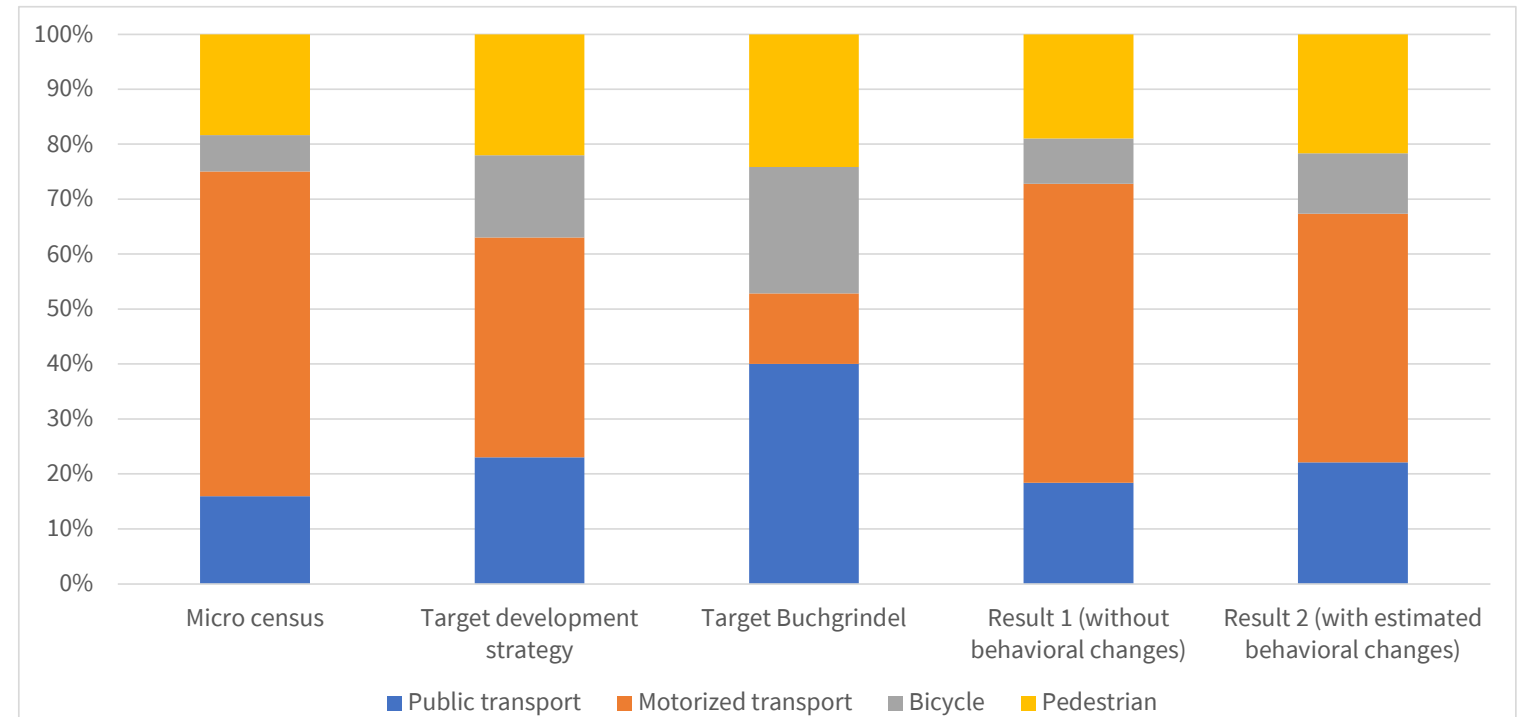
LXXII 3D Visualisation  
conservation oriented program

# Mobility - Rating

## Modal split

The change in the modal split is considered separately for existing residents and new residents and only for the development-oriented program. This is mainly due to the different levels of motorization and the better controllability of the modal split for newly developed areas.

For new residents, especially on the Buchgrindel area, there are severe restrictions on car ownership. In all developments with a design plan, only 30% of the originally planned parking spaces will be built. This affects 2894 people. Instead of 1155 parking spaces, only 421 parking spaces will be realized. The motorization rate in Wetzikon is currently 51.36% (ZH, 2023f). In the developments with a design plan, the motorization rate can be a maximum of 11.18%, as there is no space for additional vehicles. If the number of trips per car is assumed to remain the same, the car's share of the modal split will fall from 58.9% to 12.8%. These shifts will have to be absorbed by public transport and non-motorized traffic. The share of public transport is estimated to increase from 16% to 40% and the share of non-motorized traffic from 24.9% to 47%. Public transport is growing faster than non-motorized traffic,



LXXIII Modal split plot

as not all car journeys can be replaced by non-motorized traffic. However, these measures are not enough to achieve the target value.

### Behavioral changes

In a further estimate, changes in the behavior of the existing population are assumed. Due to the complex overall situation, no precise calculations are possible here. An increase of 30% is assumed for public transport, which mainly considers the new rail line, the

new train station (+20% in total) and the new bus routes as well as the increased frequency (+10%). A reduction of 15% is expected for motorized traffic. This is mainly due to the closure of Bahnhofstrasse and the resulting increase in travel time of potentially several minutes. The introduction of the 30 km/h zones in Wetzikon will also lead to a slight increase in journey times. For bicycles, an increase in the number of trips of 50% was assumed. This is mainly due to the new cycle path along Bahnhofstrasse,

the network extensions and the bike rental system with the surrounding municipalities. An increase of 20% was assumed for pedestrians. Here too, the traffic calming and the new connection from the center to Färberwiese will lead to a slight increase. The calculated values were normalized. The measures to increase the attractiveness of the center of Wetzikon will also reduce a substantial proportion of the average journeys, for example to Zurich.

### Effects of additional projects

Even if the effects of the additional S-Bahn trains and the construction of the A15 are not part of the proposed projects, their effects will be briefly discussed here. The proposed increase in the number of trains to Zurich from six to eight would probably have a smaller impact than the introduction of the S-Bahn Zurich or the introduction of the S15. However, a study by Bender, Bigler, Bonet Filella and Ruf on the effects of the S-Bahn on population development in the Glatttal and Oberland has already concluded that the impact of the introduction of an S-Bahn on population development is much weaker than generally assumed (Bender, J., Bigler, M. et al., 2021). The influence of the new line is expected to be all the weaker. One reason for this is that the newly introduced train will depart five minutes before the S5 and arrive in Zurich four minutes before the S5 and will therefore only cover a few new travel needs to Zurich main station. For connections to Oerlikon and Glatttal, however, the new connection in conjunction with the S14 is very advantageous, as the frequency is doubled, and the journey time is significantly shortened.

