

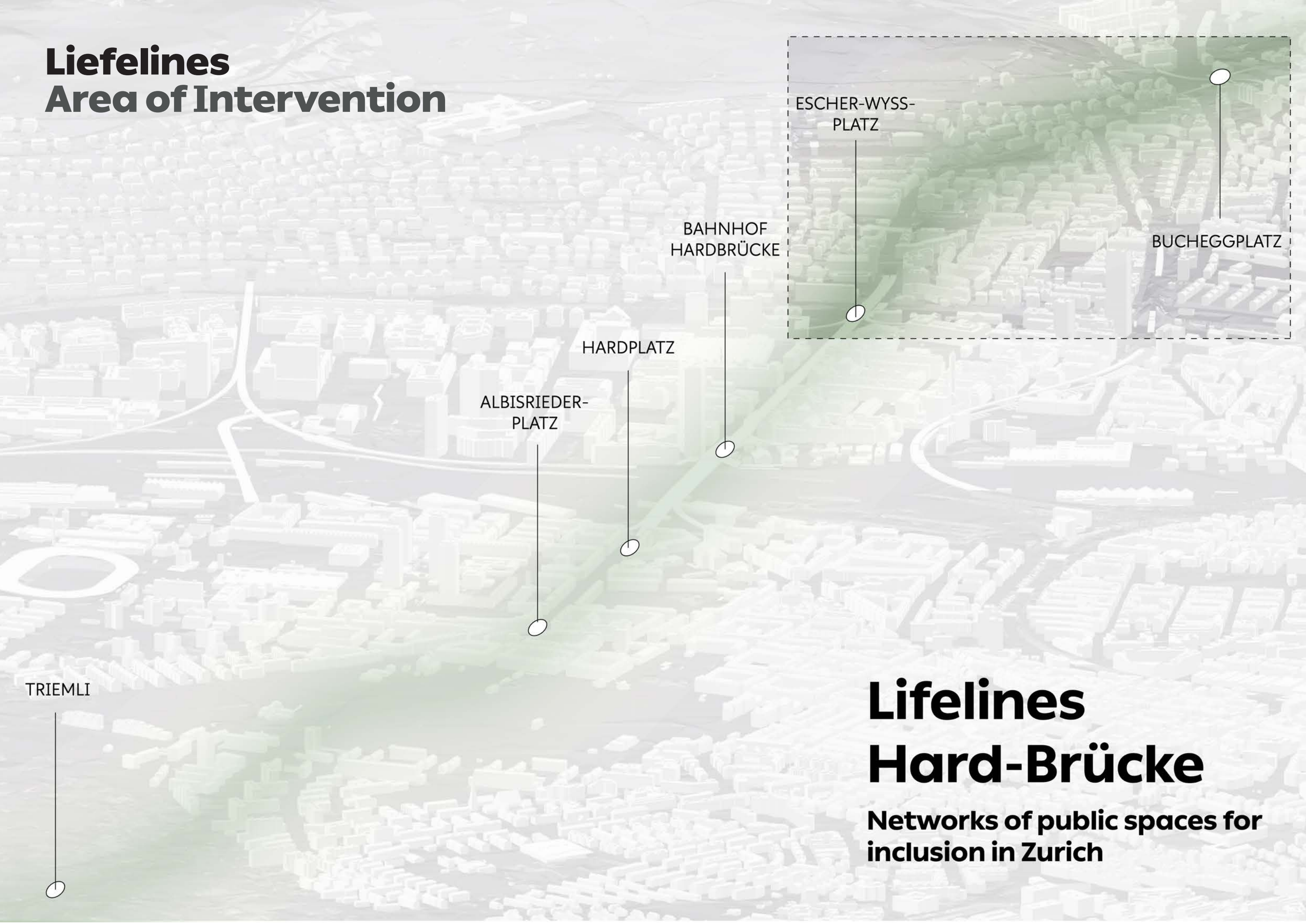
**Annamaria
Bonzanigo**

Extended pedestrianization

**Recovering a Hilly Footpath from
intensive traffic divide**

**#Soundpollution #Airpollution #Densification #Infrastructuraldivide
#Pedestrianization #Streetscape #Mobility #Neighborhoodidentity**

Liefelines Area of Intervention



TRIEMLI

ALBISRIEDER-
PLATZ

HARDPLATZ

BAHNHOF
HARDBRÜCKE

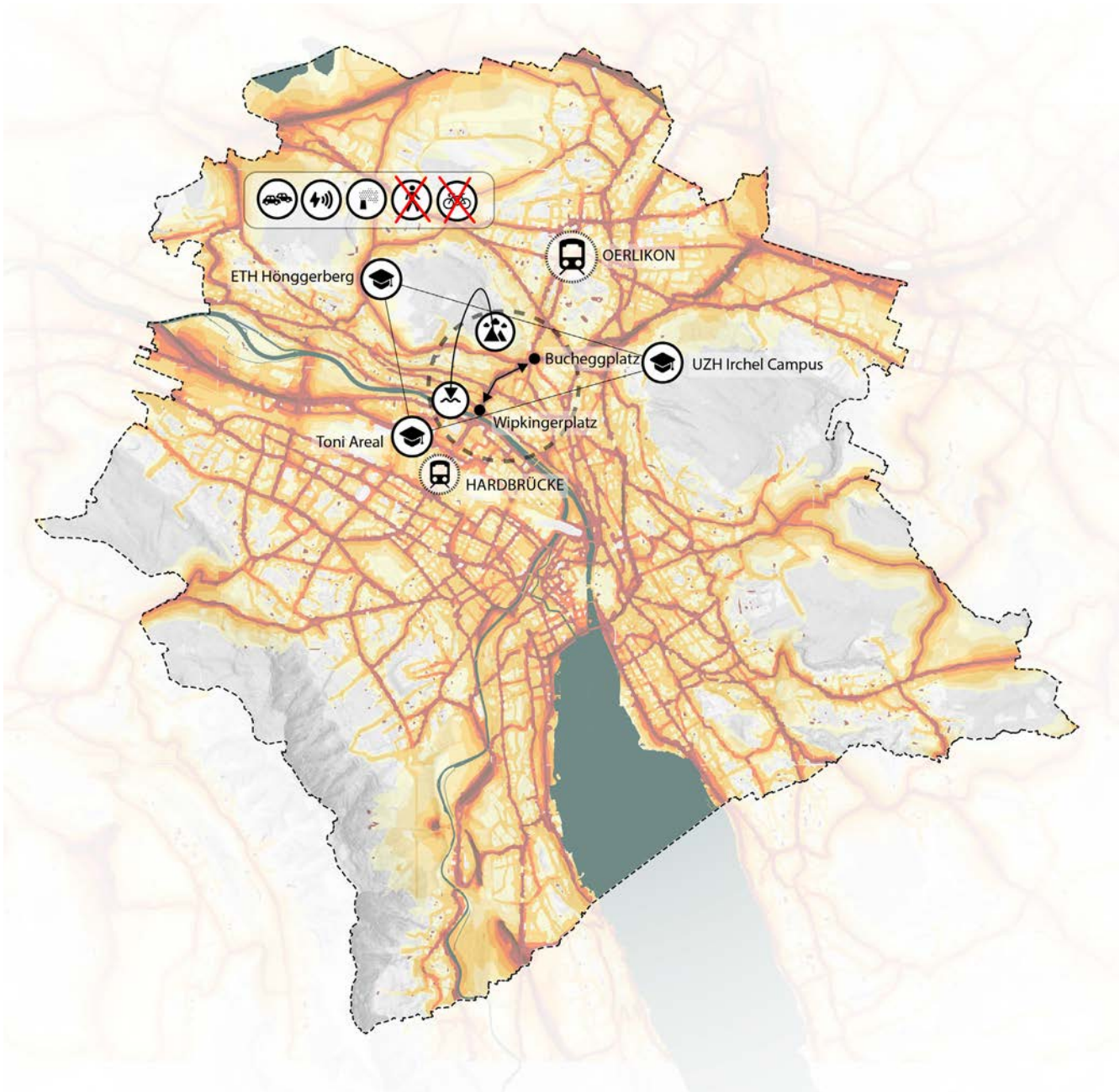
ESCHER-WYSS-
PLATZ

BUCHEGGPLATZ

Lifelines Hard-Brücke

Networks of public spaces for
inclusion in Zurich

Liefelines Rosengartenachse

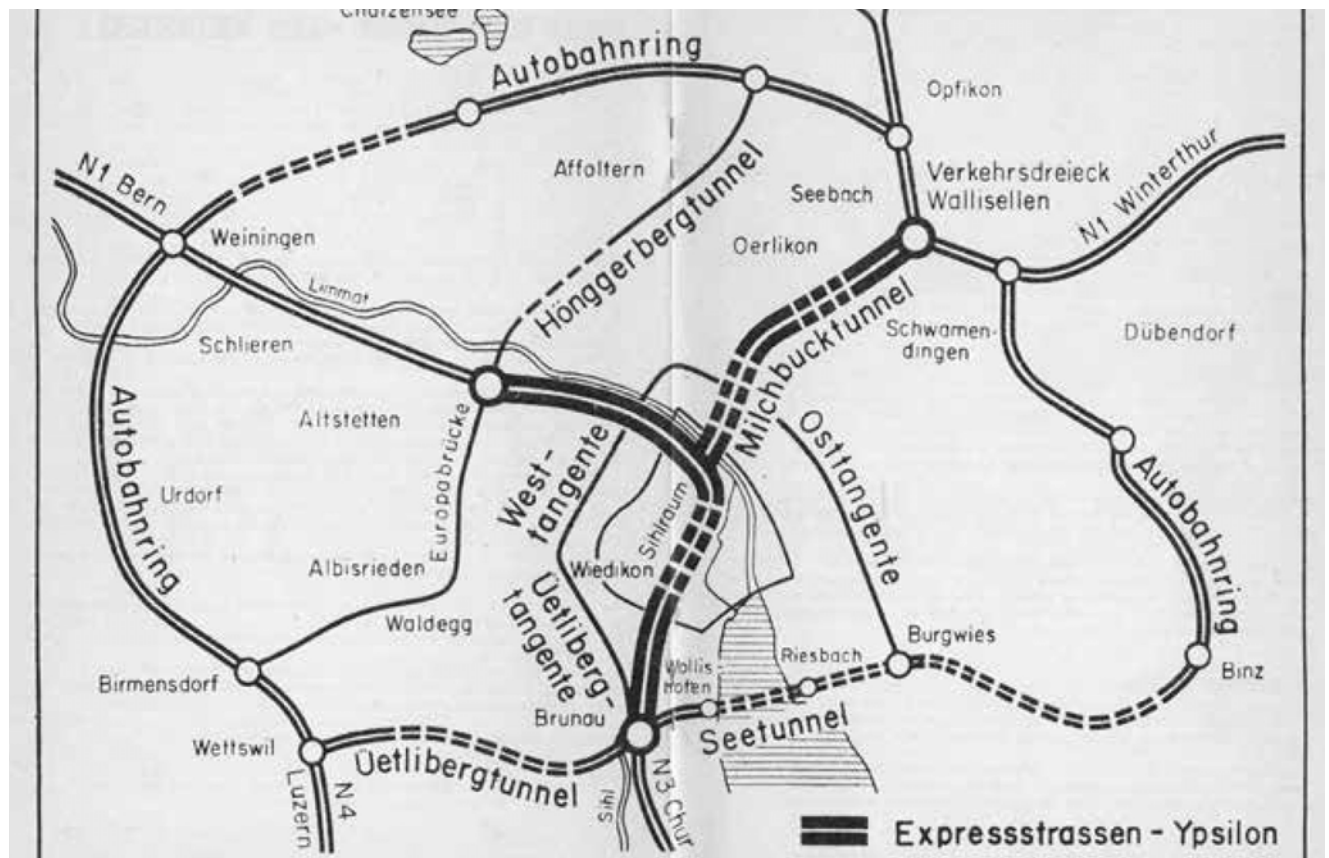


From Bucheggplatz into the Rosengartenachse



From Wipkingerplatz into the Rosengartenachse

Liefelines Rosengartenachse



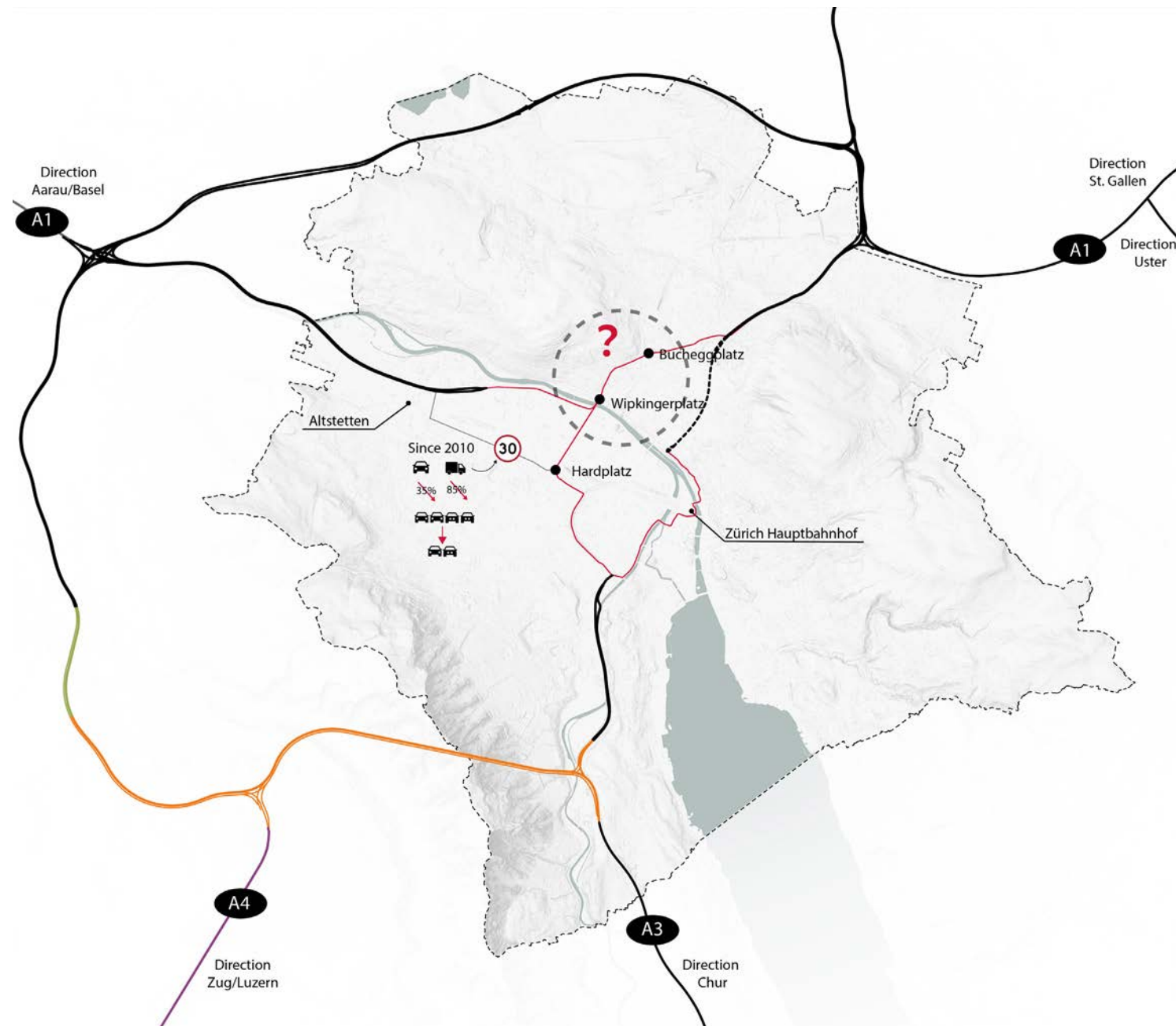
Plan for the Ypsilon Highway



Rosengartenstrasse, April 1931



Wipkinger bridge and Eyscherwyssplatz covering under construction, 1969

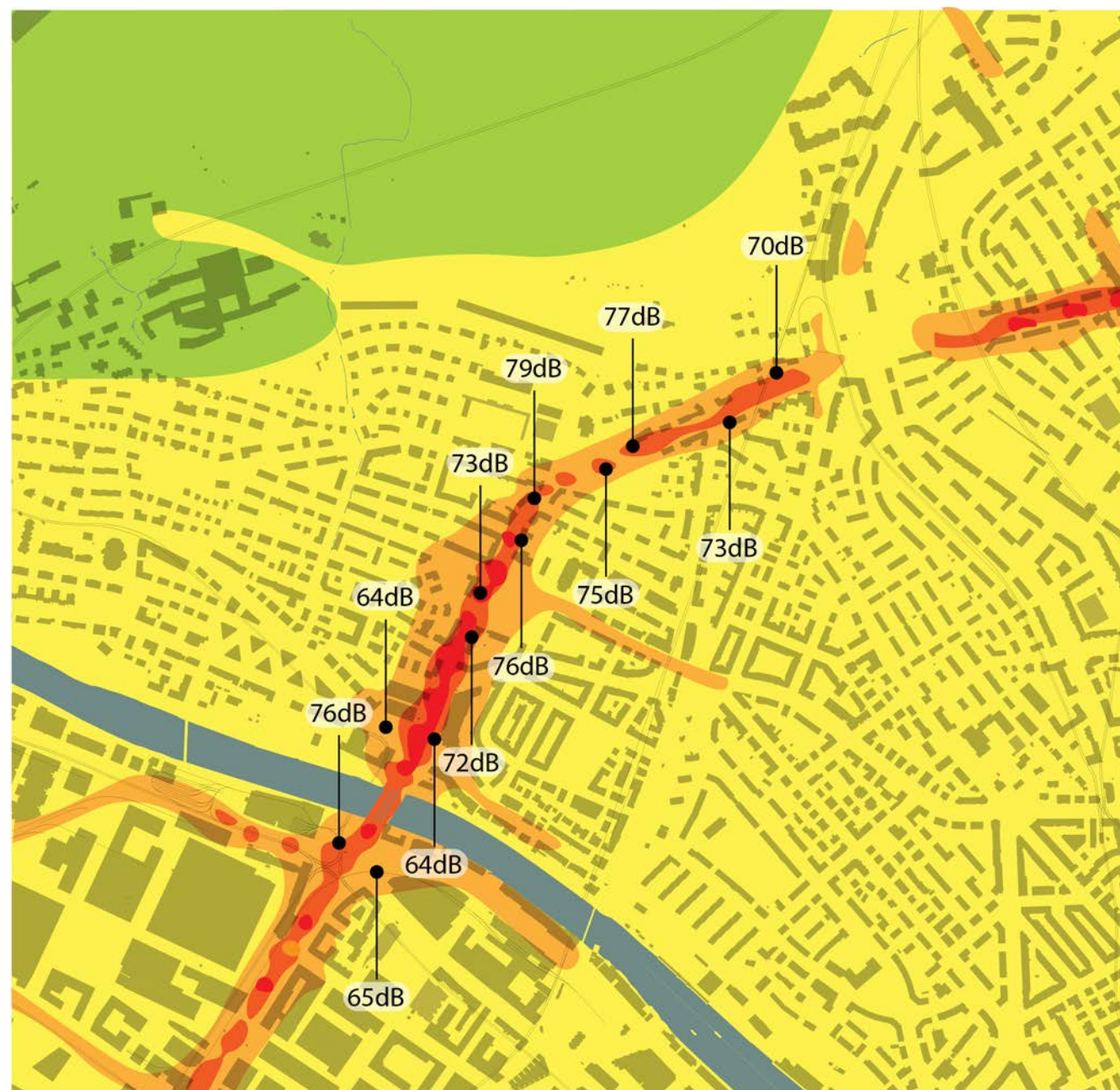


Zürich's Highways and Express streets Evolution

Legend

- Highway (HLS)
- Implemented in 2006
- Implemented in May 2009
- Implemented in November 2009
- City's Main traffic roads
- Municipal Border
- Lakes and rivers

