Let's #RepairTheAir

Empowering companies,
employees, and communities
with knowledge about the air
you breathe.

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The main topics of the report:

1. Lockdown impact on air pollution
2. Greenery and traffic
3. Impact on children

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The project for Central Bedfordshire Council

Problem description:

Central Bedfordshire Council did not have a platform that could inform them about air quality in real-time. Data about air quality was being delivered with a delay of 12 or even 24 hours.

Solution:

The installation of **25 Airly** sensors that collect and interpret data in real-time, integrated with other roadside technology, which allow them to take immediate action that reduces exposure to high levels of air pollution – such as putting traffic diversions in place.

The project for Central Bedfordshire Council

Further development of the project:

In order to minimize the impact of air pollution in Central Bedfordshire, the council has planned initiatives which relate to data collected by Airly sensors, such as:

- Educational projects with local schools.
- Monitoring pollution from buses and traffic. diversions using vehicle-activated signs when air quality levels are required.

# Lockdown impact on air pollution

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Key findings:

Central Bedfordshire

An analysis conducted by Airly proved that:

- traffic congestion is the main source of air pollution near schools in Central Bedfordshire
- there was a significant decrease of air pollution caused by lockdown, which lasted till the start of school (01.09.2020)
- air pollution was diversified within the region, amount of pollution depended on:
    - proximity to traffic jams
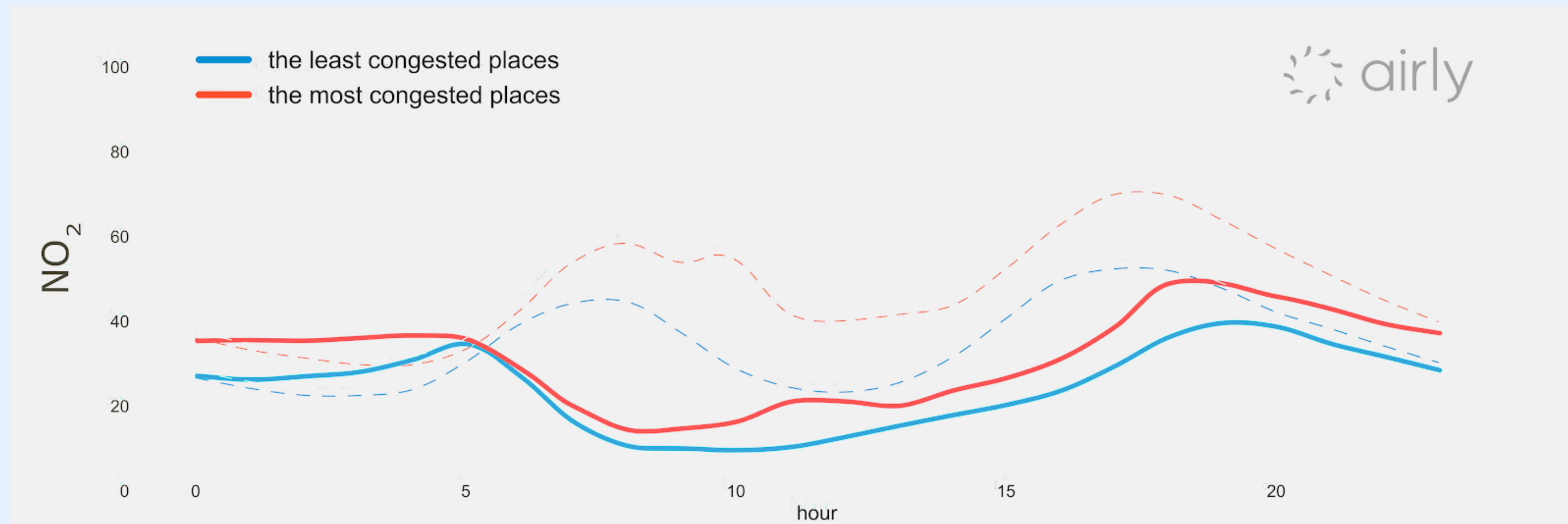   - share of green areas in the neighbourhood of a sensor

Airly sensors

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NO$_2$ concentrations in Bedfordshire (during and post lockdown)
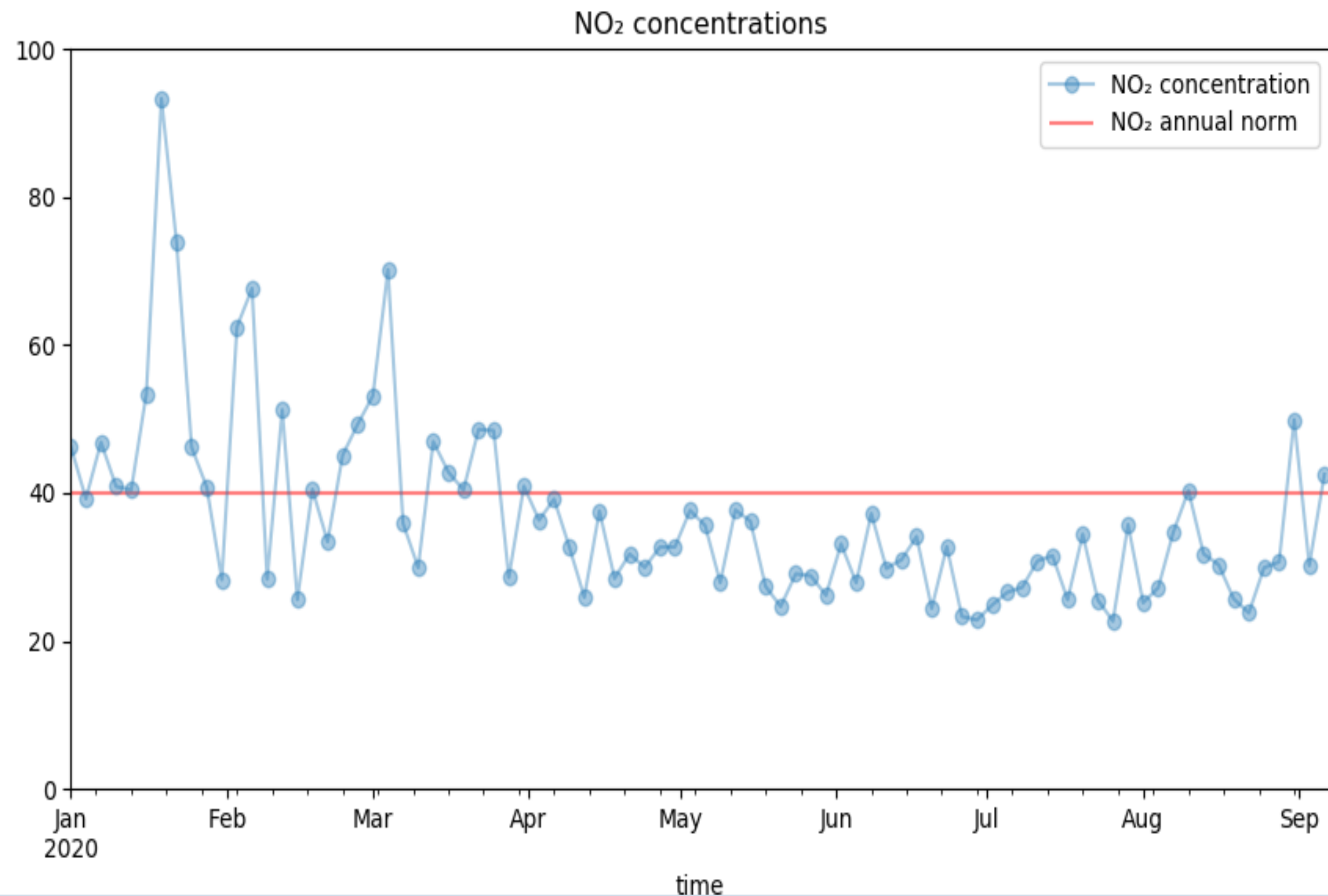
NO2 levels dropped tremendously during the **lockdown** and started to exceed the norms in the last days – after schools reopening.

