

**Do You
Know
Prague
?**

**The City
in Maps,
Graphs
and Figures**



What is a city? Can we measure it? Map it? We can plot out all the houses, the streets and the trees... But is that enough? The city is also people, cars, trams... all of them constantly moving!

Where does the energy which drives the city come from? Who are the people who live in it? What type of houses do they live in? And how do they get around the city? And how can it possibly all work together?

Can we understand the city and document it when it keeps changing in front of us? Prague Institute of Planning and Development's Spatial Information Section collects, maps and evaluates a wide range of data on various aspects of the life of the capital. This booklet demonstrates the diversity of the data processed.

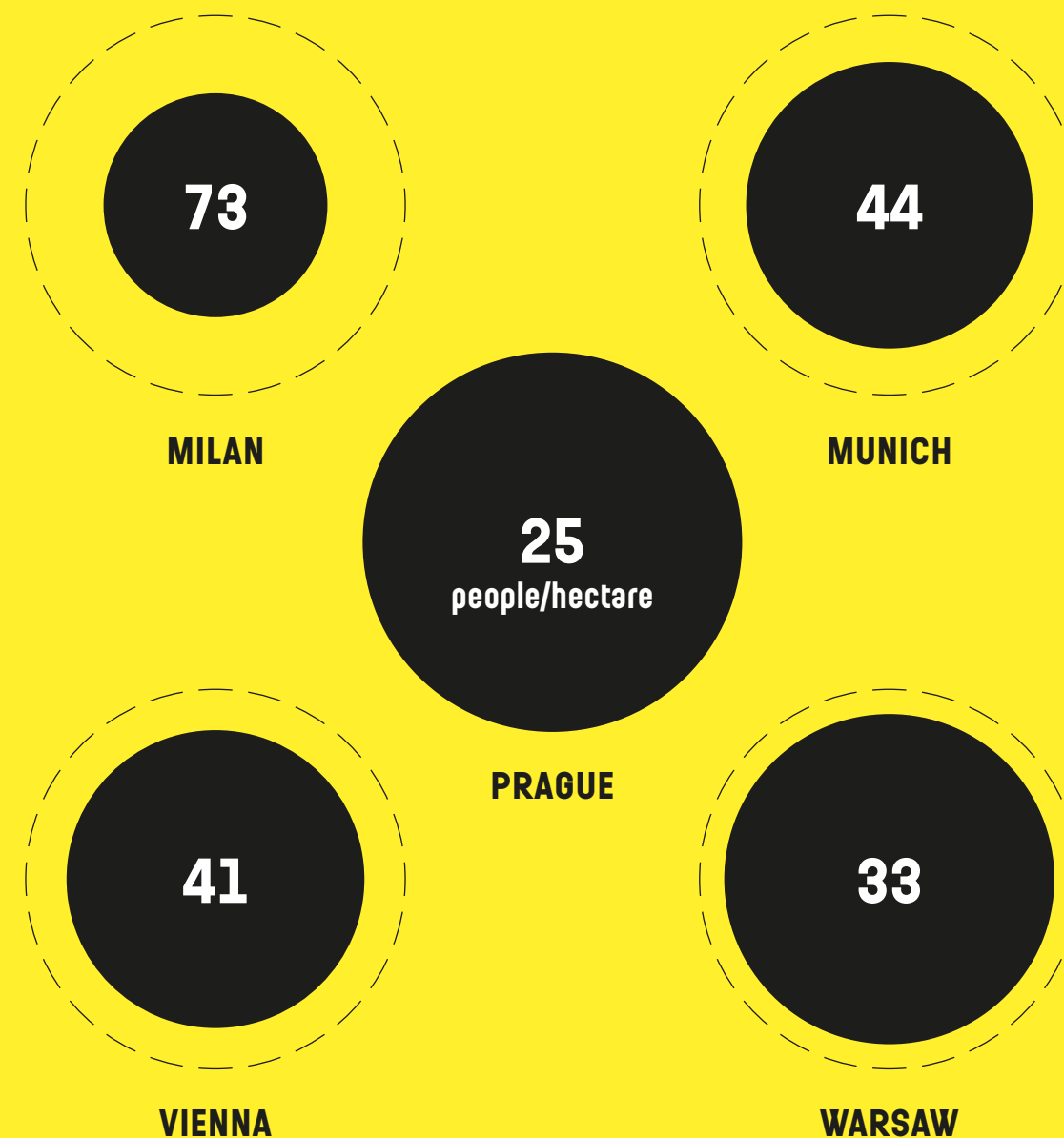
**Prague covers
49,613 hectares
and has a population
of 1,259,079.**

49,613

01

How large would Prague be if it had the population density of other European cities?

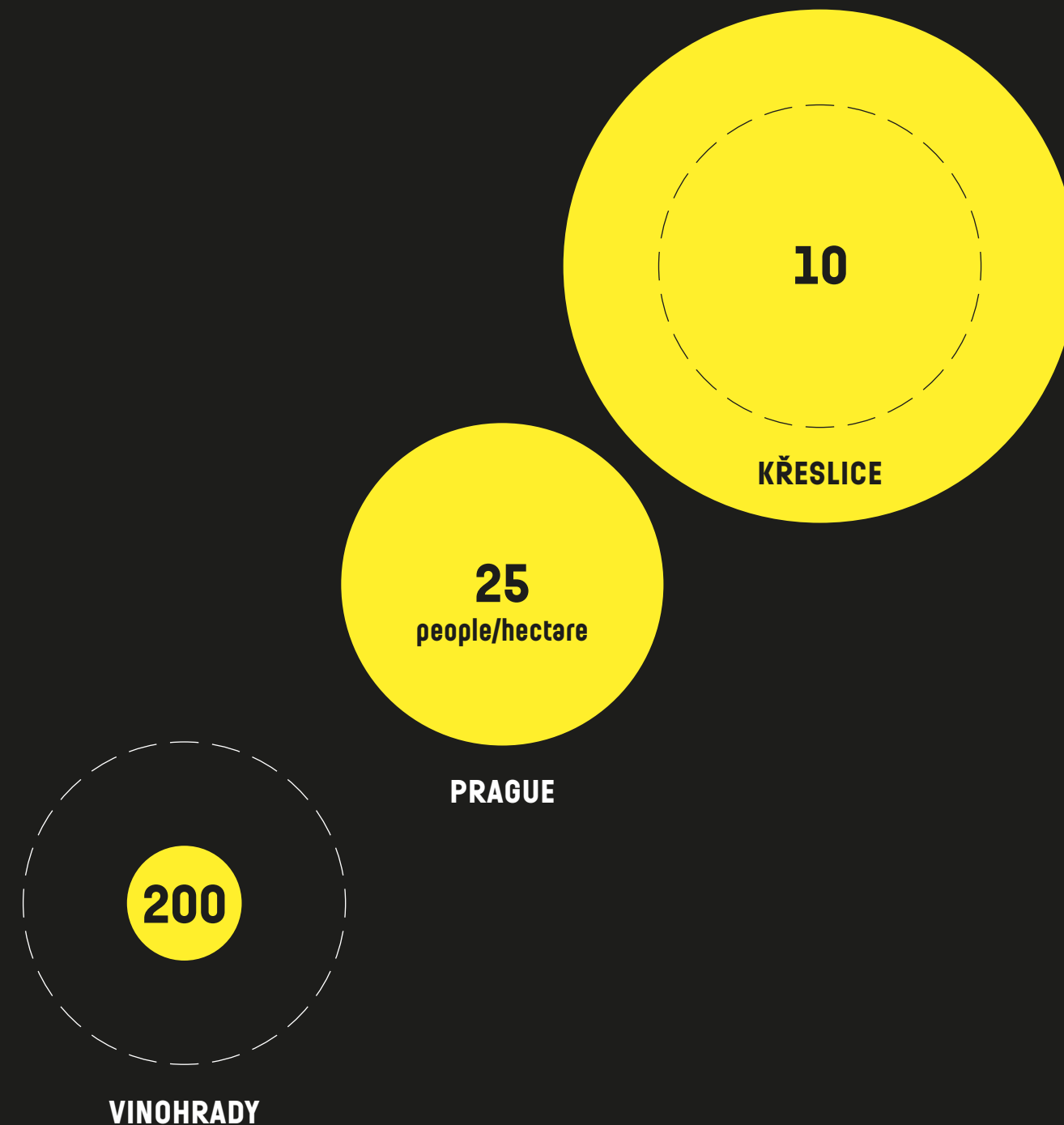
Prague covers 49,613 hectares and has a population of 1,259,079 (data from 31 December 2014). This makes an average of 25 people per hectare. If we look at comparable cities in Europe we can see that their population density is higher. Milan has a similar number of inhabitants but is almost three times smaller, because, on average, 73 inhabitants live in each hectare. The population density of Munich and Vienna is around 40 people per hectare. Warsaw and Budapest are about the same size as Prague, but with a population of roughly 1,700,000 the density is 33 people per hectare. Frankfurt am Main has the same population density as Prague, but has half the population and half the area. The circles show how large Prague would be if it had the population density of those European cities.



02

How large would Prague be if it had the population density of some of its districts?

The population density is not the same over the whole of Prague. It mainly changes according to the type of houses in the different districts and how they are arranged. The areas of Prague with multi-storey buildings standing next to each other in city blocks have the highest density (e.g. Vinohrady – 200 people per hectare). If all Prague's inhabitants lived in this type of building, the city would be 8 times smaller. The lowest density levels are to be found in districts that have family houses with gardens (e.g. Křeslice – 10 people per hectare). If the whole population of Prague wanted to move into this type of house, Prague would have to be 2.5 times larger.



03

Population by type of building

500 people live in each of these areas. In the Jižní Město housing estate this corresponds to two tower blocks, in Vinohrady one block of apartment houses, in Ořechovka 90 villas and in Křeslice 200 family houses.