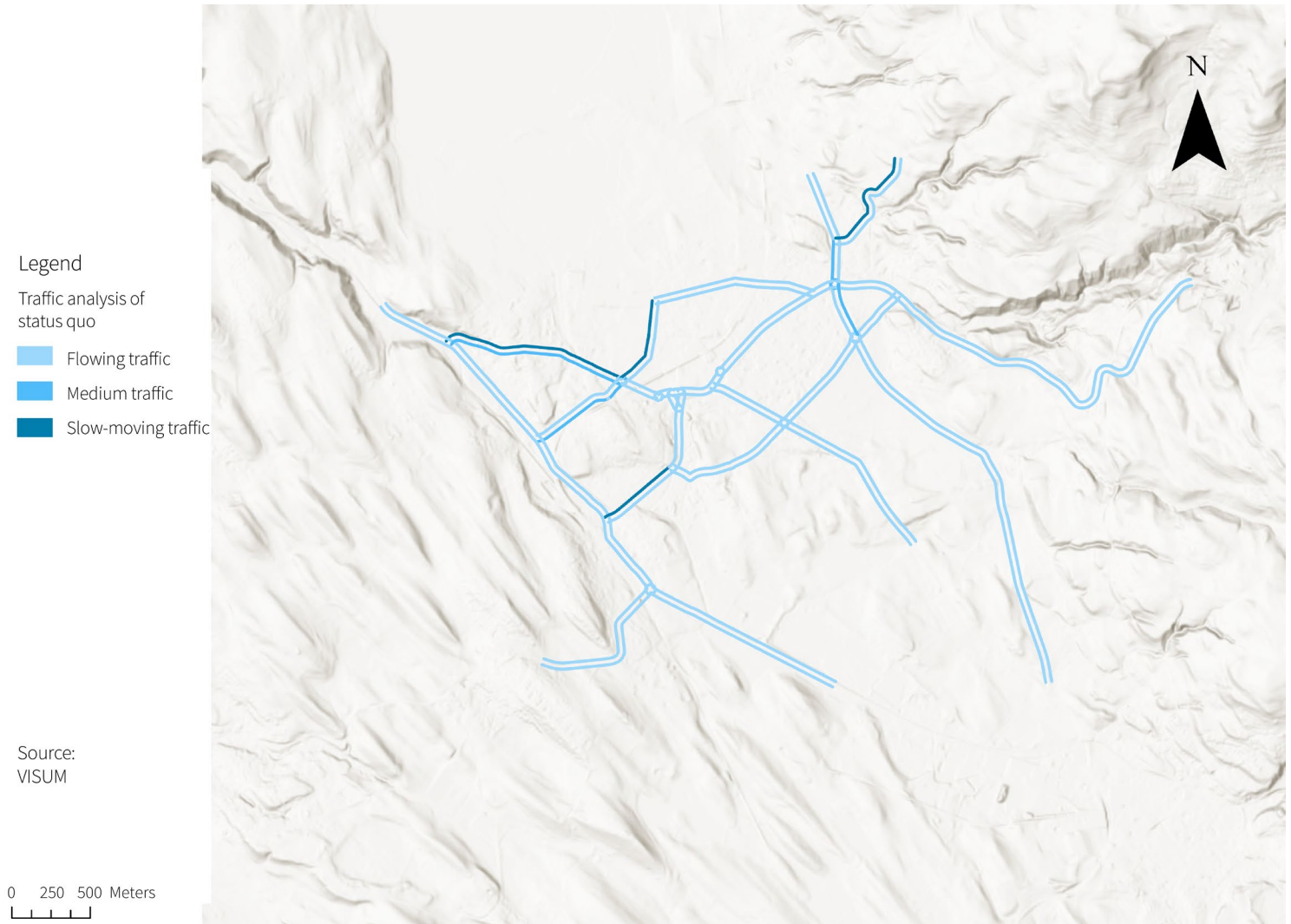
### Influence of gap closure of A15

The effects of the A15 are likely to be

more noticeable. On the one hand, the accessibility of Wetzikon by car will be improved, which will be reflected in a reduction in travel time of approx. 2

minutes (Google Maps, 2023). If there is a traffic jam in Aathal, the travel time gains tend to be greater, which should have a particular impact on commuter

LXXIV Traffic analysis map status quo traffic. The highway should significantly relieve traffic on Zürcherstrasse along



the railroad station. On the other hand, journeys along Bahnhofstrasse, Weststrasse and Spitalstrasse could increase, which is not only due to better accessibility, but also to shifts in the choice of route. Journeys from Zurich to Kempten, Bäretswil and Tösstal have so far at least partly been via Pfäffikon ZH. In the future, it is likely that a large proportion of this traffic will travel via the Wetzikon motorway junction and then through the city center. From Wetzikon's point of view, the positive effects of the highway do not seem to outweigh the negative ones.

### Travel Times

By lowering the speed limit to 30 km/h, it is already possible to achieve a high degree of speed harmonization between the modes of transport. The consistent prioritization of public transport at the traffic lights, the closure of Bahnhofstrasse to cars and the creation of a bus lane will further harmonize the speed between MIT and public transport. The construction of the new railroad station will reduce travel times from Oberwetzikon to Unterwetzikon and the city of Zurich. The new S-Bahn line, which creates additional connections between Pfäffikon ZH, Wetzikon and Hinwil, is also almost as fast as the car between Pfäffikon ZH and Hinwil.

#### Legend

Traffic analysis of development-oriented program

- Flowing traffic
- Medium traffic
- Slow-moving traffic

Source:  
VISUM

0 250 500 Meters




The new cycle lanes and cycle paths will presumably also increase the speed of cyclists, as it will be easier to overtake lines of cars. By setting up cycle lanes in places where cars are not

wanted (for example between Färberwiese and Migros or - depending on the program - along Bahnhofstrasse), bicycles can use the shorter distance to their advantage.

LXXV Traffic analysis map development oriented program



## Emissions

In terms of emissions, a distinction must be made between noise, pollutants and CO<sub>2</sub>. A reduction in noise and air pollutant emissions can be expected on Bahnhofstrasse because of the reduction in transit options. The effects of the development-oriented program are much more pronounced than those of the conservation-based program. However, the detour traffic will result in additional pollution on Weststrasse and Spitalstrasse, which is particularly pronounced on Spitalstrasse with the development-based program. This can be reduced by lowering the speed limit to 30 km/h on these roads as well.

## Safety

The reduction in the maximum speed, the spatial separation between bicycles and cars and the general decrease in motorized traffic are expected to lead to a significant reduction in accidents. However, the increase in cyclists could lead to a volume-related increase in the number of conflicts between cars and bicycles. The shift of cars from Bahnhofstrasse to Spitalstrasse and Weststrasse could lead to an increase in the number of accidents on these two roads. To prevent this, a reduced speed on these roads could also be advantageous.

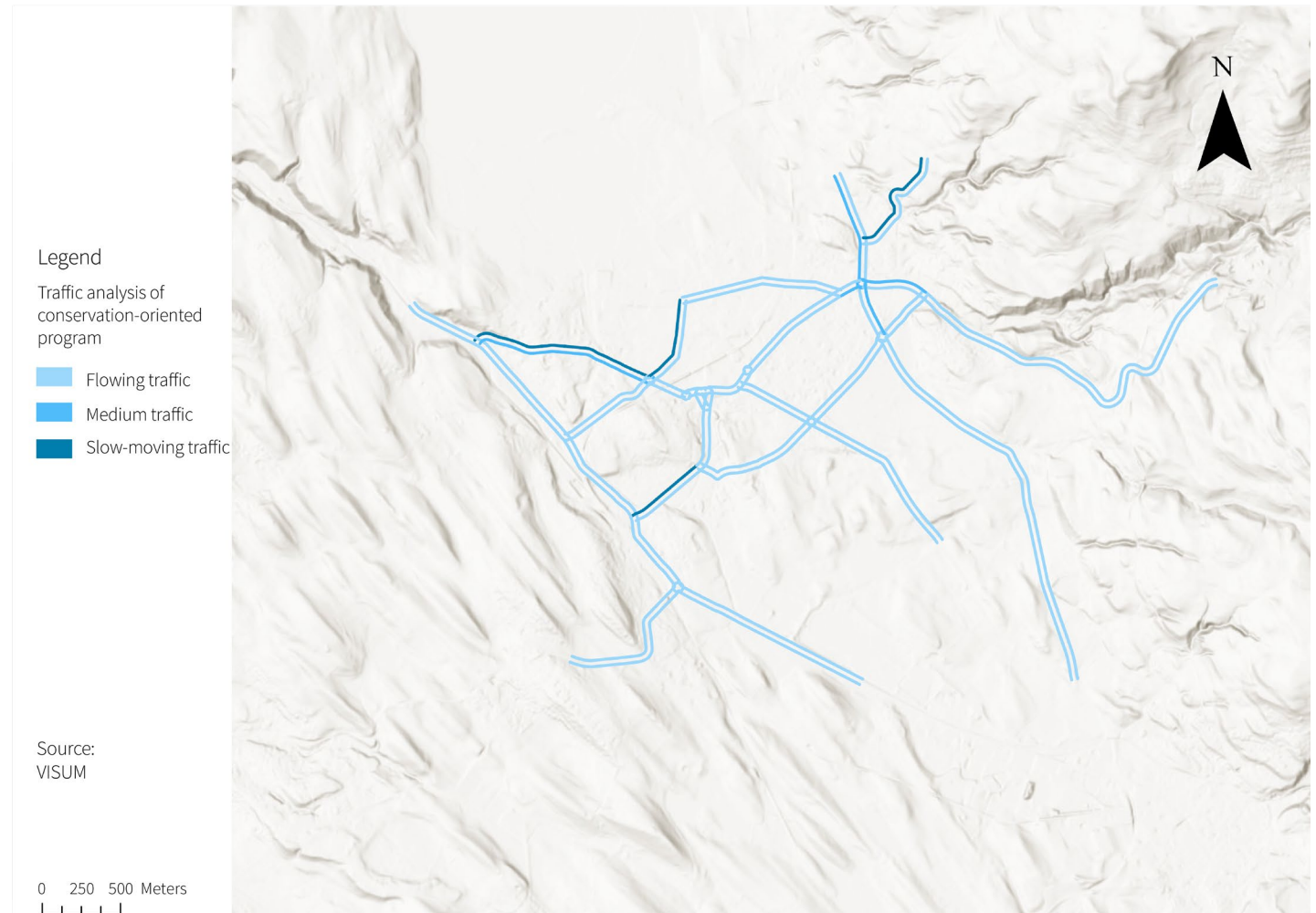
### Effects of existing street network

The traffic simulations with VISUM (SBA reallocation) have shown that as a result of the measures along Bahnhofstrasse, motorists choose other routes, primarily along Stationsstrasse

