AIR POLLUTION IN THE SLOVAK REPUBLIC 2023

ANNEX

AIR QUALITY ASSESSMENT IN ZONE TRNAVA REGION

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Emissions and Air Quality Division
SLOVAK HYDROMETEOROLOGICAL INSTITUTE

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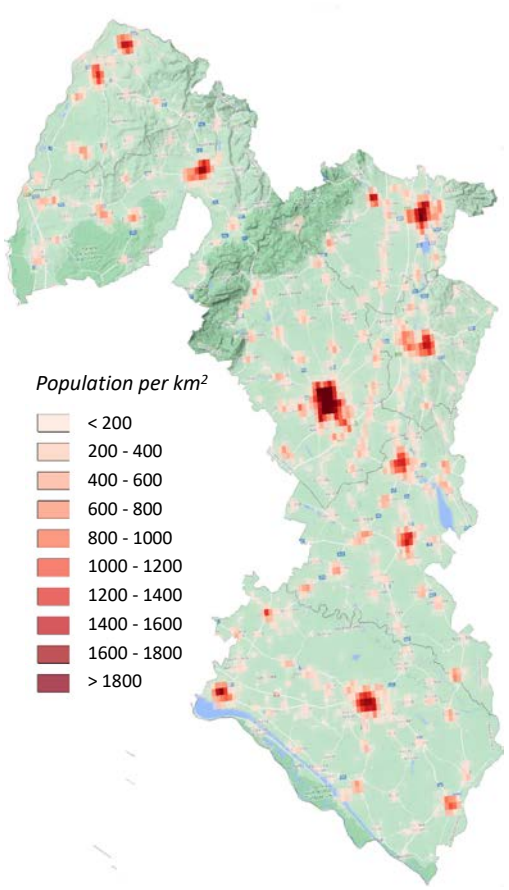
Version 1

1 DESCRIPTION OF TRNAVA REGION TERRITORY IN TERMS OF AIR QUALITY

The Trnava region is predominantly lowland and hilly. Its two important lowlands – the Danube and Záhorie – are separated by the Little Carpathians, which have a significant influence on the air flow. In the north-western part of the region, an outcrop of the Považský Inovec Mountains extends into the territory of the region. The highest point of the region is Záruby in the Liitle Carpathians with an altitude of 768 m above sea level, but the majority of this zone lies below 200 m above sea level. Larger closed basins do not occur in the Trnava region. **Fig. 1.1** shows the spatial distribution of population density in the zone.

Fig. 1.1 *Population density in the zone Trnava region (Source: EUROSTAT, 2018).*



The whole Trnava region is one zone in terms of air quality assessment for SO_2, NO_2, NO_x, PM_{10}, $PM_{2.5}$, benzene, polycyclic aromatic hydrocarbons and CO in the air.

Air pollution sources in zone Trnava region

According to the latest Population and Housing Census (PHC) 2021 data, natural gas is mainly used for heating of households in this zone. The share of solid fuels here is among the lowest compared to other zones, while the consumption of firewood is slightly higher in the more mountainous area of the Little Carpathians.

Road traffic characteristics – the most frequented parts of roads in the Trnava region with the average number of vehicles per 24 hours according to the National Traffic Census 2022 and 2023[1]:

Northwest of the Trnava region

- **D2 motorway**: 19 332 vehicles (10 036 trucks/buses (hereinafter referred to as T/B) and 9 245 cars (hereinafter referred to as C));
- **road No. 500** Myjava - Senica - Kúty (in the Skalica district): 9 015 vehicles (1 120 T/B, 7 810 C);
- **road No. 426** Holíč - Skalica (in the Skalica district): 13 220 vehicles (1 473 T/B, 11 626 C);
- **road No. 2** Kúty - Holíč (in the Skalica district): 13 153 vehicles (1 246 T/B, 11 843 C).

Centre of the Trnava region

- **D1 motorway**: 49 185 vehicles (10 734 T/B, 38 336 C);
- **R1 highspeed road** Trnava - Sereď - Pata (part in Galanta district): 51 031 vehicles (11 864 T/B, 39 084 C);
- **road No. 35** Dolna Streda - Galanta (connection from **R1**): 13 356 vehicles (3 435 T/B, 9 831 C) and **road No. 75** Sládkovičovo - Galanta - Šaľa: 13 229 vehicles (2 618 T/B, 10 564 C);
- **road No. 62** Senec - Sládkovičovo - Sereď: 14 405 vehicles (1 000 T/B, 13 374 C);
- **road No. 561** from Galanta to the south (section in the Galanta district) towards Veľká Meder: 12 141 vehicles (2 009 T/B, 10 013 C) and also to the south **road No. 507** to Dunajská Streda: 15 909 vehicles (1 388 T/B, 14 396 C);
- **road No. 507** Hlohovec - Sereď (near Hlohovec): 15 810 vehicles (1 573 T/B, 14 180 C);
- eastern bypass of Trnava, **road No. 51**: 27 040 vehicles (5 692 T/B, 21 268 C);
- Trnava - Senec **road No 61**: 26 567 vehicles (2 641 T/B, 23 819 C);
- **road No. 560** Trnava - Špačince (direction Dechtice and Vrbové): 8 073 vehicles (621 T/B, 7 419 C);
- **road No. 61** Trnava - Piešt'any (in the Trnava district): 14 847 vehicles (2 002 T/B, 12 740 C);
- **road No. 51**, which runs from Trnava to the north-west to Senica and Holíč (in Trnava district): 27 040 vehicles (5 692 T/B, 21 268 C), (in the Senica district) 16 868 vehicles (2 797 T/B, 13 994 CA).

