

Air Quality Services for Citizens

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CAMS User Workshop

30 January 2020

Dublin



Motivation: Air pollution and health



Public Health England

Health Matters

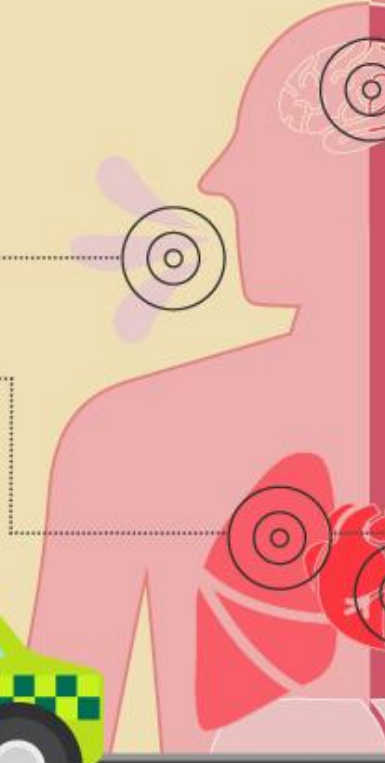
Health effects of air pollution

short-term effects

exacerbation of asthma

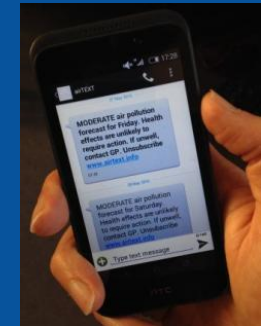
cough, wheezing and shortness of breath

episodes of high air pollution increase respiratory and cardiovascular hospital admissions and mortality



Advance warning of poor air quality can help to mitigate short-term health effects

Alert

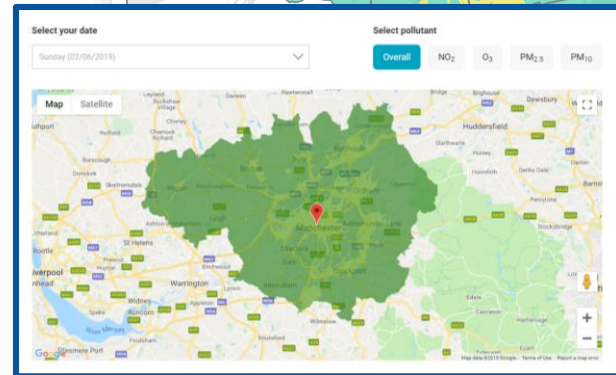
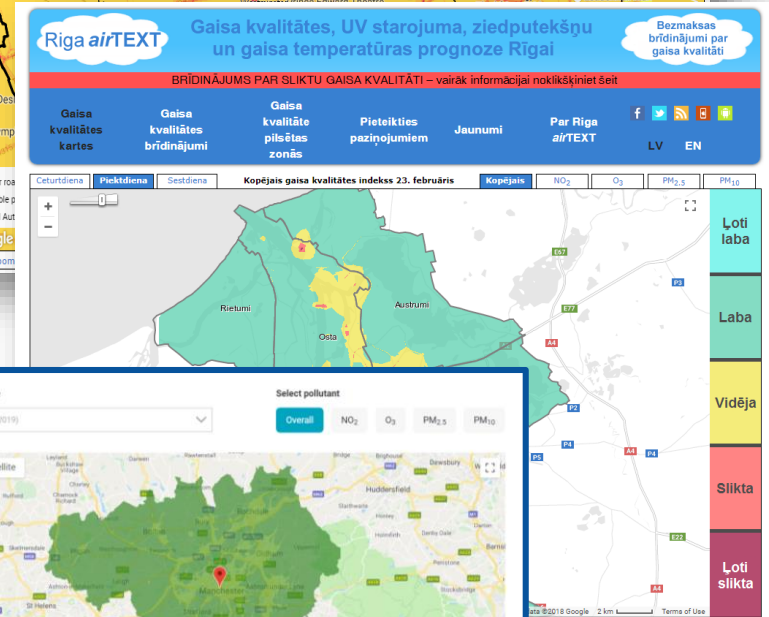
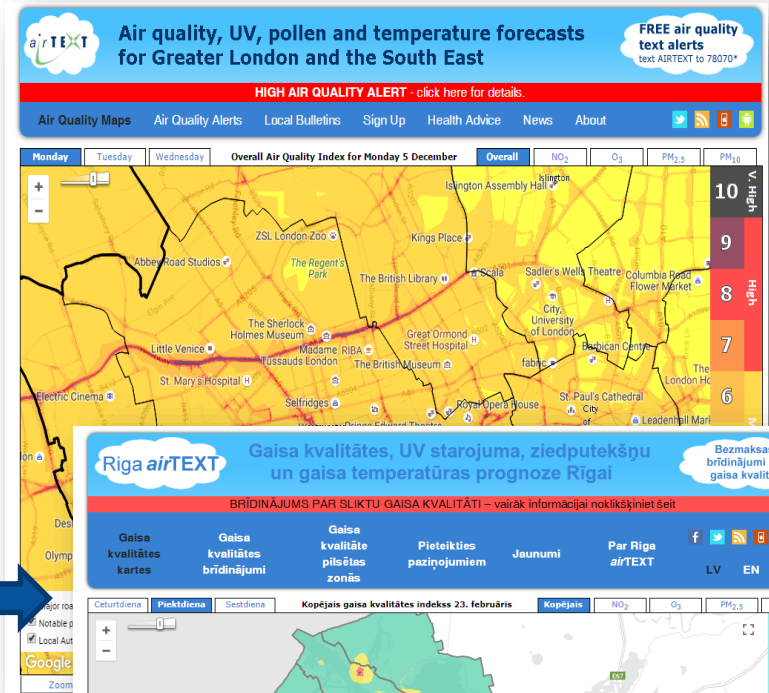


