City Introduction and Context

Please provide the following information:

1. An overview of the city and a general background to the application, including examples of environmental, social and economic sustainability in the city.
2. A description of the key environmental challenges which the city faces, including factors which have influenced the city's development.
3. The following two maps:
   a. Map 1 should show the layout of urban areas, geographical and other features across the city.
   b. Map 2 should show the city in the context of the wider surrounding area.

Please also complete the following tables:

Table 1: Benchmarking Data - City Introduction and Context

Indicator		Units	Year of data
Population	592 389	Number of inhabitants	2022
Area	401	km^2	2022
Population Density	1477	Inhabitants/km^2	2022
GDP	6112,6	€/capita	2022

Table 2: Other commitments and awards

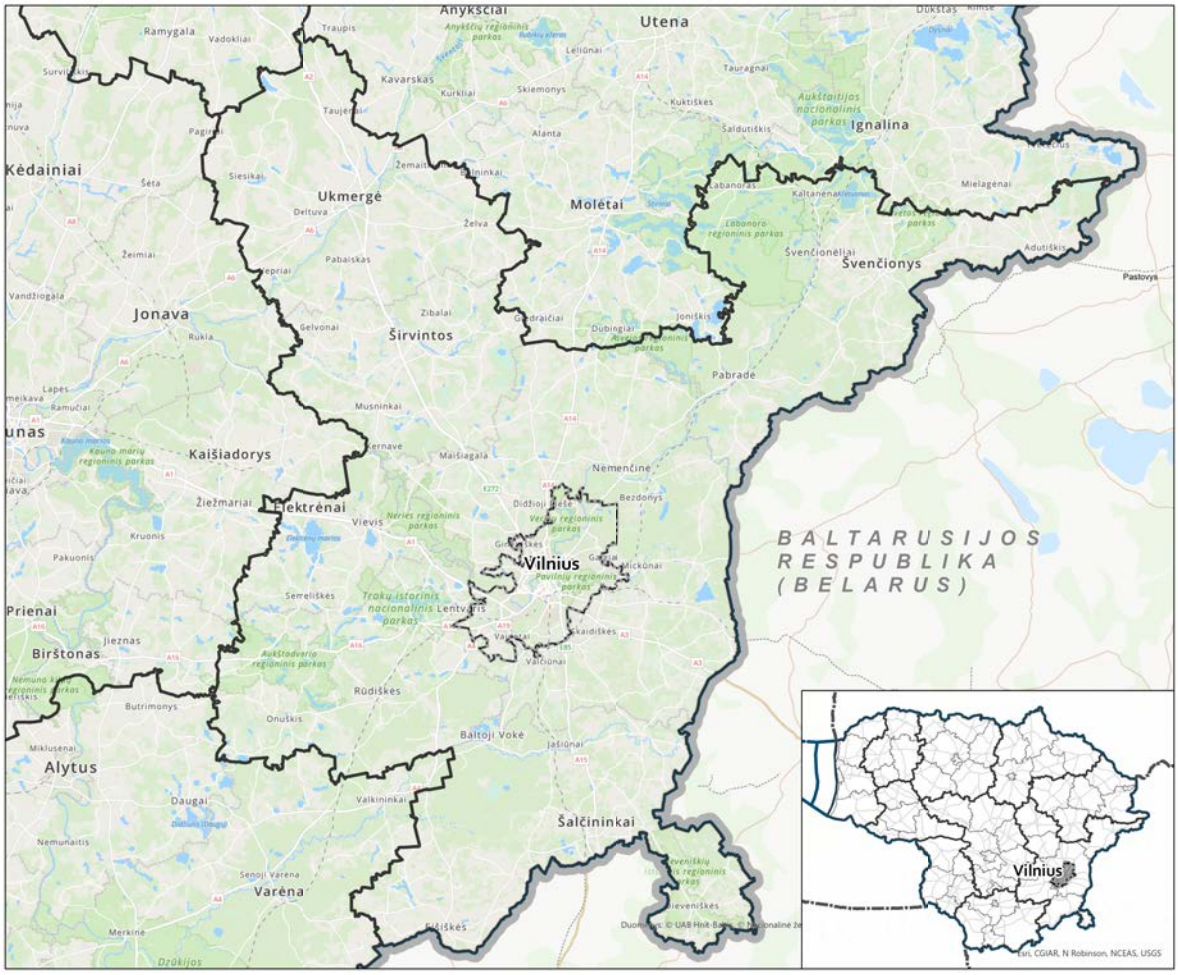
Commitment/Awards	Yes/No	Description
Signed Covenant of Mayors for Climate and Energy 2030	☒	When: 2013 The city is also a part of the prestigious EU Mission "100 Climate - Neutral and Smart Cities" where Vilnius is among 100 European cities to be implementing the experimental innovation programme aiming to become a climate-neutral city by 2030.
Signed Green City Accord[1]	☒	When: 2021
Winner of other City Awards	☒	• The European Capital of Innovation Awards, winner (2021); • World-Summit-Awards (KPI service quality indicator monitoring system), winner; • Baltic Sustainability Awards: Intelligent Energy Lab (IEL), winner (2021); EUROCITIES 2014 award for innovation: interactive energy classification map, winner (2014).
Other commitments at European level[2]	☒	• EU Mission charter on adaptation to climate change (2023)

[1] environment.ec.europa.eu/topics/urban-environment/green-city-accord_en
[2] For example signed Climate Pact, etc.

(max. 1000 words and five graphics, images or tables plus the two requested maps as detailed above)

Vilnius is the capital of Lithuania, a country located in the Baltic region of Europe. Being the largest city in Lithuania, its population in 2022 reached 592,389 people. The city is situated in the southeast part of the country, on the valley of the Neris River, and covers an area of 401 square kilometres.

The history of Vilnius dates back to the 14th century. Since its establishment, the city has been known as a modern, open city unifying different nations, religions and professions. These values have driven the city's life and its leadership in the region to these days. In 2023, Vilnius celebrates its 700th anniversary. Over the centuries, Vilnius has been under the ruling of different powers, including the Grand Duchy of Lithuania, the Polish-Lithuanian Commonwealth, the Russian Empire, and the Soviet Union. These different influences have shaped the city , which can be seen in its architecture, culture, and language.



Map 1 Location of Vilnius in the region

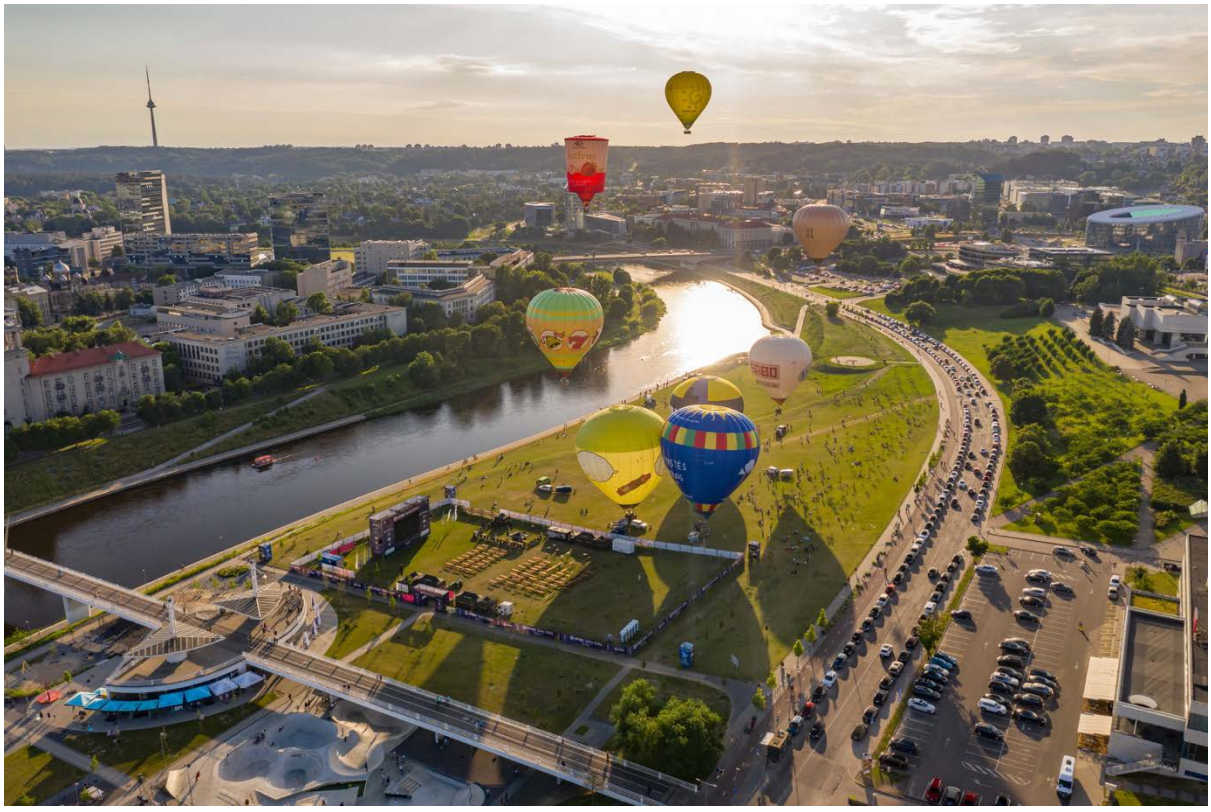
Picture 1 In 2023 Vilnius celebrates 700 years anniversary

Today, Vilnius is a modern and vibrant city that is home to a diverse population. It is a centre of business, culture, and education in Lithuania, and is known for its beautiful Old Town, which is a UNESCO World Heritage Site. Vilnius is also a popular tourist destination, attracting visitors from all over the world who come to experience its rich history, vibrant culture, and beautiful natural surroundings.

Picture 2 Vilnius Old Town, UNESCO World Heritage Site

The fact that Vilnius is located in the Neris River valley poses challenges of mitigating air pollution. This problem becomes more relevant during winter season when the old residence district burns wood and other solid fuel for heating. Legacy of city development during the Soviet Union period has left the city with a shortage of green spaces in some districts, while brownfields from industrial zones require adequate conversion. The Soviet legacy in the transport system infrastructure focussed on the individual car movement. It is currently under transformation to the walkable city concept aiming to limit transport movement in the central part of the city, narrowing down the streets, developing bicycle paths, and improving the public transport system.

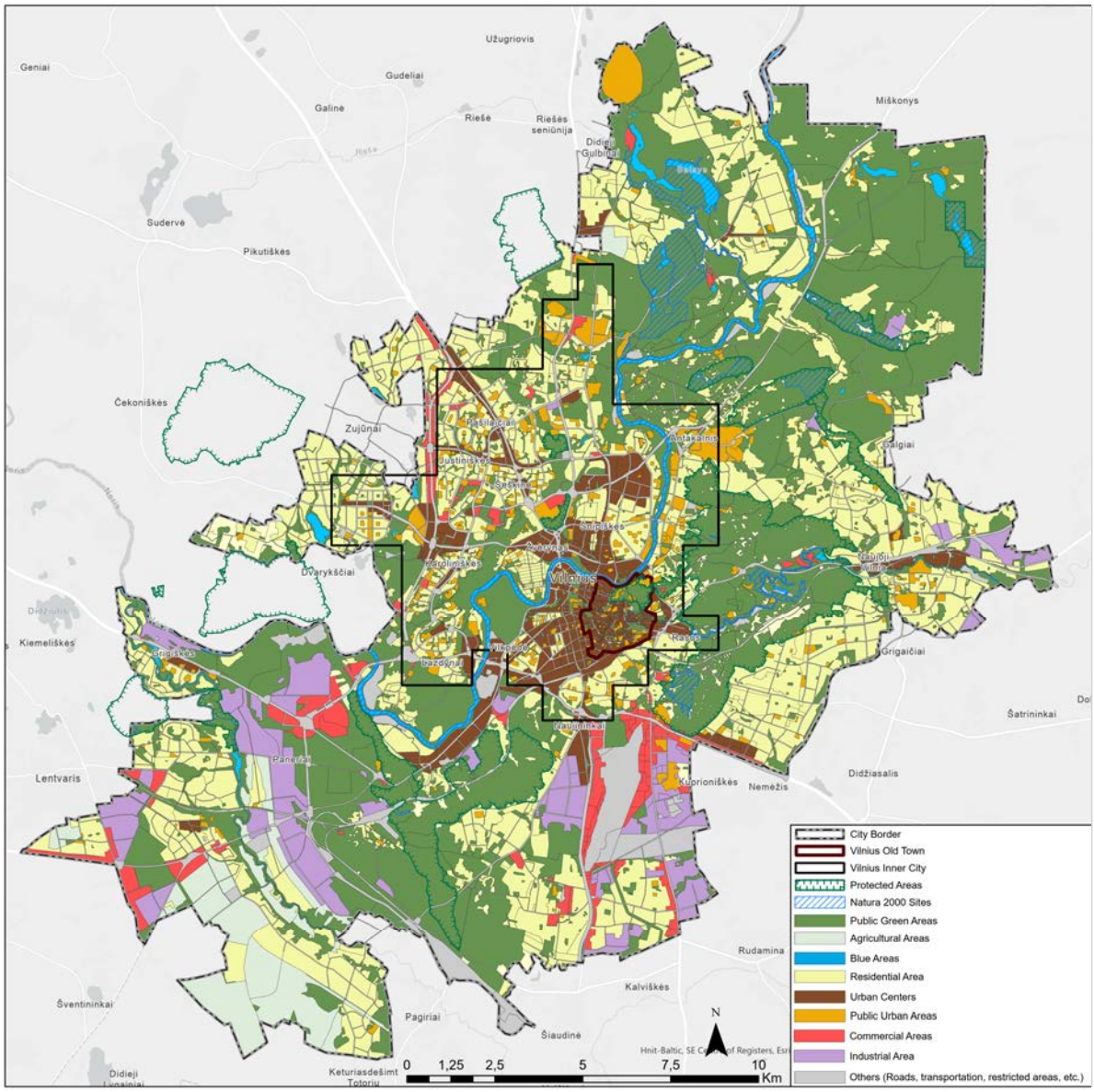
For decades, Vilnius has been known as a literally green capital. It is surrounded by forests, parks and other green spaces which cover 61% of the city. Residents enjoy its green spaces as recreational areas for both weekend hikes, relaxed walking after work and spending time in nature with their families. These green spaces as well as the Neris and other rivers flowing though the city shape the functional network of ecological corridors for urban biodiversity. There include 18 Natura 2000 sites established within Vilnius city area, designated for protecting 19 species and 18 habitat types of EU importance. The green spaces of Vilnius form a special character of the “700 years young” Vilnius.



Picture 3 Vilnius is modern and green city

Vilnius ambition to remain modern open and environmentally friendly has been recognized in various awards and nominations. It has been nominated at the World Summit Award (2021) under “Smart Settlements & Urbanization” category and received a European Capital of Innovation Award (3rd place, 2021). The newly designed Paupys neighbourhood was nominated in the prestigious MIPIM Award in the brownfield conversion programme as one of the best and most sustainable architectural projects in the world. Vilnius has been committed to EU climate targets since 2013 and has set new goals for 2030, striving to become climate neutral under the EU's "100 Climate-Neutral and Smart Cities" initiative.

Overall, these achievements demonstrate the commitment of Vilnius to sustainability and its efforts to address the environmental challenges faced by the city.



Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
Introduction	0	578	578	1000

1. Air Quality

1.A Present Situation

Please complete the following table with **official data** from sampling points reporting under the Ambient Air Quality Directive (2008/50/EC) [1] [2]. Please provide the most recent data available.

Table 1: Benchmarking Data - Air Quality

∗ For EGL applicants the following applies: in case there are no sampling points reporting under the Ambient Air Quality Directive in the city, indicate to which air quality zone the city belongs and briefly describe the latest air quality assessment available for this zone.

Indicator for each sampling point (only sampling points reporting under the Ambient Air Quality Directive (2008/50/EC))		**Unit**	**Year of Data**
Number of sampling points reporting $PM_{2.5}$	2	No.	2022
Annual average $PM_{2.5}$ concentration for each sampling point	6,5 / 12,6	µg/m^3	2022
Number of sampling points reporting PM_{10}	4	No.	2022
Annual average PM_{10} concentration for each sampling point	21 / 20 / 26 / 18	µg/m^3	2022
Number of days where the daily limit value for PM_{10} of 50 µg/m^3 has been exceeded per year for each sampling point	13 / 3 / 18 / 8	No.	2022
Number of sampling points reporting NO_2	4	No.	2022
Annual average NO_2 concentration for each sampling point	16 / 12 / 26 / 28	µg/m^3	2022
Number of hours in which the hourly limit value for NO_2 of 200 µg/m^3 has been exceeded per year for each sampling point	0 / 0 / 0 / 0	No.	2022

Please elaborate on the benchmarking data entered in the table above. Please provide the following information:

1. A breakdown of the sources of air pollution (e.g. the contribution of different local sources and from long-range transport to the annual mean concentration of $PM_{2.5}$, PM_{10} and NO_2, as mentioned in the table above).

2. Maps of air pollutant concentrations. If there are other sampling points in your city besides those reporting under the Ambient Air Quality Directive (2008/50/EC), please also provide data from this additional monitoring and/or modelling, and indicate clearly which data falls into which category.
3. The existence and implementation status of an air quality plan as per the Ambient Air Quality Directive (2008/50/EC).
4. The city's current approach to informing, raising awareness and engaging citizens in terms of air quality.

(max. 1000 words and five graphics, images or tables)

Vilnius is located between the hills, in the valley along the Neris River. This geographical configuration determines the accumulation of pollutants in the river valley, so the central districts (Žvėrynas, Šnipiškės and Old Town) are subject to higher air pollution. Meteorological factors are also significant. The prevailing dry and windless weather without precipitation increase pollutant build-up, posing an additional challenge for Vilnius City Municipality in managing ambient air pollution.

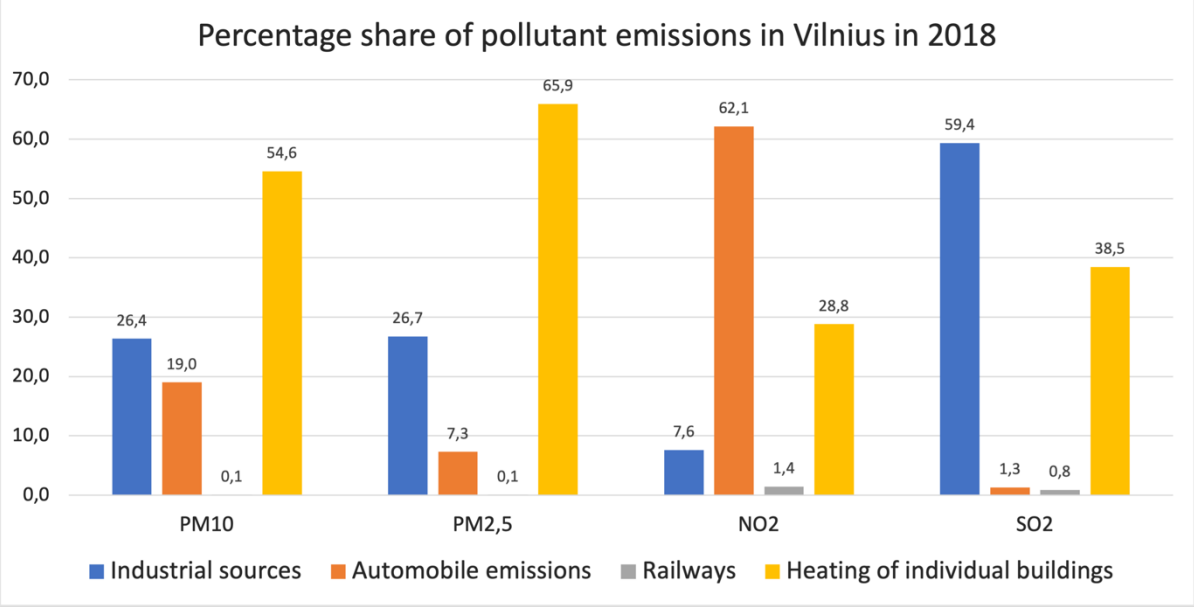
[1] https://www.eea.europa.eu/themes/air/air-quality-concentrations/classification-of-monitoring-stations-and
[2] https://www.eea.europa.eu/themes/air/explore-air-pollution-data

According to the State Land Fund data of 2019, forests cover 35.7% of the territory of the city and vegetation is known to be a barrier for stopping PM and dust spread. In recent years, Vilnius has launched its "Green wave" initiative aiming to plant vegetation along most of its streets, and to further improve the ambient air quality. According to the European City Air Quality Viewer platform, air quality in Vilnius in terms of PM2,5 levels is well-rated, with Vilnius being among top 12% of cities with the best air quality.

There are four stations monitoring air quality in Vilnius, measuring concentrations of solid particles (PM10, PM2.5), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), ozone (O_3) and other pollutants. According to data of 2018, (Table 1. 1), the largest PM10 and PM2.5 emissions come from the heating of individual houses (55% and 66%, respectively) (Graphic 1. 1). Traffic is the largest source of NO2 pollution (62% of emissions). Since 2015, the average age of cars of Vilnius inhabitants has been increasing, with more vehicles belonging to EURO 3 class and higher, thus gradually reducing pollutant emissions.

Pollutant emissions in Vilnius in 2018 by source, in tonnes						
	PM10, t	PM2.5, t	NO2, t	SO2, t	CO, t	B(a)P, t
Industrial sources	600,6	491,86	75,72	237,93	3217,36	0,04682
Automobile emissions	432,63	133,9	617,55	5,25	2077,27	0,0092
Railways	1,32	0,99	14,36	3,4	15,39	0
Heating of individual buildings	1243,91	1212,18	286,4	154,19	8832	0,00014
Total	2278,46	1838,93	994,03	400,77	14142,02	0,05616

Table 1. 1 However, the city has been making efforts to offer alternative transport, including the construction of 100 km of new bicycle infrastructure since 2016, continuous renovations of public transport, installation of new hiking paths, and easily accessible



Graphic 1. 1 Percentage share of pollutant emissions from different sources

Other sources of PM pollution include emissions from construction sites and industrial activities; wind lifting particulate matter and dust from dry surfaces; smoke from fires, burning of grass and waste in the suburbs and gardens during the warm season. Recently Vilnius started applying measures to tackle pollution from the streets and other surfaces, also educating residents on pollution reduction.

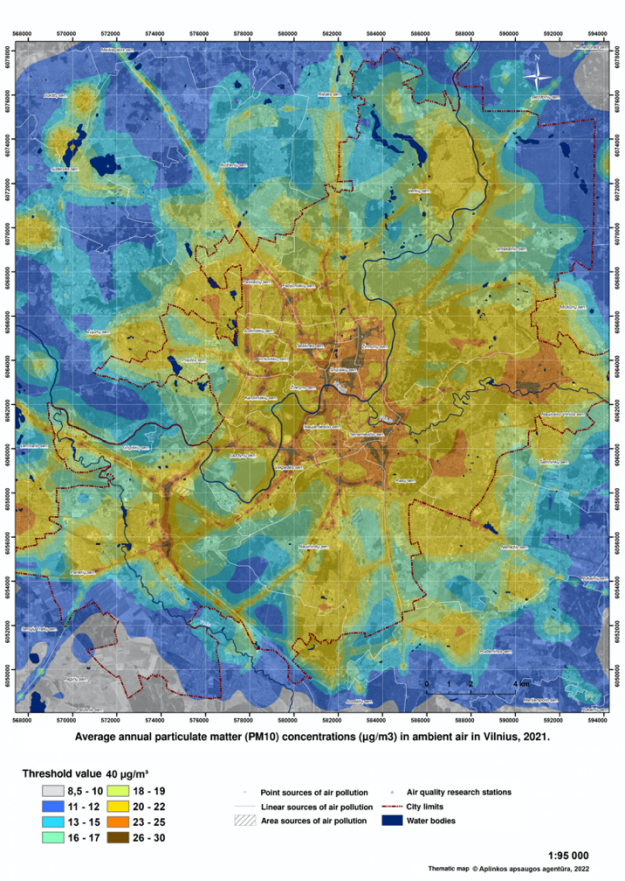
Vilnius has an extensive trolleybus system, carrying around 200,000 passengers every day (city busses transport 300,000 passengers), thus contributing to reduction of traffic pollution. Also, Vilnius offers a bicycle, electric car and electric scooter-sharing services.

In 2021, Vilnius launched its new Street Infrastructure Standard which is now used as a basis for managing the city's streets. It outlines 12 main principles targeted at making streets of Vilnius more attractive for pedestrian, bicycle and other light means of traffic. In 2022, the Vilnius City Council updated the long-term Vilnius City Sustainable Mobility Plan for 2030 aiming to improve city's public transport infrastructure and expand cycling path network.

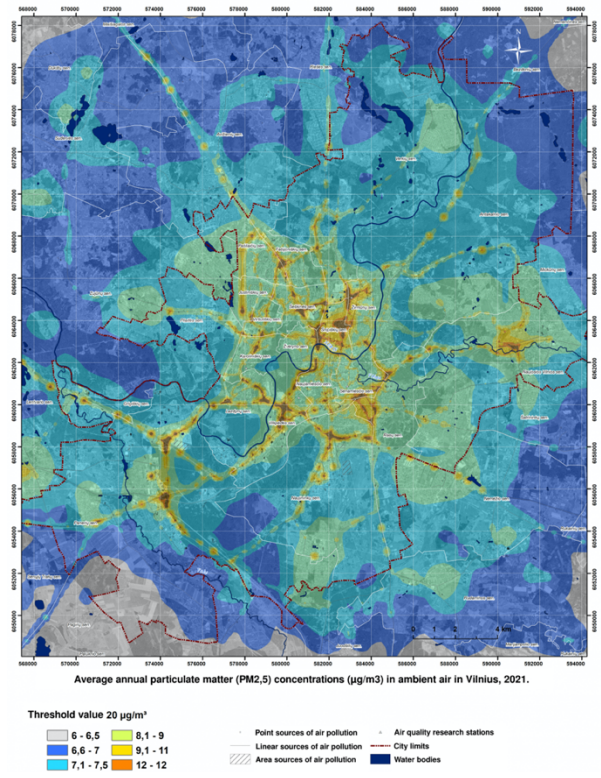
The Environmental Protection Agency's Vilnius city ambient air pollution maps 2021 below display the modelled annual average concentrations of PM10, PM2.5 and NO_2. The maps were obtained using ADMS-Urban 4.1.1 simulation software containing various data from 2021: meteorological data, average daily traffic flows, information on residential areas, residential heating and fuel types, stationary pollutant emissions data, etc.

According to the models, the highest PM10 and PM2.5 concentrations (Map 1. 1 and Map 1. 2) are observed around large industrial, heating facilities and in areas where houses are heated individually, also in the downtown area and around heavily congested streets. Highest NO_2 pollution (Map 1. 3) is distributed in areas of heavy traffic (central Vilnius) and where houses are heated individually.