[1] *https://www.ssc.sk/sk/cinnosti/rozvoj-cestnej-siete/dopravne-inzinierstvo/celostatne-scitanie-dopravy-v-roku-2022-a-2023.ssc*

South of the Trnava region

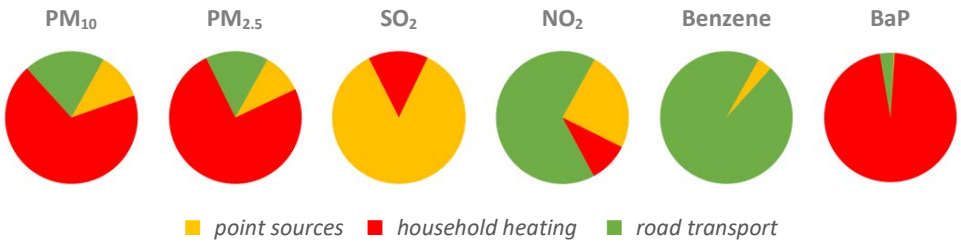
Road connection Dunajská Streda - Šamorín:

- **road No. 63** from Dunajská Streda east to Šamorín: 17 678 vehicles (3 310 vehicles T/B, 14 294 C);
- **R7 highspeed road** (disconnecting from **road No. 63**) from Dunajská Streda to Šamorín: 12 622 vehicles (2 048 T/B, 10 535 C);
- Southern bypass of Dunajská Streda (**road No. 63**) continuing southeast to Veľký Meder: 17 678 vehicles (3 310 T/B, 14 294 C).

Road connection Galanta - Dunajská Streda - Gabčíkovo:

- **road No. 507** (Dunajská Streda district): 15 909 vehicles (1 388 T/B, 14 396 C);
- **road No. 572** Dunajská Streda - Most pri Bratislave: 18 849 vehicles (975 T/B, 17 776 C).

Fig. 1.2 *Share of different types of air pollution sources in total emissions in the Trnava region.*

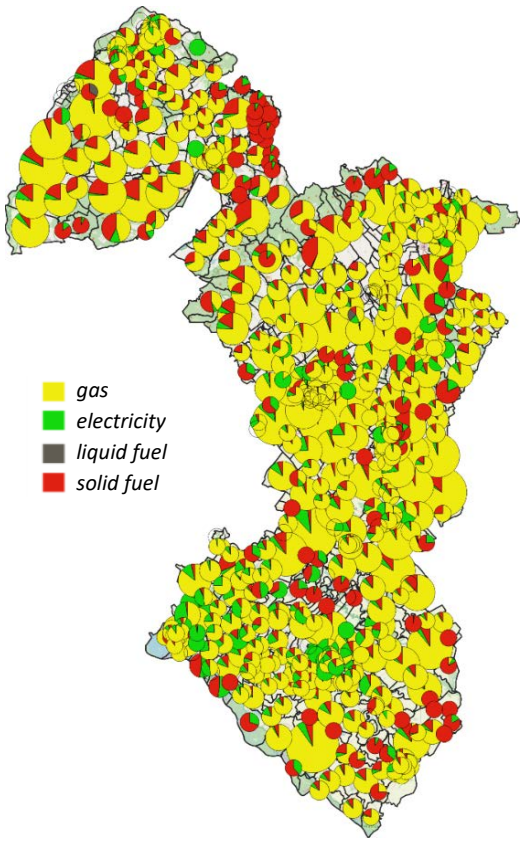


Note: Medium and large air pollution sources registered in the NEIS database are identified for this purpose as "point sources".

Industrial sources of air pollution are less important here in terms of their contribution to local air pollution from basic pollutants.

Fig. 1.3 shows the shares of fuel types in the heating of family and residential dwellings in individual municipalities (or basic settlement units) of the Trnava region, while it can be seen that the spatial distribution of fuel types is not geographically homogeneous. However, in the total for the whole region in 2021, gas heating was significantly more prevalent, while compared to other regions, a small representation of heating with solid fuels is evident.

Fig. 1.3 *Share of different types of fuel used for heating in the municipalities of the region [2].*



[2] *https://www.scitanie.sk*

2 AIR QUALITY MONITORING STATIONS IN ZONE TRNAVA REGION

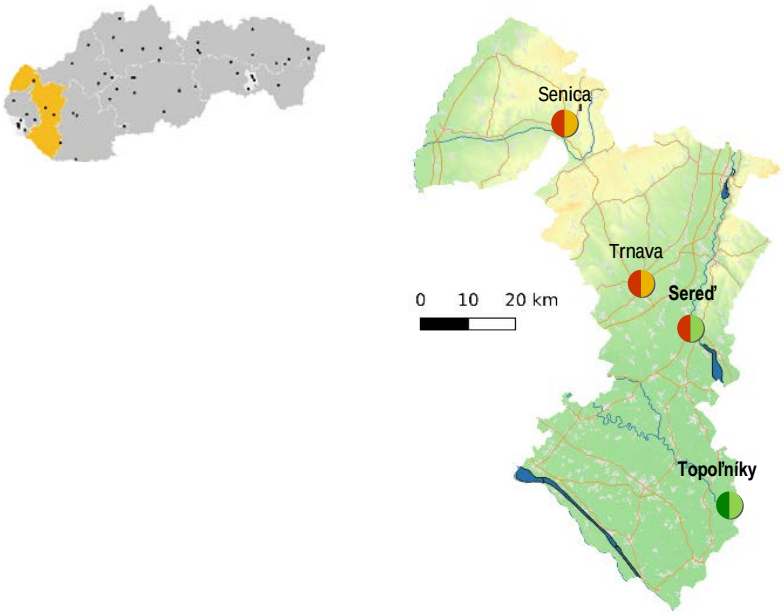
In the Trnava region, air quality is monitored at 4 stations. In Trnava, on a busy road (Kollárova street), near the train station, we observe the impact of traffic. Another traffic station is located in the northwestern part of the region in the district town of Senica. The monitoring station in Sereď is a representative of the urban background and is located in a housing estate of concrete high-rise block of flats. There is a rural background station with the lowest altitude in the municipality of Topoľníky, near the Klátov river arm, belonging to the EMEP network in Slovakia. It monitors the impact of long-range air pollution transport on the territory of Slovakia, as well as other monitoring stations included in the EMEP monitoring network (Chapter 2 of *Air pollution in the Slovak Republic 2023 Report*).