500
PEOPLE =

JIŽNÍ MĚSTO

2
TOWER
BLOCKS

OŘECHOVKA

90
VILLAS

VINOHRADY

1
BLOCK
OF APARTMENT
HOUSES

KŘESLICE

200
FAMILY
HOUSES

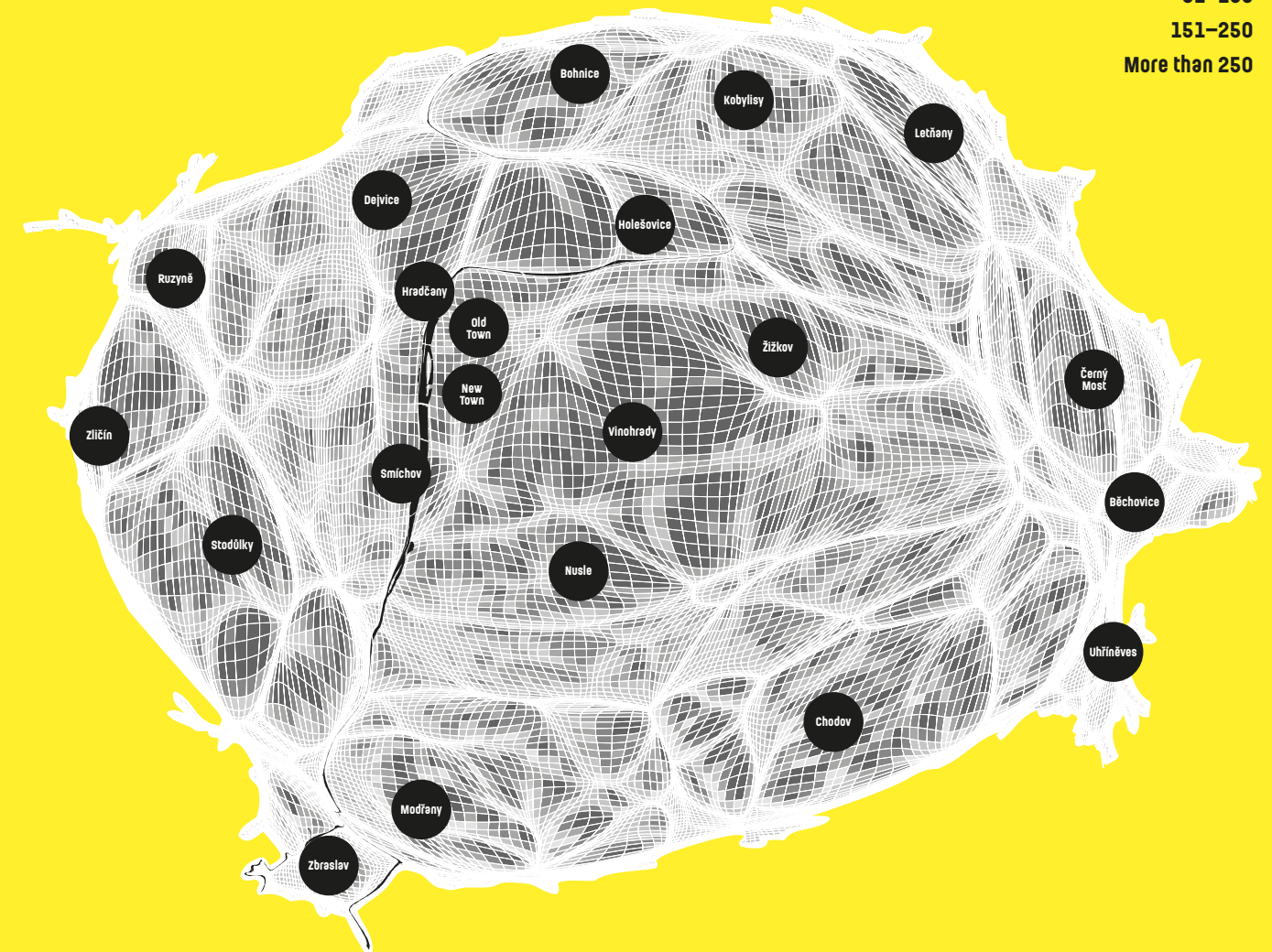


Population density

Prague is not evenly populated. To show the different population densities in the city, we divided Prague into squares measuring 100×100 m (1 ha). We then counted how many people live in each square and changed its size accordingly. The more people live in a square, the larger it is. The result is that the densely populated areas of Prague have been “inflated” and the sparsely populated areas “shrunk”. The most densely populated area is the centre of Prague, while in the outskirts fewer people live in a larger area.

POPULATION PER HECTARE

- Less than 10
- 11–80
- 81–150
- 151–250
- More than 250



Age structure of Prague and the Czech Republic

An age pyramid shows the numbers of people of a certain age at a certain point in time in a certain area. A comparison of the age pyramids of Prague and the Czech Republic in 2000 and 2013 clearly shows a similar distribution of major irregularities in the age structure. The most significant difference is the larger share of the population in the 25–40 year age range, which is strongly influenced by young people moving to Prague for work. In contrast, the smaller proportion of children is the result of families with children leaving the city for the suburbs, as well as the decline in birth rates compared to previous generations.

Population growth

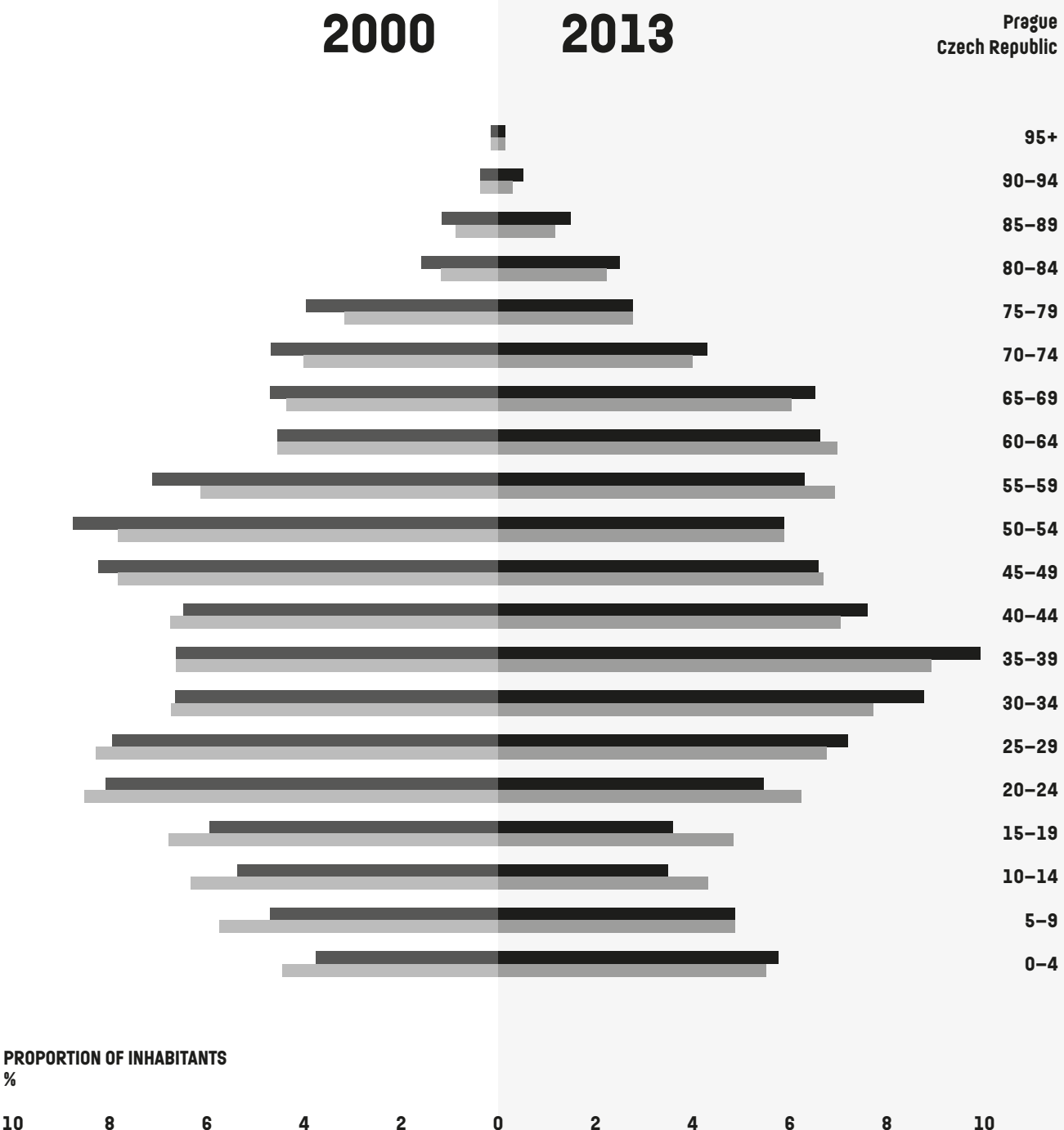
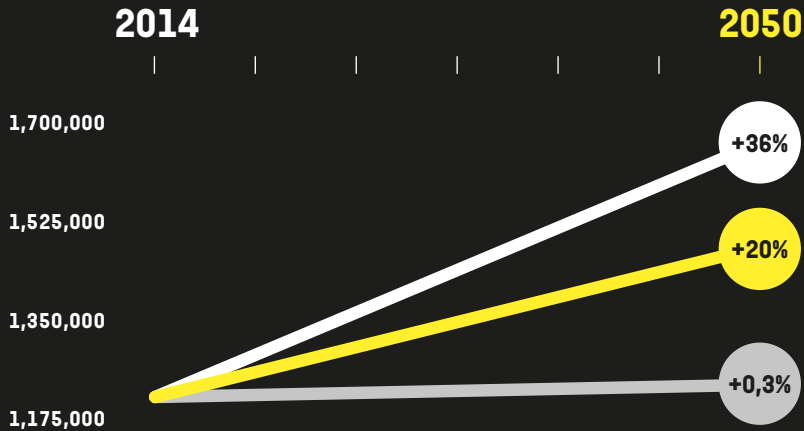
According to demographic projections, there is a very high probability that the population of Prague will grow over the coming years. There are three scenarios for this development. The highest scenario gives a figure of up to 1.7 million people living in Prague in 2050, which represents a 36% increase compared to the current situation. According to the most likely, mid-level scenario, around 1.5 million people will be living in Prague in 2050, which corresponds to an increase of 20%. The lowest estimate only foresees an increase of 3,000 people.

?

DO YOU KNOW
THE AVERAGE AGE
OF PRAGUE'S
INHABITANTS?

42 YEARS

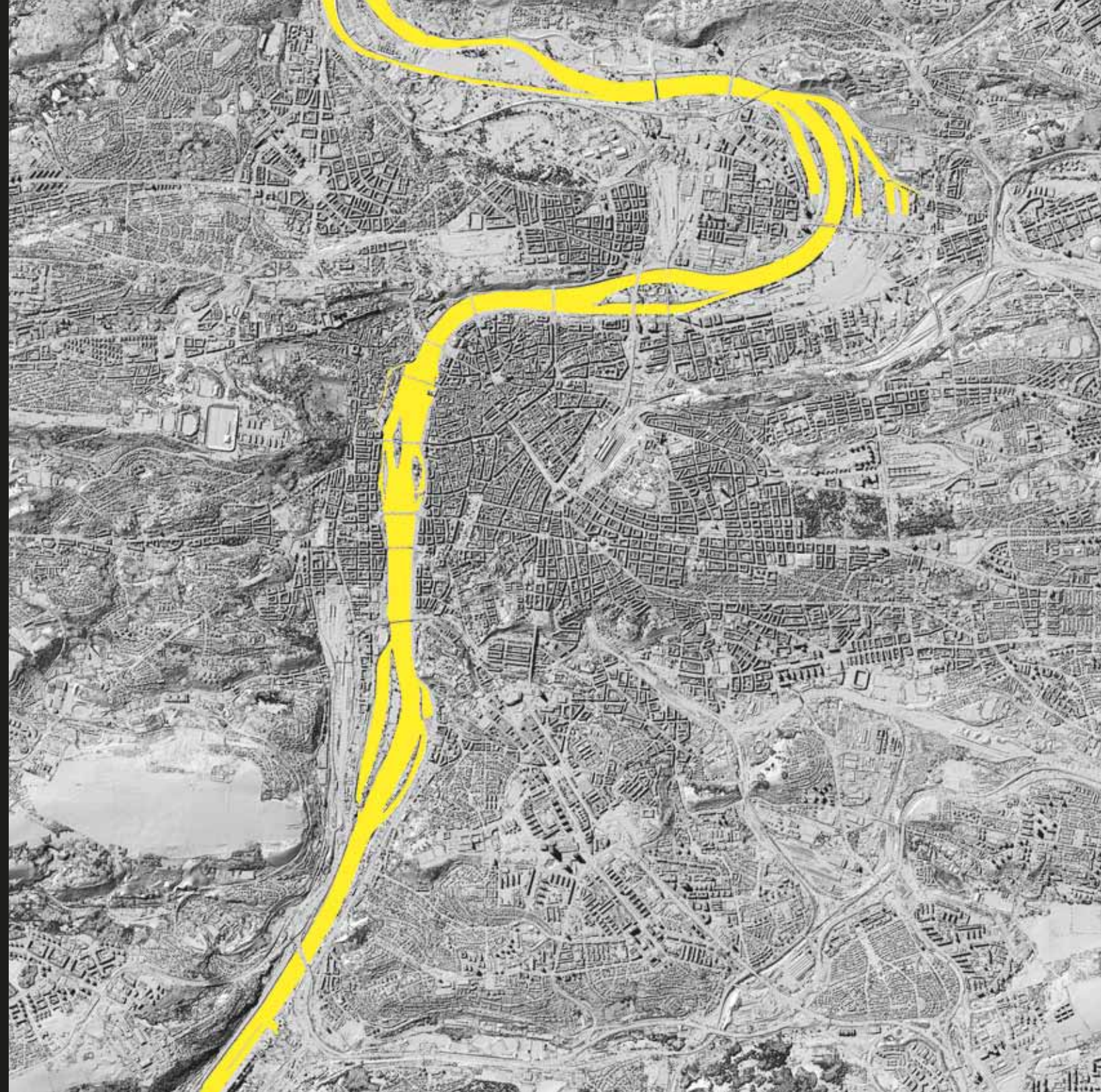
!



06

View of Prague

The shaded relief is created from a digital surface model (DSM). The Earth's surface is formed by the terrain and all the objects on it (e.g. trees, houses, cars). The surface model is calculated automatically from aerial images that are taken of Prague at regular intervals. This is the fastest and cheapest method of mapping. Our orthophoto maps are not only used to monitor developments and for city planning, but are also available to the general public.



