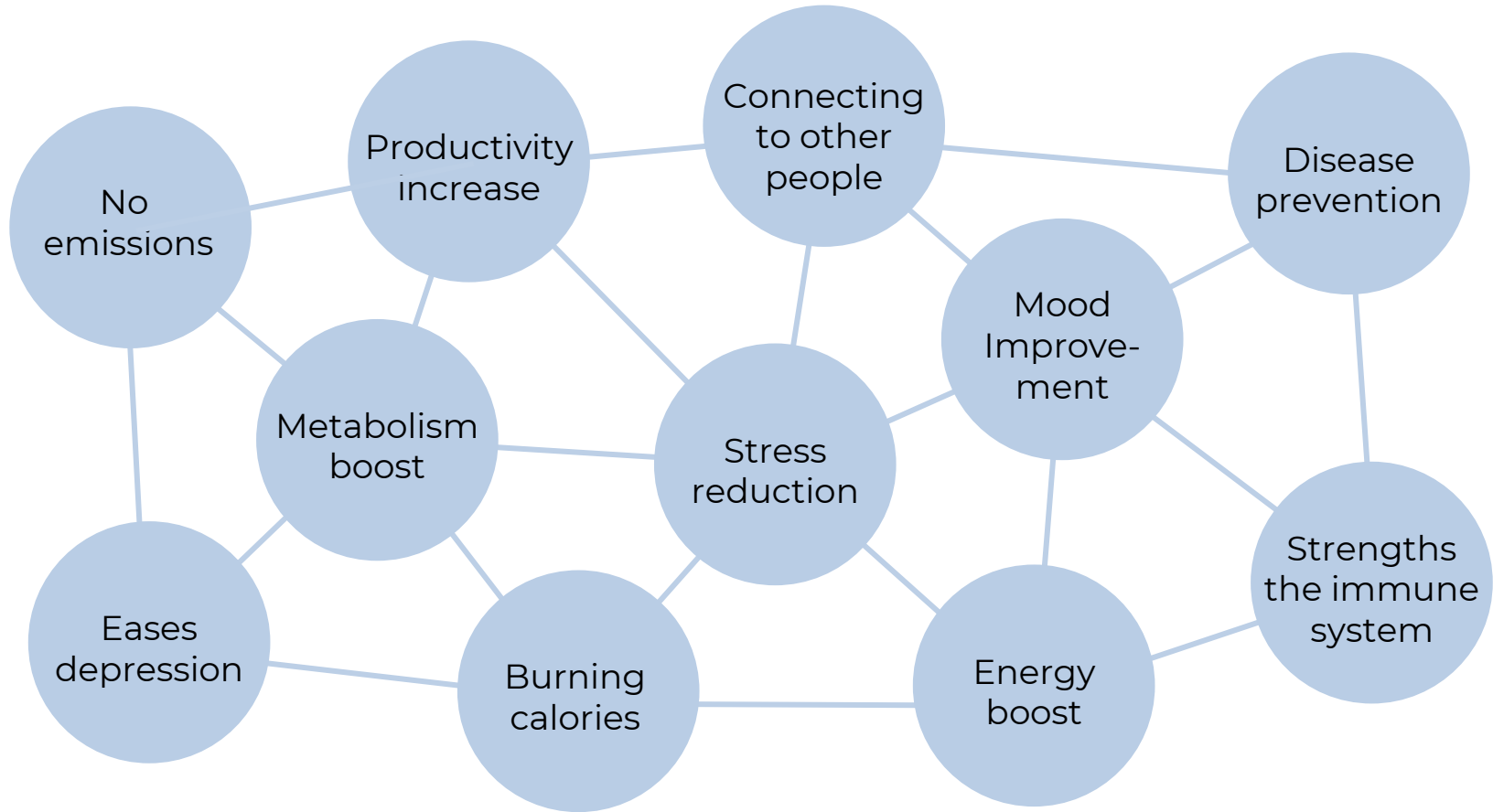


# Geneva as “The Walkable City”

# Why walking?



# Benefits of Walkability



## Health

Residents of walkable neighborhoods weigh 6-10 lbs less. Walkability may also have mental health benefits.



## Environment

87% of CO2 emissions come from burning fossil fuels. Fewer cars on the road means less smog and less traffic.



## Finances

Research shows that 1 point of Walk Score is worth \$3,250 in home value. Additionally, cars are the second largest household expense.

# Choice of Transport 2015

## Percentages of domestic daily distances



## Percentages of domestic daily travel times



<sup>1</sup> Without waiting and transfer times

# Is Geneva walkable?

# Structure



# Project Site





Immeuble Clarté, Le Corbusier and Pierre Jeanneret, 1930-1932, Geneva

Source: <https://www.batimag.ch/architecture/le-genie-du-corbusier-va-pouvoir-revivre-dans-son-immeuble-genevois-clarte-3965>



## Public Space Situation In Geneva Example: “Rue Adrien-Lachenal”



Designed public spaces like this seating area do not serve any quality

- useless -



Parked vehicles and garbage container blocking the view to cross the street

- unsafe -



Objects in the middle of the walkway interrupting the walk

- uncomfortable -

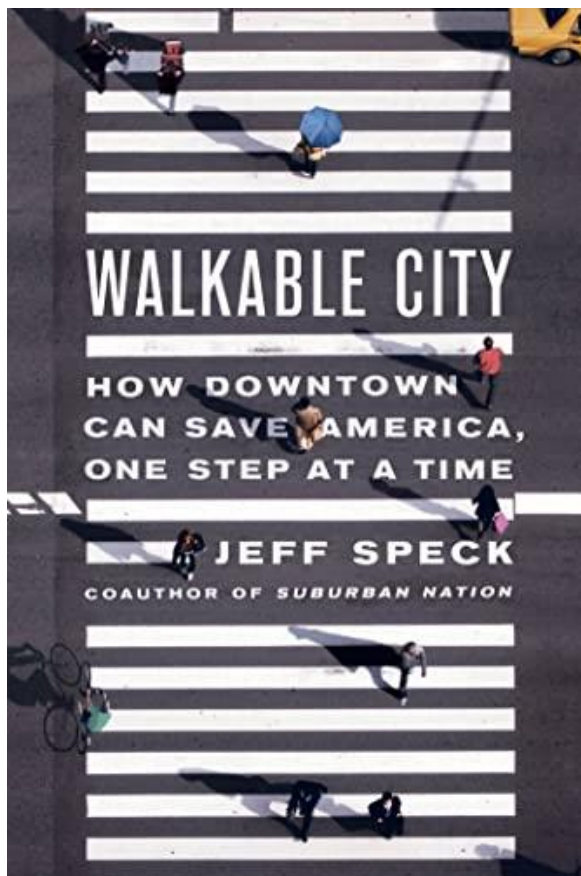


Outdoor seating is surrounded by parking without walkway accessibility

- uninteresting -

# Theory of Walkability





# Walkable City

Jeff Speck

(American city planner, writer, and lecturer)

## Walkability

Walkability is a term for planning concepts best understood by the mixed-use of amenities in high-density neighborhoods where people can access said amenities by foot.

- Dovey, Kim; Pafka, Elek (January 2020).

**“A walk needs to be  
as good as a drive”**

**- Jeff Speck -**

## A walk needs to be...



1

**Useful**



3

**Comfortable**



2

**Safe**



4

**Interesting**

Category	Subcategory	Object of investigation
Usefulness	Vehicle usage	Number of public transportation stops (500m)
Usefulness	Vehicle usage	Number of parking lots at the street side
Usefulness	Vehicle usage	Route hierarchy
Usefulness	Bike usage	Distance to closest cycle path
Usefulness	Bike usage	Bycycle line types
Usefulness	People	Distance in 15 min
Usefulness	People	BMI
Safety	Traffic	Traffic accidents
Safety	Traffic	Speed zones
Safety	Public	Income change
Safety	Public	Publicly accessible enterprises
Comfortability	Environment	NO2 emissions
Comfortability	Environment	Noise during daytime
Comfortability	Environment	Distance from soil and water polluted sites
Comfortability	Density	Ratio building height / number of floors (Housing)
Comfortability	Density	Volume of buildings (Housing)
Comfortability	Density	Ratio building height / number of floors (not Housing)
Comfortability	Density	Volume of buildings (not Housing)
Interesting	People	Population density
Interesting	Space	Build up area
Interesting	Space	Public space
Interesting	Greenary	Amount of greenary
Interesting	Greenary	Number of trees



# Aspect 1

## “Usefulness”



# Mobility and Transport

## Geneva

### Mobility and transport

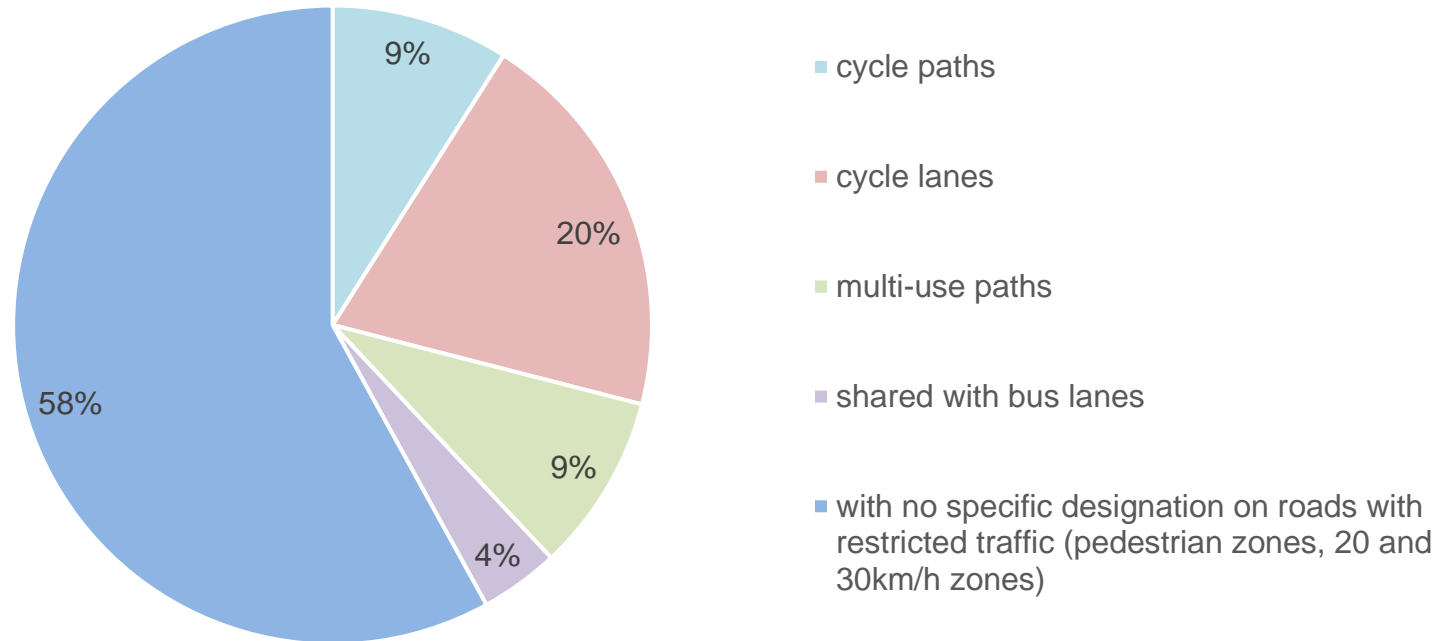
Passenger cars per 1000 inhabitants	2019	439
Main mode of transport of employed commuters in %		
Public transportation	2019	45.5
Private motorised transport	2019	32.5

## Switzerland

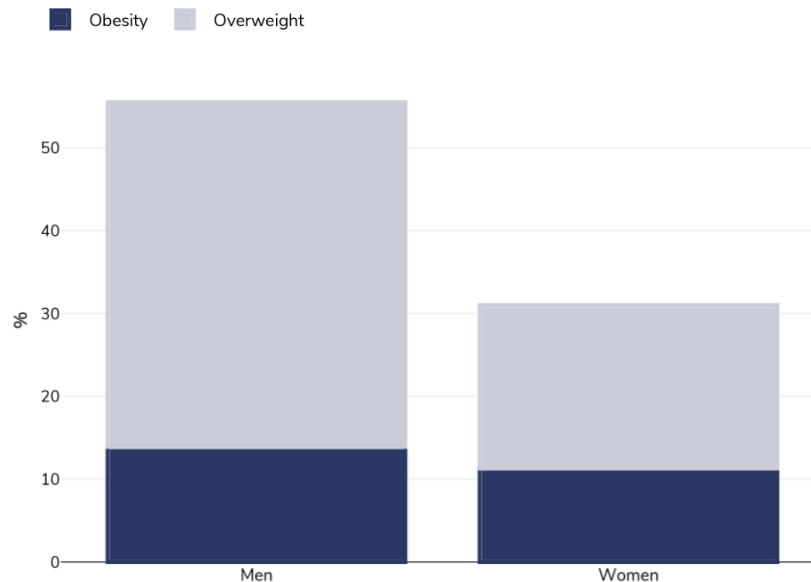
### Mobility and transport

Passenger cars per 1000 inhabitants	2019	541
Main mode of transport of employed commuters in %		
Public transportation	2019	30.6
Private motorised transport	2019	52.5