Tab. 2.1 contains information on air quality monitoring stations in the zone Trnava region:

- international EoI code, station characteristics according to the dominant sources of air pollution (traffic, background, industrial), type of monitored area (urban, suburban, rural/regional) and geographical coordinates;
- monitoring programme. Continuous monitoring automatic instruments provide hourly average concentrations of PM_{10}, $PM_{2.5}$, nitrogen oxides, sulphur dioxide, ozone, carbon monoxide, benzene and mercury. The SHMÚ test laboratory analyses heavy metals and polycyclic aromatic hydrocarbons as part of manual monitoring, resulting in 24-hour average values of. The exception is the EMEP station Topoľníky, whose monitoring programme is described in **Tab. 2.1**.

Tab. 2.1 *Air quality monitoring programme in the zone Trnava region.*

Zone Trnava region								Monitoring programme									
								Continuously								Manually	
District	EoI code	Station	Type of area	Type of station	Geographical longitude	Geographical latitude	Altitude [m]	PM_{10}	$PM_{2.5}$	NO, NO_2	SO_2	O_3	CO	Benzene	Hg	As, Cd, Ni, Pb	BaP
Dunajská Streda	SK0007R	Topoľníky, Aszód, EMEP	R	B	17°51'37"	47°57'34"	113									*	
Senica	SK0021A	Senica, Hviezdoslavova	U	T	17°21'47"	48°40'51"	212										
Trnava	SK0045A	Trnava, Kollárova	U	T	17°35'06"	48°22'17"	152										
Sereď	SK0063A	Sereď, Vinárska	U	B	17°44'07"	48°17'01"	130										
							Total	4	4	3	2	1	1	1	1	2	1



* *Monitoring of heavy metals at the station Topoľníky is carried out according to the EMEP monitoring programme (Tab. 2.2).*

Type of area:
U – urban
S – suburban
R – regional

Type of station:
T – traffic
B – background
I – industrial

The Topoľníky monitoring station characterises the regional background level of pollution. It is included in the EMEP[3] monitoring programme which, in addition to extended air pollution monitoring, also covers the analysis of atmospheric precipitation.

The air quality monitoring programme at the EMEP station Topoľníky in 2023 is presented in **Tab. 2.2**. Heavy metals are analysed from weekly samples (sampling duration is 7 days).

Tab. 2.2 *Monitoring program at the EMEP station Topoľníky.*

	Ozone (O_3)	PM_{10}	Lead (Pb)	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	Chromium (Cr)	Copper (Cu)	Zinc (Zn)
Topoľníky	x	x	x	x	x	x	x	x	x

The sampling interval of precipitation (**Tab. 2.3**) for heavy metal analysis is the calendar month. Heavy metals occur at lower concentrations at this site. A wet-only rain gauge is used to collect precipitation, which records only precipitation (the gauge is closed during periods when no precipitation occurs). Wet deposition is assessed by analysing the samples thus collected.

Tab. 2.3 *Precipitation monitoring programme at EMEP station Topoľníky.*

	pH	Conductivity	Sulphates (SO_4^{2-})	Nitrates (NO_3^-)	Chlorides (Cl^-)	Ammonium ions (NH_4^+)	Alkali ions (K^+, Na^+, Ca^{2+}, Mg^{2+})	Lead (Pb)	Arsenic (As)	Cadmium (Cd)	Nickel (Ni)	Chromium (Cr)	Copper (Cu)	Zinc (Zn)
Topoľníky	x	x	x	x	x	x	x	x	x	x	x	x	x	x

[3] *https://www.emep.int*

3 ASSESSMENT OF AIR QUALITY IN ZONE TRNAVA REGION

This chapter contains an assessment of air quality in the zone Trnava region based on monitoring, supplemented by mathematical modelling results for PM_{10}, $PM_{2.5}$ and benzo(a)pyrene for the year 2023.