Rosengartenachse Sound & Air Pollution



Sound & Air Pollution - Site Map

Legend

9-10 µg/m	12-13 µg/m
10-11 µg/m	>13 µg/m
11-12 µg/m	Lakes and rivers



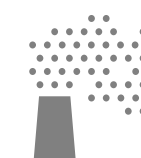
55'000
CARS/DAY



1'000
EXPOSED TO SOUND
EMISSION ALARM VALUES,
> 70dB for trade and living
area over the day



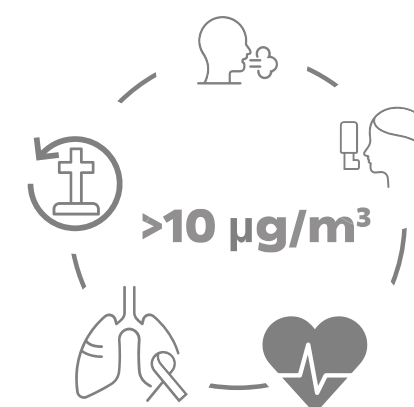
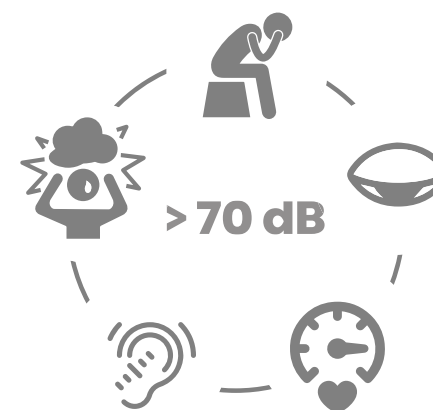
75dB
AVERAGE NOISE EMISSIONS



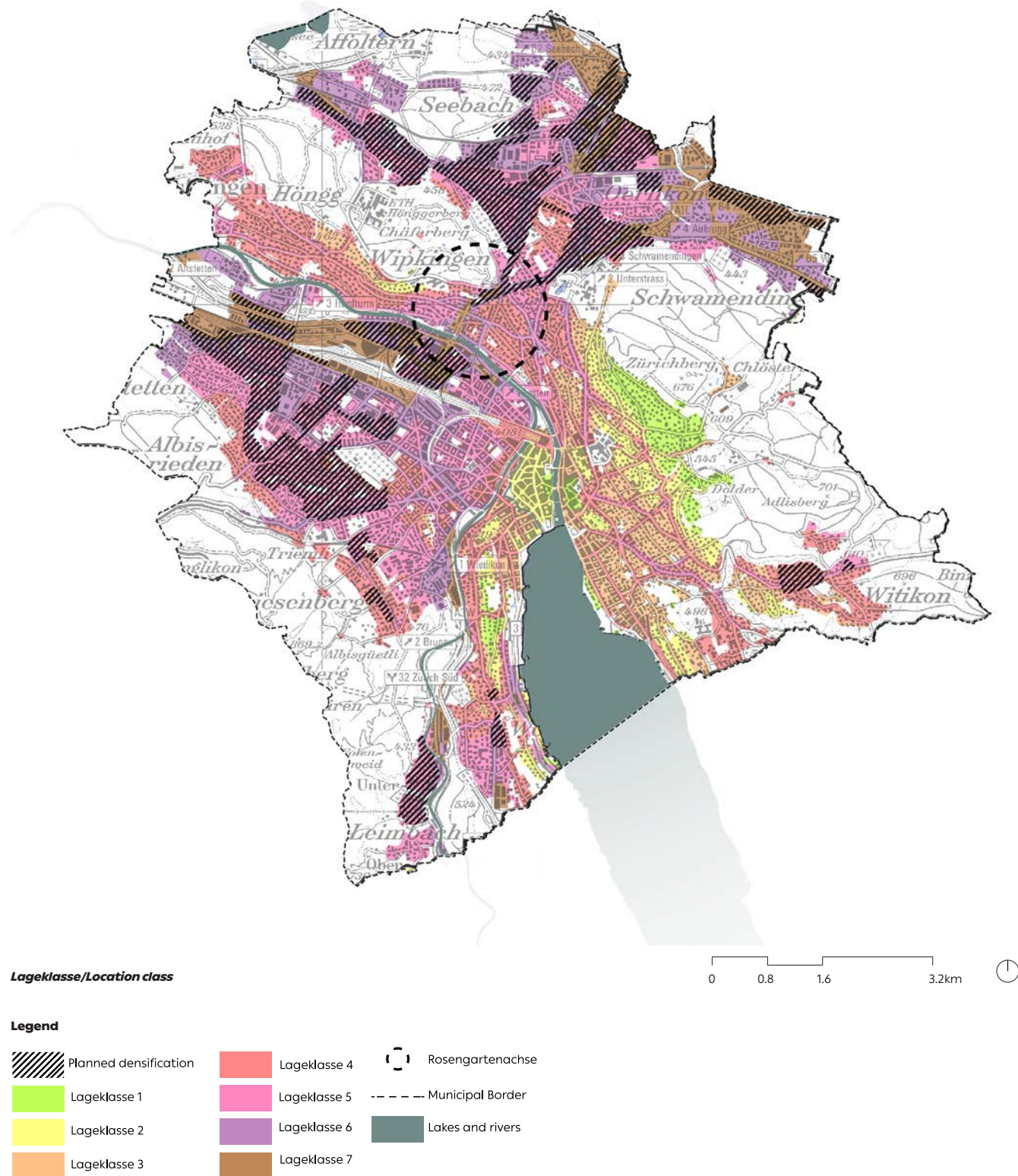
13 µg/m³
YEARLY AVERAGE FINE DUST
EMISSIONS

OK

3'000
INHABITANTS LIVING
UNDER NOISE LIMIT VALUE,
> 65dB for trade and living
area over the day



Rosengartenachse Densification



January/February 2020



9th February 2020



September 2021

«Dear Security department, please implement a speed limit the Rosengartenstrasse to reduce sound and air pollution.»

30



Current discussions around Rosengartenstrasse

Rosengartenachse

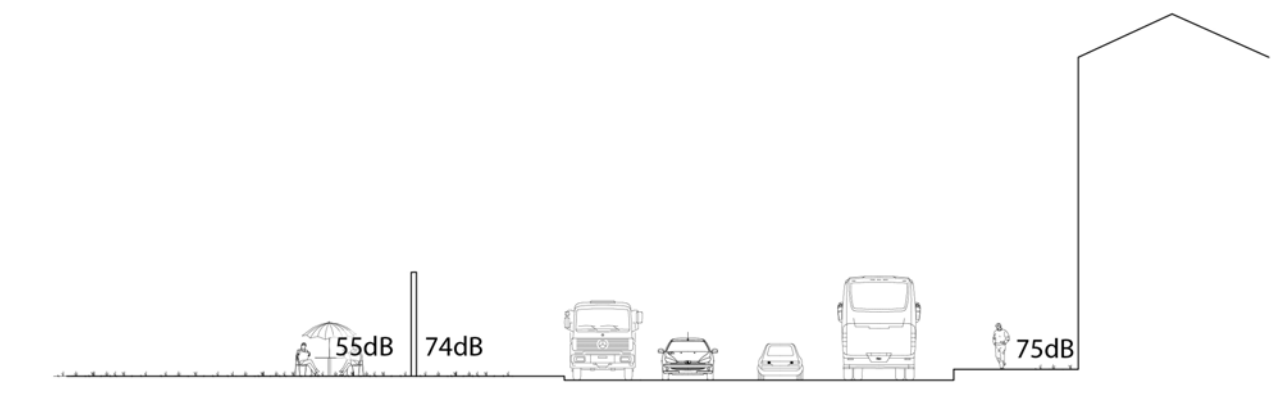
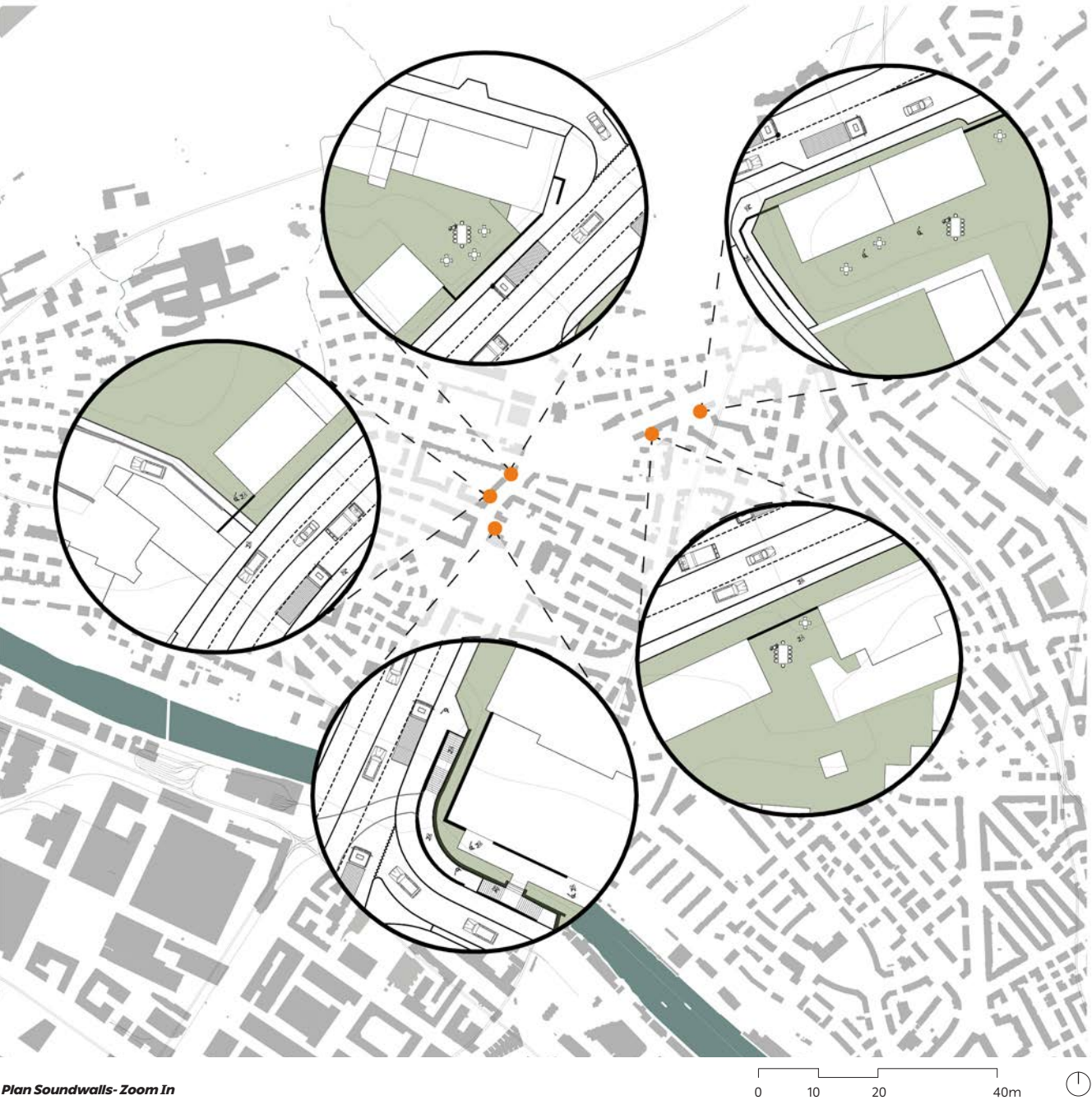
Empirical Research