Daily trends – before and after lockdown

The diagrams above show the daily NO_2 curves, averaged for the period before lockdown (until March 23 – dashed line) and after lockdown (solid line). The daily waveforms are presented for two sensors located near the most congested roads in the commune (red line) and two sensors located near the least congested roads (blue line).

The before lockdown lines clearly show the NO2 concentration peaks – morning and afternoon, related to road traffic. The after-lockdown lines clearly show the reduction of these peaks, caused by the traffic restriction during the lockdown period.
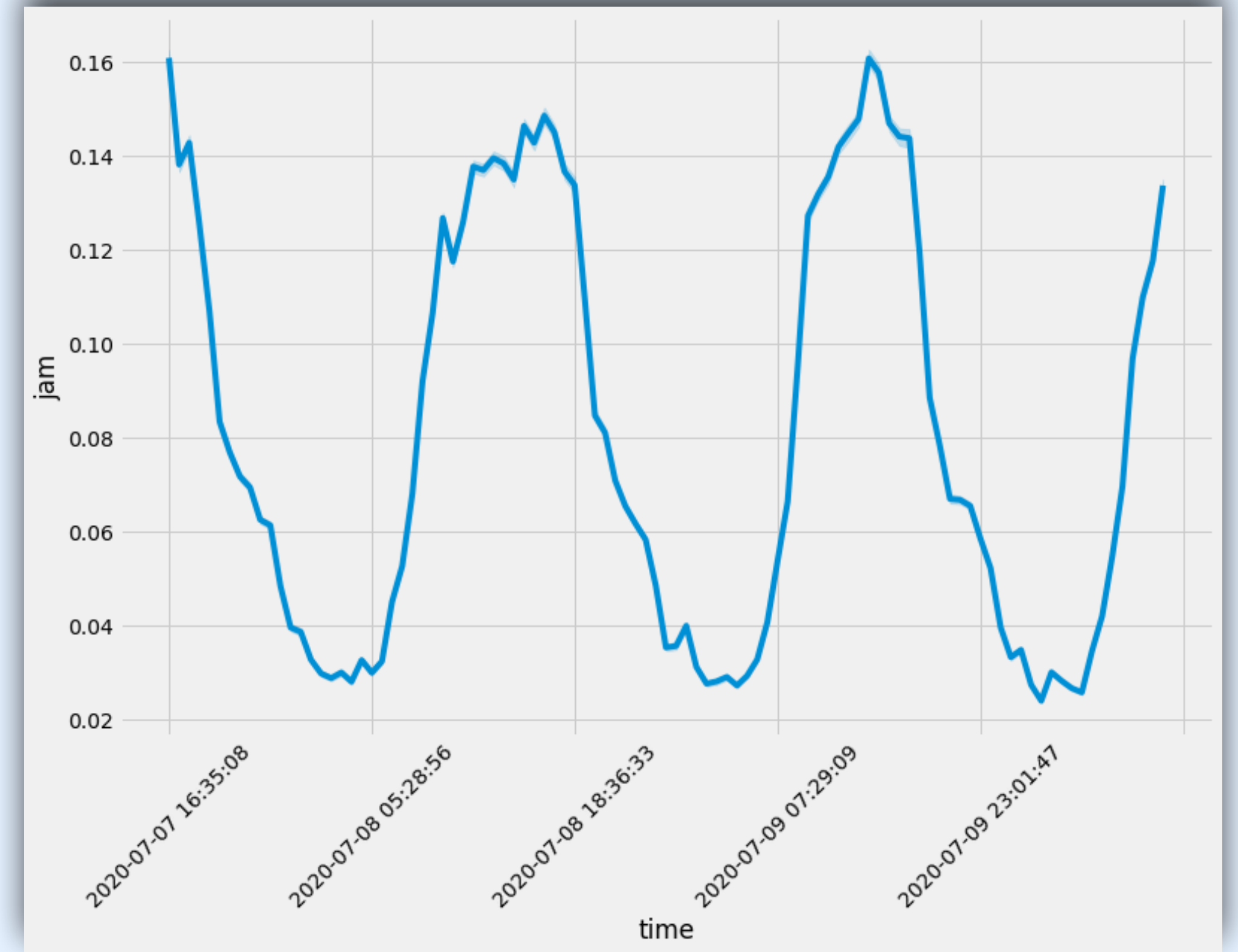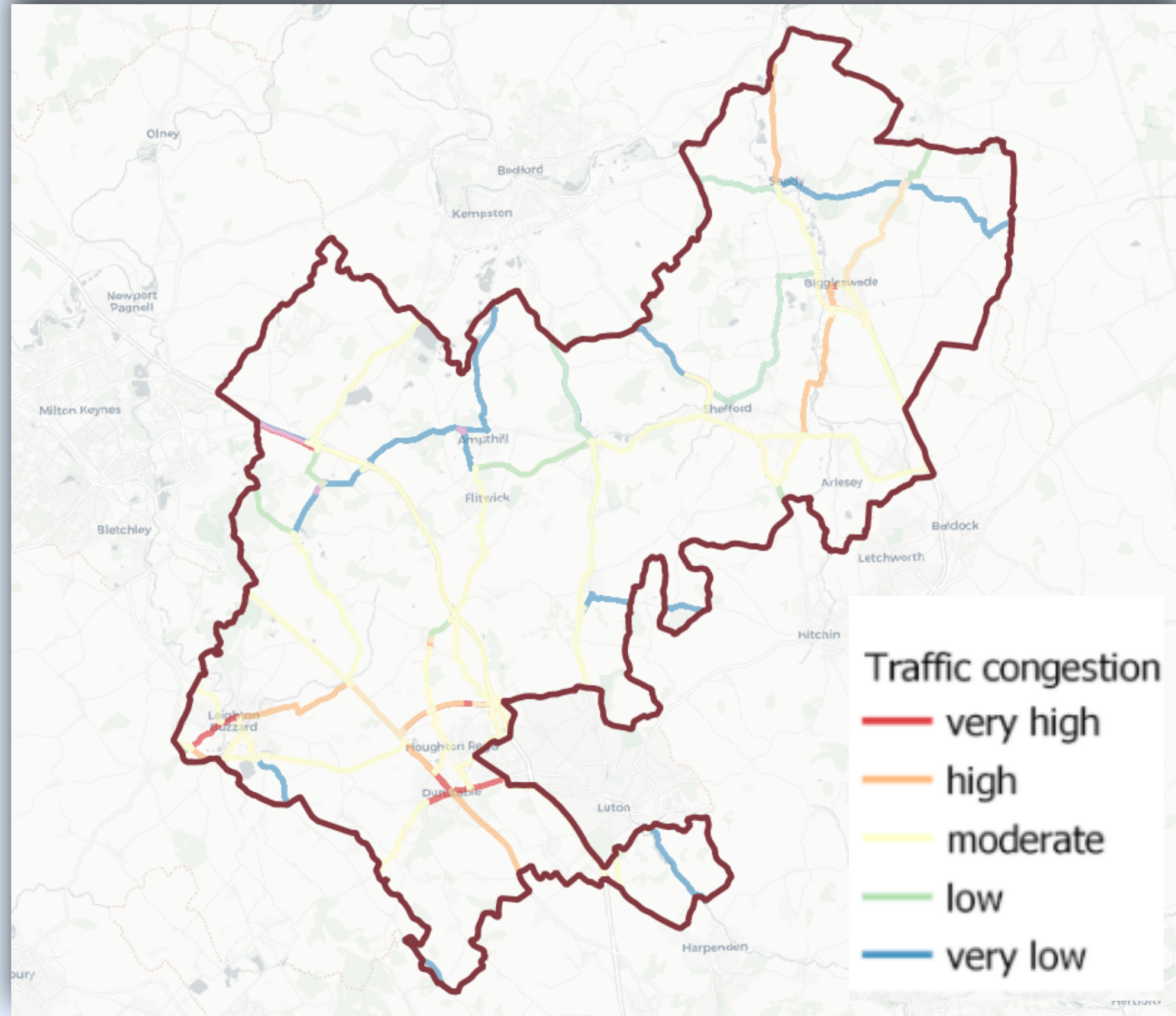
Differences between sensors
in Bedfordshire – what caused it?

NO2 concentrations
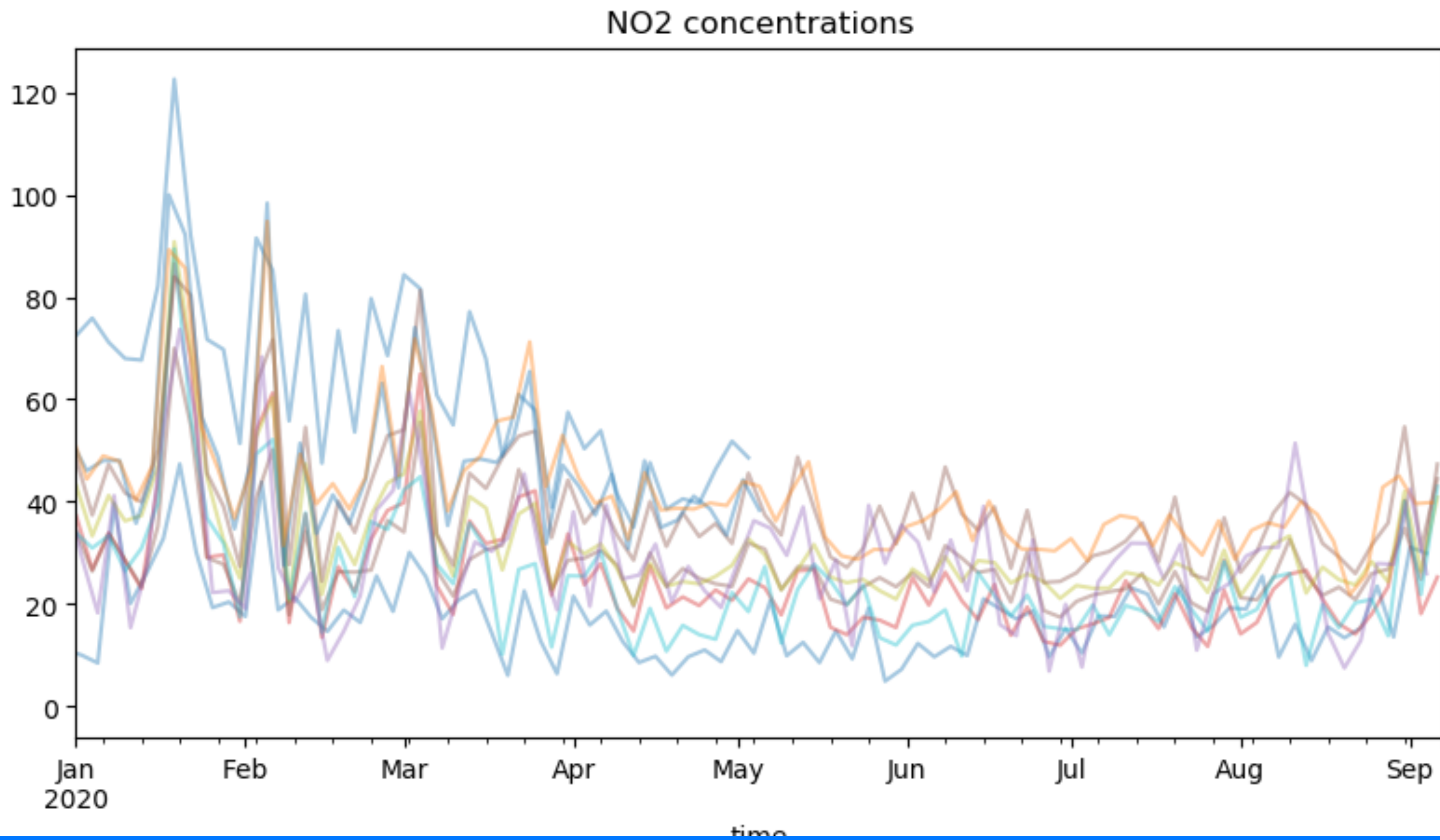
all sensors (25)