and Weststrasse to the south and in the development oriented program also along Spitalstrasse to the north. These two axes are experiencing a significant increase in the number of cars. However, congestion times will not change

LXXVI Traffic analysis map  
conservation oriented program

significantly based solely on the reallocation simulations. Details can be found in the three maps.



# Vibrant - Rating

## People oriented city center

As shown in the situation analysis, the center of Wetzikon is heavily influenced by car traffic. Numerous measures should greatly reduce this impact in the coming years. The redesign of the streets and adjacent areas will also make the center much more people friendly. A comparison with the smaller town of Lyss in the canton of Bern is worthwhile. Thanks to various measures such as a speed reduction on the main roads, the installation of a new, attractive stone pavement on the main square and the organization of cultural events and markets, the center has become much more attractive and livelier in recent years. Even though there may not be enough space in the center of Wetzikon to organize such events, the Buchgrindel area will create the necessary conditions.

## Lively neighbourhood

The success of the community centers in Zurich has shown that the concept is fundamentally suitable for revitalizing neighborhoods and connecting people. However, the question arises as to whether a concept that is successful in a large city can also lead to revitalization under much smaller conditions. This would have to be examined in detail as part of scientific monitoring in subsequent

years. However, the people-friendly architecture in the development areas, the many squares, parks, and attractive street spaces should result in a much

more active neighborhood regardless of the community centers, as can be seen in the Vauban district in Freiburg or in the Kalkbreite development.

Legend  
Perception Score  
Social

- < 6
- 6 - 7
- > 7

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



LXXVII Perception map social  
status quo

## Perception Maps

To assess the effectiveness of our planned interventions, we utilized Dr. Switalski's Perception Maps model. The base model, provided as an IPA document, was enhanced using the OpenStreet-Map road network and key attributes: road hierarchy, lane count, maximum speed, and adjacent land use. Land use was added using spatial join.

To investigate various programs and themes, the following modifications were made:

### Status quo

The usage of nearby buildings (spatial join tool, match option - closest search radius - 15 m, merge rule -> first) and open green space with recreational functions (for this case only Färberwiese) (spatial join tool, match option - closest search radius - 5 m, merge rule ->first) are passed to the road network. The links that did not receive a new value from this join, we retained the original value from base model.

### Programs

For programs both we did the same process as status quo but with different building plan and green plan according to the interventions in the program. The hierarchy of the road, number of



lanes, speed limit on the link of the road network is changed according to our mobility interventions. The following 6 maps depict the Perception Maps as

an impact analysis of the perception of interventions on the green space and social space. Out of these 6 maps, 2 each represent the status quo, the

LXXVIII Perception map social  
development oriented program

conservative oriented program, and the development oriented program.

The perception of the green space changes across the entire focus area when comparing the two programs with the status quo. The perception score decreases in many places. Why? When comparing the two programs with each other, it is evident that the development oriented program has the higher perception score, especially along Bahnhofstrasse. Additionally, there are additional perception scores in the reserve zone area. Significant differences are evident between the two programs, indicating that the various measures have distinct effects on perception.

The project authors cannot fully understand the results of the perception maps in every detail. Some changes contradict the intuition of the project authors. Further evaluation is necessary in any case.

Legend  
Perception Score  
Social

- < 6
- 6 - 7
- > 7

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



LXXIX Perception map social  
conservation oriented program

Legend  
Difference in  
Perception score -  
Social

- decrease > 1
- decrease < 1
- increase < 1
- increase > 1

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



Legend  
Difference in  
Perception score -  
Social

- decrease > 1
- decrease < 1
- increase < 1
- increase > 1

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



# Green - Rating

## De-sealing

De-sealing achieves 3 effects in particular: Lowering the ambient temperature, promoting biodiversity, and infiltrating precipitation. These effects have different costs and impacts depending on the size of the area under investigation. The size of the area that we unseal depends on our program. For the development-oriented program

The costs for de-sealing vary depending on the effort required to unseal the area and dispose of the accumulated material. Data from the literature assumes 65CHF per m<sup>2</sup> (Held, 2023). This is an estimate, as the costs can vary greatly depending on the initial situation. This means estimated investment costs of 65CHF\*14'000m<sup>2</sup>=910'000CHF for the conservative oriented program and 494'000CHF for the development-oriented program of 65CHF\*76'000m<sup>2</sup>. The subsequent planting or water-permeable paving of the unsealed area incurs additional costs.

In addition to the costs, there are also positive cooling effects. Zurich has carried out various calculations and produced a document that provides valuable information on the costs and benefits of heat mitigation measures. For example, if asphalt is replaced by grass, the temperature (perceived heat) can be

reduced by a median of 3.6°C, with asphalt by 2.2°C and with paving by 2.4°C (Stadt Zürich, 2020). The de-sealing measures therefore already promise a

significant reduction in temperature, which can noticeably improve the quality of stay on hot summer days.

Legend  
Perception Score  
(Natural+Recreational)/2

- < 6
- 6 - 7
- > 7

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



LXXXII Perception map green  
status quo

## Planting green and open green space

When replanting greenery, the focus is on planting additional trees. Replanting involves considerable costs. The city of Zurich mentions costs of 5000CHF for a large-crowned tree with mechanical transplanting. The larger the tree, the faster it can contribute to the urban climate. Large trees also come at a much higher price. A tree on grass leads to a reduction in median perceived heat of 4.2 °C compared to asphalt (Stadt Zurich, 2020).

In both intervention programs, it is planned to plant a considerable number of new trees to achieve the greatest possible effect on temperature reduction. Planting 79 and 216 trees respectively and assuming 5000CHF per tree would result in estimated costs of  $79 \cdot 5000\text{CHF} = 395'000\text{CHF}$  in the conservative-oriented program and  $216 \cdot 5000\text{CHF} = 1'080'000\text{CHF}$  in the development-oriented program.

The creation and expansion of public green spaces and parks have high benefits for the recreational activities of the residents. The public green spaces can be used for recreation and sport. In the development-oriented program, the creation of a green belt also contributes to connectivity and thus to the preservation of animal populations and

biodiversity. In quantitative terms, the creation and expansion of open green spaces/parks can be quantified primarily in terms of heat reduction effects. As

mentioned in the previous section, a tree on grass as a replacement for an asphalt surface results in a temperature reduction of 4.2°C. The main cost of these

LXXXIII Perception map green development oriented program

measures is the design of the areas. This means planting trees and bushes,

Legend  
Perception Score  
(Natural+Recreational)/2

- < 6
- 6 - 7
- > 7

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters





creating pathways and recreational areas, installing seating and lighting. The estimated costs of these measures differ greatly between the conservative-oriented and development-oriented program, as the size of the area and therefore the tree requirements are fundamentally different. 54 new trees are planned in the conservative oriented and 88 in the development-oriented program. Based on the assumptions of  $54 \cdot 5000\text{CHF} = 270000\text{CHF}$  and  $88 \cdot 5000\text{CHF} = 440000\text{CHF}$  respectively.

