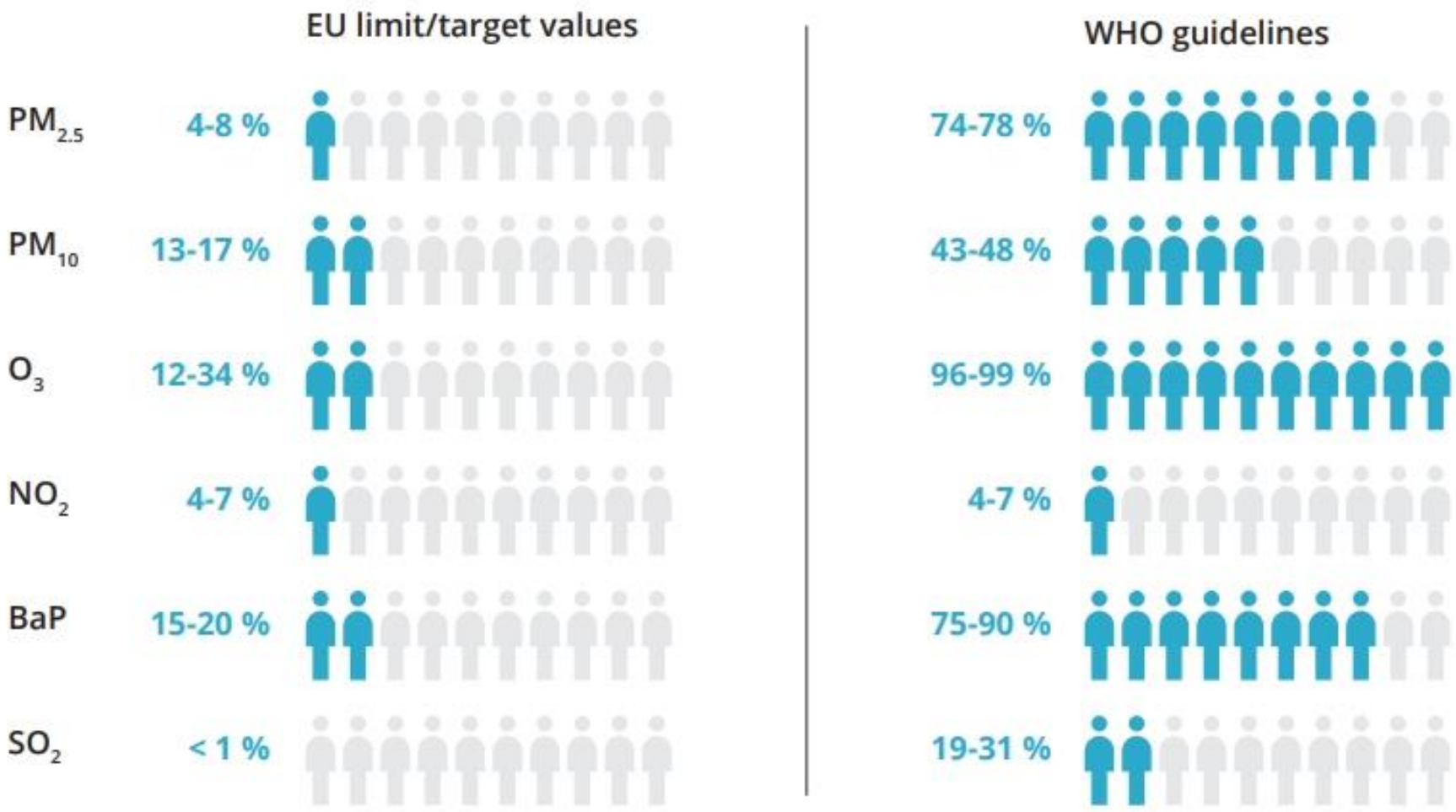
“Sustainable urban mobility – links to air pollution”