In the preparation of the Air Quality Management Programme and Action Plan of Vilnius City 2020-2025, additional air quality measurements were made. The impact of small stationary sources of air pollution (stoves and solid fuel furnaces) was assessed. NO_2, SO_2, CO and VOC concentrations were analysed in 10 blocks of low-rise houses throughout the city using passive sorbents. These analyses revealed that household sources significantly contribute to PM10, PM2.5 and NO_2 emissions.



Map 1. 1 Average annual PM10 concentrations in ambient air in Vilnius.

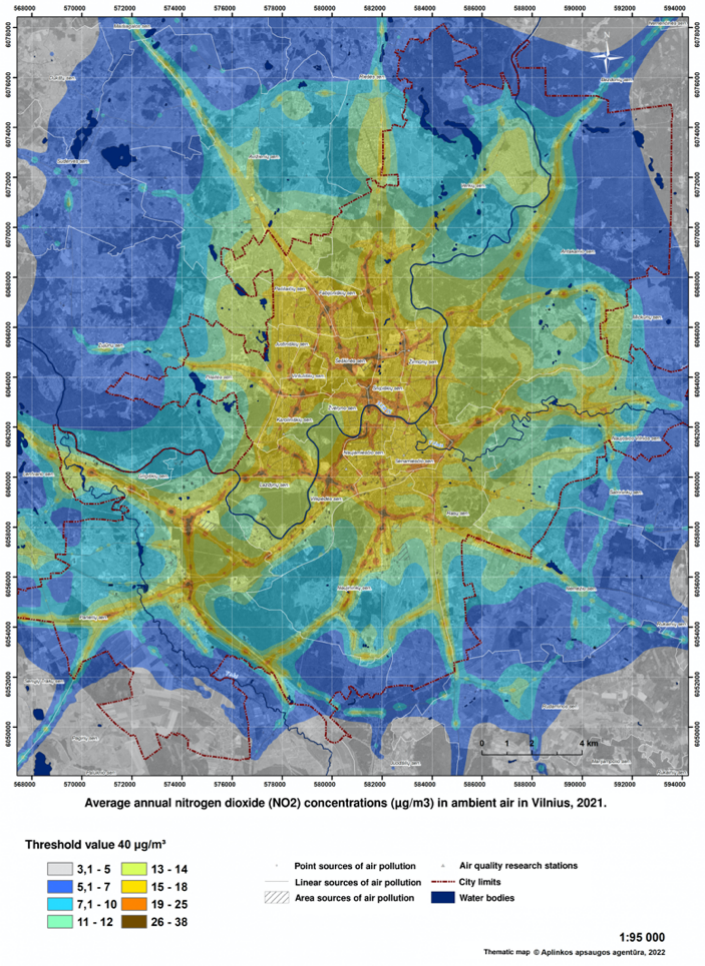


Map 1. 2 Average annual PM2.5 concentrations in ambient air in Vilnius.

Directive (2008/50/EC) was transposed to Lithuanian law, and municipalities are now required to propose ambient air quality management measures. In 2017-2018, ambient air was monitored in Vilnius according to the 2015-2018 Air Quality Management Programme. Most measures were implemented successfully. During 2020-2022, 151 air quality improvement measures were already implemented or began to be implemented as part of the 2020-2025 ambient air quality management programme.

The City of Vilnius informs residents about the ambient air quality on its website and social media page. In case of an increase in air pollutant concentrations, residents get notifications sent to their phones and are informed through mass media. Vilnius also has a dedicated city's environment information website and advanced public platform “Miesto plaučiai” (“City Lungs”) posting real-time information on air quality and warning inhabitants during the pollen season, so that people suffering from allergies can take precautions.

The city's environment page publishes articles and reports related to air quality. In 2022, Vilnius residents were provided with information about the dangers of burning old grass, increased air pollution levels, air quality in Vilnius in 2021; dangers of burning plastic; works to be done at the beginning of the heating season; benefits of building renovation, use of renewable energy resources and others. Moreover, Vilnius inhabitants can report their concerns or observed violations to the city’s administration on the www.tvarkaumiesta.lt platform.



Map 1. 3 Average annual NO2 concentrations in ambient air in Vilnius

1.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years. Please provide the following information:

1. Charts showing the following trends over a period of 10 years:
   a. Annual average concentration of $PM_{2.5}$, PM_{10} and NO_2 for each sampling point reporting under the Ambient Air Quality Directive (2008/50/EC), clearly indicating if and when annual limit values were exceeded.
   b. Number of daily limit value exceedances for PM_{10} per year for each sampling point reporting under the Ambient Air Quality Directive (2008/50/EC).

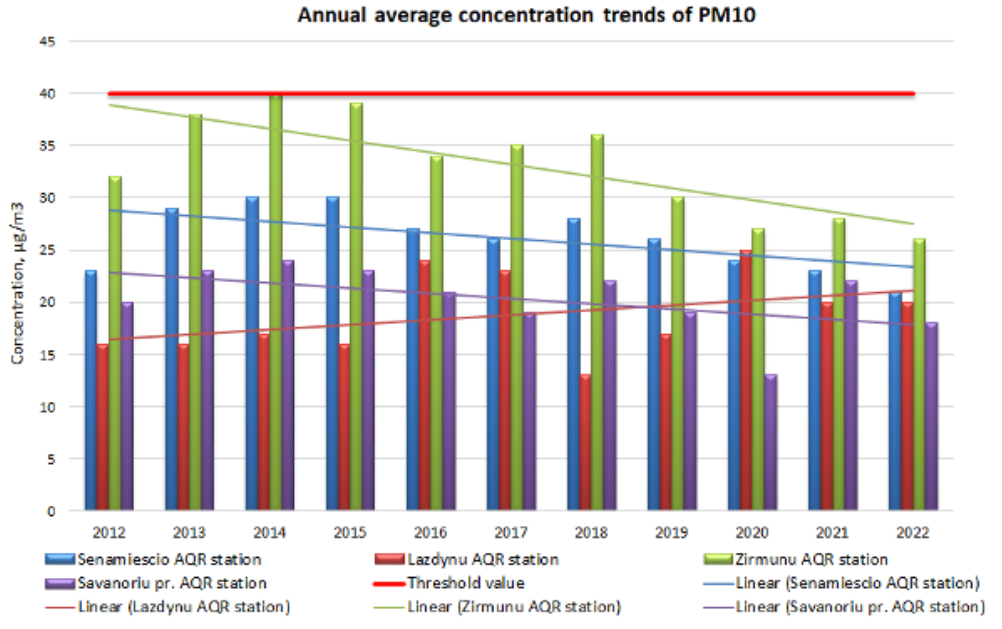
c. Number of hourly limit value exceedances of NO_2 per year for each sampling point reporting under the Ambient Air Quality Directive (2008/50/EC).

2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under point 1.

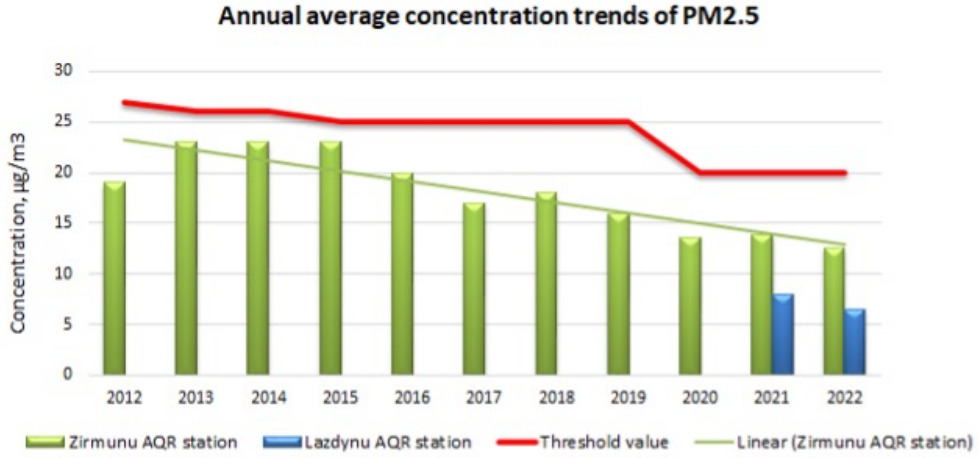
(max. 600 words and five graphics, images or tables plus the requested charts detailed above)

Graphic 1. 2 shows the change in annual average PM10 concentrations in 4 monitoring stations in Vilnius over the period of 10 years. The annual average concentration threshold value has not been exceeded during this time, and there were trends of decreasing concentration of PM10 pollution observed in some parts of the city.

The annual average PM2.5 concentrations (Graphic 1. 3) have also been decreasing over the 10-year period without any exceedances of threshold value.

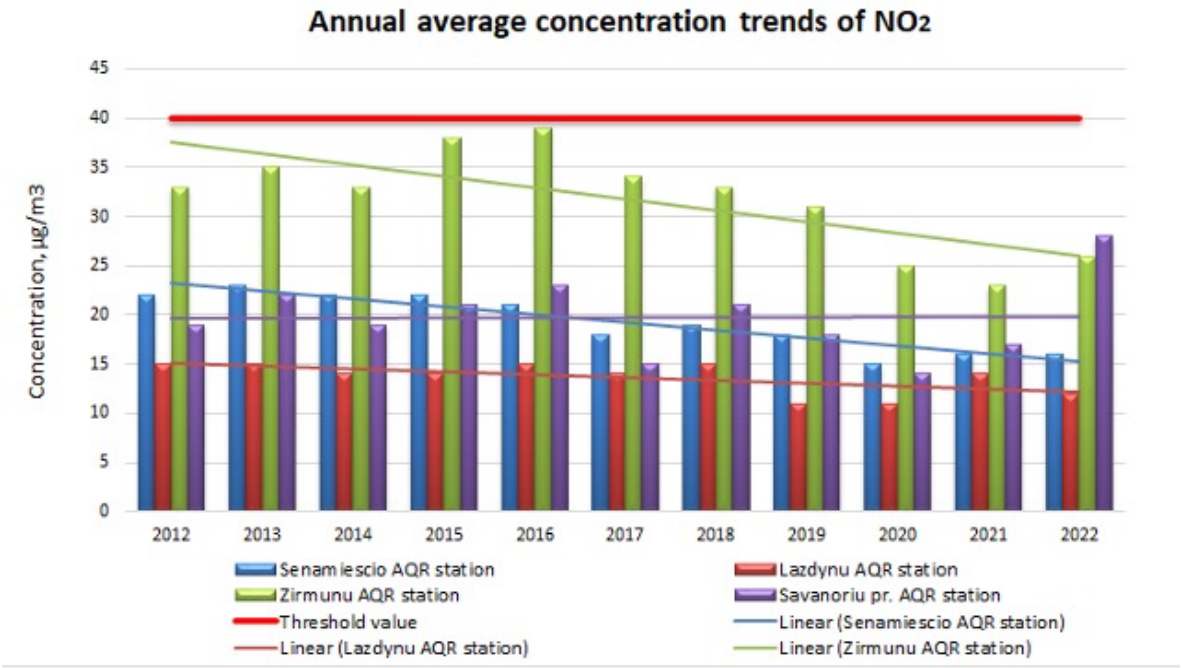


Graphic 1. 2 Annual average PM10 concentrations in 4 monitoring stations in Vilnius over 10 year period.



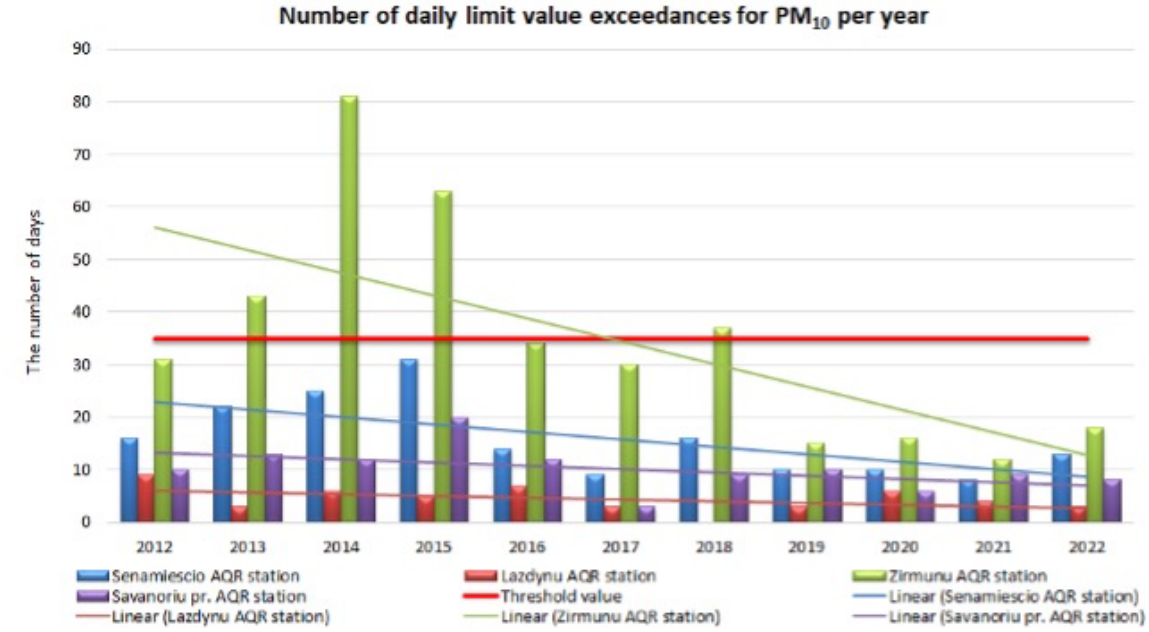
Graphic 1. 3 Annual average PM2.5 concentrations in Vilnius over 10 year period.

The annual average NO2 concentrations (Graphic 1. 4) were relatively stable over 10-year period with a slight decreasing trend. No exceedances of threshold values were recorded.



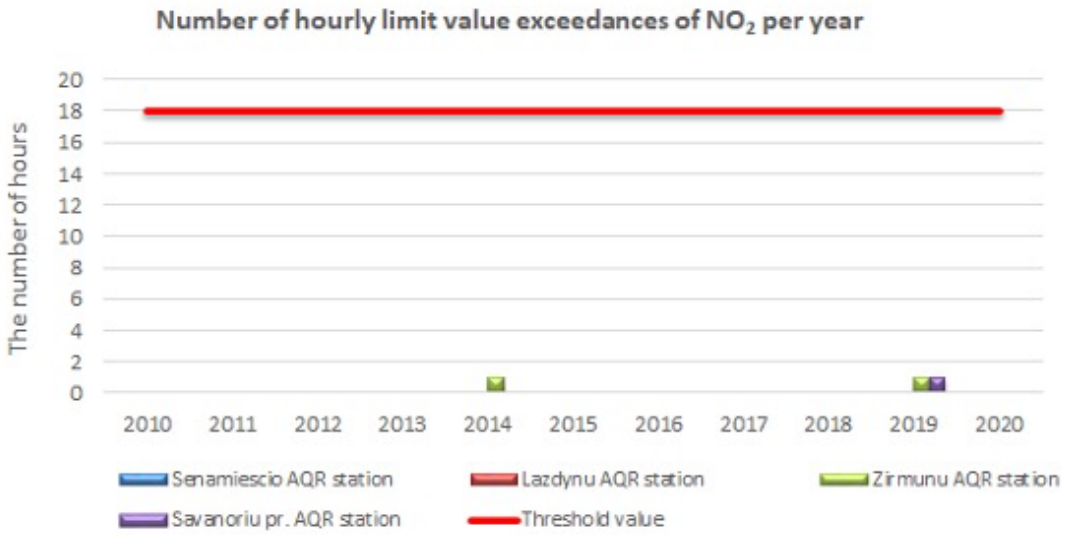
Graphic 1. 4 Annual average NO2 concentrations in 4 monitoring stations in Vilnius over 10 year period.

When it comes to PM10 concentration daily limit exceedances (Graphic 1. 5), there has been a decreasing trend over the 10-year period as measured in all 4 monitoring stations. The threshold number of days (35) in Žirmūnai monitoring station was exceeded in 2013 (43 days), 2014 (81 day), 2015 (63 days) and in 2018 (37), but from 2019 to 2022 this number decreased to below 20 and threshold limit was not exceeded. Overall, all 4 monitoring stations recorded a decreasing trend in the number of daily limit exceedances. Thus, the measures taken by Vilnius city municipality to reduce pollution were successful.



Graphic 1. 5 Number of PM10 concentration daily limit value exceedances in 4 monitoring stations in Vilnius over 10 years.

Regarding the hourly limit values (Graphic 1. 6) of NO_2 concentrations, there was only 1 instance in 2014 and 2 instances in 2019 when the hourly limit values were exceeded, but the threshold number of exceedances was never reached.



Graphic 1. 6 Number of NO2 concentration hourly limit value exceedances in Vilnius over 10-year period.

The Vilnius Ambient Air Quality Management Programs 2012-2014, 2015-2018, 2020-2025 and their respective action plans list the main measures implemented in Vilnius city that affected pollution reduction, including more than 250 different measures aimed at improving air quality.

In the 10-yer period, a number of changes were implemented in Vilnius, contributing to decreasing trends of air pollutant indicators. These included: renovation of the outdated city infrastructure (roads, engineering networks), using more modern and less polluting equipment and materials; renewal of the outdated public transport fleet with newer less polluting and more efficient vehicles - Vilnius started to run electric buses or hybrid electric buses, bought 50 additional low-polluting LPG powered buses and is in the process of purchasing 90 trolleybuses;

Picture 1. 1 New trolleybuses of Vilnius that will contribute to reducing ambient air pollution.

In the central parts of the city traffic is being reorganised in a more efficient manner to reduce congestion and thus pollution, public transport traffic is also being optimised; the cycling path network and the bicycle ride-share infrastructure has been expanded and developed, which has been very popular among Vilnius residents and improved access to the central part of the city; new electric vehicle charging stations are being set up;

new green areas are formed, “green infrastructure” is being further developed in the city, which may help reduce pollution spread from roads and other areas/ objects.

Picture 1. 2 City's bicycle ride-share service is available in central parts of Vilnius.

Picture 1. 3 Dense vegetation barriers, such as the shrubs along the street help to reduce particulate matter spread.

Industrial and energy companies also applied measures to reduce pollution and adapt to the new environmental standards: some of them phased-out old, inefficient and polluting devices, installing new more efficient technologies that use fewer natural resources and emit lower pollutant levels. The city's promotion and the state's financial mechanism that facilitates phasing-out of old vehicles encouraged many residents to switch to new or newer vehicles having lower pollutant emission levels. Another successful programme supported the replacement of old inefficient and polluting solid fuel boilers by smart heat-generating systems that have little or no pollutant emissions. Also, residential and some public and educational buildings have been renovated, contributing to better energy use efficiency and thus reducing pollution.

1.C Future Plans

Please describe the following:

1. The medium term (2030) and long term (2050) objectives regarding air quality, with a focus on $PM_{2.5}$ and NO_2, and keeping in mind the 2030 targets and zero pollution objective for air recently proposed by the Commission[3].

2. The planned measures to achieve the ambitions described under 1. Please also describe:
   a. which innovations your city is planning to use.
   b. whether and how air quality measures are integrated with other plans in the city, such as Sustainable Energy & Climate Action Plans (SECAPs) under the Covenant of Mayors, Sustainable Urban Mobility Plans or Climate City Contracts under the EU Mission on Climate-Neutral and Smart Cities.
3. To what extent measures and ambitions described under 1 and 2 are supported by:
   a. strategic and policy commitments
   b. budget and resource allocations
   c. plans for monitoring of impacts
   d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringement procedures under the Ambient Air Quality Directives (2008/50/EC and 2004/10/EC) that concern exceedances of air quality standards or issues with air quality monitoring in your city. If there are, please indicate how and when you are planning to have ensured compliance in your city.

(max. 600 words and five graphics, images or tables)

The medium-term goals related to air quality and emission reduction are set in:

1) Vilnius Ambient Air Quality Management Programme 2020-2025: to maintain air quality favourable for human health and the environment; to reduce PM, NO_2 and other pollutant levels, avoid threshold value exceedances; to reduce emissions from stationary and mobile pollution sources; etc.

2) Vilnius City Municipality Sustainable Mobility Plan 2030: to increase the quality of and access to pedestrian traffic so that its share increases to 35%; reduce the number of cars per thousand inhabitants to 381; reduce heavy traffic flows and their negative consequences; increase infrastructure for low or non-polluting traffic;

[3] https://environment.ec.europa.eu/news/zero-pollution-ec-proposes-rules-cleaner-air-and-water-2022-10-26_en

3) The National Air Pollution Reduction Plan of the Republic of Lithuania includes national air pollution reduction targets until 2030: to reduce NO_x emissions by 51% and PM2.5 emissions by 45% compared to 2005 baseline.

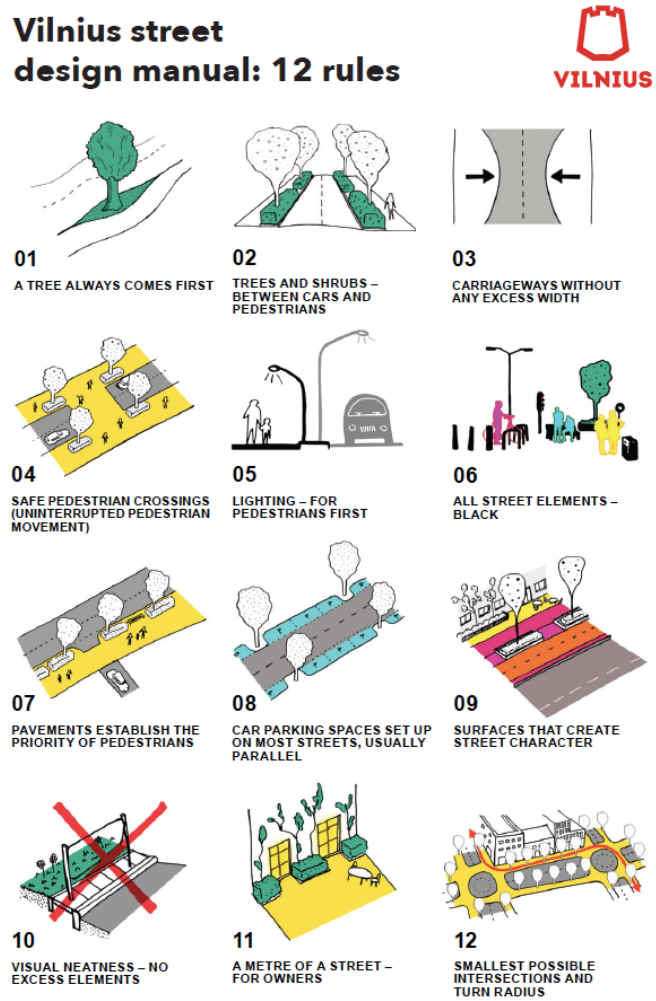
4) National Environmental Protection Strategy of the Republic of Lithuania aims to ensure that pollutant concentrations do not exceed safe limits set in international and EU legislation, ensuring protection of human health and the environment. It lays down objectives related to ambient air quality, their evaluation criteria and 2030 target environmental indicator values.

5) Lithuania Progress Strategy "Lithuania 2030" sets out the objectives for ambient air pollutant emission reduction until 2030.

Most of the planned goals of the city are also included in the state and municipal strategies, thus their achievement is also supported at the political level.

Longer-term (2050) air quality and pollution reduction targets will follow once the present and near-future measures are implemented and evaluated. They will be closely related to developments and aims of the EU policy, such as the European Green Deal's Zero Pollution Action Plan, which envisions to reach such ambient air quality where it is no longer considered harmful to human and natural ecosystem health.

To implement the air quality targets set in the above-mentioned strategic documents, respective measures have been planned and funds allocated. In its Ambient Air Quality Management Programme 2020-2025, Vilnius has foreseen numerous measures, which will help to achieve strategic ambient air quality objectives.

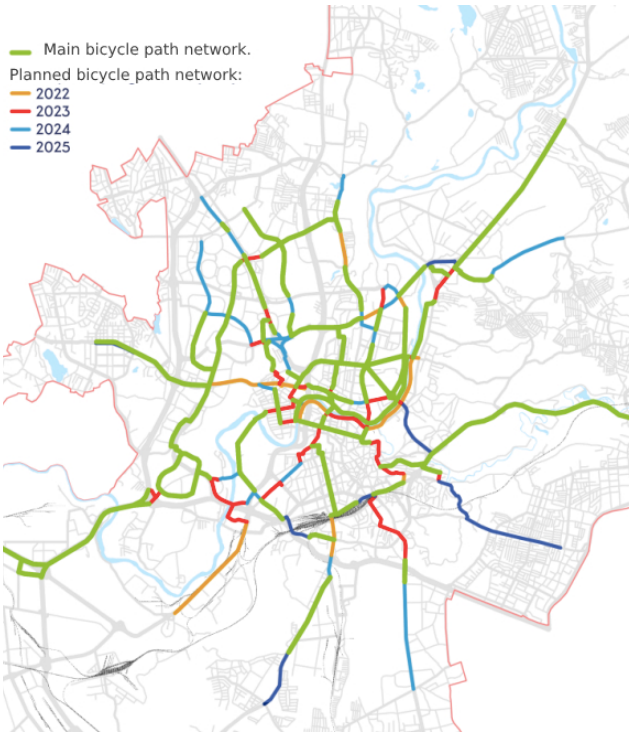


Picture 1. 4 The 12 principles of the new Street Infrastructure Standard of Vilnius.

Many measures related to Vilnius city traffic have been planned under the Vilnius City Sustainable Mobility Plan, including: improvement of cargo and transit vehicle logistics to reduce pollution; improving the appeal of public transport in the city; public transport route and traffic optimization; modernisation of the city bus and trolleybus fleet. Vilnius plans a renewal and optimisation of streets at the city centre in accordance with the new Vilnius Street Infrastructure Standard (Picture 1. 4), which is an important innovation in Vilnius, by adapting streets for pedestrian, bicycle and other light vehicle traffic.

Vilnius also plans on expanding bicycle path infrastructure (see Picture 1. 5) and sharing service and other rideshare services (electric scooters, cars, electric cars); developing electric vehicle charging infrastructure.

Furthermore, Vilnius plans to continue educating and informing the public about air quality in Vilnius and maintaining tvarkaumiesta.lt platform where inhabitants can raise their concerns, including environmental ones.



Picture 1. 5 Bicycle path network in Vilnius with newly planned paths. Source: Vilnius sustainable mobility plan until 2024.

1.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at thisstage.

(max. 400 words)

Land Fund of the Republic of Lithuania, 2019.

Vilnius „Green Wave“, Vilnius City Municipality. https://zalias.vilnius.lt/

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Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
1A	56	838	894	1000
1B	0	573	573	600
1C	88	494	582	600

2. Water

2.A Present Situation

Please complete the following table providing the most recent data that is available:

Table 1: Benchmarking Data – Water

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding drinking water, wastewater and surface and ground water bodies must be provided.