### Perception map green

The perception of the green space changes across the entire focus area when comparing the two programs with the status quo. The perception score decreases in many places. Probably due to the densification of communities. When comparing the two programs with each other, it is evident that the development oriented program has the higher perception score, especially along Bahnhofstrasse. Additionally, there are additional perception scores in the reserve zone area. Significant differences are evident between the two programs, indicating that the various measures have distinct effects on perception.

Legend  
Perception Score  
(Natural+Recreational)/2

- < 6
- 6 - 7
- > 7

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters




LXXXIV Perception map green  
conservation oriented program

Legend  
Difference in  
Perception score -  
(Natural+Recreational)/2

- decrease > 1
- decrease < 1
- increase < 1
- increase > 1

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



Legend  
Difference in  
Perception score -  
(Natural+Recreational)/2

- decrease > 1
- decrease < 1
- increase < 1
- increase > 1

Source:  
IPA Documents -  
Perception Map

0 25 50 100 Meters



# Inclusive - Rating

## Distribution of street space

The redesign of the streets with an increased focus on pedestrians and cyclists, both in the newly planned Buchgrindel area and in the changes to the existing infrastructure, leads to a redistribution from motorized private transport to slow-moving traffic. The road space is now available to more users and is therefore more inclusive.

## Activities

The consistent orientation of the public spaces towards the needs of people and social interaction leads to a high increase in the quality of stay. The event spaces for the local population enable planned and spontaneous meetings, performances and parties and further promote social interaction.

## Medical service

The planned establishment of several doctors in the Buchgrindel development area guarantees medical care for the population in this area.

## Apartments for elderly

The envisaged quota for older people and the focus on designing this housing to meet their needs means that this objective is fully met.

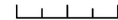
### Legend

#### Healthcare

● new healthcare

● existing healthcare

0 25 50 100 Meters



LXXXVII

Healthcare map  
development oriented program

## Wheelchair users

Thanks to the adapted street design, the consistent lowering of the sidewalks around pedestrian crossings, the additional pedestrian connection between Migros and Färberwiese and the continuous use of elevators in the buildings and at the train station, access for wheelchair users is guaranteed throughout. The extension of the buses to the Buchgrindel area also enables people with limited mobility to reach various destinations in Wetzikon and Zurich quickly and comfortably.

## Distribution of renting prices

For 89% of the residents of all development projects, rent limits and distributions can be set as part of the design plan. For the Buchgrindel area, rent limits were set in relation to the existing rents. However, lower rents are a double-edged sword for the municipality. On the one hand, Wetzikon can fulfill its social responsibility and ensure that poorer families can also find suitable living space; on the other hand, Wetzikon already suffers from below-average taxable incomes and therefore also below-average tax revenues, which reduces the municipality's scope for action. For this reason, the design plans specify that 20% of the apartments must be rented at least 10% below the average

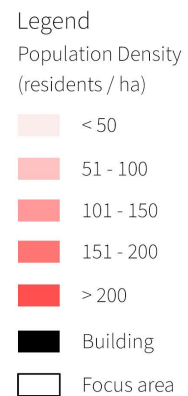


rent. In this way, a balance can be struck between the diverging interests.

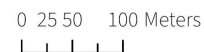
# Future oriented - Rating

## Number of inhabitants

The construction of new buildings in addition to the exemplary inner densification measures shown will provide additional living space. The development-oriented program with the development of the Buchgrindel site will create space for around 3,322 residents. It was to be expected that this would not cover the entire population forecast of 6000 additional inhabitants by 2040. This is only an excerpt and other possible projects not covered in this report can absorb the remaining part of the population growth and create additional living space. If the Buchgrindel area is not developed, as in the conservative-oriented program, it would provide additional living space for 1062 residents. It is unrealistic that the remainder could be accommodated elsewhere in Wetzikon without a large greenfield development. In this case, other options would have to be considered and further potential for inner densification would have to be found.



Source:  
Federal Statistical Office



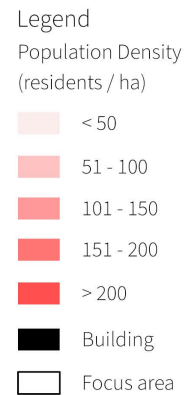
LXXXIX Population density map  
development oriented program

## Number of jobs

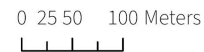
The fact that the new development has a mixed-use component means that new workspaces will be made available. Dedicated rooms for co-working spaces will also be provided. The 50 new businesses will not provide jobs for the entire projected population growth. Further measures such as financial and tax advantages must be taken to ensure that more businesses will settle in other parts of Wetzikon. If the Buchgrindel site is not developed, even fewer job opportunities will be created. This goal will not be achieved in either program.

## Building zones

The goal of not creating any additional building zones and working with the current areas is achieved with the conservative-based approach. Unexploited potential is utilized, and densification measures are implemented. This goal is not achieved with the development-based approach. The Buchgrindel site is currently a reserve zone that would need to be rezoned as a building zone.



Source:  
Federal Statistical Office



XC Population density map  
conservation oriented program

# Environmentally friendly - Rating

The various construction measures, especially in the development-oriented program, have negative impacts on the environment. The construction activities in the reserve zone lead to the additional sealing of previously unsealed green areas. In the development-oriented program, approximately 25,000 square meters are newly sealed due to the construction activities. However, this area is generously compensated for by the newly unsealed area of about 76,000 square meters.

## CO<sub>2</sub> emissions

Long-term reduction of CO<sub>2</sub> emissions in Wetzikon can be achieved through tree planting. However, the effect is ultimately minuscule. A growing tree can absorb about 50 kg of CO<sub>2</sub> from the atmosphere (Berner Fachhochschule, 2023). In the case of the development-oriented program, where approximately 304 trees are planted, an annual CO<sub>2</sub> reduction of about  $304 * 50 \text{ kg} = 15.2$  tons is possible. The development in the reserve zone covers approximately 107,000 square meters of floor area. Literature suggests an emission of 10-16 kg of CO<sub>2</sub> per square meter of floor area with conventional construction methods (Mahler et al., 2019). Assuming 13 kg per square meter of floor area results in an emission of 1,391 tons of CO<sub>2</sub>.



XCI Park with high quality of stay

Therefore, it is imperative to use sustainable building materials, such as wood and recycled materials. The use of concrete may be unavoidable, but there are already models for producing concrete with lower CO<sub>2</sub> emissions, for instance, by storing CO<sub>2</sub> and thus binding it in the long term (Neue Zürcher Zeitung, 2023).

Another important aspect is the CO<sub>2</sub> emissions from transportation. Our planned measures result in a change in the modal split. According to our calculations, currently, approximately 159,000 km are covered by cars per day in Wetzikon, leading to CO<sub>2</sub> emissions of nearly 24 tons per day. After the

implementation of our measures, the daily kilometers traveled are reduced to about 137,000 km, resulting in a reduction of daily CO<sub>2</sub> emissions by approximately 3.2 tons per day.