Davor Pehchevski
davor@bankwatch.org

CEE Bankwatch Network

Urban air pollution

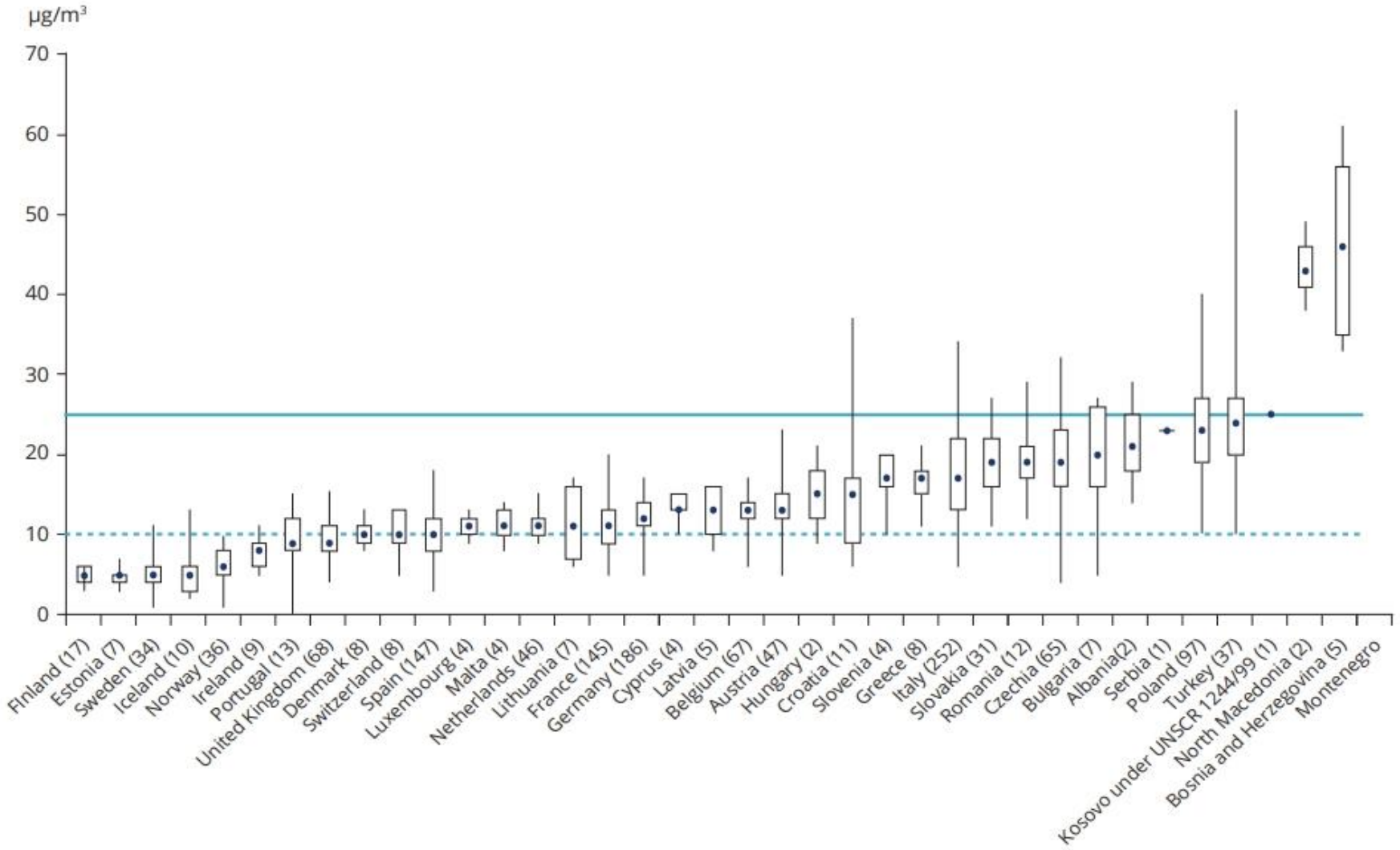
Share of the EU urban population exposed to air pollutant concentrations above EU and WHO reference values in 2016-2018