## Cycling in Geneva



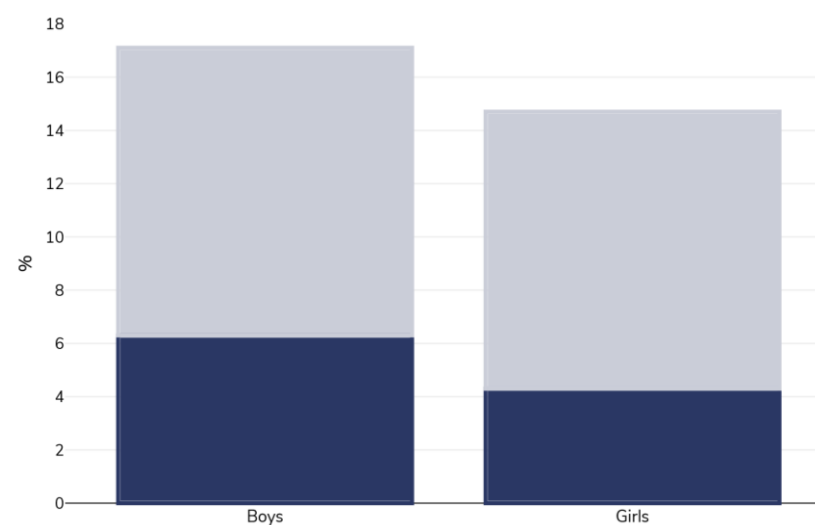
# Switzerland: Obesity prevalence



Adults, 2014 – 2015

**Reference:**

Federal Office of Public Health and the Food Safety and Veterinary Office(2017) Characteristics and indicators of eating and physical activity behaviors in the Swiss adult population Results from menuCH 2014-2015 Available at <https://menuch.iumsp.ch/index.php/catalog/4>



Children, 2017 – 2018

**Reference:**

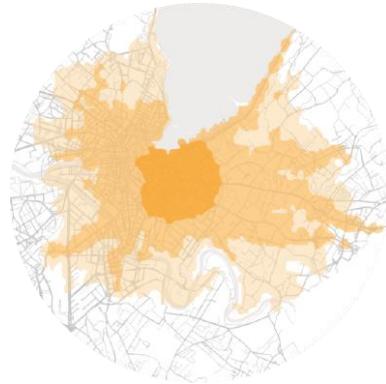
Herter-Aeberli I, Osuna E, Sarnovská Z, Zimmermann MB. Significant Decrease in Childhood Obesity and Waist Circumference over 15 Years in Switzerland: A Repeated Cross-Sectional Study. Nutrients. 2019 Aug 15;11(8). <https://www.mdpi.com/2072-6643/11/8/1922>

In terms of time, the fastest way to cross Geneva is by bike. Public transport does not provide any time advantage.

The coverage of the main traffic routes with cycle paths is inadequate. The few cycle paths that exist also do not provide suitable protection against faster traffic.

The distances to the nearest bike path are long in the city center and accidents can occur on this route. Outside the city center there are almost no cycle paths

### 15 Minutes distances



#### Legend

- 15 Minute Distances
- 15 Minutes distance by walking
  - 15 Minutes distance with public transport
  - 15 Minutes distance by bike

Source:  
<https://www.geoapify.com/isoline-api>

### Traffic routes



#### Legend

- Bicycle lane types**
- Separated bicycle lanes
  - Marked bicycle lanes
  - Streets with reduced speed
  - Shared streets
- Route hierarchy**
- Primary routes
  - Secondary routes
  - Tertiary routes

Source:  
 AGGLO\_SCHEMA\_CYCLABLE  
 AGGLO\_HIERARCHIE\_ROUTE

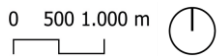
### Distance to closest cycle path



#### Legend

- Distance to closest cycle path [m]**
- 0 - 25
  - 25 - 50
  - 50 - 100
  - 100 - 200
  - 200 - 500
  - 500 - 1500

Source:  
 Grid Zenodo

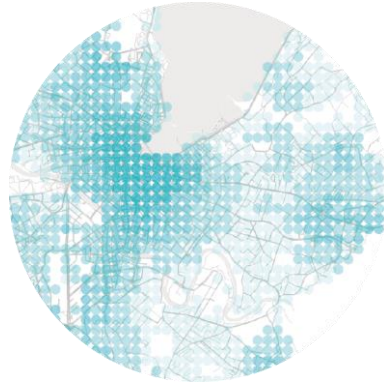


Coverage with public transport stops in the city center is good, but coverage in the outskirts is not always available.

The city center of Geneva has a well-developed range of parking facilities, which favors heavy commuter traffic into the city center.

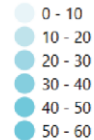
In some areas of the city, an increased BMI value of the population can be observed. This is especially the case in the outer districts, where long errand trips are prevalent.

**Public transportation stops in 500m distance**



**Legend**

**Public transportation stops in 500m distance**

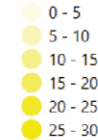


**Number of parking lots at the street side**

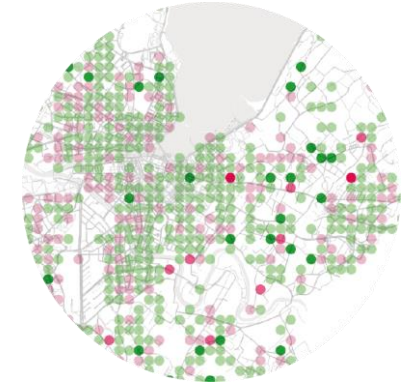


**Legend**

**Number of parking lots at the street side**

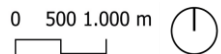
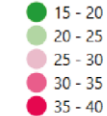


**BMI**



**Legend**

**BMI**



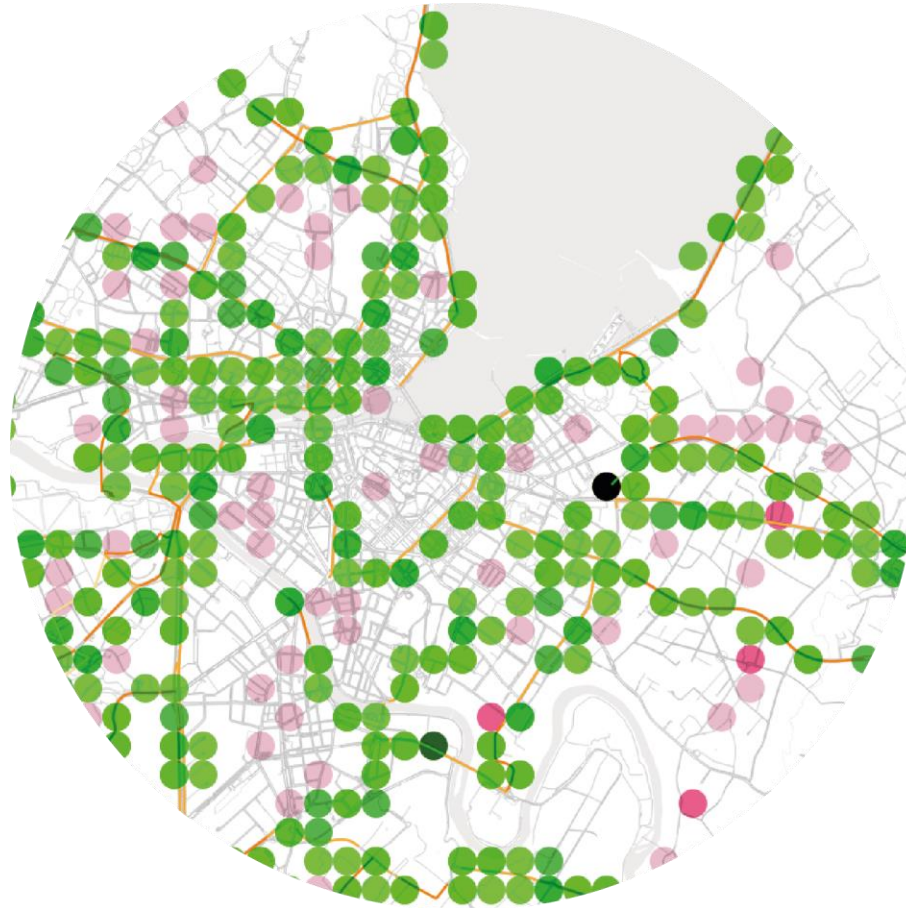
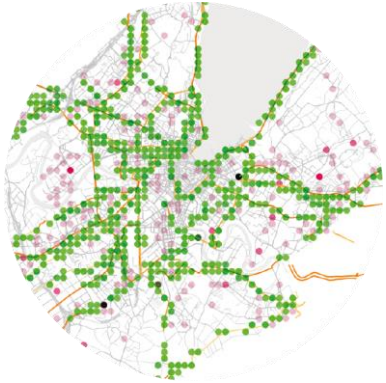
**Source:**  
Grid Zenodo

**Source:**  
OTC\_STATIONNEMENT\_V\_P  
UBLIQUE.

**Source:**  
Grid Zenodo

## BMI and bike use

It can be seen that the BMI in the population is higher when the distances to the nearest cycle paths are longer. The use of the bicycle is cumbersome, which is why fewer health-promoting methods of transport are chosen.



### Legend

#### Distance to closest cycle path [m]

- 0 - 25
- 25 - 50
- 50 - 100

#### Bicycle lane types

- Separated bicycle lanes
- Marked bicycle lanes
- Streets with reduced speed
- Shared streets

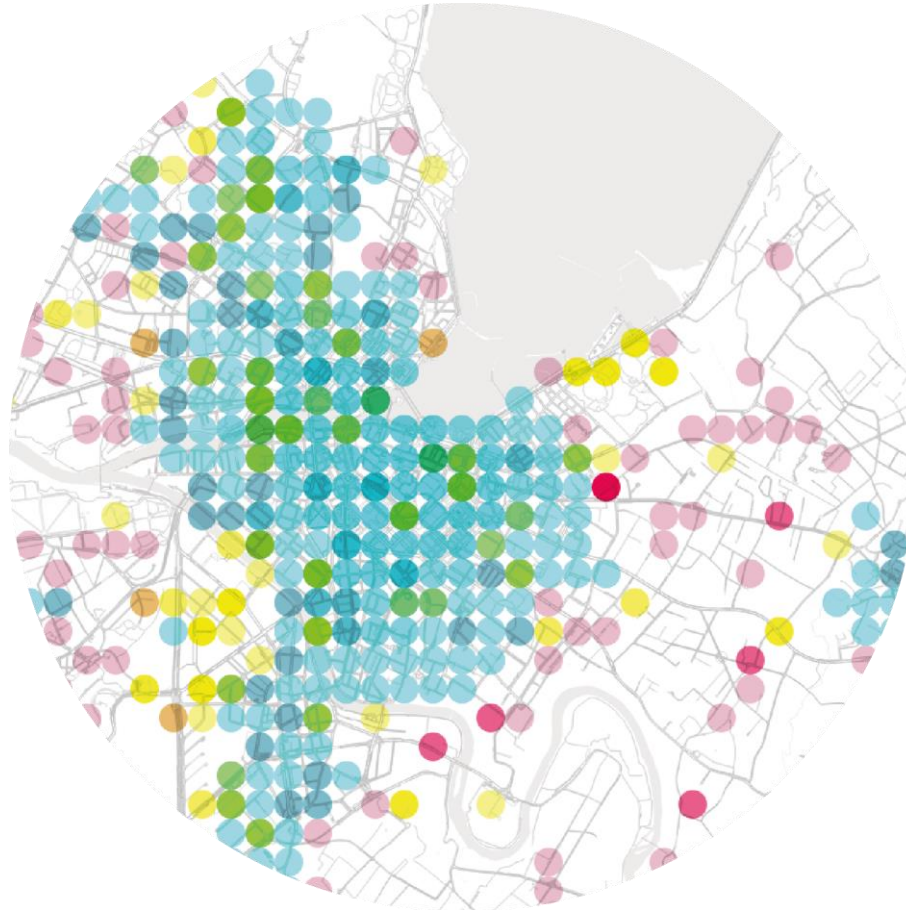
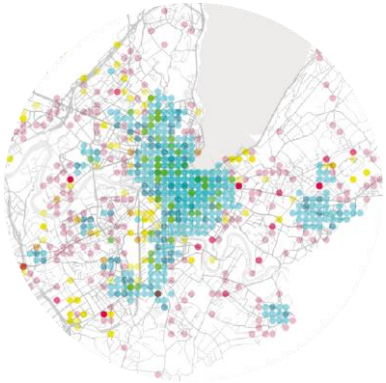
#### BMI

- 25 - 30
- 30 - 35
- 35 - 40



## BMI and vehicle use

Good coverage with public transport stops and parking spaces promotes the use of transport vehicles and thus creates counter-incentives to a more active form of transport. Here, too, a higher BMI of the population can be seen in the corresponding areas.