Action



CERC Forecasting Services

- London *airTEXT*
 - www.airtext.info
 - Launched 2007
 - 20,000 subscribers
 - Consortium of all 33 London Boroughs plus Slough, Thurrock, Chelmsford, Colchester and the GLA
- Riga *airTEXT* – CAMS Use Case
 - www.rigaairtext.lv
 - Launched 2018
 - 600 subscribers
 - Stakeholders are Riga City Council and the Latvian Ministry for the Environment
- Manchester
 - www.cleanairgm.com
 - Launched Jan 2019
 - Commissioned by Transport for Greater Manchester
- Kuala Lumpur (Malaysia) under development
- Also systems in Hong Kong, Barcelona and France using ADMS-Urban



London airTEXT Subscriber Survey

97%

“airTEXT increases my awareness of high pollution days”

83%

“When I receive an *airTEXT* alert I take action to reduce my pollution exposure”

98%

“Either I or someone I care for suffers from a health condition adversely affected by air pollution”

94%

“*airTEXT* is useful to me”

- Online survey carried out during December 2018 and January 2019
- 507 survey responses (9% of those invited to take part).

Causes of air pollution: Sources

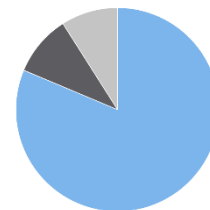
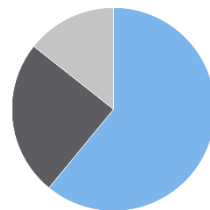
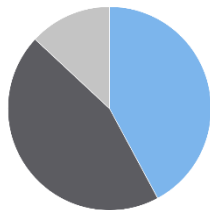
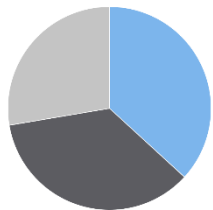
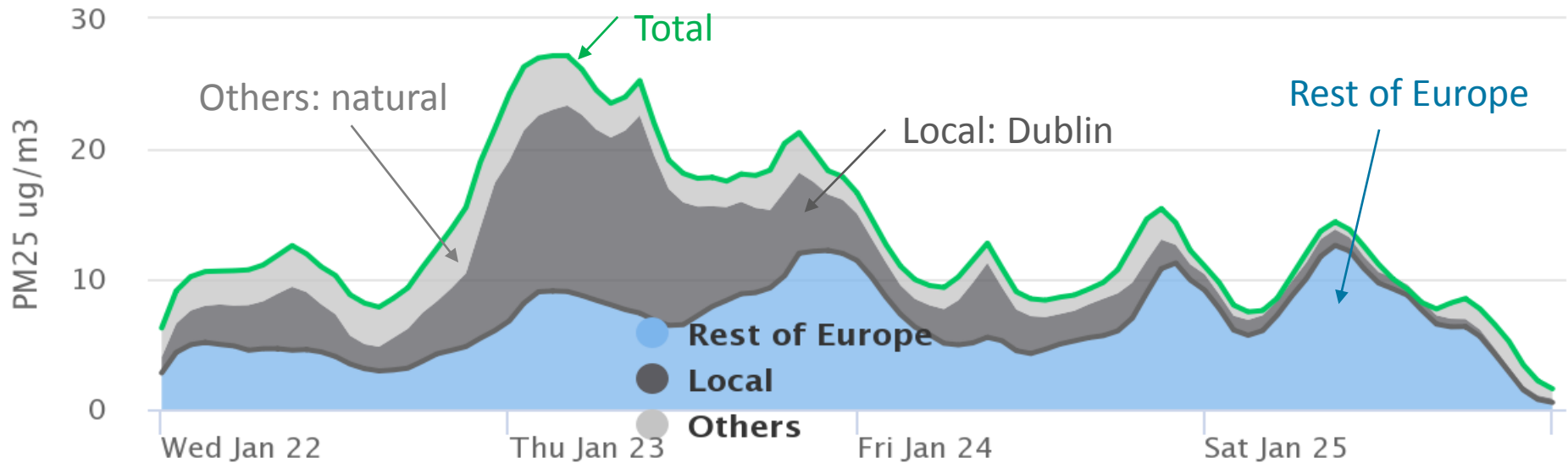
- Air pollution is caused by
 - Local sources (road traffic, construction, industry, domestic fuel burning...)
 - Non-local sources (pollution is blown in from elsewhere...)