Indicator		Unit	Year of Data
Drinking water			
Drinking water consumption	85	Litres/capita/day	2022
Proportion of water losses from the distribution network	10,5%	Infrastructure leakage index ILI, or (revenue volume (on invoices)) / supplied volume) * 100	2022
Wastewater			
Number and capacity of urban waste water treatment plants (UWWTP)	One waste water treatment plant – Vilnius city waste water treatment plant Design capacity 660000 PE; Capacity of waste water treatment: • 225000 m^3/day; • BOD_7 46000 kg/day; • TN 8000 kg/day; • TP 1000 kg/day;	No. , population equivalents	2023
Treatment level which is applied in each UWWTP: primary, secondary or more stringent	Secondary (Currently, mechanical and biological treatment with nitrogen and phosphorus removal is operating in the wastewater treatment plant)	Treatment level	2023
Proportion of population connected to the waste water collecting system and treatment plant(s)	99,22	%	2023
Number of times sewer overflows occur per year	Such information is not collected	No. of times sewer overflows per year	2023
Surface and ground water bodies			
Ecological status of surface water bodies identified under the Water Framework Directive (WFD)	There are 6 rivers identified under the WFD in Vilnius. 4 of them have a good ecological status, while the other 2 – moderate. There is 1 lake identified under the WFD in Vilnius. The ecological status of the lake is good.	Status	2023
Ecological status of groundwater bodies identified under the WFD	There were 17 groundwater posts in Vilnius that were monitored in 2022. Most of their status is relatively good.	Status	2022
Classification of existing bathing sites according to requirements of the Bathing Water Directive (excellent/good/sufficient/poor)	There were 11 bathing sites monitored in Vilnius in 2022. 10 were classified as excellent and 1 as sufficient.	Classification	2022

Please elaborate on the benchmarking data entered in the table above. Please provide the following information:

Drinking water:

1. To what extent the requirements of the EU Drinking Water Directive (DWD, 98/83/EC) are met. If the parametric value of a parameter set out in the Annex I, part A and B of the EU DWD 98/83/EC was exceeded, indicate for this parameter the ratio of non-compliance i.e. the number of exceedances versus the total number of samples taken.
2. A breakdown over the last 3 years of the drinking water consumption for the different sectors (households, industry, agriculture, etc.).
3. Source of drinking water - refer to aquifers and river basin management. Also refer to non-conventional resources and water recycling initiatives.

Wastewater:

4. To what extent the requirements of the EU Urban Waste Water Treatment Directive (UWWTD, 91/271/EEC) are met (collection and treatment). Also mention any additional treatment steps beyond requirements of the UWWTD 91/271/EEC.
5. Explanation of the type of treatment applied to fraction of wastewater that is not connected to the waste water collecting systems (individual or other appropriate systems).
6. Beyond the current UWWTD, but in line with the proposal for a revised UWWTD, list any energy efficiency or energy production measures.
7. Beyond the current UWWTD, but in line with the proposal for a revised UWWTD, list any measures for the reduction of greenhouse gas emissions.

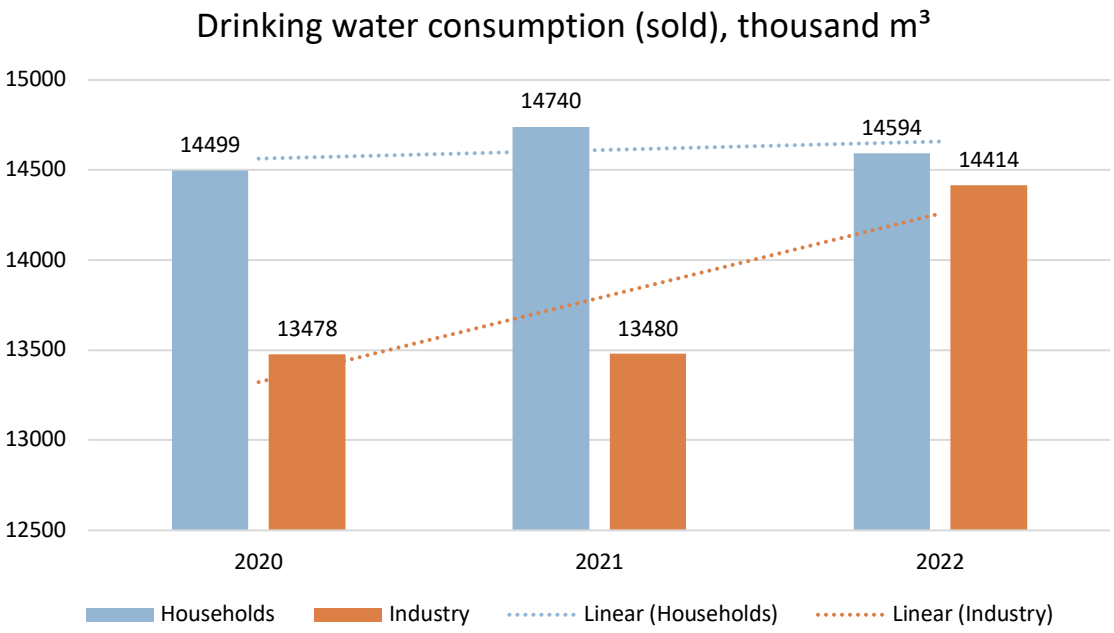
(max. 1000 words and five graphics, images or tables)

Most of drinking water supplied in Vilnius comes from deep underground (40 to 245 meter-deep) wells, which are protected from environmental impacts by waterproof rock layers. There are 20 water supply areas in Vilnius with 272 deep wells used to supply water to Vilnius districts. The requirements of the EU Drinking Water Directive (DWD, 98/83/EC) are met almost by 100 % - there are a few exceedances, however they do not have a significant adverse impact on water quality. Looking at the overall parameters, 90 % of the drinking water in Vilnius is of great or very good quality and meets all Lithuanian and EU drinking water standards.

The wells are managed by "Vilniaus Vandenys", a company partly owned by the City of Vilnius, responsible for supplying drinking water to Vilnius city consumers. In 2021, the company's laboratory tested 21,157 water samples checking 43 parameters. 6 out of the 20 water supply areas had iron and manganese parameters above the limits set in the Lithuanian hygiene norm HN24:2017, which corresponds to the parametric values set out in Annex I, part A and B of the EU DWD 98/83/EC. However, the values of these parameters did not exceed the values specified in the guidelines of WHO, which, if exceeded, may have a negative impact on health. If the laboratory finds any exceedances, it repeats sampling, and local water supply departments take measures to restore water quality.

Timely water quality information is easily accessible through the company's initiative: in spring 2021, the company launched an interactive public "Water quality map". The water quality data within it is updated at least once per month. The application provides access to detailed data for each parameter, also giving a cumulative conclusion on whether the water supplied is drinkable.

Graphic 2. 1 illustrates drinking water consumption in the last three years. Household water consumption has been quite stable with a minimum trend of increase, while the industry sector uses less water than households, however a strong increase was observed in 2022.



Graphic 2. 1 Drinking water consumption by sector for the last three years.

Great quality of drinking water in Vilnius has spurred several initiatives. The initiative "Drink clean water in Vilnius" was officially launched on 20 July 2021. The ultimate goal of this initiative is to promote good quality tap water and make it available anywhere in Vilnius (cafes, hotels, streets, gyms, etc.). During the campaign, almost 700,000 glasses of tap water were distributed, saving 240,000 plastic bottles and reducing CO2 emissions by more than 15 tons. LLC "Vilniaus Vandenys" also established a network of drinking water fountains (see Picture 2. 1) in Vilnius in 2021. The original network of 16 fountains expanded to 33 in 2022. Vilnius residents and tourists drank more than 5

Picture 2. 1 A resident filling up his bottle with water from the free drinking water fountain in Vilnius city.

million glasses of water from this free drinking water source, thus having used 2 million plastic bottles less and saved more than 3 million euro. Moreover, in cooperation with the City of Vilnius, LLC "Vilniaus Vandenys" installed stationary drinking water dispensers in more than 100 schools in Vilnius, which students can use to fill their water bottles.

Wastewater in Vilnius is collected and cleaned in one wastewater treatment plant (see Graphic 2. 2), which uses nitrogen and phosphorus mechanical and biological treatment. The wastewater treatment plant operates in line with the national Wastewater Management Regulation, which is stricter than the Urban Wastewater Treatment Directive 91/271/EEC. Wastewater sampling frequency is according to the UWWTD. The analysis of the main tested parameters (BOD_7, TP and TN) revealed treatment efficiency above the required minimum. At the end of 2021, the company started cooperation with LLC "Uvireso", to find a solution to remove phthalates and phenols from wastewater so plastic softeners could be cleaned from wastewater.

Picture 2. 2 Wastewater being cleaned in Vilnius wastewater treatment plant.

There are 3,262 households (6524 PE) in Vilnius agglomeration (includes Vilnius city and its suburbs) that are still not connected to the central wastewater collection system. Wastewater from these households is cleaned in two ways: some residents have individual wastewater treatment systems, which clean wastewater according to the standards on site, while others have large containers where wastewater is collected and then taken to a wastewater treatment company for treatment.

In 2011, LLC "Vilniaus vandenys" started a solar panel project in the company's territory. Currently, the company has 5 ground and 5 roof solar plants with the total efficiency of 692 kW. One 100 kW solar power plant allows the company produce 100 000 kWH of green energy. The company also uses biogas generated in the wastewater treatment process to produce electricity. This way, the company not only reduces costs, but also contributes to environmental protection and CO2 emissions reduction (up to 5000 tonnes annually).

In 2021, the company's vehicle fleet was supplemented with 6 new electric cars, and at the end of the year, the company had 14 fully electric cars, the use of which reduced the company's CO2 emissions

(by 12 tonnes). The company also plans to conduct an energy audit to identify the links to be modernized to further reduce GHG emissions.

Picture 2. 3 Balsiai bathing site, one of the two which were given the Blue Flag award.

LLC "Grinda" collects and cleans surface wastewater (rain and snow melt water) in Vilnius. Cleaned surface water is currently collected from 2400 ha out of 8830 ha territory, i.e. from 27 % of the total area. A total of 13 surface wastewater cleaning stations are in operation, with an efficiency of 16 170 l/s. Another 884 ha are cleaned by LLC "Vilniaus vandenys", collecting both domestic and surface wastewater.

Vilnius currently has 11 official bathing sites. According to the Bathing Water Directive, 10 of them are of excellent and 1 - of sufficient quality. Two of the beaches have won the Blue Flag award in 2021 (see Picture 2. 3 Balsiai bathing site, one of the two which were given the Blue Flag award.). In general, the monitored surface waters in Vilnius are in good condition. Condition of two major rivers of the city is moderate due to pollution concentration in Neris river and hydromorfological changes caused by barriers for fish migration in Vilnia river.

2.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved in the past ten years. Please provide the following information:

1. Trends on/changes in:

   Drinking water:
   a. Total water consumption and a breakdown over the last 10 years of the drinking water consumption for the different sectors (households, industry, agriculture, ...).
   b. Leakage management and network rehabilitation.

   Wastewater:
   a. Connection to the wastewater collecting system.
   b. Storm water management (including number of storm water overflows) and use of natural

water retention measures and/or sustainable urban drainage systems (SUDS).

c. Treatment of waste water (improvements)

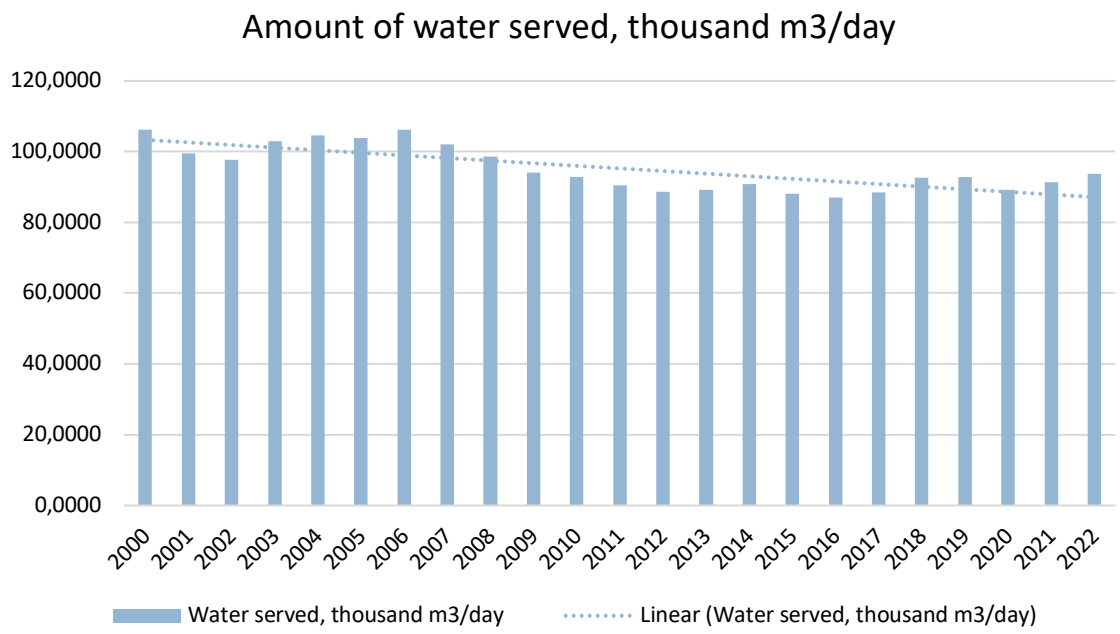
Surface and ground water:

a. River restoration (e.g. for resurfacing rivers, naturalising previous channelled rivers)

2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under point 1.

(max. 600 words and five graphics, images or tables)

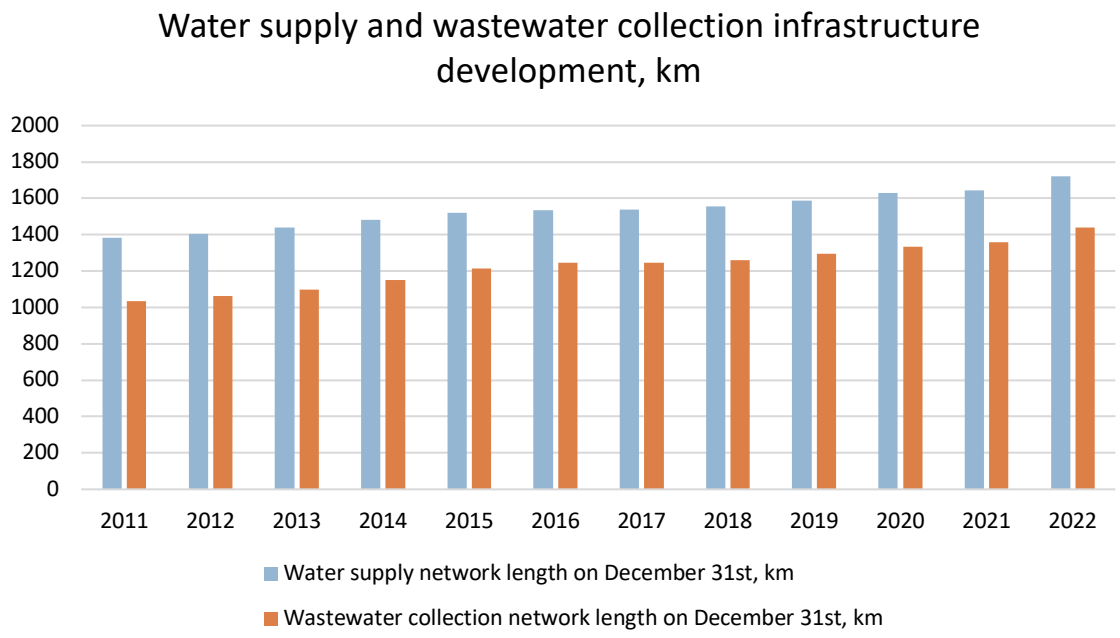
Drinking water consumption over the last 10 years by households was decreasing due to changing habits, but the demand for water in industrial sectors was increasing. Graphic 2. 2 illustrates the total dynamics of the amount of water served and the decreasing trend.



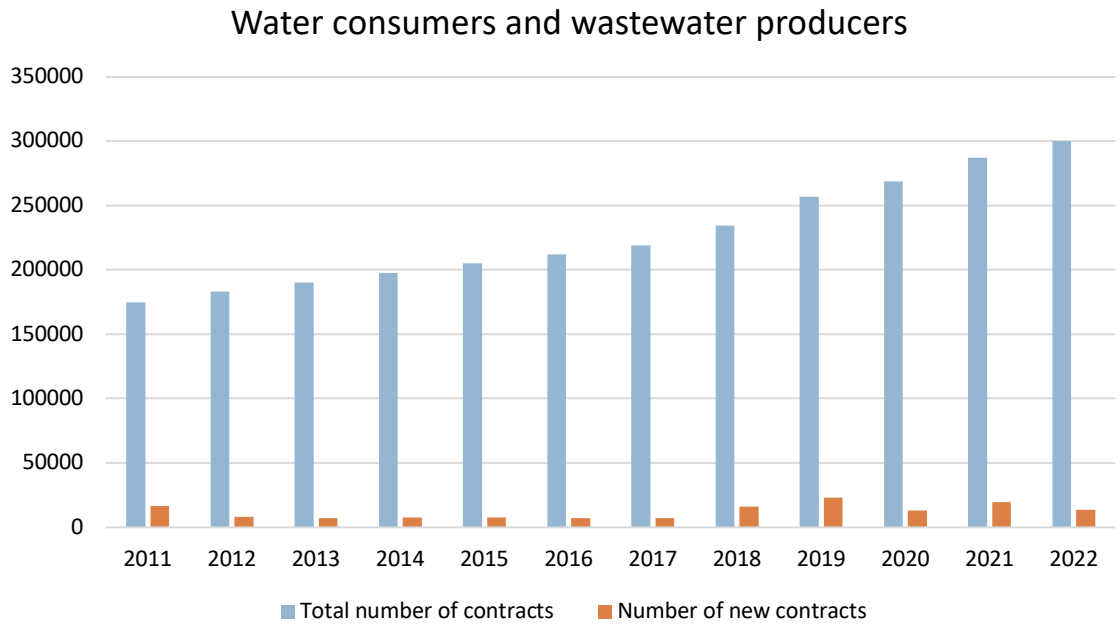
Graphic 2. 2 Amount of total water served to consumers in Vilnius for the period 2000-2022.

Since 2015, water losses decreased from 15% to 10.5% due to the applied defect management procedures, reconstruction of water supply networks, zoning of water supply areas and remote water consumption metering. A leak search group was brought together, using acoustic devices to search for leaks and a hydraulic simulation information system to simulate water volumes between water supply areas and to identify potential leaks.

During the 11-year period (2011-2022), the water supply and wastewater collection infrastructure was heavily expanded in Vilnius. Graphic 2. 3 shows that the water supply network length increased more than 24 %, while the wastewater collection system length increased more than 40 %. This allowed to collect and clean much more wastewater compared to ten years ago. In line with the expansion of the water supply and wastewater collection infrastructure, more contracts with water consumers and wastewater producers have been signed (an increase of almost 72 % in 11 years) (see Graphic 2. 4).



Graphic 2. 3 Water supply and wastewater collection network expansion in the period of 2011-2022



Graphic 2. 4 The increase of water consumers and wastewater producers in the period of 2011-2022.

In 2017, LLC “Grinda” launched 5 major projects to increase the capacity of surface wastewater and stormwater collection and treatment. One of the projects was finished in summer of 2020, increasing the treatment capacity by 750 l/s and collecting surface water from the area covering 93,3 ha. Other three projects are also in progress, while the fifth is in planning stages. Innovative approaches were integrated in some of the projects, for example: one surface wastewater capture reservoir will also act as a pond in a newly created recreational zone for the city residents (see Picture 2. 4 Visualization (left) and finished (right) surface wastewater capture reservoir in beginning of 2022.).

In order to improve fish migration conditions, the City of Vilnius constructed special fish-ladder for fish migration in two dams in Vilnia river.
The City initiated infrastructure development programs that have increased the number of users connected to district water supply and domestic wastewater networks, thus ensuring sustainable

Picture 2. 4 Visualization (left) and finished (right) surface wastewater capture reservoir in beginning of 2022.

domestic wastewater management and safe drinking water supply. It also made a significant contribution to infrastructure reconstruction to reduce water losses and infiltration into sewage networks. The City of Vilnius continues to create and provide strategic directions for sustainable development and operation of the infrastructure to maximise the capacities and quality of water supply and wastewater treatment.

2.C Future Plans

Please describe the following:

1. The objectives for 2030 and 2050 in terms of:
    a. Drinking water (incl. water saving and reuse)
    b. Wastewater treatment and management (incl. improvements in the collecting systems and in the UWWTPs). Adaptation to the requirements of the proposal for a revised UWWTD.
    c. Surface water and ground water bodies (incl. the management measures taken in order to improve bathing water quality/plans to officially identify and monitor new bathing sites, river restoration projects)
2. The planned measures to achieve the ambitions described under 1, including how they are influenced by the expected impacts from climate change and other long-term trends. Please also indicate which innovative approaches your city is planning to use and keep in mind the new targets from the Commission on water quality [1].
3. To what extent measures and ambitions described under 1 and 2 are supported by:
    a. strategic and policy commitments
    b. budget and resource allocations
    c. plans for monitoring of impacts
    d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringements regarding the relevant EU legal frameworks on Water. If there are, please indicate how and when you are planning to comply.

[1] https://environment.ec.europa.eu/news/zero-pollution-ec-proposes-rules-cleaner-air-and-water-2022-10-26_en

(max. 600 words and five graphics, images or tables)

LLC “Vilniaus vandenys” has a prepared long-term activity strategy for 2023-2032. The strategic goals set in the strategy are in line with the United Nations Sustainable development goals. The document provides for strategic goals for the reduction of water losses and infiltration into sewage networks:

Reduction of water losses:
• General losses reduced from 15 % in 2022 to 9 % in 2032.
• Reduction of water losses in apartment buildings from 8 % in 2022 to 2 % in 2032.
• Reduction of water losses in water supply networks from 12 % in 2022 to 8 % in 2032.
• Reduction of infiltration into sewage networks from 27 % in 2022 to 18 % in 2032.

The strategy also sets goals for better wastewater treatment efficiency:

- Discharge of hazardous priority substances specified in Annex 1 of the Wastewater Management Regulation with wastewater, tons per year - from 0,016 in 2022 to 0,000 in 2032.
- Estimated release of pollution with wastewater - BOD7, tons per year - from 350 in 2022 to 130 in 2032.
- Estimated release of pollution with wastewater - total nitrogen (Nb), tons per year - from 730 in 2022 to 170 in 2032.
- Estimated release of pollution with wastewater - total phosphorus (Pb), tons per year - from 50 in 2022 to 10 in 2032.

A major improvement in wastewater treatment is planned once the company finishes the ongoing reconstruction of the wastewater treatment plant. During the reconstruction, the facilities of the plant will be upgraded, expanding the biological cleaning chain and installing the tertiary cleaning chain (stricter cleaning). The company also plans to build an equalization tank, which would equalize the debit of water flow during heavy rainstorms and help deal with overflows of the wastewater cleaning system. Also, after finishing the expansion of the wastewater collection infrastructure, 99,95% households will be connected to the central system in Vilnius agglomeration (currently 98,97% of households are connected).
To reach the above-mentioned goals, the plan is to also increase the number of metered water supply zones and to reconstruct water supply networks. Also, TV diagnostics of domestic wastewater networks is planned in search of infiltration sources, conducting further reconstruction works of wastewater networks and searching for illegal connections to rainwater collection places.

When it comes to improving quality of surface and groundwater bodies, strategic goals generally relate to a more efficient wastewater treatment system. However, as from 2023, the city plans to monitor two more bathing sites (13 in total). A major project for restoring the connectivity of one of the most valuable rivers within Vilnius is planned to be implemented by the city administration by 2025. The documentation procedures have started in autumn 2022 and the 1.5 million euro-worth financing contract was signed on 30 December 2022. The main project goal is to remove obstacles to fish migration at the Grigiškės dam and hydroelectric power plant, and to improve the condition of the water body by restoring the natural flow of the Vokė river (see Picture 2. 5).

Picture 2. 5 Dam on the Vokė river, which is planned to be removed.

The company has a very clear monitoring system, monitoring strategic indicators related to increasing the efficiency of wastewater treatment on a monthly basis. Also, a stakeholder impact analysis is carried out periodically.

The city has no existing or pending legal procedures for environmental protection violations.

2.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at thisstage.

(max. 400 words)

LLC “Vilniaus vandenys”. Drinking water quality map.

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https://aplinka.vilnius.lt/wp-content/uploads/2022/07/2022_pozeminis_zip.pdf

LLC “Grinda”. Information on surface wastewater cleaning and developed projects.

https://www.grinda.lt/pavirsiniu-nuoteku-tvarkymas/

Water quality of Vilnius County bathing sites in 2022.

http://www.smlpc.lt/lt/aplinkos_sveikata/maudyklos/_vilniaus_apskrities_maudyklu_vandens_kokybe_2022_m.html

Characteristics of Vilnius County bathing sites.

http://smlpc.lt/lt/aplinkos_sveikata/maudyklos/maudyklu_charakteristikos_-_vilniaus_apskritis.html

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
2A	0	989	989	1000
2B	0	463	463	600
2C	0	543	543	600

3. Biodiversity, Green Areas & Sustainable Land Use

3.A Present Situation

Please complete the following tables:

Table 1: Benchmarking Data – Land use within the city

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding land use within the city.

Land Use Data (in % of total surface area)	**Inner City[1]**	**Overall City[1]**	**Unit**	**Year of Data**
Public Green Area	25,7	40,3	%	**2023**
Private Green Area	n/d	n/d		
(Urban) Agricultural Land	5,1	17,8		
Water	2,1	2,2		
Other	67,1	39,7		
Total	**100%**	**100%**		
Urban tree canopy cover (% of total surface area)	**34,8**	**44,3**		
Population Data	**Inner City[1]**	**Overall City[1]**	**Unit**	**Year of Data**
Population density in built-up areas (city area minus green and blue)	**54**	**14**	Inhabitants/ha	**2022**
Percentage of people living within 300 m of green urban areas of >5,000 m²	**94,2**	**94,7**	%	**2022**

Table 2: Benchmarking Data – Nature and Biodiversity

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding nature and biodiversity.