Source: SIGNALS 2020 - Towards zero pollution in Europe

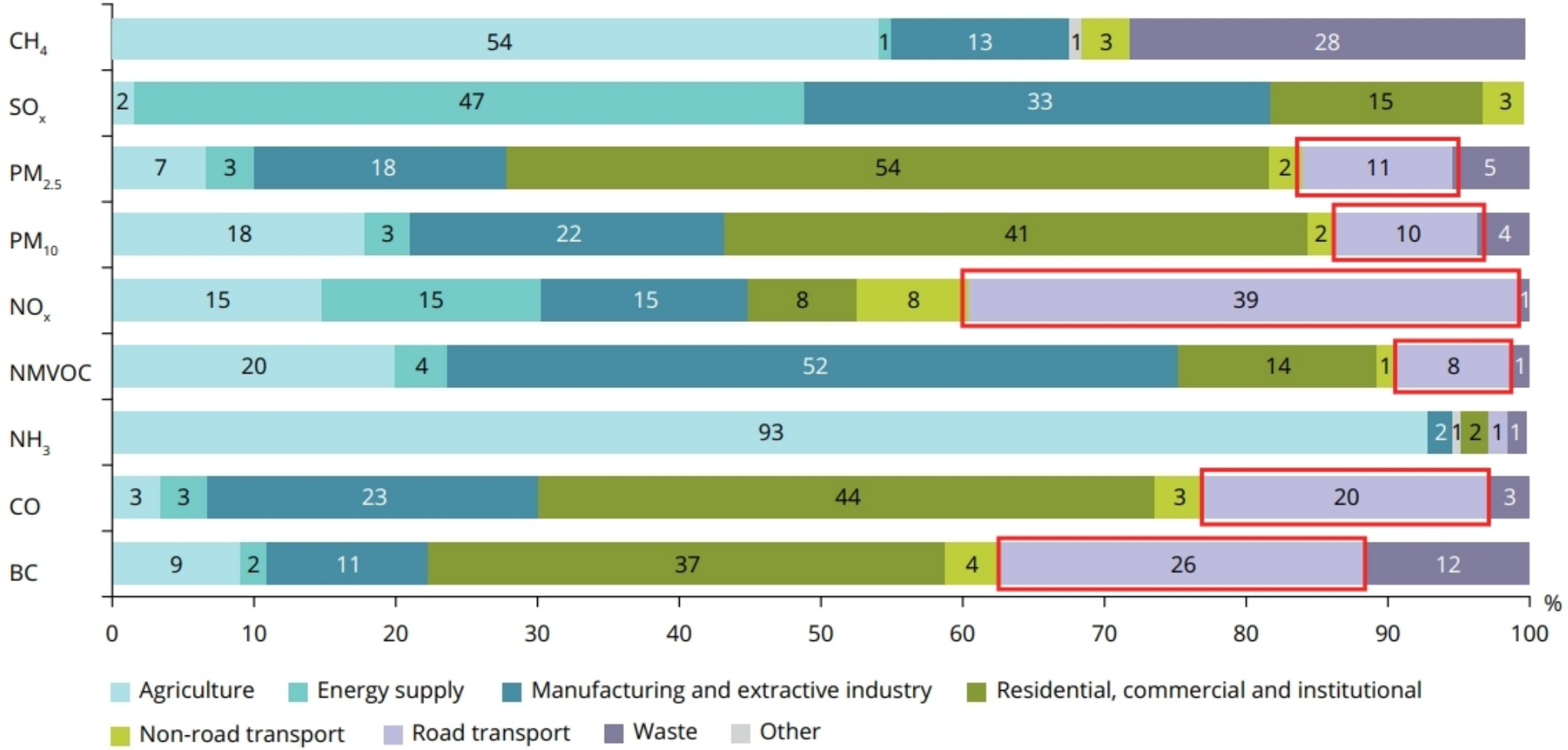
Where does the region stand?

Country comparison — PM2.5 concentrations in 2017



Source: The European Environment State and Outlook 2020

Road transport and air pollution



Note: Only sectors contributing more than 0.5 % of the total emissions of each pollutant were considered.

Source: EEA (2020e; 2020f).

How does traffic pollute?