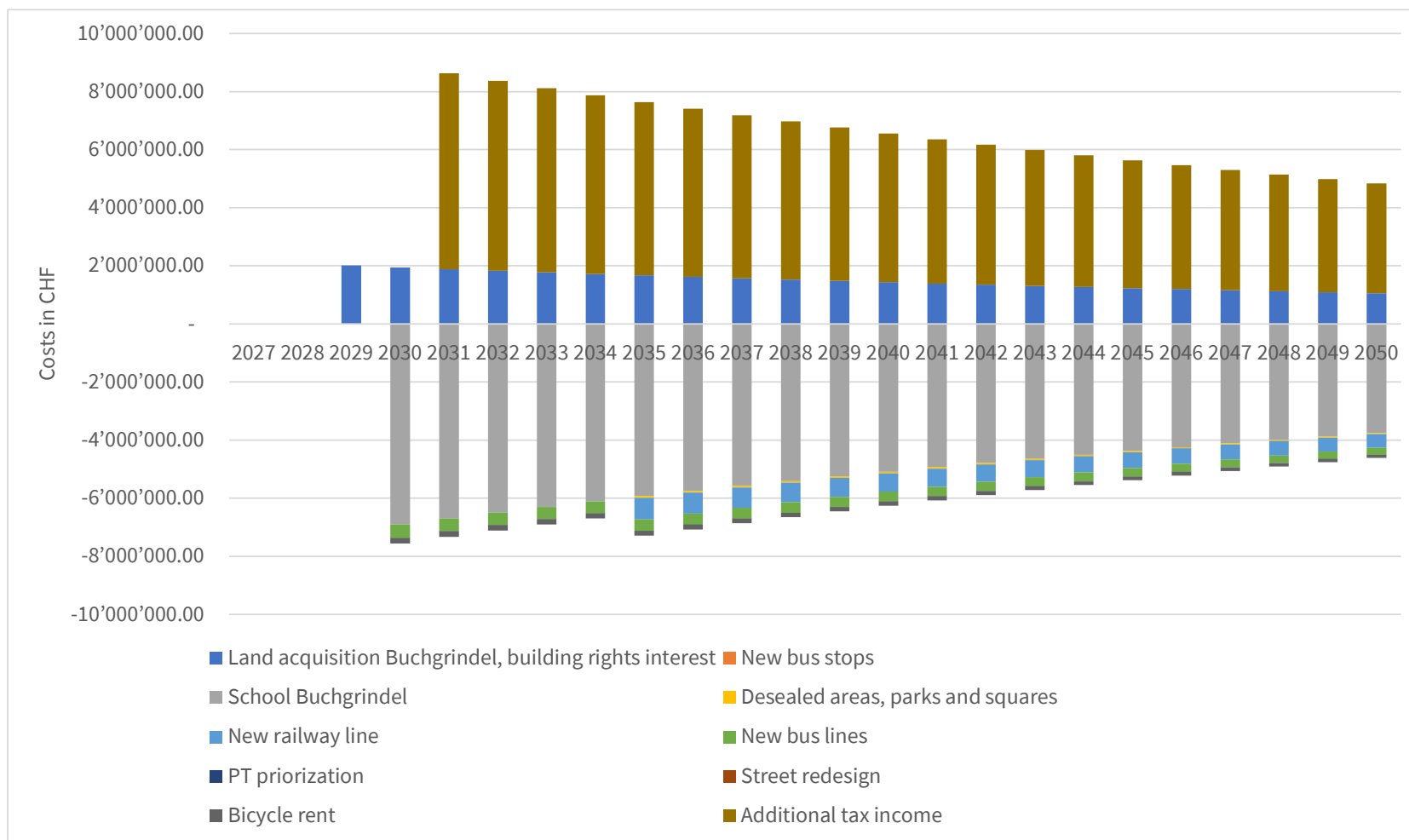


# Financial - Rating

The investment costs and the running costs for the public sector were considered when calculating the financial impact of the projects. The two diagrams shown consider all costs according to the development-oriented program. Due to the large number of projects, the costs were estimated in summary form.

## Annual costs for Wetzikon

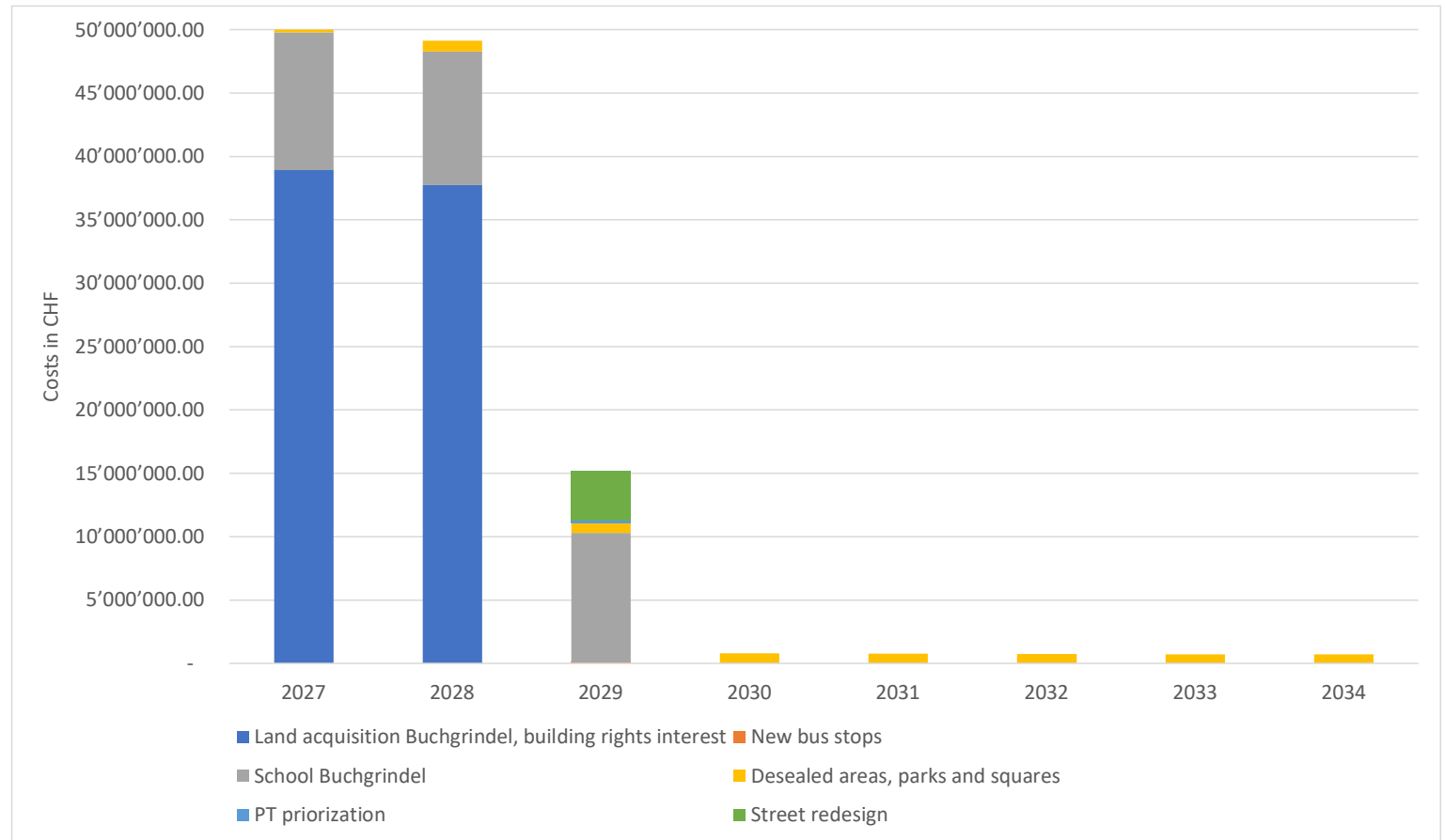
This results in substantial annual expenditure for the municipality of Wetzikon, particularly for the school. In the area of public transport, the canton and the federal government could possibly make an additional contribution to cover the costs if the traffic is not considered to be local traffic. Expenditure and income are roughly balanced. According to this calculation, Wetzikon will have a (discounted) surplus of CHF 27 million by 2050, although Wetzikon will incur further costs that could not be considered in this study (social expenditure, administration, borrowing costs).