Indicator	**Number**	**Total Area (ha)**
Number and total area of **Natura 2000 sites** within the city limits	**18**	**1696**
Number and total area of designated sites of **national** biodiversity importance within the city (habitat/species management areas)	**6**	**4975**
Number and total area of designated sites of **local (city)** biodiversity importance within the city (habitat/species management areas)	**10**	**1648**

This section is aimed at providing information on the current importance of green areas and biodiversity in your city. Please provide the following:

1. *A brief explanation of the data in the above tables.*
2. *One or more maps with the following information:*
   a. *protected areas, sites, habitats, ecosystems or biotopes.*
   b. *land use, showing the municipality boundaries delineating the overall city area and the inner-*

[1] Please refer to Guidance Note on how to delineate 'Inner City' and 'Overall City'.

city area.

c. *green and blue (water) areas in the city, and their connectivity and coherence.*

3. *The species and habitat monitoring programmes your city has in place.*
4. *Your city's approach to involving and engaging residents, visitors, business and institutions in planning and action for nature.*

(max. 1000 words and five graphics, images or tables)

For decades Vilnius has been literally considering being a green capital. Its public green areas cover 40.3 % of the city (25.7 % are in the inner-city), while total urban green space covers app. 61% of the city area. Most of the city's green spaces are forest parks, but app. 17.5 % the territory is classified as agricultural land, shaping more open grassland landscapes. This part of land use covers 5.1% of the Inner City and significantly contributes to the diversity to the overall forested urban landscape. The central part of the city is located in the valleys of the Neris and Vilnia rivers. Neris is the second largest river in Lithuania. Most of the river terraces in the city are covered in forests, where no commercial forestry is carried out. These areas of natural forests stretching along the rivers form distinctive, recognizable urban landscape and shape ecological corridors of national and local importance, contributing to rich biological diversity of the city of Vilnius. There is a total of 13 rivers, 73 lakes and 57 ponds in the territory of Vilnius.

Picture 3. 1 The central part of Vilnius is located in the Neris River valley and is surrounded by a natural forested landscape.

The abundance of forest-type parks is a distinctive feature of Vilnius. Located in the central part of the city, with an area of almost 200 hectares, Vingis Park is the largest and most visited green area in the capital, with one of the oldest forests in Lithuania. Several centuries-old pine tree stands predominate the park, with the oldest ones being 300 years of age. 300-400 thousand people visit the park every year due to its convenient location in the city and the developed network of trails suitable for pedestrian and bicycle traffic.

Urban tree canopy cover accounts for 44.3 % in the city of Vilnius, and this indicator of green spaces totals 34.8 % in the city centre. Population density in built-up areas of the city centre and in the entire city is 54 and 14 inhabitants per hectare, respectively, and almost 95 % of people live within 300 meters of green urban areas greater than 5,000 m^2.

Special approach to public lawns management allows enjoying natural ecosystems of grasslands in the city (for more information, see the Climate Change Adaptation chapter). Areas, which are not actively used for walking or leisure, have been transformed into flowering meadows mowed twice a year. It provides aesthetic value, habitat for pollinators and enhances biodiversity. More distant grassland areas are even more extensively managed to maintain wildlife. Some protected habitats involve sheep grazing to maintain favourable conservation status of protected species and landscape of high natural value.

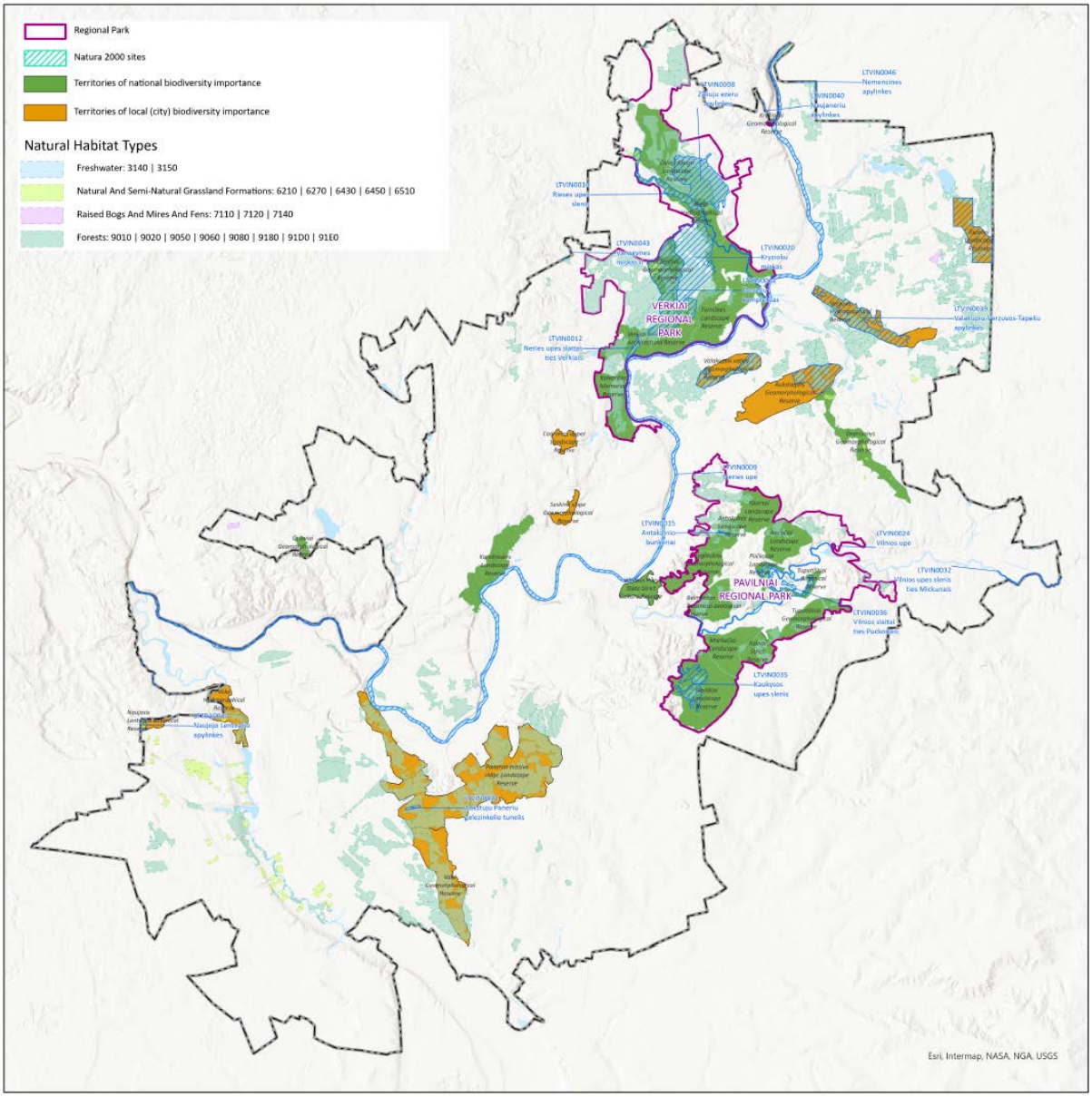
Picture 3. 2 Public lawns management in Vilnius: actively used lowns are kept short, others - transformed into flowering meadows

Even in the development of its streets Vilnius manages to protect existing and create new green spaces. Its special street standard sets priority to maintaining the existing trees as well as planting new trees and shrubs between cars and pedestrians.

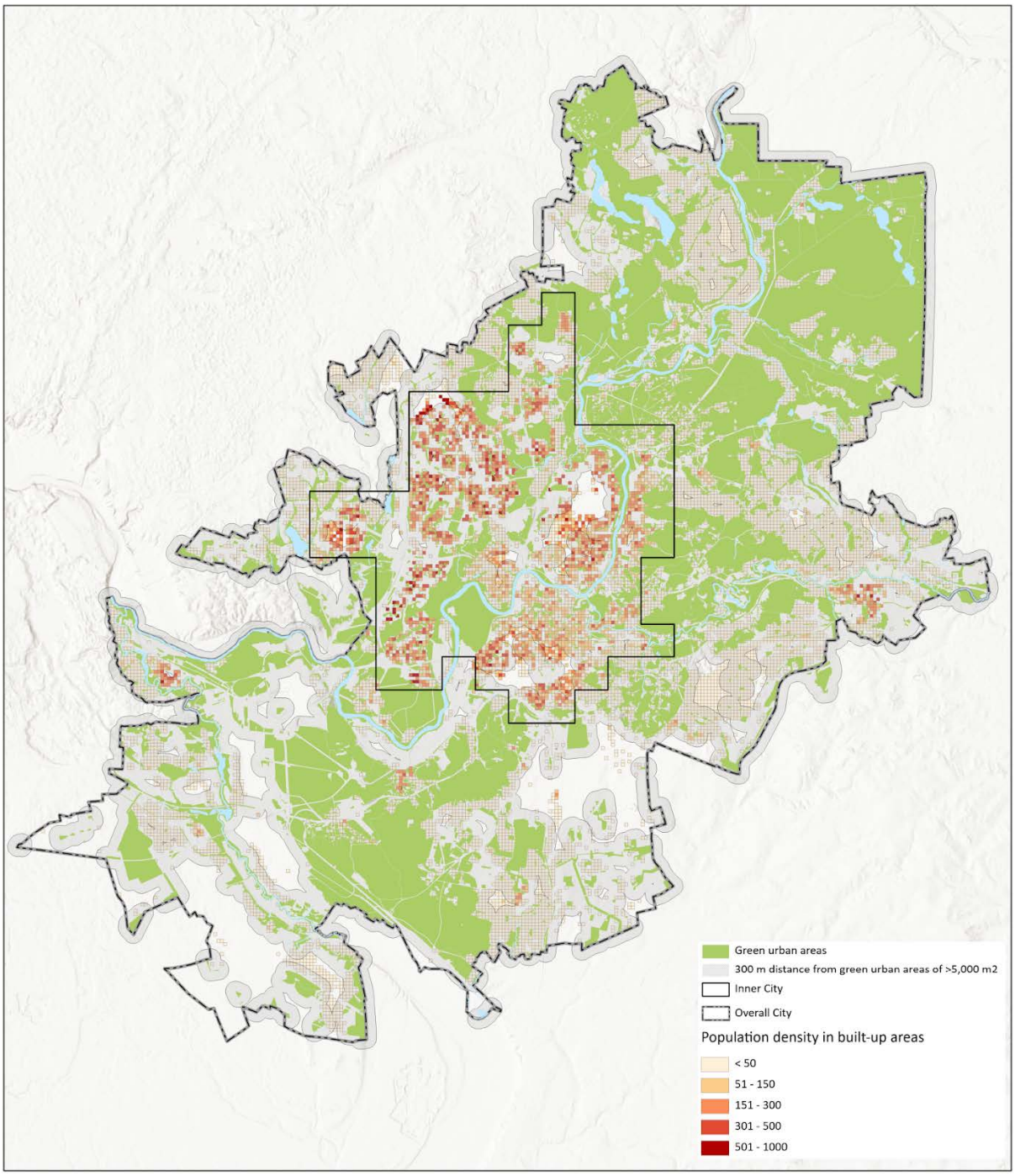
There is a total of 18 Natura 2000 sites within the city limits. Their conservation objectives target protection of 19 species and 18 natural habitats of EU importance. There are 6 protected areas of national importance (Regional Parks of Pavilniai and Verkiai, State nature reserves and State Reserve of Vilnius Castles), and 10 nature reserves established and managed by the City of Vilnius.

Since 2022, Vilnius has been running a new environmental monitoring programme approved by the Vilnius City Council. Biodiversity has been monitored by the Directorate of Pavilniai and Verkiai Regional Parks established by the City of Vilnius. The directorate is responsible for the supervision of protected areas, the protection of values and implements the biodiversity monitoring programme. The new biodiversity monitoring programme helps to obtain more detailed information about the condition of the natural environment and impact of the management activities. The programme monitors protected species, including 4 species of mammals, 2 species of amphibians, 16 species of insects, 12 species of plants, 2 species of fish, and 8 species of birds. It also monitors 4 invasive species and assesses the impacts of the grassland management standard. Annual biodiversity monitoring reports are easily accessible to the public on the website of the City of Vilnius.

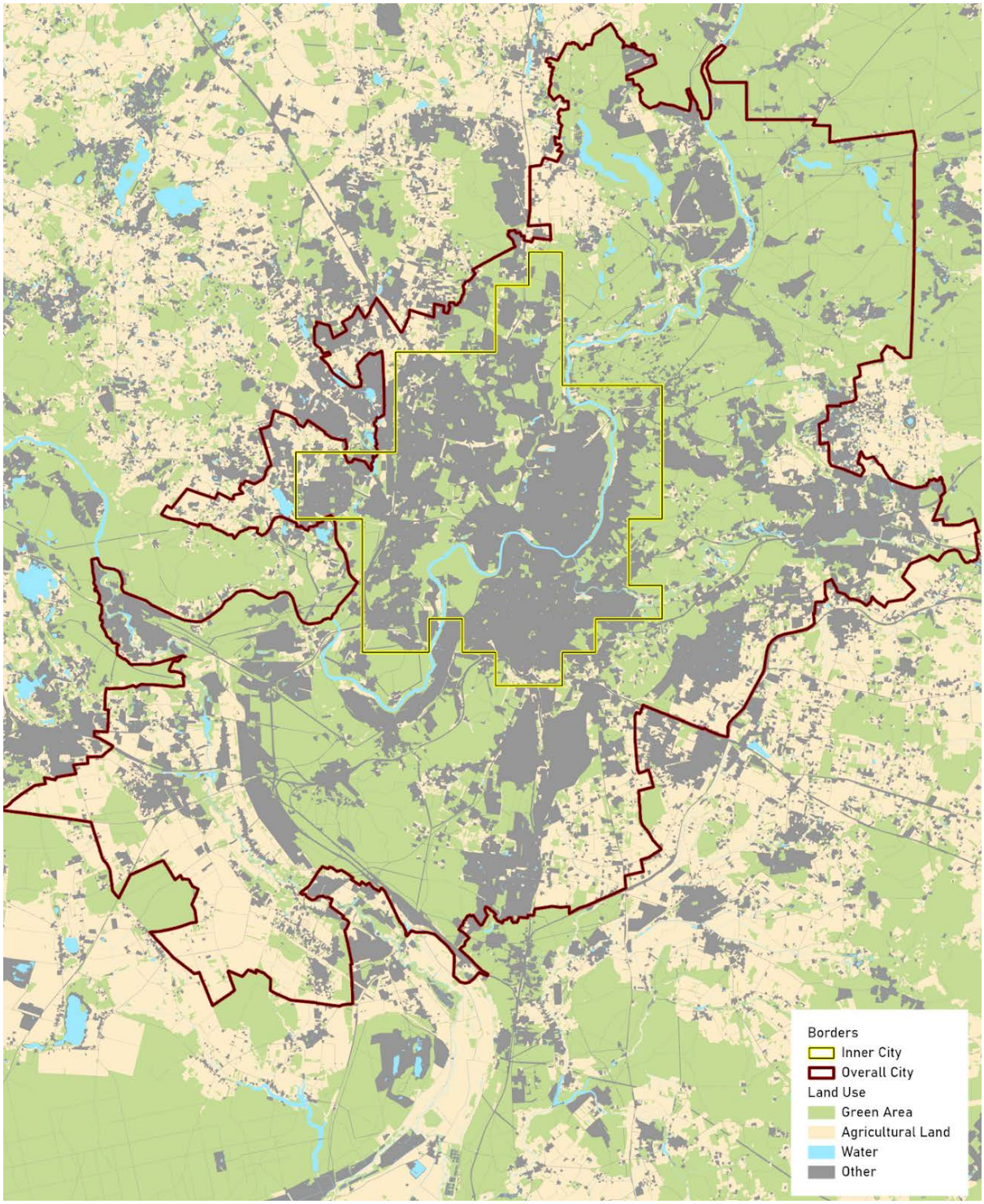
Residents take an active role in maintaining and expanding green spaces in Vilnius. Like no other city, Vilnius involves residents and businesses in the greening of the city. In 2021, Vilnius launched a greening campaign called “Green wave”, which already planted more than 68,000 trees and shrubs. A mere 2,500 plants were planted by the City of Vilnius itself, while resident communities and businesses planted the rest. The city encourages all stakeholders to get involved and participate together in the preparation and planning of various initiatives related to nature protection and its improvement. Another illustration of open and participatory approach of Vilnius governance is the involvement of its residents thought participatory budgeting process, where residents can contribute their ideas on planning recourses for the greening of Vilnius. An interactive online reporting tool available on the City’s website www.tvarkaumiesta.lt has been actively used to report any observed problems and provide suggestions on various issues, including maintenance of green spaces. Residents also give feedback and suggestions on how/where to public lawns and grasslands could be managed. An interactive map https://maps.vilnius.lt/ provides detailed online information on Vilnius green spaces and their management (e.g. sustainable lawns, invasive species management etc.).



Map 3. 1 Protected areas, sites of local biodiversity importance, and natural habitats of EU importance.



Map 3. 2 Population density and connectivity of green and blue (water bodies) areas.



Map 3. 3 Land use, showing the municipality boundaries delineating the overall city area and the inner-city area.

3.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved. Where available, quantitative information and data should be provided for the previous ten years in order to show recent trends. Please provide information on:

1. Trends on/changes in:
    a. The area protected for nature and biodiversity
    b. Presence of habitat and species
    c. The total green area within the city limits.
2. Map(s) of the location of brownfield sites (derelict zones) that have been regenerated in the past 10 years.
3. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under points 1 and 2.

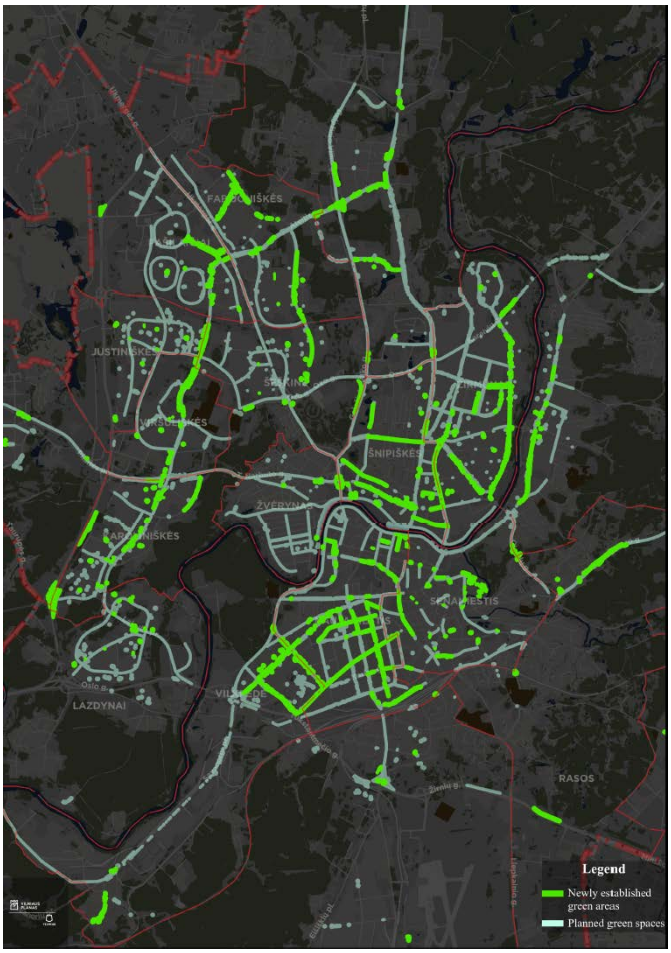
(max. 600 words and five graphics, images or tables)

The City of Vilnius has established a number of nature reserves and is responsible for supervision of several protected areas of national importance, implementing state monitoring programme in these areas, and managing the sites and natural habitats. The Directorate of Regional Parks of Pavilniai and Verkiai, which is subordinate to the City and financed from Vilnius budget, is in charge of the performance of these functions. As a result, the state of the natural environment of Vilnius has not deteriorated in recent decades, while the area of protected areas, the number of protected species and natural habitats in the city has increased. Number of Natura 2000 sites during the last 10 years increased from 9 (2013) to 18 (2023) according to the recently obtained new data on distribution of natural habitats and species of EU importance. The total area of Natura 2000 sites increased from 887 ha to 1697 ha, respectively. In the last decade, the list of protected species has been constantly increasing, and the network of natural habitats of EU importance expanded as well. The diversity of natural habitats of EU importance distinguishes Vilnius from other European capitals. Various natural habitats of fresh waters, forests, natural meadows and marshes can be found in different parts of Vilnius (see Map 3. 1above). Many of them also contain plant and animal species protected by the EU Habitats Directive. Vilnius is proud that its population of the Lady's-slipper orchid *Cypripedium calceolus* is the largest among European cities and still increasing. Vilnius protects one of the largest populations of EU protected hibernating Pond bat *Myotis dasycneme* and Barbastelle bat *Barbastella barbastellus* in the old railway tunnel of Aukštieji Paneriai (Natura 2000 site). The city also boasts a large population of the old growth forest umbrella species – the Hermit beetle *Osmoderma barnabita*.

The total city's green area covers 61% of the city. Recently, significant attention has been paid to the quality of green urban areas. All mature individual trees are mapped and regularly inventoried, determining their condition and performing managements as needed. In 2020, Vilnius published 10 rules for better urban architecture, which include the principles of green infrastructure development directly related to better adaptation to the challenges of climate change, better conditions for biodiversity, improvement of ambient air quality and prevention of noise pollution. The rules provide for preservation of natural landscape and expansion of green spaces. The landscape preserved (relief and greenery) should not be covered or destroyed, highlighting it by architectural means. Adequate compensation of ecological functions is used when planning for the felling of trees: the diameter of the felled tree is compensated by equivalent diameters of the planted young trees, thus restoring the ecosystem services provided by former trees as quickly as possible.

Picture 3. 3 "The Green Wave of Vilnius" involved many citizens in public planting campaigns.

In 2021, the city set itself the goal of creating a real Green Wave in Vilnius. Millions of bushes, climbing plants and trees now stretch along renewed pedestrian and bicycle paths, humanized streets, walls and fences, and fill up street alleys that have become sparse in previous decades. A decision was made to achieve that every kilometer of Vilnius streets is green. In addition, by maintaining green hedges of public spaces, the city seeks to preserve young trees that have spontaneously sprouted in them. The principle "Nature gives - Vilnius protects" has been followed since the beginning of the "Green Wave" implementation.



Map 3. 4 The Green Wave of Vilnius [GR1] - newly established public green areas and areas planned for greening.

3.C Future Plans

Please provide the following information:

1. The medium term (2030) and long term (2050) objectives for:
   a. nature and biodiversity, including the contribution to the EU goal to plant 3 billion additional trees.
   b. establishment and management (maintenance) of green urban areas (publicly and privately owned), including the goal to reduce net land take (EU Soil Strategy)
   c. the rehabilitation of brown field sites (derelict and/or contaminated land)
2. The planned measures to achieve the ambitions described under 1. Please also indicate if your city has developed an Urban Greening Plan as per guidance available at European level[2]. In addition, please indicate which innovations your city is planning to use.
3. How the ambitions and measures described under 1 and 2 are supported by:
   a. strategic and policy commitments
   b. budget and resource allocations
   c. plans for monitoring of impacts
   d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringements regarding the EU Birds and Habitat Directive. If there are, please indicate how and when you are planning to comply.

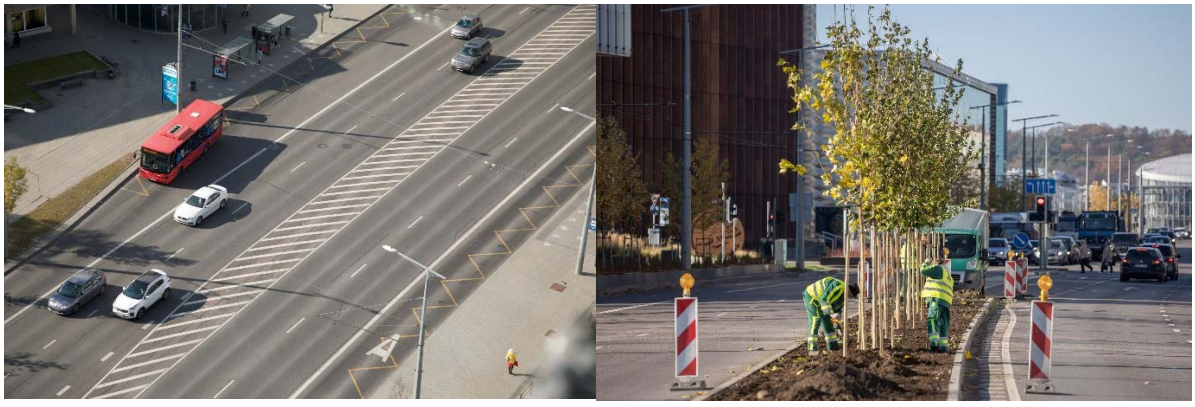
(max. 600 words and five graphics, images or tables)

The Master Plan of Vilnius lays down the medium- or long-term objectives of Vilnius for biodiversity, green areas and sustainable land use. Both green connections and green solutions important for the living environment have been included in the Master Plan. The city will continue implementing its "Vilnius Green Wave" campaign aiming to contribute 100 thousand trees, 10 million bushes and 300 thousand climbing plants to the EU's 3 billion trees pledge during the next two years, in addition to more than 68,000 trees and shrubs already planted in 2021-2022.

[2] https://environment.ec.europa.eu/topics/urban-environment/urban-greening-platform_en

Picture 3. 4 Properly managed green spaces in Vilnius are attractive to city residents.

The Master Plan aims to maintain Vilnius as a green city, managing the city's forests that are located near residential areas for recreation. The Master Plan emphasizes the green connection passing through the city, connecting Bukčiai Forest with Karoliniškės Landscape Reserve, Šeškinė slopes, and Ozas reserve, through Jamontas Park towards Vanaginė forests and along Cedronas riverbed towards Verkiai Regional Park. The Master Plan provides for the creation of a network of local green spaces in the densely built-up urban area, ensuring their availability within a distance of 200-300 meters from housing and major urban parks within the 2,000 meter-radius. Decisions of the Master Plan also foresee the possibilities of establishing at least two new protected areas in Vilnius. One of the territories – the State Šeškinės Ozas Landscape Reserve – is planned to be established taking into account not only institutional, but also residents' initiatives.