- Pedestrian bridges
- - -●- Underground passages
- Bridges
- Soundwalls
- Water



Rosengartenachse Soundwalls



Cross-Section - Noise Impact Soundwalls



Soundwall - Front View Collage, down



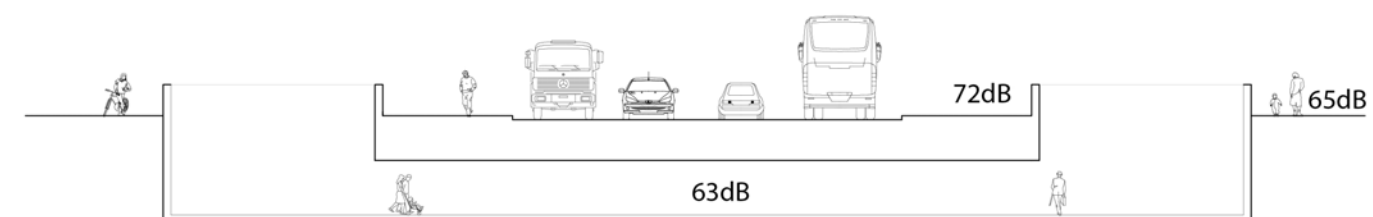
Soundwall - Front View Collage, up

Rosengartenachse Underground Passages



Plan Underground passages- Zoom In

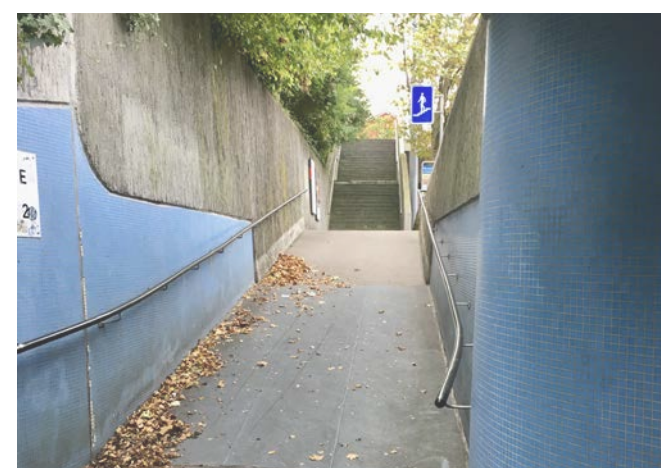
0 10 20 40m



Cross-Section - Noise Impact Underground Passage



Underground Passage - Front View Collage

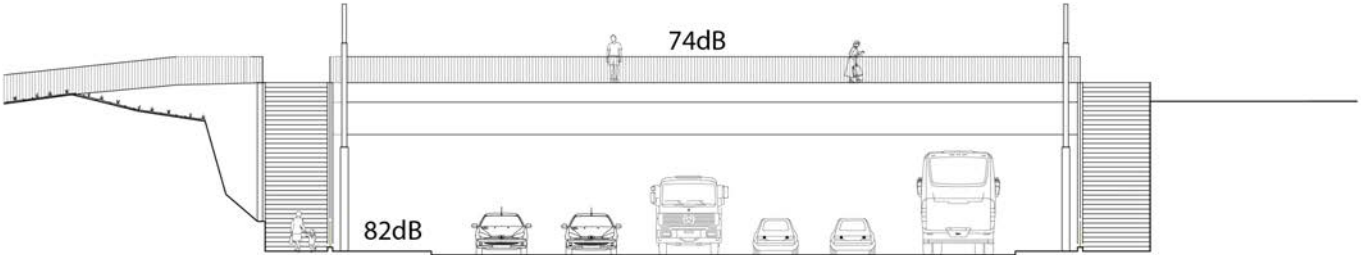


Underground Passage - Access



Underground Passage

Rosengartenachse Pedestrian Bridges



Cross-Section - Noise Impact Pedestrian Bridges



Pedestrian Bridge - Front View Collage

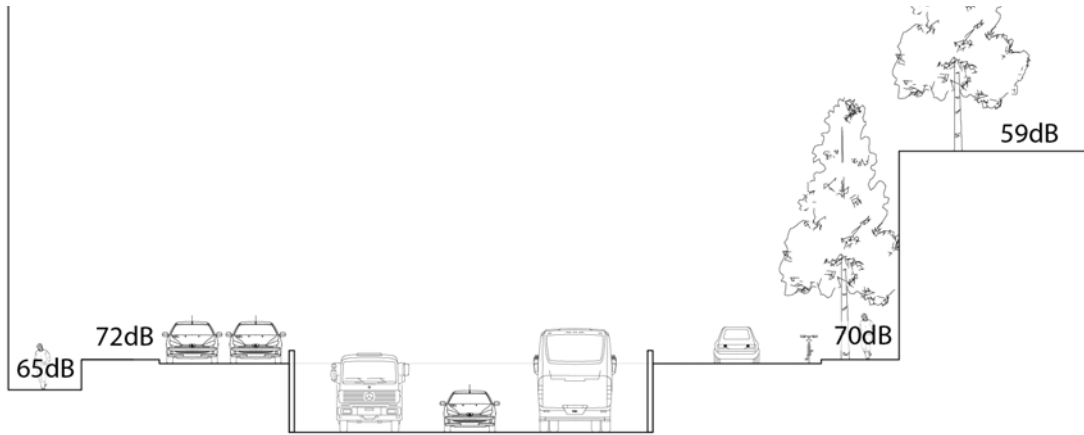


Pedestrian Bridge Buchegplatz



Pedestrian Bridge Rosengarten

Rosengartenachse Tunnel/lowering footpath



Cross-Section - Noise Impact Tunnel



Car Tunnel - Front View Collage, down



Car Tunnel - Front View Collage, up

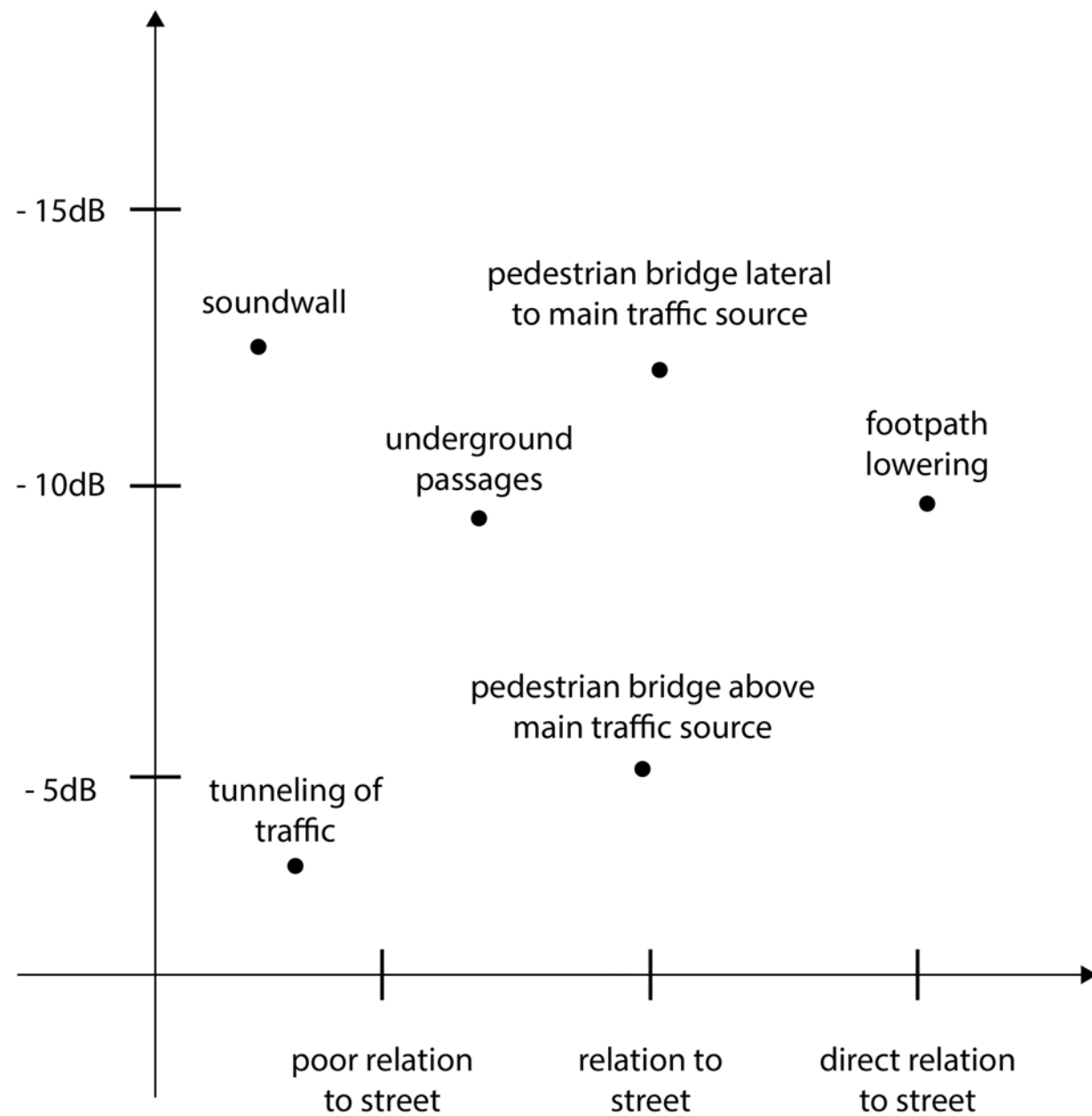
Rosengartenachse

Various built boundaries



Rosengartenachse

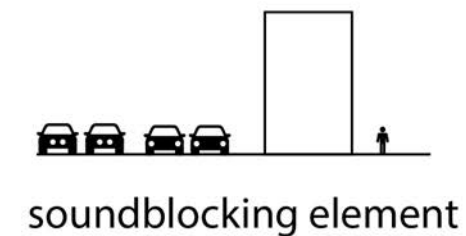
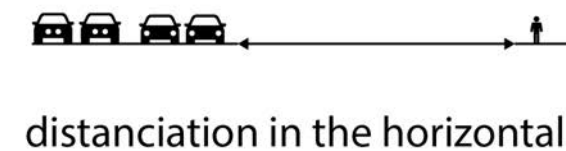
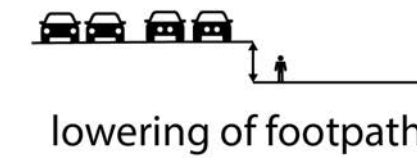
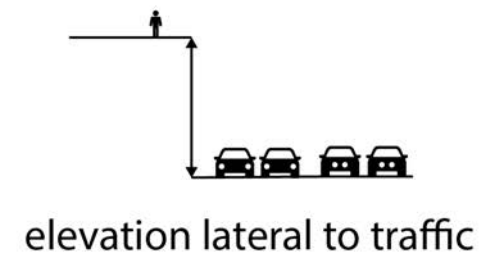
Empirical Analysis - Conclusions



Infrastructure sound lowering efficiency Diagram

From alarm value > 75dB
to good value < 60dB

- 10/-15dB



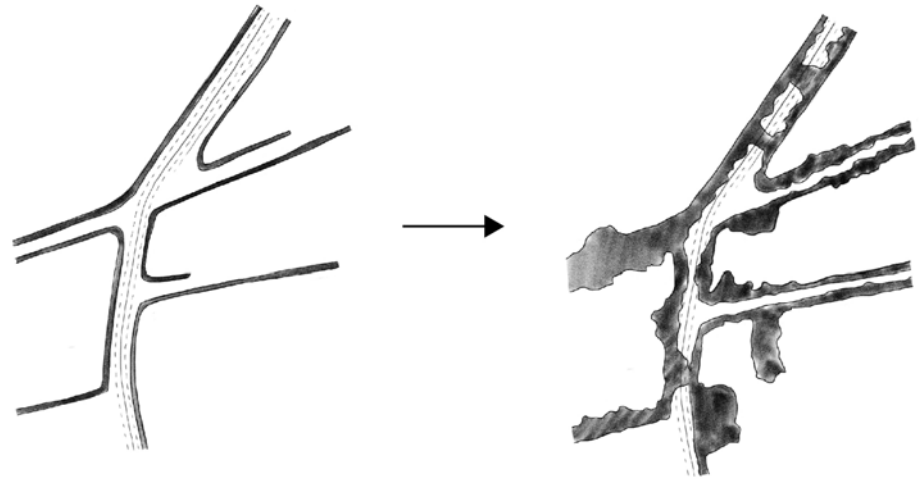
Sound lowering preferred solutions - Diagram

Rosengartenachse Concept

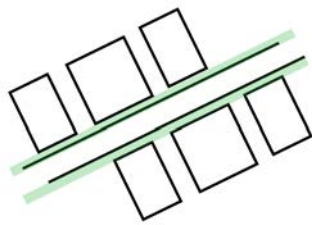
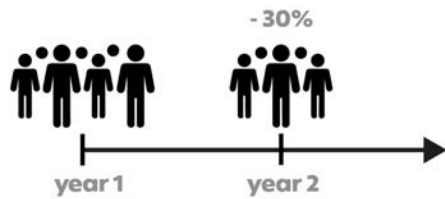


How can we make the walking along hilly congested traffic corridors less loud and more durable? In particular how can we enhance social, environmental and functional durability?

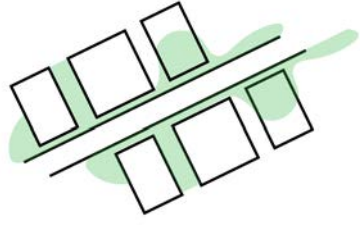
EXTENDED PEDESTRIANIZATION



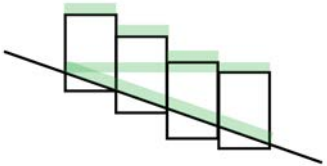
«First life, then spaces, then buildings - the other way around never works.» Jan Gehl



1. De-Densification of traffic



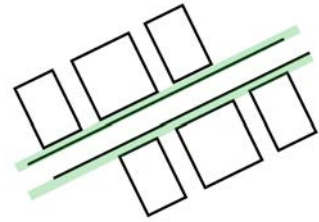
2. Densification of Programm



3. Densification of free space at multi-levels

Rosengartenachse 2016-2035

De-Densification of traffic



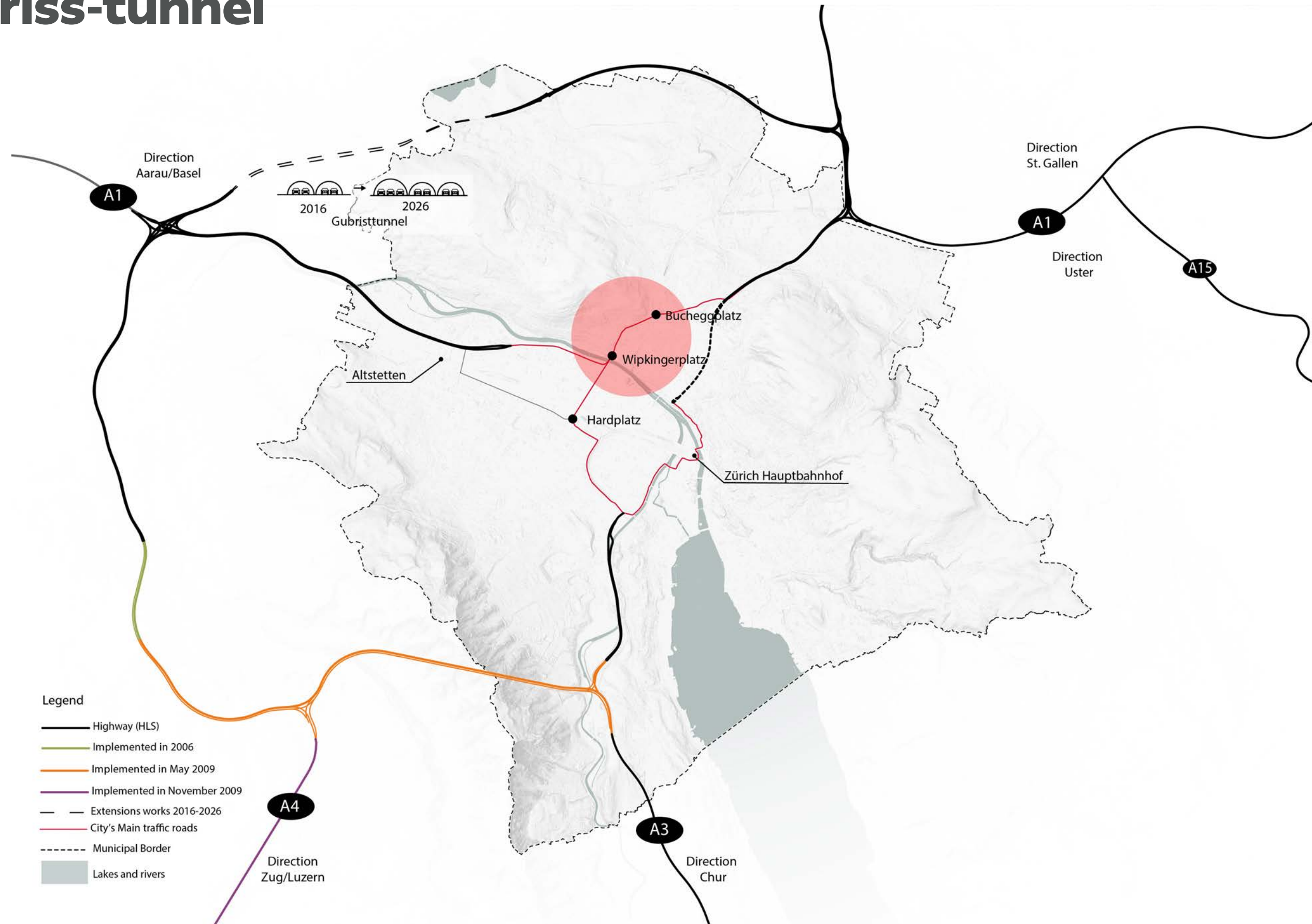
Rosengartenachse 2016



In 2016 the Rosengartenstrasse was a congested street with heavy transit traffic. This situation was severely damaging the health of the inhabitants of the Rosengartenstrasse. The city of Zürich, aware of the situation and recognizing the potential of this axis for leisure and pedestrianization, decided to add a lane into a tunnel which was bypassing the northern part of the city of Zürich, the «Gubris-Tunnel». This with the aim to lower the transit traffic along the Rosengartenstrasse. The tunnel constructions starts in 2016.

Rosengartenachse

Gubrist-tunnel



Rosengartenachse 2023-2024



Over the year 2023 and 2024 the critical mass movement becomes more and more relevant among Zürich citizens and every last Friday of the month taking the car along the Rosengartenstrasse became almost impossible.

CRITICAL MASS 
SEI EIN TEIL DER
KRITISCHEN MASSE!

WIR NEHMEN UNS DEN
RAUM MIT DEM VELO!
IMMER AM LETZTEN FREITAG IM MONAT.
MEHR INFOS AUF: [CRITICALMASS-ZH.CH](https://criticalmass-zh.ch)

18:45
BÜRKLIPLATZ

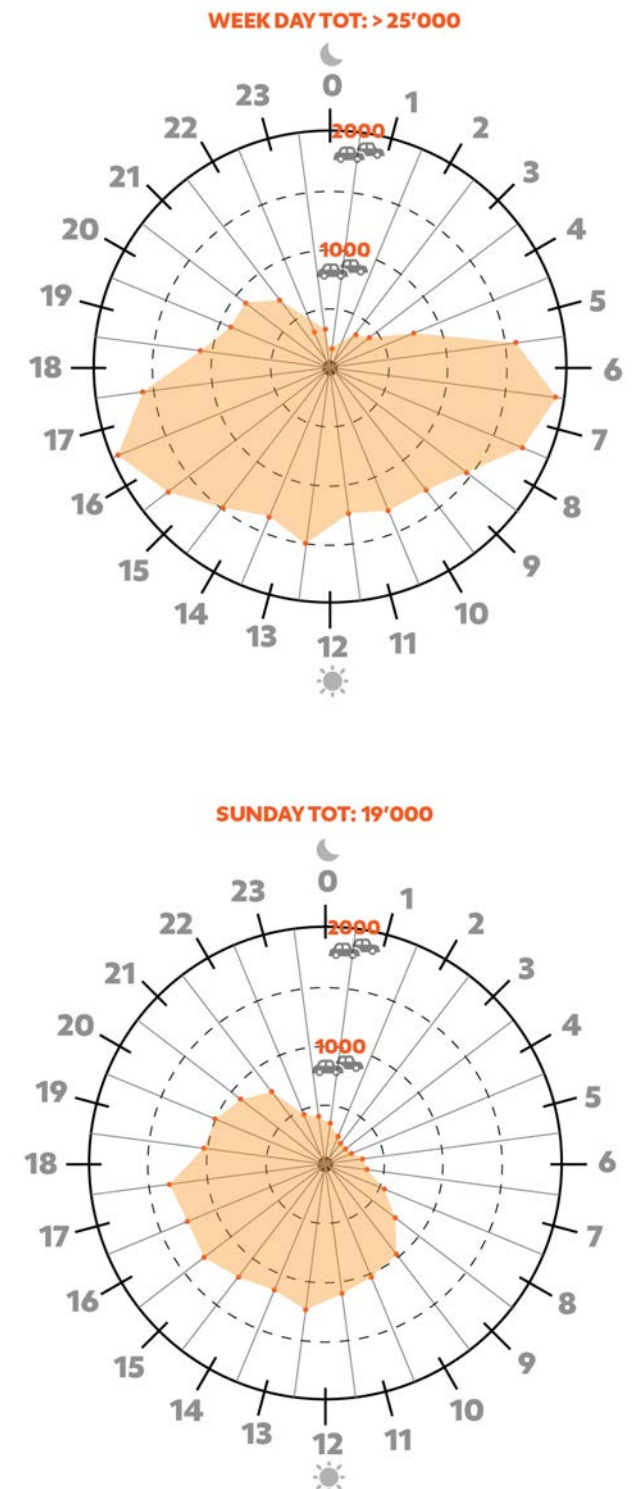


Rosengartenachse 2024-2025

Rosengartenstrasse - FREED FROM CARS every Sunday Morning from 7AM to 11AM

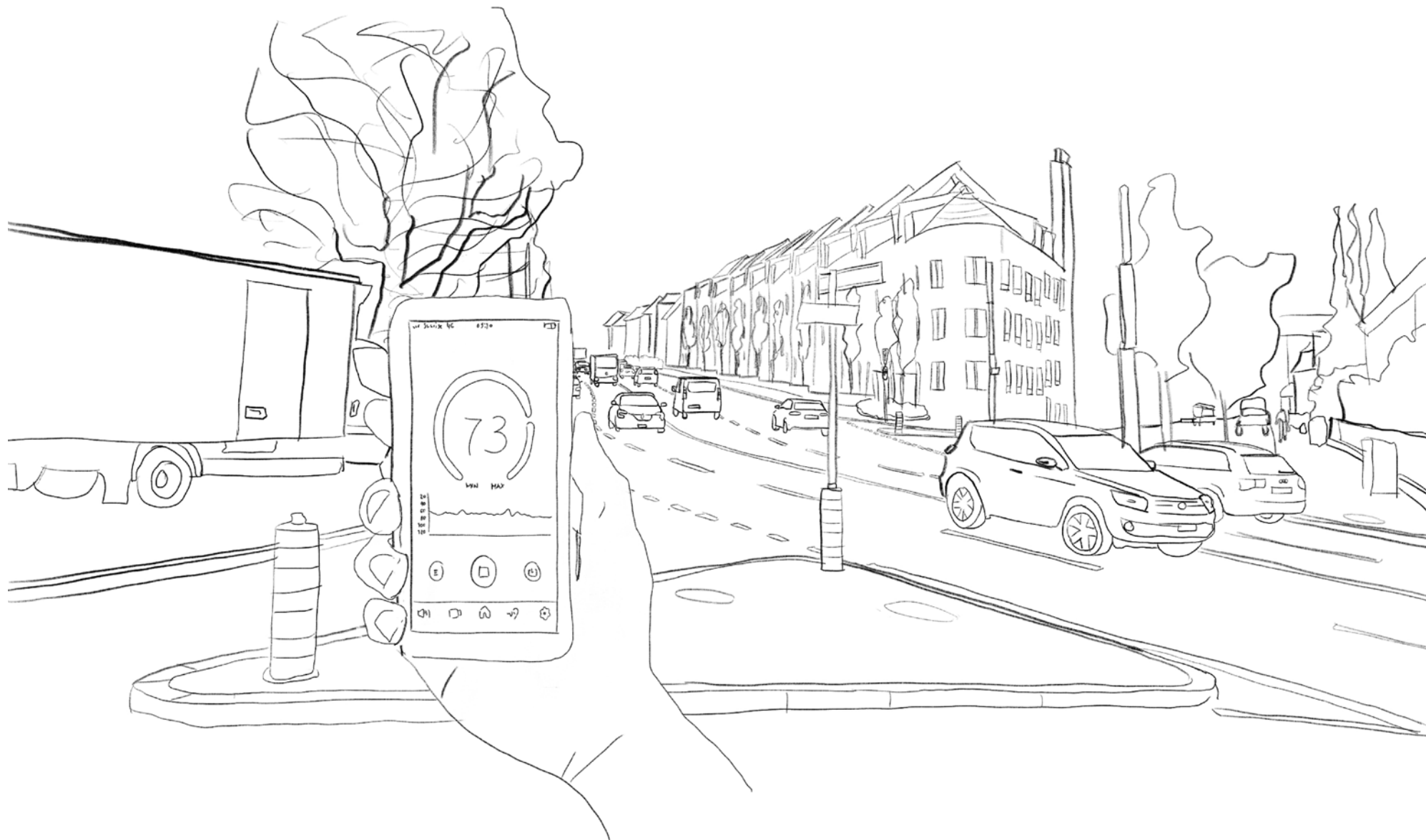


The city of Zürich consequently decided to close the street over Sunday mornings from 7Am to 11AM, as a compromise, giving back to the inhabitants a part of their street. While the Grubris Tunnel was finishing to be built and they were hoping to see the traffic diminish