View
of the Old Town

Prague has a 3D model of the whole city, which consists of a terrain model of the Earth's surface without any structures and a building model with detailed representations of buildings and bridges. These models are based on aerial photographs.

We can see from the 3D model of the Old Town how it developed gradually over the centuries. Houses of differing ages, large and small, are standing close to each other and are connected by an irregular network of streets and public spaces.

GROSS FLOOR AREA m²	BUILT VOLUME m³	BUILT-UP SHARE %
2,048,349	10,099,524	49
STREETS AND ROADS %	POPULATION DENSITY people/hectare	NUMBER OF INHABITANTS
30	100	9,378



Build-up area development

Prague has grown over time, not only as a result of new construction, but also by incorporating outlying villages. Prague's current borders have remained unchanged since 1974. The historically largest impetus for new construction in Prague resulted from the demolition of the city walls, which allowed new space for expansion. A typical feature of the second half of the 1950s was the building of housing estates in the rings surrounding the city centre, and also high-rise buildings. After 1989, there was renewed interest in building in the central parts of the city. The outskirts of Prague began to be filled in with satellite towns. In future, the city wants to focus on developing the transformation areas close to the city centre, which are most commonly former industrial sites and disused railway land.

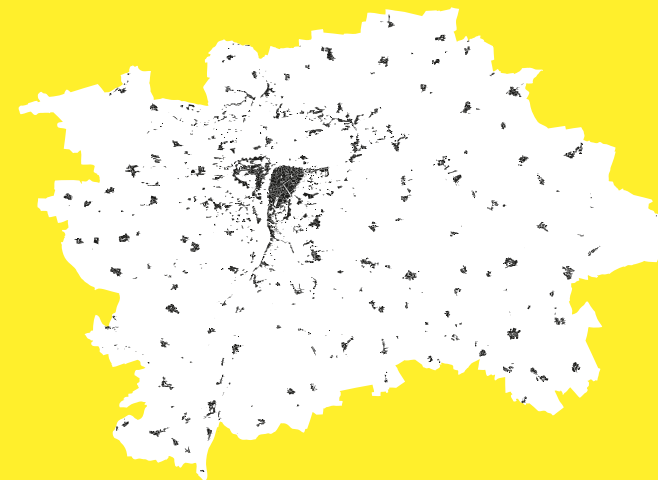
?

DO YOU KNOW HOW MANY
DISTRICTS THERE ARE
IN PRAGUE?

57 DISTRICTS

!

1840



0 5 10 km

1920



0 5 10 km

1970



0 5 10 km

2010

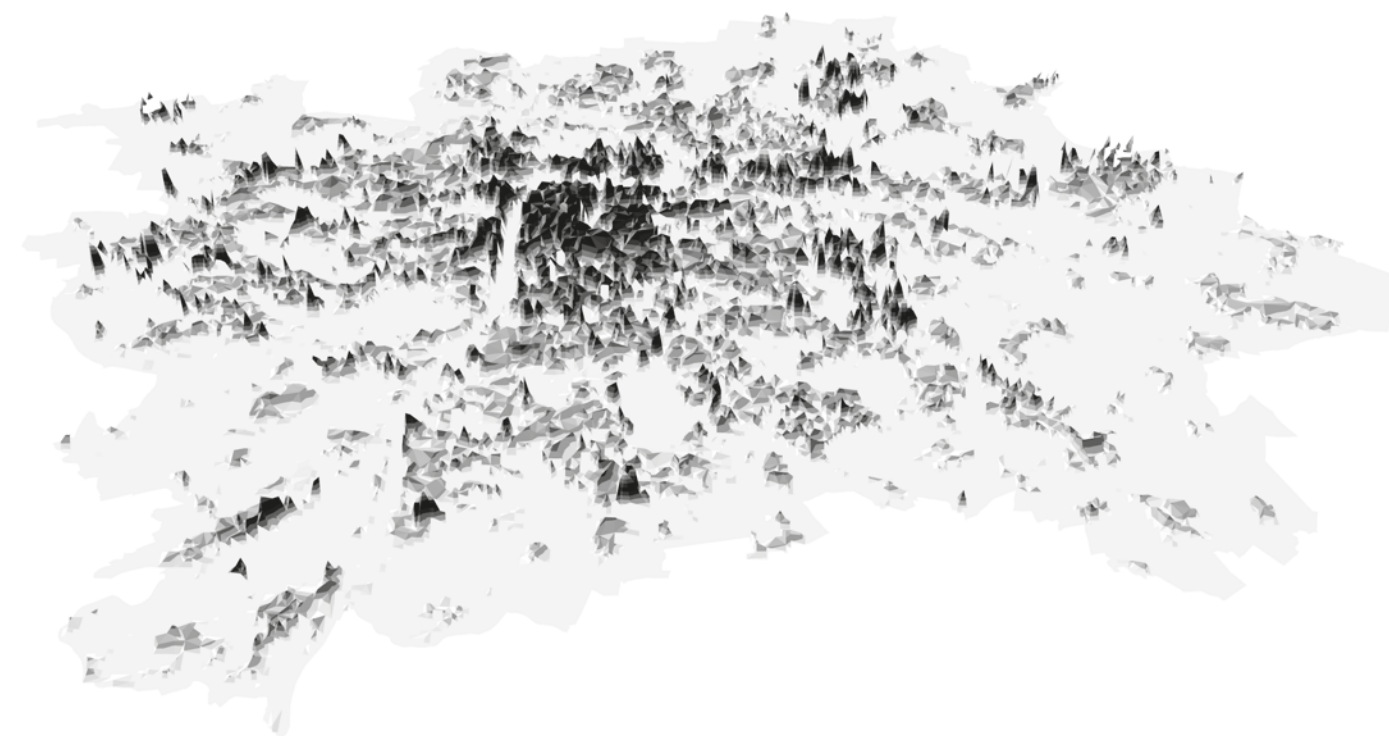


0 5 10 km

09

The built-up share of the area

The height of the surface in the diagram results from the ratio of the built-up areas and open spaces. This means the height of the relief corresponds to the density of construction – black peaks show areas that have above-average construction density, grey hills are in less densely-built up areas and light-coloured flat areas are open spaced. The centre has the highest density of buildings, but there are also raised areas that house commercial, storage or production buildings which – although they are not tall – cover large areas of land.



**56% of houses
in Prague are less
than 10 m in height.**

56

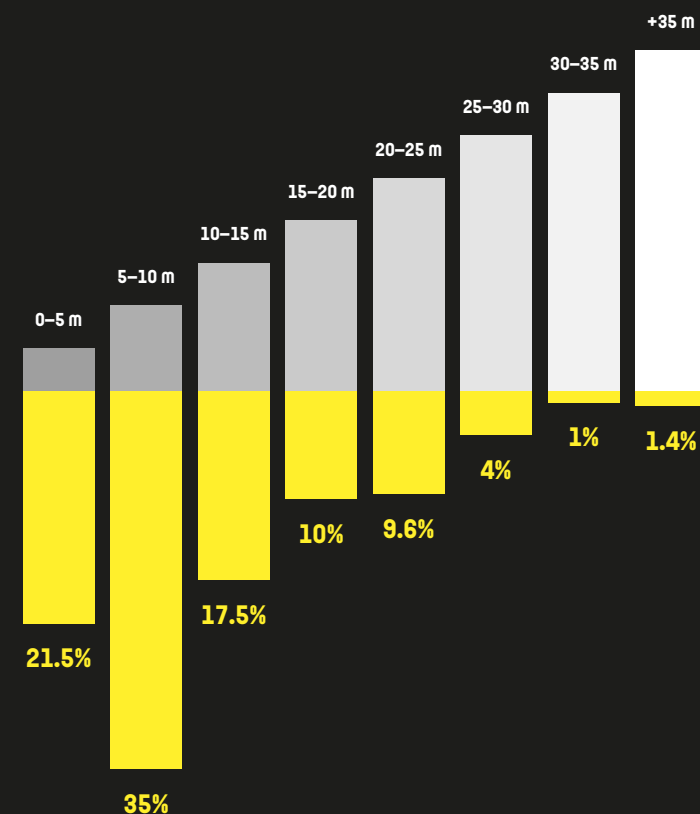
10

Building heights

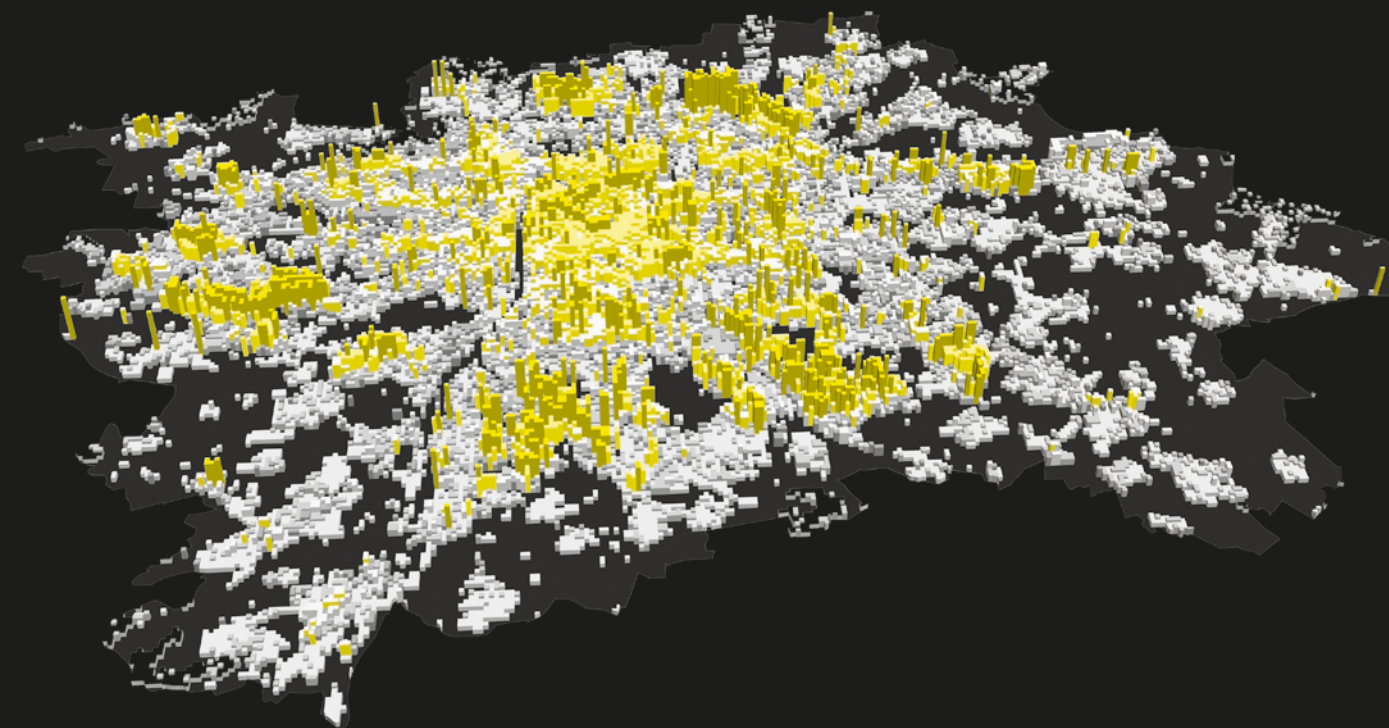
The heights of the columns in the image copy the most typical heights of buildings located in the given area. You can see that 56% of houses in Prague are less than 10 m high and 60% of the total number have only two storeys. Only 1.4% of buildings in Prague are more than 35 m high and they cover an area of 97 ha, which is 0.2% of the total area of Prague. Prague is therefore a relatively “low-rise” city.



DO YOU KNOW WHICH DISTRICT HAS THE HIGHEST BUILDING (NOT TOWER) AND WHICH ONE IT IS?