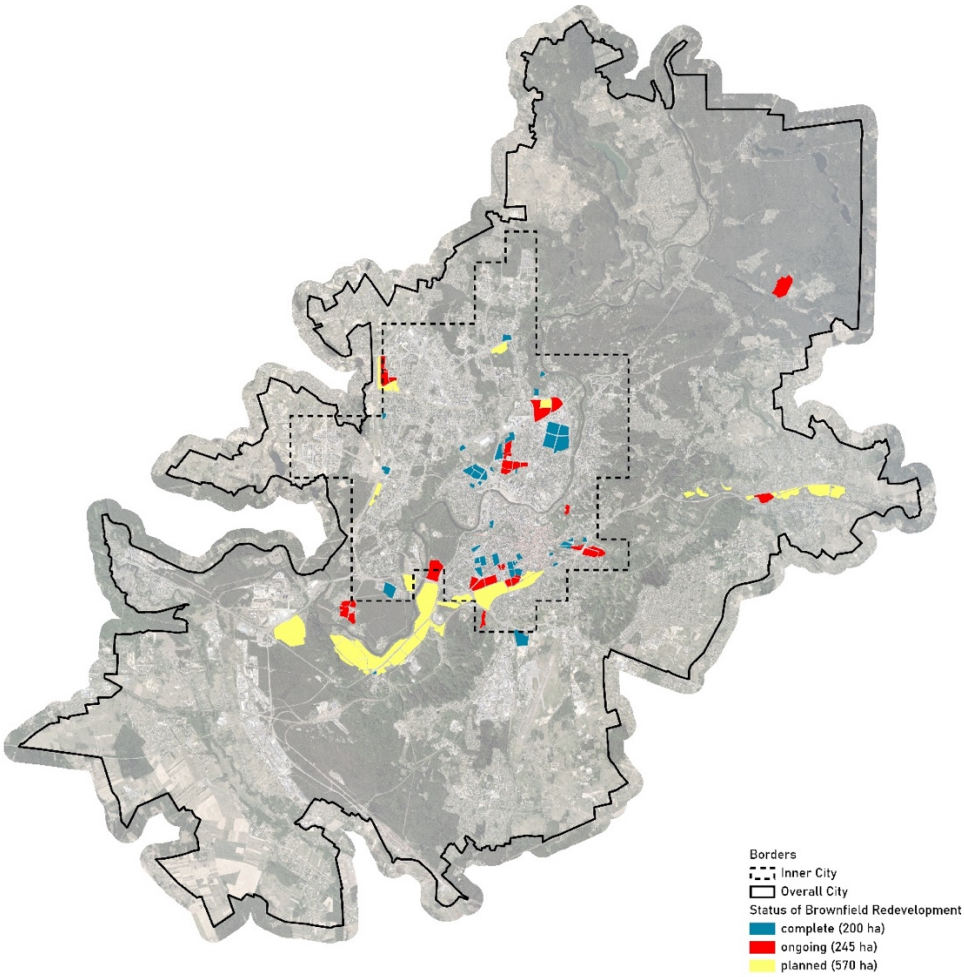
Picture 3. 5 The greening elements are added to the largest streets : Konstitucijos avenue before and after greening.

Today's new challenges, technological progress and changing attitude of society show the direction in which the compactness of individual parts of the city will increase. The concept of urban densification will increase the appeal of the existing residential parts of the city, thus leading to a slowdown in the expansion of the city. This is in line with the EU Commission's objective "no net land take by 2050"

within the Roadmap to a Resource Efficient Europe. Today's decisions in Vilnius already aim to create a dynamic walkable city and points of attraction in separate residential areas, where most necessary everyday objects of attraction would be accessible without the need to use a car or public transport. Communication infrastructure of the city is already planned so that it has less hard surfaces, more businesses, life and green areas. The network of green spaces in the city will consist of urban parks, garden squares, connecting paths, and other green connections. Green spaces have been carefully inventoried in the Master Plan, so their boundaries and areas are clear. The plan is to also purchase popular green spaces, which are now located in private plots, or to otherwise ensure their public use.

Among innovative solutions for greening urban environment, future sustainable water management solutions can be distinguished. The city is already looking for ways to use rainwater for watering green areas, so that excess rainwater does not get into existing pipelines, but is used for irrigation of green areas.

Rehabilitation of brownfield sites in the city has already started with the implementation of brownfield conversion projects. The conversion of abandoned industrial areas has already been implemented in the Paupio district which was nominated in the prestigious MIPIM Award as one of the best and most sustainable architectural projects in the world. Similar transformation projects are planned in Vilkpėdė and Naujininkai districts, while “Vilnius Connect” project, will cover the railway and bus station district.



Map 3. 5 Location of brownfield [GR1] sites (derelict zones).) that have been regenerated in the past

Ambitions towards tree planting, establishment and management of green urban areas, and rehabilitation of brownfield sites are planned in the Master Plan, planning annual budget appropriations accordingly. Public involvement in planning procedures and implementation is also a consistent part of the new urban development policy.

3.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at this stage.

(max. 400 words)

Biodiversity of the city of Vilnius: Biojvairovė | Vilniaus aplinka (vilnius.lt)
Environmental monitoring reports of the city of Vilnius: https://aplinka.vilnius.lt/aplinkos-kokybe/aplinkos-monitoringas/ataskaitos/
Statistical data of green area inventory: Želdinių inventorizacijos statistiniai duomenys | Želdynų skyrius (arcgis.com)
Protected areas of the city of Vilnius: Saugomos teritorijos
Short summary of the implementation of the Vilnius Green Wave in 2022: Žalesnis miestas gyvenimui ir judėjimui | Ataskaita 2022 (vilnius.lt)
Short summary of the implementation of the Vilnius Green Wave in 2021: Žalioji banga | Vilniaus miesto savivaldybės mero ir tarybos 2021 m. ataskaita (vilnius.lt)
Short summary of the implementation of the Vilnius Green Wave in 2020: Ataskaita 2020 (vilnius.lt)
Short summary of the implementation of the Vilnius Green Wave in 2019: Vilniaus evoliucija 2019 m. (vilnius.lt)
Thematic map of the green spaces in Vilnius: Žaliasis Vilnius / Vilniaus miesto interaktyvūs žemėlapiai
Thematic map of environmental protection in Vilnius: Aplinkosauga / Vilniaus miesto interaktyvūs žemėlapiai (vilnius.lt)
Environmental Monitoring Programme: https://aplinka.vilnius.lt/aplinkos-kokybe/aplinkos-monitoringas/programos/
10 rules for better urban architecture: Vilniaus miesto savivaldybė - Vilnius paskelbė 10 taisyklių geresnei miesto architektūrai (vilnius.lt)
Vilnius City: a new lawn mowing strategy will aim to restore natural meadows: Vilniaus miesto savivaldybė - Vilnius imasi naujos vejų šienavimo strategijos: sieks atkurti natūralias pievas

Conservation of the Ribiškių landscape reserve by grazing: Vilniaus miesto savivaldybė - Ribiškių kraštovaizdžio draustinį „šienaus“ avys (vilnius.lt)

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
3A		868	868	1000
3B		557	557	600
3C		596	596	600

4. Waste and Circular Economy

4.A Present Situation

Please complete the following table providing the most recent data that is available for the city. If city data is not available, please provide a brief explanation and use regional data where available.

Table 1: Benchmarking Data – Waste

∗ For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding waste.

Indicator	**Type of Data (City/Regional)**		**Unit**	**Year of Data**
Amount of municipal waste generated per capita	338,2		kg/capita/year	2022
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)	17,4%		%	2022
Percentage of municipal waste sent to incineration (R1 code)	42,9%		%	2022
Percentage of municipal waste sent to landfill (or other forms of disposal (D codes)	19,4%		%	2022
Percentage of recycled packaging waste	20,3%		%	2022
Established collection systems for hazardous waste:	**Type of Data (City/Regional)**	**Yes/No**	**Unit**	**Year of Data**
Waste from electrical and electronic equipment	0,217	Yes	kg/capita/year	2022
Batteries	0	Yes	kg/capita/year	2022
Waste oils	0,034	Yes	kg/capita/year	2022
Household chemicals	0,107	Yes	kg/capita/year	2022
Asbestos	2,161	Yes	kg/capita/year	2022
Construction & demolition waste	10,951	Yes	kg/capita/year	2022
Unused pharmaceuticals	-	-	kg/capita/year	-

Describe the present situation in relation to waste production and management by providing details about each of the following areas:

1. Current waste collection system, including the types of waste collected separately and the extent of rollout (% coverage) of the systems.
2. Application of the 'polluter pays' principle and economic instruments, including through differentiated tariffs ('Pay as You Throw' initiatives) and landfill and incineration charges.
3. Green public procurement of the municipality.

(max. 1000 words and five graphics, images or tables)

Current waste management activities in Vilnius are based on the 2021-2027 Waste Prevention and Management Plan of Vilnius region. The maintenance and development of municipal waste management system in Vilnius is planned in accordance to waste management priorities, with waste prevention being the most important. If waste generation cannot be avoided, the aim is to reuse or recycle it, and only to landfill the waste that cannot be reused or recycled. The 2021-2027 plan is the basis for regional cooperation, partnership, mutual trust and the implementation of the European Green Deal and national strategy. The Vilnius region's waste prevention and management plan aims to increase the region's contribution not only to state goals, but also to the implementation Sustainable Development Goals.

In Vilnius city municipality, underground, semi-underground and above-ground containers are used for the collection of mixed municipal waste and secondary raw materials (paper, plastic, glass and metal). 100% of the city population receive the mixed municipal waste collection service. The network of semi-underground containers is presently being expanded, also installing food waste collection containers. In 2019 -2022, 810 sites were set up and new ones are planned in order to improve the accessibility of containers to inhabitants. Additionally, in the past, Vilnius residents living in private houses were provided with composting boxes for gardening and food waste. A total of 23,000 of such boxes were distributed to Vilnius residents until 2020. If used properly, these boxes allow reducing the generation of biodegradable waste.

Picture 4. 1 Newly established waste container site with mixed, sorted, glass and food waste containers included.

Picture 4. 2 Garden waste composting boxes that were provided for private households in Vilnius.

Vilnius residents are charged a communal waste management fee based on the average amount of waste generated per capita (current threshold value – 390kg). This system is based on the "Polluter pays" principle enshrined in the Waste Management Law of the Republic of Lithuania and applied in Vilnius city municipality. Exploitation costs of bulky waste collection sites are included in the fee. When residents leave non-sortable waste by communal waste containers (e.g. bulky waste), costs of its disposal are divided among the residents assigned to the site. If the offender is identified, he is charged for the waste management respectively.

Vilnius also has an infrastructure for the collection of textile waste. Containers are distributed close to the centres of attraction of population. Bulky waste, including construction and demolition, hazardous, electrical and electronic equipment, batteries, and asbestos-containing waste generated in households are collected separately at 5 bulky waste collection sites in Vilnius.

Picture 4. 3 Textile waste collection infrastructure helps to lower the amount of unsorted waste generated.

Additionally, a new beverage container deposit system has been in place in the city since 2016, which collects 9 out of 10 metal cans, plastic or glass bottles marked with "deposit" sign (although these numbers are not included in the city's waste accounting, as the City of Vilnius does not own or operate the system). Presently, there are around 200 deposit machines operating in Vilnius.

In larger supermarkets or shopping centres, there are small electronic waste and battery collection containers where residents can discard batteries, light bulbs and other small electronic waste, while larger electronic waste items can be discarded both in bulky waste collection sites of the city, at several dedicated electronic waste collection sites (containers) or collected by private electronic waste recycling companies that operate the collection points, and mobile collection points in the city.

Regarding the food waste prevention, a charity and support foundation "Maisto Bankas" (Food bank) has been operating in Vilnius since 2009. The organisation collects from supermarkets or

manufacturers/ providers food items still safe for consumption that would be disposed of otherwise and distributes them to the poor. These are sample products, food products with improper labelling, non-marketable products, overproduction, food production by-products, products with damaged packaging and food products that did not reach their destination due to errors in the supply chain. In 2021 alone, “Maisto Bankas” distributed 9,000 tonnes of food.

The Vilnius City Municipality Administration also aims to encourage reuse, repair and recycling of various household items and sees it as one of the ways to reduce the amount of waste generated. In 2019, first item sharing stations “DĖK’ui” were set up in Vilnius, where people can leave and exchange unwanted furniture, clothing, toys, tools, books, crockery and other household items. In 2022, there were 5 such stations functioning in Vilnius. Here educational workshops on reuse, recycling/ upcycling and repair of various items are held.

Picture 4. 4 In "DĖK'ui" item sharing stations books, household items and even furniture can find new hosts.

Furthermore, outdoor “libraries” resembling small houses with shelves have been set up in recent years not only in Vilnius parks, but also near kindergartens, schools, and cultural centers. The books are free, there is no reader's ticket or return period. Also, there are other small initiatives taking place, such as “Commune DIY” skateboard recycling workshop; “Miesto laboratorija”, where sharing and exchange events and various DIY workshops are occasionally held; Vilnius hosts several urban gardening communities who also engage in public teaching on gardening, self-sustenance and DIY.

Vilnius also aims to make decisions that prevent pollution or waste generation, which is reflected in its public procurement. In terms of value, green public procurements (GPP) committed by the City of Vilnius have accounted for above 74% since 2021. For instance, in 2021, the value of GPP was 74,4%, whereas in 2022 it grew to 78,3%. In Q1 of 2023, the municipality has already achieved 54,2% of green procurements in terms of value (which will definitely increase in the remaining 3 quarters). In 2022, municipality’s green public procurements accounted for 69,8%, and in Q1 of 2023, it has already achieved 40,9% in terms of quantity. Vilnius is committed to maintaining its sustainable procurement aims and plans to expand the proportion of green public procurement even more in the future. In 2022, the Ministry of Environment of the Republic of Lithuania has named and awarded the City of Vilnius as the leader in Green Procurement among Lithuanian Municipalities. Furthermore, procurement of sanitary cleaning and green space maintenance services for Vilnius City's common areas was recognised the most sustainable procurement in 2022 (by Ministry of Economy and Innovation and Public Procurement Office).

4.B Past Performance

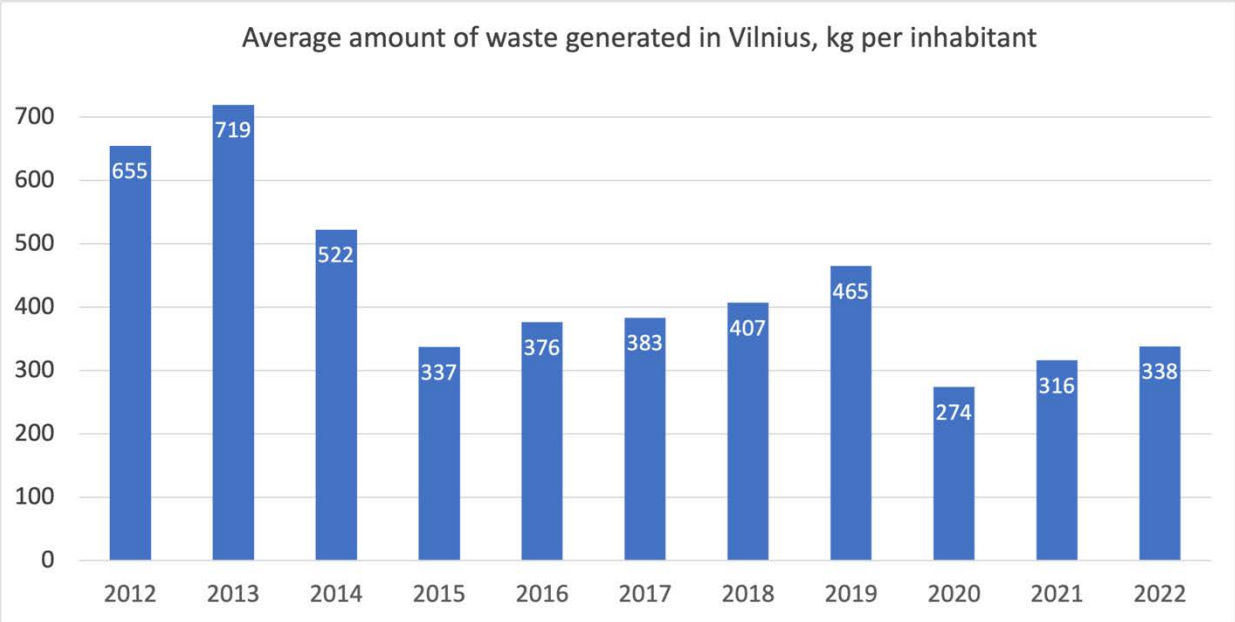
The aim of this section is to make clear how the situation described in the previous section has been

achieved. Where available, quantitative information and data should be provided for the previous ten years in order to show recent trends. Please provide information on:

1. Trends or changes in:
   a. Amount of municipal and packaging waste produced per capita in the city.
   b. Percentage of municipal waste sent to incineration (R1 code).
   c. Percentage of municipal waste sent to landfill (or other forms of disposal (D codes)
   d. Separate collection systems in the city.
2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under 1.

(max. 600 words and five graphics, images or tables)

Vilnius population has grown by more than 10% in the last 10 years, but the amount of waste generated per capita has been decreasing. According to calculations made in 2014, the average amount of waste generated per capita was 445 kg per year in the municipality, including packaging waste. In 2022, this amount was much lower – approximately 338 kg.



Graphic 4. 1 Average amount of waste generated per inhabitant of Vilnius per year 2012-2022.

This positive trend in reducing waste generation per capita came as a result of the implementation of more accurate accounting of generated waste; introduction of a new waste management fee which helped to ensure unified requirements for the provision of mixed municipal waste collection services; update of Vilnius city municipality rules that changed the organization of mixed municipal waste management; and the improvement of the collection system of different types of waste. This includes setting up bulky waste collection sites that collect all sorts of bulky waste (paper, plastic, metal, glass, wood, construction waste, electronic waste, hazardous materials, household chemicals, etc.) and textile waste containers closer to centres of attraction of the population (105 container units have been installed, with another 250 planned to be installed in the near future). This allowed to reduce the above-mentioned waste types in the general municipal waste stream. Another unique service provided in Vilnius is collection of bulky waste that cannot be disposed of at municipal waste collection sites from residents (e.g. furniture, household appliances, construction waste, etc.).

Vilnius city is improving the accessibility and appeal of waste sorting. Currently, the network of semi-underground/ underground containers is being expanded. As many as 810 container sites were

installed in 2019- 2022 for mixed municipal waste and sorted packaging waste. It should be noted that containers intended for food waste are planned for the newly installed sites as well, thus preparing for the collection and further processing of this waste type.

Over the past 10 years, the share of municipal waste disposed of in landfills was greatly reduced. In 2014, the share of landfilled municipal waste accounted for 59% of the total generated amount. Till 2022, this amount has been gradually reduced to a mere 19,4%. The start of operation of a new regional mechanical-biological waste treatment facilities in 2016 made it possible to reduce the amount of landfilled waste. All of the mixed municipal waste collected in Vilnius has been taken to these facilities for processing. First, the packaging and secondary raw materials are separated, then waste is sorted, followed by biological digestion to digest organic material and stabilise waste. Then, a suitable part of waste is sent to incineration facilities, and the unsuitable part is disposed of in landfills.

Graphic 4. 2 Modern mechanical-biological waste treatment facilities operated by Vilnius Region Waste Management Center.

There were no incinerators in Vilnius region in 2014, but a cogeneration power plant was launched in Vilnius city in 2021, incinerating waste from mechanical biological waste treatment plants. In 2022, as much as 42,9% of the total waste generated in the Vilnius city municipality was incinerated, using heat generated from waste incineration for district heating of residential buildings during the cold season.

4.C Future Plans

Please provide information on:

1. The medium term (2030) and long term (2050) objectives for the management of waste and specifically of plastics and the prevention of food waste.
2. The planned measures to achieve the ambitions described under 1. Please also indicate which innovations your city is planning to use.
3. How the measures and ambitions described under 1 and 2 are supported by:
    a. strategic and policy commitments
    b. budget and resource allocations
    c. plans for monitoring of impacts
    d. participatory approaches

4. Current or outstanding ongoing environmental legal proceedings, including infringement procedures under the Waste Framework Directive. If there are, please indicate how and when you are planning to comply.

(max. 600 words and five graphics, images or tables)

The medium-term objectives for waste management are set out in the 2021-2027 Waste Prevention and Management Plan of the Vilnius Region. It is based on strategic documents including 2021-2030 National Progress Plan; State Progress Strategy 2030; National Environmental Protection Strategy, etc. The objectives are related to further use and sorting of waste, reducing the percentage of landfilled waste, improving waste sorting rates, current waste collection and processing infrastructure, educating residents on preventing waste generation in the first place, encouraging and facilitating reuse of waste. The municipal waste management system and its development will continue to be funded from the collected municipal waste management fees, EU funds, producers and importers fees.

Some of the specific aims set out in the waste prevention and management plan include:

-Municipal waste amount generated per inhabitant (kg/year) in 2027 will continue to be below the EU average;

-Biological waste percentage managed at waste generation sites and sorted municipal waste will amount to 80% in 2027;

-Quantity of waste reused annually in Vilnius region in 2027 will total 900 t;

-Percentage of waste ready for processing will reach 57 % in 2027;

-Share of landfilled municipal waste will decrease to 8% of the total amount in 2027

Graphic 4. 3 Waste management projection in Vilnius after having implemented the foreseen developments in 2021-2027 programme. Diagram: Vilnius Region Waste Management programme 2021-2027.

To achieve these and other objectives of the 2021-2027 plan, Vilnius seeks at further improving the existing waste collection infrastructure, increasing the availability of sorted waste containers in cooperation with producer and importer organizations; expanding bulky waste collection infrastructure in Vilnius; developing food waste sorting infrastructure and providing Vilnius residents with separate household sorting bins; further developing textile waste collection infrastructure; developing new infrastructure of mobile collection containers for household hazardous waste. Electronic waste collection will also continue at designated sites. As per the waste management plan of Vilnius region, Vilnius will continue recording the amounts of waste collected, managed, and the methods of waste management.

Vilnius aims to inform the public about changes in waste management system and to conduct active educational campaigns on food waste reduction, general waste prevention, waste sorting, reuse and recycling. Furthermore, public trash collection events are planned with social partner support.

Vilnius operates a network of "Dėkui" (English: Thank you) used item sharing stations at bulky waste collection and other sites. This network will be further developed until 2027. The plan is to conduct educational workshops “Atsinaujink” (English: “Renew") on waste repair, reuse and recycling. Vilnius seeks to involve social partners in further development of activities and operation of “Dėkui” stations. One of these stations offers an open workshop for carpentry in Vilnius “Senjorų avilys” (English: Senior’s Hive) – a community venue hosting events for senior citizens of Vilnius.

Picture 4. 5 Vilnius plans to expand "DĖK'ui" item sharing station infrastructure facilitating reuse, recycle and reduction of waste.

Picture 4. 6 Small electronic waste and battery collection container available in supermarkets and other public sites.

Educational events “Eco-picnic”are planned there on repairing, reusing and recycling of waste and on reducing consumption, etc. These activities have a positive impact on emotional health of older people, reducing social isolation.

One of the innovations planned is the development of a network of public drinking water stations, which is expected to reduce bottle waste generation, and installation of secondary raw materials sorting bins in public parks, playgrounds and squares to make waste sorting system even more convenient for residents.

Picture 4. 7 Further development of public water drinking station is planned in Vilnius

Meanwhile, long-term waste management objectives will be set in the future based on the developing EU legislation, priorities of the European Green Deal, the Circular Economy Action plan, national priorities and the achievement of Sustainable Development Goals of the United Nations.

4.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at this stage.

(max. 400 words)

Vilnius Region Waste Management Center. (2022). Vilnius region waste prevention and management plan for 2021–2027. https://www.vaatc.lt/wp-content/uploads/2022/12/Vilniaus-regiono-atliek%C5%B3-prevencijos-ir-tvarkymo-2021-2027-planas_projektas.pdf

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Lithuanian Environmental Protection Agency, Information about municipal waste management systems in Lithuanian municipalities. http://aaa.lrv.lt/lt/veiklos-sritys/atliekos/atlieku-apskaita/informacija-apie-komunaliniu-atlieku-tvarkymo-sistemas-lietuvos-savivaldybese

Deposit system in Lithuania. Public institution “Deposit System Administrator”.

https://grazintiverta.lt/apie/17

Small and large electronic waste collection sites, “Electronics Distributor Association”. https://www.epa.lt/surinkimo-vietu-sarasas/

Electronic waste collection sites map, “Aplinkos Apsaugos Institutas”. https://atliekos.lt/miestas/vilniaus-m/paslauga/elektronikos-atliekos/

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“DĖK‘ui” station map, „Vilnius Region Waste Management Center”. https://www.stoteledekui.lt/kontaktai/

Resolution of the Government of Lithuania on the approval of the National Progress Plan 2021-2030, 2020 September 9th. https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/c1259440f7dd11eab72ddb4a109da1b5?jfwid=-whxwii77y

Resolution of the parliament of the Republic of Lithuania on the approval of the state progress strategy “Lithuanian progress strategy: Lithuania 2030", 2012 May 15th. https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.425517

Resolution of the parliament of the Republic of Lithuania on the approval of the national environmental protection strategy, 2015 April 16th. https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/609a6f82ea4e11e4ada6f94d34be6d75/asr

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
4A	0	985	985	1000
4B	0	497	497	600
4C	0	556	556	600

5. Noise

5.A Present Situation

Please complete the following table providing the most recent data that is available[1]:

Table 1: Benchmarking Data – Noise

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding noise.

Indicator		Unit	Year of Data
Share of population exposed to total noise values of L_{den} above 55 dB(A)	38	%	2021
Share of population exposed to total noise values of L_{den} above 65 dB(A)	5,1	%	2021
Share of population exposed to total noise values of L_n (night noise indicator) above 50 dB(A)	21,3	%	2021
Share of population exposed to total noise values of L_n (night noise indicator) above 55 dB(A)	6,6	%	2021
The percentage of citizens living within 300 m of quiet areas	3,9	%	2021
Which limits or reference value does the city apply to residential areas? (L_d/L_e/L_n)	65/60/55		
In the last year how many noise complaints did the city receive related to leisure or recreational activities?	12		

Please describe the present situation in relation to the quality of the acoustic environment. Please provide the following information:

1. The most recent noise map(s) of the city (no older than 5 years according to the Environmental Noise Directive). In addition, figures for noise exposure to individual noise sources (e.g. road, rail, air, industry, and leisure/entertainment) can also be provided.
2. Formally defined and delimitated quiet areas and sound improved areas.
3. Citizen engagement and public awareness initiatives.