Diagrams - traffic count analysis

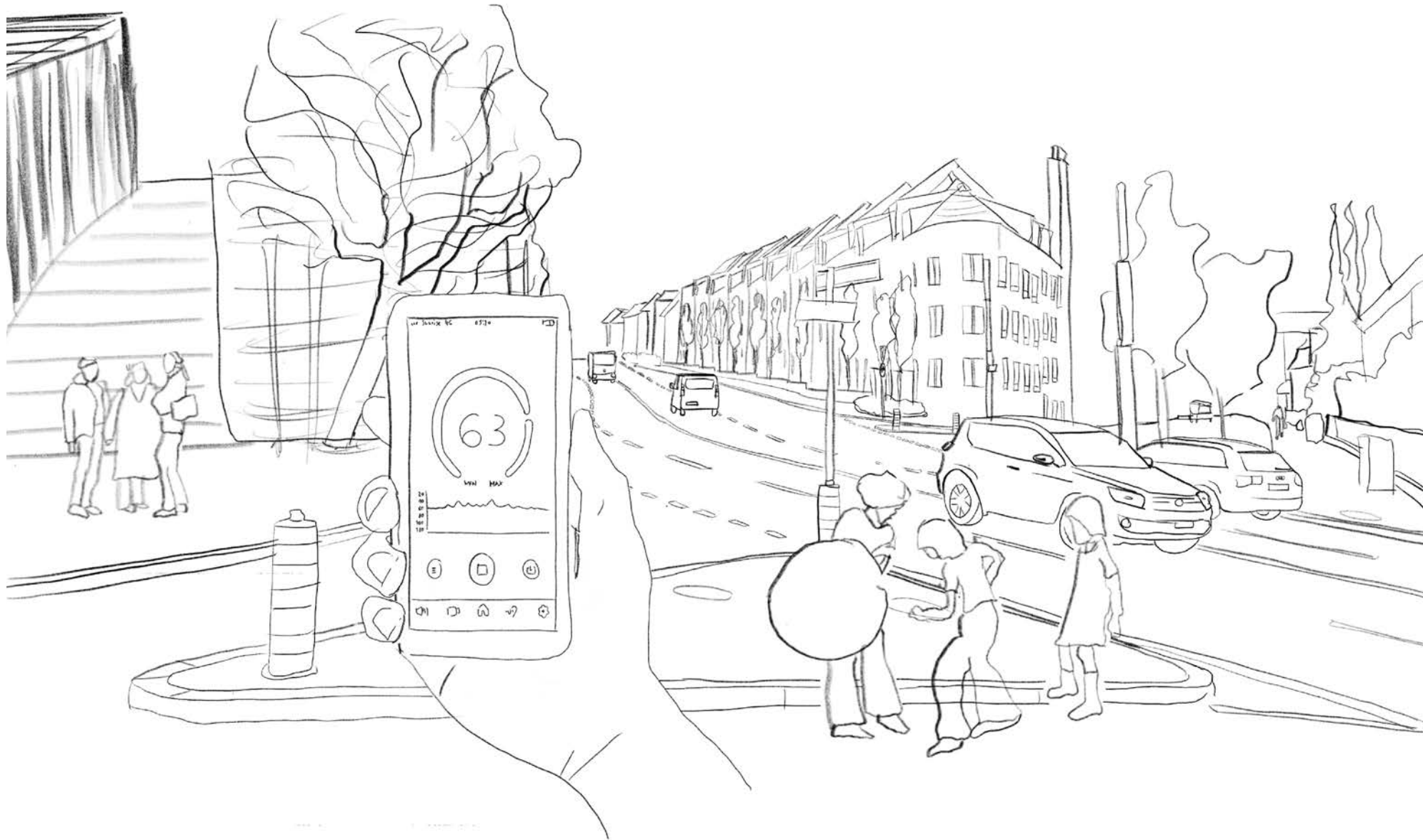
Rosengartenachse 2025-2026



Ref:
Hammer Emanuel; Egger, Sebastian; Saurer, Tina;
Bühlmann Erik: *Traffic noise emission modelling at lowering Speed*. In: 23rd International Congress on Sound and Vibration (ICSV23)

The street speed is reduced to 30km/h. The sound emissions also reduce from 82dB average value to 73dB.

Rosengartenachse 2026-2027



~~35%~~



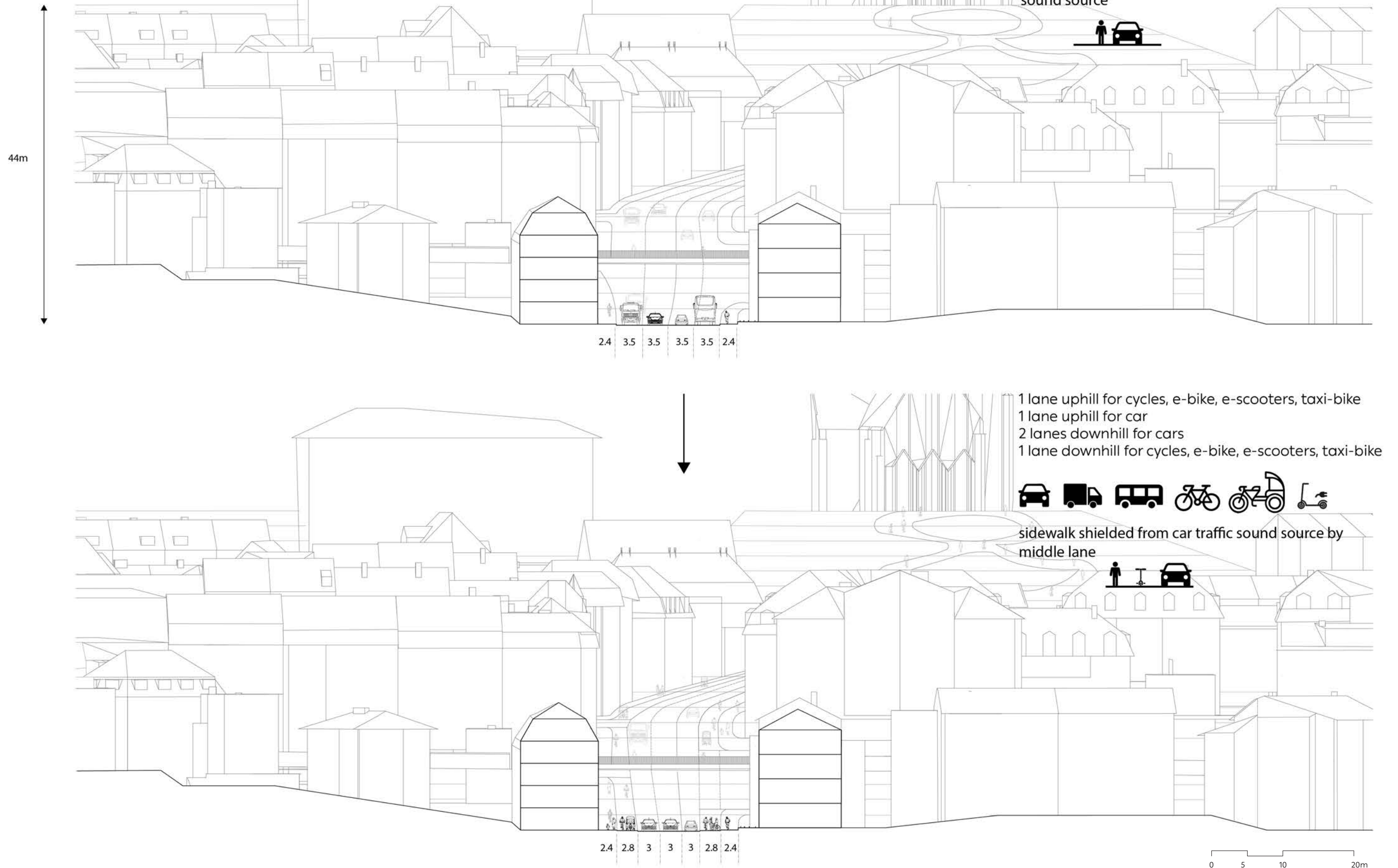
~~85%~~

Ref:
Hardplatz 2010, following the opening of the Westumfahrung.

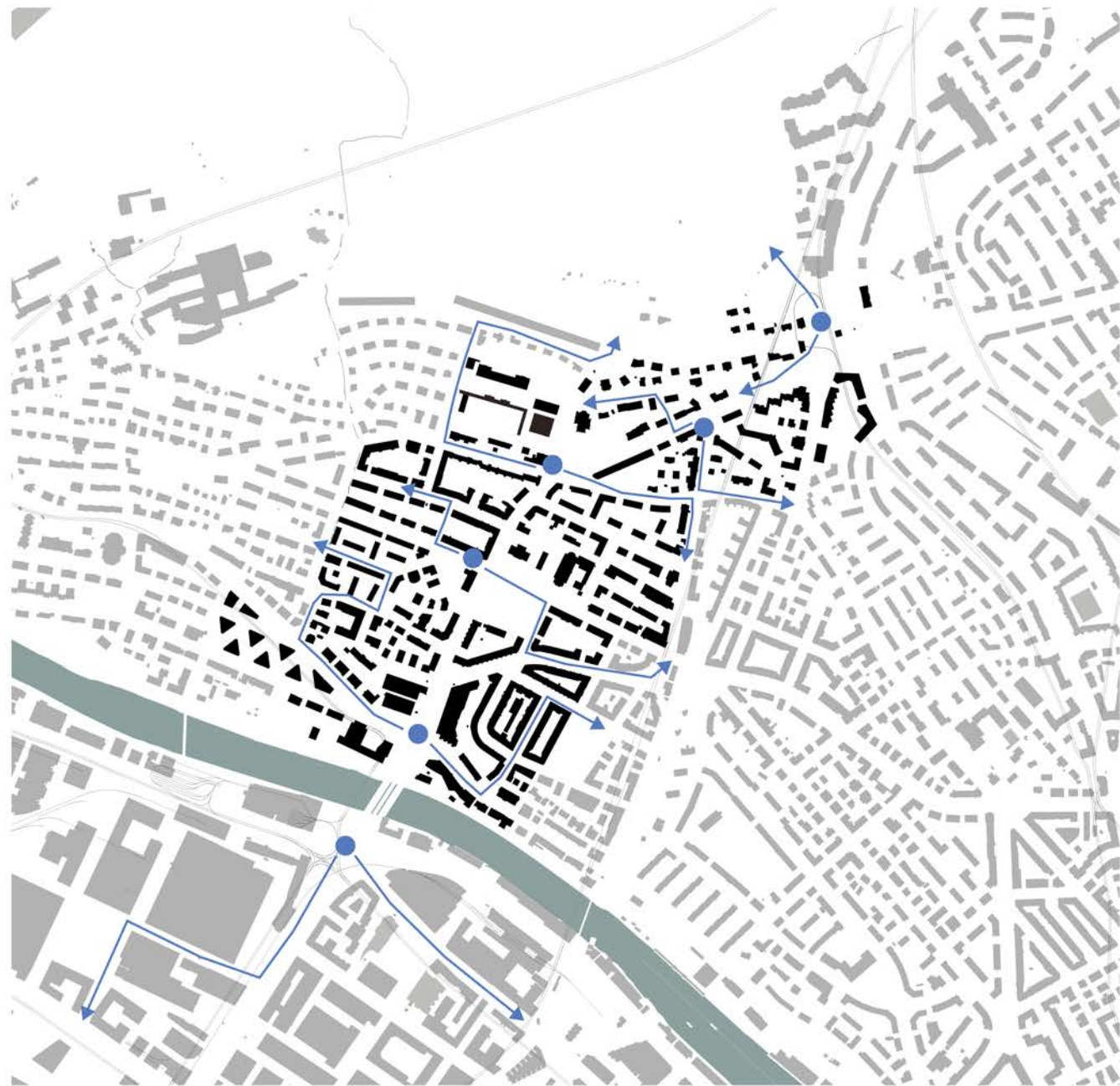
In 2026 and 2027 the opening of the Gubriß-Tunnel had for consequence that the heavy traffic diminished by 85% along the Rosengartenstrasse and the private traffic by 35%, similar to what happened in 2009 along the Hardstrasse. The sound emissions are further reduced from 73dB to 63dB

Rosengartenachse

2028-2035



Rosengartenachse , Mobility Shared Mobility Hubs



● shared mobility stations

↔ distribution line



Shared Mobility Hub - Zoom In



Rosengartenachse, Mobility Bus

 Public Transportation



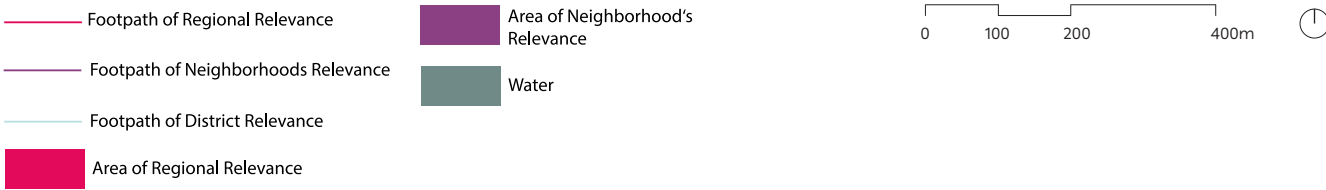
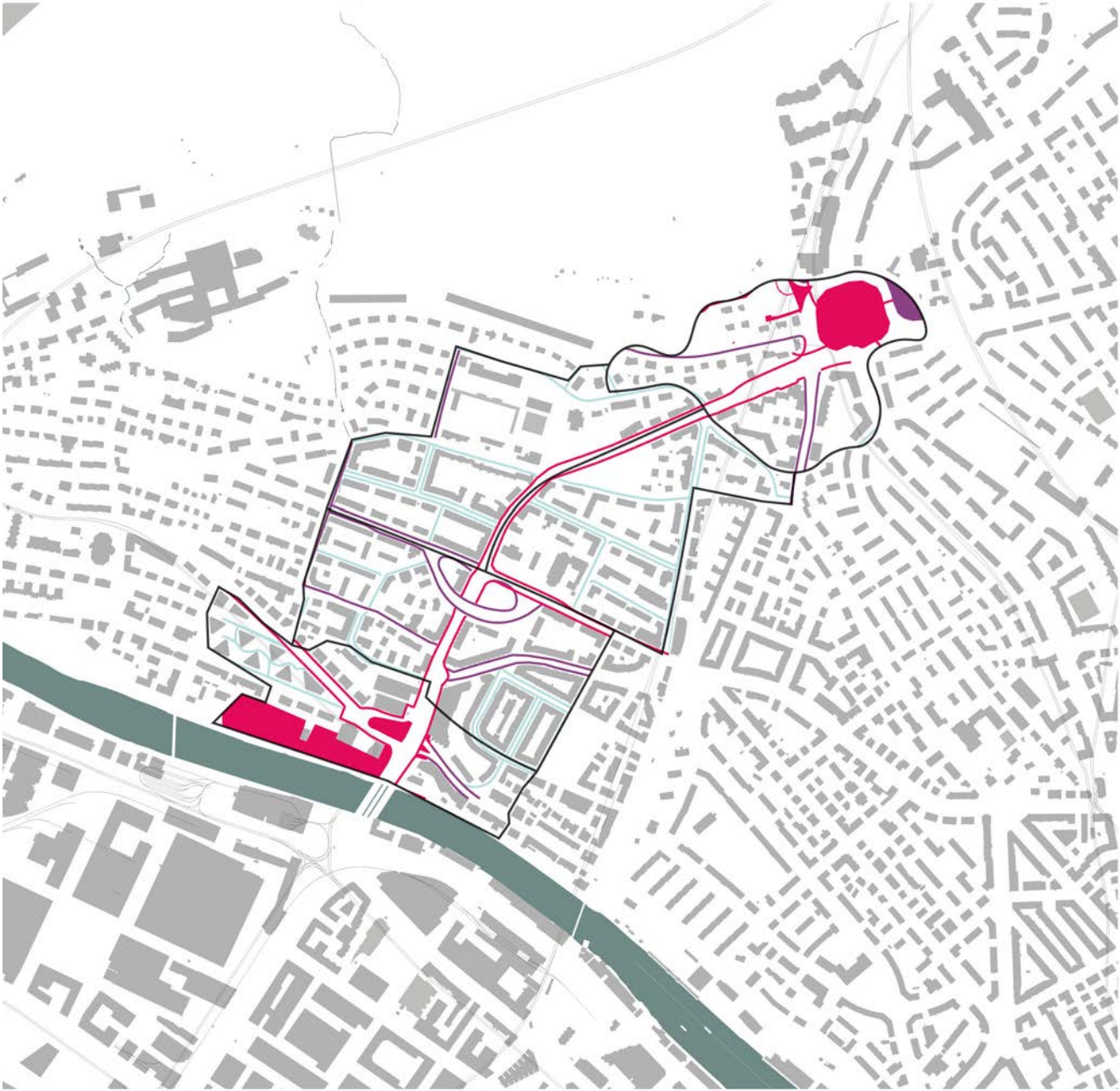
-  Railway
-  Underground Railway
-  Tram lines
-  Bus lines
-  Water
-  Train stations
-  Tram Stations
-  Bus Stations
-  Impact Zone