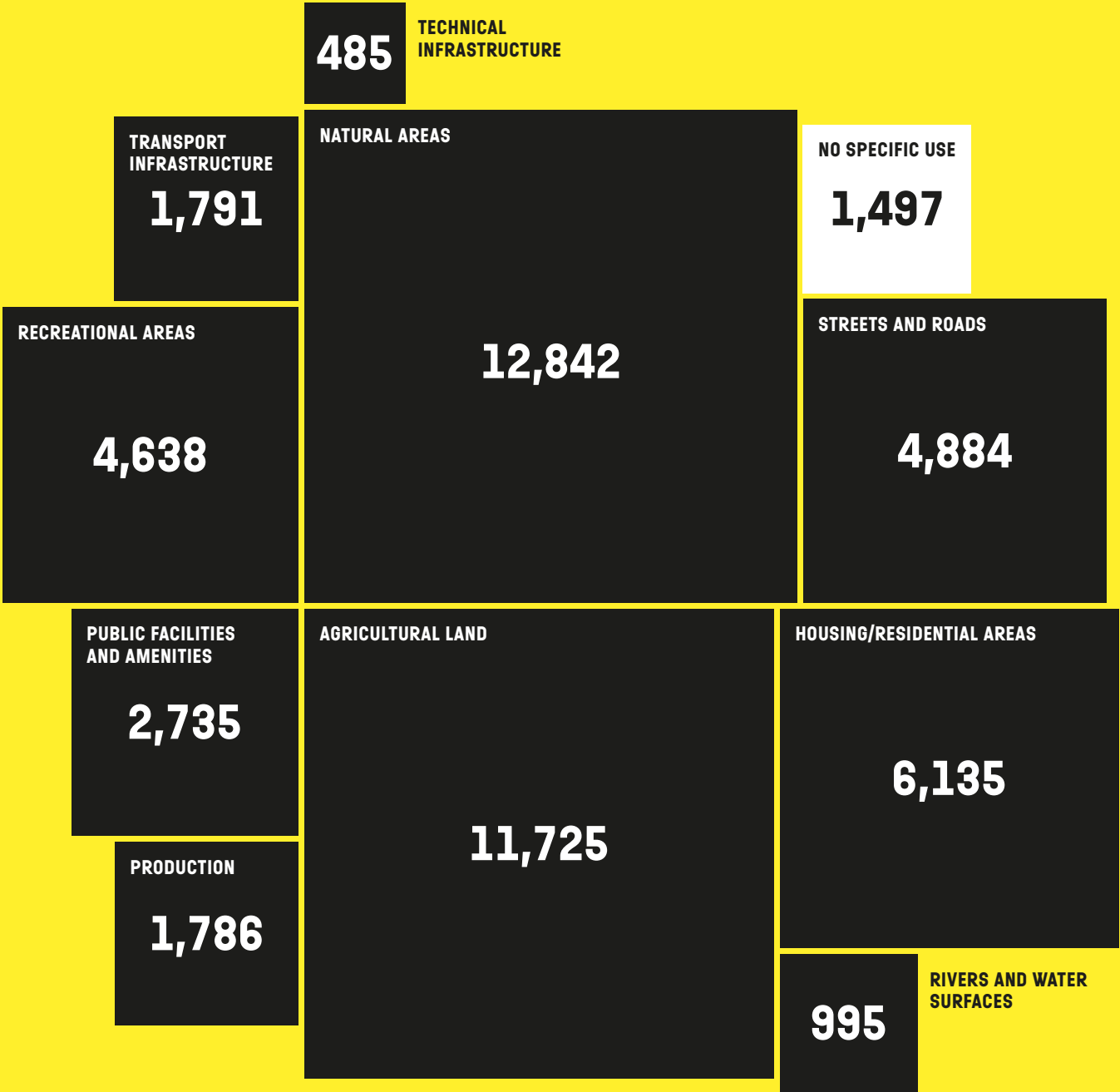


NUSLE, THE CITY TOWER BUILDING
IN PANKRÁC, BUILT IN 2008 (109 m)



Land use

12% of the total area of Prague is occupied by land used for housing (houses, including courtyards and gardens) and 5.5% is taken up by public facilities and amenities (e.g. hospitals, shops). A very small proportion of the total area is devoted to manufacturing. The land is also used for a network of streets and roads, which make up 1/10 of the area of the capital. As much as 26% of Prague is open countryside and arable agricultural land accounts for nearly one quarter of the city area (24%). Around 3% of the city consists of unused or devastated land. Only 7% of the total area of Prague is physically occupied by buildings.



Figures given in hectares

**Forests cover
10.3% of Prague's
surface area.**

10.3

Sites of natural value

A relatively large number of natural or near-natural sites can be found within the territory of Prague, which are protected under local or international law. Sites of natural value include individual tree stands and more extensive forested areas (e.g. Klánovice Forest, Radotín Wood or Divoká Šárka). Prague is also home to 12 Natura 2000 sites of European importance, 27 registered landscape features of importance and 12 natural parks. The only large-scale special protection area (SPA) in Prague is part of the Český Kras Protected Landscape Area. The small SPA extends into territory occupied by 69 natural monuments, 17 nature reserves and 8 national natural monuments, with a total area of 2,540 ha, representing around 5% of Prague.



DO YOU KNOW WHICH IS THE LARGEST OF PRAGUE'S NATURAL PARKS, AND CAN YOU FIND IT ON A MAP?

REGISTERED LANDSCAPE
FEATURES OF IMPORTANCE

27

NATURAL
PARKS

12

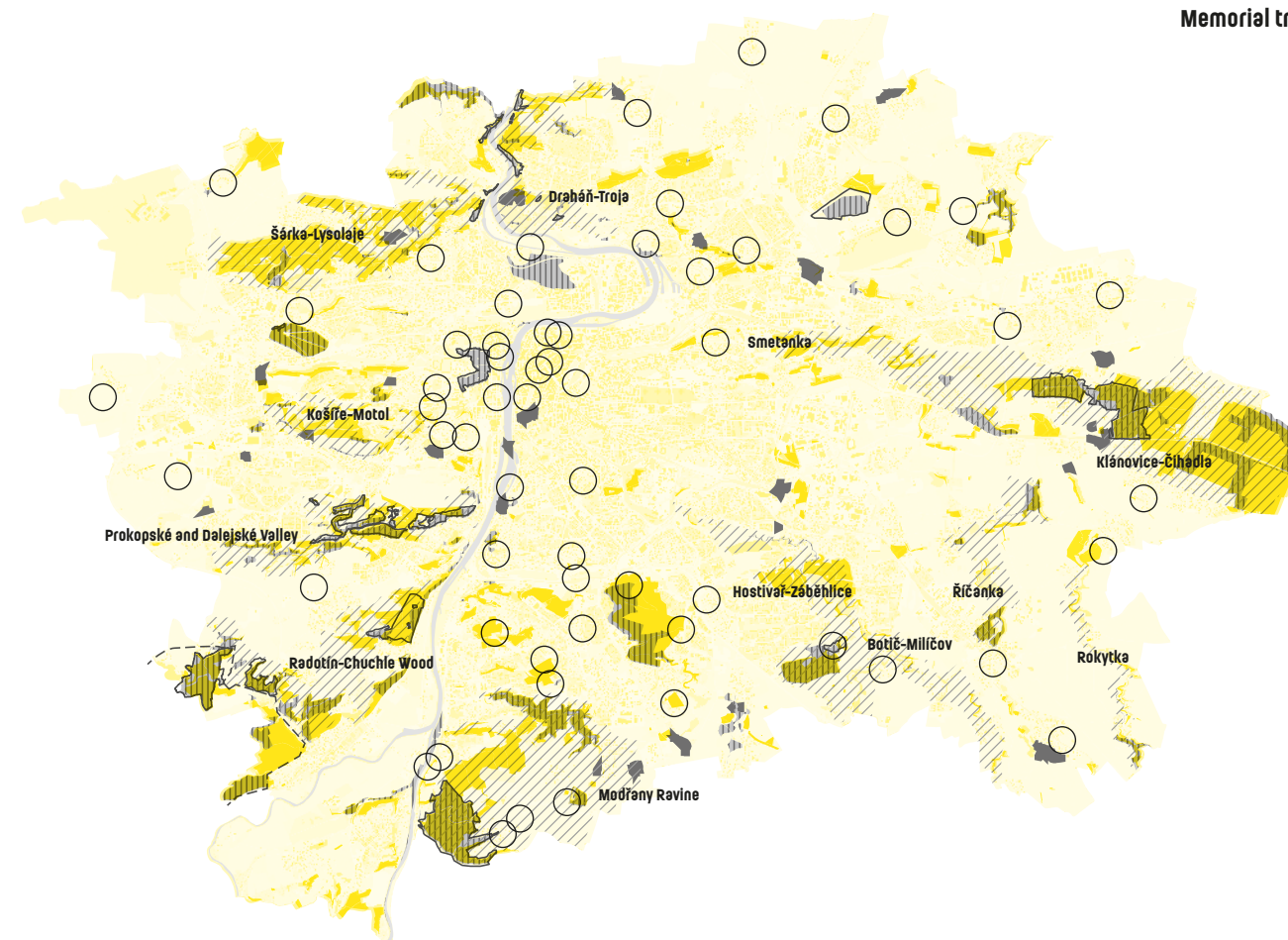
SMALL-SCALE SPECIAL
PROTECTION AREAS

94

KLÁNOVICE-ČIHADLA PARK
(2222.8 ha)



Český Kras Protected Landscape Area
Natural parks
Natura 2000 – sites of European importance
Registered landscape features of importance
Small-scale special protection areas
Woodland
Memorial trees



0 5 10 km

**Approximately 74%
of Prague's drinking water
is supplied from Želivka.**

74

Drinking water supply

Prague is supplied with drinking water from the Central Bohemian water supply system. The principal sources of crude water are the Švihov water reservoir (the Želivka water treatment plant) and water from the Jizera river (the Káraný water treatment plant). These sources are supplemented by the Vltava river (the Podolí water treatment plant), which currently serve as a reserve supply. Approximately 74% of Prague's drinking water is supplied from Želivka.

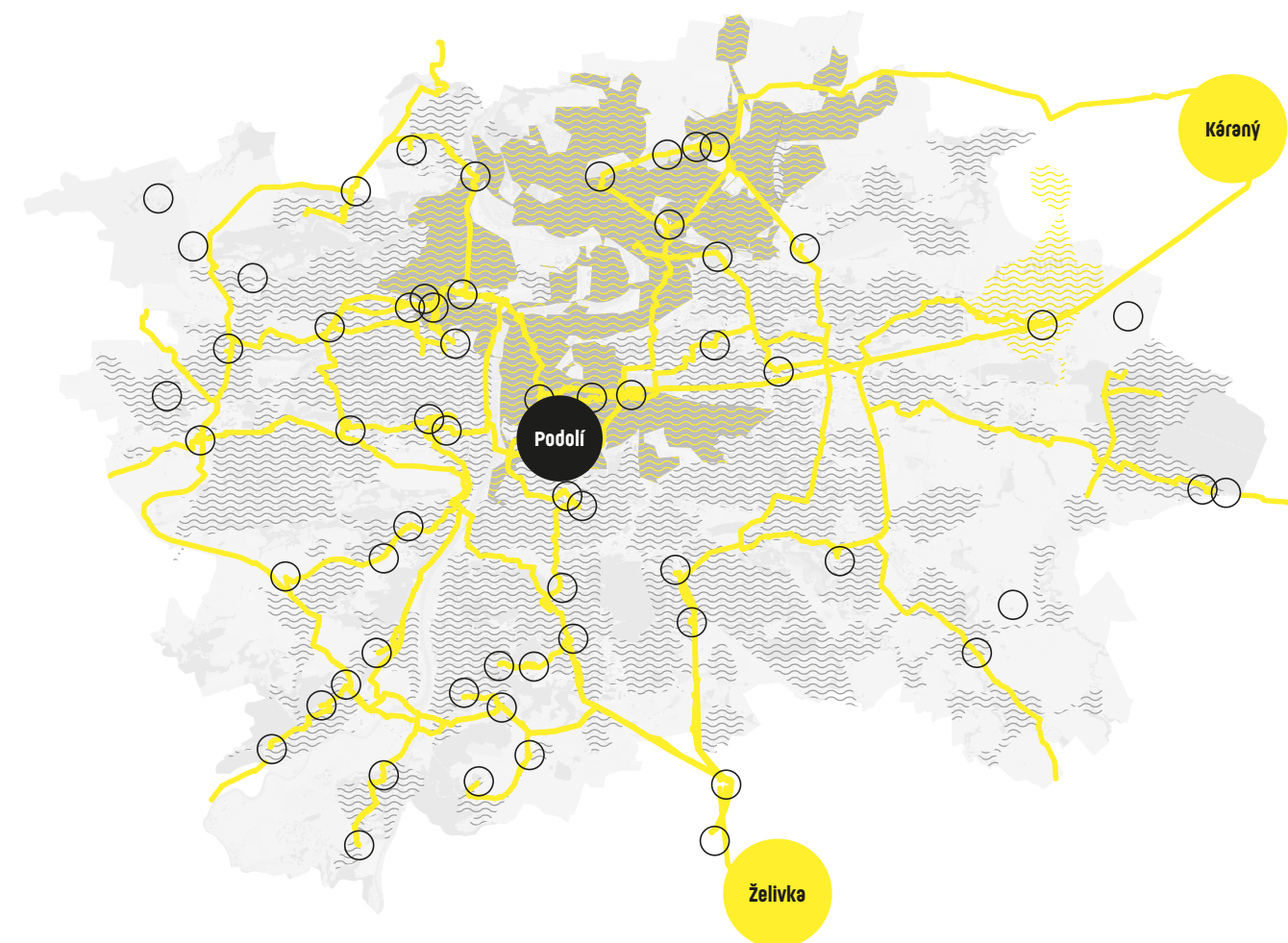
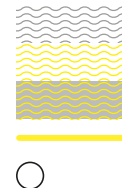


SEE WHETHER YOU CAN FIND THE SOURCE OF THE DRINKING WATER DELIVERED TO YOUR HOME, SCHOOL OR THE OLD TOWN HALL ON THE MAP.