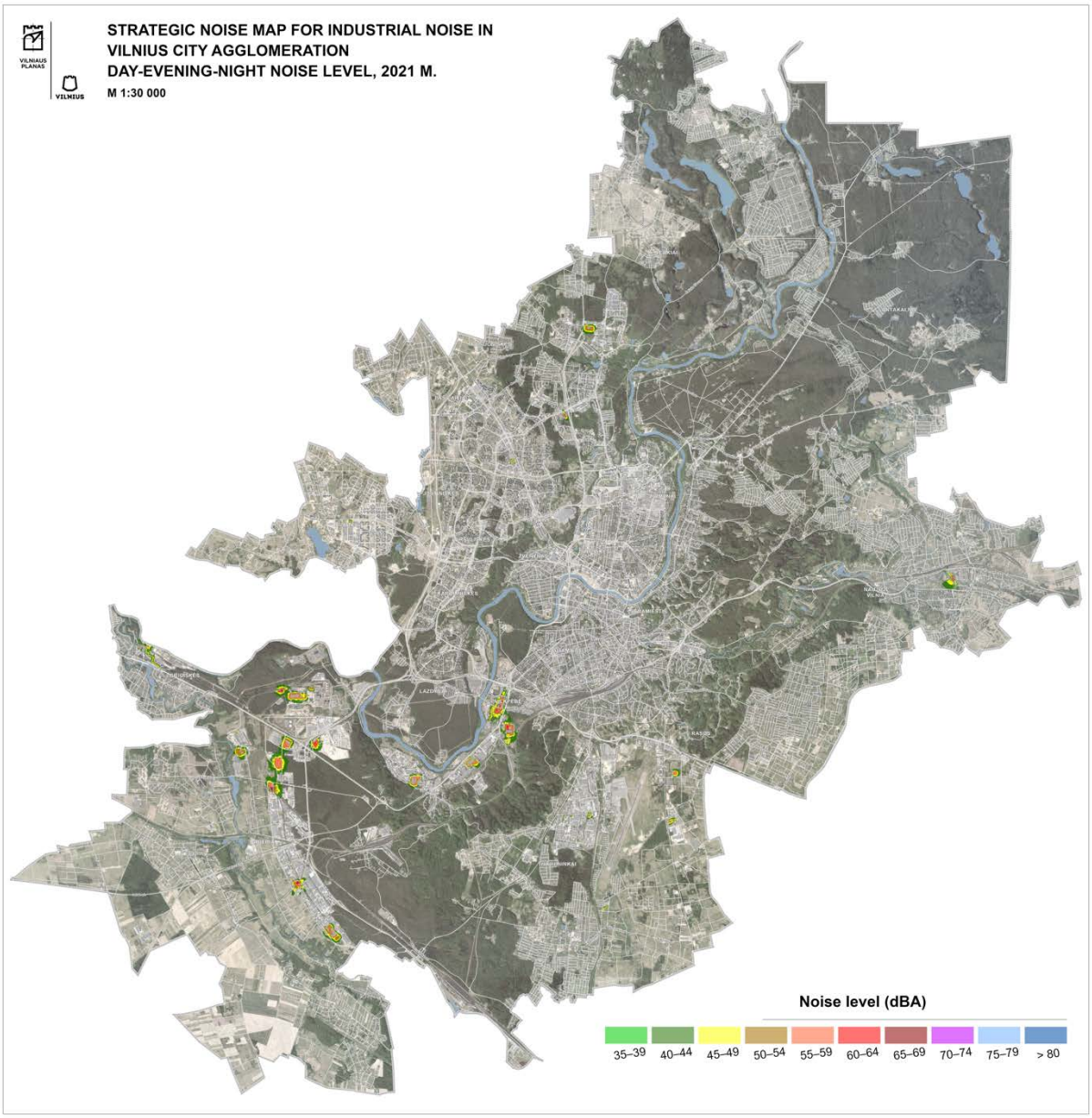
(max. 1000 words and five graphics, images or tables)

Currently, the noise level in Vilnius is the lowest in a decade. Table 8 reveals that 5,1% of population is exposed to total noise values of L_{den} above 65 dB(A). A more detailed analysis of the data from the period 2011-2021 is presented in section “5B. Past Performance”.

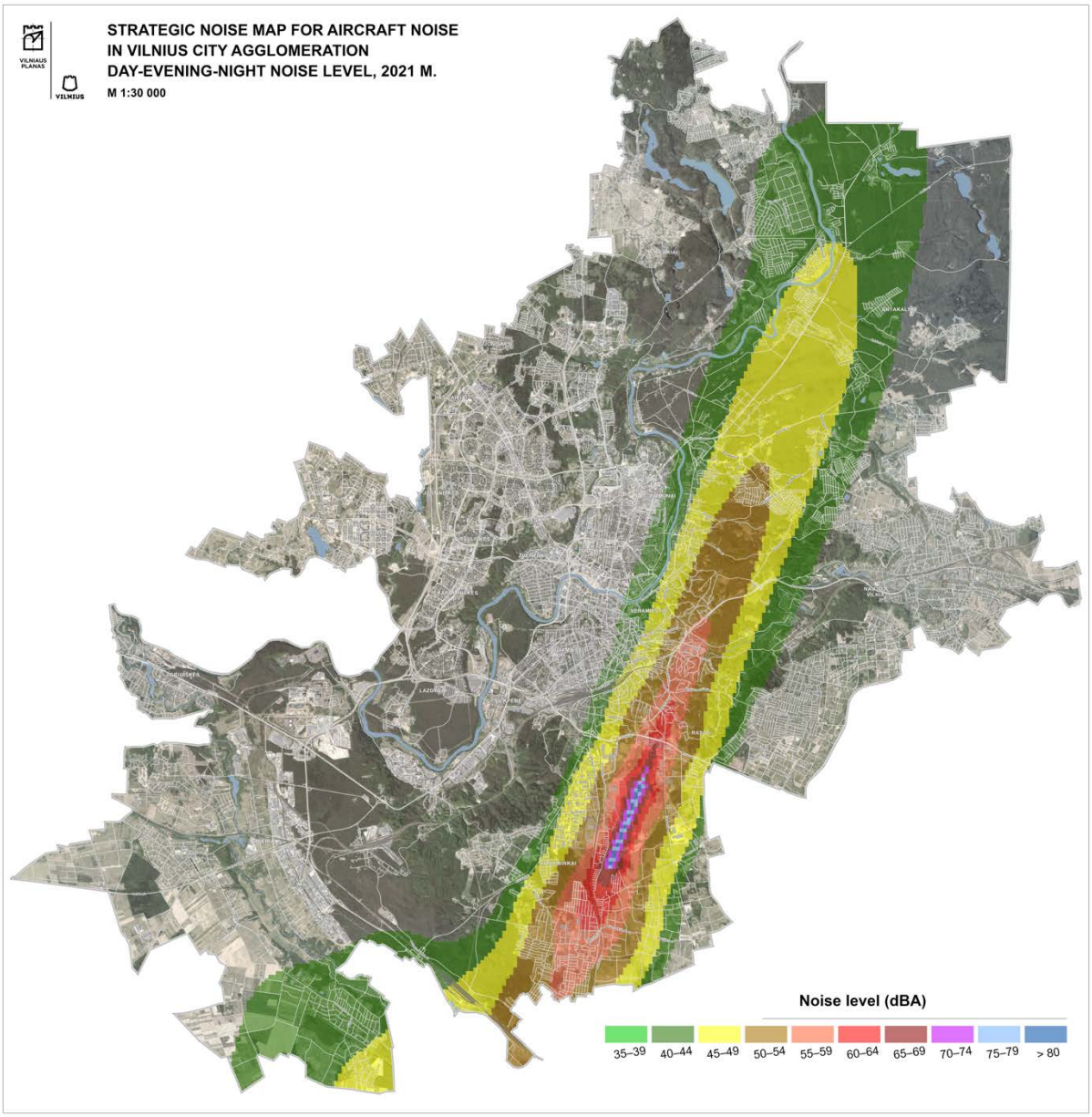
The biggest source of noise in Vilnius is road transport (Ldvn - 99 percent, Ln - 97 percent), railway (Ldvn - 1 percent, Ln - 2 percent), while noise from aircraft and industrial activity zones accounts for up to 1 percent. The maps below (see Figures 5.1-5.4) illustrate that industry (daily), airport (daily) and railways (daily) produced noise is quite concentrated in certain areas, while road traffic (daily) noise is distributed across the city due to a wide network of roads. However, the biggest road noise is produced in the main road sections – start of the Vilnius-Kaunas-Klaipėda highway (11,000 - 40,000 cars per day), the Vilnius southern roundabout and the start of Vilnius-Panevėžys highway (32,000 cars per day).

[1] In case (some of) the requested benchmarking data is not available, please briefly outline the present situation regarding noise in the city.

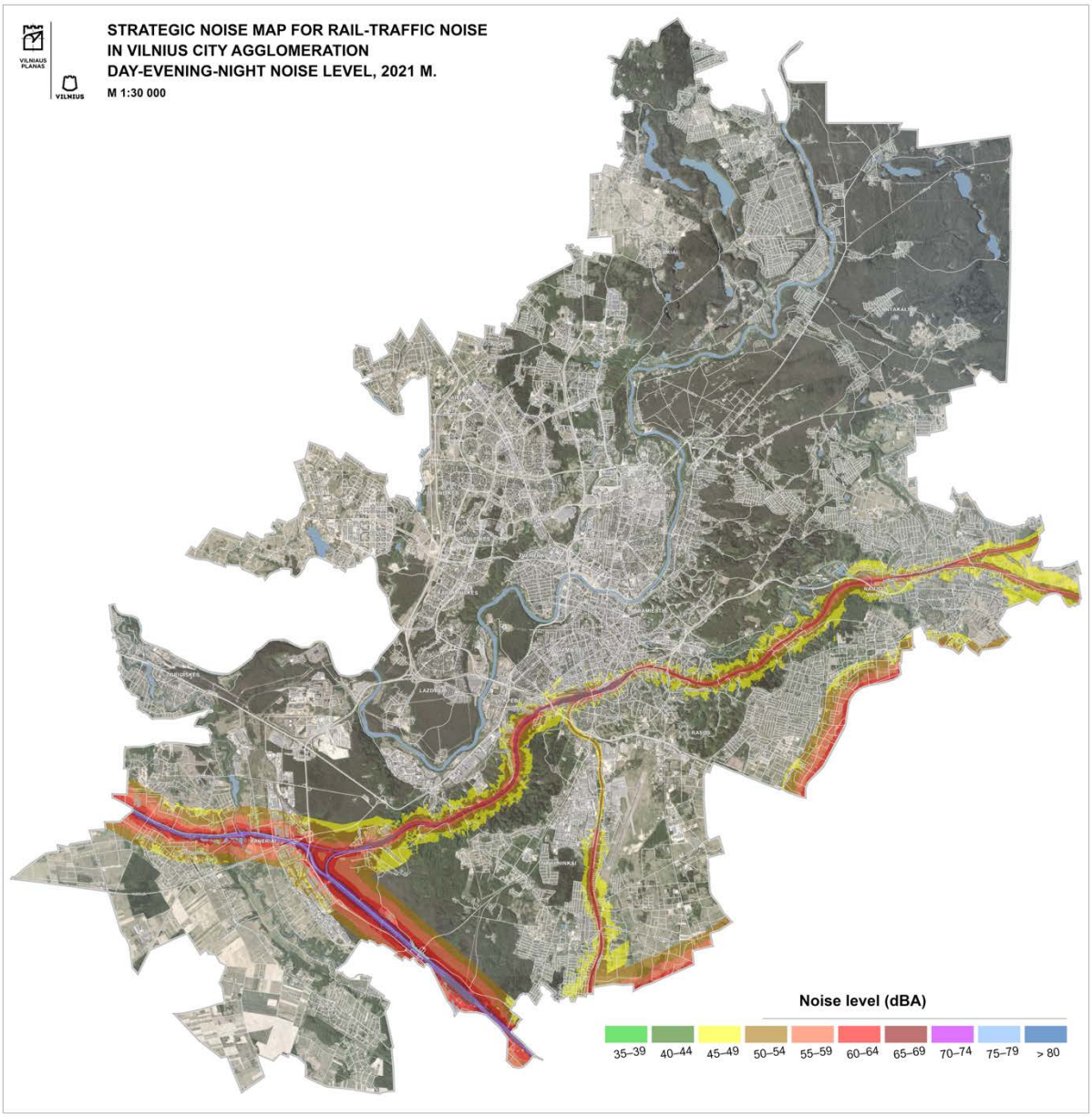
The area of the agglomeration with spreading noise of 65 dBA and higher from the main roads, covers 5.0 km2. The area of Vilnius city is 401 km2, therefore the affected areas constitute a mere 1,2% only.



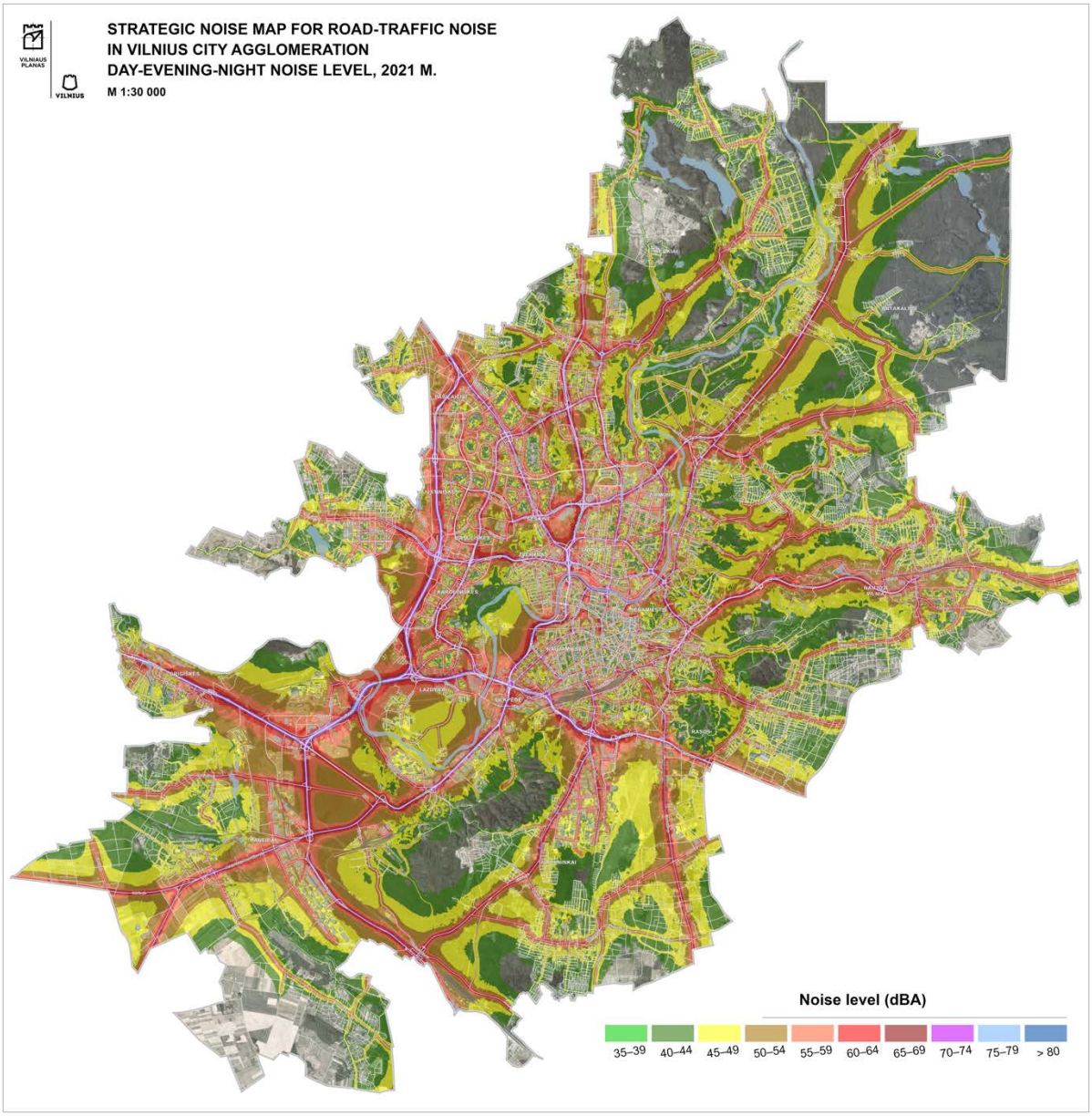
Map 5. 1 Strategic noise map for industrial noise in Vilnius agglomeration, L_{den} noise level, year 2021.



Map 5. 2 Strategic noise map for aircraft noise in Vilnius agglomeration, L_{den} noise level, year 2021.



Map 5. 3 Strategic noise map for rail-traffic noise in Vilnius agglomeration, L_{den} noise level, year 2021.



Map 5. 4 Strategic noise map for road-traffic noise in Vilnius agglomeration, L_{den} noise level, year 2021.

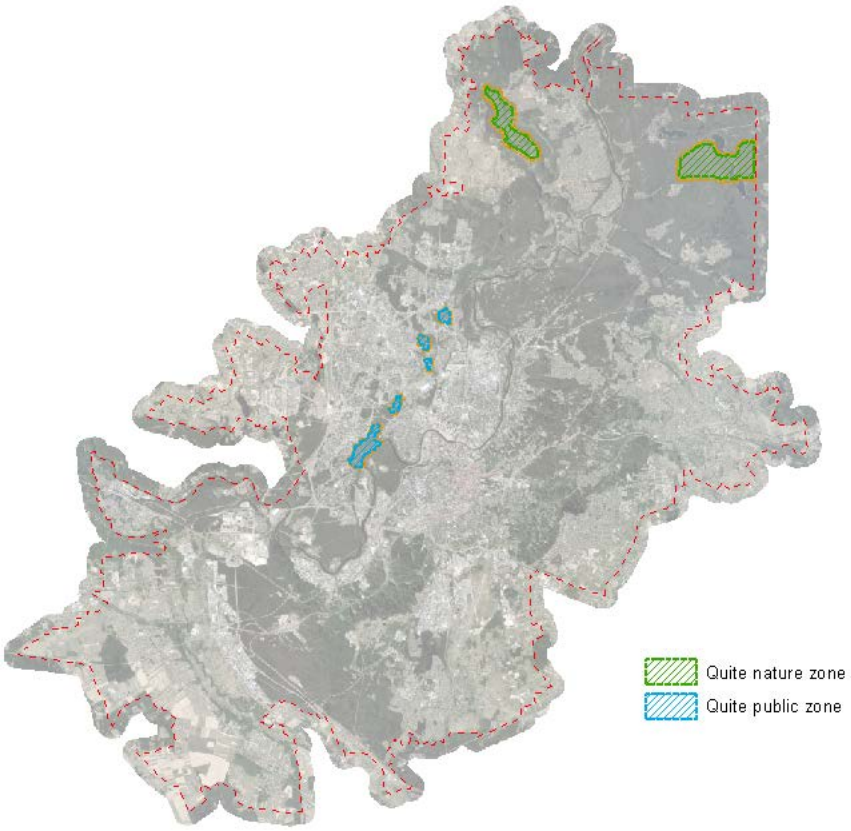
Other (day, evening, night and/or daily) digital maps of roads, main roads, railways, main railways, industrial activity zones, and airport noise are available at: Vilnius city interactive maps.

The 2019-2023 noise prevention action plan is the main document providing for the measures for noise reduction. However, the Sustainable Mobility Plan of the City of Vilnius is also very important as it supports and complements the implementation of road traffic noise reduction with its four strategic directions:

- Development and promotion of the public transport network.
- Humanization of the environment and promotion of walking.
- Development of non-motorized transport network and its integration into the current transport system.
- Road transport greening and traffic management.

All these four directions have implementation measures grouped into two categories: a short-term and a long-term implementation strategy.

The municipal council of the city has approved seven quiet areas (see Figure 5.5 below), the tranquillity of which cannot be disturbed by traffic, industry or visitor noise. These include quiet nature areas of Gulbinai and Tapeliai as well as quiet public areas of Viršuliškės, Karoliniškės, Baltupiai, Fabijoniškės and Ozas. To protect the quiet areas from excessive noise levels, buffer preventive strips were installed.



Map 5. 5 Map of Vilnius quiet areas.

Citizen engagement in the noise reduction process was ensured when drafting the 2019-2023 noise prevention action plan, which was approved in 2019. It was prepared in consultation with the public and managers of noise sources. Information about the prepared draft plan was published on various websites and media channels, then holding a meeting with the public. During the public consultation procedure, the plan, its goals and objectives were presented, introducing participants to the objects of the noise source and discussing the main noise prevention and reduction measures. Meeting organizers also took down the comments and suggestions made to the plan, and it was updated accordingly. The plan was later approved by the City Council.

Another way of involving the public is through the application "Tvarkau miestą". Here people can register various issues, including noise-related ones, and then they are passed on to respective departments of the city for response. Over the past 11 years, 673 unique users have reported 1,318 noise issues. 98% of them have already been investigated.

5.B Past Performance

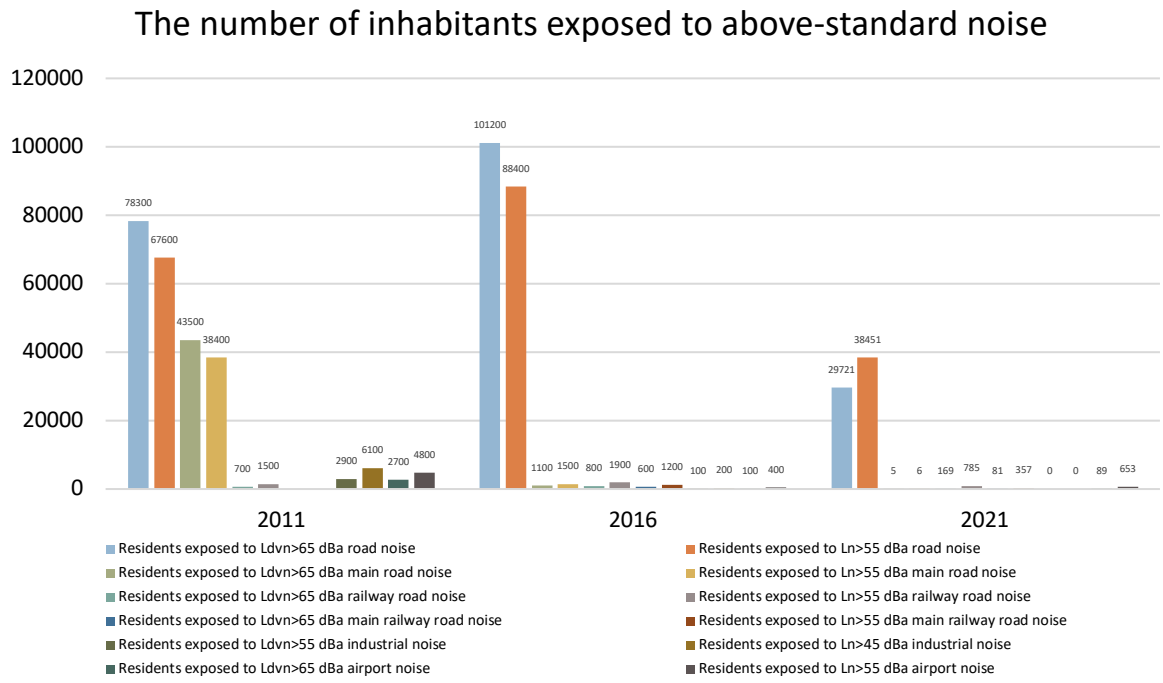
The aim of this section is to make clear how the situation described in the previous section has been

achieved in the past ten years. Please provide the following information:

1. Trends or changes in terms of noise in the city that have taken place over the last ten years.
2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under 1.

(max. 600 words and five graphics, images or tables)

As shown in the graph below (see Figure 5.6), there has been a significant overall noise reduction in Vilnius over the last 10 years. The number of inhabitants exposed to above-standard noise has decreased in most of the noise sections dramatically. Only the number of people exposed to airport noise (Ln>55 dBa) has slightly increased in 2016-2021, however it still is much lower than in 2011.



Graphic 5. 1 The number of inhabitants exposed to above-standard noise levels in years 2011, 2016 and 2021.

The city's measures to reduce noise level have been foreseen in noise prevention action plans, which provide for the methods of solving noise problems considering the data of the noise level and the number of people exposed to noise.

During the last ten years, the city's administration has taken several direct measures to reduce noise levels and the number of residents exposed thereto:

1. **Acoustic walls.** Several were built besides intensive roads (see Figure 5.7, 5.8) to reduce noise impact on surrounding houses, also planting trees and bushes next to them to form the maximum noise buffer zone.
2. **Renovation of residential houses**. New noise-proof windows were installed in 20 houses, also balconies were glazed and their doors were replaced.
3. **Renovation of educational institutions.** In 2016, there were 318 preschool institutions and 152 schools in the city, 106 and 66 of which, respectively, were in the noise pollution zone. In 2005-2018, noise-proof windows were installed in 99 preschool institutions and schools.
4. **Renovation of health institutions.** Three health institutions were renovated in 2004-2015, installing new noise-proof windows and implementing other noise reduction measures.

5. **Noise reducing road surface.** In 2018, three sections of roads were renovated using asphalt with noise reduction properties. This type of asphalt was designed and tested in Vilnius Gediminas Technical University.
6. **Road construction noise reduction measures.** During the planning and implementation of the Western Bypass of Vilnius, a tunnel was constructed near a residential area. 786 trees and 4,078 bushes were planted along the road.
7. **Other noise reduction measures:**
    a. Promotion of non-motor transport (See Figure 5.9). The city has a bicycle path system covering 154 km and a bike-sharing system with 37 stations across the city.
    b. Scooter and car sharing systems. There are several companies in Vilnius offering electric scooter and car-sharing systems.

Picture 5. 1 Acoustic wall besides one of the most intensive streets in Vilnius.

Noise reduction measures implemented by other entities, which helped reduce the overall noise level in Vilnius:

1. The Lithuanian Road Administration built several acoustic walls in sections of busy roads.
2. AB “Lietuvos geležinkeliai” (Lithuanian Railways) implemented the following noise reduction measures in 2014-2018:
    a. In 2015, it installed signs “Silent whistle” in residential areas, so that train drivers use a low-sound mini whistle instead of a one-time long noisy sound.
    b. In 2015, a section of a second rail in the outskirt of Vilnius was finished, also implementing noise reduction measures. Also, cargo trains from Belarus have been directed to Vilnius bypass.
    c. In 2017, project of electrifying a rail section from Vilnius city to Belarus border was finished. Diesel locomotives were replaced by electrical ones.
    d. Control of geometric parameters of rolling stock wheels was carried out.
    e. Periodic control of the technical condition of speakers, their direction, volume level and the information broadcasted in train stations was carried out.
    f. In 2018, several rail sections were renovated, including: total reconstruction of a rail section, installation of new rail forks, welding of railway joints, and replacing rails within the boundaries of Vilnius city. All these measures contributed to noise reduction from railways.
3. In 2014-2018, the SOE Lithuanian Airports implemented six measures to reduce aircraft noise. Most of them were targeted at noise reduction at night.

Picture 5. 2 Rapid development of bicycle lanes in recent years has really spurred the use of non-motor transport in Vilnius.

5.C Future Plans

Please describe the following:

1. The medium term (2030) and long term (2050) objectives in for the quality of the acoustic environment.
2. The planned measures to achieve the ambitions described under 1. Please also indicate which innovative approaches your city is planning to use in this regard.
3. To what extent measures and ambitions described under 1 and 2 are supported by:
   a. strategic and policy commitments
   b. budget and resource allocations
   c. plans for monitoring of impacts
   d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringements regarding the Environmental Noise Directive (2002/49/EC). If there are, please indicate how and when you are planning to comply.

(max. 600 words and five graphics, images or tables)

The master plan of Vilnius lays down medium-term (2030) or long-term (2050) objectives for the acoustic environment and the entire development of the city. The plan provides for a focus on public transport and pedestrian and cycle traffic over other modes of transport, thus reducing noise and pollution in the city. Therefore, the city aims to halve the use of conventionally fuelled cars by 2030 and reduce car traffic into the city centre by planning no new parking areas in that zone. The plan states a clear goal to reduce the number of people in the zones of exceeded noise pollution by 2,5 % and/or the area of such zones by 2,5%, and/or to take measures to improve sound insulation of buildings by 2,5 % at the least. The master plan also provides for other measures, such as regular

updates of noise prevention plans and programmes, and the formation of noise buffer greenery. There are also several government-level documents that lay down the direction and goals for noise reduction or prevention taken into consideration by the City of Vilnius.