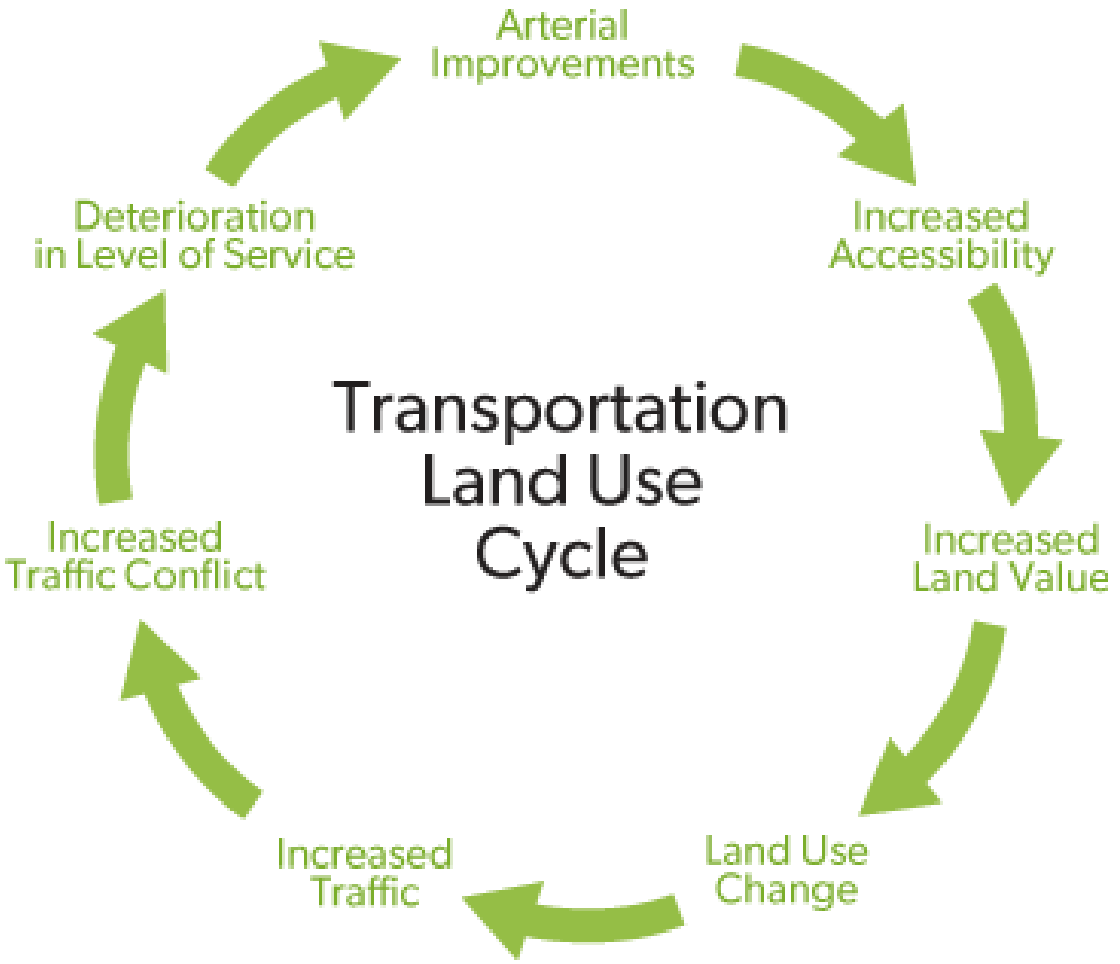
Emissions from combustion engines

- Particulate matter (PM10, PM2.5)
- Nitrogen oxides (NO_x)
- Volatile organic compounds (VOCs)
- Carbon monoxide (CO)
- Black carbon (BC)

How does traffic pollute?

Land use

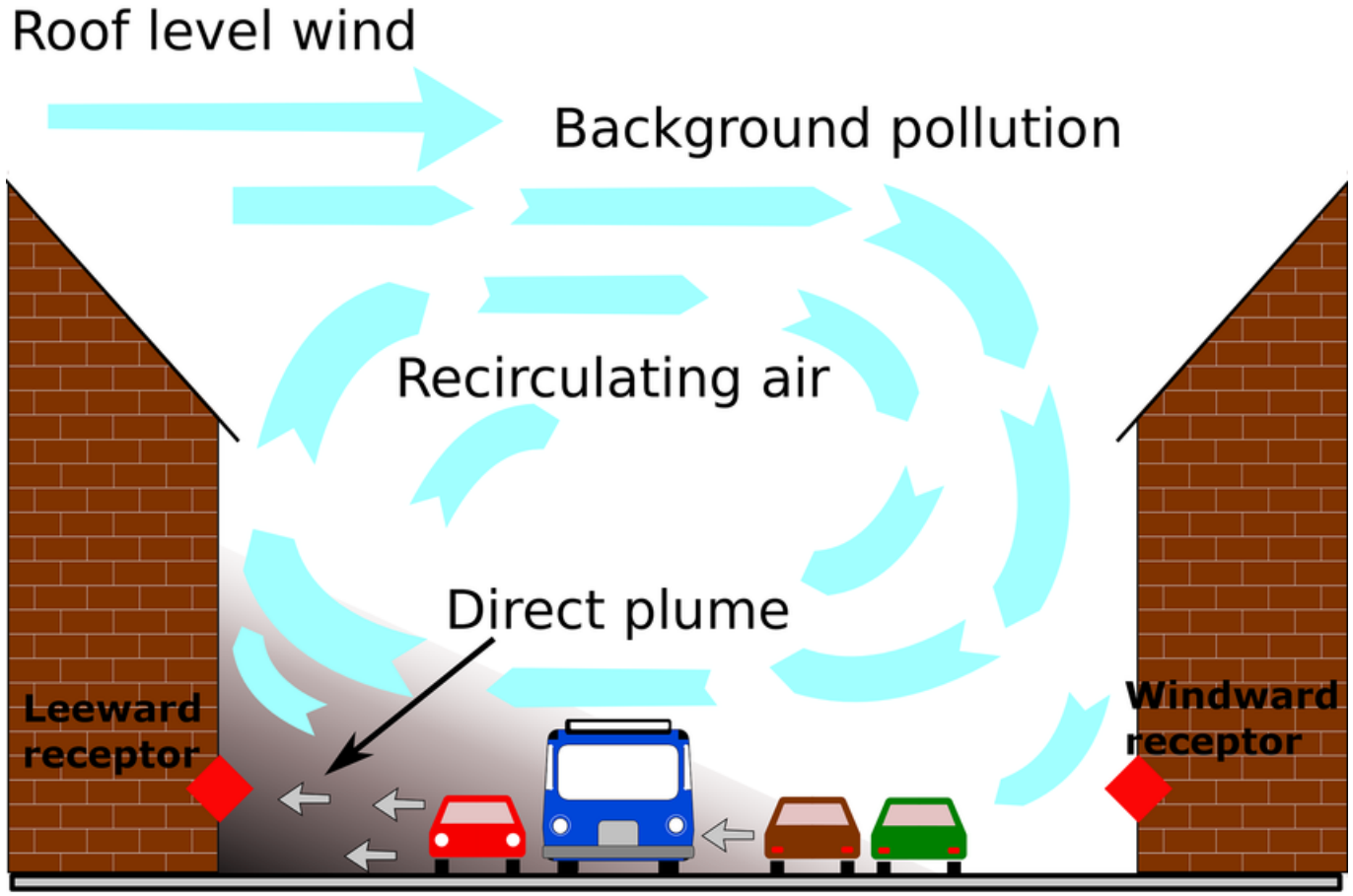
- Significant amount of urban surface area dedicated to road traffic
- Example – Skopje, N. Macedonia: ~30% of surface is primary and secondary road network (without parking spaces)



How does traffic pollute?