Bus Stops - Zoom In



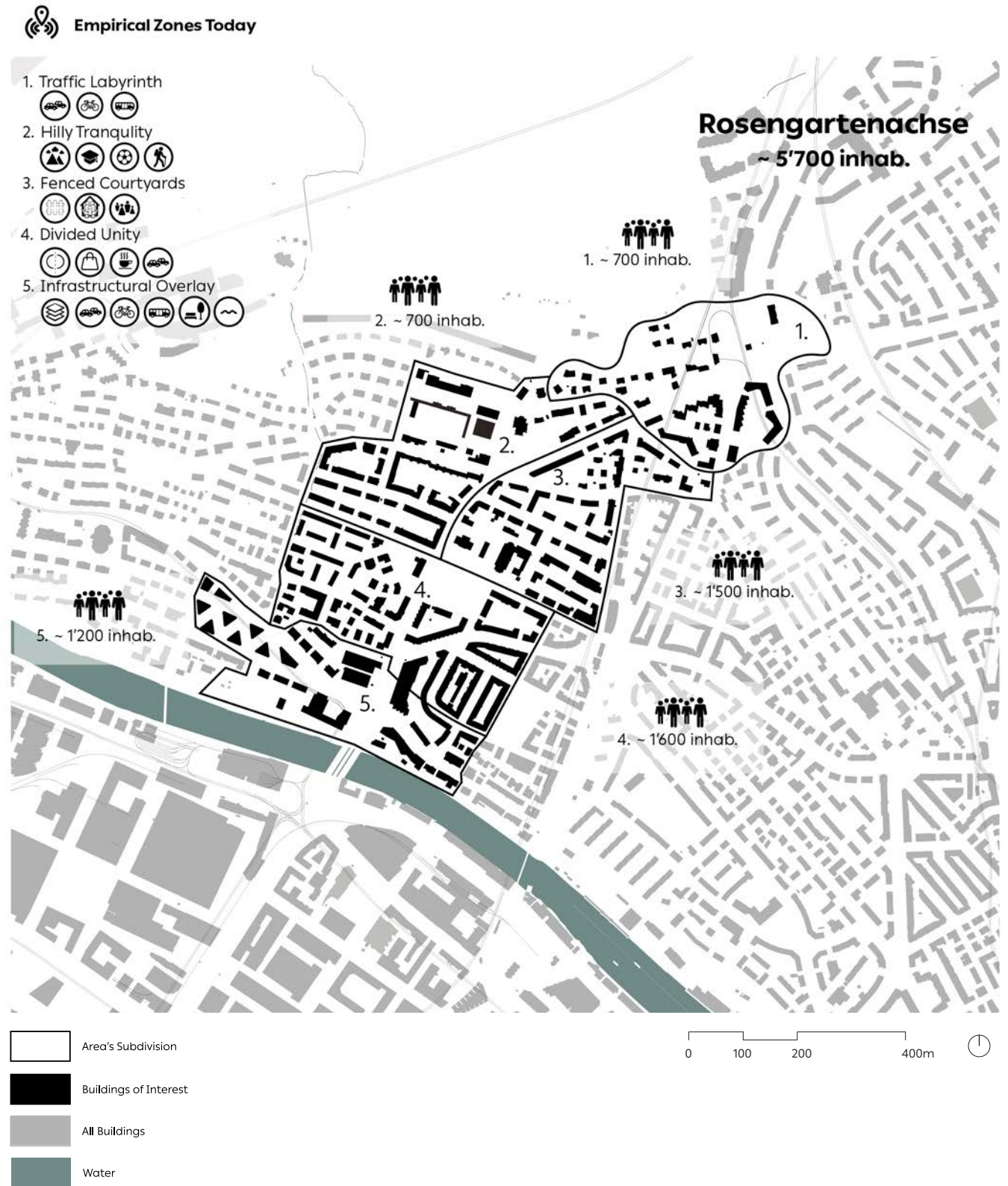
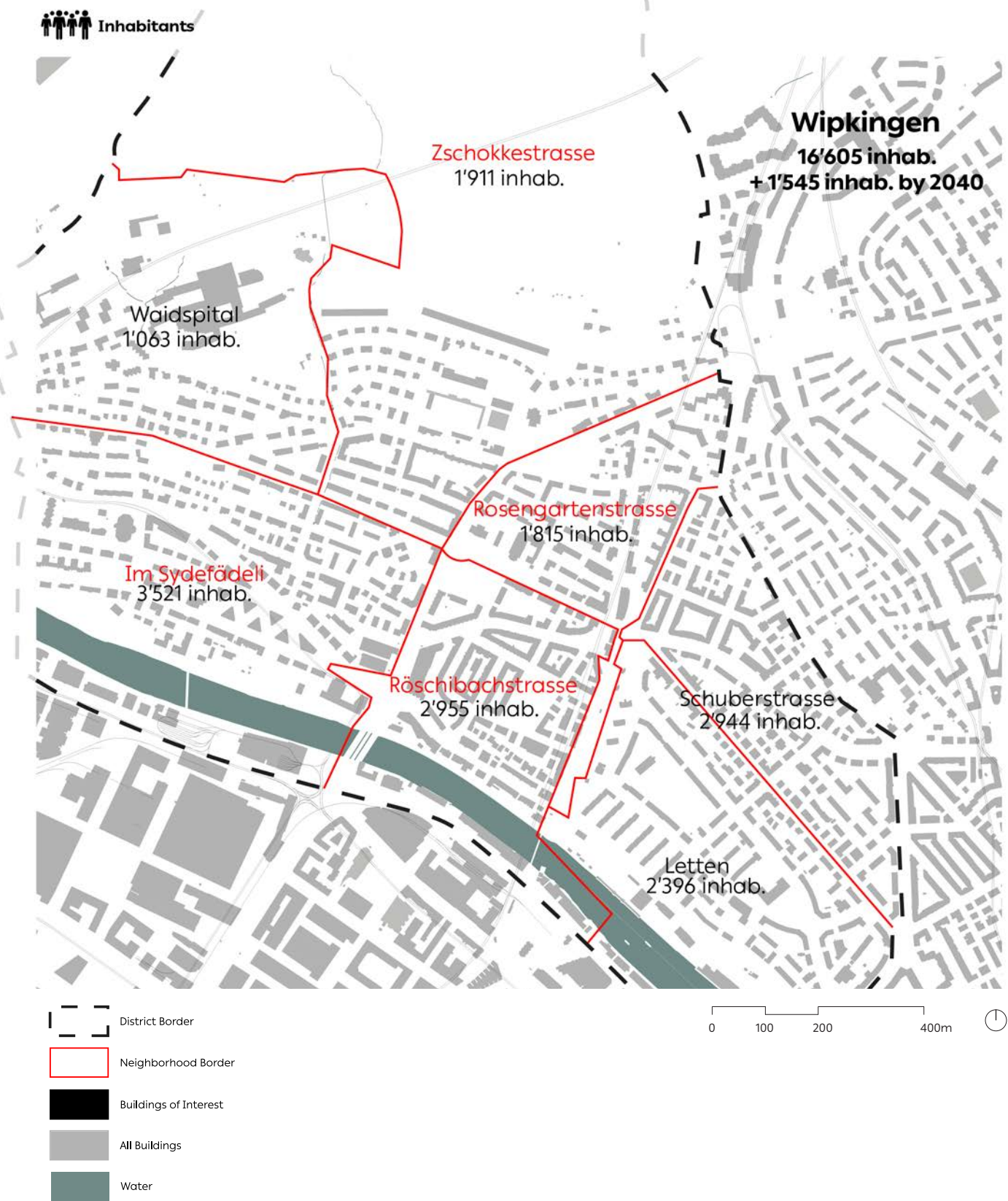
Rosengartenachse Walkability



The Rosengartenstrasse is nowadays considered a pedestrian street of regional relevance. The Public space must increase **from 14'000m² to 45'000 m²**, To reflect the desired value of the Richtplan of 8m²/inhabitant and 5m² per worker.

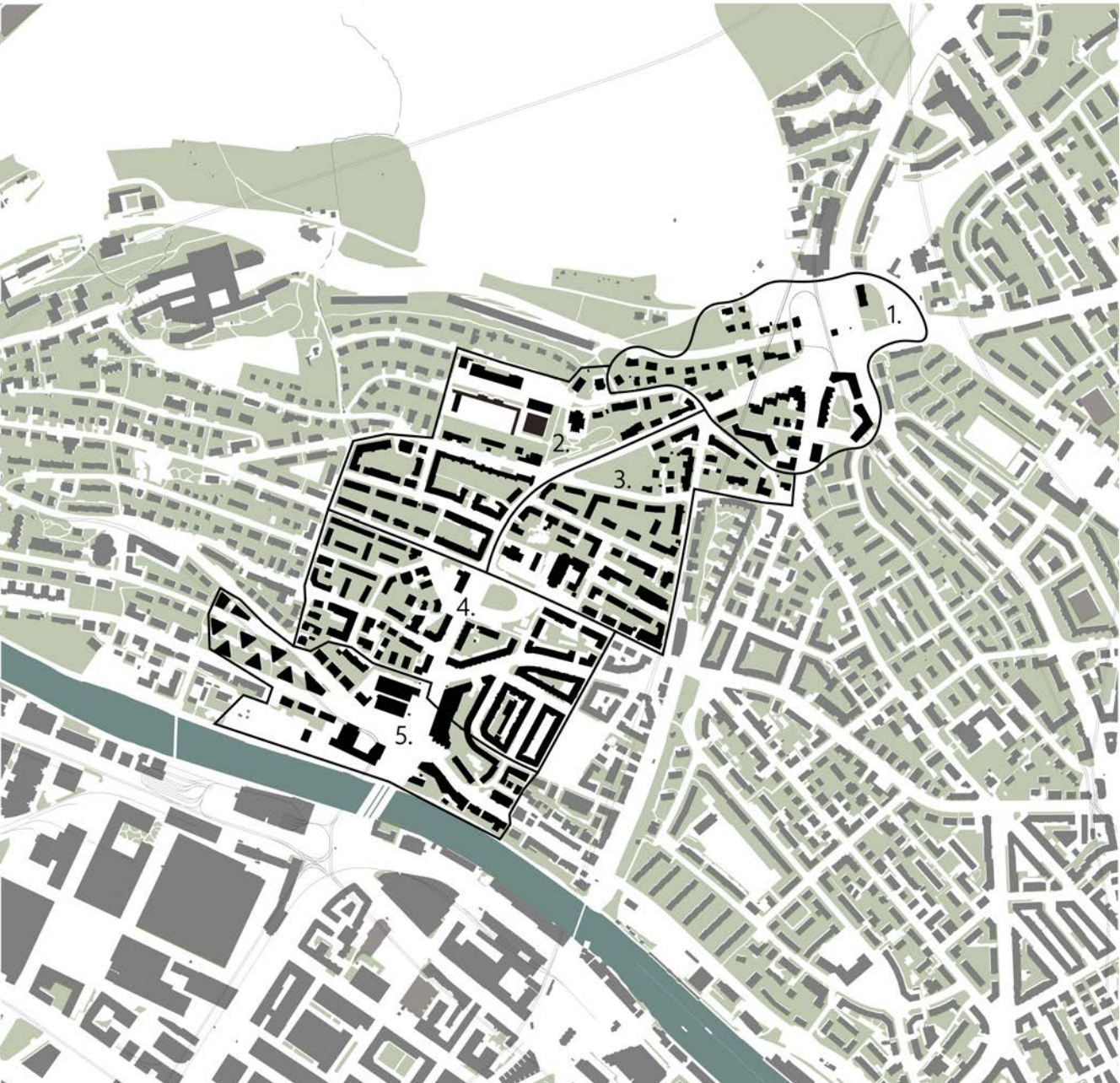


Rosengartenachse Inhabitants Approximation



Rosengartenachse

Green areas



- Green Cover
- Area's Subdivision
- Buildings of Interest
- All Buildings
- Water

0 100 200 400m



8m²/inhab.
5m²/worker

- 1. ~ 700 inhab.
Required free space: 5'600 m² missing: 5'600 m²
- 2. ~ 700 inhab.
Required free space: 5'600 m² missing: 500 m²
- 3. ~ 1'500 inhab.
Required free space: 12'000 m² missing: 12'000 m²
- 4. ~ 1'600 inhab.
Required free space: 12'800 m² missing: 9'260 m²
- 5. ~ 1'200 inhab.
Required free space: 9'600 m² missing: 9'260 m²

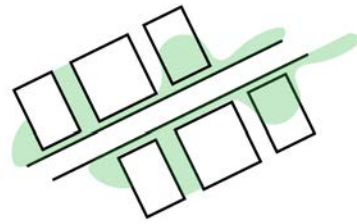


- Free Space
- Area's Subdivision
- Buildings of Interest
- All Buildings
- Water

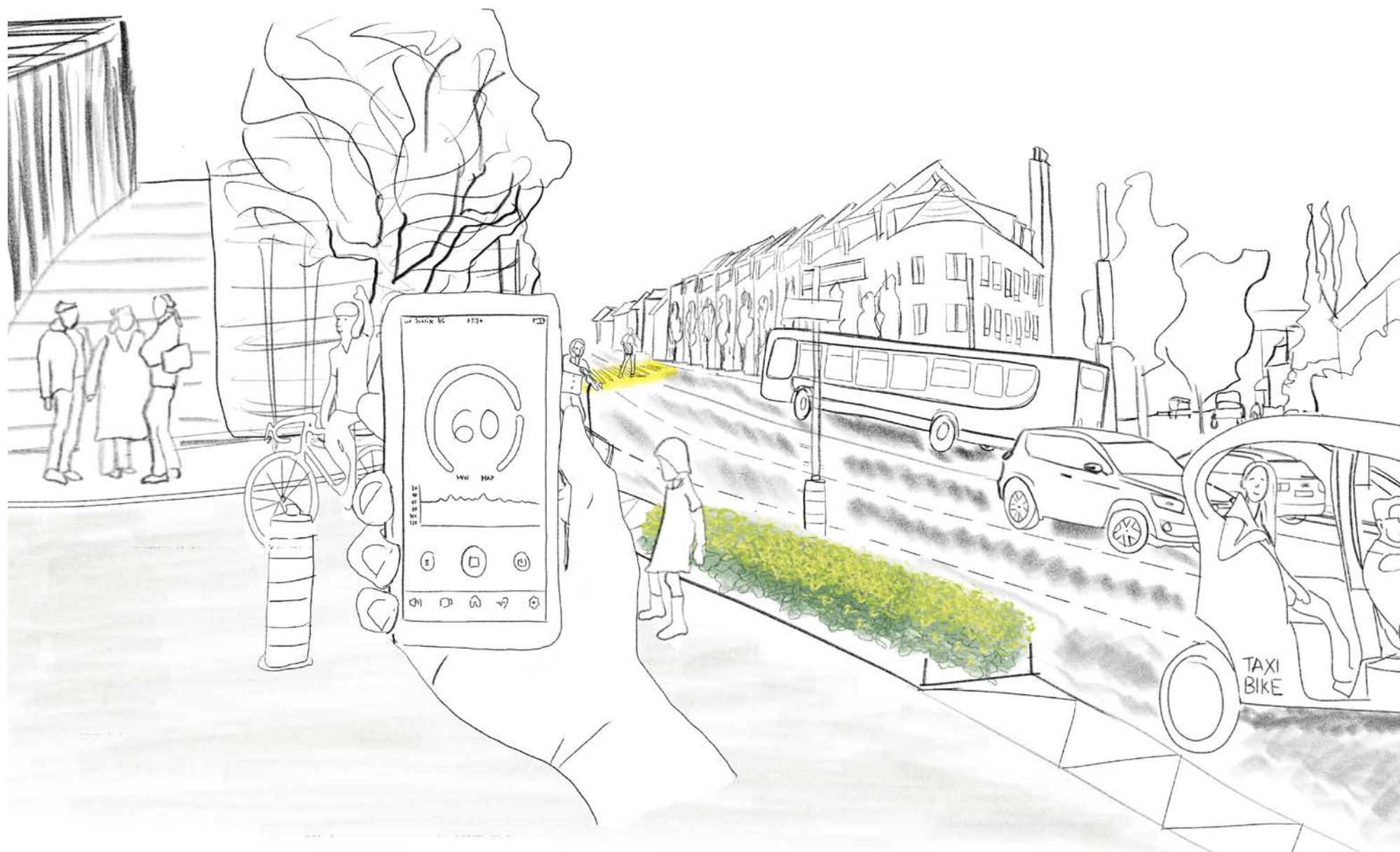
0 100 200 400m

Rosengartenachse 2035-2040

Densification of Programm



Rosengartenachse 2035



The new condition of traffic led to a reduction of 60dB, the soundwalls can be teared down.