The Vilnius City Noise Prevention Action Plan for 2024-2028 is currently under preparation and should be approved in December of 2023. Also, specialists of the City of Vilnius are drafting an implementation report of the current Vilnius City Municipality Noise Prevention Action Plan 2019-2023. Most of the planned measures have already been implemented, and some will be completed by the end of the year. This includes the 6th and final street to be planted with noise-shielding vegetation, finishing new bicycle lanes that are currently under construction and holding public meetings and consultations on the new plan.

Most of the planned measures have also been foreseen and supported by state strategic and policy documents, therefore the pursuit of the set goals also has political support. Several examples of these documents include:

1. Law on Noise Management used as the basis for drafting Noise Prevention Action Plans.
2. State noise strategic mapping programme, the main goal of which is to create conditions for strategic mapping of environmental noise in Lithuania in accordance with the Directive 2002/49/EC on environmental noise assessment and management requirements in order to protect residents from negative effects of environmental noise.
3. National Public Health Care Development Programme for 2016-2023.
4. Lithuania Health Programme for 2014-2025.

Funds from multiple sources, including the state budget, municipal budget and EU support funds, are allocated for the implementation of noise prevention action plans, as they fall within the responsibility of municipalities and the state. Certain projects are financed from private business funds.

Prepared plans and their goals are monitored periodically, drafting implementation reports accordingly. For instance, strategic noise maps are reviewed every five years since their preparation, monitoring their goals during preparation.

Besides the involvement of the public in public meetings (see Figure 5.10) of planning procedures, the city invites people to actively participate in tree planting campaigns (see Figure 5.11), also promoting and providing financial support for the renovation of buildings and entire residential neighbourhoods. The society can also engage in noise issues accessing all sorts of available open data and maps through the interactive map portal and report noise concerns on the online platform.

The city has no existing or pending legal procedures for environmental protection violations, including infringements regarding the Environmental Noise Directive (2002/49/EC).

Picture 5. 3 Public meeting and consultation on planning a new street.

Picture 5. 4 Community participation in the “green wave” campaign, which planted app 60 000 trees and bushes..

5.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at thisstage.

(max. 400 words)

Vilnius city municipality. Information and data on the noise topic.

https://aplinka.vilnius.lt/aplinkos-kokybe/triuksmas/

Municipal company “Vilniaus planas”. (2019). Vilnius City Noise Prevention Action Plan for 2019-2023.

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Administration of Vilnius city municipality. (2021). General plan of Vilnius city up to year 2030.

https://www.e-tar.lt/portal/lt/legalAct/a945c880c51511eba2bad9a0748ee64d

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
5A	0	565	565	1000
5B	0	596	596	600
5C	0	554	554	600

7. Climate Change Mitigation

7.A Present Situation

Please complete the following table with most recent data available.

Table 1: Benchmarking Data - Climate Change Mitigation

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding climate change mitigation.

Indicator			
Energy consumption		**Units**	**Year of Data**
Final energy consumption	11603437	MWh	2019
Final energy consumption per capita	21	kWh/capita	2019
Share of renewable energies of final energy demand	27,6	%	2019
Share of locally produced renewable energies of final energy demand	0.9	%	2019
Energy performance of municipal buildings (mean)	55-193	kWh/m^2	2019
CO_2 (and other greenhouse gas) emissions		**Units**	**Year of Data**
Total CO_2 equivalent emissions per year	2010000	t CO_2 eq.	2017
Total CO_2 equivalent emissions per capita	3,7	t CO_2 eq./capita	2017
Total CO_2 equivalent emissions per MWh energy consumed	0.2	t CO_2 eq./MWh energy consumed	2017
Emission reduction targets	**Base Year**	**Target Year**	**% Reduction**
City's emissions reduction targets	2017	2030	100

Table 2: Benchmarking Data – Energy consumption and CO_2 emissions per sector

∗For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding energy consumption and CO_2 emissions per sector.

Sector	**Percentage of final energy consumption**	**Unit**	**Percentage of total CO_2 equivalent emission per year**	**Unit**
Agriculture & fisheries	-	%	-	%
Industrial & commercial	-		-	
Transport	38		50	
Domestic	40		30	
Services	-		-	
Other	22		20	
Total	**100**		**100**	

This section is aimed at providing information on the current situation in relation to energy and CO_2 emissions (and other greenhouse gases) in the city. Please provide information on the following:

1. *A breakdown of the sources of energy.*
2. *The current monitoring system of CO_2 emissions.*

3. *The city's organisational structure in charge of energy performances in the city (of buildings, transport, industry, etc).*
4. *How the city works on emissions reduction with other governmental bodies, private sector service providers, enterprises and citizens.*
5. *An existing sustainable energy and climate action plan (SECAP)[1] under the Covenant of Mayors for Climate and Energy (CoM) and respective references will be positively noted.*
6. *The modal share of transport (detailing at least the share of transport by car, public transport, and active transport) and plans such as a sustainable urban mobility plan (SUMP)[2] or sustainable urban logistics plan (SULP)[3].*

(max. 1000 words and five graphics, images or tables)

As a growing city with expanding urban infrastructure, increasing number of residents and improving economic situation, Vilnius recognises the challenges of climate change and sees the necessity to use joint efforts of public institutions, private enterprises, and society to tackle climate change. Positive socio-economic changes not only pose the challenge of managing increasing demand for infrastructure, energy consumption and quality of services, but also give more possibilities for a sustainable transition towards a net-zero emissions city.

Vilnius started reporting GHG emissions in 2013, after signing the CoM. GHG inventories have been drafted following the IPCC guidelines for the whole municipal area, and include direct and indirect emissions. CO2 emissions are monitored together with other GHG and reported in the municipal GHG inventory. The latest GHG inventory report for 2018 – 2022 will be published in August 2023.

Based on the last available GHG inventory, natural gas (44%) and biomass (56%) were the primary energy sources in the heat and power sector in 2017. Diesel (66%), gasoline (29%), liquid gas (4%) and natural gas (1%) dominated the transport sector. Since then, the percentage of alternative energy sources has been increasing (27,6% in 2019). Details on GHG footprint will be presented in the following Vilnius city GHG inventory.

Energy performance in the city is subject to a three-level organisational structure – policy-making, management and implementation level. The policy-making level made up of the Mayor and his team coordinates and sets goals for energy performance. The management level comprises municipal divisions responsible for each energy sector (heating, building renovation, transport, green infrastructure, etc.), and coordinates and ensures the implementation level – implementing public institutions responsible for city's heat production, heat supply, renewable energy and the use of renewable energy sources, renovation of buildings, public transport, infrastructure, and public lighting. In total, there are 11 public institutions taking care of the city's energy infrastructure and efficiency. Each of these institutions sets individual sustainability and efficiency goals corresponding to local and international policies.

All the public institutions in the city seek to make each energy sector modern, efficient and up-to-date. For example, the private limited company Vilniaus Apšvietimas (Vilnius Lighting) is responsible for all public lighting in the city and uses the "Vilnius Public lighting standard" with 9 principles of lighting, thus ensuring sustainability of its services. Currently, 100% of energy used for public lighting is renewable, lightbulbs are LED energy saving, cars used by the company are electric, lighting is managed by a smart control system automatically choosing intensity for the ambient, saving energy

[1] Local authorities joining the Covenant of Mayors commit to submitting an action plan within two years after formally signing up to the initiative. More information on the SECAPs and the relevant processes can be found in the FAQ of the Covenant of Mayors: https://eu-mayors.ec.europa.eu/en/FAQs

[2] https://transport.ec.europa.eu/transport-themes/clean-transport-urban-transport/urban-mobility/urban-mobility-actions/sustainable-urban-mobility-plans_en

[3] https://www.eltis.org/resources/tools/planning-sustainable-urban-logistics

and reporting malfunctions, and thus reducing the number of check-up trips. The overall concept of lighting infrastructure design is to use each lighting pole as a hub for all the necessities of each location – for hanging road signs, semaphores, security cameras, dataloggers for contamination, electric car charging plugs (Picture 7. 1), or as a support for climbing plants. In order to contribute to a better-balanced energy consumption, car charging is performed at night. For remote locations, autonomic lighting systems with solar panels are used.

Picture 7. 1 Street lighting poles with electric car charging station.

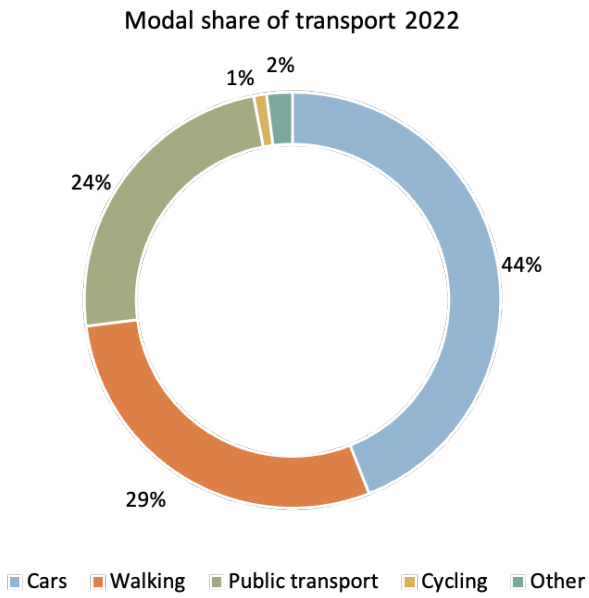
Picture 7. 2 Participatory approach in city planing is cruicial for a sustainable development.

Even though public institutions are doing a great job in making Vilnius a green capital, successful performance in emissions reduction cannot be achieved without the involvement of private enterprises and citizens (Picture 7. 2). Several public initiatives (e.g. communal vegetable gardens "Idėjų lysvė" (Picture 7. 3) and "Antakalniečių bendruomenė"), standards (e.g. 12 principles used in Vilnius Street Design Manual, Vilnius lighting standard) and platforms have been in place in pursuit of social, inter-organizational, and intercultural collaboration for emissions reduction and sustainability.

Picture 7. 3 Communal vegetable garden project "Idėjų lysvė" developed by locals and supported by Vilnius City Municipality.

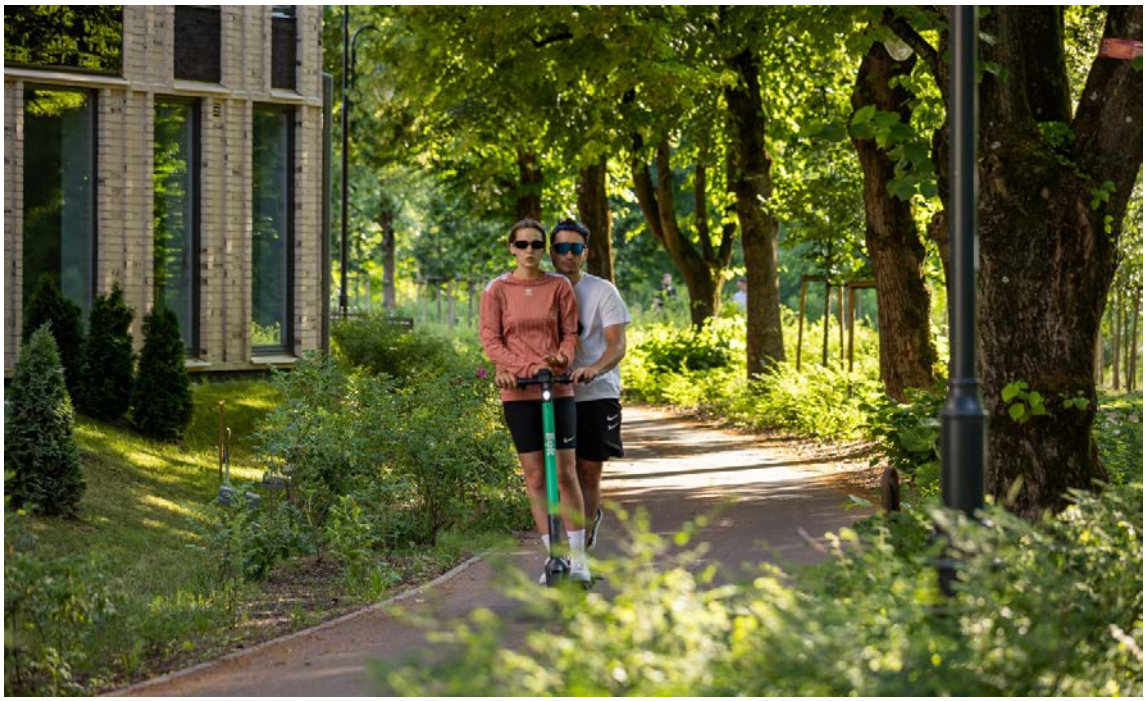
To achieve sustainability and net-zero emissions, Vilnius launched two major innovation projects – the Intelligent Energy Lab (IEL) and Vilnius City Innovation Industry Park (VCIIP). IEL is a platform that invites companies, universities, and institutes to promote energy efficiency and sustainability, with 79 members already engaged in pilot projects (e.g. smart meters with NB-IoT technology, low-temperature district heating grid, solar energy cogeneration, etc.). The VCIIP raises investments for innovative companies, start-ups and research centers in various fields, including health, biotechnologies, sustainable environment and energy, smart and clean transport, modern educational technologies, having created 515 jobs and raised € 73,991,311 so far.

Involvement and intersectoral collaboration are necessary for solving another growing city's issue – transport. Dealing with transportation issues in Vilnius requires intersectoral collaboration. Currently, 44% of commuting is done in private vehicles, with walking accounting for 29% and public transport – for 24% (Graphic 7. 1). Vilnius aims to transition to a sustainable transportation system through its SUMP 2030, having achieved the level of implementation of 15%. Having implemented the SUMP 2030, Vilnius transportation will become more convenient, efficient, and green. The city is becoming a "Walkable Vilnius" with numerous green routes and renewed infrastructure for walking and biking. Innovative infrastructure for electric car charging stations is being developed in cooperation with private entities (having already installed 59 fast charging and 9 slow charging stations). Not only electric vehicles are more environmentally friendly, but also the use of charging stations at night allows making the consumption of electricity more balanced and efficient. Collaboration has led to a competitive car-sharing market, with 25% of the fleet being electric, helping to reduce the number of private vehicles.



Graphic 7. 1 Modal share of transport 2022

Architecturally Vilnius is still facing an important challenge of outdated and energetically inefficient Soviet architecture, especially multi-apartment building blocks and brownfields. Collaboration with locals for the renovation of these building blocks has been encouraged through a variety of public financial tools and incentives to help speed up the renovation process. Building new sustainable architecture is equally important, thus in cooperation with the municipality, private enterprises developed neighbourhoods in previously brownfield lands corresponding to modern lifestyle and respecting architectural heritage. E.g., the Paupys neighbourhood was nominated in the prestigious MIPIM Award as one of the best and most sustainable architectural projects in the world (Picture 7. 4).



Picture 7. 4 Paupys neighbourhood nominated for MIPIM award.

Currently, several plans are being drafted to set the goals for mid-term and long-term climate action. These include a new Sustainable energy and climate action plan (SECAP), a GHG inventory, and an ambitious Green Vilnius policy.

7.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been *achieved in the past ten years. Please provide the following information:*

1. *Trends and changes in terms of the energy performance and CO_2 emissions (and possibly other greenhouse gases) in the city that have taken place over the last ten years. Refer to:*
   a. *Trends in CO_2 and other greenhouse gas emissions.*
   b. *Trends in energy consumption.*
   c. *Trends in the use of renewable energy technology.*
2. *Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under 1.*

(max. 600 words and five graphics, images or tables)

CO2 and other GHG were estimated for the first time in 2003, with the first official GHG inventory prepared in 2012 and the latest available data from 2017. In 2003-2017, leaders in GHG emissions remained similar, with transport sector accounting for the major share, followed by energy, waste disposal, and others. Despite a 7% increase in overall GHG emissions, there was a significant reduction in emissions from the energy sector due to a shorter heating season, increased use of renewable energy sources, and heating infrastructure renovations, leading to a reduction in energy sector emissions of around 30%.

Over the past decade (since 2012), Vilnius has seen consistent improvements in socio-economic conditions, with a 7% increase in population, the adoption of the euro as national currency, and a 260% increase in average salary. These improvements have led to better living conditions, city growth, an increase in privately owned cars and kilometers driven. However, the city has been making efforts to offer alternative transport, including the construction of 100 km of new bicycle infrastructure since 2016, continuous renovations of public transport, installation of new hiking paths, and easily accessible car, bicycle, and scooter sharing platforms to encourage citizens to reduce their reliance on personal transportation (Picture 7. 5).

Picture 7. 5 Alternative means of transportation are becoming more accessible to citizens.

The use of renewable energy (RE) technology has been growing continuously in Vilnius. In 2013, RES accounted for 16.2% in the final energy consumption, and almost doubled (to 27.6%) in 2019. Vilnius produces approximately 5% of national RE, with biofuel power plants contributing 95% and hydropower plants – 2%. In the context of recent geopolitical shifts, both the municipality and citizens of Vilnius have taken immediate action to support energy autonomy, with an increase in personal solar panel installations and significant use of solar power.

Picture 7. 6 Continuously renewed public transport is more energy-efficient and eco-friendly.

A Sustainable Energy and Climate Action Plan was prepared in 2013 with the aim to reduce GHG emission by 20 % by 2020. Some significant steps were taken in each GHG generating sector trying to reduce emissions, make energy and infrastructure usage more sustainable and durable:

- Housing sector:
  - Renovation of Soviet multi-apartment building blocks started in 2005, upgrading energy class from G/F to B/C. In the past 10 years, 150 multi-apartment building blocks have been renovated with state aid (Picture 7. 8).
- Infrastructure:
  - Renovation of heating infrastructure for energy efficiency and reduced losses.
  - Public lighting renovated, 100% powered by renewable energy sources and designed to save energy.
  - Expanded green infrastructure for CO2 absorption/storage with public lawns management.
- Renewable energy sources:
  - Shifting the heating system of Vilnius to renewable sources; renewable biofuels used for municipal heating accounted for 44% in 2018, 54% in 2019, and 61% in 2020.
- Transport sector:
  - Municipal public transport has used sustainable management principles according to the LST EN ISO 14001:2005 standard since 2011.
  - Public transport was upgraded to newer, more energy-efficient and eco-friendly vehicles. In 2022, 17 electric vehicles were added.

- Three car-sharing companies in Vilnius have a fleet of around 2,000 cars, of which 25% are electric.
- Sustainable Urban Mobility Plan 2030 was approved in 2018.
- 59 fast-charging and 9 slow-charging electric vehicle charging stations were installed, serving 44% of Vilnius residents within 500 meters.

Picture 7. 7 Before the renovation of Soviet multi-apartment building blocks

Picture 7. 8 After the renovation of Soviet multi-apartment building blocks

For better management of transition towards emissions net-zero city and in preparation for the EU's Mission "100 Climate- Neutral and Smart Cities", a new public institution Climate-neutral Vilnius was established in September 2022 working on a City's sustainable transition map, strategies and plans. The institution coordinates efforts to make Vilnius a climate-neutral city, implementing solutions for socio-economic and environmental benefits.

7.C Future Plans

Please describe the following:

1. *The medium term (2030) and long term (2050) objectives for further emissions reduction and shaping a sustainable energy system. An existing sustainable energy and climate action plan (SECAP) under the CoM should be referenced, or – if not – the elaboration of such plan should be considered.*
2. *The overall strategy for climate change in the city to achieve the ambitions described under 1 and how it is integrated with other environmental areas. Please refer to:*
    a. *The city's strategy regarding renewable versus non-renewable energy mix, including the plans to implement the European Solar Rooftops Initiative.*
    b. *Measures affecting the total energy use and CO_2 emissions in the city.*
    c. *The city's strategy and measures to promote the transition towards increased zero-emission transport including active mobility (i.e. walking and cycling) (if not yet done, elaboration of a sustainable urban mobility plan (SUMP) and/or logistics plan).*
    d. *Changes in industries, consumers' behaviour, municipal buildings and import and export chains.*
    e. *Innovative approaches your city is planning to use.*
3. *To what extent measures and ambitions described under 1 and 2 are supported by:*
    a. *Strategic and policy commitments.*
    b. *Budget and resource allocations.*
    c. *Plans for monitoring of impacts.*
    d. *Participatory approaches.*

(max. 600 words and five graphics, images or tables)

Vilnius has been committed to EU climate targets since 2013 and has set new goals for 2030, striving to become climate neutral under the EU's "100 Climate-Neutral and Smart Cities" initiative. The Green Vilnius Policy outlines plans for maintaining and enhancing urban landscapes, preserving natural value, and creating green infrastructure to combat climate change.

Vilnius is set to approve a Renewable Energy Development Plan for 2030 in April 2023, which includes installing solar panels on all municipal buildings to reach 34 MW power plants. The implementation of the REPowerEU package has already led 318 public institutions to become self-sufficient by installing solar panels on their rooftops (Picture 7. 9). New buildings are required to utilize renewable energy sources, and the government is actively encouraging legal entities and residents to take advantage of state aids for purchasing green energy equipment.

Picture 7. 9 Solar pannels beeing installed on a municipal building of Vilnius city maintenance institution „Grinda“.

Private enterprises are also contributing to the cause by installing solar panels on supermarkets and other buildings. In addition, Vilnius plans to completely ban the burning of coal and peat in the city from June 2023 onwards.

Upon full completion of biofuel cogeneration facilities (Picture 7. 10), the share of RES used for heating in Vilnius should reach 90 % already by 2024 and become completely fossil fuel free by 2030. Vilnius is also planning to start pilot projects for using heat pumps to consume the excess heat, planning to start projects for centralized air conditioning and for the use of biogas.

Picture 7. 10 Vilnius biofuel cogeneration facilities will be fully functioning in 2024.

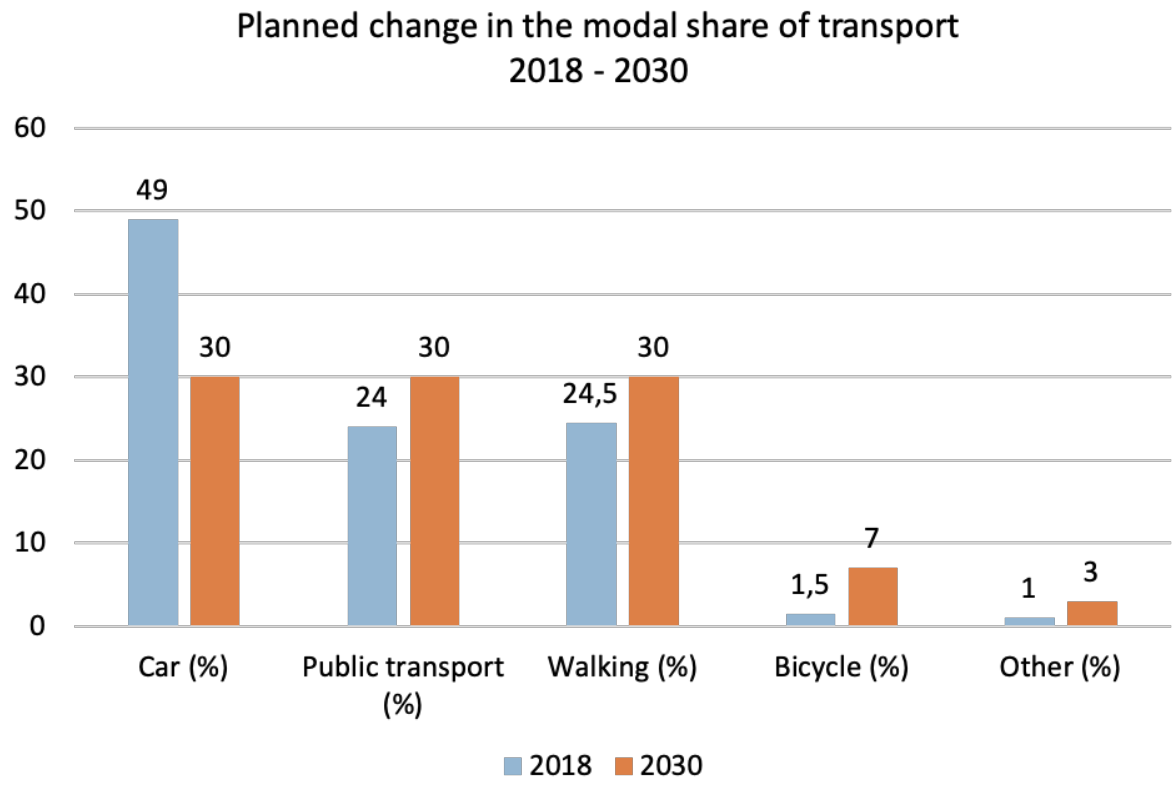
Public transport is also on its way of becoming fossil fuel free. The aim of Vilnius SUMP 2030 is to achieve that not more than 20 % of public transport runs on fossil fuels and the remaining 80 % is fuelled by alternative means (e.g. hydrogen), with electric vehicles accounting for 55 % at the least. A new project is coming up for developing hydrogen powered public transport in 2026 with hydrogen powered buses that would save up to 655 tCO2e per year.

In current planning phase, the focus stays on the sectors using the most energy and having the biggest CO2 footprint, which are the transport and energy sectors. To tackle growing GHG levels in transport sector the SUMP provides three main goals to be achieved by 2030:

1. To improve the quality of travel, shorten commuting times and make commuting a pleasant experience;
2. To reduce the negative environmental impact of travelling;
3. To reduce congestion in urban spaces.

Picture 7. 11 New, comfortable infrastructure is helping tos change the modal share of transport.

The goals will be achieved in application of more than 300 different measures to promote public transport, cycling, walking and better traffic management, such as less polluting public transport, providing better accessibility for people with disabilities, adapted for transporting bikes, with visual security systems, smart passengers ticket systems, increased cleanliness, improved routes and frequency of buses, organized public engagement events etc (Graphic 7. 2). The modal share of transport is shown in the graph comparing the data of 2018 and expected in 2030.



Graphic 7. 2 Planned change in the modal share of transport 2028 – 2030.

General public will be involved in for the pursuit of change through many educational and participatory events and projects. One of them is the H2020 project CAMPAIGNers which aims to engage more than 100,000 citizens around the world in research into low-carbon lifestyle, bringing together scientific institutions, influential non-governmental organisations and 15 cities.

Some other innovative projects have been started as pilot and are being further developed, for example, the collection of waste heat from a data centre (H2020 pilot project Reuseheat) or digitisation of data.

7.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at thisstage.