### Legend

**Public transportation stops in 500m distance**

- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60

**Number of parking lots at the street side**

- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30

**BMI**

- 25 - 30
- 30 - 35
- 35 - 40

**Source:**

Grid Zenodo  
 OTC\_STATIONNEMENT\_V\_P  
 UBLIQUE.



# Aspect 2

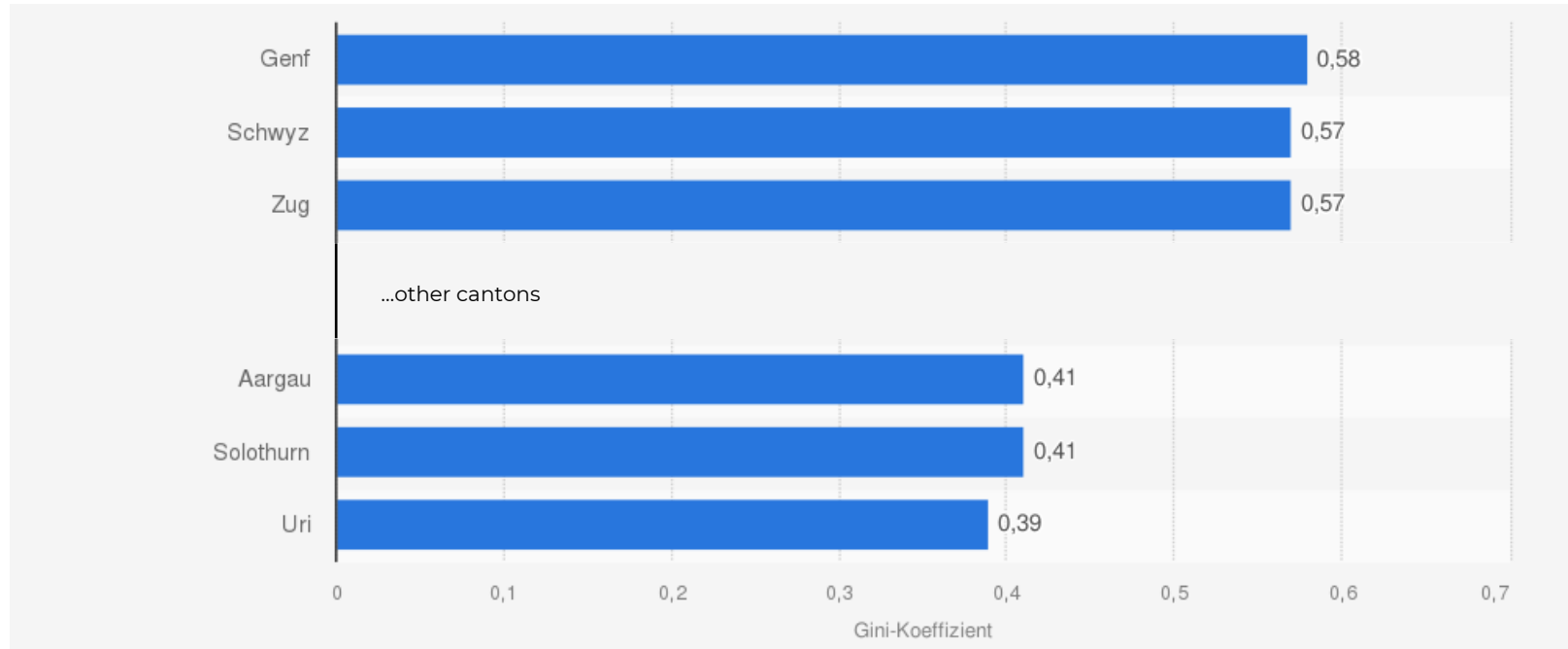
## “Safety”



## Income and education level

		Geneva	Switzerland
<b>Work and income</b>			
Net activity rate (15-64 years)	2019 <sup>①</sup>	73.9	82.2
Unemployment rate (according to SECO)	2020 <sup>①</sup>	4.9	3.1
<b>Economy</b>			
Private motorised transport	2019 <sup>①</sup>	32.5	38.9
<b>Social security</b>			
Social assistance rate	2019 <sup>①</sup>	6.0	3.1
<b>Education level in %</b>			
Without post-compulsory education	2019 <sup>①</sup>	23.5	14.5
Upper secondary education	2019 <sup>①</sup>	30.8	41.6
Tertiary level	2019 <sup>①</sup>	45.7	43.9
Graduation rate in higher education institutions	2019 <sup>①</sup>	30.3	23.7

# Income inequality according to the Gini coefficient



# Criminal Offences

## Geneva

### Criminal offences as ‰ of total population

under the Swiss Criminal Code	2019	95.1
under the Narcotics Act (NarcA)	2019	15.5
under the Foreign Nationals Act and Integration Act (FNIA)	2019	19.6

## Switzerland

### Criminal offences as ‰ of total population

under the Swiss Criminal Code	2019	50.6
under the Narcotics Act (NarcA)	2019	8.9
under the Foreign Nationals Act and Integration Act (FNIA)	2019	4.3

## Guns per 100 People

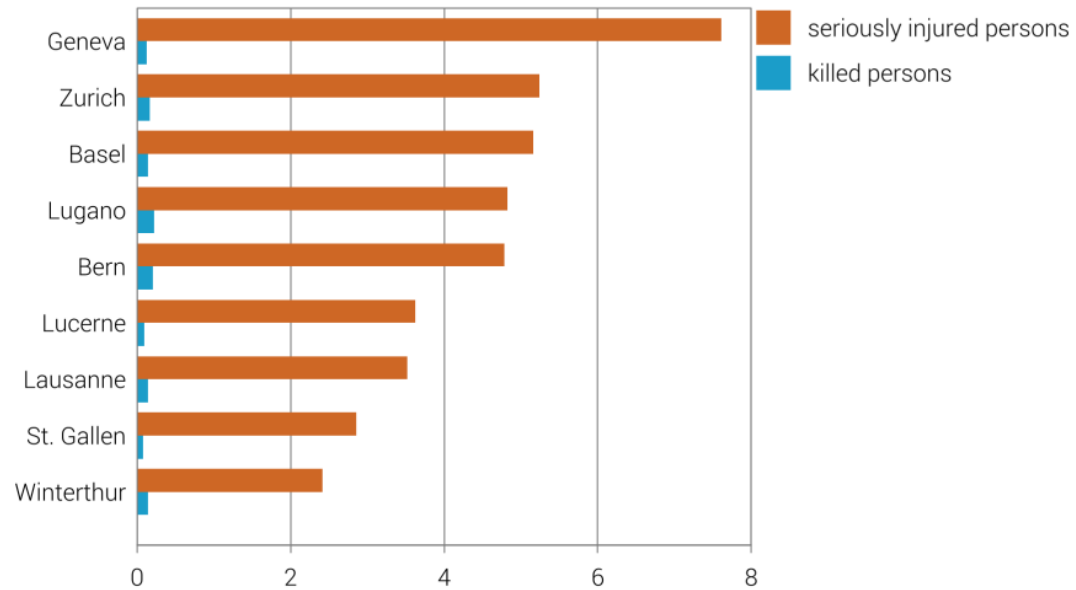
24.45



The gun death rate in Geneva is 3.01 per 100k residents every year. Taking into account Geneva's population of 626,900 it means that on average, a gun death occurs once every 19 days, 8 hours, 14 minutes and 11 seconds.

# Road accident victims

Number of persons seriously injured or killed per 10 000 inhabitants, average from 2016 to 2020, in the core cities



Source: FEDRO – SVU

© FSO 2022

## Swiss cities by traffic jam level

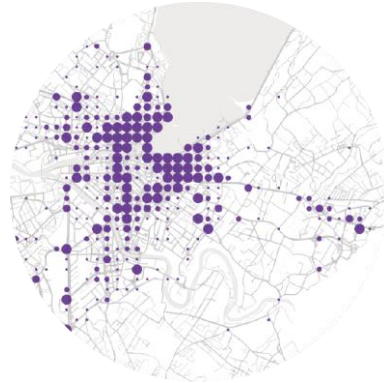
Rank	City	Traffic jam level morning	Traffic jam level evening	Traffic jam level general
1	Genf	51%	66%	33%
2	Zürich	47%	61%	29%
3	Basel	32%	67%	25%
4	Bern	28%	51%	18%

Traffic accidents are particularly high in the city center. This correlates with the increased volume of traffic in the city center.

In terms of income, Geneva is changing without any concrete trend. There is a risk of gentrification and trading down processes.

Most of the enterprises open to the public are located in the city center. They have a special safety effect.

**Traffic accidents**

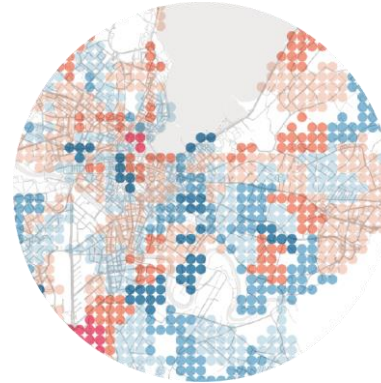


**Legend**

**Traffic accidents**

- 1 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100

**Income change 2006 - 2016**



**Legend**

**Income change 2006-2016**

- -20 - -10
- -10 - 0
- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40

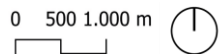
**Publicly accessible enterprises**



**Legend**

**Publicly accessible enterprises**

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50



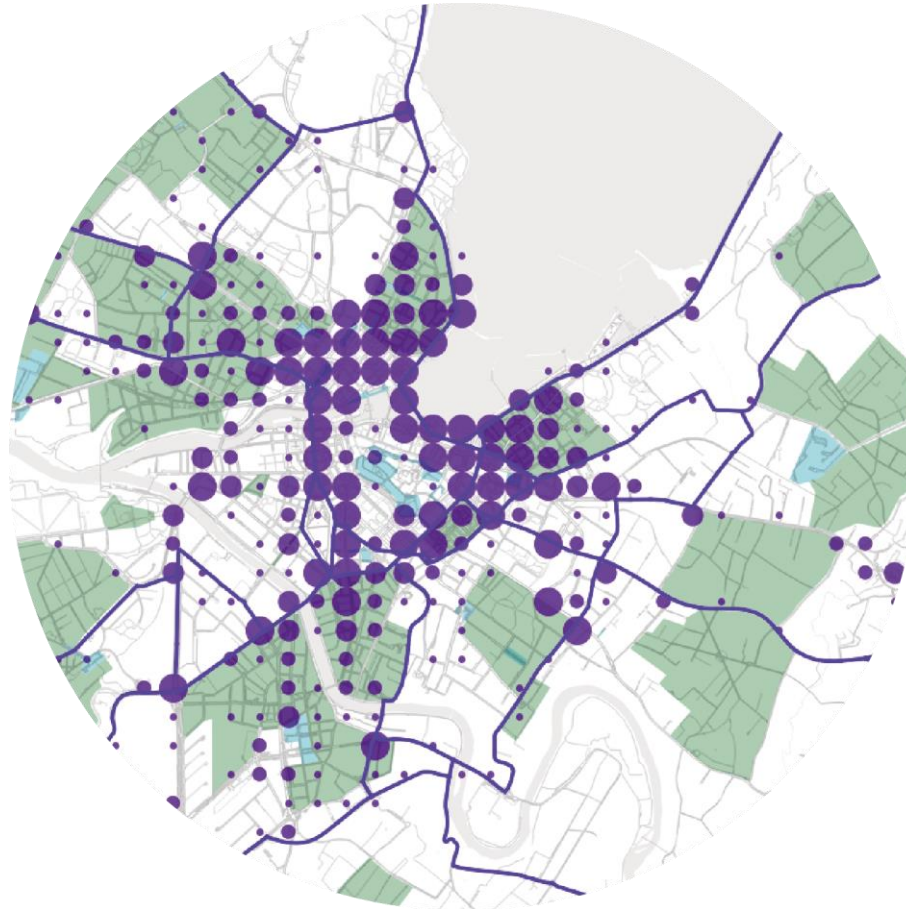
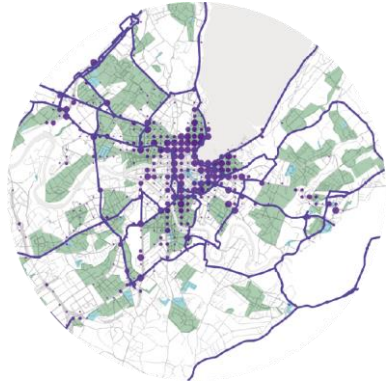
**Source:**  
OTC\_ACCIDENTS

**Source:**  
Grid Zenodo

**Source:**  
REG\_ENTREPRISE\_ETABLIS  
SEMENT

### Traffic safety

It can be seen that accidents occur particularly frequently along the main traffic routes. In addition, there is often no reduced speed at the accident sites.