Greenery and traffic

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Traffic congestion

Traffic congestion
— very high
— high
— moderate
— low
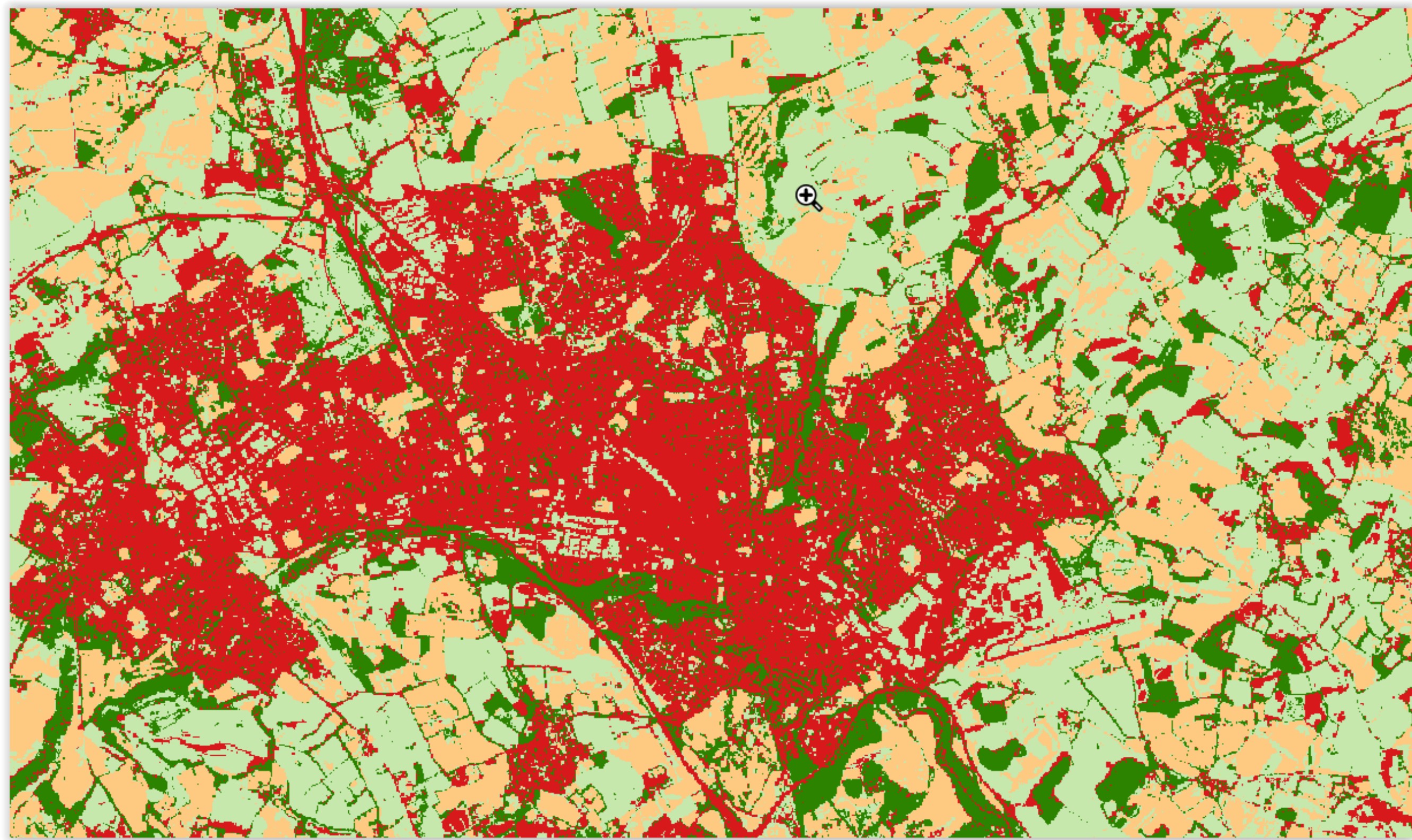— very low

We assigned a traffic jamming parameter to every section off the road. This was based on the measured average velocity in reference to normal traffic on that road. We applied this for whole period of analysis.

Data from HERE API and Department of Transport.

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Land cover - % of green areas

We classified land by how much it is urbanized and how much is covered with different types of green vegetation.

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The analysis

On the map one can see the average density of a traffic jam (shown as colors).