(max. 400 words)

Vilniaus planas. (2015). Report Evaluation of the Vilnius City Sustainable Energy and Climate Change Indicators. Assessment of greenhouse gas emissions in 2012 and 2013.

https://vilnius.lt/wp-content/uploads/2018/03/Tvarios_energetikos_klimato_kaitos_vertinimas_1.pdf

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https://vilniusatmipim.com/wp-content/uploads/2023/02/Apsvietimo-principai-1-Lapas-EN.pdf

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
6A	0	997	997	1000
6B	0	594	594	600
6C	0	469	469	600

7. Climate Change: Adaptation

7.A Present Situation

In this section we ask you to present the current situation of climate change adaptation in your city. Please, complete the following table with the most recent data available:

Table 1: Benchmarking Data - Climate Change: Adaptation

** Double left click the check box and select 'Default Value - Checked' where appropriate*
*** For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding climate change adaptation.*

<table>
<tr><th colspan="7">Systematic climate risks and vulnerabilities assessment</th></tr>
<tr><td>☒ Existing</td><td rowspan="2">If yes, year it was or will be finished:</td><td>2017</td><td rowspan="3">Considers:</td><td>☒ Heat</td><td>☒ Current climate risks</td></tr>
<tr><td>☐ In preparation</td><td>The assessment is planned to be updated in 2024.</td><td>☐ Droughts</td><td>☒ Future climate risks</td></tr>
<tr><td>☐ None</td><td colspan="2"></td><td>☒ Floods</td><td>☐ Sea level rise</td></tr>
<tr><td colspan="3"></td><td colspan="3">☐ Other: […list here]</td></tr>
</table>

Complement the information in the table by the following:

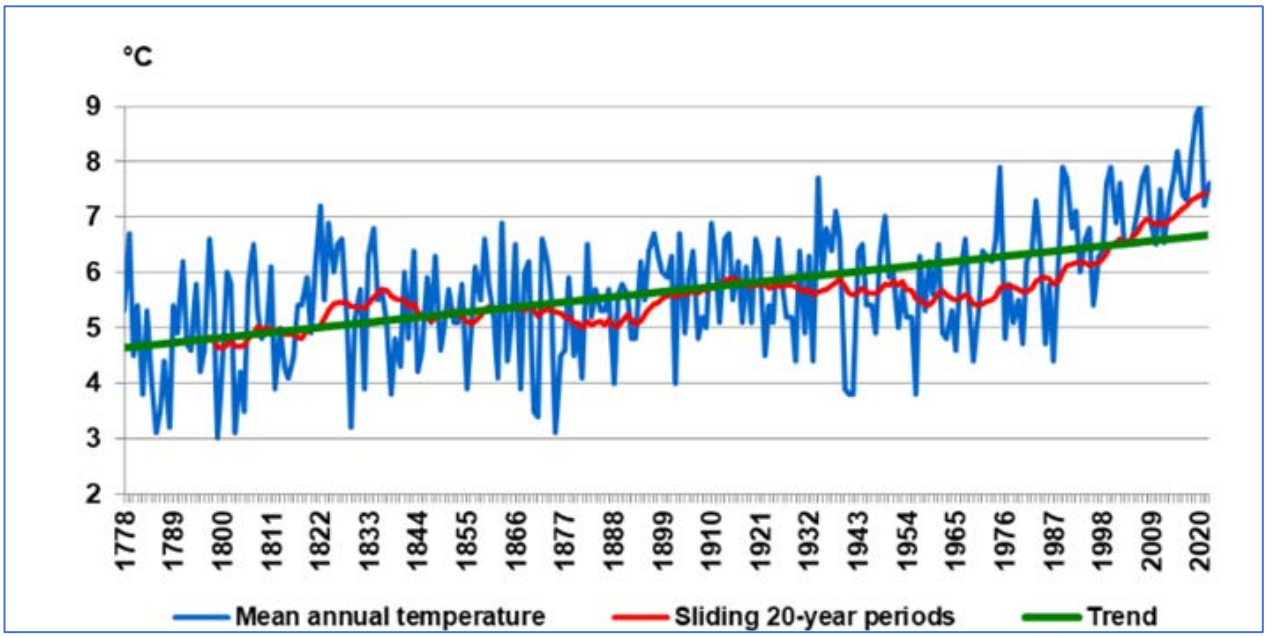
1. Explanation of:
   a. Identified climate impacts (e.g. temperature, different types of flooding, droughts and vulnerability of certain population groups).
   b. Sectors concerned (e.g. transport, energy, water management and health)
   c. What is done to adapt the city to threats from heat, drought, food security, etc.
2. The organisation of the responsibility for adaptation in the administration and collaboration between different departments on this subject.
3. The way your city monitors progress in terms of the implementation of measures and of actual reduced vulnerability/risks.
4. The way your city involves stakeholders, like citizens, other sectors, public and private owners by awareness raising, planning and implementation.
5. An existing sustainable energy and climate action plan (SECAP)[1] under the Covenant of Mayors for Climate and Energy (CoM) and respective references will be positively noted.

(max. 1000 words and five graphics, images or tables)

[1] Local authorities joining the CoM commit to submitting an action plan within two years after formally signing up to the initiative. More information on the SECAPs and the relevant processes can be found in the FAQ of the CoM - https://eu-mayors.ec.europa.eu/en/FAQs

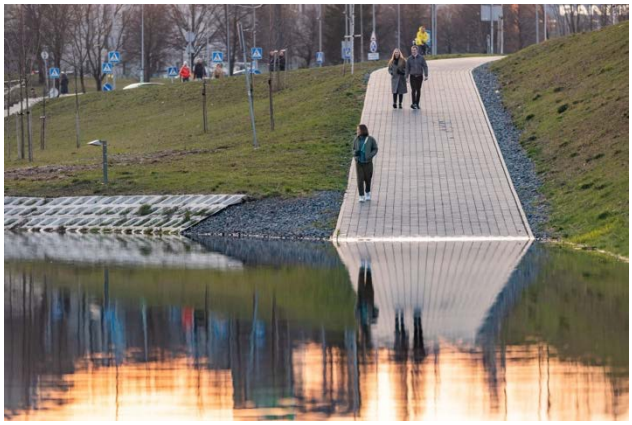
Climate change is an inertial process, the impacts of which are likely to get stronger in the upcoming years causing environmental, social, and economic damage. Vilnius has one of the longest temperature monitoring time series in Europe started in 1778 at Vilnius University, therefore the assessment of climate change impacts is based on solid data (table 12). Climate change scenarios, risks and vulnerabilities were assessed while preparing the first GHG municipal report. In 2017, measures for climate change adaptation were identified under the CoM, focusing on nature-based solutions in city planning, providing for a reasonable ratio of hard and water-permeable covering, and offering measures to regulate rainwater on the roofs of buildings.

Temperatures are now higher in Vilnius in all seasons, with an average annual air temperature 0.7°C higher compared to the end of the last century. Projections show a potential increase of 3°C to 9.8°C by 2100 compared to the 1981-2010 period, with winter temperatures seeing the greatest change. By 2085, the average winter temperature is predicted to increase by 3.7°C compared to 1981-2010, resulting in lower energy consumption but increased health risks such as tick-borne encephalitis. Public health is a major concern, as increasing heat waves could lead to higher mortality rates, especially among vulnerable groups like the elderly. Urban areas in Vilnius have a higher prevalence of tick-borne encephalitis compared to rural areas.



Graphic 7. 1 Annual air temperature in Vilnius in 1778-2022 (source: Lithuanian Hydrometeorological Service).

Temperature change affects river water levels and flooding periods, resulting in lower spring floods and more unpredictable flooding during the rest of the year (Picture 7. 1). There are unexpectedly high floods in summer and winter, making management difficult. In Vilnius, managing floods and ensuring public safety is a big concern. Average summer temperatures are expected to increase by 2.6 °C by the end of the 21st century, resulting in prolonged droughts affecting agriculture and ecosystems. The probability of extreme hydrometeorological events will increase by 27% in the 21st century, with such events occurring almost every year. The probability of low and extremely low water periods in the Neris River is predicted to increase, resulting in an average runoff reduction of 11%. Heat waves and prolonged drought periods increase excess deaths, especially among vulnerable populations.

Picture 7. 1 Spring flood of Neris river is (not) stopping citizens from using infrastructure.

Heatwaves are considered a prevalent concern in Vilnius city from the climate change perspective, therefore, in pursuit of adaptation and resilience, the city focused on green and blue infrastructure, installing more artificial water bodies, ponds, public fountains. A number of plants were planted under the initiative "The Green Wave of Vilnius" (Picture 7. 2) (see Chapter "Biodiversity, Green Areas & Sustainable Land Use" for more details), also starting to calculate the Green Index. Recently, the city has implemented a new approach to public lawns management, turning lawns into flowering meadows. By mowing meadows once or twice during the season only, the city helps to establish rich biodiversity, capture and store carbon in the soil, reduce heat island effect and manage water levels. Nature-based solutions for climate change mitigation, emissions reduction and compensation are among priorities in Vilnius, and more innovative measures will be taken.

Picture 7. 2 "The Green Wave of Vilnius" attracted many citizens for public tree planting campaigns.

Transport and infrastructure are also at risk because increased rainfall is already affecting road infrastructure and building constructions. By implementing the City of Vilnius Street Design, (Picture 7. 3) Vilnius increases green areas able to absorb water faster and helping to manage water levels.

Picture 7. 3 Vilnius Street design example, with three sections for cars, bicycles and pedestrians separated by green infrastructure.

Public involvement has been encouraged through the implementation of EU-funded projects such as Urban Agriculture for Resilient Cities (RU:RBAN) where communal gardens are planted in the cities to reduce heat islands and increase food supply autonomy. Communal projects allow city-dwellers to develop districts through social activities and foster social cohesion in areas where public space is not available.

By raising residents' awareness of climate change issues, ways to adapt to it and develop new more sustainable habits, Vilnius expects to transit towards a more resilient city. Continuous meetings and presentations are held to upscale the renovation of multi-apartment building blocks, with 100 multi-apartment buildings scheduled for renovation this year alone. There are events of the European Sustainable Mobility Week organized encouraging citizens to reduce private car use, and various ecological education programmes are implemented at educational establishments. City is actively sharing its know-how of the implementation of various initiatives and measures to enhance city's environmental sustainability on both national and international levels at conferences, seminars, workshops or bilateral meetings.

The platform Intelligent Energy Lab that involves various stakeholders, including academia, focuses on increasing efficiency of energy management using sustainable energy (see Chapter "Climate Change: Mitigation" for details).

In 2022, the public institution "Climate-neutral Vilnius" was established by Vilnius City Council. It will be a coordinating institution within Vilnius Municipality Administration and focus on climate mitigation and adaptation. The institution will mediate the work between different departments on this matter to ensure consistent implementation of the measures planned.

Currently, Vilnius does not have a Climate Change Adaptation Action Plan in place, but climate change projections till 2050 and 2100 have been prepared at a national level. Vilnius will start working on municipal climate change adaptation plans by the end of this year. The preparation of a Climate Change Adaptation Action Plan will include indicators and a framework for monitoring and risk assessment. While the plan is still in preparation, Vilnius follows national level climate change management and adaptation policies, such as the National Climate Change Management Agenda, the Strategy for the National Climate Change Management Policy, Vulnerability to Climate Change of Individual Sectors, Risk Assessment and Opportunities. A SECAP for 2020 was adopted in 2012, now preparing its updated version. In 2021, the City of Vilnius was elected among 100 cities to participate in the Cities Mission under the Net Zero Cities project, therefore Vilnius is drafting a 2030 Climate Neutrality Action Plan, which will include measures for adaptation to climate change, including forecasted climate change scenarios of the Ministry of Environment of the Republic of Lithuania. Also, the plan is to update the municipal Emergency Management Plan incorporating a climate change adaptation measure (see Chapter Climate Change: Mitigation for details).

7.B Past Performance

In this section we ask you to describe the city's development of climate change adaptation in the past ten years to reach the present situation. Please provide the following information:

1. The trends: the development of the actual vulnerability and risks in your city to the different aspects of climate change.
2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under point 1.

(max. 600 words and five graphics, images or tables)

As mentioned before, in 2017, the risk factors and recommended measures for climate change adaptation were identified under the CoM. The Table below lists the risks and measures identified.

Climatic events	Risks	Measures for adaptation
Heavy rainfall	Flood risk	In city planning, direct rainwater overflow toward green areas and plants has been planned.
		In city planning, a reasonable permeable and impermeable surface proportion has been chosen
		Water overflow from buildings is reused, directing it for slow runaway (reuse for fire extinguishing, plants, water bodies etc.)
		Designing landscape elements ensuring green areas for water retention.
		Early flood warning system
		Drafting detailed flood risk maps and planning infrastructure accordingly.
	Infrastructure damage	More information and education of population on the prevalence of ticks, health risks posed by them and safe behaviour in high-risk areas. Provision of information on tick prevalence (e.g. installation of information boards on tick populations and their risks) in high risk areas

		(parks, woodlands) where tick populations are relatively high.
Increased average annual temperature	Increase in distribution of bloodsucking insects	Controlling the reproduction of bloodsuckers and other parasites
		Temporary restriction of traffic in certain areas of the city during heat waves due to increased pollution
Heat waves	Increased air pollution with particles and ozone	More information to the public, together with recommendations on increased air pollution (telephone notifications, radio, television, city displays/lighting boards, etc.) in medical facilities, social welfare departments, elders' offices, etc.
		Develop and promote public transport, cycle path networks.
		Control of environmental risk areas (maintenance of streets and pavements – irrigation and cleaning).
		Informing the public on how to deal with heatwaves.
	Increased health risk	Establish a register of people at risk to initiate additional care (e.g., unscheduled access to a doctor, designated phone line or social care workers).
		Increase the number of artificial water bodies, parks and other green spaces. Install fountains (Picture 7. 5).
		Fountains in public spaces, ensuring their continuous operation during heatwaves.
		Ensure public cooling facilities in urban areas (e.g. special bus stops, underpasses, etc.).
		Ensure air conditioning in public transport.
		Install free water drinking facilities in the city.
		Preparation of recommendations for design and planning to reduce the impact of heat - creating shades with the help of trees and other plants, increasing vegetation cover, designing natural irrigation systems, etc.
	Higher temperatures in buildings	Assess the prevailing wind directions during planning and design and ensure architectural, engineering and natural measures to reduce draughts.
Storms, more frequent extreme weather occasions	Trees falling over streets and roads	Continuously maintain trees.
		Inform the public on how to behave during storms.
	Human health risks from falling trees	Underground design of utility systems
	Threats to electricity, communication infrastructure (damaged wires) (Picture 7. 4)	

Picture 7. 4 Extreme weather events are posing threats to public security, health and infrastructure.

In the past ten years, Vilnius faced challenges with growing built-up territories; the old rainwater collection network experienced difficulties in managing increased intensity of rainfall which flooded the streets. As a result, five projects to reconstruct rainwater networks were implemented, increasing infrastructure resistance to intense rainfall. Since 2021, Vilnius has been creating a digital clone of the rainwater system, which will allow analysing the functioning of the rainwater system, simulating the development of the city's infrastructure, and finding answers to strategically relevant engineering questions of the town. As heat waves are one of the biggest concerns in Vilnius, steps to adapt to it have been taken, e.g. installing more artificial water bodies (fountains), parks and other green areas. The City of Vilnius launched the campaign “The Green Wave of Vilnius” (Picture 7. 6). Its other initiative just started to evaluate the Green Index of buildings.

Picture 7. 5 Artificial water bodies and fountains helps to refresh and reduce heat effect.

Picture 7. 6 "The Green Wave of Vilnius" is turning building into a green infrastructure.

7.C Future Plans

Please describe the following:

1. The medium term (2030) and long term (2050) objectives regarding climate adaptation. An existing SECAP under the CoM should be referenced.
2. The planned measures to achieve the ambitions described under 1. Please indicate whether the city has a climate change adaptation strategy and/or action plan. Provide information about the following:
    a. Status of implementation.
    b. Relation to overall city planning and other plans and strategies.
    c. The impacts and sectors considered.
    d. Targets set.
    e. Innovative approaches your city is planning to use.
3. To what extent measures and ambitions described under 1 and 2 are supported by:
    a. strategic and policy commitments
    b. budget and resource allocations
    c. plans for monitoring of impacts
    d. participatory approaches

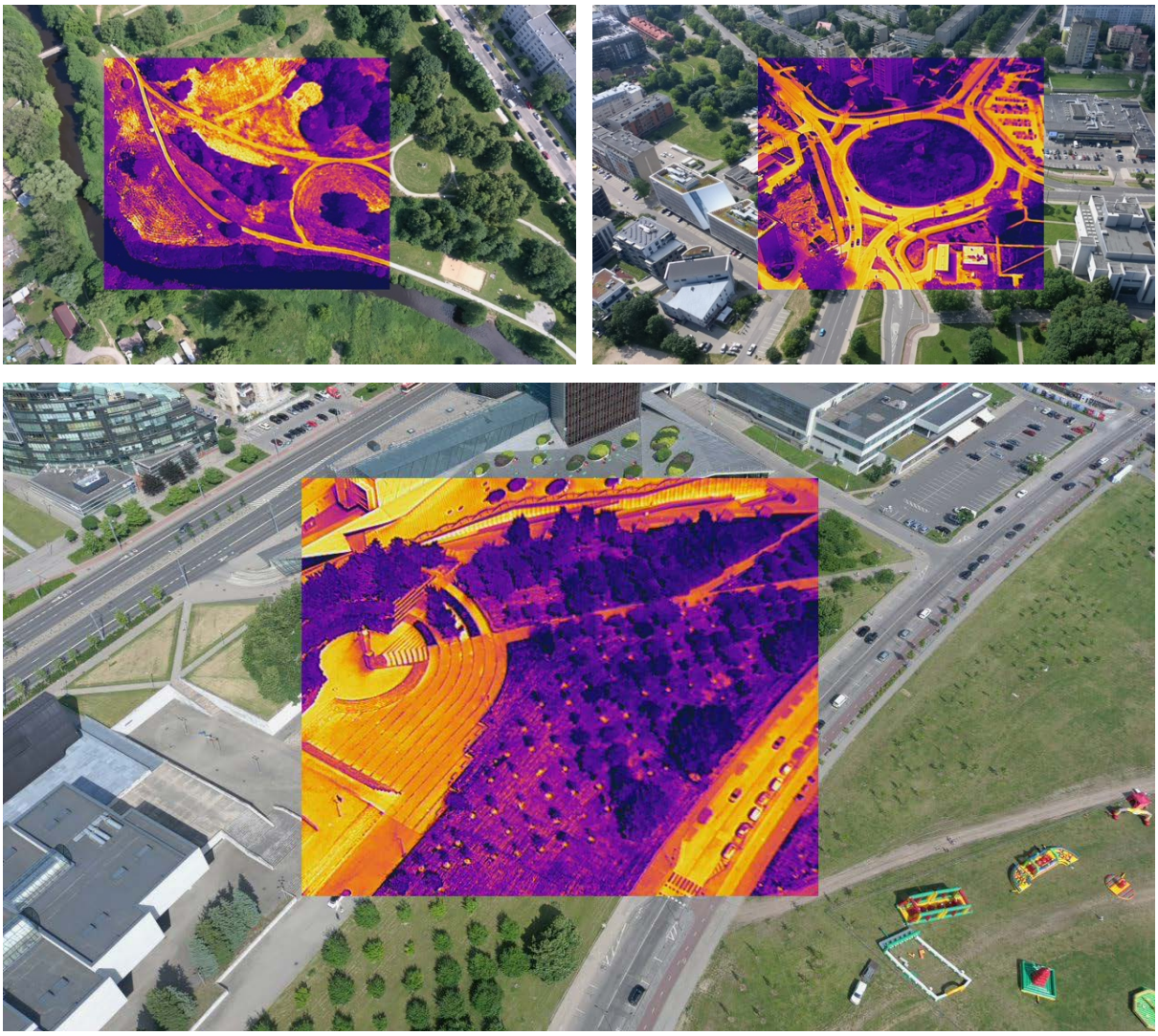
(max. 600 words and five graphics, images or tables)

Currently, the City of Vilnius is drafting the 2030 Climate Neutrality Action Plan, which will include the adaptation to climate change measures updated according to the climate change scenarios prepared by the Ministry of Environment of the Republic of Lithuania. In addition, the plan is to update the municipal emergency management plan incorporating a climate change adaptation plan in it.

The city does not currently have an active Climate change adaptation action plan in place, but plans to have it ready shortly. The plan will be aligned with the city's strategic plans, national documents and include an updated impact assessment and sectoral consideration. The city is determined to become emissions net-zero by 2030. A number of measures used to reduce carbon footprint and the overall impact on climate also help to adapt to changing climatic conditions and make systems more resilient, therefore development of carbon sequestering and preserving nature-based solutions (meadows, forests, parks, singular plants) is and will be among development and conservation priorities in the city (Picture 7. 7).

Picture 7. 7 Public lawns in Vilnius City are converted to flowering meadows, for multiple climate benefits.

Growing renewable energy sources increase autonomy of the city, growing and healthy green areas reduce the impact of extreme weather events and help to capture and store carbon (Picture 7. 7). These are just some examples of how climate mitigation and adaptation are intertwined and can be achieved through the same actions (see Chapter Climate Change: Mitigation for more details). Climate action in Vilnius is an integral process, providing for multiuse actions and measures.



Picture 7. 8 Heat reduction effect of green spaces, meadows and water bodies in the city are amont top nature based solutions for climate change adaptation.

With a new Climate Change Adaptation Action Plan in place, respective budget appropriations will be made. The resources considered for the implementation of the measures will be allocated from the local and national budget, financed by EU programmes and funds, EU Funds Investment Action Programme 2021-2027, Recovery and Resilience Facility Climate Change Programme (CCP) - CCP-funded projects related to climate change mitigation, energy efficiency and production improvement projects (e.g., modernisation of multi-apartment buildings, of public buildings, renovation/modernisation of one- and two-apartment dwellings of individuals), projects to promote the use of renewable energy sources and the introduction of environmentally friendly technologies (e.g., installation of biofuel boilers, heat pumps or solar power plants for natural and legal persons (schools, kindergartens, hospitals, care homes)).

7.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at this stage.

(max. 400 words)

Vilniaus planas. (2015). Report Evaluation of the Vilnius City Sustainable Energy and Climate Change Indicators. Assessment of greenhouse gas emissions in 2012 and 2013.

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Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
7A	0	999	999	1000
7B	415	174	589	600
7C	0	365	365	600

Good Practices

Please provide details of at least one present or future flagship project that demonstrates the city's commitment to an integrated approach to the management of the urban environment.

Please summarise up to five additional good practices, relating to any indicator(s) that demonstrate how the city is improving its environmental record. Please identify to which indicator(s) the good practice is relevant.

Good practices should be taken from information already provided within the application form.

Each good practice should be supported by a maximum of three graphics, images or tables (max. 300 words per good practice).

Future flagship project: Climate-neutral Vilnius by 2030

Vilnius has been committed to EU climate targets since 2013 and has set new goals for 2030, striving to become climate neutral under the EU's "100 Climate-Neutral and Smart Cities" initiative. The Green Vilnius Policy outlines plans for maintaining and enhancing urban landscapes, preserving biodiversity, and creating green infrastructure to combat climate change. This ambitious target will remain headlining on environmental agenda of Vilnius for coming years. A special public institution "Climate-neutral Vilnius" was established in September 2022 working on the city's sustainable transition map, strategies and plans. The institution coordinates efforts to make Vilnius a climate-neutral city, implementing solutions for socio-economic and environmental benefits. Climate neutrality will be achieved through various sectoral programmes. For example, Vilnius is set to approve a Renewable Energy Development Plan for 2030 in April 2023, which includes installing solar panels on all municipal buildings to achieve 34 MW power plants. In the implementation of the REPowerEU package, 318 public institutions have already become self-sufficient after installing solar panels on their rooftops. New buildings are required to use renewable energy sources, and the government is actively encouraging legal entities and residents to take advantage of state aids for purchasing green energy equipment. Private enterprises are also contributing to the cause by installing solar panels on supermarkets and other buildings. In addition, Vilnius plans to completely ban the burning of coal and peat in the city from June 2023 onwards. Housing, transport sectors and the development of the city infrastructure have also made some important transformations towards climate-neutral Vilnius (for more information, see Chapter 7 Climate Change Mitigation).

Open and engaging Vilnius

The governance principles of Vilnius include openness and active engagement of city residents in the implementation of environmental activities. Resident engagement can be structured into three levels: 1) engagement in strategic and policy implementation through participatory budgeting process, where residents can contribute their ideas on planning recourses for the greening of Vilnius; 2) a few online tools available to the public where the City of Vilnius informs residents about current environmental status of the city as well as the functionality enabling residents to report any observed problems on the interactive map and/or to provide suggestions concerning management of the city (e.g. green spaces); 3) direct engagement of residents in the development of green spaces through the "Green Wave" initiative. The City of Vilnius maintains a special map-based websites www.tvarkaumiesta.lt dedicated for reporting observed problems and suggestions and https://maps.vilnius.lt/ – for providing up-to-date information about environmental status of Vilnius. The "Green Wave" initiative involved invited residents and businesses of the city to plant 68,000 trees and shrubs. The City itself

planted 2,500, while the rest was planted by local businesses and residents. Overall, these initiatives of the City of Vilnius stimulate the feeling of ownership of the city among residents and an active community engagement in city life.

Sustainable management of city grasslands

Vilnius has implemented a new approach to public lawns management, turning lawns into flowering meadows. By mowing meadows once or twice during the season only, the city helps to establish rich biodiversity, capture and store carbon in the soil, reduce heat island effect and manage water levels. Areas which are not actively used for walking or leisure have been transformed into flowering meadows, thus providing aesthetic value, habitat for pollinators and enhancing biodiversity. More distant grassland areas are even more extensively managed to maintain wildlife. Some protected habitats involve sheep grazing to maintain favourable conservation status of protected species and landscape of high natural value. Nature-based solutions for climate change mitigation, emissions reduction and compensation are among priorities in Vilnius, and more innovative measures will be taken.

Lighting system of Vilnius

The private limited liability company Vilniaus Apšvietimas (Vilnius Lighting) is responsible for all public lighting in the city and uses the "Vilnius Public lighting standard" with 9 principles of lighting, thus ensuring sustainability of its services. Currently, 100% of energy used for public lighting is renewable, lightbulbs are LED energy saving, cars used by the company are electric, lighting is managed by a smart control system automatically choosing intensity for the ambient environment, saving energy and reporting malfunctions, and thus reducing the number of check-up trips. The overall concept of lighting infrastructure design is to use each lighting pole as a hub for all the necessities of each location – for hanging road signs, semaphores, security cameras, dataloggers for contamination, electric car charging plugs, or as a support for climbing plants. In order to contribute to a better-balanced energy use, cars are charged at night. For remote locations, autonomic lighting systems with solar panels are used.

Vilnius street standard

Vilnius has developed and is implementing its City of Vilnius Street Design standard. It is a simple 12 rules-based standard, which helps to unify street development and transform the city into a greener place friendly for walks of residents. The standard sets the rule of preserving the currently growing trees and planting new trees and shrubs between cars and pedestrians. By narrowing down the streets, road asphalt is replaced by new green areas, which are able to absorb water faster and help to manage water levels.

Sustainable transport in Vilnius

Vilnius is making efforts to offer public and alternative transport, including the construction of 100 km of new bicycle infrastructure since 2016, continuous renovations of public transport, installation of new hiking paths, and easily accessible car, bicycle, and scooter sharing platforms to encourage citizens to reduce their reliance on personal transportation. Vilnius has been recognized the leading city globally in terms of the amount of transport participating in sharing platforms.

In near future, Vilnius plans to renew its trolleybuses and to replace its current bus fleet with electric busses.