XCII Annual costs for Wetzikon plot

### Investment costs for Wetzikon

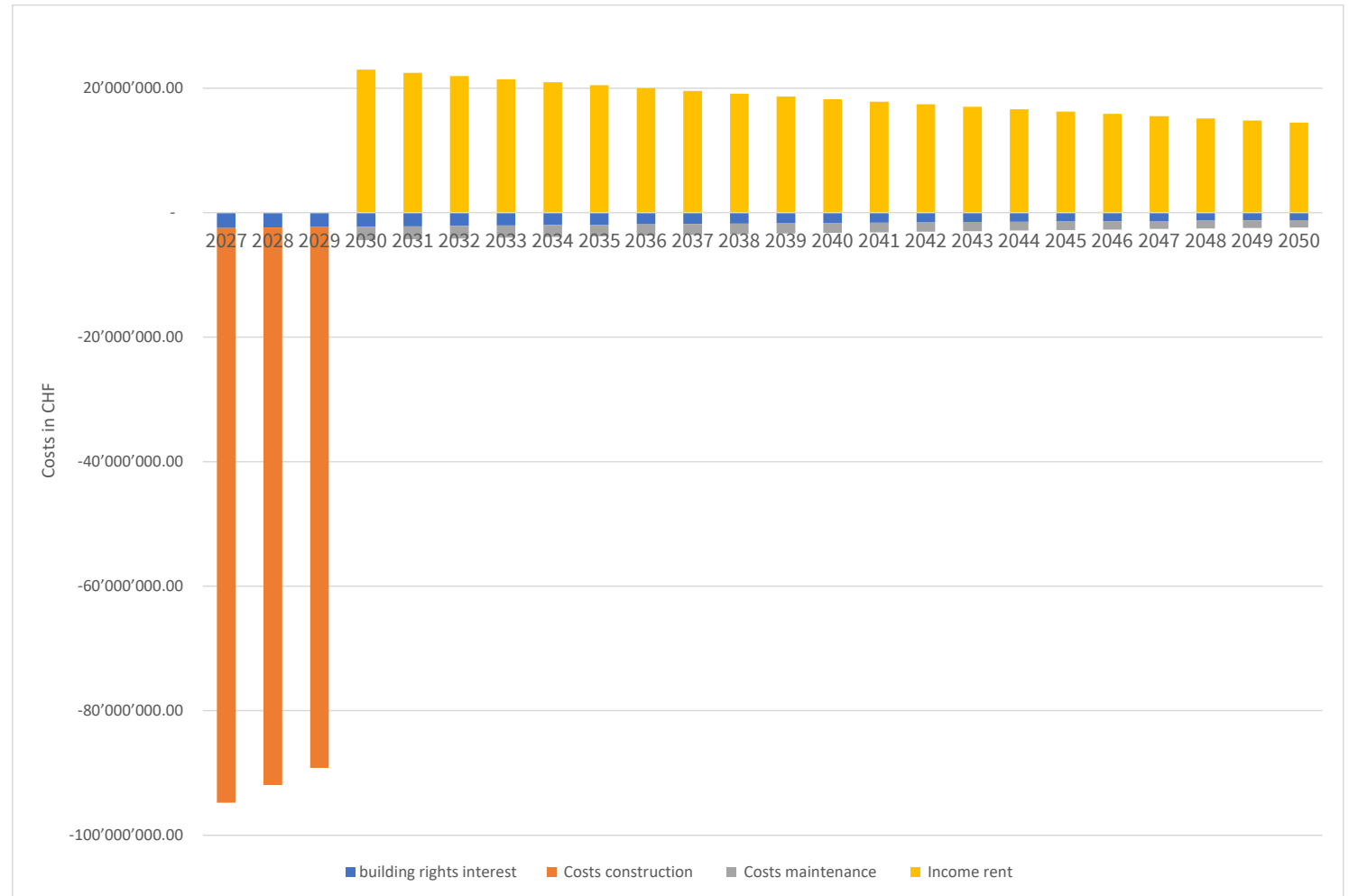
The investment costs for the municipality of Wetzikon are high. It is unclear whether the municipality of Wetzikon would be able to raise the necessary outside capital. This would have to be clarified in detail. In the years between 2027 and 2034, (discounted) costs of CHF 119 million will be incurred



XCIII Investment costs for Wetzikon plot

### Investment costs for investor

The investment calculation for investors for the Buchgrindel project shows that a positive return can be achieved over the expected useful life of 50 years. The expected income less all construction and maintenance costs as well as building lease interest is estimated at (discounted) CHF 30 million.



XCIV Investment costs for Investor plot

# Feasibility

The political feasibility of such a far-reaching change as proposed in this project depends on many factors. The political balance of power in the municipality must certainly be considered. In recent years, it has been shown that cities with progressive majorities take a bolder approach to transport policy and promote stronger measures in favor of public transport and non-motorized traffic. On the other hand, left-wing parties are also repeatedly cautious when it comes to large-scale developments, as was shown, for example, in the SBB's Neugasse development in Zurich. In this specific project, it was criticized that too little affordable living space was being created. In Wetzikon, 48.5% voted for right-wing conservative parties (SPV, FDP, EDU, Aufrecht und Massvoll) in the National Council elections. The municipal parliament in Wetzikon is strongly polarized between left-wing and right-wing forces, although the center party, the EVP and the GLP have the option of entering into alliances with either the left or the right (Wikipedia, 2023). In Wetzikon, a vote was held on 19.11.2023 on the introduction of 30 km/h zones in residential areas. This proposal was rejected with 64.41%, although the municipal council and parliament supported the proposal (ZH, 2023h). Two years earlier, an

initiative to reduce traffic in the city center was rejected by 64.27% (ZH, 2023h). This proposal was rejected by the municipal council and parliament. On the other hand, a parliamentary proposal to improve the pedestrian and cycle path network was approved by 62.85% on the same date, with a budget of CHF 6 million and calling for a change in the modal split (ZH, 2023h).

These three votes show the area of tension in which this project operates. The reduction of the speed limit to 30 km/h seemed to be one of the least controversial road measures for the project authors. The closure of Bahnhofstrasse, the massive reduction in parking spaces and the relocation of the train station would, in the view of the authors, have a much greater impact on part of the population. These are the three most controversial measures in the transport sector. In contrast, additional bus and train lines, bicycle rental and an improved cycle path network are less controversial, at least if funding is available.

Some of the projects, such as the bike rental or a change to the building and zoning regulations, can be approved by parliament without a mandatory referendum. For the Buchgrindel development, however, a mandatory referendum is required, as land worth over

CHF 5 million is being purchased and the same area is being handed over in building rights. The new construction and operation of the school will also result in additional expenditure of more than CHF 5 million and more than CHF 500,000 CHF over several years (Wetzikon, 2021). While votes in parliament are more predictable, referendums are always a threat to the feasibility of a project.

Realistically, the traffic measures can at best be implemented in stages. In particular, the reconstruction of Bahnhofstrasse must be examined in depth and further developed in a dialog with the municipality. Traffic trials lasting a few weeks are also conceivable to better assess the impact on Weststrasse and Spitalstrasse.

## Social feasibility

However, the approval of such a far-reaching conversion is not only a political question, but also a social one. For the Swiss Landscape Observation project, people throughout Switzerland were asked whether they had noticed any changes to the landscape in their local community. Many agree with the statement that many new residential areas have been built settlements have become denser and green spaces have been built on (Arn, D., Bigler, M. et al.,

2022). The majority of those who noted changes perceive them negatively. Nevertheless, many survey participants rate the perceived beauty of the landscape positively, even in urban and peri-urban areas (Arn, D., Bigler, M. et al., 2022). The authors of the LABES study therefore wrote that to prevent the loss of cultivated land, settlement development must be increasingly inward-looking, but with a focus on quality and with the greatest possible protection of existing green spaces. The calculation of the average perception scores for urban qualities and perceived beauty shows that the development-oriented program achieves a score of 7.46 compared to 7.34 for the status quo. The conservation based program achieves 7.43. The perceived beauty drops from 6.7 to 6.65 for the development oriented program and rises to 6.76 for the conservation oriented program.