Tab. 3.1 *Assessment of air pollution according to limit values for protection of human health and smog warning system for PM_{10} in the zone Trnava region – 2023.*

	Protection of human health									IT[2]	AT[2]
Pollutant	SO_2		NO_2		PM_{10}		$PM_{2.5}$	CO	Benzene	PM_{10}	PM_{10}
Averaging period	1 h	24 h	1 h	1 year	24 h	1 year	1 year	8 h[1]	1 year	12 h	12 h
Parameter	number of exceedances	number of exceedances	number of exceedances	average	number of exceedances	average	average	average	average	duration of exceedance [h]	duration of exceedance [h]
Limit value [µg·m^{-3}]	350	125	200	40	50	40	20	10 000	5	100	150
Maximum number of exceedances	24	3	18		35						
Senica, Hviezdoslavova	0	0			4	18	13			0	0
Trnava, Kollárova			0	27	2	19	14	1 178	0.67	0	0
Topoľníky, Aszód, EMEP	0	0	0	5	0	13	13			0	0
Sereď, Vinárska			0	12	3	17	11			0	0

≥ 90% of valid measurements

[1] *eight-hour maximum concentration*

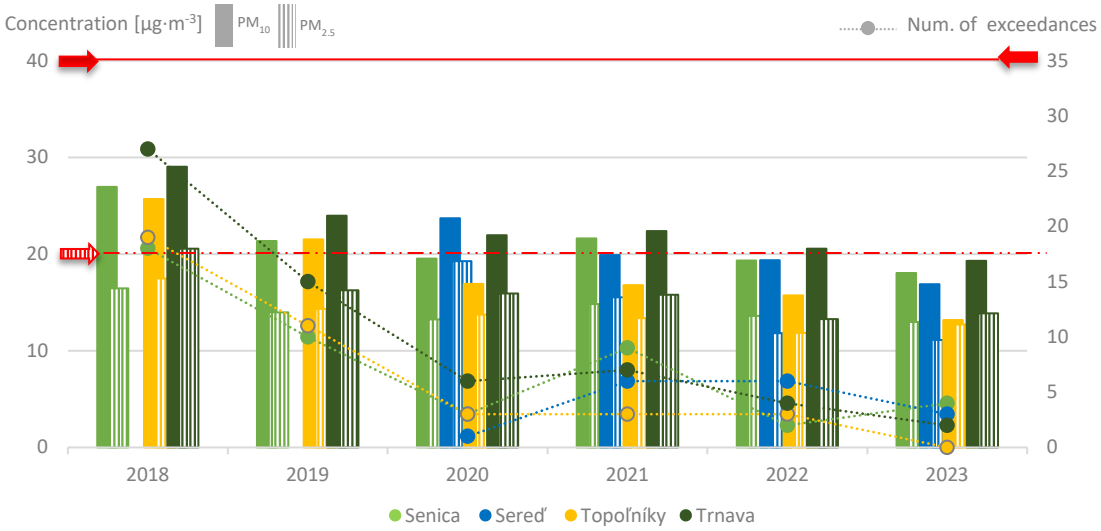
[2] *IT, AT – duration of exceedance (in hours) of the information threshold (IT) and alert threshold (AT) for PM_{10}*

In accordance with the Decree of the Ministry of Environment of the Slovak Republic No. 250/2023 Coll. on air quality, the required proportion of valid values was observed at the monitoring stations.

3.1 PM_{10} and $PM_{2.5}$

Fig. 3.1 shows the average annual concentrations of PM_{10}, $PM_{2.5}$ and the number of days with average daily PM_{10} concentrations above 50 µg·m^{-3} according to the results of measurements at monitoring stations in the Trnava region in 2018 – 2023.

Fig. 3.1 *Average annual concentrations of PM_{10}, $PM_{2.5}$ and the number of exceedances of the daily limit value for PM_{10}.*



*The arrows show the limit values, **red striped** $PM_{2.5}$ (average annual concentration: 20 µg·m^{-3}); **red on the left** PM_{10} (average annual concentration: 40 µg·m^{-3}) and **red on the right** the number of exceedances (average daily PM_{10} concentration of 50 µg·m^{-3} must not be exceeded more than 35 times in a calendar year).*

The annual average PM_{10} concentration in the zone Trnava region did not reach even half of the limit value of 40 µg·m^{-3} at any station. The limit value for the number of exceedances (35) of the average daily concentration of 50 µg·m^{-3} PM_{10} was also not exceeded by any station – the highest number of exceedances was measured in Senica (4) (**Fig. 3.1**). The annual average PM_{10} concentration at the traffic stations Trnava, Kollárova was 19 µg·m^{-3} (21 µg·m^{-3} in 2022) and Senica, Hviezdoslavova 18 µg·m^{-3} (19 µg·m^{-3} the year before). At the urban background station in Sereď, we measured the annual average concentration 17 µg·m^{-3} (in 2022 19 µg·m^{-3}). As expected, PM_{10} concentrations in the zone were lowest at the regional background station in Topoľníky – the annual average here was 13 µg·m^{-3}, which is a significant year-on-year improvement of 4 µg·m^{-3}. In 2023, this station thus met not only the new EU limit for annual PM_{10} (20 µg·m^{-3}), which EU Member States have to achieve by 1 January 2030, but also the stricter WHO recommendation (annual PM_{10} up to 15 µg·m^{-3}).

Fig. 3.2 shows monthly precipitation totals, average and minimum temperatures in different months at the meteorological station Jaslovské Bohunice. Values of higher PM concentrations in winter months correlate with the period of low temperatures and the necessity of heating homes. The occurrence of low temperatures continued in February for only a few days, but the situation was complicated by the long-term influence of pressure highs with unfavourable dispersion conditions.

Fig. 3.2 *Monthly precipitation totals, average and minimum temperatures (data from the meteorological station Jaslovské Bohunice).*

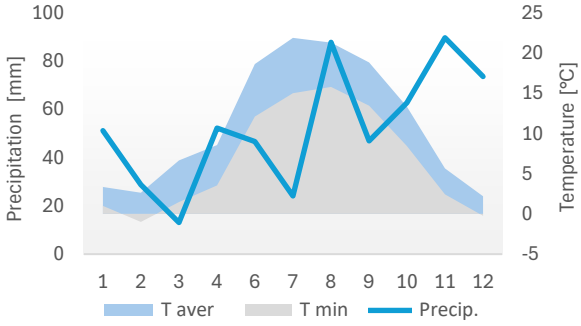


Fig. 3.3 shows the modelling results for PM_{10}, calculated for 2023 using the RIO model subsequently adjusted using the regression IDW-R method (see Chapter 4 of *the Slovak Air Quality Report 2023* for more details). Based on the model outputs, we can assume that the highest annual average concentrations may occur mainly in the municipalities of the Trnava, Hlohovec and Piešťany districts.