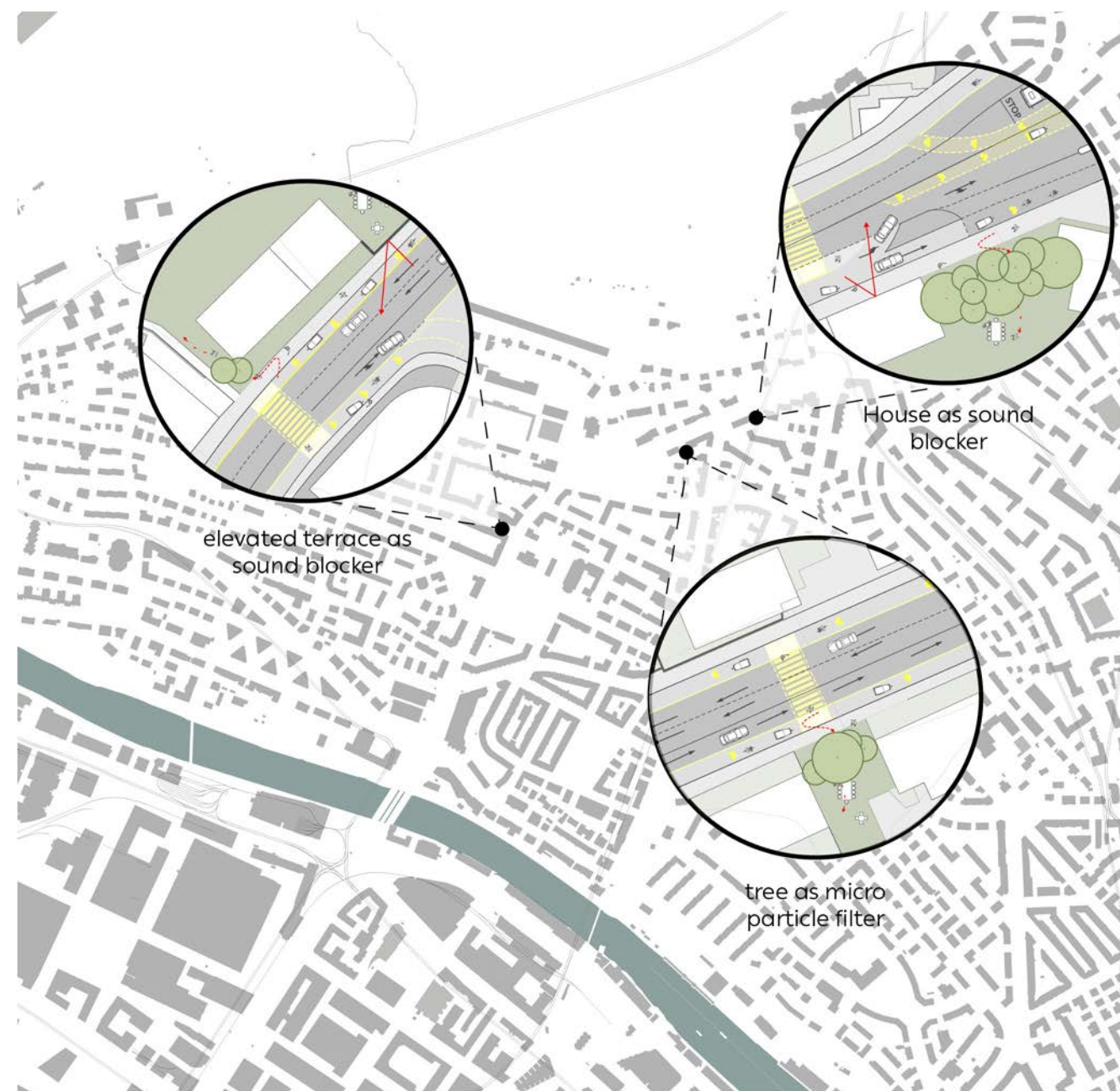
Rosengartenachse

Opening up the existing



Plan Current Condition Soundwalls- Zoom In

0 10 20 40m

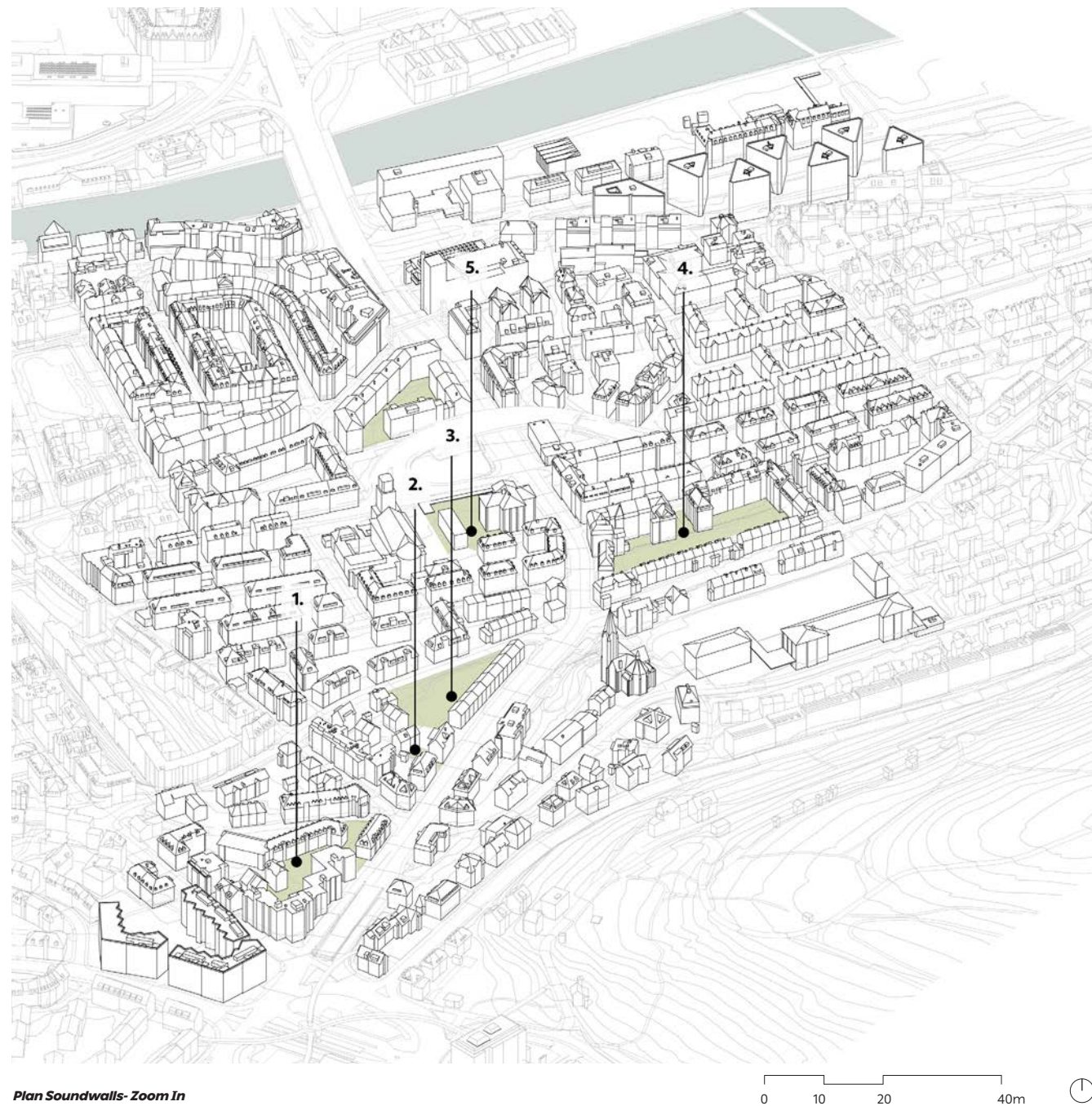


Plan New Condition Soundwalls- Zoom In

0 10 20 40m

Rosengartenachse

Opening up the existing



1.



2.



3.



4.



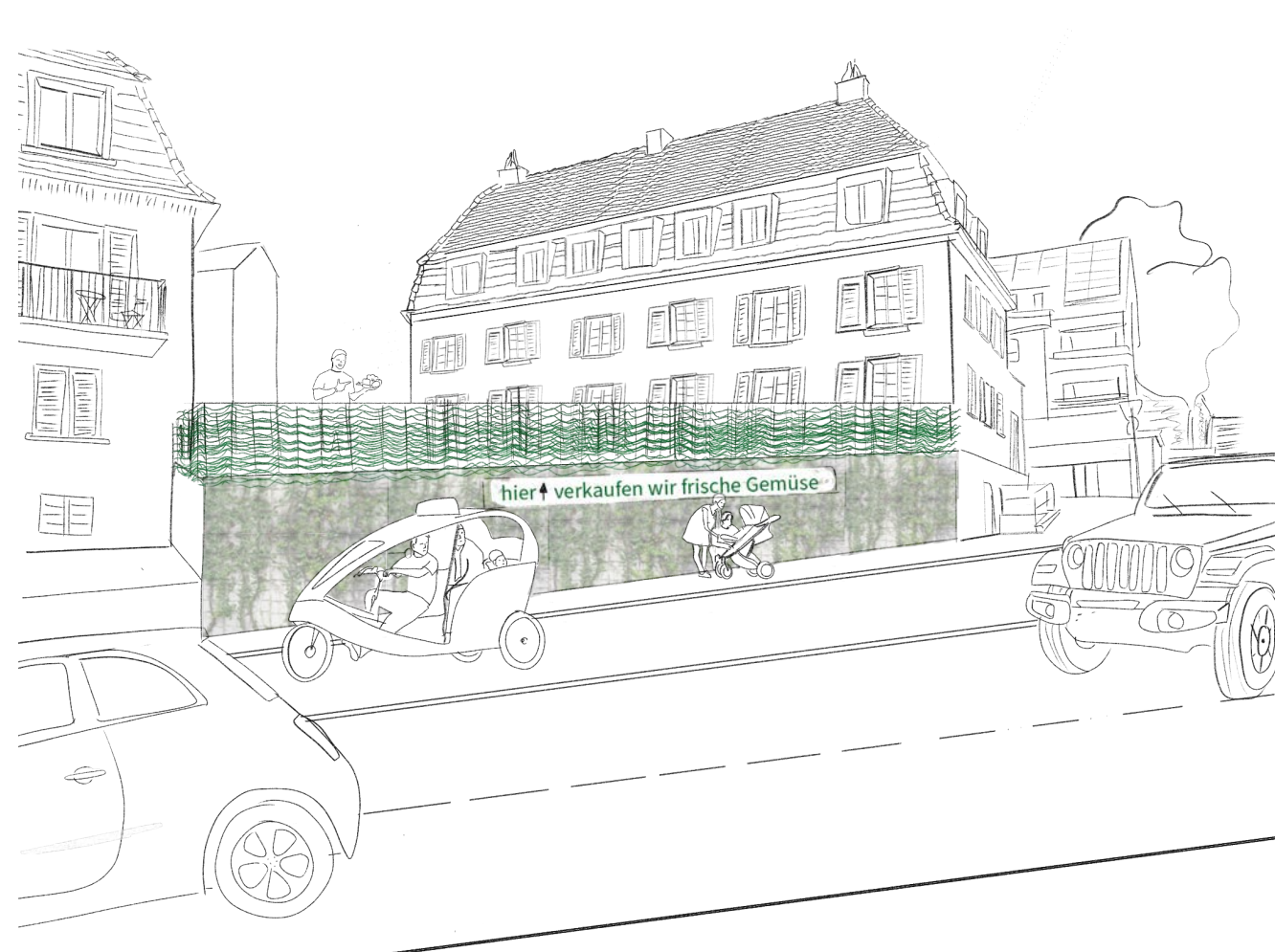
5.

Rosengartenachse

Opening up the existing



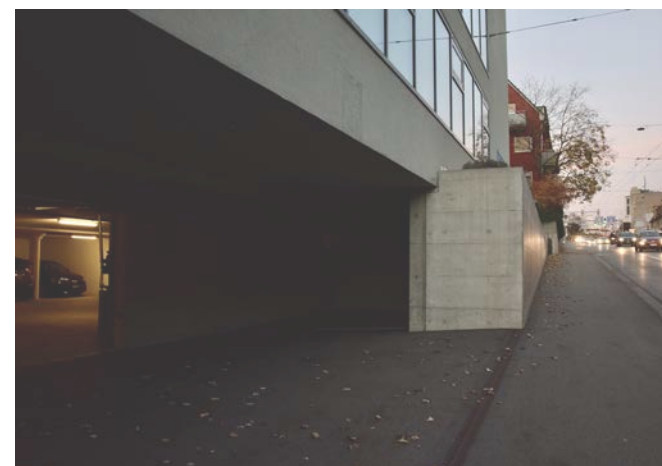
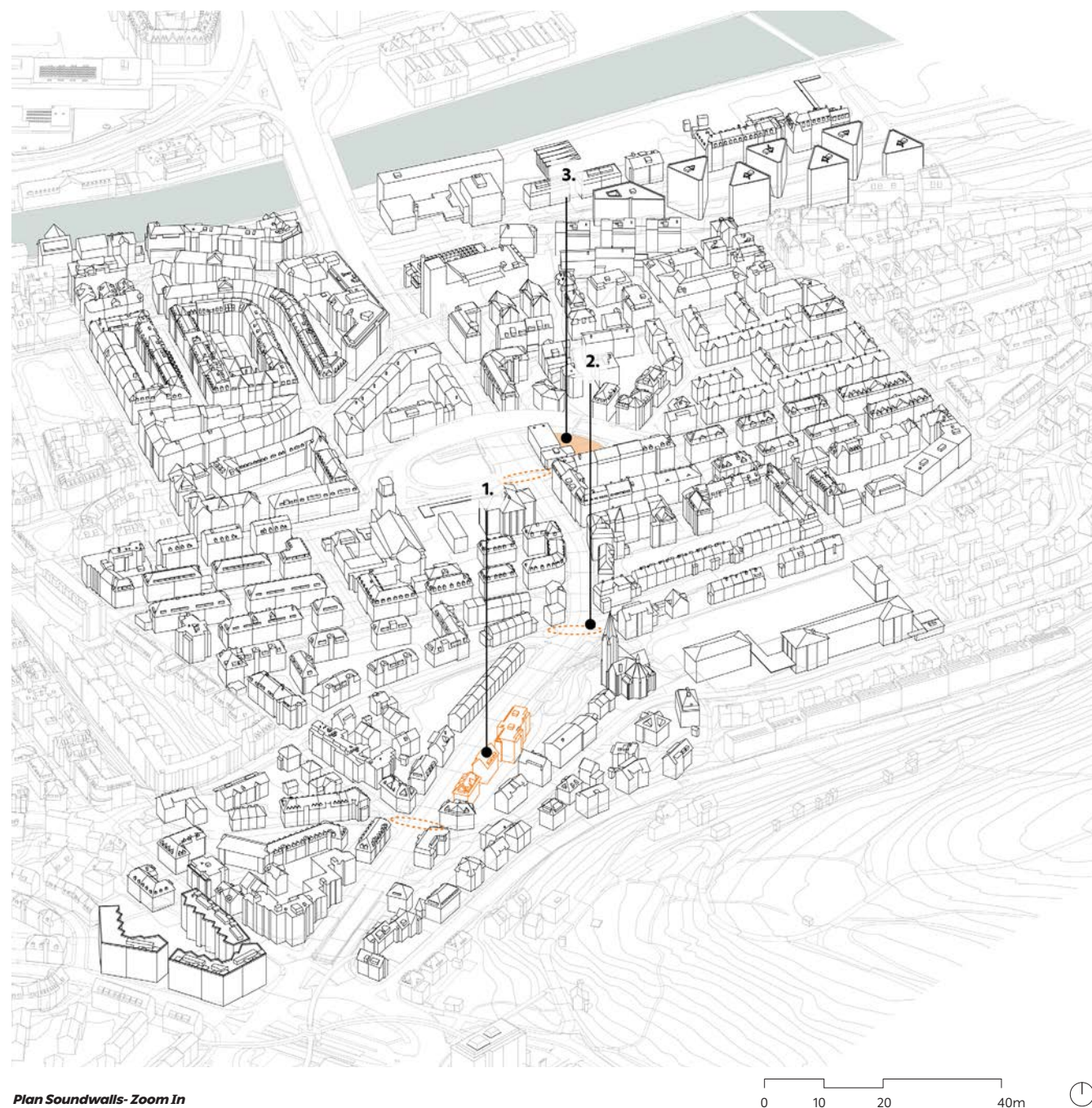
Closed Courtyard along the Rosengartenstrasse, 2021



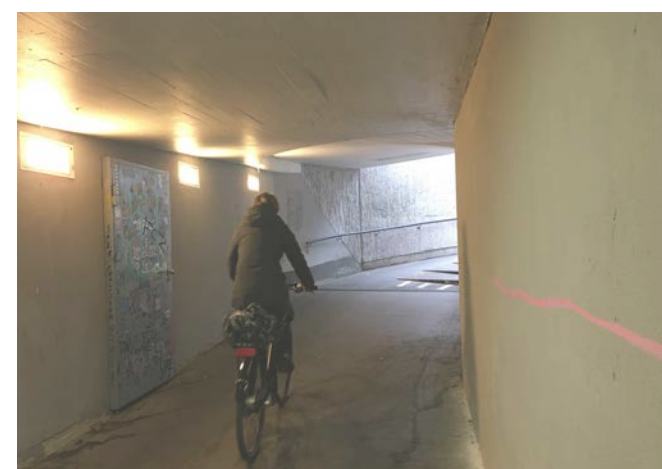
Opened Courtyard along the Rosengartenstrasse, 2040