What causes air pollution in Dublin?

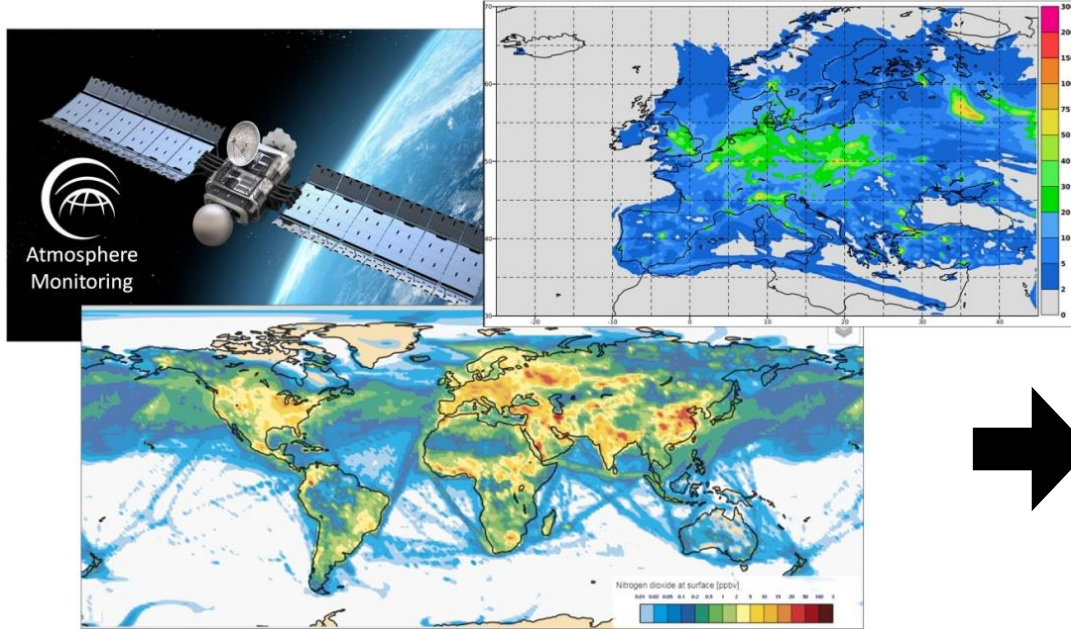
Averaged across the city, a significant proportion of Dublin air pollution comes from sources outside Dublin

CAMS Policy Support: Daily Forecasts of Source Contributions to EU cities

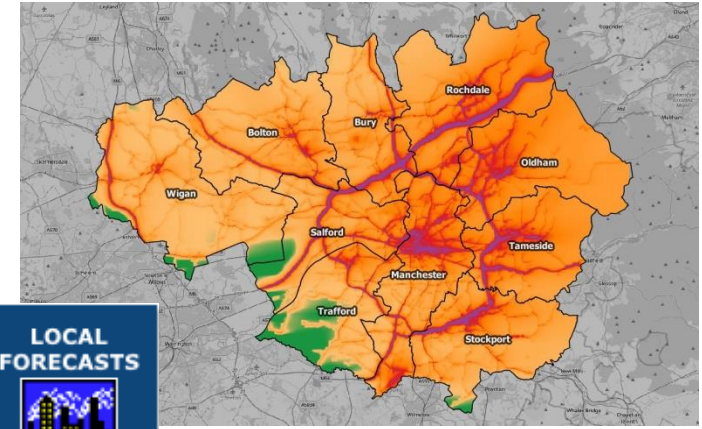
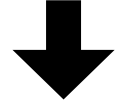


CERC's Air Quality Forecasting System

Copernicus Atmosphere Monitoring Service (CAMS)



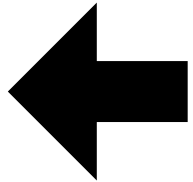
Weather Forecast
(e.g. Met Office, Meteogroup)