Urban planning

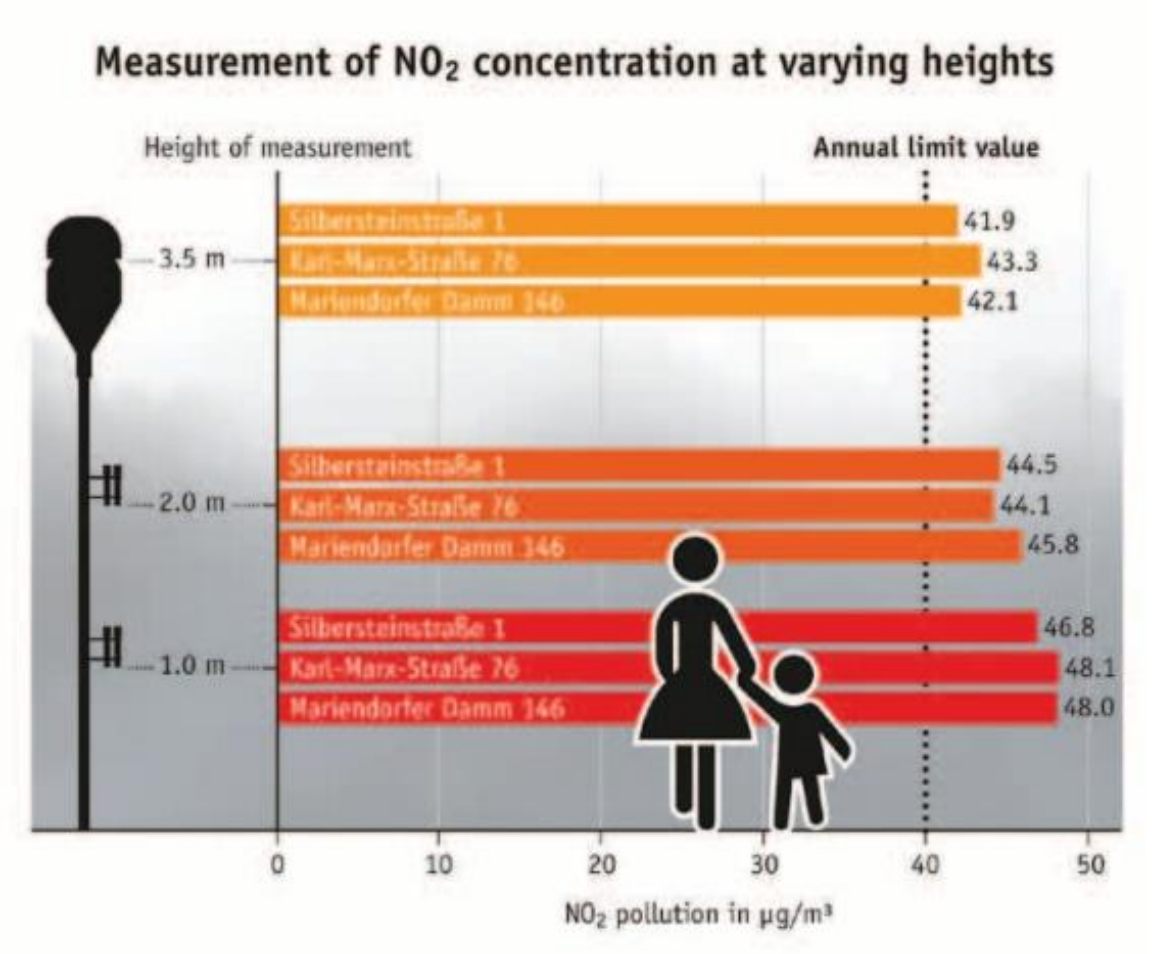
- Creating the so-called street canyon effect
- Keeps emissions trapped in urban area
- Increases local exposure



How does traffic pollute?