### Legend

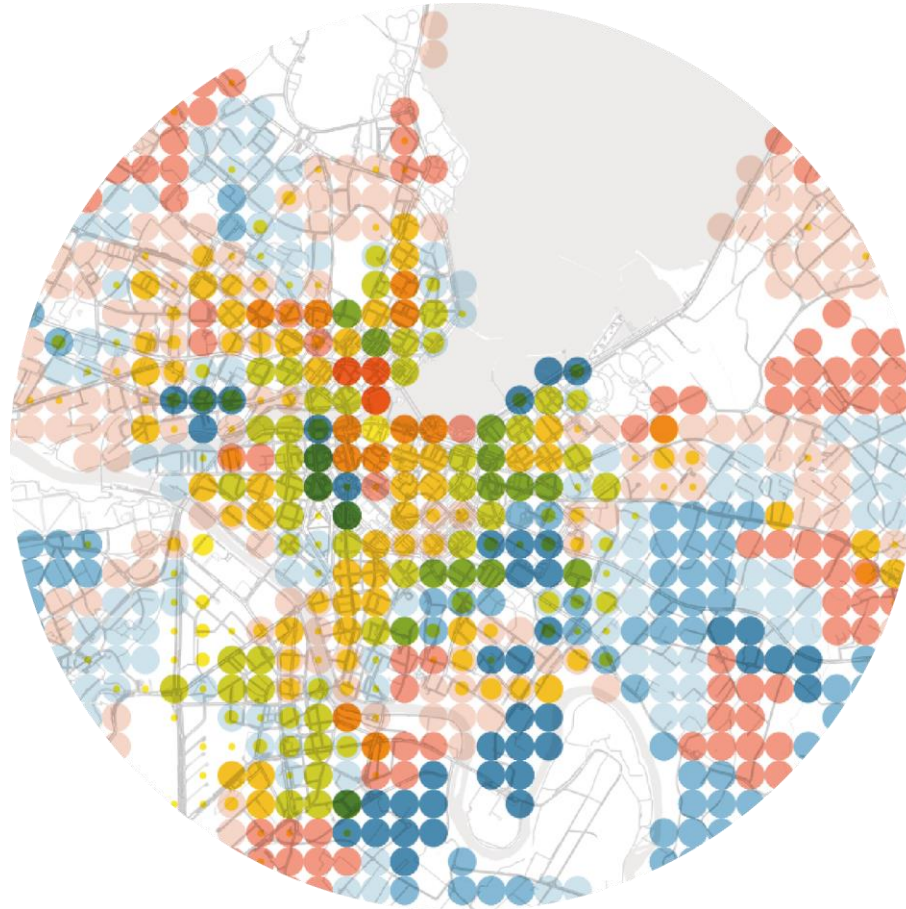
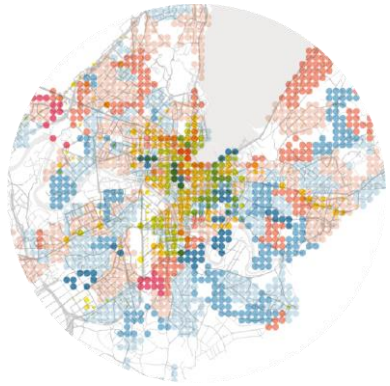
- Primary routes
- Traffic accidents**
- 1 - 20
- 20 - 40
- 40 - 60
- 60 - 80
- 80 - 100
- Speed Zones**
- 20km Zone
- 30km Zone

**Source:**  
 AGGLO\_HIERARCHIE\_ROUTE  
 OTC\_ACCIDENTS  
 OTC\_ZONE\_MODERATION\_TRAFFIC



### Safe areas

Openly accessible shops cater to the public and thus ensure safety. Declining incomes are encouraging companies to relocate, adding to the area's downward trend.



### Legend

**Income change 2006-2016**

- -20 - -10
- -10 - 0
- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40

**Publicly accessible enterprises**

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50

**Source:**  
Grid Zenodo  
REG\_ENTREPRISE\_ETABLISSEMENT



# Aspect 3

## “Comfortability”



# Change in annual CO<sub>2</sub> emissions

Carbon dioxide (CO<sub>2</sub>) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.

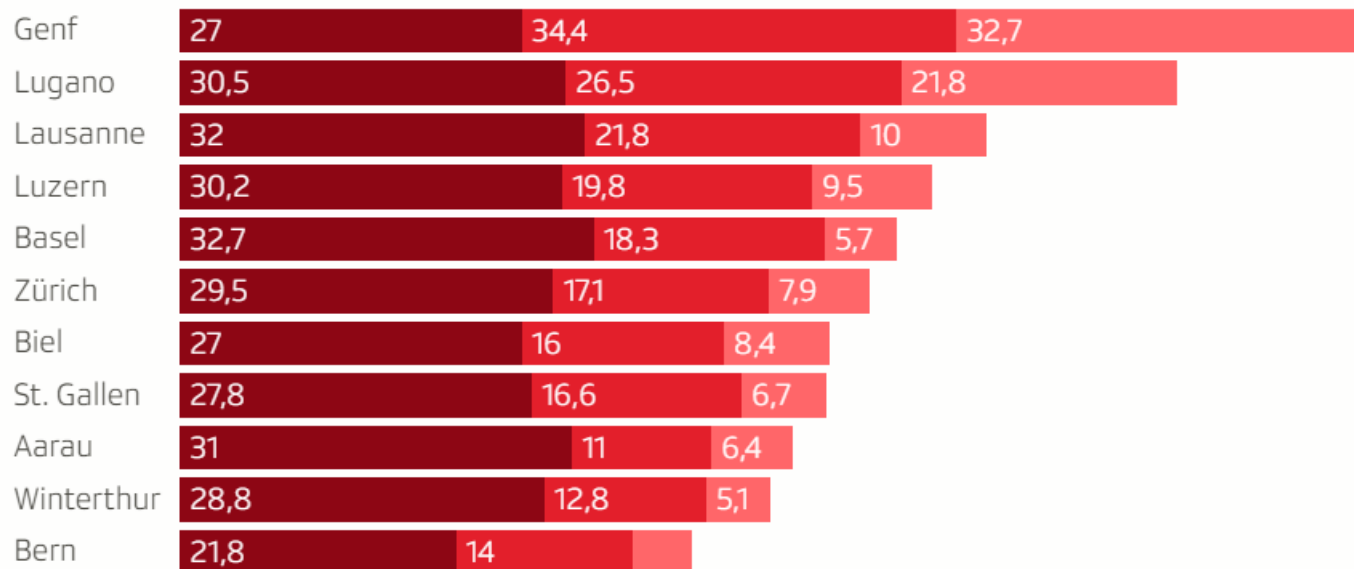


Source: Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

## Share of residential addresses with noise

In percent



Quelle: ZKB

# Density

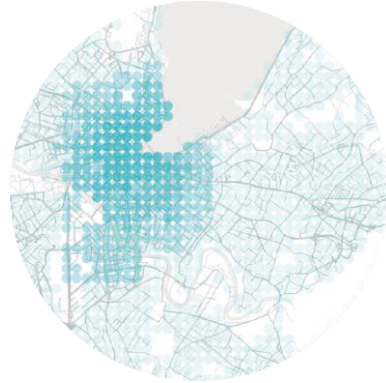
		Geneva	Switzerland
<b>Population</b>			
Residents	2019 <sup>①</sup>	504,128	1,539,275
Change in %	2010 – 2019 <sup>①</sup>	10.1	12.1
Population density per km <sup>2</sup>	2019 <sup>①</sup>	2.050.8	926.8
Size of households in persons	2019 <sup>①</sup>	2.4	2.2
<b>Area</b>			
Total surface area in km <sup>2</sup>	2016 <sup>①</sup>	282.3	1,728.9
Settlement and urban area in %	2004/09 <sup>①</sup>	33.4	21.9
Change in %	1979/85 – 2004/09 <sup>①</sup>	14.8	18.3
<b>Construction and housing</b>			
Dwelling vacancy rate	2020 <sup>①</sup>	0.49	0.91
Homeownership rate	2019 <sup>①</sup>	18.1	27.7
Average per capita living space in m <sup>2</sup>	2019 <sup>①</sup>	37	45
New housing units per 1000 residents	2018 <sup>①</sup>	5.4	6.5

NO<sub>2</sub> emissions are highest in Geneva city center, which can be explained by the high proportion of motorized road users.

The city center is comparatively noisy. One of the main reasons for this is the high volume of traffic.

For most of Geneva's urban area, there is an increased level of soil and ground-water pollution.

**NO<sub>2</sub> emissions**



**Legend**

**NO<sub>2</sub> emissions [ $\mu\text{g}/\text{m}^3 \cdot 10$ ]**

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6

**Noise during daytime**



**Legend**

**Noise during daytime [dB]**

- 26 - 36
- 36 - 46
- 46 - 56
- 56 - 66
- 66 - 76

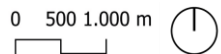
**Distance from soil and water polluted sites**



**Legend**

**Distance from soil and water polluted sites [m]**

- 27 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000

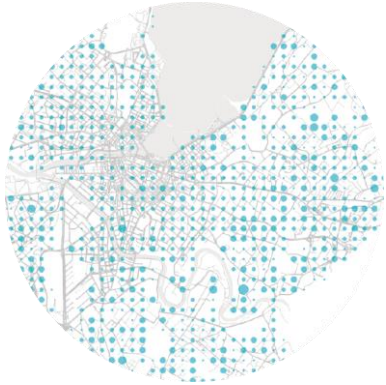


**Source:**  
Grid Zenodo

**Source:**  
Grid Zenodo

**Source:**  
Grid Zenodo

Ratio building height /  
number of floors  
(Housing)



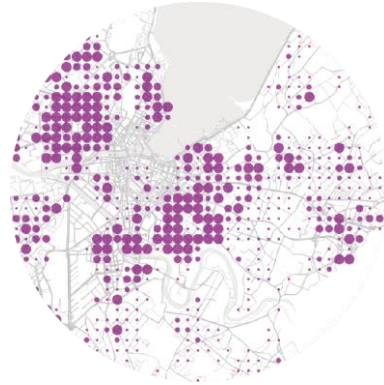
Legend

Ratio building height / number of floors

- 0,2 - 0,25
- 0,25 - 0,3
- 0,3 - 0,35
- 0,35 - 0,4
- 0,4 - 0,45
- 0,45 - 0,5

Source:  
Cad.sqlite

Volume of buildings  
(Housing)



Legend

Volume of buildings [m³]

- 0 - 20000
- 20000 - 40000
- 40000 - 60000
- 60000 - 80000
- 80000 - 100000

Source:  
Cad.sqlite

Ratio building height /  
number of floors  
(not Housing)



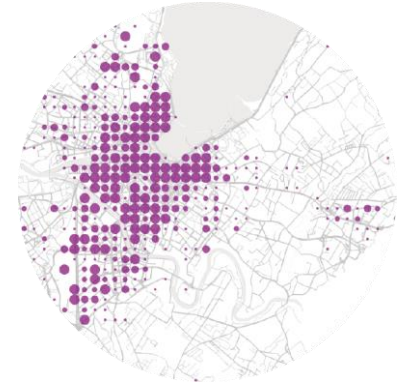
Legend

Ratio building height / number of floors

- 0,2 - 0,25
- 0,25 - 0,3
- 0,3 - 0,35
- 0,35 - 0,4
- 0,4 - 0,45
- 0,45 - 0,5

Source:  
Cad.sqlite

Volume of buildings  
(not Housing)



Legend

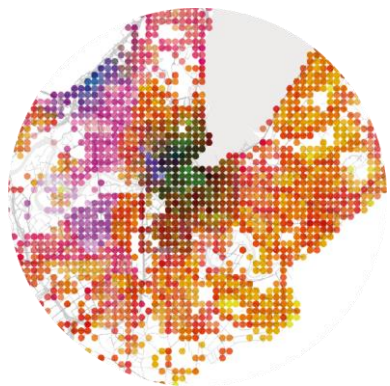
Volume of buildings [m³]

- 0 - 60000
- 60000 - 120000
- 120000 - 180000
- 180000 - 240000
- 240000 - 300000

Source:  
Cad.sqlite

## Environment

It can be seen that the city center in particular is severely affected by emissions.