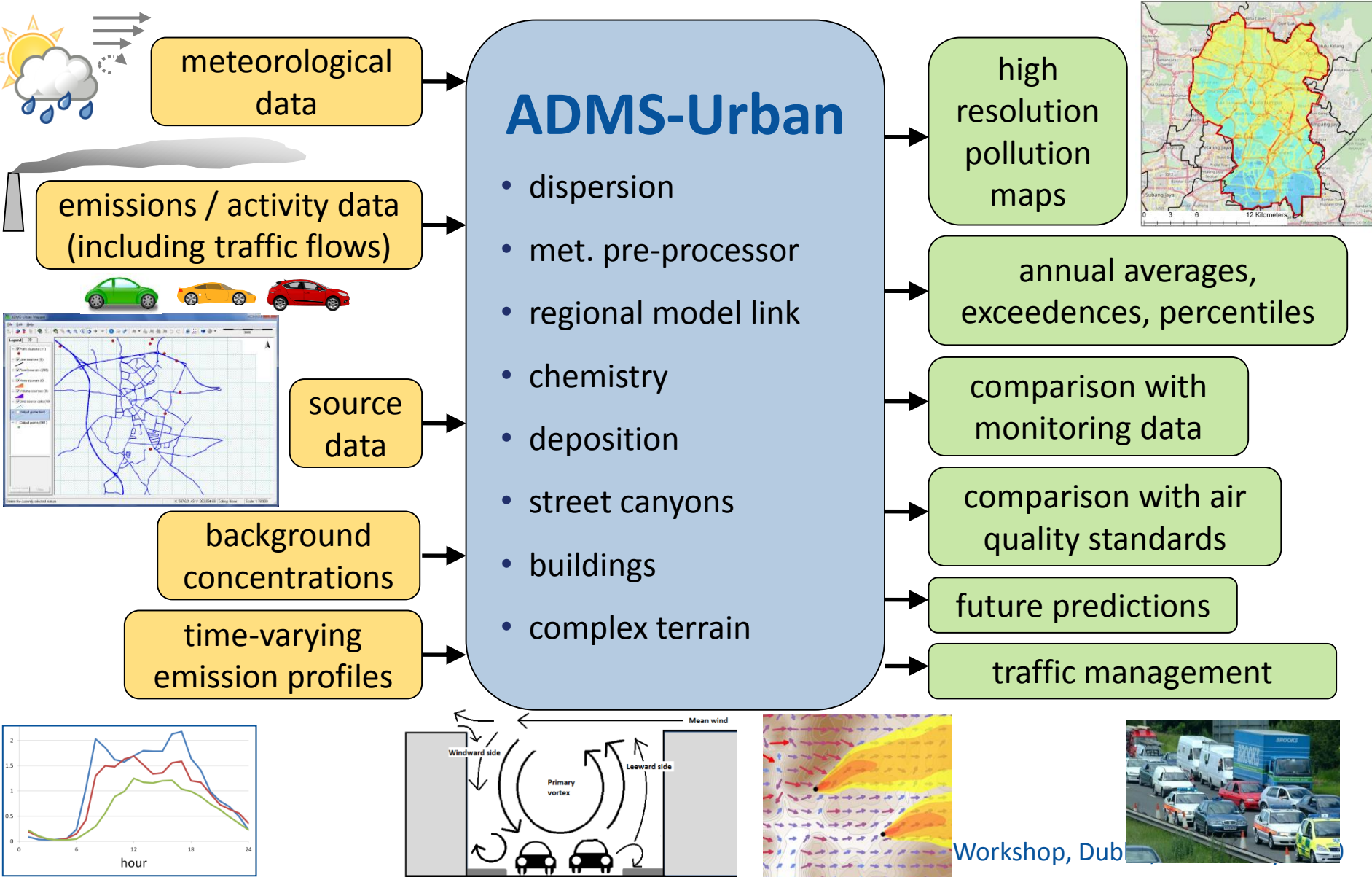
3-day pollution forecasts expressed using Air Quality Index (AQI), e.g. UK DAQI, EU AQI