The greatest traffic congestion is typical for urbanized areas and junction areas, where there are high-ranking road intersections.

We compared data from before, during and after the lockdown.

Traffic congestion
- very high
- high
- moderate
- low
- very low

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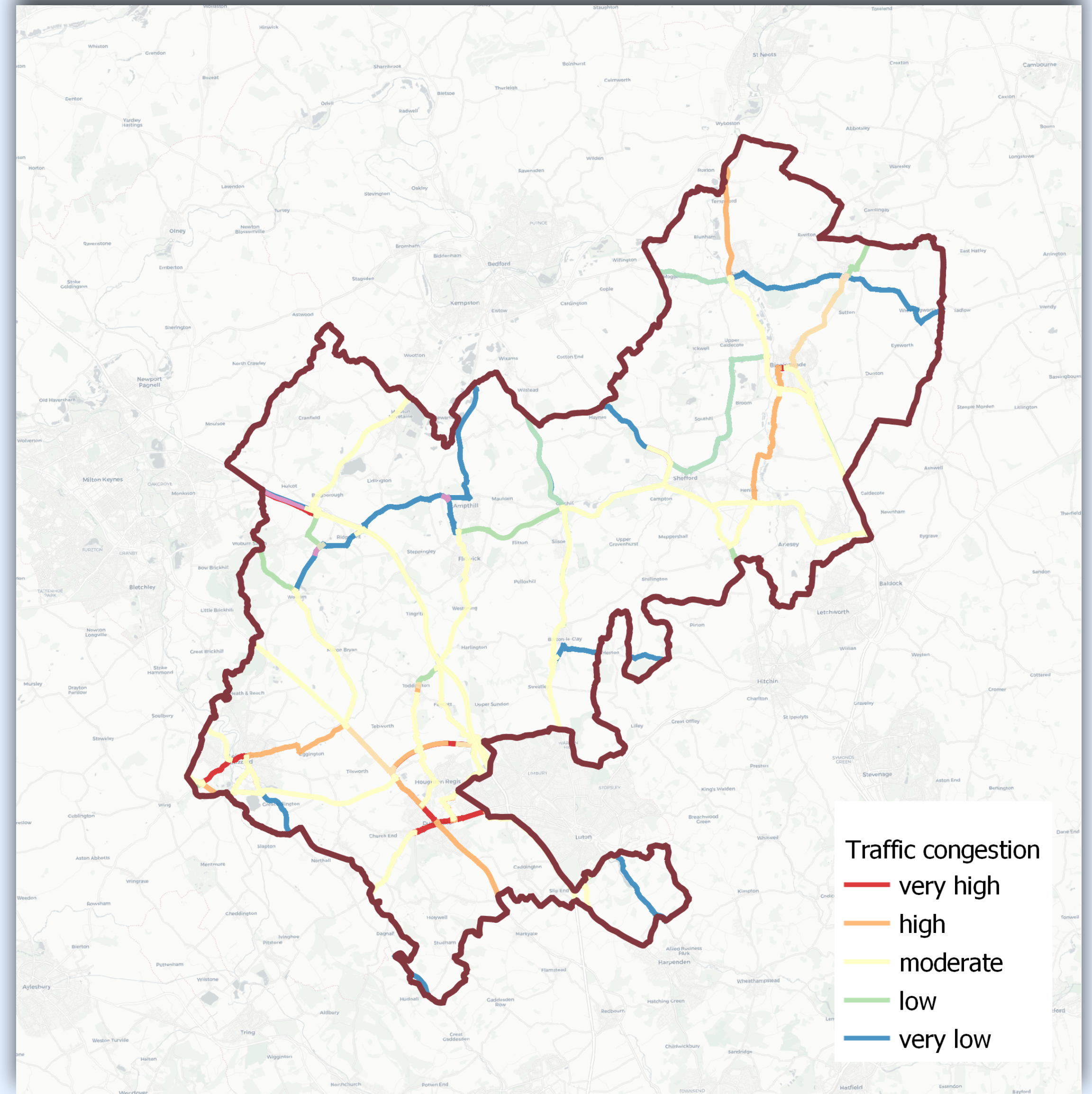
The analysis

On the map we present the location of schools in the Bedfordshire (**218 buildings**) with relation to the traffic congestion levels.

We can see that many schools are located next to the most congested roads.