Exposure and health impacts

- Exposure is higher at lower heights, particularly worrying for children
- Exposure inside cars can be higher, especially in highly congested traffic (*Assessment of personal exposure to particulate air pollution during commuting in European cities, Karanasiou et al, 2014*)



Source: NO2 report, Deutsche Umwelthilfe 2019

Policy measures to reduce traffic pollution and their impact on health

1. Data collection – every settlement has individual needs and adjusting measures to those needs brings better investment:effect ratio

2. Reduce emissions at the source:

- Flip the transport pyramid – move away from car-centric planning and prioritize zero-pollution transport options

- Plan according to land use – prioritize transport options that can move more passengers in the same space

- Plan for resource and energy efficient transport

- Incorporate climate change in every aspect of planning

3. Adjust urban planning for better health protection

- Avoid creating street canyons during new development

- Include protective green belts for new streets and reconstruction of old ones

Policy measures to reduce traffic pollution

Data collection

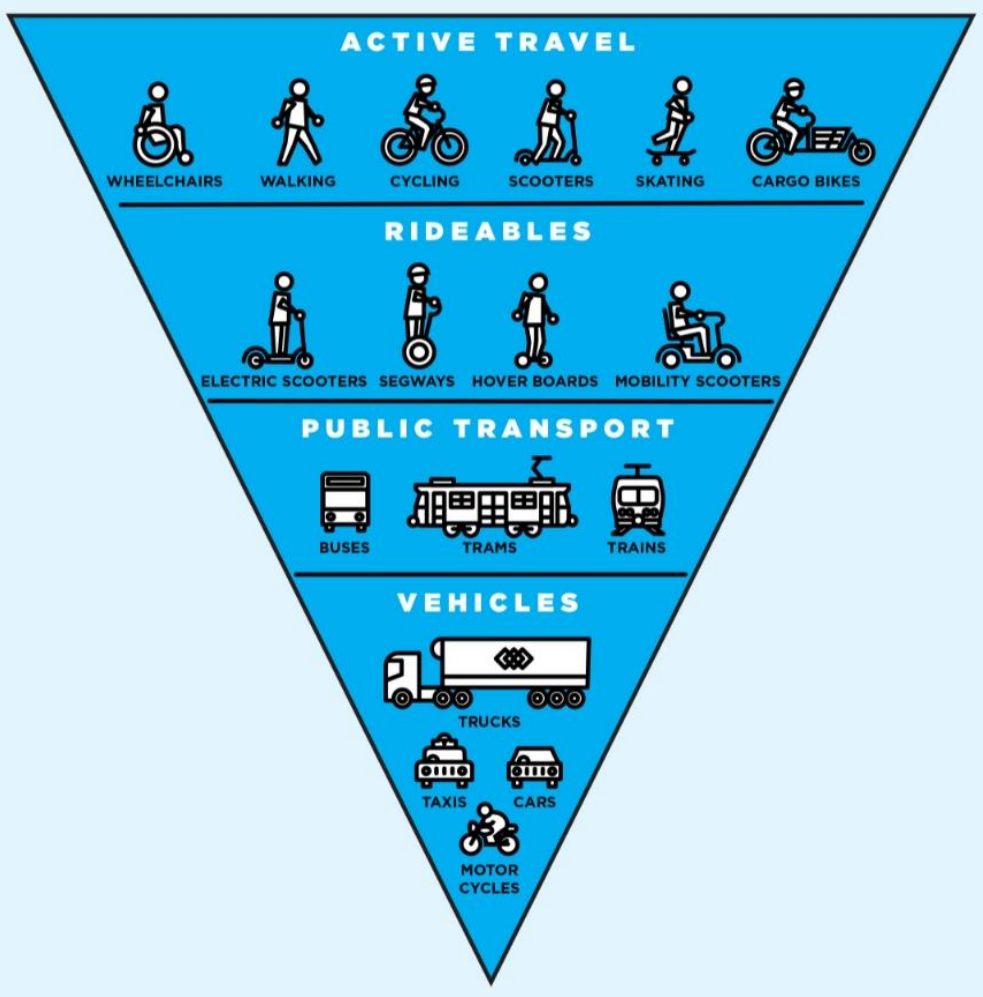
- Rule no. 1 – Good quality data is your best friend.
- Rule no. 2 - You can never have enough data.

- Population, demographics (on city, neighbourhood and street level)
- Traffic metrics (no. of vehicles by type and age, where they move, how often, length of trips, peak periods etc.)
- Transport habits (preferred method of transportation and why, when, how is it used (purpose) etc.)
- Movement hot-spots – most visited locations, why are they most visited, how can they be accessed
- Pollution measurements at different levels
- Pollution hot-spots – reasons (congested traffic, urban canyons, movement hot-spots)