Fig. 3.3 *Average annual PM_{10} concentration (left) and number of exceedances of the PM_{10} daily limit value (right) in 2023.*

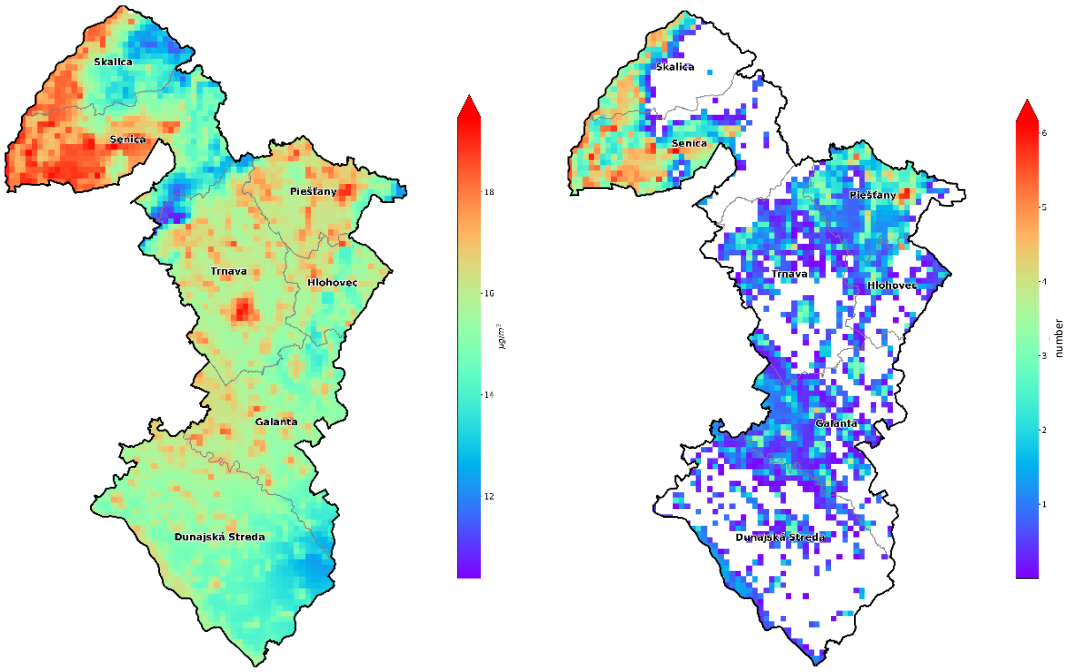
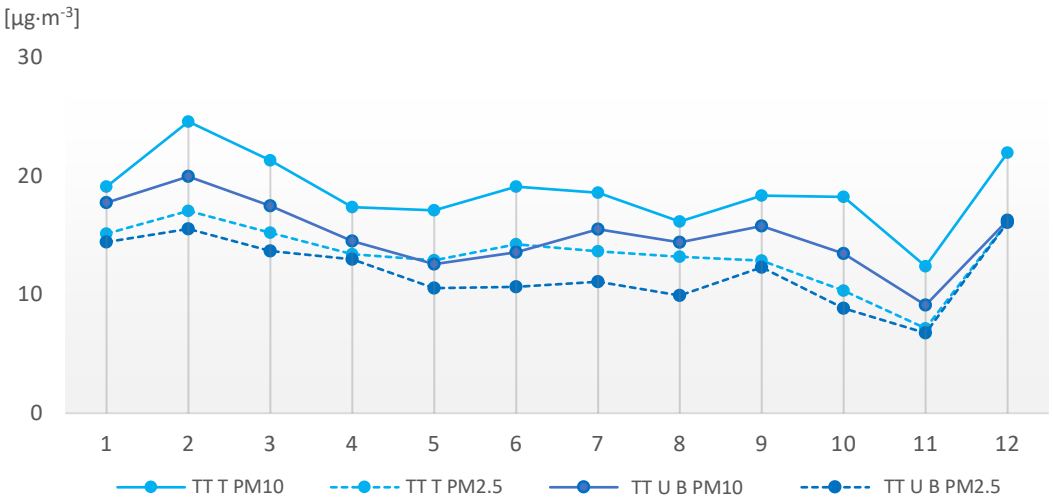


Fig. 3.4 *Average monthly concentrations of PM_{10} and $PM_{2.5}$ in the Trnava region by station type.*



T PM10 *and* ***T PM2.5*** *– average monthly concentrations of PM_{10} and $PM_{2.5}$ at Trnava, Kollárova and Senica, Hviezdoslavova traffic stations;* ***U B PM10*** *and* ***U B PM2.5*** *– monthly concentrations of PM_{10} and $PM_{2.5}$ at the urban background station Sereď, Vinárska.*

Both traffic stations in the zone have similar average monthly concentrations of PM_{10} and $PM_{2.5}$. **Fig. 3.4** compares their average monthly concentrations with the monthly PM_{10} and $PM_{2.5}$ concentrations at the urban background station in Sereď.