### Legend

#### N02 emissions [ $\mu\text{g}/\text{m}^3 \times 10$ ]

- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6

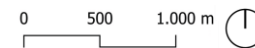
#### Noise during daytime [dB]

- 26 - 36
- 36 - 46
- 46 - 56
- 56 - 66
- 66 - 76

#### Distance from soil and water polluted sites [m]

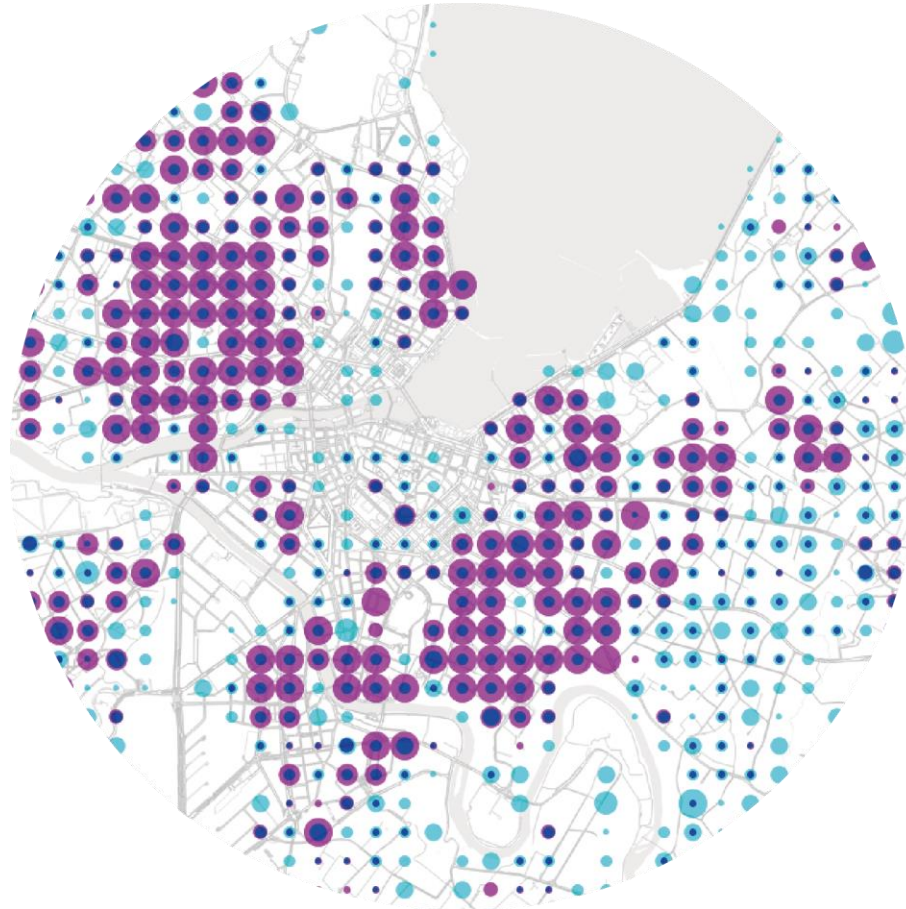
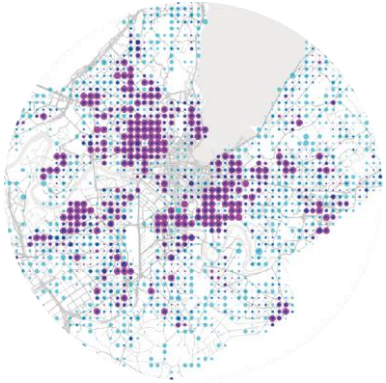
- 27 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000

Source:  
Grid Zenodo



## Building density (Housing)

Living in Geneva takes place mainly outside the city center, but is directly adjacent to the city center. The residential buildings located here are comparatively high.



### Legend

#### Ratio building height / number of floors

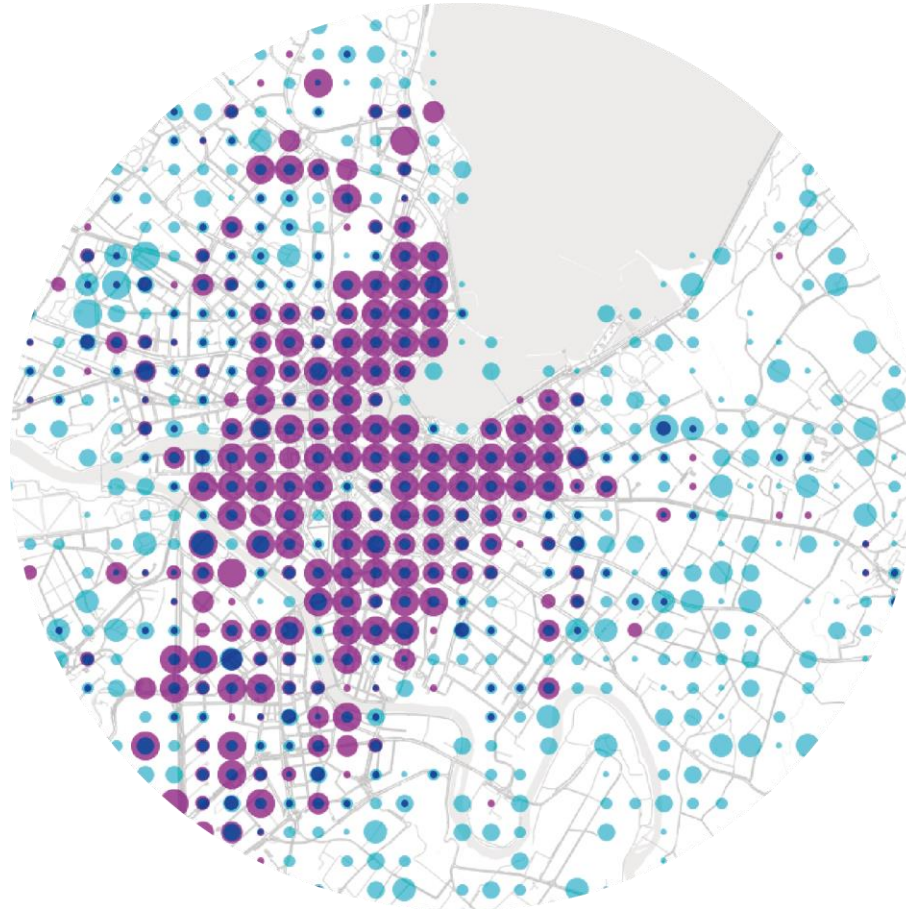
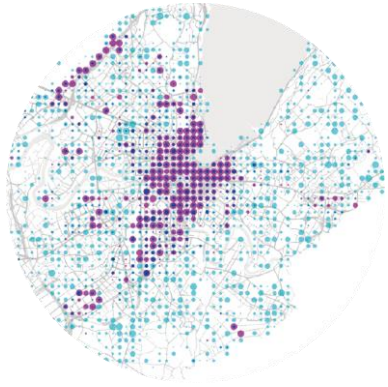
- 0,2 - 0,25
- 0,25 - 0,3
- 0,3 - 0,35
- 0,35 - 0,4
- 0,4 - 0,45
- 0,45 - 0,5

#### Volume of buildings [m<sup>3</sup>]

- 0 - 20000
- 20000 - 40000
- 40000 - 60000
- 60000 - 80000
- 80000 - 100000

## Building density (Not Housing)

All remaining uses (non-residential) are concentrated in the city center. Above all, the large-volume buildings in the city center often have public uses with cultural and social references.



### Legend

#### Ratio building height / number of floors

- 0,2 - 0,25
- 0,25 - 0,3
- 0,3 - 0,35
- 0,35 - 0,4
- 0,4 - 0,45
- 0,45 - 0,5

#### Volume of buildings [m<sup>3</sup>]

- 0 - 60000
- 60000 - 120000
- 120000 - 180000
- 180000 - 240000
- 240000 - 300000

Source:  
Cad.sqlite



# Aspect 4

## “Interesting”

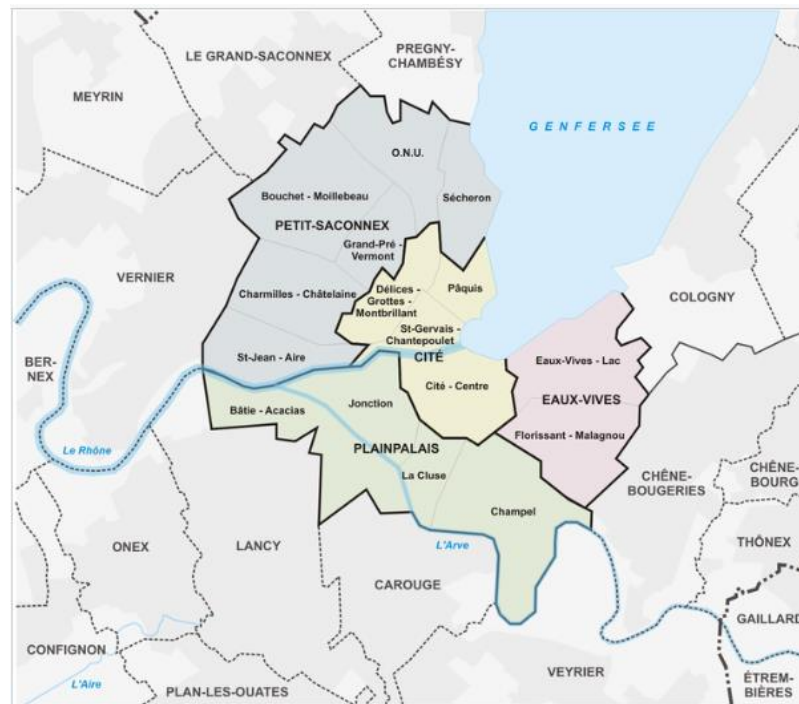


# Density

		Geneva	Switzerland
<b>Population</b>			
Residents	2019 <sup>①</sup>	504,128	1,539,275
Change in %	2010 – 2019 <sup>①</sup>	10.1	12.1
Population density per km <sup>2</sup>	2019 <sup>①</sup>	2.050.8	926.8
Size of households in persons	2019 <sup>①</sup>	2.4	2.2
<b>Area</b>			
Total surface area in km <sup>2</sup>	2016 <sup>①</sup>	282.3	1,728.9
Settlement and urban area in %	2004/09 <sup>①</sup>	33.4	21.9
Change in %	1979/85 – 2004/09 <sup>①</sup>	14.8	18.3
<b>Construction and housing</b>			
Dwelling vacancy rate	2020 <sup>①</sup>	0.49	0.91
Homeownership rate	2019 <sup>①</sup>	18.1	27.7
Average per capita living space in m <sup>2</sup>	2019 <sup>①</sup>	37	45
New housing units per 1000 residents	2018 <sup>①</sup>	5.4	6.5

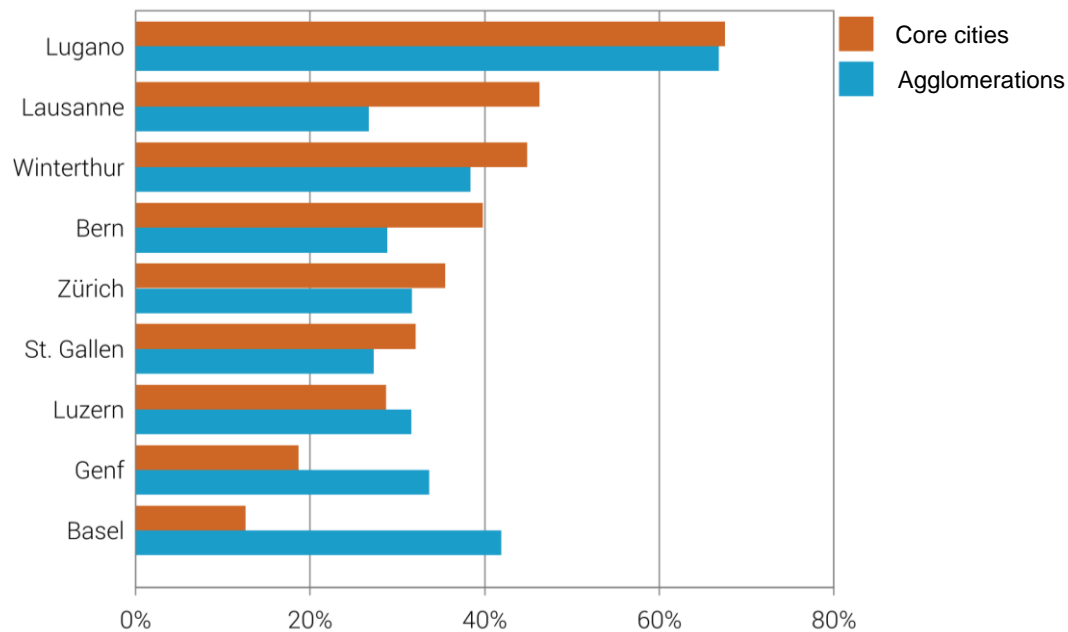
## Population density according to quarters

Section	Quarter	Area ha	Population (End 2015)	Population density
Cité	Cité – Centre	106	6'720	63
	St-Gervais – Chantepoulet	47	4'474	95
	Délices – Grottes – Montbrillant	68	13'806	203
	Pâquis	42	10'650	156
Plainpalais	Champel	180	17'968	99
	La Cluse	46	16'050	348
	Jonction	97	15'704	161
	Bâtie – Acacias	139	4'835	34
Eaux-Vives	Eaux-Vives – Lac	136	20'578	151
	Florissant – Malagnou	118	15'018	127
Petit-Saconnex	Sécheron	74	6'923	93
	O.N.U.	107	2'088	19
	Grand-Pré – Vermont	62	10'617	171
	Bouchet – Moillebeau	161	15'303	95
	Charmilles – Châtelaine	115	23'537	204
	St-Jean – Aire	94	9'529	101



# Planted areas and recreation areas

Proportion of the total area, 2013/2018



Quelle: BFS – AREA

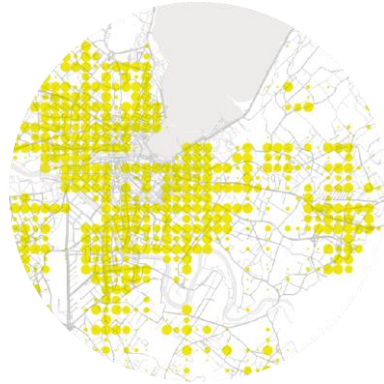
© BFS 2022

The population density is very high, especially in the inner city. There are also some outer areas where there are comparably high densities.