Policy measures to reduce traffic pollution

Reduce emissions at the source

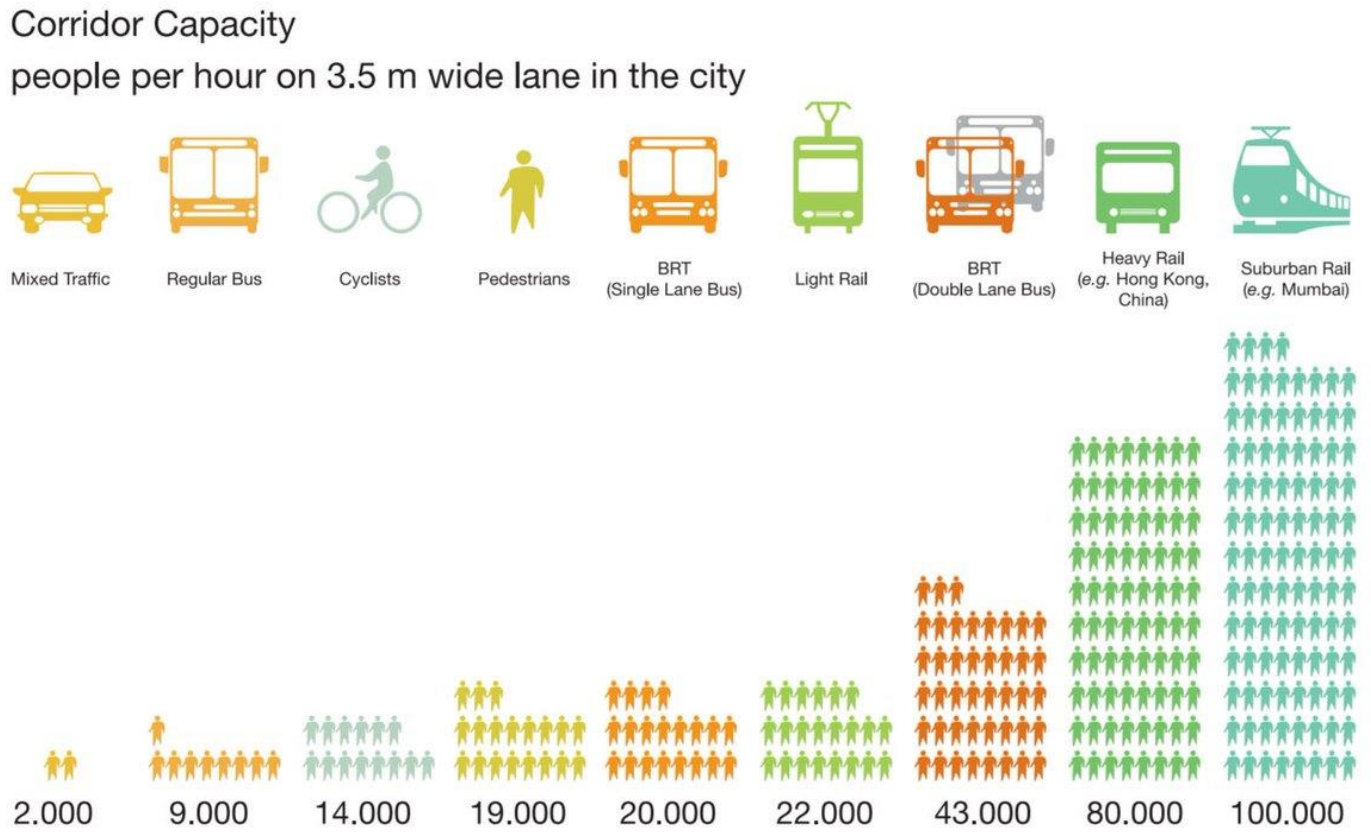
- Flipping the transport pyramid and including the new concept in all aspects of traffic planning.
- If every public space is adjusted for easy access to disabled persons, half of the work is done.
- Creating equal and safe space for zero-polluting transport, introducing the "15-minute city" concept in urban planning, introducing intermodal transport options (eg. combining non-motorised with public transport), offer low-polluting transport options for daily commuters from nearby settlements etc.



Policy measures to reduce traffic pollution

Reduce emissions at the source

- Moving more passengers in the same space means less traffic, less pollution and more space for mitigation measures.
- Reduction of the number of cars, regardless of their technology, and replacing them with options that move more passengers brings more benefits.