Compared to the other zones, the average monthly PM_{10} concentrations show less seasonal differences between the cooler and warmer months. This is because solid fuel heating, which is a significant source of particulate matter emissions, is not dominant in the zone and dispersion conditions are mostly favourable.

Higher concentrations of $PM_{2.5}$ are particularly risky due to their adverse impact on human health.

The annual average $PM_{2.5}$ concentrations in the Trnava region were at a similar level as a year ago: from 11 to 14 $\mu g \cdot m^{-3}$ (a decrease of 1 $\mu g \cdot m^{-3}$ occurred at the AMS in Senica and Seredi, an increase of 1 $\mu g \cdot m^{-3}$ was recorded at the AMS in Trnava), while the limit value is 20 $\mu g \cdot m^{-3}$. In **Fig. 3.1**, the dashed line shows the average monthly $PM_{2.5}$ concentrations, which do not (like PM_{10}) show such a pronounced seasonal pattern as in other zones in Slovakia. At the rural background station in Topoľníky, as a year ago, we recorded an average annual concentration of 13 $\mu g \cdot m^{-3}$, which is 2.5 times higher than the WHO recommendation (up to 5 $\mu g \cdot m^{-3}$). This is also true for monthly concentrations, even in summer when $PM_{2.5}$ concentrations tend to be lower.

Map on **Fig. 3.5** illustrates the spatial distribution of average annual concentrations of $PM_{2.5}$ according to the output of the RIO model in combination with the IDW-R model.

Fig. 3.6 shows $PM_{2.5}$ concentrations in relation to the new EU limit and the forward-looking target to be achieved (not exceeded) by EU Member States by 1 January 2030 (approved together with the other forward-looking EU limits in April 2024). In this case, the newly introduced EU limit specifies that the daily average concentration of $PM_{2.5}$ (25 $\mu g \cdot m^{-3}$) is not to be exceeded more than 18 times per calendar year. When we apply this commitment by 1 January 2030 to the results in 2023, we see that the new EU limit is closely exceeded by the traffic stations Trnava, Kollárova (20 exceedances) and Senica, Hviezdoslavova (22 exceedances) as well as by the regional EMEP regional background station Topoľníky (19 exceedances). The urban background station in Sereď (13 exceedances), on the other hand, would meet it already in 2023.

Fig. 3.5 *Average annual $PM_{2.5}$ concentrations in 2023.*

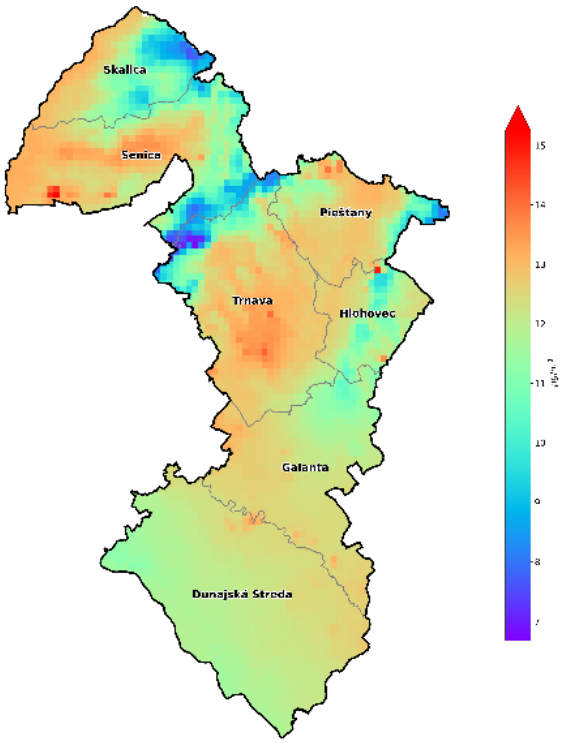
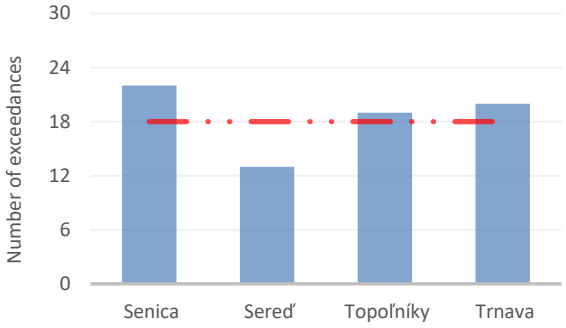


Fig. 3.6 *Number of days with average daily $PM_{2.5}$ concentration > 25 $\mu g \cdot m^{-3}$ in 2023 – evaluation in view of the newly introduced EU limit*.*



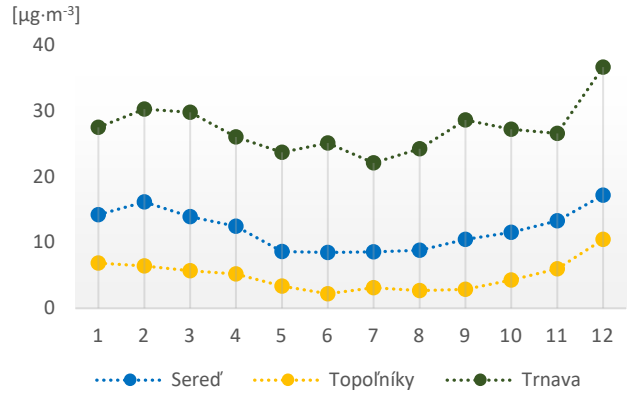
** Under to the new EU limit, which will enter into force on 1 January 2030, the average daily concentration of $PM_{2.5}$ must not exceed 25 $\mu g \cdot m^{-3}$ more than 18 times per year.*

The new EU limit value of 10 $\mu g \cdot m^{-3}$ – to be achieved by 1 January 2030 – for the annual average $PM_{2.5}$ concentration was not met by any station in the zone in 2023.