Rosengartenachse

Requalifying the existing



1. From Garage to Workshop



2. From Transit Space to Book Share



3. From Fallow Land to Lady's Mantle Garden



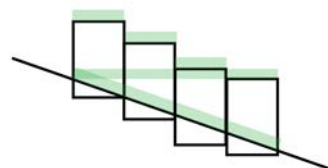
Rosengartenachse

Green areas

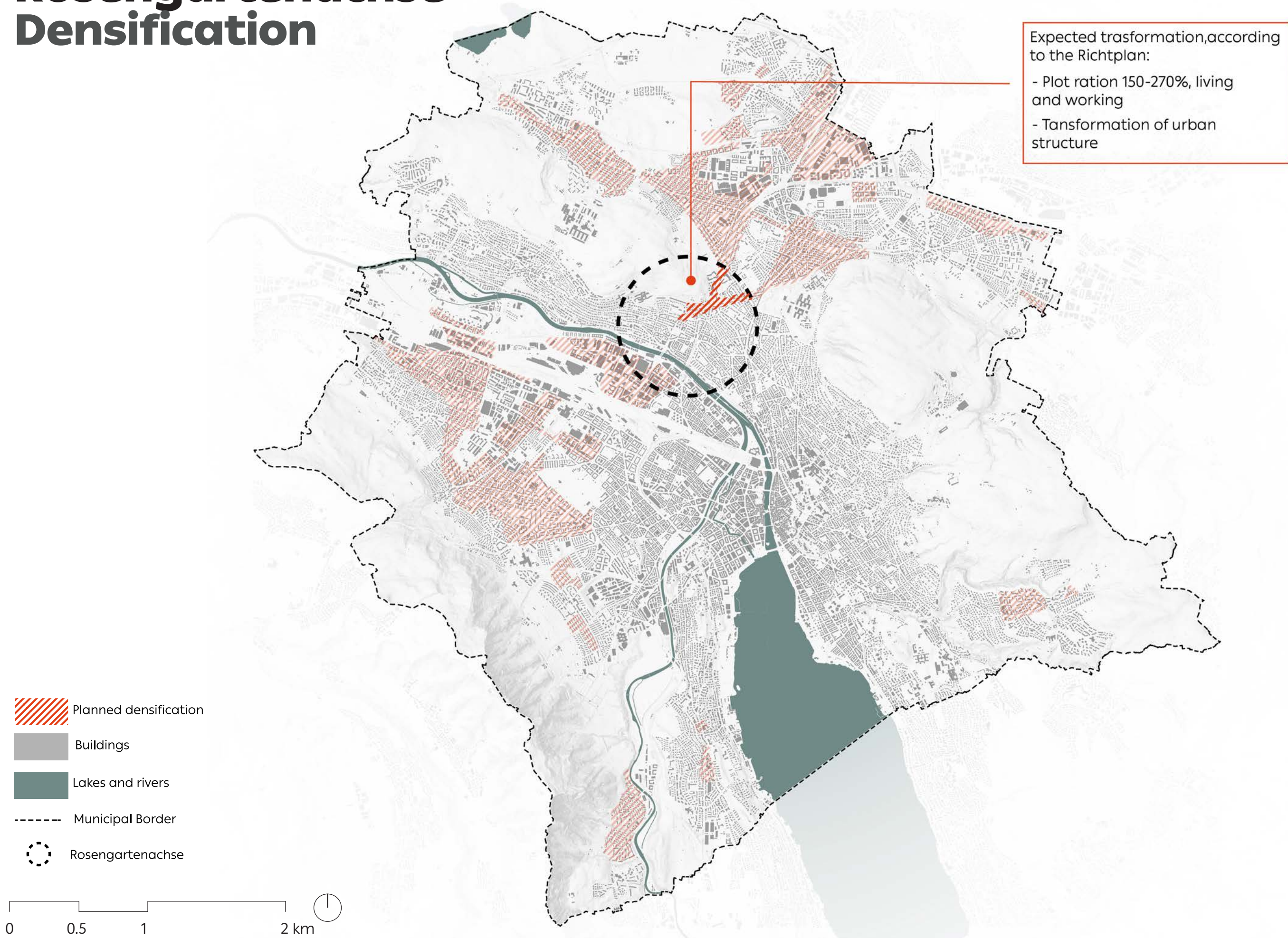


Rosengartenachse 2040-2050

Densification of free space at
multi-levels



Rosengartenachse Densification



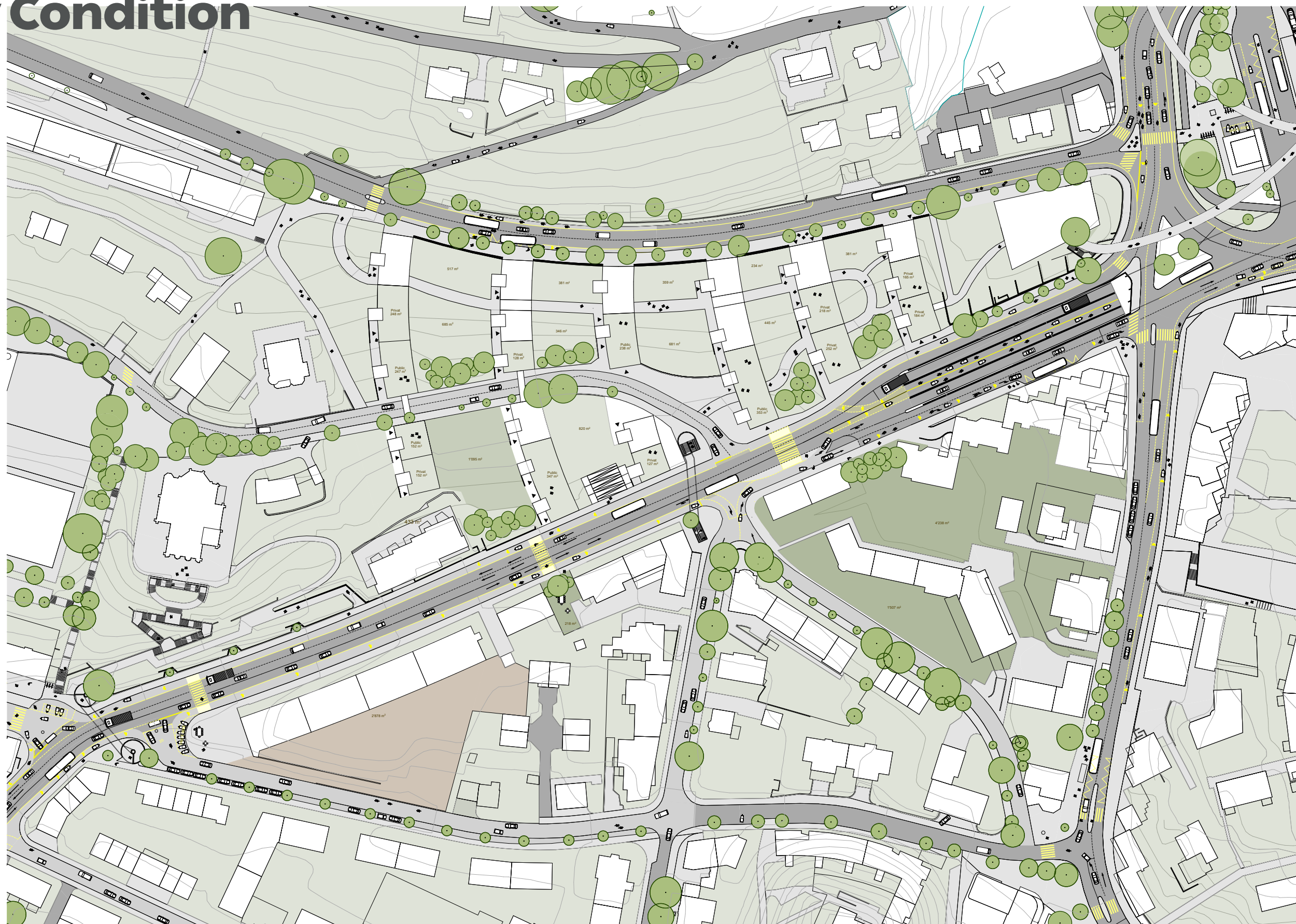
Densification Area

Current Condition



From Single Detached Houses with private garden

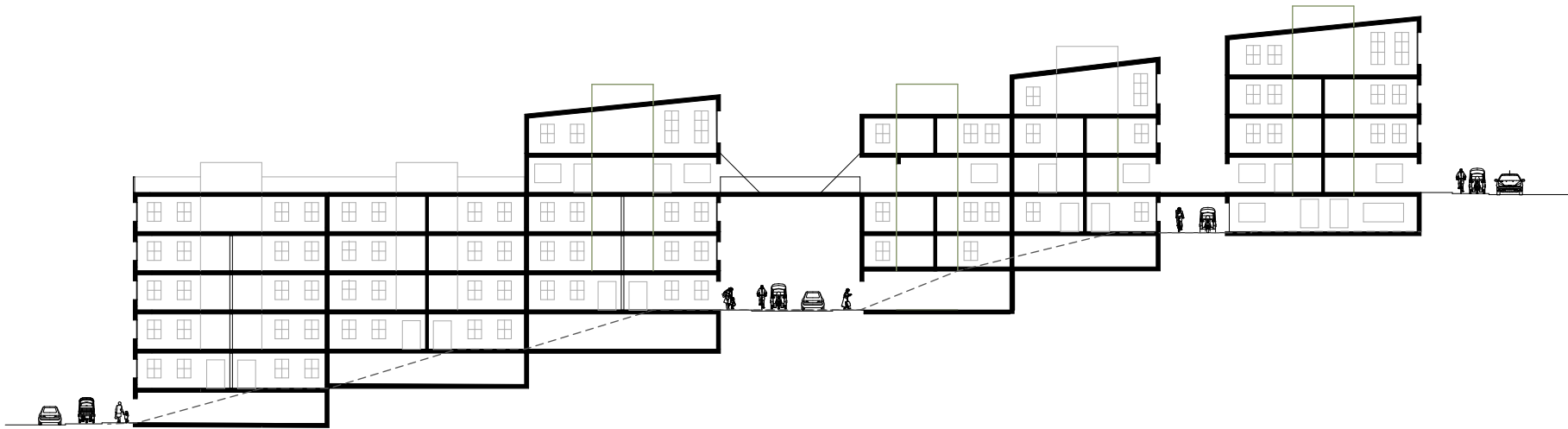
Densification Area New Condition



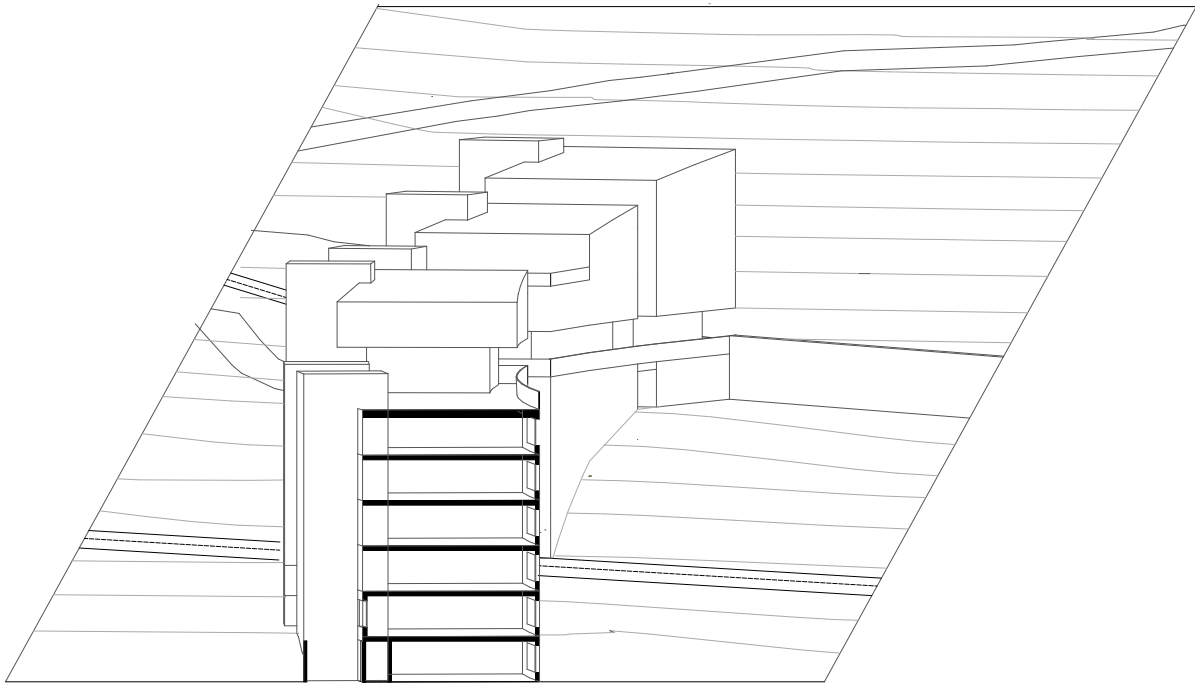
To single attached Houses with shared garden and roof terraces



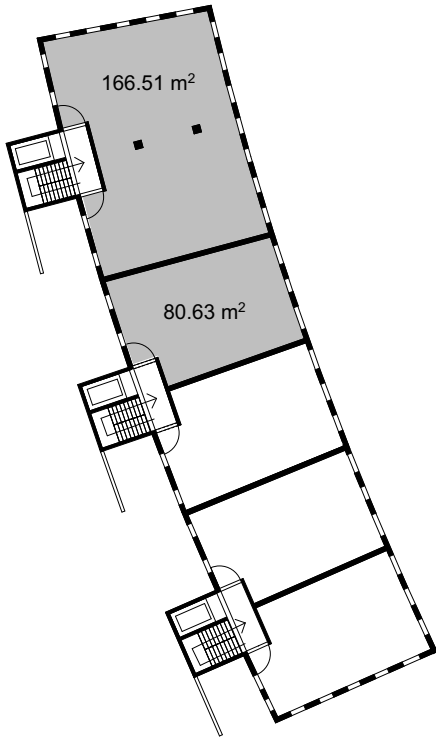
Densification Area Building Typology



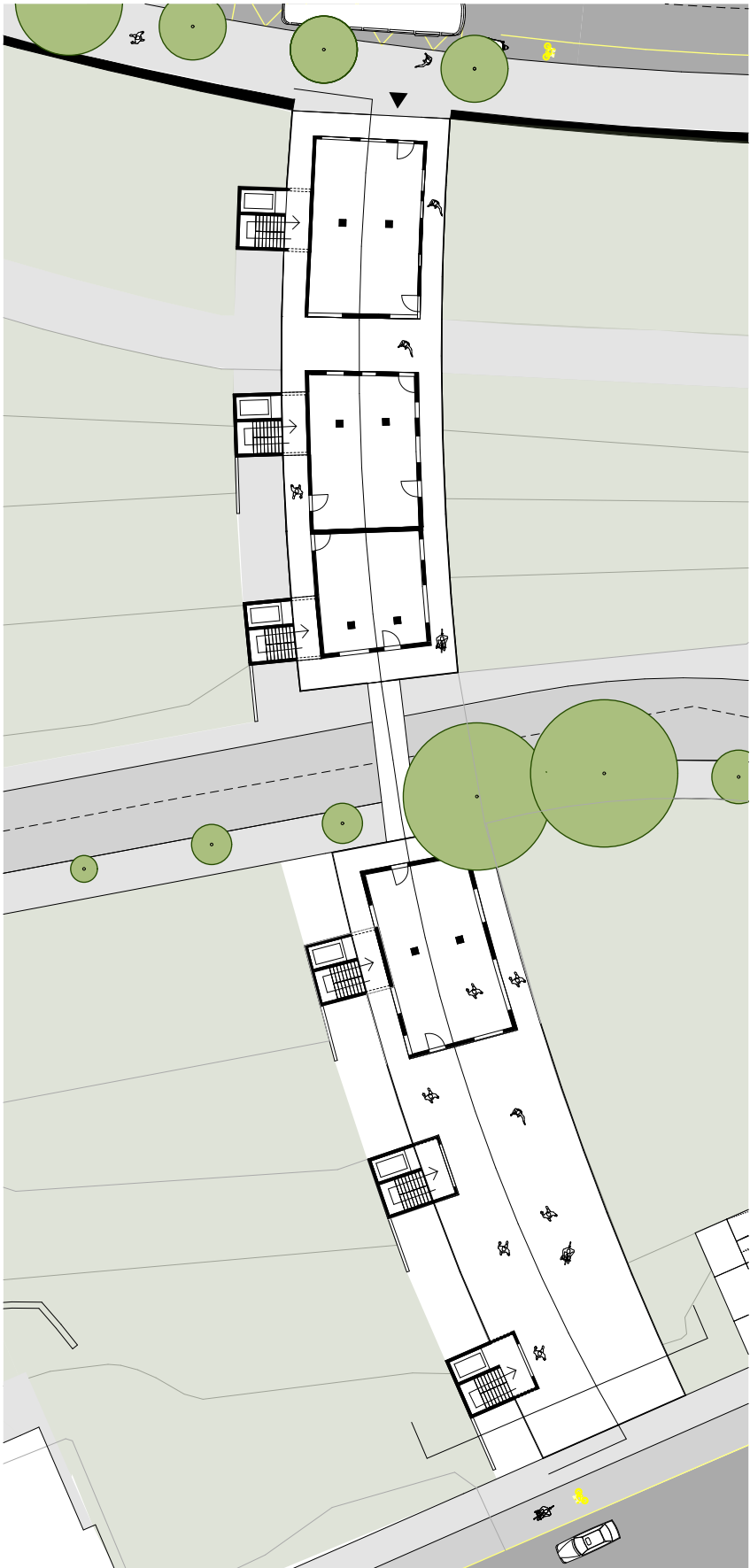
Length Section



Cross-Section

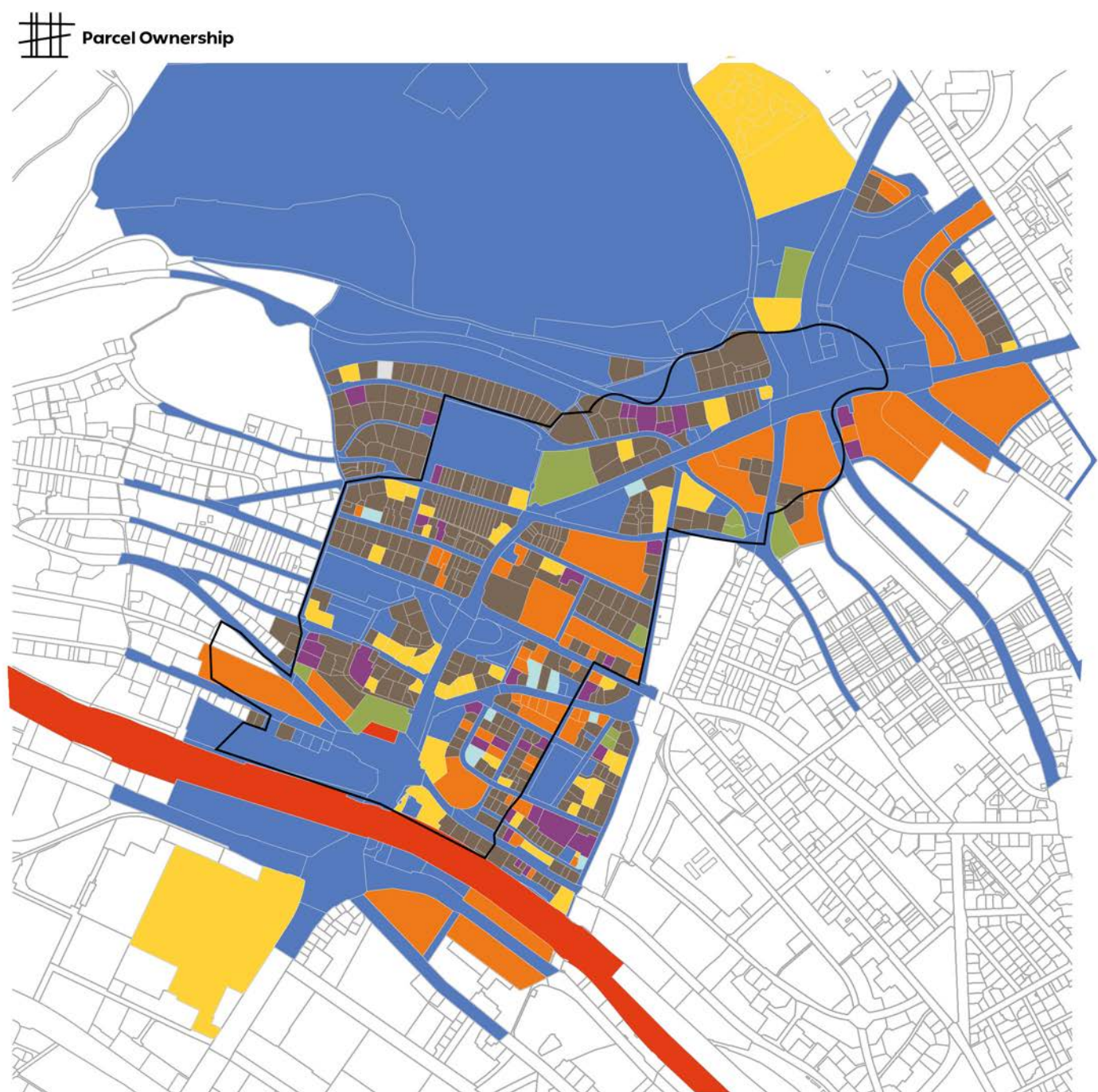


Apartment Plan

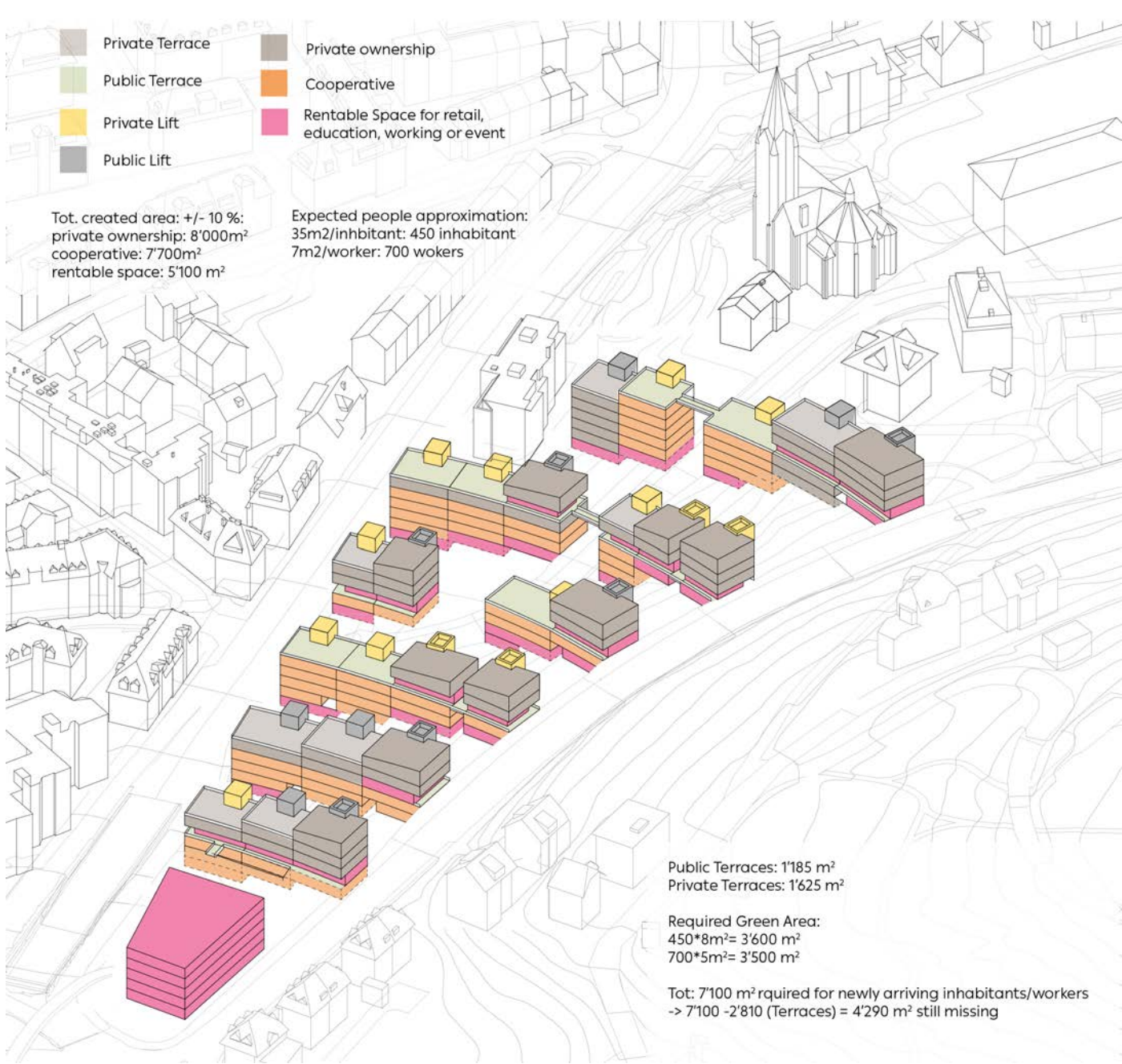
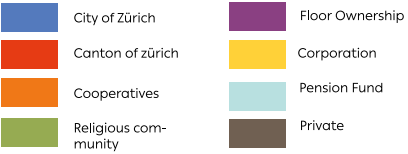