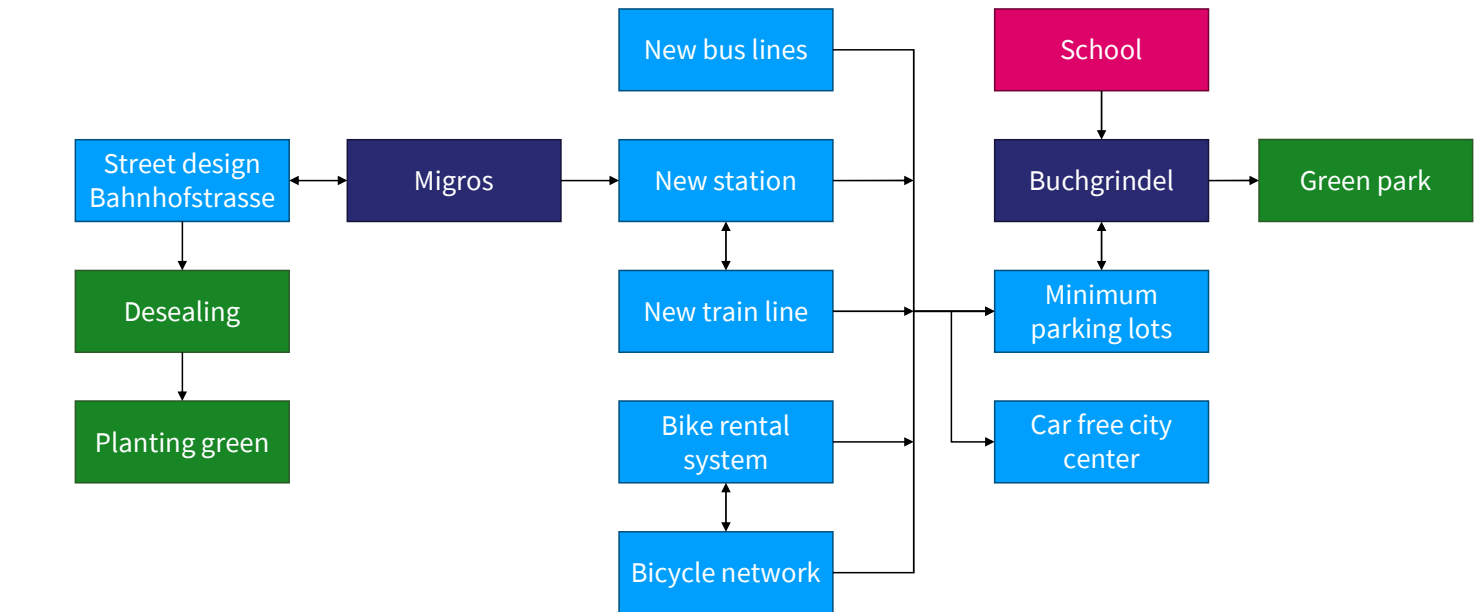
The ambitious goals of the development strategy and strict rules of the design plans precisely enable this quality-oriented and careful inner densification from the perspective of the project authors. However, it is crucial for implementation that the residents are also convinced of this and appreciate the additional, usable green spaces in the Buchgrindel area.

# Recommendation

The evaluation of the planned interventions has shown that the proposed measures make an important contribution to advancing Wetzikon based on the development goals. Not all measures have the same scope and not all make the same contribution to achieving the development goals in terms of scope. None of the measures fundamentally run counter to the objectives of the development strategy. However, the overall impact of certain measures is ambiguous, namely the Buchgrindel development project. While the project will make an important contribution to achieving the population, mobility, and attractiveness goals, 8 hectares of agricultural land will be lost and some of it will be sealed. Thanks to numerous measures, this is not expected to have a negative impact on biodiversity or the recreational needs of the surrounding population.

## Interdependence of the measures

Many of the measures can be implemented independently of each other; for some, no prior steps are even required from the municipality of Wetzikon, such as the Nordstrasse project. For other projects, however, a bundle of measures is necessary. To develop the Buchgrindel area, numerous transportation measures must be implemented



in parallel. These include the new train station, the new railroad line, the new bus routes, the bicycle rental system and the bike network. Although the development could also be built with a regular number of parking spaces, which would make all the measures listed unnecessary in regulatory terms, this would run strongly counter to the objectives of the development strategy and should therefore be rejected. There are further dependencies, which are

shown in the following diagram. For example in order to plant greenery, it must be first desealed. However street design of Bahnhofstrasse and the reconstruction of Migros are dependent of each other.

XCV Dependencies plot

## Dealing with uncertainties

From the perspective of the project authors, there are three main uncertainties.

- Political feasibility
- Municipal financing
- Development of demand for housing

## Political feasibility

As already mentioned in the previous chapter, the political feasibility of some traffic projects is questionable. Even if one or more of these projects (e.g., 30 km/h, redesign of Bahnhofstrasse, minimal parking lots) cannot be implemented, this does not call into question the entire package of measures or the development strategy. Nevertheless, important measures to increase the attractiveness and greening of Bahnhofstrasse will be lost if the redesign is not implemented.

## Municipal financing

Some of the projects require a not inconsiderable financial contribution from the municipality of Wetzikon. As shown above, the purchase of the Buchgrindel site requires considerable financial outlay. Even if the land remains on Wetzikon's balance sheet as

a book value, the purchase requires the procurement of a large amount of borrowed capital, which will not be easy and will not be uncontroversial. The building lease interest and the additional tax revenue will compensate Wetzikon in the long term, but it remains a subjective assessment as to whether this can outweigh the disadvantages for the municipal finances in the short term. Some other projects require considerable cumulative expenditure that could exceed Wetzikon's budget. These mainly include the additional bus routes, the bicycle rental system and the operation of the school. After all, the school should be self-supporting in the long term thanks to the additional tax revenue. It should be examined whether repetitive expenses incurred in connection with the development projects can be passed on to the project sponsors via the design plans. These include the maintenance of the parks and part of the costs of the bicycle rental system. The discontinuation of certain services must also be considered if the deficit of the municipality of Wetzikon becomes problematic.

## Development of demand for housing

Even if a decrease in demand for living space seems unlikely today with a vacancy rate of 1.01%, it must nevertheless

be expected in the longer term (ZH, 2023f). The building lease is expected to run for 50 years, which is associated with major uncertainties due to the length of time involved. Numerous financial obligations are attached to the Buchgrindel development, which will only pay off for the municipality if the building lease interest flows as planned and the tax revenue corresponds to the targeted level. The problem with a decrease in demand for apartments is not only that more apartments would remain empty, but also that rents would have to be adjusted downwards, which would significantly reduce income in the long term. In such a situation, both the investor and the municipality would have to write off their investments and would hardly be able to react to such a situation.

## Recommendation for interventions

In principle, it has been shown that both the development-oriented program and the conservation-oriented program achieve some of the previously set goals. The development-oriented program achieves more goals and generally performs better in terms of the individual goals. However, there are also clear risks, in particular political and financial feasibility. Further phasing, the testing of measures or

the re-dimensioning of some projects could also help to improve acceptance. In principle, as many measures as possible should be taken to promote acceptance of the measures as much as possible. The residents of Wetzikon should be involved in the development of the projects at an early stage, be it in dialog groups or open information and discussion events.

# Reflection

## Difficulties in the process

The nature of a planning process means that the level of abstraction changes greatly from very abstract at the beginning to very concrete at the end. The abstract start was difficult, and finding a development strategy that suited the group and Wetzikon, that was innovative but could still be realized, was not easy. With a development strategy and a focus area in place, the work became much more concrete and tangible, but also more confusing. Suddenly, many projects had to be processed and kept under control. Good project management was necessary to coordinate all group members, avoid duplication and fill gaps. Nevertheless, coordination difficulties arose time and again, particularly in the case of interdependencies between the projects, but these were probably unavoidable. It was also difficult to always work on and assess both programs with the same intensity. The Buchgrindel project is the most important product of this work and the fact that it is not part of the conservation-oriented program led to a partial neglect of this program. In retrospect, it is also questionable to what extent the creation of two intervention programs was helpful in the evaluation and assessment of feasibility. In the end,

except for the Buchgrindel area and the redesign of Bahnhofstrasse, both programs were very similar, which did not only help with the elaboration and evaluation. It may have been better to evaluate the individual projects regarding the development goals. The conclusion to be drawn here for future projects is that the allocation of projects to the programs should be more exclusive. It also became apparent that the aim of quantitatively evaluating the two programs with a total of 23 projects in eight categories and 31 points proved to be partly unfeasible in terms of time resources and the complexity of the task, regardless of the difficulties with individual evaluation points.

## Technical difficulties

Apart from the procedural difficulties, some specific functional or technical difficulties also arose. For many of the projects, the impact on people's behavior should be estimated, for example in the case of the traffic measures or the projects to revitalize the city center. Unfortunately, it was hardly possible to reliably estimate the cumulative effect of all transport measures on the modal split, as the proposed measures are too diverse, the elasticity values in the literature differ widely and the effects of these measures in a rather small city are

unclear. It seems that the data collection and research focus mainly on larger cities. For example, while the effect of introducing a new fast cycle route in the city of Bern can be well quantified, it remains questionable whether the introduction of a fast cycle route along Bahnhofstrasse would have a similar effect, although the length of the two routes is comparable (Swisstopo, 2023). The situation is similar with measures to increase the attractiveness of cities. Here, too, projects in larger cities are much better documented and probably more frequent, which makes it much more difficult to draw conclusions about Wetzikon.