3.2 Nitrogen dioxide

Nitrogen dioxide monitoring is carried out at three stations in the zone, the average monthly values for individual stations are shown in **Fig. 3.7**.

Fig. 3.7 Average monthly NO_2 concentrations in 2023.

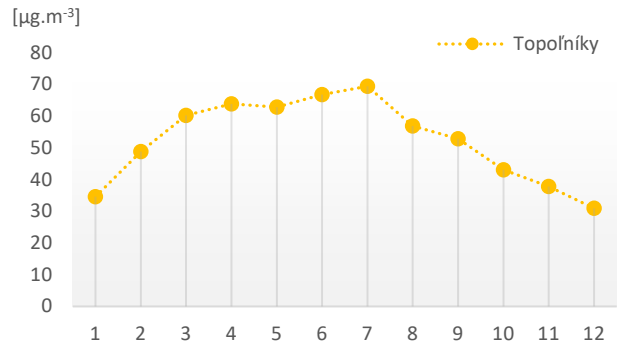


The main source of NO_2 emissions is road transport. For this reason, the highest NO_2 values are recorded at the Trnava, Kollárova traffic station, where the average annual concentration in 2023 reached 27 µg·m^{-3} (a year-on-year decrease of 1 µg·m^{-3}), while the limit value is 40 µg·m^{-3}. Overall, NO_2 concentrations in the Trnava region were at a relatively low level. Nevertheless, the only station in the zone meeting the WHO recommendation (average annual concentration: 10 µg·m^{-3}) in 2023 is the regional background station Topoľníky with a level of 5 µg·m^{-3}. WHO recommendations are generally significantly stricter than national and EU limits (the new EU limit for annual NO_2 concentration to be met by 1 January 2030 is 20 µg·m^{-3}). Measured values maintain a relatively constant level throughout the year, with an insignificant minimum in the summer months. The highest hourly NO_2 concentration at the Trnava, Kollárova traffic station was 126 µg·m^{-3} (8 Feb. 2023 at 18:00), and at the Topoľníky regional background station it was more than 2.5 times lower (46 µg·m^{-3}; 6 Dec. 2023 at 17:00).

3.3 Ozone

Ozone monitoring is carried out in the Trnava region at the rural background station Topoľníky.

Fig. 3.8 Average monthly concentrations O_3 in 2023.



The highest concentrations of ground-level ozone generally occur in warm months with high sunshine intensity (**Fig. 3.8**). Concentrations increase with sunrise, reaching a peak around midday and gradually decreasing in the evening to a minimum that occurs early in the morning. Large differences in ground-level ozone concentrations are also observed in the warm and cold seasons.

3.4 Benzo(a)pyrene

Benzo(a)pyrene is monitored in this zone at the monitoring station Trnava, Kollárova. As in previous years, the target value (1 ng·m^{-3}) was not exceeded here last year and reached half of its level.

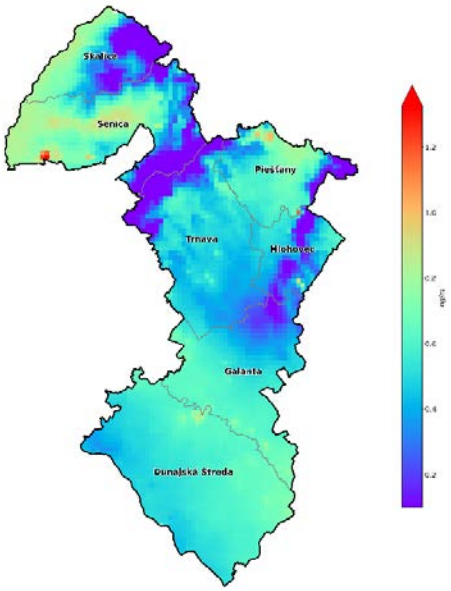
Tab. 3.2 Average annual concentration of benzo(a)pyrene in 2018 – 2023.

	2018	2019	2020	2021	2022	2023
Target value [ng·m^{-3}]	1.0	1.0	1.0	1.0	1.0	1.0
Trnava, Kollárova	0.9	0.7	0.5	0.6	*0.5	0.5

≥ 90% of valid measurements

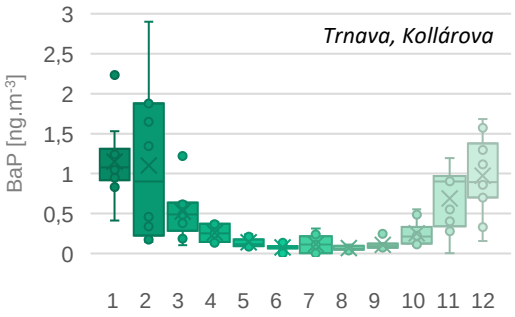
** sampler malfunction from 19 September 2022 to 4 November 2022*

Fig. 3.9 *Average annual concentration of BaP according to RIO model output, IDW-R (2023).*



Higher levels of benzo(a)pyrene were measured in the colder months of the year (Fig. 3.10). Based on the mathematical modelling outputs (Fig. 3.9), we can assume that the annual target value for benzo(a)pyrene is probably largely not exceeded in the zone Trnava region, the risk areas are described in Chapter 3.6.