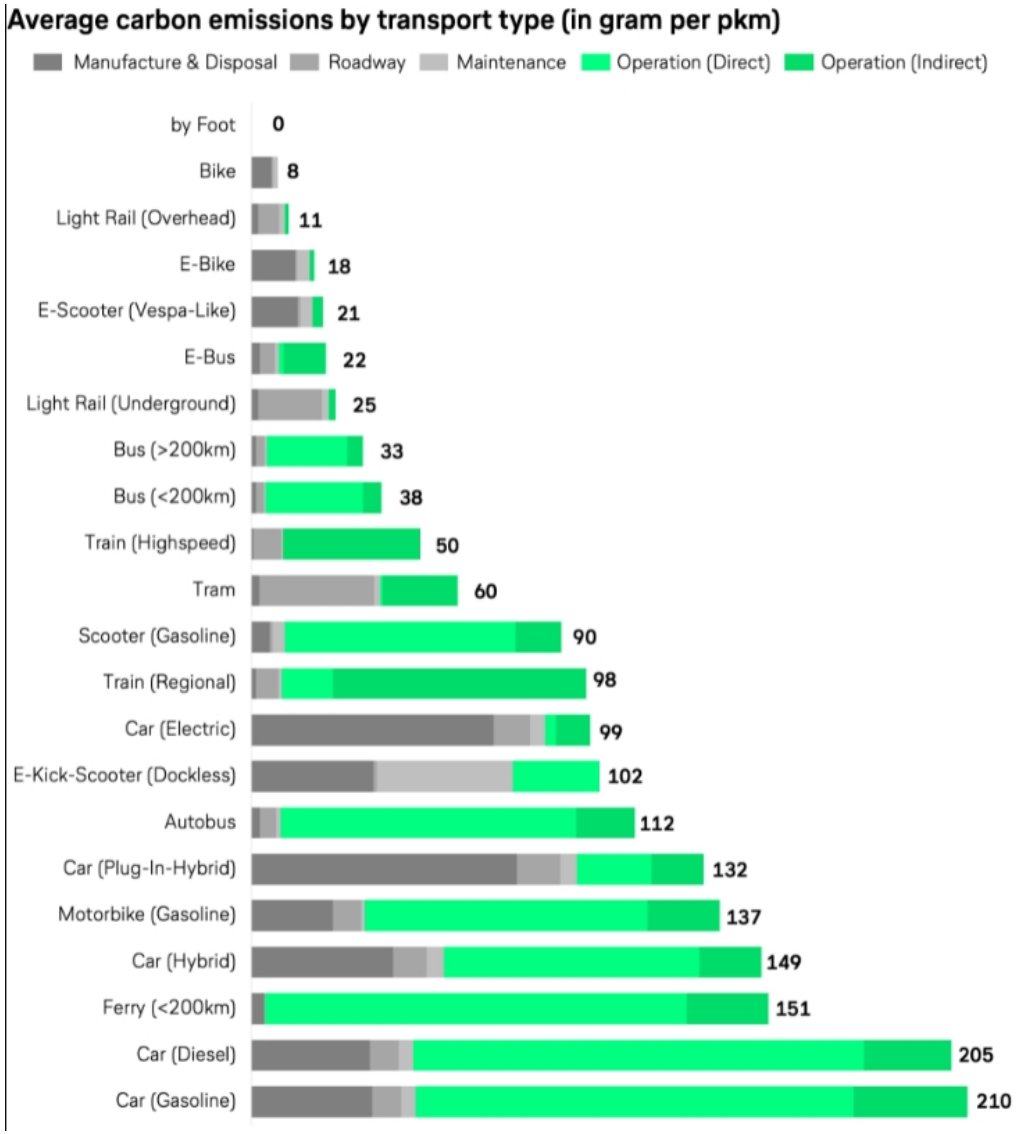
BRT = bus rapid transit, m = meters

Sources: H. Botma and H. Papendrecht. 1991. Traffic Operation of Bicycle Traffic. In *Transportation Research Record 1320*. TRB. Washington, D. C.: National Research Council, and based on GTZ calculations (2009).

Policy measures to reduce traffic pollution

Reduce emissions at the source

- Planning with climate change in mind leads to the same results and conclusions.
- Resource and energy efficient transport means less polluting transport.
- ~90% of the fuel or electricity in a car is used to move the car itself. This means that this same amount of emissions are produced to move the car, not the passenger.
- Electric and hybrid cars have huge environmental footprint, even more so in countries dependent on fossil fuels for electricity production.



Policy measures to reduce traffic pollution

Reduce emissions at the source – prioritization and summary

1. Provide adequate and safe space for disabled persons.
2. Provide adequate and safe space for non-motorized transport.
3. Introduce (or improve) public transport that is regular, efficient, comfortable, accessible and easy to use.
4. Introduce intermodal transport by allowing non-motorized transport to be combined with public transport.
5. Use space previously used for car transport for the above measures for efficient land use.
6. Introduce multimodal transport options (eg. park and ride for city centre or entire city, bike/scooter sharing options at public transport hot-spots)
7. Plan a 15-minute city according to collected data, where all citizens have easy access to supermarkets, green spaces, theatres, cinemas etc. without the need for motorized transport.
8. Incentivise non-motorised and public transport.
9. Incentivise car-pooling.
10. Support electrification of transport by creating infrastructure (charging stations, local RES energy production).

Policy measures to reduce traffic pollution impact on health

The road to zero pollution is long, mitigation measures can be put in place sooner.

- Mostly preventive measures like:

- avoiding street canyon effect during planning of new neighbourhoods

- including a tree belt between car lanes and remaining space when redesigning streets for reducing the effect of air and noise pollution

Ljubljana – leading with example

- **300 kilometres** of well-maintained cycling paths
- pedestrian zone in the city centre
- four cycling counters - **more than 3 million cyclists** ride past these points every year
- listed in the Copenhagenize Bicycle Friendly Cities Index among the top 20 bicycle-friendly cities in the world in three consecutive periods

- **502,88 km** of bus lines with 214 busses
- almost **40 million trips made with bus** in the city
- **677 km** of interurban bus lines with 61 busses
- 3,2 million passengers transported with interurban busses (daily commutes)

Thank you for your attention

Davor Pehchevski

davor@bankwatch.org