- NO₂
- Ozone
- PM₁₀
- PM_{2.5}

Forecasts
and alerts

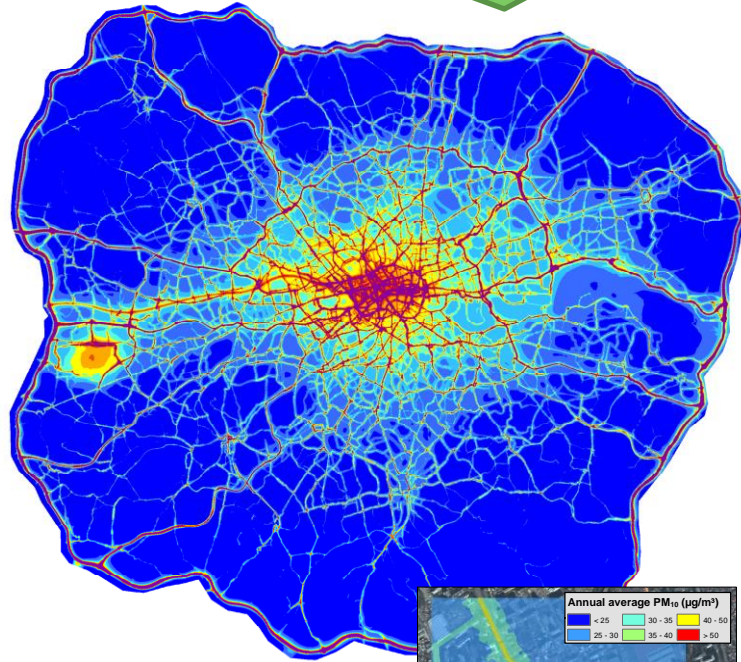


Air quality modelling using ADMS-Urban

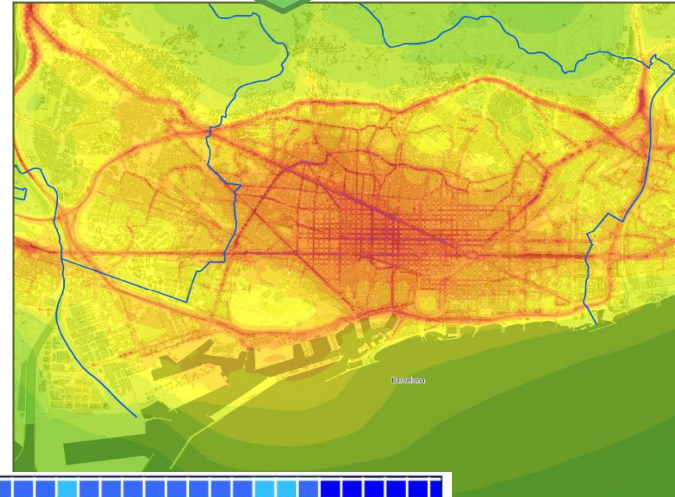


CERC's ADMS-Urban Model

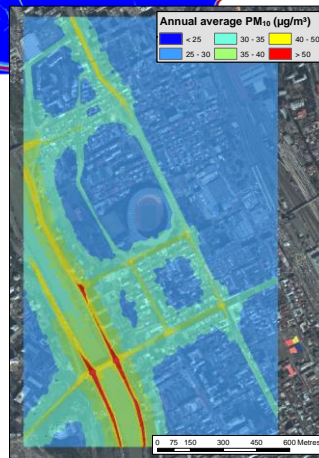
Annual average NO₂ concentrations in Greater London calculated using ADMS-Urban



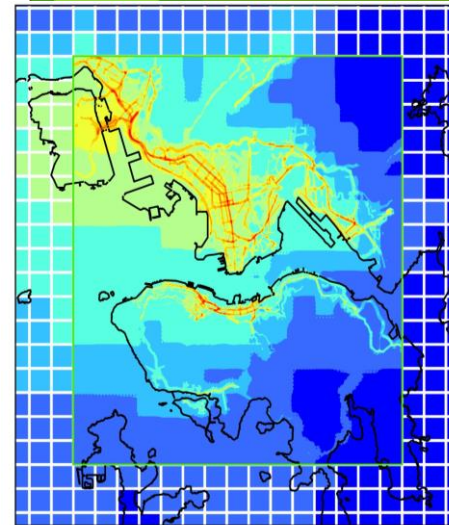
Annual average NO₂ concentration map of Barcelona calculated using ADMS-Urban. Modelling by Barcelona Regional.