The built-up area also has the highest floor area in the city center. This goes back to the densely populated medieval city plan.

Public spaces in Geneva are distributed relatively evenly across the entire city area. However, some areas in the center have a slightly lower coverage of public space.

**Population density**



**Legend**

**Population density [people/ha]**

- 3 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300

**Source:**  
Population 2019

**Build up area**



**Legend**

**Build up area [m<sup>2</sup>]**

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500

**Source:**  
Cad.sqlite

**Public space**

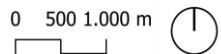


**Legend**

**Public space [m<sup>2</sup>]**

- 0 - 15
- 15 - 50
- 50 - 250
- 250 - 500
- 500 - 1000

**Source:**  
Cad.sqlite



The proportion of green areas in downtown Geneva is very small and is mostly limited to a few parks.

The city center has a certain number of trees, which increases towards the edge of the city center. The lack of planting in the outer city districts can be explained by missing data in the data set.

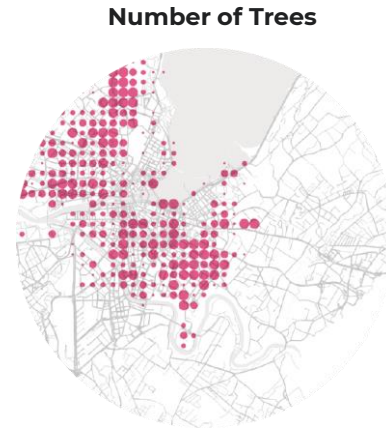


#### Legend

##### Amount of greenery [%/km<sup>2</sup>]

- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100

Source:  
Grid Zenodo

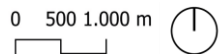


#### Legend

##### Number of trees

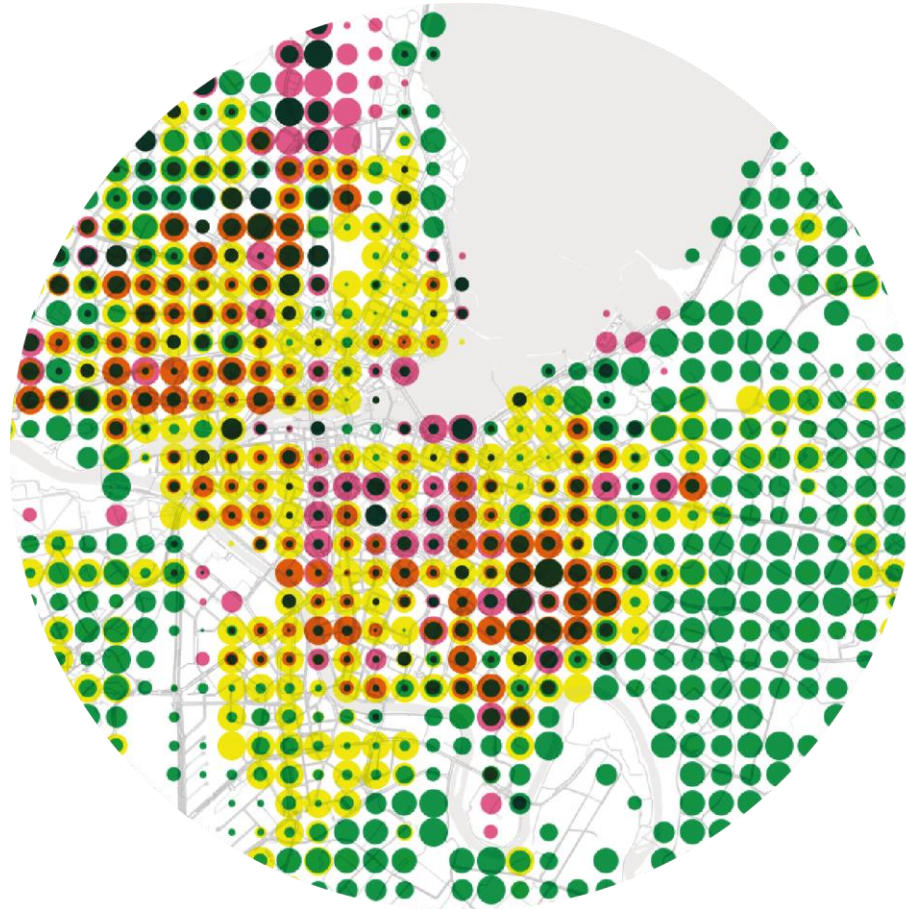
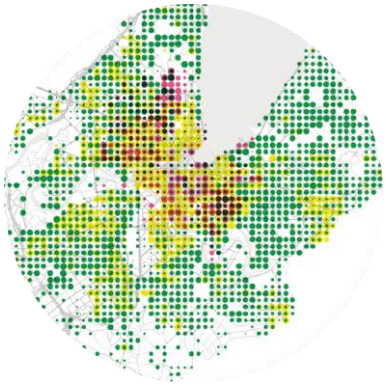
- 1 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 200

Source:  
Quick OSM



## Greenary

The high proportion of the population in the city center requires a corresponding amount of green space, which is currently not the case in Geneva city centre. In addition, the paths to the outside green areas are very long.



## Legend

### Population density [people/ha]

- 3 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300

### Amount of greenery [%/km<sup>2</sup>]

- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100

### Number of trees

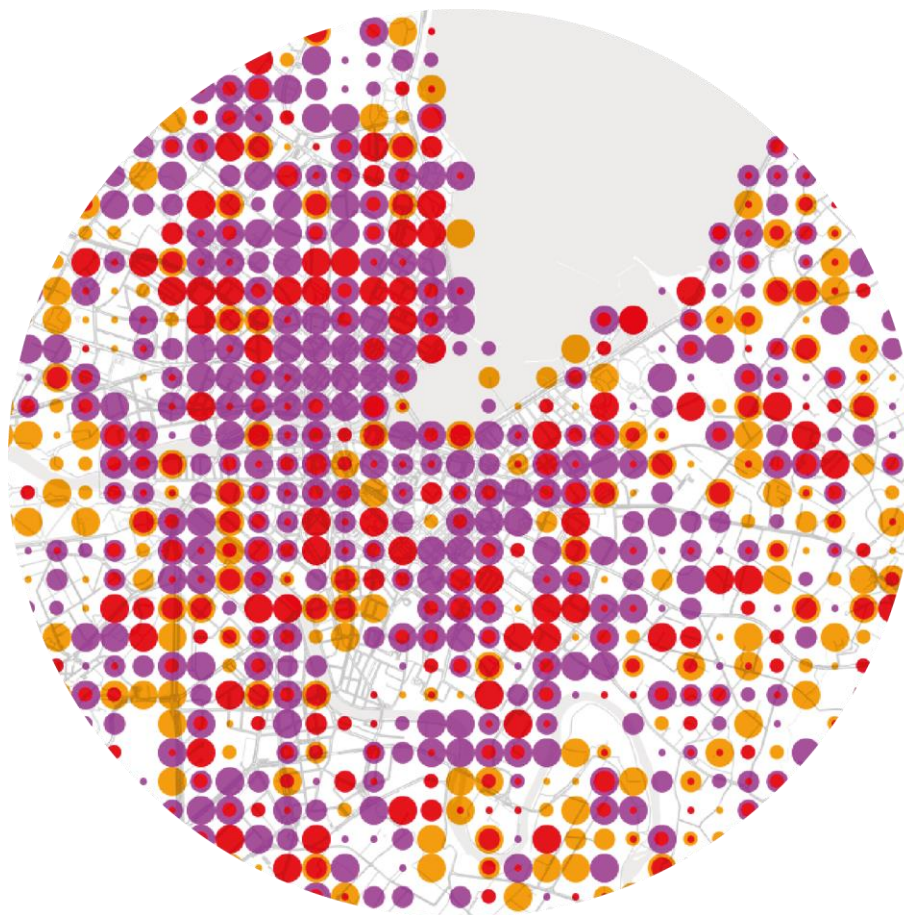
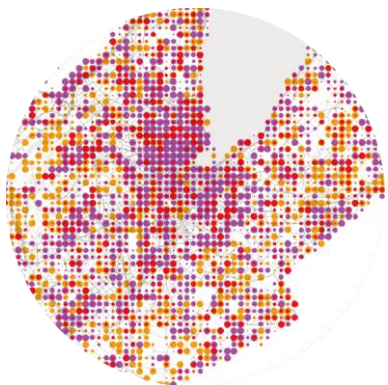
- 1 - 10
- 10 - 20
- 20 - 40
- 40 - 60
- 60 - 200

**Source:**  
Population 2019  
Grid Zenodo  
Quick OSM



## Build and public space

In some places in Geneva's city center there is not enough public space. Public spaces must be adequate for both local residents and commuters.



### Legend

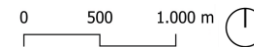
#### Build up area [m<sup>2</sup>]

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250 - 500

#### Public space [m<sup>2</sup>]

- 0 - 15
- 15 - 50
- 50 - 250
- 250 - 500
- 500 - 1000

Source:  
Cad.sqlite



# Interventions



## Negative impacts in Geneva right now



1

High level of emissions



2

Heavy traffic



3

High risk of accidents due to road traffic



4

Poor pedestrian and cycle path infrastructure



5

Few mixed uses of residential and commercial



6

Few green areas in the city center

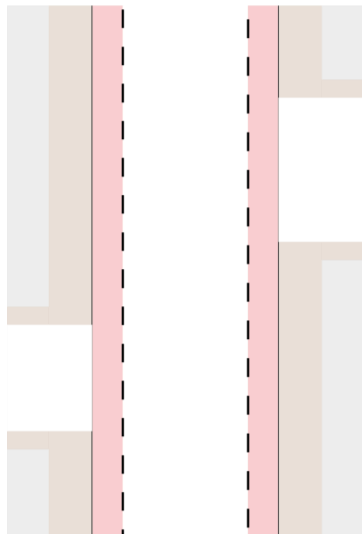


7

Few and poor quality public spaces



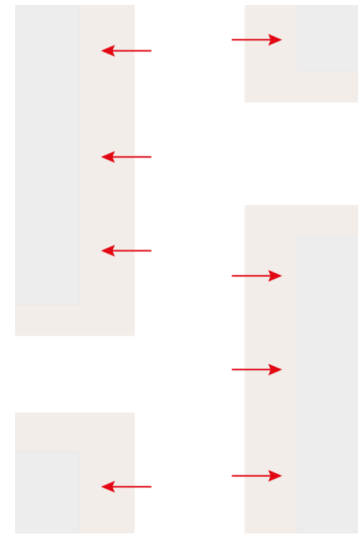
## Strategies



**Improve bicycle and footpath infrastructure**



**Creation of public spaces in the city center**



**Promotion of the use of the ground floor zone**

# Tool box

## Usefulness



### Parking spots

- Decrease of number of parking spots
- Incentive to use the bike or walk



### Green areas

- Space freed up by the reduction of parking spaces
- More trees for shade and better air quality

## Safety



### Traffic light system

- Sensor control for better traffic flow coordination
- More safety
- Air pollution measurement



### Lighting

- Extension of the lighting
- Sensor controlled lighting
- Charging function

## Comfortability



### Bicycle lanes

- Increase of number of bicycle lanes
- Bicycle lanes must be wider
- Bicycle lanes should be marked or separated from car traffic