83 (40%) schools buildings in Bedfordshire are located within 500 metres from the roads with **high and very high congestion.**
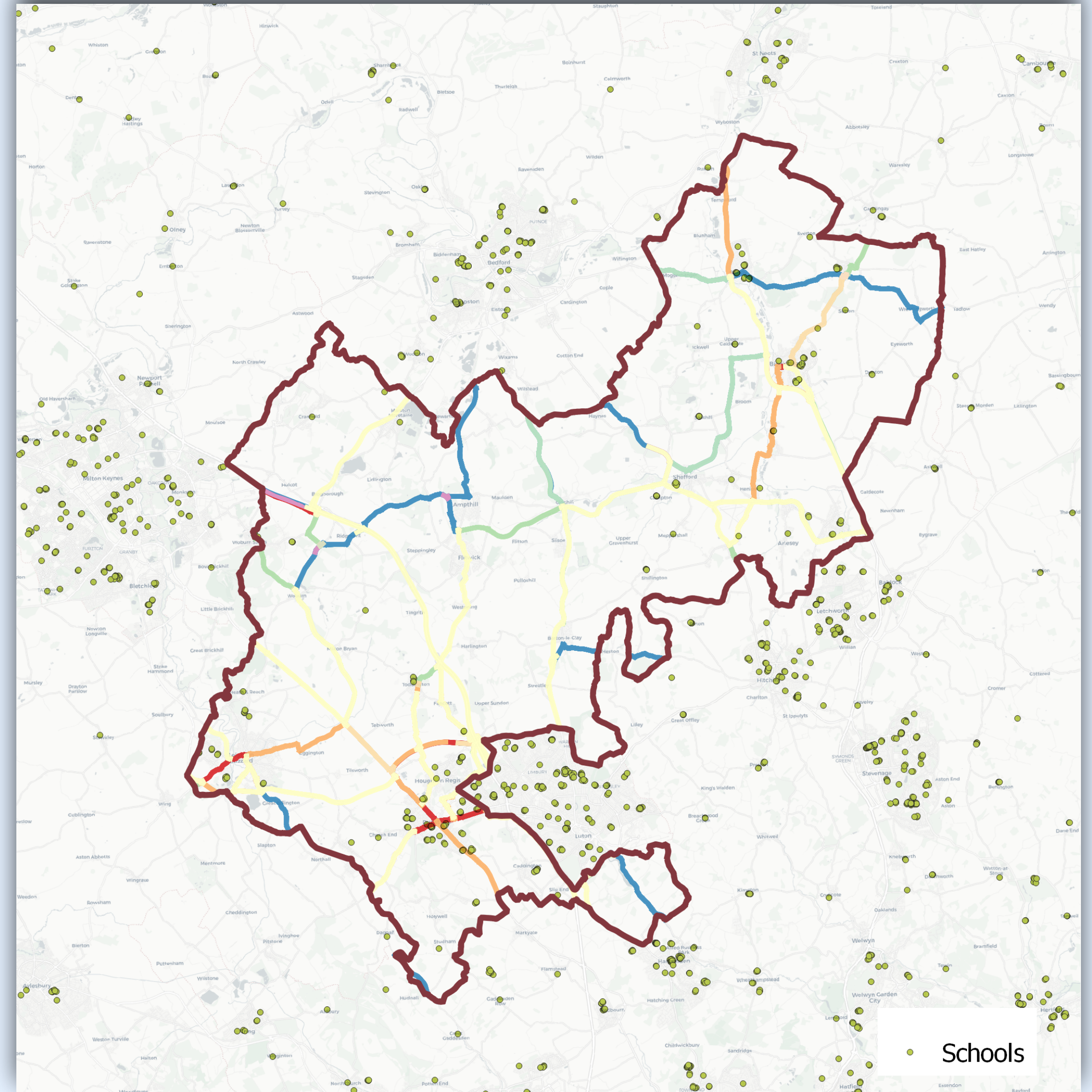
Schools

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The analysis

Last maps overlays Airly sensors
on the schools and roads information.

We can see that sensors are located in
all of the traffic-schools hotspots in
the Bedfordshire as well as in the places
with lower traffic congestion.

Schools
Airly sensors

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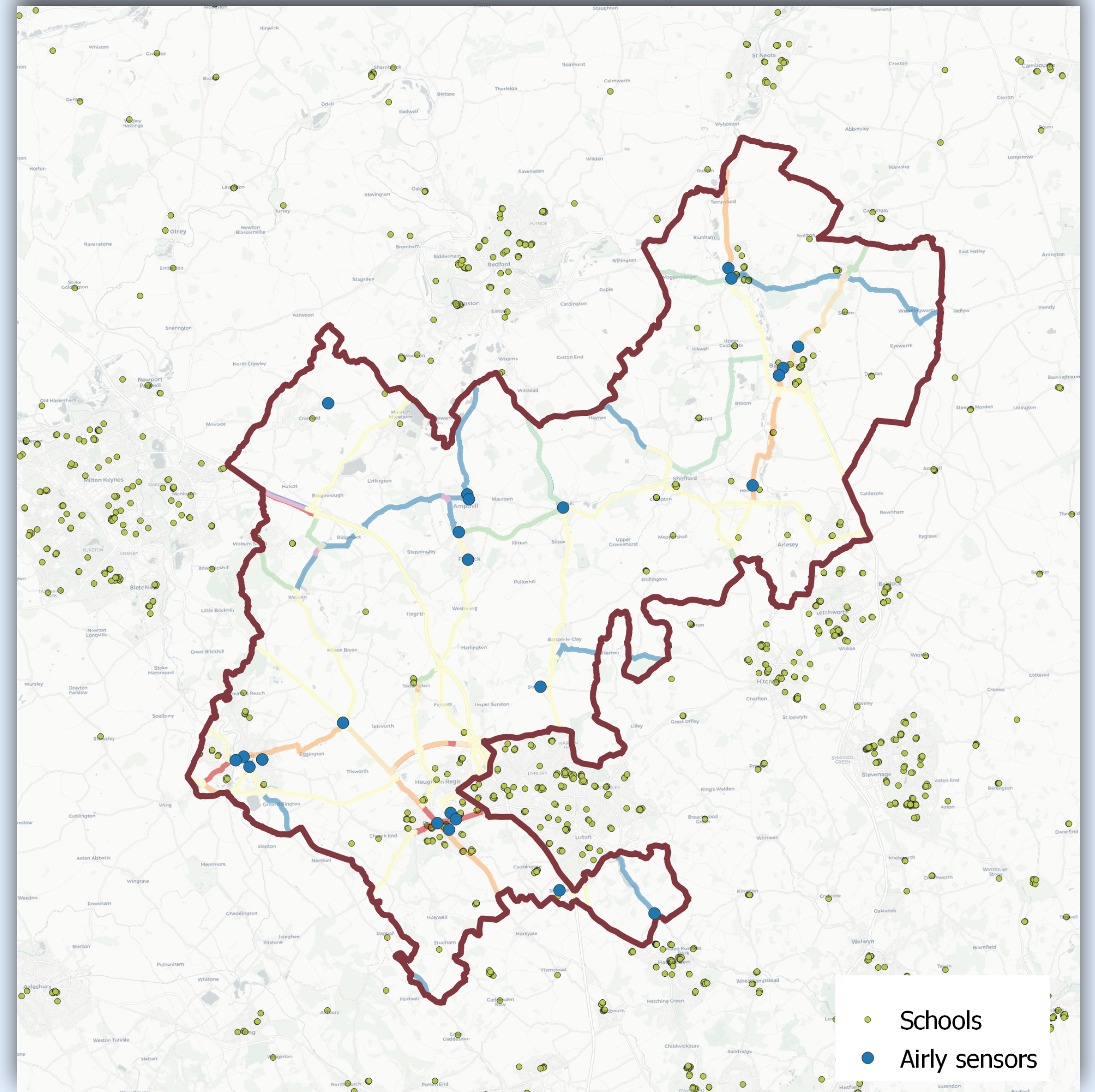
Key findings

1. The analysis has shown that 10% increase in road traffic led to a 7% increase in NO2 pollution and up to a 2% increase in PM 2.5 pollution, within close proximity of the traffic jam.