Annual average PM₁₀ for Tblisi in Georgia calculated using ADMS-Urban



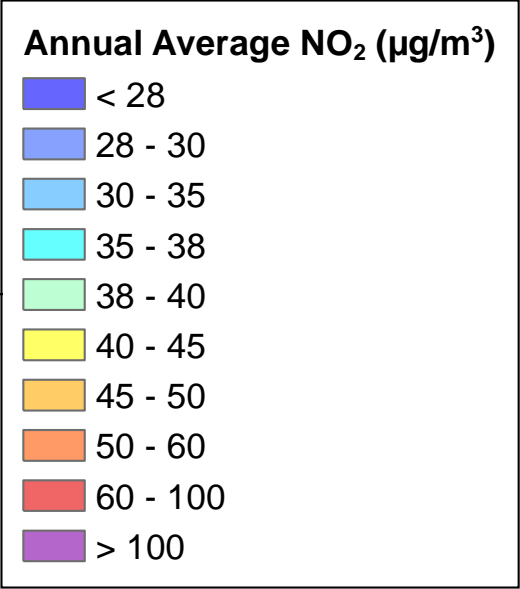
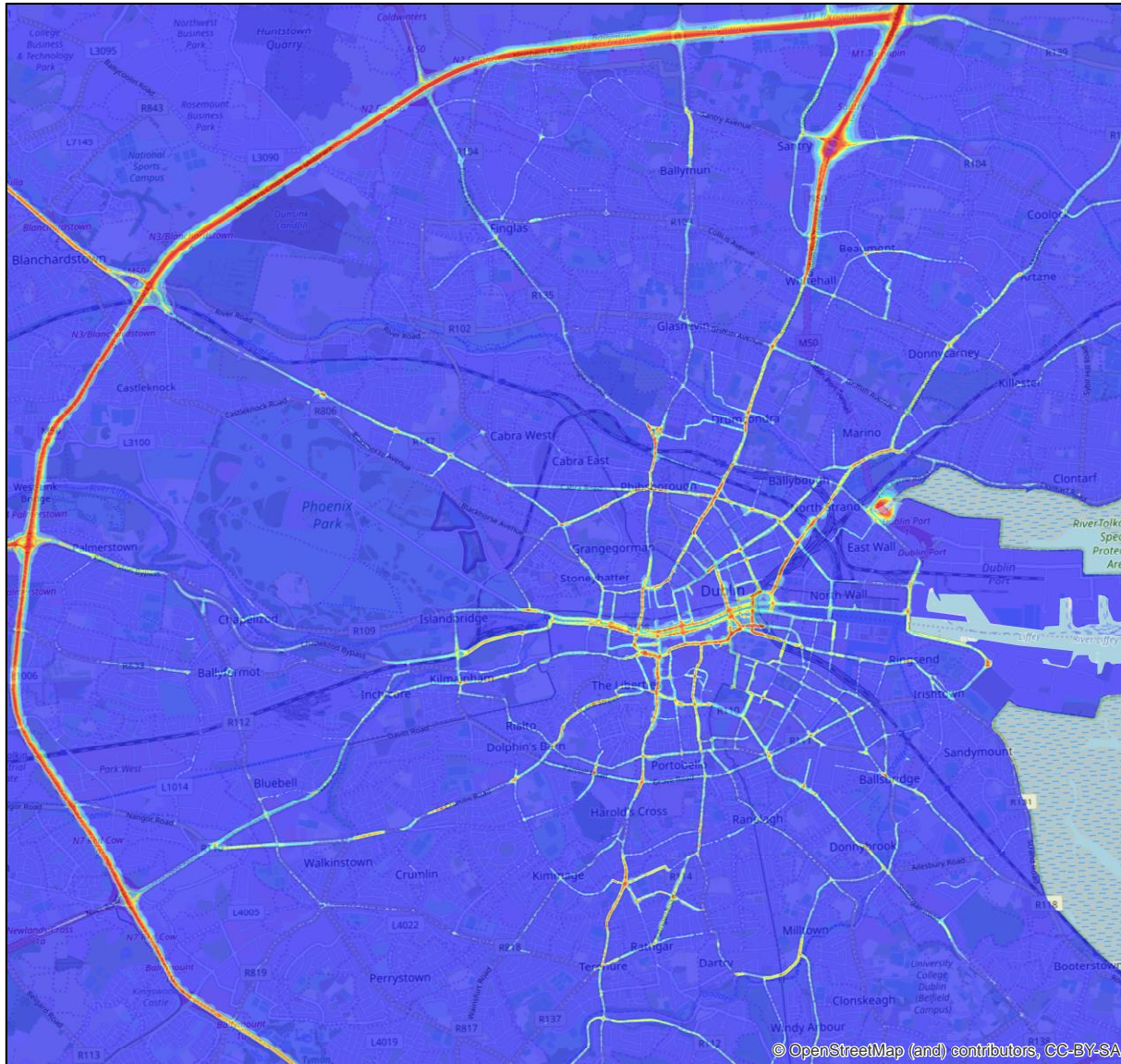
Annual average NO₂ over Hong Kong Island calculated using ADMS-Urban linked with CAMx regional model



ADMS-Urban air quality modelling of Dublin

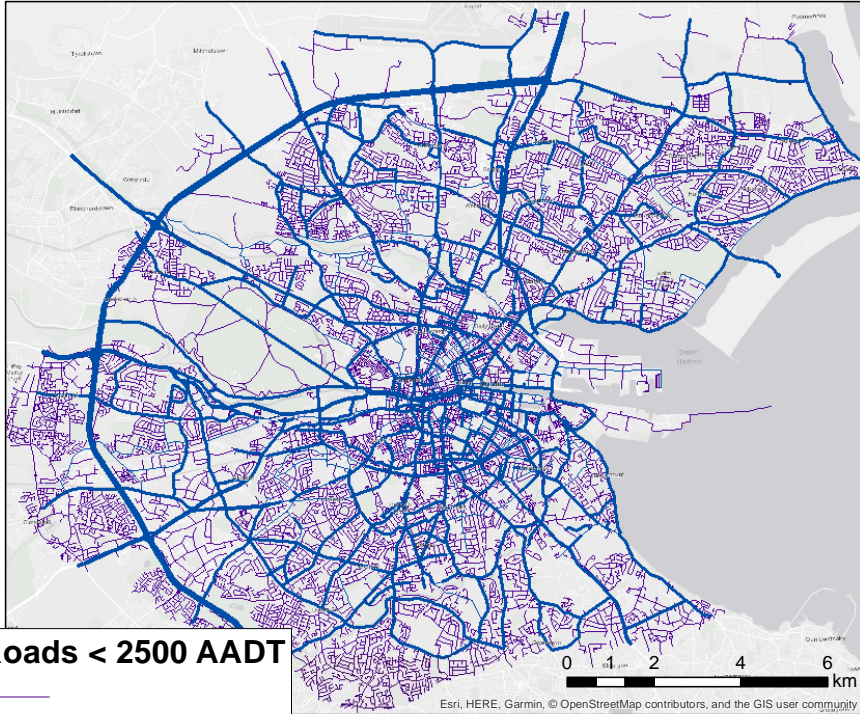
2017 NO₂

Recent work by CERC for EPA Ireland as part of the National Ambient Air Quality Monitoring Programme



ADMS-Urban air quality modelling of Dublin

Modelled Traffic AADTs
(Annual Average Daily Totals)