### Walkways

- Designation of premium footpaths
- Special focus on road safety
- Extra wide

## Interesting



### Public rental spaces

- Pop-up events
- Food suppliers
- Markets

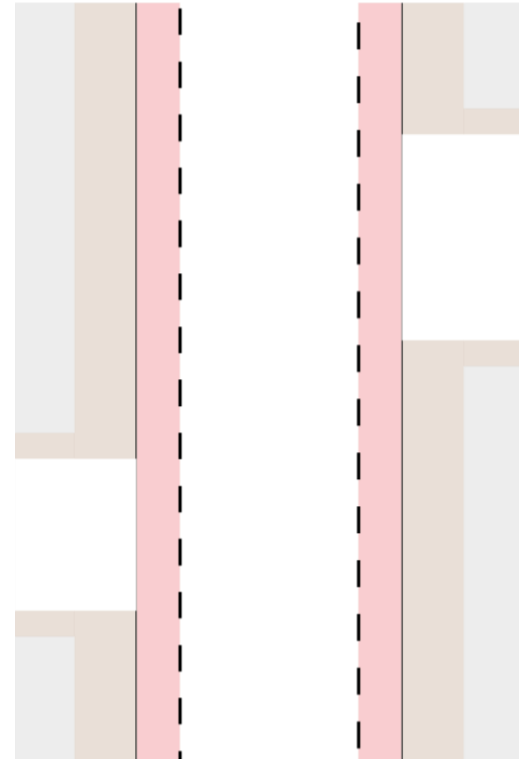


### Street furniture and equipment

- Intelligent benches with lighting, charging function and WIFI
- Individual children's play equipment
- Housing boxes for the homeless

## Improve bicycle and footpath infrastructure

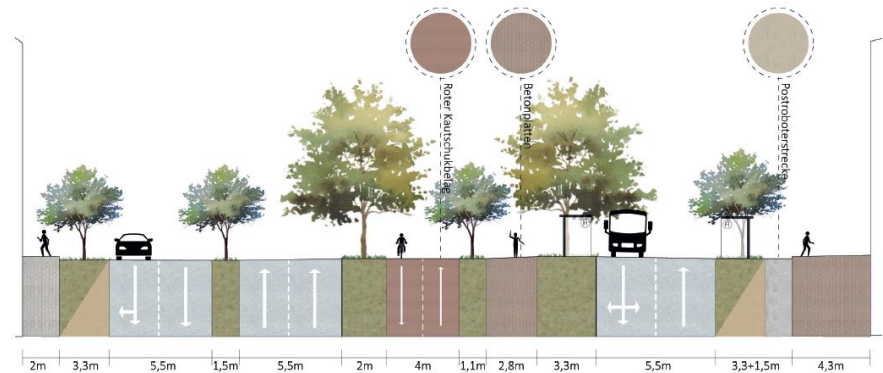
- Reduction of car traffic
- Expansion of sharing offers
- Extension of the cycling network
- Structural separation of cycle paths
- Creation of premium footpaths
- Installation of smart street furniture
- Expansion of bicycle parking spaces
- Sensors in road traffic for more road safety
- Speed limit in the city center



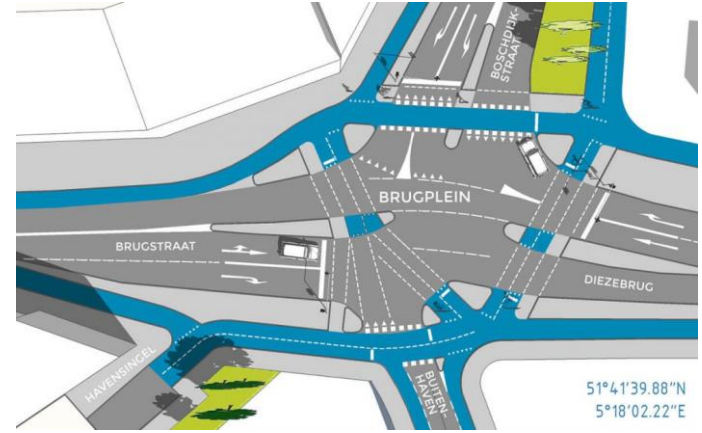
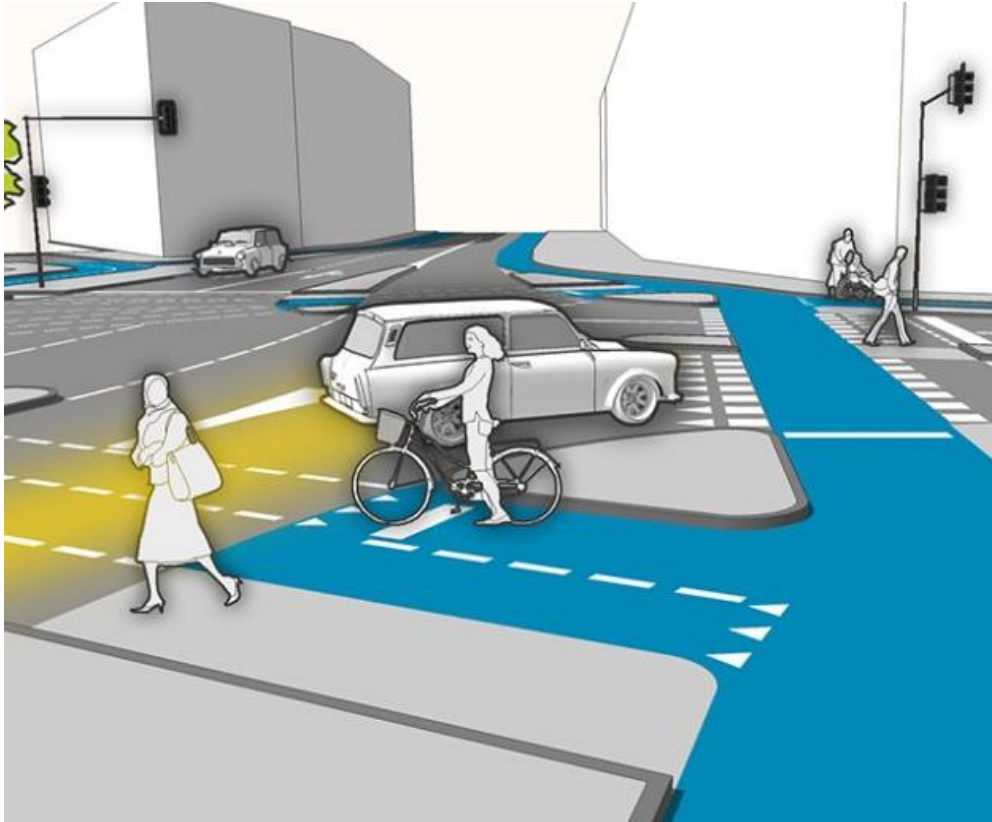
# Redesign and greening of a main road



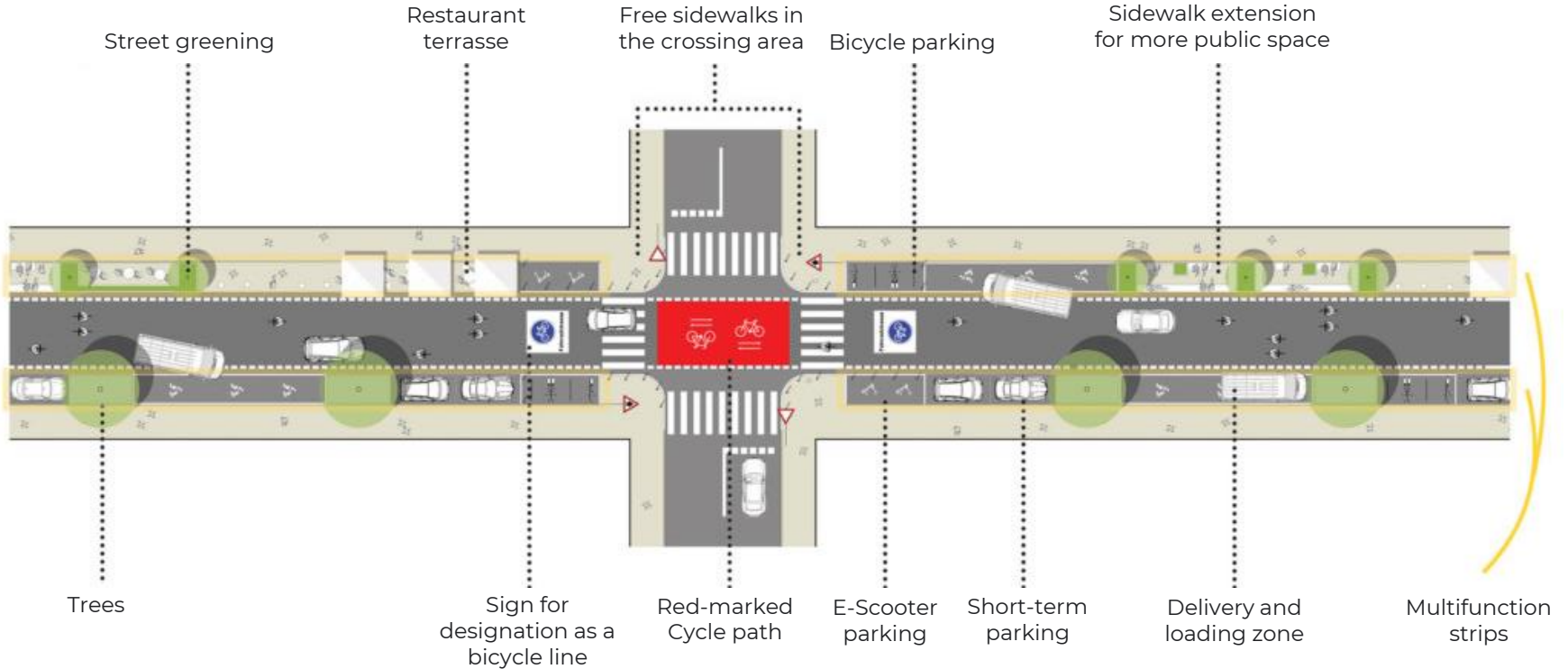
Rue de Chantepoulet, Geneva



## Redesigned junction in s-Hertogenbosch (NL)



# Bicycle-friendly redesign of a street









## Creation of public spaces in the city center

- Establishment of pocket parks on the free traffic areas
- Simplified regulations for renting space for events or sales stands (placemaking)
- Due to the lack of parking spaces and streets, the space that has been freed up can be used for subsequent greening
- Expansion of the infrastructure in public places (lighting, rubbish bins, benches, playground equipment)

### Advantages:

- More security through the publicity of the squares
- Improved environmental qualities through increased greening



## Pocket parks and Parklets



Source: <https://www.pinterest.de/pin/584271751637249476/>



Source: <https://www.themayor.eu/en/a/view/bialystok-unveils-its-first-pocket-park-5847/>



Source: <https://www.wochenanzeiger-muenchen.de/westend-schwanthalerhoehe-innenstadt/parklets-in-eigener-verantwortung,123282.html>



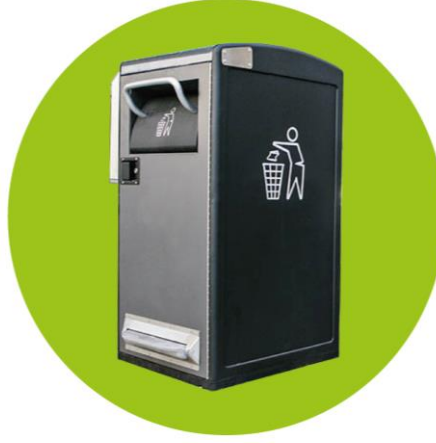
Source: <https://itstartedwithafight.de/2017/05/10/parkplaetze-zu-gruenflaechen/>

## Smart public furniture



### Smart traffic lights

- Sensors to control traffic light phases depending on traffic volume
- Sensors for intelligent parking space management
- Sensors to measure and control traffic
- Sensors for measuring the air purity values



### Smart trash can

- Measure ultrasonic sensors in the rubbish bins level
- Emptying is reported when the filling level is specific
- Optimization of routes and thereby Savings in CO2 emissions



### Smart bench

- Electricity by connecting to mains and solar powered battery
- Features:
- Charging function for e-bikes / e-scooters
  - Sidewalk lighting at night
  - Charging port for smartphones
  - WIFI hotspot via LTE router