3. The analysis has shown also that 10% increase of the green areas in the immediate vicinity of a sensor was accompanied by a decrease in PM 2.5 concentration by 2.5% and in NO_2 by up to 4%.

5. The best way to combat this type of pollution is to create bicycle and pedestrian routes as well as to increase the area of green spaces.
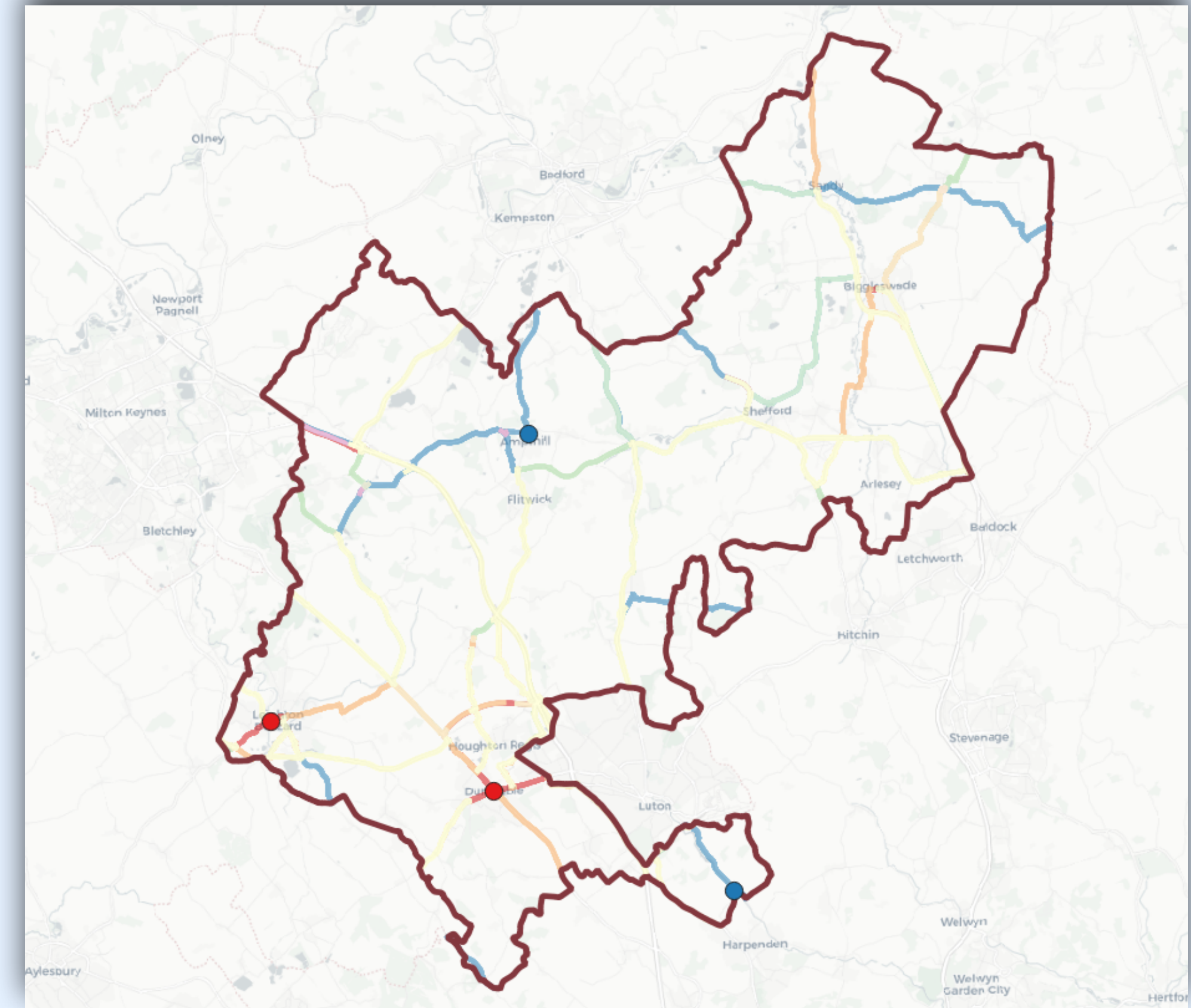
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Impact on children
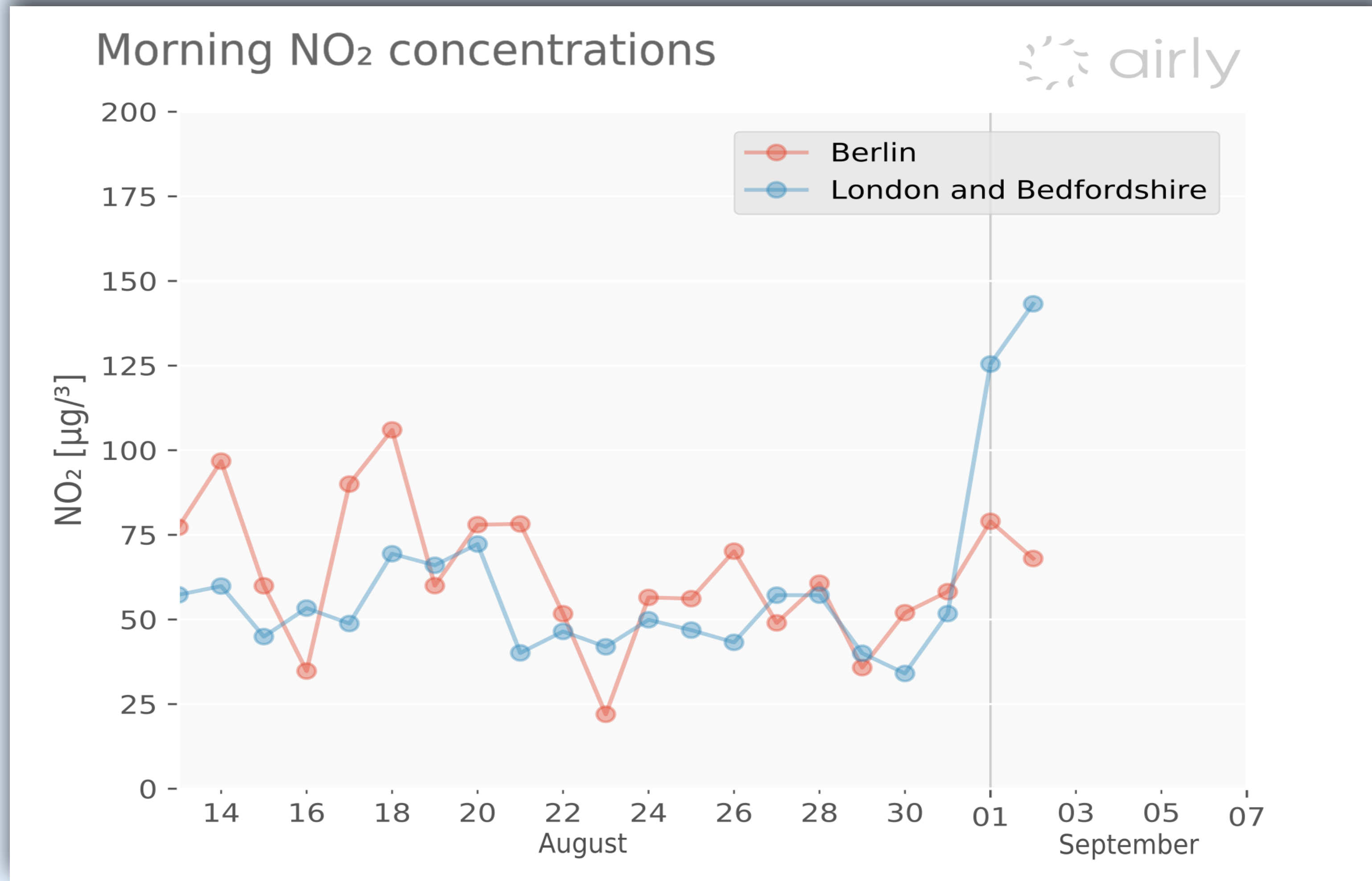
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Impact of pollution on children
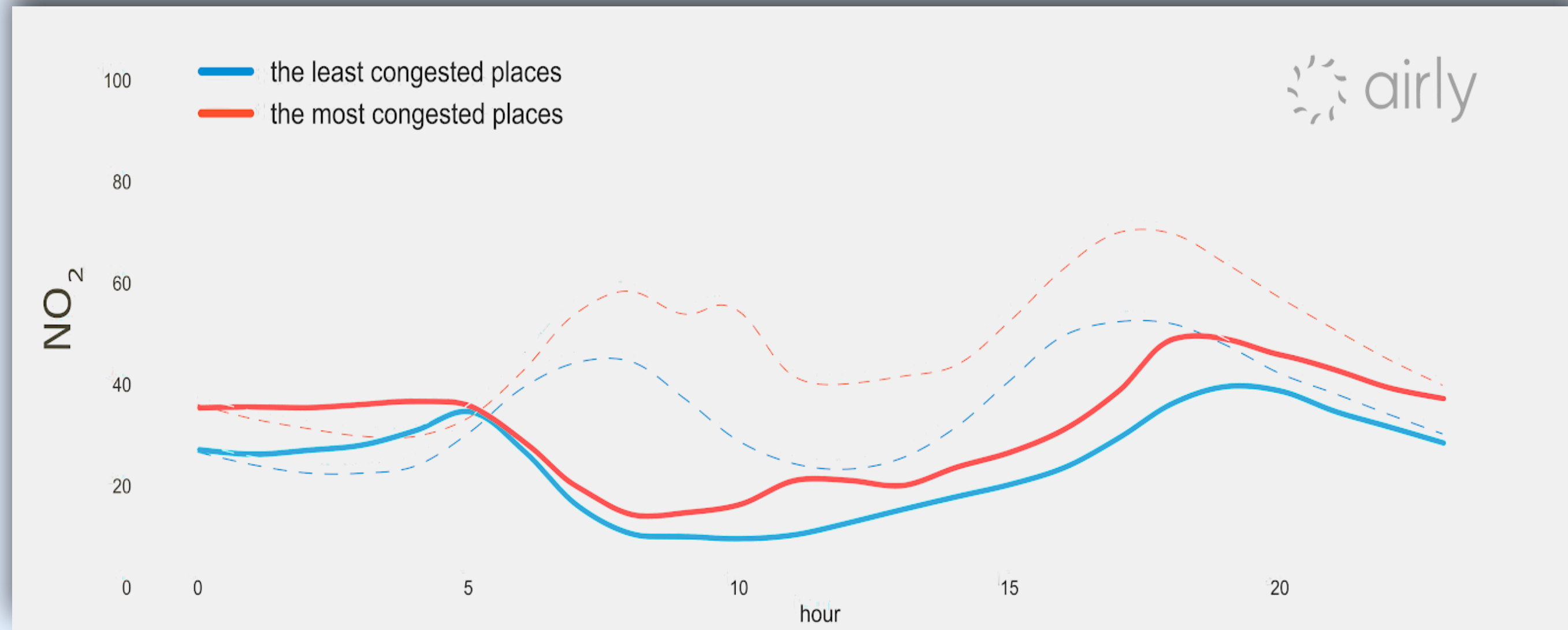
Sensors for which the values (red ones) are presented in the graph above are located in the immediate vicinity of the schools, e.g. Leighton Middle School.

The peaks occur at the **exact time school students entered** or **left the school** building and spent the most time in front of school, which can have negative consequences for their health.

Impact of pollution on children

After returning to schools (09.2020) the pollution in UK have started to return to the pre-lockdown levels.

Why Airly?

1 the best air quality sensor in the EU

2 the densest worldwide network of sensors

3 data from four continents and all climate-zones

4 AI based 24h forecasting with 95% accuracy

5 real-time measurements

6 powerful and flexible API

7 ultra-local measurements

8 constant calibration of data

9 proven on the market – 500+ clients in 24 countries

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