Roads < 2500 AADT

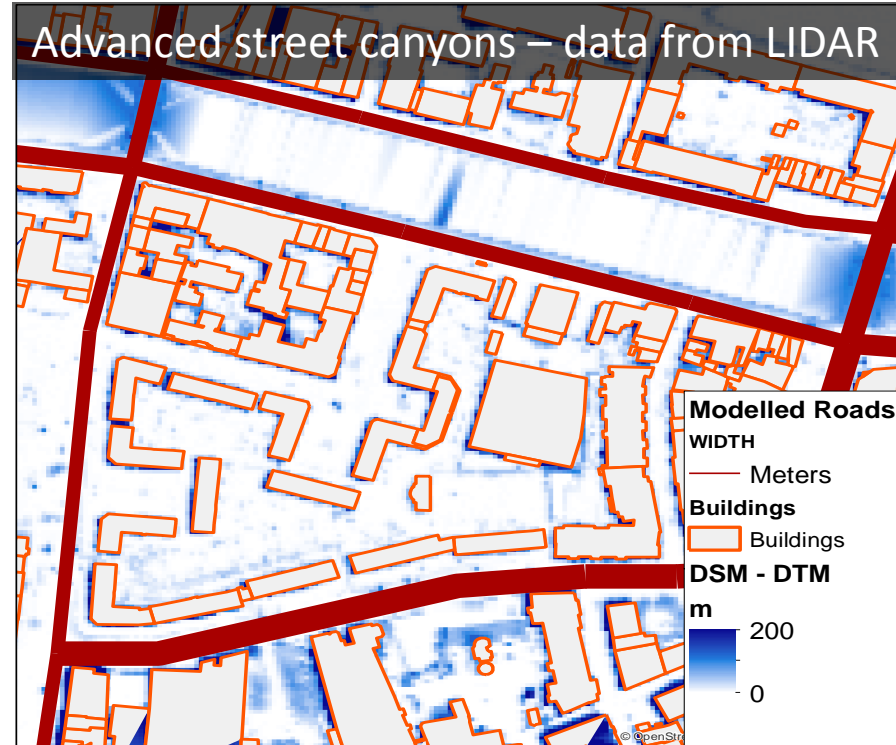
Roads > 2500 AADT

- 2,500 - 10,000
- 10,000 - 50,000
- 50,000 - 75,000
- > 75,000



Tunnels – Dublin Port Tunnel

Advanced street canyons – data from LIDAR



Modelled Roads

WIDTH

— Meters

Buildings

— Buildings

DSM - DTM

m

200

0

- Explicit road traffic and industrial emissions
- 1 km emissions for all sectors (power, industry, other stationary combustion, solvents, road transport, off-road transport, fugitive emissions, waste, aviation, shipping, livestock, other agriculture, land use)

London *air*TEXT

airTEXT Air quality for Greater London

Air Quality Maps

Monday Tuesday Wednesday

Major roads
Notable places
Local Authorities

Google

Zoom to London

airTEXT Air quality and temperature forecasts

Air Quality Maps **Air Quality Alerts**

The tables below show all of the regions that will be LOW for that region for all the days shown for your health.

Region
Central London
Local Authority
Barking and Dagenham
Bexley
Brent
Camden
City of London
Greenwich
Hackney
Hammersmith and Fulham
Hounslow
Islington
Kensington and Chelsea
Kingston upon Thames

airTEXT Air quality, UV, pollen and temperature forecasts for Greater London and the South East

FREE air quality text alerts

There are no air quality alerts.

Air Quality Maps Air Quality Alerts Local Bulletins Sign Up Health Advice

Local Bulletin for **Central London**

	Wednesday 21 June	Thursday 22 June
Air Pollution	Low No action required. Effects unlikely to be noticed.	Low No action required. Effects unlikely to be noticed.
UV	Very High Protection required. Avoid being outside during midday hours. Shirt, sunscreen and hat essential.	Moderate Protection required. Seek shade during midday hours. Cover up and wear sunscreen.
Pollen	Very High	Very High
Temperature	Max. Day 33°C/91°F Min. Night 17°C/62°F	Max. Day 27°C/80°F Min. Night 19°C/66°F

Download PDF Download PDF Download PDF

About airTEXT Info

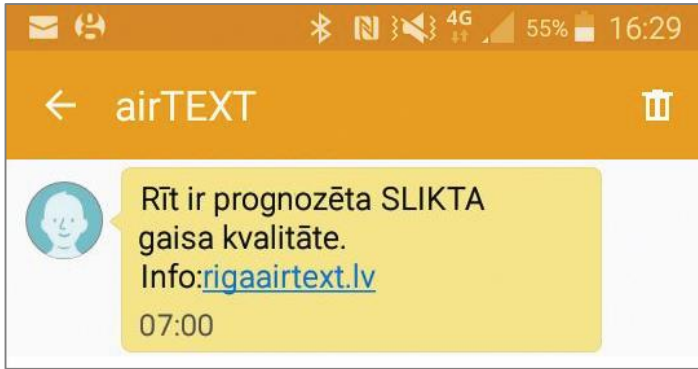
Forecast for: Olympic Park

Today Tomorrow

Air Pollution LOW (2)	UV Index MODERATE (3)
Pollen HIGH	Temperature 13C -20C

Download PDF

Riga airTEXT – CAMS Use Case



Facebook

Text alerts



Email alerts

Atvērt šo e-pastu interneta pārlūkprogrammā

Riga airTEXT Gaisa kvalitātes, UV starojuma, ziedputekšņu un gaisa temperatūras prognoze Rīgai