## Placemaking



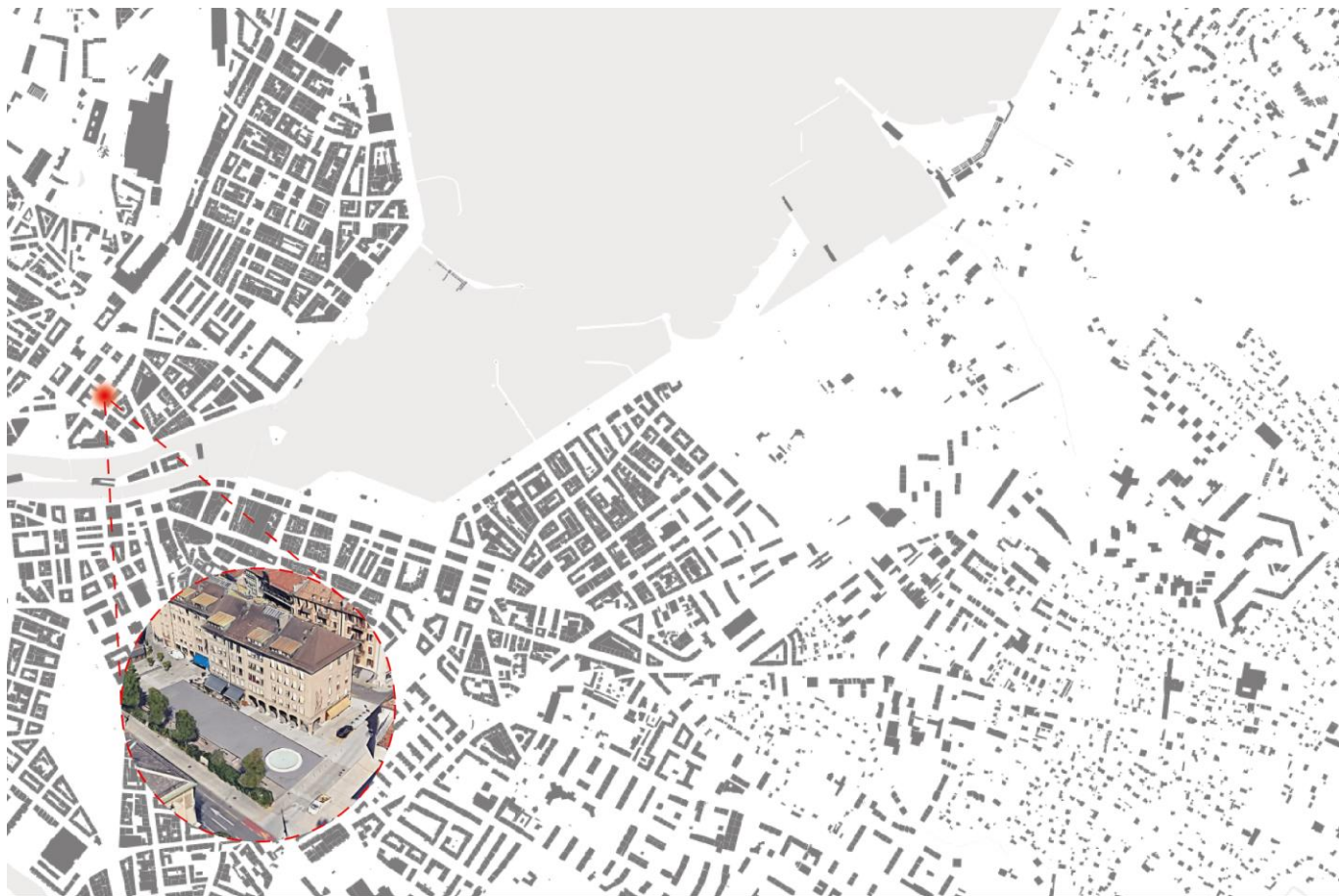
Public bicycle workshop



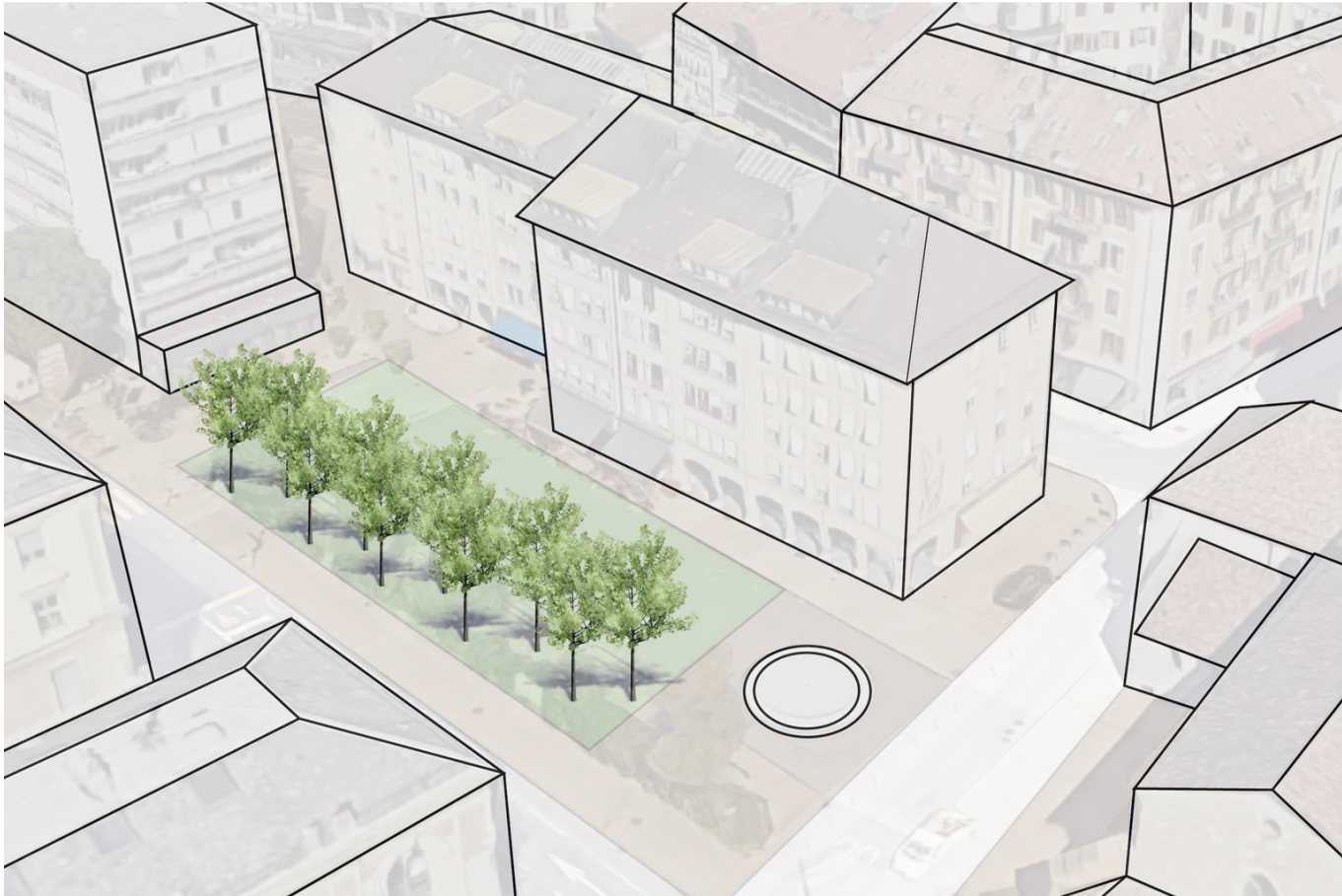
Book flea market



Reading with catering service





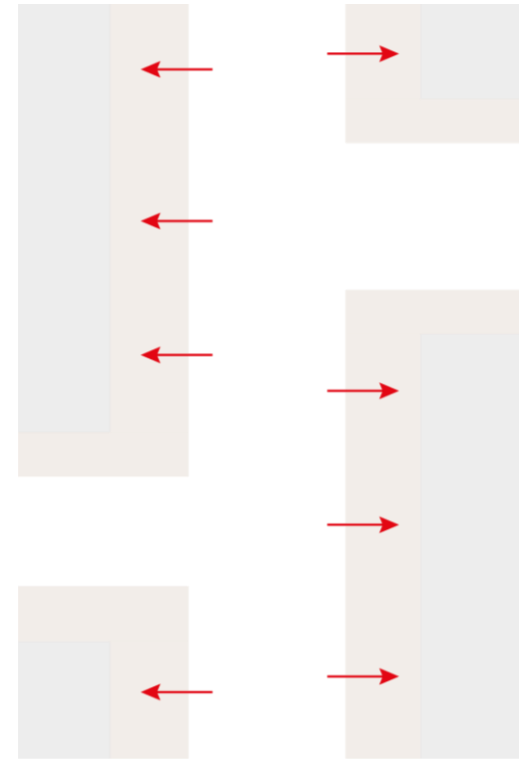


## Promotion of the use of the ground floor zones

- Integration of new public uses to upgrade neighborhoods in the downward process
- Liberalization of regulations for outdoor catering
- High mix of usages for a temporally comprehensive offer

### Benefits

- The distances for errands are becoming shorter and thus provide an incentive to walk
- More uses create a broader public and thus more security
- Improved supply of the outer city districts



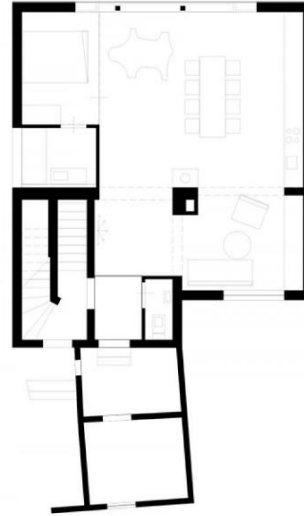
## Redesign of a shop with flexible floor plans



Before

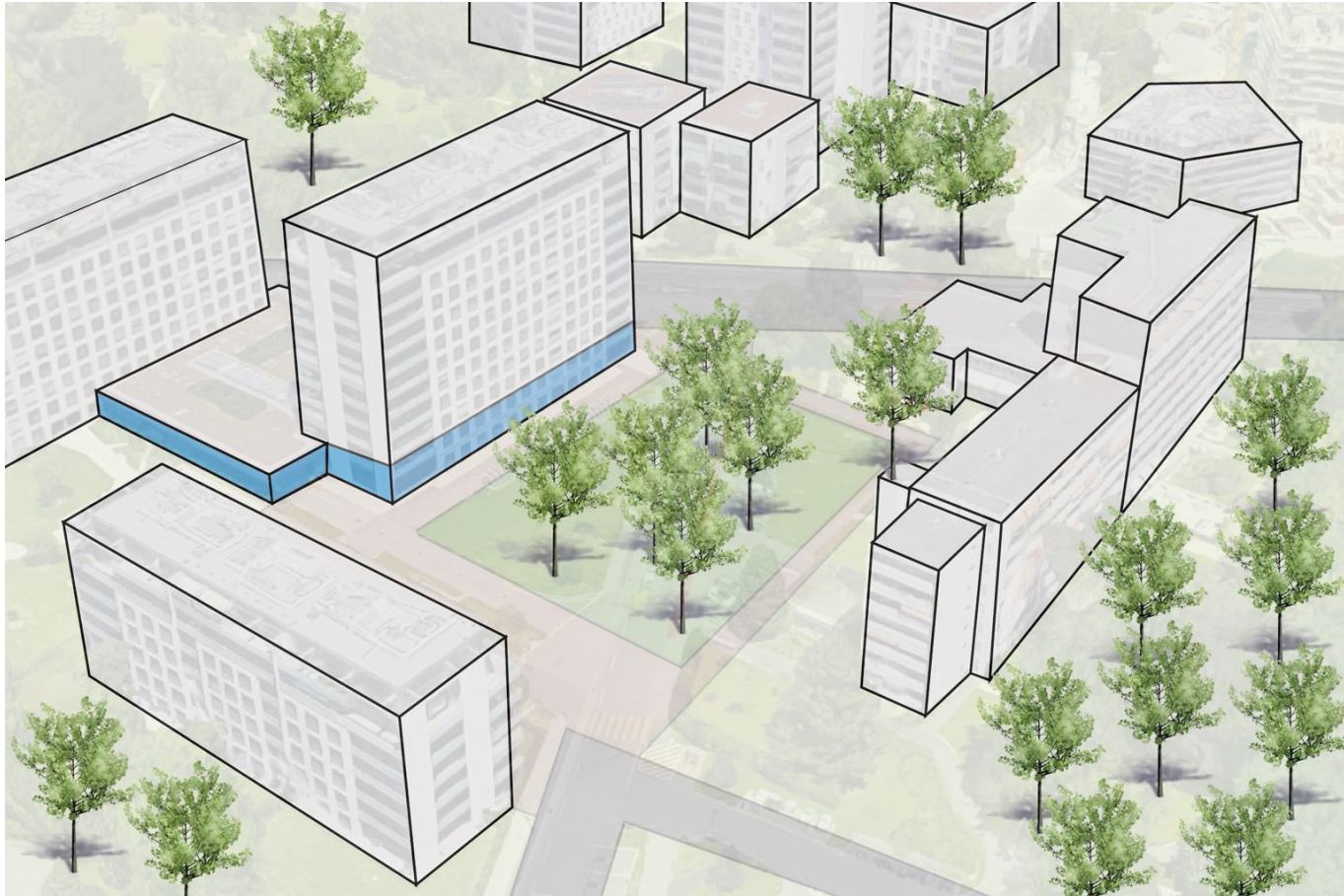


After









**Thank you!**