THE OLD TOWN HALL IS IN A DISTRICT THAT RECEIVES A MIX OF WATER FROM BOTH ŽELIVKA AND KÁRANÝ.



Želivka supply area
Káraný supply area
Mixed supply area
Influx water lines
Reservoir



Model of air quality monitoring

Nitrogen dioxide (NO_2) is mainly produced in the ambient air through the conversion of nitric oxide, which is the product of combustion. It causes respiratory infections, asthma, decreased lung function and diseases of the circulatory system. Vehicular traffic is the primary source of nitrogen oxides and accounts for more than 75% of total emissions in Prague. The emission limit for average annual concentrations of nitrogen dioxide is set at $40 \mu\text{g}\cdot\text{m}^{-3}$, which, in addition to the area around the Radotín cement works, which is the largest stationary source of pollution, is exceeded in the central parts of the city (Wilsonova, Žitná and Ječná streets, Palacký Bridge), at places close to the Jižní spojká ring road (Barrandov Bridge, the crossings at Vídeňská and Chodovská streets) and around the airport at Ruzyně.

Carbon monoxide (CO) is one of the most common pollutants in the ambient air and results from the incomplete combustion of carbonaceous materials. The main source of traffic emissions is passenger vehicles (75%). Traffic is the main source of pollution in the central parts of the city (particularly New Town and the surrounding area). Elevated CO levels are particularly dangerous for people with chronic respiratory infections and those with diseases of the circulatory system.

CAN YOU FIND OUT
FROM THE MAP
HOW POLLUTED
THE OLD TOWN IS
IN TERMS OF NITROGEN
DIOXIDE?

UP TO $40 \mu\text{g}\cdot\text{m}^{-3}$, ACCEPTABLE
CONCENTRATIONS OF NO_2 IN THE AIR
ARE NOT EXCEEDED IN THE DISTRICT.



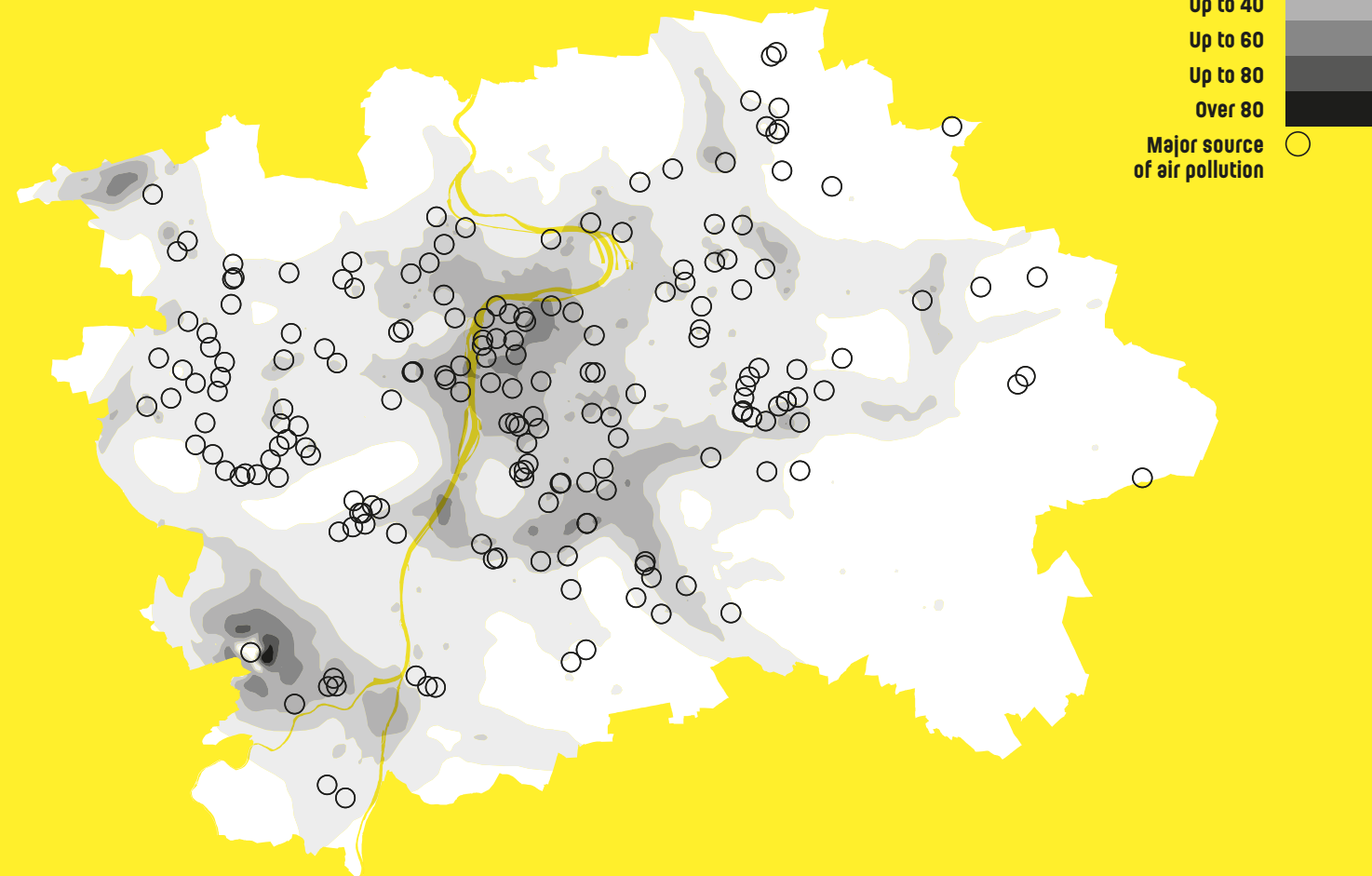
NO_2

AVERAGE ANNUAL CONCENTRATION

Emission limit up to $40 \mu\text{g}\cdot\text{m}^{-3}$

Up to 20
Up to 25
Up to 30
Up to 40
Up to 60
Up to 80
Over 80

Major source
of air pollution



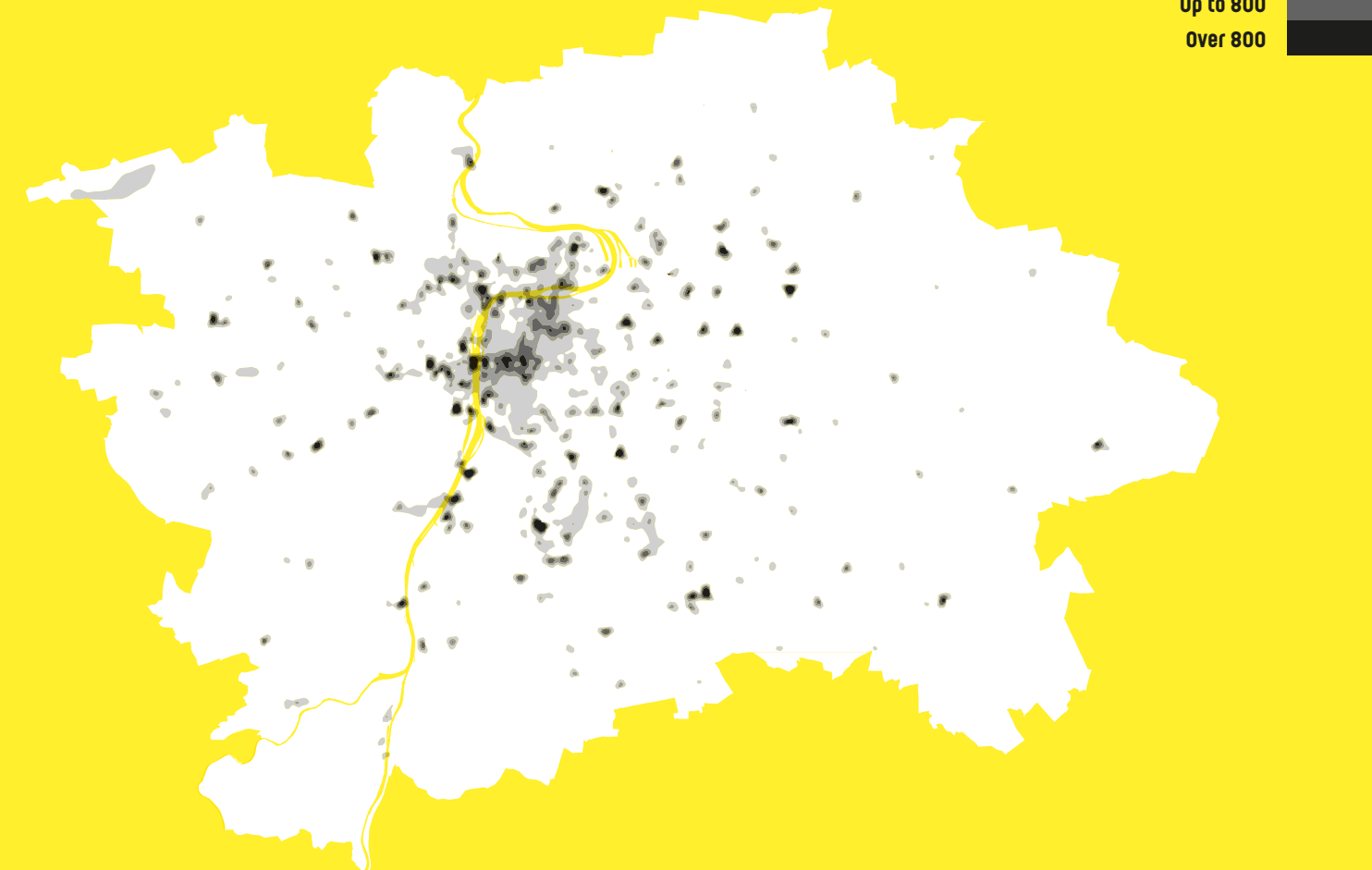
0 5 10 km

CO

AVERAGE ANNUAL CONCENTRATION

No emission limit, $\mu\text{g}\cdot\text{m}^{-3}$

Up to 600
Up to 650
Up to 700
Up to 800
Over 800



0 5 10 km

Noise levels

The map shows the level of ambient noise from all traffic during the daytime or at night throughout Prague. Noise bands of 5 dB have been selected. The table shows hygiene limits in dB broken down by the source of the noise.