Fig. 3.10 *Average monthly concentrations of benzo(a)pyrene in 2023.*



3.5 Chemical composition of precipitation

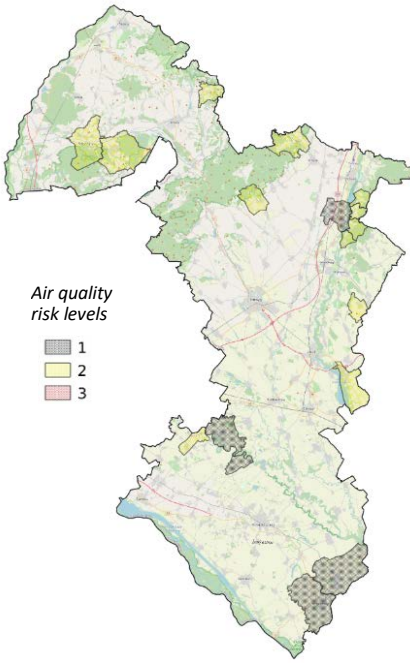
At the Topoľniky rural background station, the quality of precipitation is monitored on a weekly basis. The qualitative composition of basic ions, pH parameters and conductivity are monitored. The annual average pH value was 5.5. Sulphate and nitrate concentrations were at low levels throughout the year. It can be concluded that there is no excessive acidification of the environment in the zone Trnava region. Detailed monitoring results are presented in Chapter 3.4 of *Air pollution in the SR 2023 Report.*

3.6 Risk municipalities

Fig. 3.11 displays municipalities at risk due to deteriorated air quality as determined by the integrated municipal assessment method[4]. Level 3 corresponds to the highest probability of air pollution risk. The methodology includes the level of household heating with solid fuels, the impact of worsened dispersion conditions from both short-term and long-term perspectives, results from the chemical transport model CMAQ, the interpolation model RIO, and high-resolution modelling results using the CALPUFF model in selected domains with an assumed deteriorated air quality.

Municipalities in which the limit value for PM, NO_2, or the target value for BaP was exceeded based on high spatial resolution modelling were automatically assigned a risk level 3, similar to municipalities where the limit or target value exceedance was detected through measurement. The list of municipalities and their risk levels can be found on the SHMÚ website[5].

Fig. 3.11 *Risk municipalities in zone Trnava region (2023).*



[4] *Štefánik, D., Krajčovičová, J.: Metóda integrovaného posúdenia obcí vzhľadom na riziko nepriaznivej kvality ovzdušia, SHMÚ, 2023, available at https://www.shmu.sk/sk/?page=996*

[5] *https://www.shmu.sk/sk/?page=2873*

Zones and agglomerations that include at least one municipality with a risk level 3 will develop an Air Quality Plan. In this regard, municipalities with a risk level 3 correspond to *air quality management areas*. However, measures to reduce emissions must be implemented in all municipalities within this designated zone with a risk level 2 or 3, ideally also in municipalities with a risk level 1.

The assessment using the integrated assessment method aims to identify areas where action to improve air quality needs to be targeted. Given the distribution of air pollution sources and considering the microclimatic characteristics of the region, it is likely that pollution levels vary at different locations within the risk area. Spatial distribution of air pollution is provided by high-resolution modelling results, which are updated on the SHMÚ website[6].

3.7 Summary

In 2023, no exceedances of the limit values for SO_2, NO_2, CO and benzene, nor exceedances of the limit values for the annual average concentration of PM_{10} and $PM_{2.5}$ were measured in the zone Trnava region, while overall there was a slight year-on-year improvement in air quality at the monitored sites. The long-term trend of PM pollution (since 2018) is decreasing in the zone, similarly for NO_2 at the traffic station in Trnava.

The number of days with average daily PM_{10} concentrations above 50 $\mu g \cdot m^{-3}$ was below the permissible limit in 2023. The target value for the annual average concentration of benzo(a)pyrene was not exceeded. In the Trnava region, no exceedance of the limit or target value for any pollutant has been measured in the last three assessment years, therefore no *air quality management area* has been designated in this zone on the basis of the monitoring. However, the energy crisis may cause an increase in firewood consumption, which may result in a deterioration of air quality in areas with poorer ventilation.

If we were to assess compliance with the requirements of the new Air Quality Directive adopted by the European Parliament in April 2024 (setting new EU limit values applicable from 1 January 2030), in the Trnava region we would meet the 2030 targets for annual averages of PM_{10} and $PM_{2.5}$ as early as 2023. The limit value for the number of exceedances of daily concentrations of $PM_{2.5}$ would be slightly exceeded at three stations and met at AMS Sereď. We would meet the target for annual mean NO_2 at two stations and exceed it significantly at one station (Trnava, Kollárova).

If we were to assess the air quality in the zone according to the WHO recommendations[7], none of its stations would meet the recommended values for annual concentrations of PM_{10} and $PM_{2.5}$. Only AMS Topoľníky, EMEP would meet the limit for annual mean NO_2. The ambition of the Zero Pollution Action Plan[8] is to achieve the following air quality recommendations by 2050.

The zone Trnava region is one of the least problematic areas in Slovakia in terms of air quality.

[6] *https://www.shmu.sk/sk/?page=2699*

[7] *WHO GLOBAL AIR QUALITY GUIDELINES, 2021. Recommendations on classical air pollutants, p. 4. https://apps.who.int/iris/bitstream/handle/10665/345334/9789240034433-eng.pdf*

[8] *https://www.consilium.europa.eu/en/press/press-releases/2024/02/20/air-quality-council-and-parliament-strike-deal-to-strengthen-standards-in-the-eu/*