Another problem concerns the lack of data to quantify the measures. In particular, standard cost rates for building or road construction in Switzerland are difficult to find, especially after the cost increases of recent years. Even small differences in construction costs, discount rates or rental income can turn a profitable project into a loss-making one for the investor.

Several technical problems also arose during the process. For example, it proved difficult to always keep the spatial data up to date for all group members and to make all changes made by

group members available to everyone at all times and incorporate them into the project. As part of project management, better care should be taken here to ensure that all changes are regularly merged, and the data made available to all group members.

## Achievements

Wetzikon will continue to develop dynamically in the coming years. Such development must be controlled and aligned with clear objectives so that the negative effects of growth do not get out of hand. This work can help Wetzikon to define more clearly the goals to which development can be geared and what impact this would have on the design of the town. The work not only sets development goals in all relevant areas such as spatial, traffic and landscape planning as well as real estate development, but also illustrates how these goals can have a concrete impact on the area.

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# Appendix - Cost analysis

Item	Price	Unit	Source
Land purchase	1426	Fr/m2	ZH, 2023i
Construction costs residential	3000	Fr/m2	Ofri, 2023
Maintenance	0.9%	per construction price	ZKB, 2023
Chargeable floor area	80%	Per floor area	Grêt-Regamey, A, 2023
Height of one floor	3	m	estimate
Average rent residential	22.8	Fr/m2	ImmoMapper, 2023
Average rent commercial	33.3	Fr/m2	Wüest&Partner, 2023
Discount rate	3%	-	FPRE, 2023
Development of rent price	0.7%	-	own calculation (see below)
Local tax income per person	2355	Fr/person	ZH, 2023f
Construction costs park	129	Fr/m2	Opfikon, 2023
Mortgage interest	2.5%	-	VZ, 2023
Construction costs station	12'000'000	Fr/station	BAV, 2018
Construction costs bus stop	110'000	Fr/stop	Oltner Tagblatt, 2021
Construction costs square	1300	Fr/m2	Berner Zeitung, 2017
Construction costs traffic signal	245'000	Fr/intersection	Stadt Bern, 2018
Adaption costs traffic signal	49'000	Fr/intersection	estimate
Mobility measures Buchgrindel	100	Fr/person	estimate
Construction costs de-sealing	50	Fr/m2	Aargauer Zeitung, 2023
Construction costs school	5000	Fr/m2	Stadt Zürich, 2023a
Construction costs gymnasium	4000	Fr/m2	Stadt Zürich, 2023b

XCVI Cost per unit table

# Appendix - Rent and School rooms

% of floor space	% of rent	actual rent / m2
20%	90%	20.6
60%	120%	27.4
20%	150%	30.8

XCVII Rent distribution table

	rent	consumer price	difference
1996	78.5	103.1	
2021	104	114.2	
change rate	1.0	1.0	1.0
source	HEV, 2023	BfS, 2023b	

XCVIII Rent development table

$$\text{Change rate rent} = e^{\frac{\ln\left(\frac{\text{rent}(2021)}{\text{rent}(1996)}\right)}{2021-1996}}$$

XCIX Rent development formula

Subject	Number	Area (m2)	Area total (m2)	Volume total (m3)
Classroom Kindergarten	6	72	432	1296
Classroom School	18	72	1296	3888
Group room	18	18	324	972
Therapy room	2	36	72	216
Psychomotor therapy room	0	72	0	0
Handicrafts room	3	72	216	648
Handmade room material	3	18	54	162
Craft room	2	72	144	432
Craft room material	2	18	36	108
Craft room machines	1	18	18	54
Multipurpose room	1	144	144	432
Common room	1	144	144	432
Staff room	30	6	180	540
School management	1	18	18	54
Warehouse / Archive	30	9	270	810
WC	10	6	60	180
Dining room	1	400	400	1200
Reheating kitchen	1	120	120	360
Indoor break areas	24	9	216	648
Sports hall	2	448	896	2688
Sports instructors / paramedics	1	16	16	48
Checkroom / shower	4	80	320	960
Equipment room	2	200	400	1200
Outside break area	24	72	1728	

C School room table

# Appendix - Parking lots

In order to achieve the set MIV reduction targets, the number of parking spaces in the Buchgrindel development area is to be severely restricted. §243 of the Planning and Building Act of the Canton of Zurich specifies that parking spaces must be created to the required extent (ZH, 2023a). The building and zoning regulations (BZO) and the parking regulations (PV) of the municipalities regulate the details in accordance with § 242 (Wetzikon, 2022a) (Wetzikon, 2017). In the municipality of Wetzikon, the PV stipulates that the limit requirement for apartment buildings is at least one parking space per 80 square meters of floor space, but at least 1.5 parking spaces must be created per apartment. This limit is reduced on the basis of the public transport quality class. Based on the limit requirement, at least 40% of the parking spaces in public transport quality class A must be created as parking spaces. In quality class B, this is at least 55%, in classes C and D 70% (Wetzikon, 2017). According to the situation analysis, the center around Migros is currently in public transport quality class B, while parts of the densely populated areas and the Buchgrindel area are in quality class C (ARE 2022b). On the one hand, this is problematic, as substituting the car is effectively more difficult in lower quality classes, but on the other hand,

more parking spaces have to be created, which in turn can lead to increased use of the car. The building and zoning regulations of the city of Wetzikon make it possible to deviate from the minimum number of parking spaces if the area is in quality classes A and B, at least 20 apartments are built, a mobility concept is drawn up that proves the reduced requirement and permanent controlling of effective car use is ensured (Wetzikon, 2017). According to the guidelines for low-car usage of the city of Zurich, a mobility concept contains the following chapters: requested reduction of the minimum requirement, analysis of the specific development of the property, planned measures, empirical values for car ownership and parking space demand, a fall-back level and controlling (Stadt Zürich, 2017).

For the Buchgrindel site, on which living space for 1992 additional residents will be created, there is a limit requirement of 1350 parking spaces. According to the public transport measures, the area will be so well developed that the public transport quality class can be raised from C to B and partly A. This will result in 743 new parking spaces to be created. If the additional parking spaces generate proportionally the same amount of traffic as the existing traffic

(calculated using the modal split numbers for Wetzikon), then the number of trips increases for car traffic by 102% and for public transportation by 154%.

Due to the goal of reducing the proportion of car traffic and the measures to reduce the road space provided, it is not desirable to create 743 additional parking spaces. Therefore, a significant reduction should be sought in accordance with the guidelines of the City of Zurich. Instead of the 743 additional parking spaces, only 30% should be created, i.e. 223. The area is close to the new Oberwetzikon train station and is served by several additional bus lines. The detailed measures are described in the corresponding chapter. Accessibility via the cycle path network and the options for local amenities and recreation are also described in detail. However, according to the guidelines, additional measures must also be taken to prevent demand exceeding supply and existing parking spaces around the site being used. To achieve a significant reduction, a package of measures consisting of promotional measures, contractual and financial measures as well as proof of the feasibility of a specific fall-back level must be demonstrated. Specifically, a car-sharing service will be provided for all residents, bicycle parking spaces will

be created for all residents, the bicycle rental system will have several locations on the site and cargo bikes will also be offered for rent. For all apartments, the rental agreement will require residents to refrain from owning a car; this can only be waived if it can be proven that an individual parking space is available. Residents will also be offered an attractive bike-sharing tariff. If, despite all these measures, it turns out that too many households have their own car, a larger parking garage could be built on the Färberwiese, which will only be developed in a second construction phase. The occupancy rate of the surrounding street parking spaces and the parking garage will be recorded to monitor the situation. If the occupancy rate is too high, a second step would be to check whether too many households own a car. In addition, the success of the accompanying measures is recorded (degree of use of the bicycle parking spaces and the shared bicycles and cars). If it is determined that too many households own a car, the first step is to check whether additional measures need to be taken. If this is not possible, the fallback level may actually have to be used.