Hygienic limits

	NOISE SOURCE	6 a.m.–10 p.m.	10 p.m.–6 a.m.
ROADNÍ DOPRAVA	Noise from traffic on motorways, 1st and 2nd grade roads and 1st and 2nd grade local roads	60	50
TRAM TRAFFIC	New tram tracks that are part of the road system	55	45
RAILWAY TRAFFIC	Noise from rail traffic in the rail protection zone	60	55
AIRLINE TRAFFIC	Flight operations	60	50

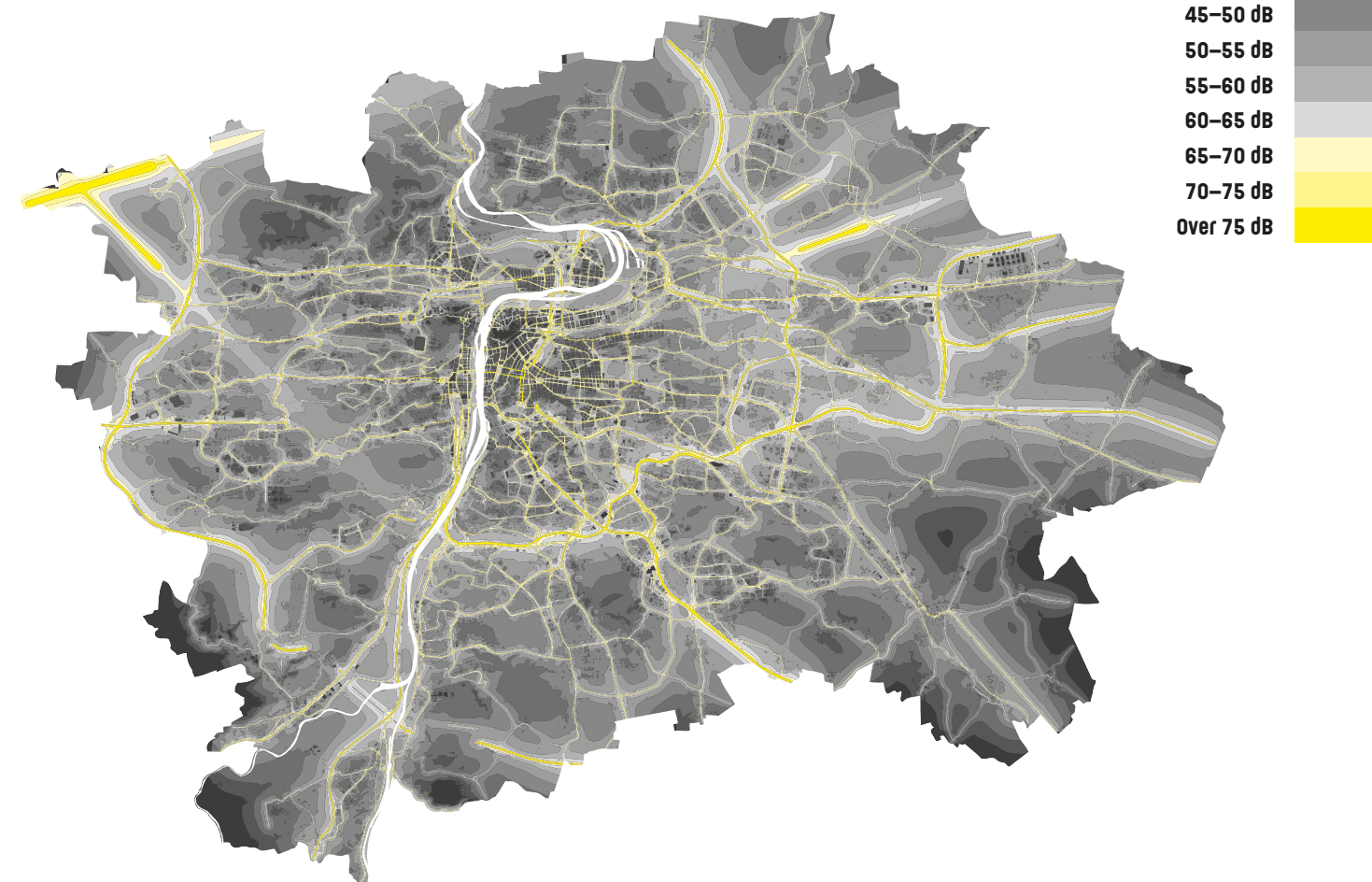
Noise comparisons in dB

Cock crow	85
Very loud recorded music	80
Engine room, loud pub, clapping in a hall	70
Croaking frogs	64
Television at normal volume	55
Everyday street noise	50
Muffled talk	40

Day

NOISE LEVEL

2009, 6 a.m.–10 p.m.



0 dB
35–40 dB
40–45 dB
45–50 dB
50–55 dB
55–60 dB
60–65 dB
65–70 dB
70–75 dB
Over 75 dB

0 5 10 km

Night

NOISE LEVEL

2009, 10 p.m.–6 a.m.



0 dB
35–40 dB
40–45 dB
45–50 dB
50–55 dB
55–60 dB
60–65 dB
65–70 dB
70–75 dB
Over 75 dB

0 5 10 km

**In 2013, every person
living in Prague produced
334 kg of municipal waste.**

334

16

Municipal waste

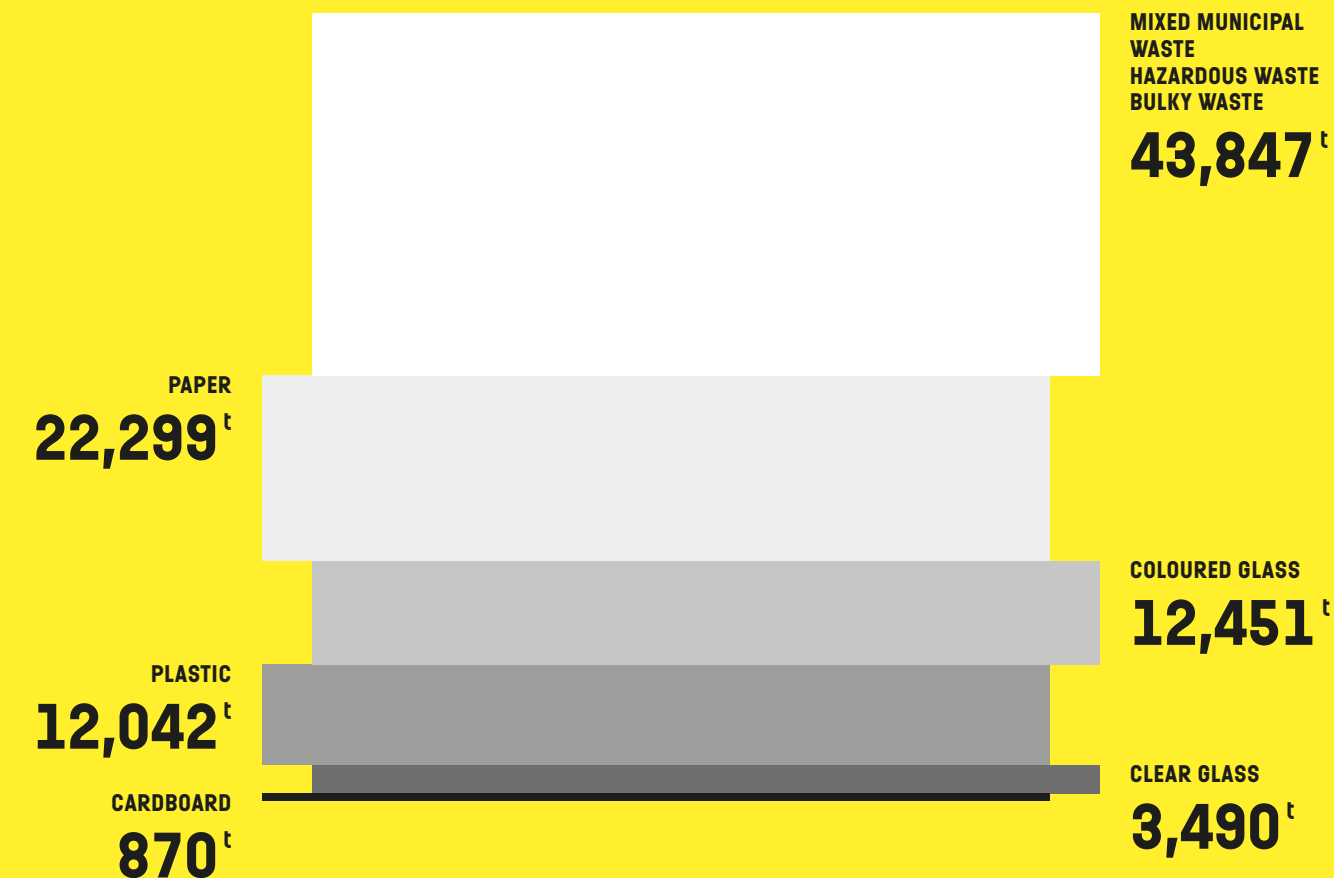
In 2013, the total volume of municipal waste produced in Prague was 400,900 t, which represented 334 kg of municipal waste for each Prague resident. Since 1998, a comprehensive municipal waste sorting system has been operated in Prague. This results in 23.7% of waste being recycled.

TOTAL PRODUCTION
OF MUNICIPAL WASTE

400,900^t

PERCENTAGE
OF RECYCLED WASTE

23.7%



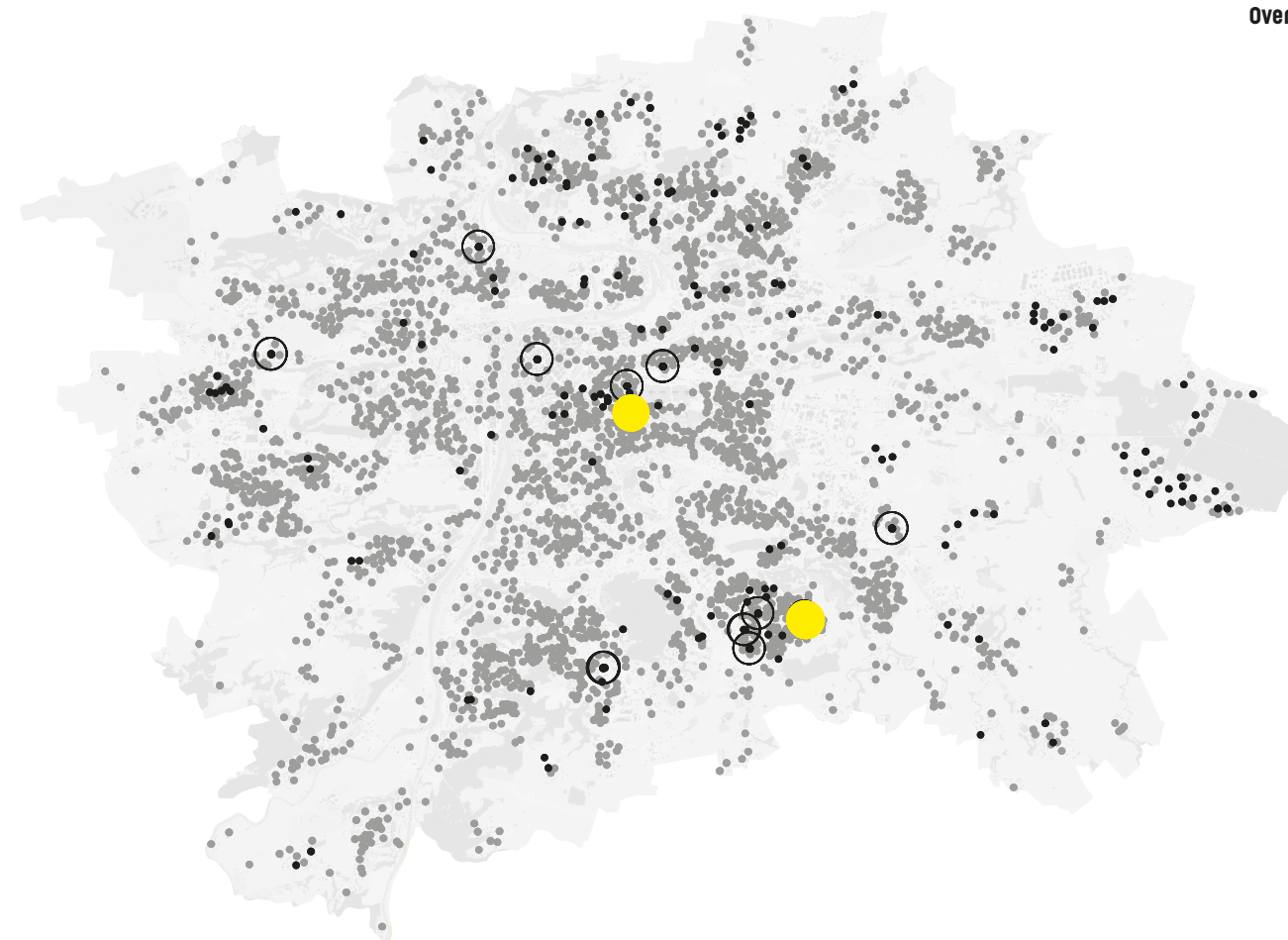
Waste sorting

In Prague, sorted waste for recycling is delivered by residents to collection points, of which there are 3,288 in the city, 69 of which are underground. Each collection point holds an average of 4–5 containers. There are a total of 13,970 waste recycling containers in Prague. In 2013, 51,153 tons of municipal waste was sorted through this system, of which 43% was recyclable paper. Prague also has collection yards to sort collected waste, with a total of 22 distributed over its territory. Mixed municipal waste is delivered to the Měšice incinerator to produce energy, with the remainder deposited in landfill at Ďáblice.