Elevated Groundfloor Plan

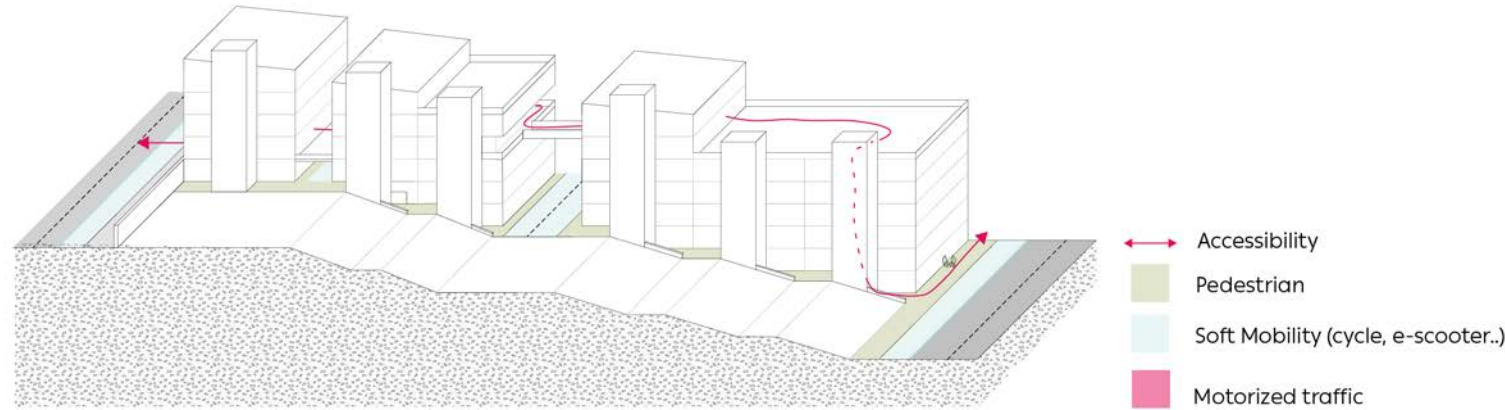
Densification Area Ownership



Parcel Ownership - Current Condition, done in plan

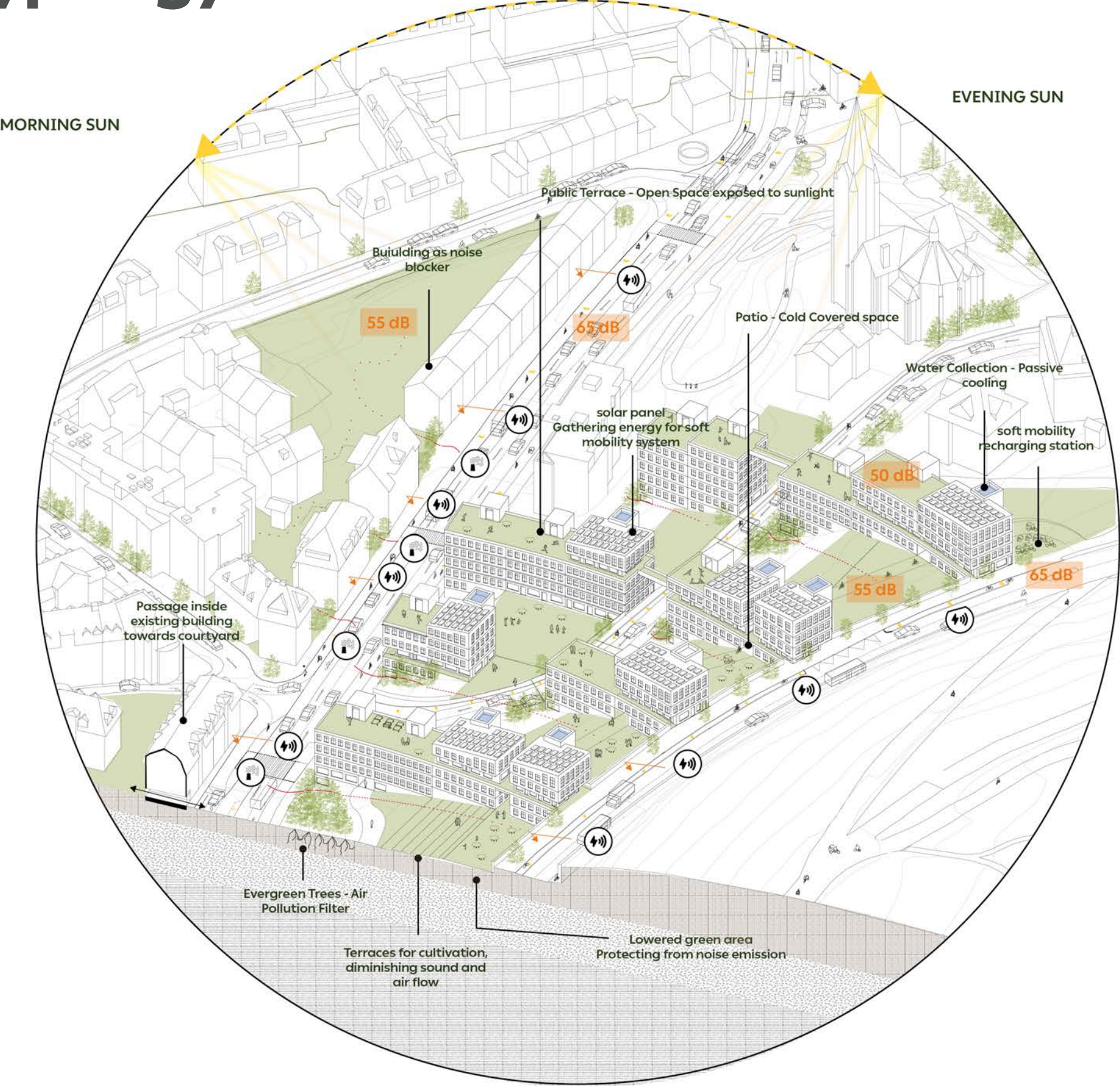


Parcel Ownership - Project Condition, done in the verticality

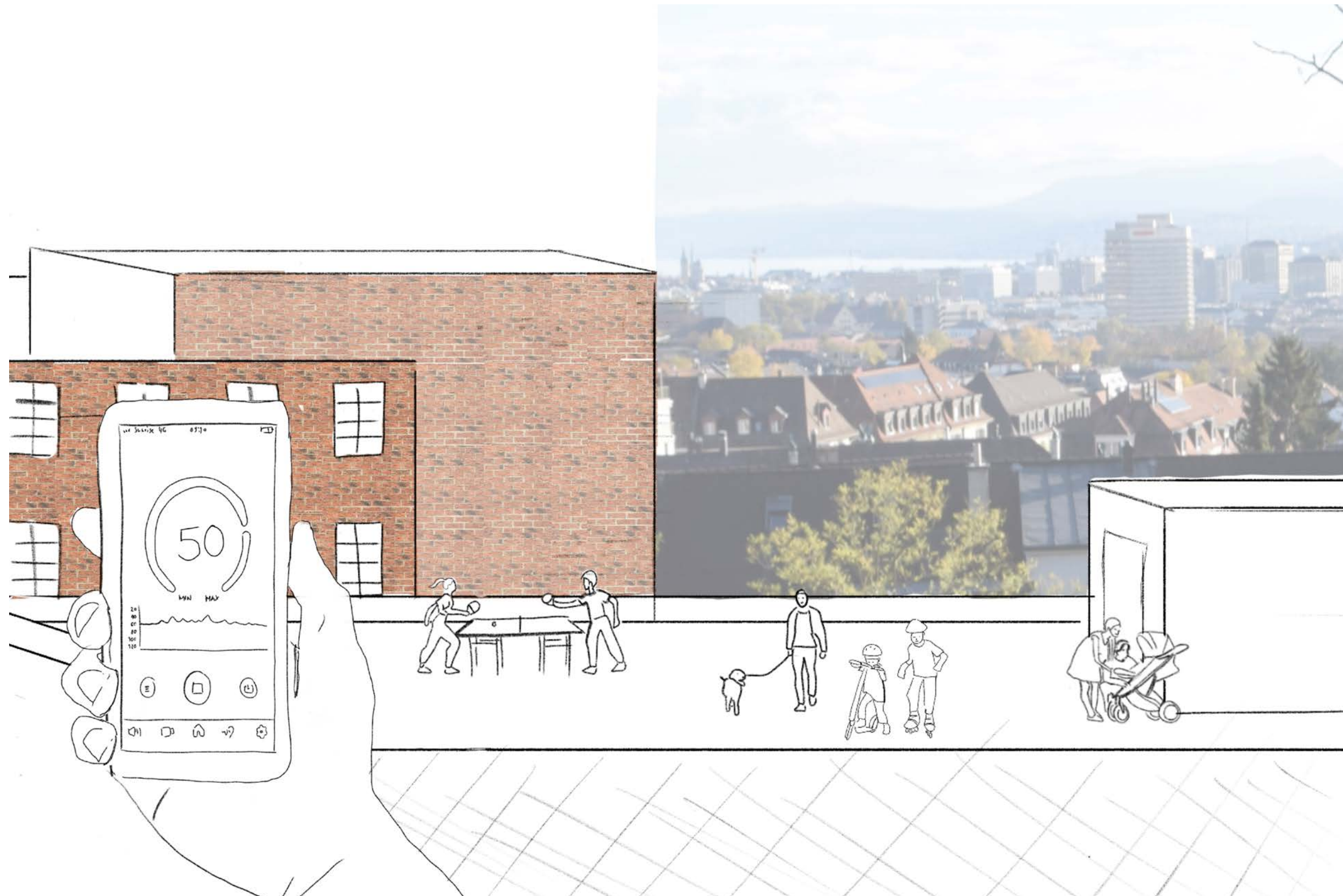


Accessibility Diagramm

Extended Pedestrianization Building Typology

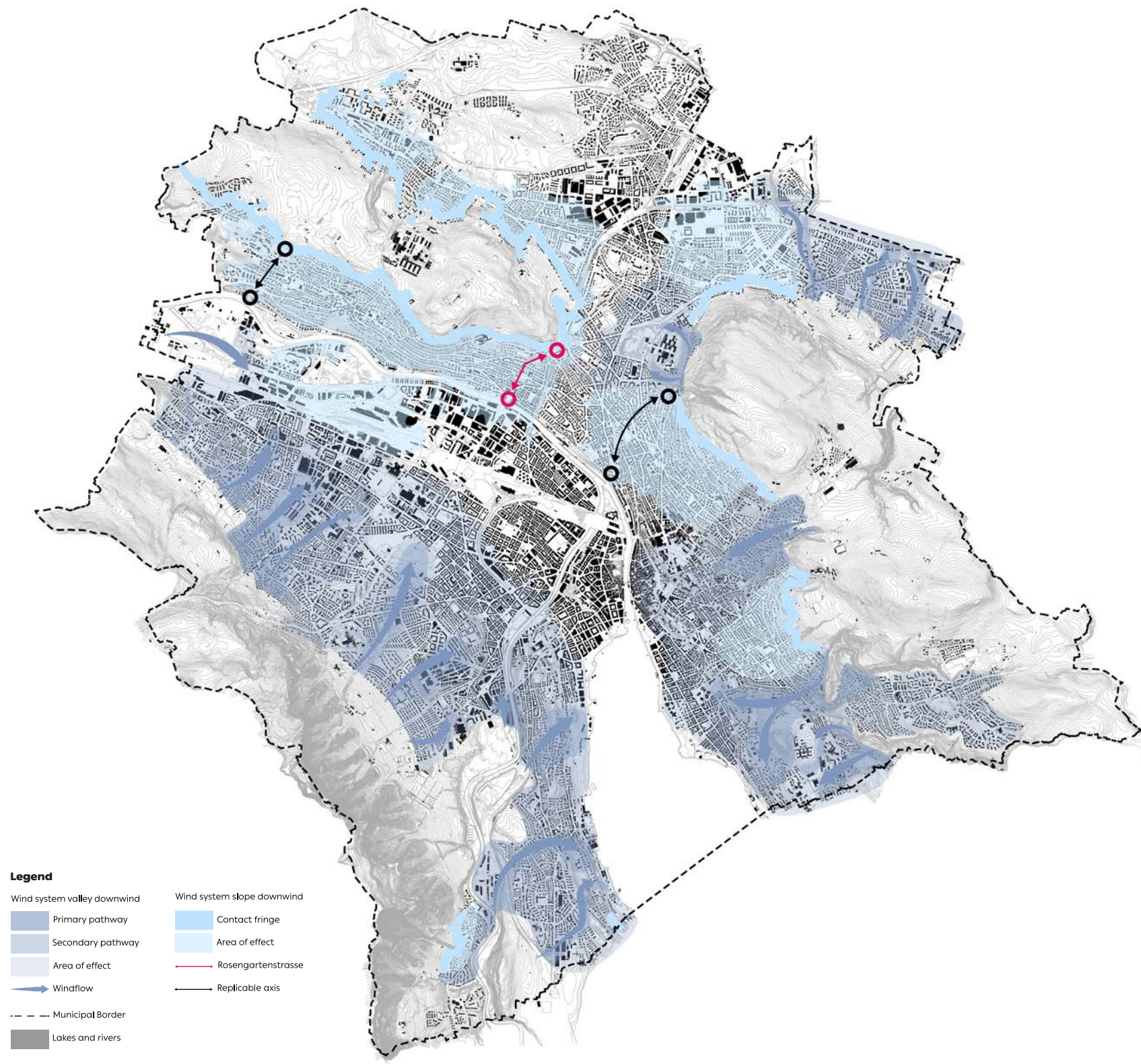


Rosengartenachse 2050

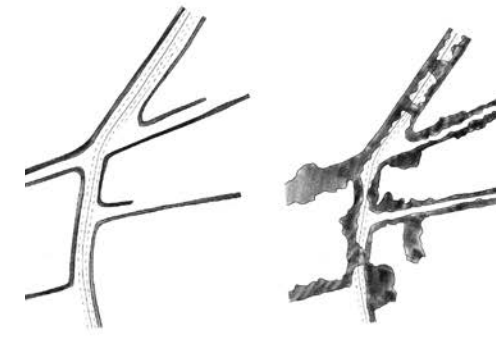


View and Atmosphere from one of the new building's roof

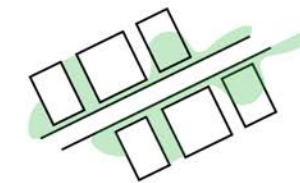
Extended Pedestrinization Replicability



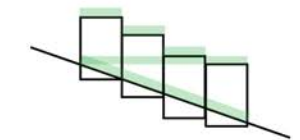
Replicability Diagramm



1. De-densification of traffic



2. Densification of Programm



3. Densification of free space

EXTENDED PEDESTRIANIZATION AS POLICY ADVICE:

When:

Along hilly, highly congested streets, connecting mountains to river, close to the contact fringe, and which are not subjected to primary windflows.

What:

1. De-densification of traffic

Transformation from a 4-lane street into a 3-lane street. A specific bike-lane for cycle and soft mobility systems, such as e-cycle-taxi, e-scooter, is built. A shared e-cycle-taxi system is implemented, and unused parking space are transformed into soft mobility hubs with charging stations. Bus system has to be preserved and promoted.

2. Densification of Programm

Tear down the soundwalls. Instead of wall, plant air filtering trees. Requalify garages and underground passages into covered cold spaces which can be used for ateliers, or book share stall. Replace fallow lands with air pollutant absorbing plants such as «Lady's Mantle» or cotoneaster.

3. Densification of free space

Densify the area of the street connected to the mountains with a new typology of long building, which work as connector between street and mountains and create public space at multi-levels. The green areas in between the buildings are understood as filtering corridors. Those green areas have the potential to filter air and sound pollution. On the lower part of the hill evergreen trees, such as pines, filter micro particle coming from traffic pollution. On the upper part of the hill a wall divides the green areas from the footpath adjacent to the upper street and lower in such a way sound emissions. In the middle part terraces offer space for urban farming «Schräbegarten» and at the same time work as obstacle for sound and air travel. This division in three parts ensures the quality of the space at ground level. On the roof elevated free space is created, exposed to lower sound and air emission due to the vertical distanciation. Through my empirical analysis, I approximate 50dB on the roof level and 55dB on the ground level. This vertical division of the free space will also influence the ownership which is not understood in the horizontal anymore as in traditional parcel plans but in the vertical. Private ownership is situated on the upper floor, where some apartments offer direct relation to private terraces. Rentable spaces are situated on the groundfloor, those could be owned by corporations, or the city of Zürich for instance and can be used for work, education or event. In the middle floors where the view is not exceptional and the public accessibility of the lift could disturb, cooperative housing or student housing is located.