LOCATION OF WASTE RECYCLING CONTAINERS

Number of containers at collection points

- 1–5 ●
- 6–10 ●
- 11–20 ○
- over 20 ●



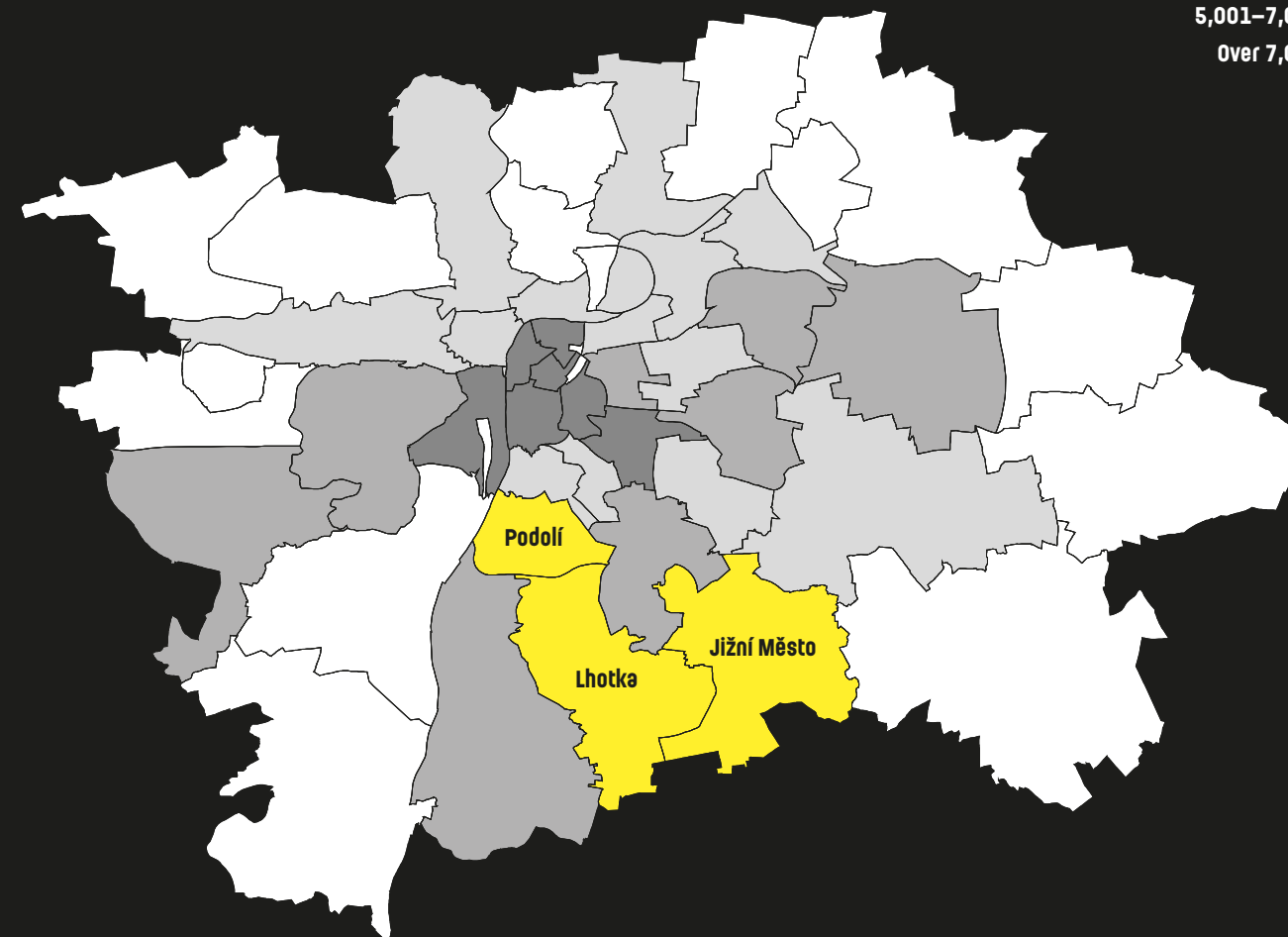
Crimes by police unit

The territory of the Capital City of Prague is supervised by the regional Police Directorate of the Capital City of Prague, which is divided into four district headquarters containing 47 local police units, 4 railway police units and a unit for the airport at Ruzyně. The map shows the frequency of criminal acts registered in 2013 and 2014, broken down by police unit. The darker the shade of the police unit, the more crimes committed on its territory during the period monitored. According to police statistics, a total of 153 833 crimes were reported in Prague in 2013 and 2014. Most crimes were reported to the local police unit at Podolí.

NUMBER OF CRIMES

2013–2014

1–2,000
2,001–3,500
3,501–5,000
5,001–7,000
Over 7,000



1st PODOLÍ

9,122

2nd LHOTKA

7,844

3rd JIŽNÍ MĚSTO

7,134

0 5 10 km

**The busiest road section
in 2013 was Barrandov Bridge
(136,000 vehicles a day).**

136,000

Prague's road system

The map shows the main sections of the road system for Prague and its surrounding area (motorway, high-speed roads, the Prague ring road and other major roads) along with information on road traffic counts during 2013. Traffic was monitored during normal working days from midnight to midnight. The result is an overview of the vehicular load on individual roadways. Passenger vehicles place a heavier burden on the main roads than freight vehicles, which are predominantly only transit. The busiest section in 2013 was the Barrandov Bridge (136,000 vehicles a day). The busiest grade-separated junction was 5. května – Jižní spojka (212,000 vehicles a day), and the busiest at-grade junction was Poděbradská – Kbelská (73,000 vehicles a day).

SECTIONAL COUNT – VEHICULAR TRAFFIC

Number of vehicles, 0–24 hours, 2013

- Less than 15,000
- 15,001–25,000
- 25,001–40,000
- 40,001–100,000
- More than 100,000
- Major roads outside Prague



Access to the centre

Access to the city centre is one of the important benchmarks indicating the true proximity or remoteness of areas of the city. This also influences how people decide on an area to live in. The picture shows the accessibility of the centre using a combination of walking with public transport and is modelled on the situation on a working day during the morning rush hour. The starting points are all the Prague Integrated Transport stations in the city and the target points are three stops within the city centre (Můstek, Muzeum and Václavské náměstí), from which the shortest commuting times are calculated. These stops can be accessed from anywhere in the central part of the city within 15 minutes. Thanks to the metro, we can also access the city centre relatively quickly even from more distant areas, such as Jižní Město or Nové Butovice.



0 5 10 km

PID lines

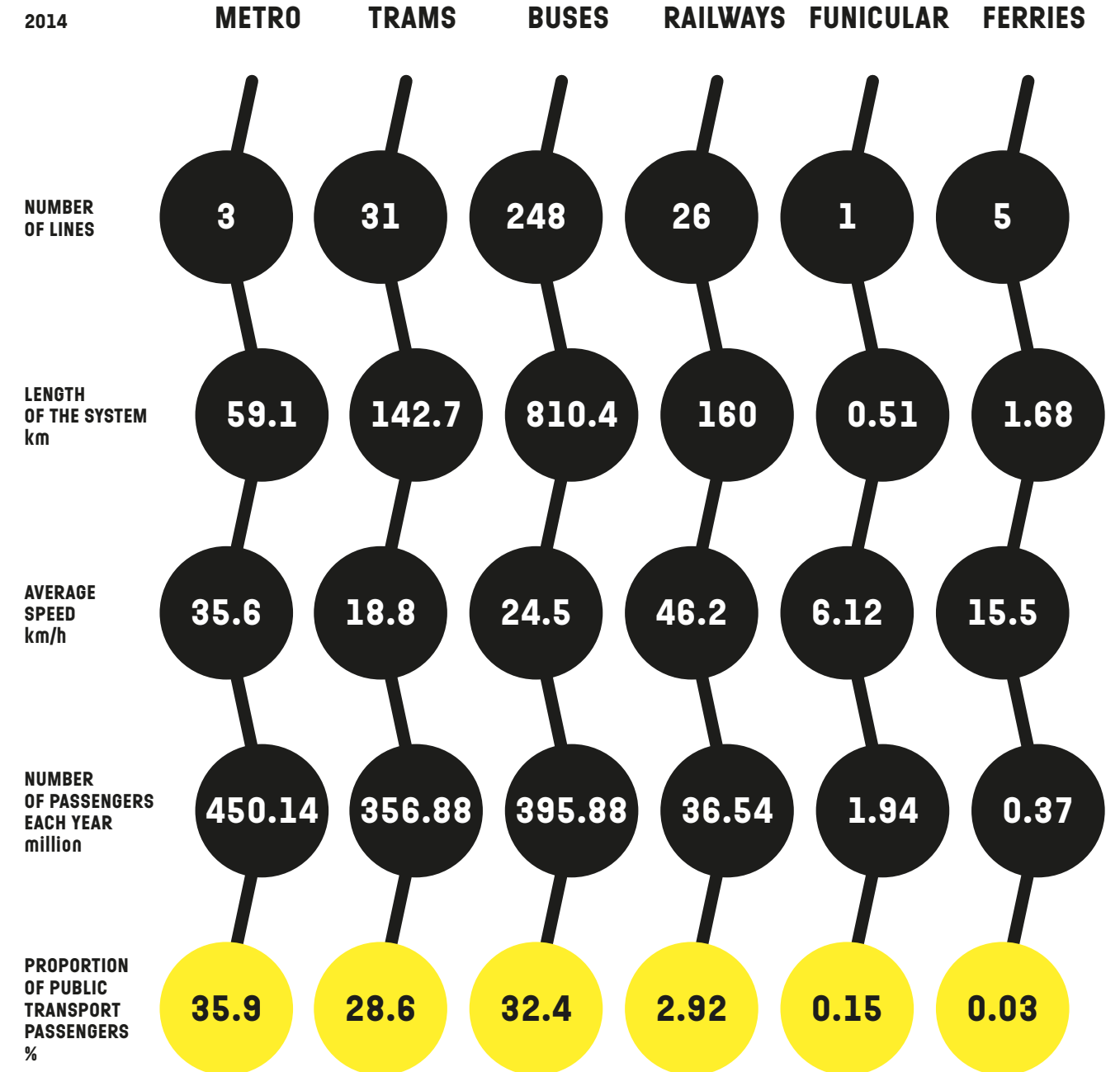
The Prague Integrated Transport system (PID) is a public transport system that serves the entire area of Prague and one-third of the Central Bohemian region. The PID transport system includes the metro, trams, urban, suburban and regional buses and trains, the funicular railway and ferries.

Most people travelled by metro in 2014, totalling 35.6% of all passengers. 32.4% of passengers used the buses. The fastest form of transport is the train, with those in the PID running at an average of 46.2 km/h.



DO YOU KNOW WHICH
THE DEEPEST METRO
STATION IN PRAGUE IS?

NÁMĚSTÍ MÍRU (53 m DEEP)

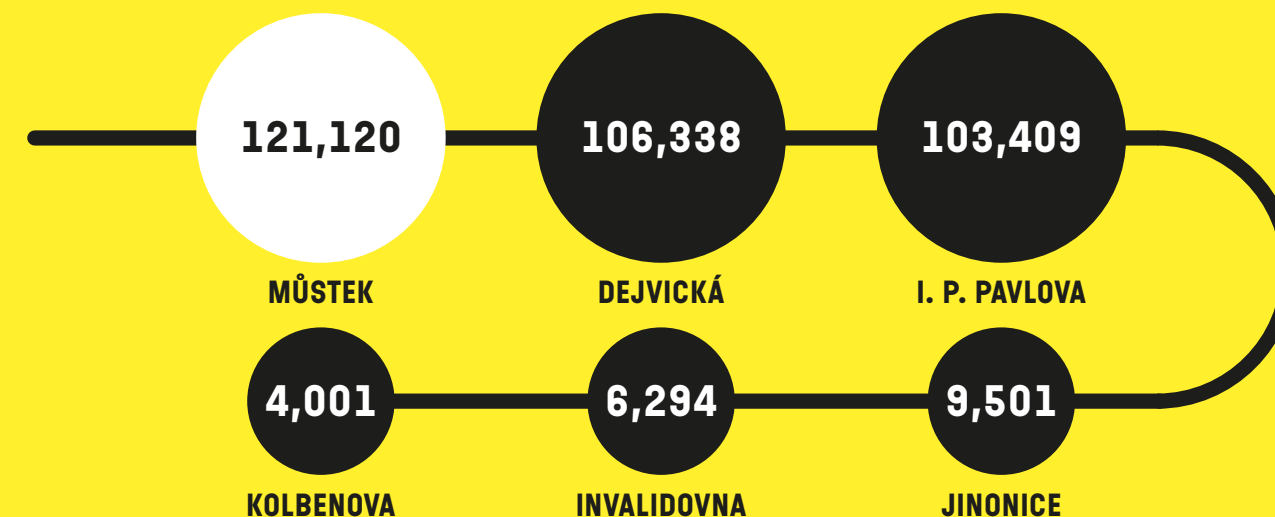


Number of passengers at PID stops

The diagram shows the rate of passenger use of PID stops and stations, which is the number of people who entered or exited public transport from a given station. These data also give an indirect illustration of the flow of people through public spaces around public transport stations. In 2014, the most frequented station was the Můstek metro station and the least used was Kolbenova. The highest turnover in the tram system was at the Anděl stop, while the tram stops Hercovka and Nad Trojou were the least used by passengers.

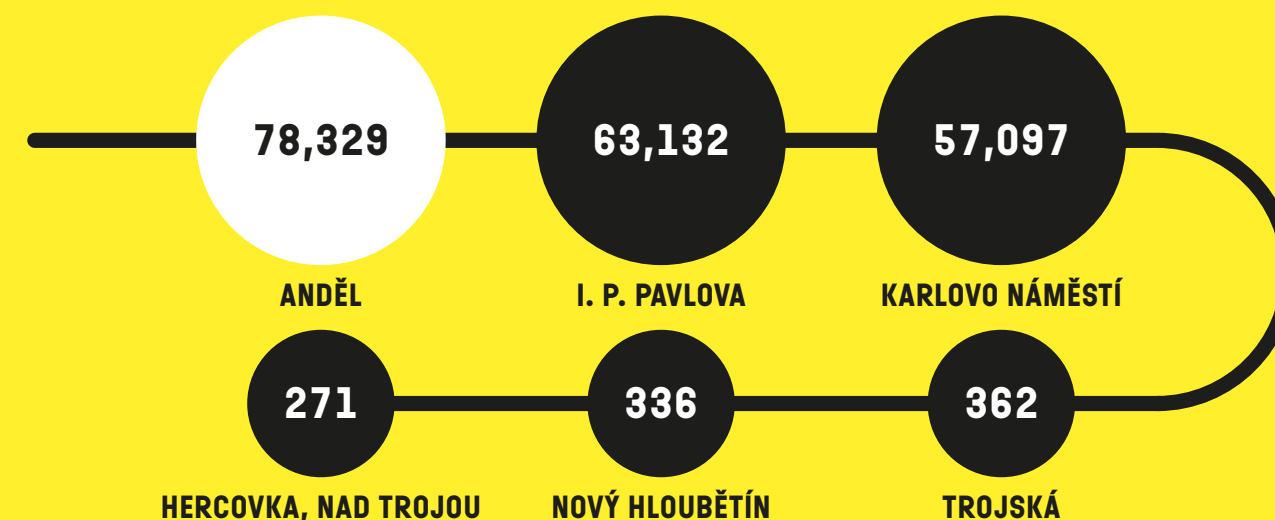
METRO – MOST AND LEAST FREQUENTED STATIONS

2014



TRAM – MOST AND LEAST FREQUENTED STOPS

2014



Movement of people in the city

Five volunteers, employees of the Prague Institute of Planning and Development, monitored their movements around the city using the MOVES mobile application. Each line is the route taken by one person over a period of at least one week. This type of data is an invaluable source of information for monitoring the real movement of residents and visitors around the city and for its management.



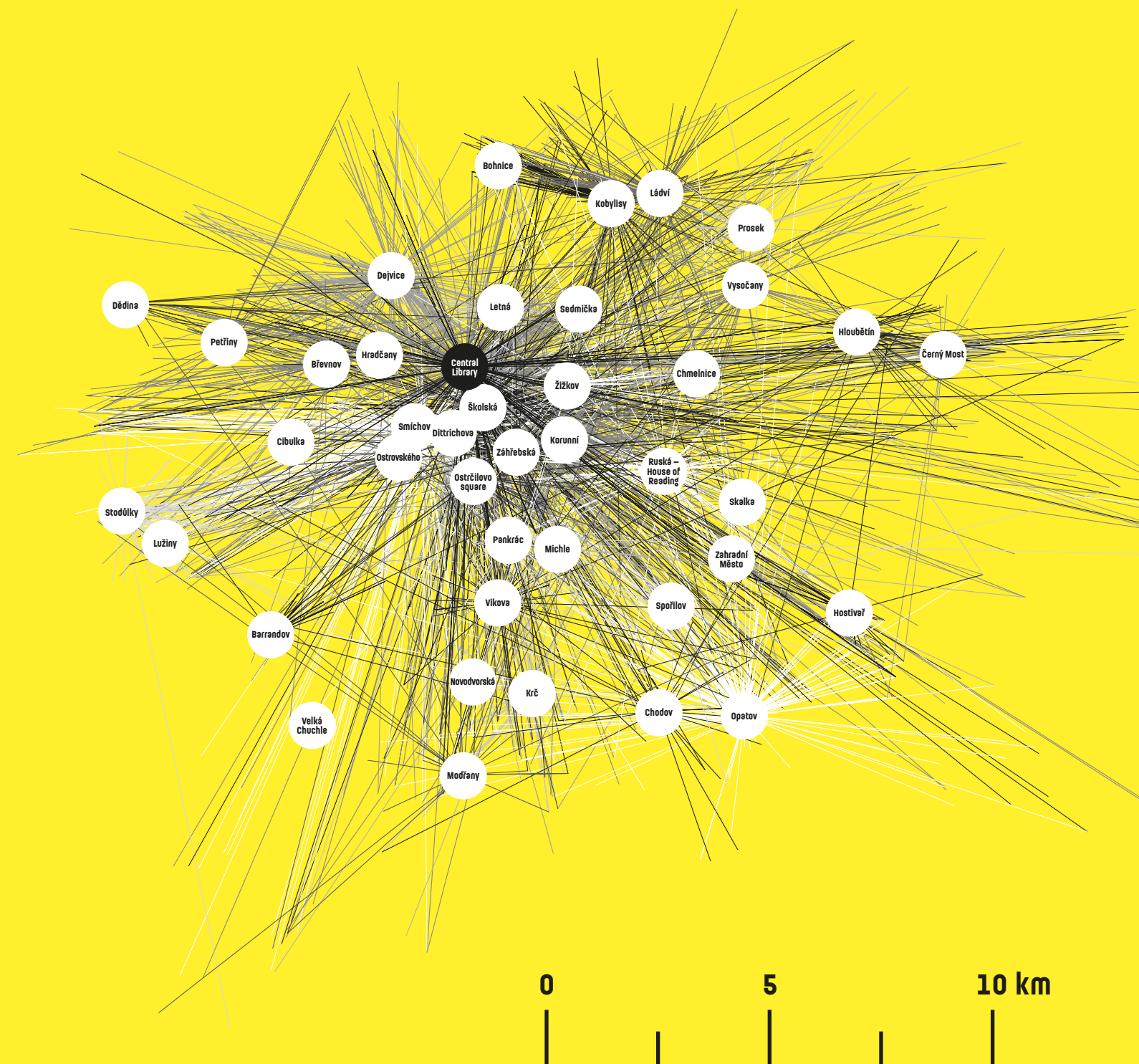
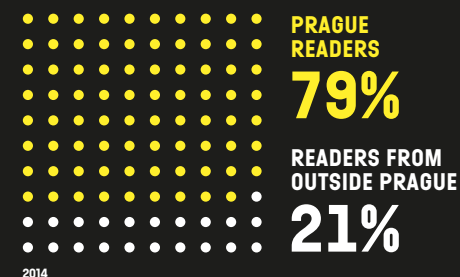
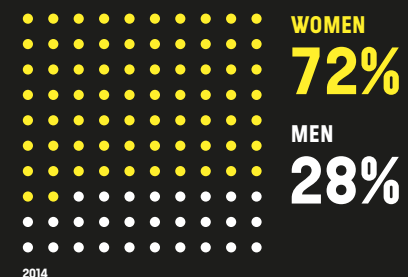
DO YOU WANT TO TRACK YOUR MOVEMENTS IN THE CITY? ARE YOU INTERESTED IN KNOWING HOW MANY KILOMETRES YOU HAVE WALKED OR DRIVEN IN A CERTAIN PERIOD? DOWNLOAD THE MOBILE APP AND CREATE YOUR OWN TRACKING MAP.

MOVES MOBILE APP



Users of the Municipal Library of Prague

The map shows the number of people who visit Prague libraries in one day. The branches of the Prague Municipal Library are depicted on the map by white dots. The lines leading from them link up to the homes of readers who use that particular branch. Branches that are further from the city centre tend to be used by people living close by, while visitors to libraries in the centre may also come from further afield. Readers from all over Prague visit the Central Library. It is interesting that, regardless of age, women use libraries 2.5 times more than men. Active readers include 79% of Prague residents and 21% from outside Prague. The highest proportion of readers who do not live in Prague are aged between 20 and 30 years, which means they are probably university students studying in Prague.





**The Prague Institute
of Planning and Development
Spatial Information Section
(SPI) manages an information
system on the territory
of Prague and creates
geographical data, analyses
and maps to meet the needs
of the public administration,
particularly in the areas of
transport, spatial planning,
the environment, technical
infrastructure, nature
conservation, water
management, healthcare,
monument preservation
and culture.**

SPI PROJECTS

PLANNING ANALYTICAL MATERIALS OF THE CITY OF PRAGUE

DIGITAL MAP OF PRAGUE PUBLIC ADMINISTRATION

Digital technical map of Prague
Thematic cadastral map
Elements of city orientation (addresses, streets)
Administrative boundaries
Base map of Prague 1 : 25 000
Set of orthophotomaps of Prague
3D model of Prague

GEOPORTAL OF PRAGUE

MAP APPLICATIONS

On-line map
Georeport
Two Pragues
Prague 5000 atlas
Price map of building plots

CREATION OF BASE AND THEMATIC MAPS

Departments of the Prague City Hall
City districts
Prague Information Service

OPEN DATA

PARTNERS

Technical Administration of Roadways of the Capital
of Prague

Prague City Police – Find your local police patrol officer

Prague Emergency Medical Service – map data for
emergency vehicles

Prague Public Transit Company

ROPID – Prague Integrated Transport

Fire Rescue Service of the Capital City of Prague

Municipal Library of Prague



**www.geoportalpraha.cz
www.iprpraha.cz**

Do You Know Prague?

The City in Maps, Graphs and Figures

This booklet was published on the occasion of the exhibition of the same name organised by the Prague Institute of Planning and Development in Hall of Architects in Prague's Old Town Hall (1 October to 31 December 2015).

www.iprpraha.cz

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