Sliktākais prognozētais gaisa kvalitātes līmenis no 12.10.2017 līdz 14.10.2017 ir:

Slikta gaisa kvalitāte zonā "Osta"
Bridinājums sagatavots: 12.10.2017 17:01

Gaisa kvalitātes prognoze trīs turpmākajām dienām zonā "Osta":

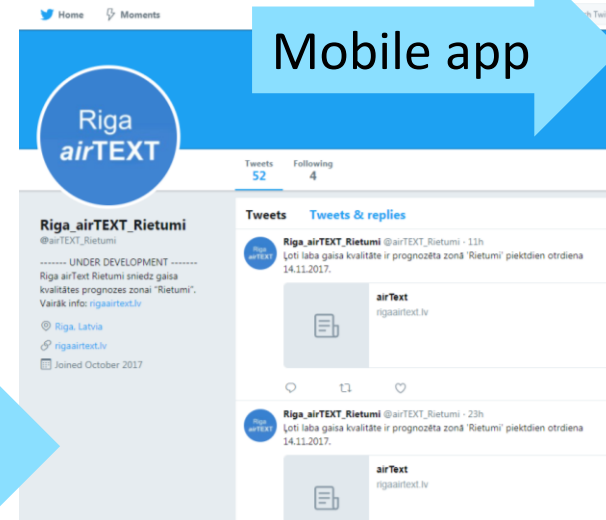
ceturttdiena, 12. oktobris	piektdiena, 13. oktobris	sestdiena, 14. oktobris
Slikta	Vidēja	Laba

Uzzināt vairāk par prognozēto gaisa kvalitāti zonā "Osta" var [šeit](#).

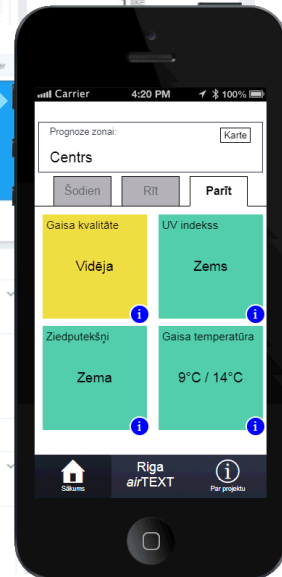
Projekta vajadzībām Rīgas pilsēta ir sadalīta 7 zonās. Zonā "Osta" ir iekļautas šādas Rīgas pilsētas apkaimes: Spilve, Voleri, Bolderāja (daļēji), Daugavgrīva (daļēji), Mangaļsala (daļēji), Vecmīlgrāvis, Kundziņsala, Sarkandaugava.

Gaisa kvalitātes prognoze attēlo paredzamos līmeņus nākamajām trīs dienām, lai Jūs varētu plānot uz priekšu. Pašreizējās gaisa kvalitātes mērījumu dati ir pieejami [Rīgas pašvaldības Mājokļu un vides departamenta mājaslapā](#).

Mobile app



Twitter



Riga *air*TEXT pollen and UV forecasts

Through the Riga *air*TEXT phone app and website you can also receive UV and pollen forecasts for Riga - these forecasts are provided by CAMS



Riga *air*TEXT Gaisa kvalitātes, UV starojuma, ziedputekšņu un gaisa temperatūras prognoze Rīgai

Bezmaksas brīdinājumi par gaisa kvalitāti

Brīdinājumu par gaisa kvalitāti nav

Gaisa kvalitātes kartes | Gaisa kvalitātes brīdinājumi | Gaisa kvalitāte pilsētas zonās | Pieteikties paziņojumiem | Jaunumi | Par Riga *air*TEXT | f | t | s | g | w | LV | EN

Zona	Centrs		
	Sestdiena, 24. februāris	Svētdiena, 25. februāris	Pirmdiena, 26. februāris
Gaisa kvalitāte	Vidēja	Vidēja	Vidēja
UV starojums	Zems	Zems	Zems
Ziedputekšņu koncentrācija	Zema	Zema	Zema
Gaisa temperatūra	Max. dienā: -9°C	Max. dienā: -8°C	Max. dienā: -9°C
	Min. naktī: -15°C	Min. naktī: -14°C	Min. naktī: -14°C

Riga *air*TEXT sniedz gaisa kvalitātes (gaisa piesārņojuma), UV, bērzu un zāles ziedputekšņu un maksimālās un minimālās gaisa temperatūras prognozes.

- Gaisa piesārņojuma prognoze var būt ĻOTI LABA, LABA, VIDĒJA, SLIKTA vai ĻOTI SLIKTA.
- UV līmenis var būt ZEMS, VIDĒJS, AUGSTS vai ĻOTI AUGSTS.
- Ziedputekšņu prognozes ir dienas bērzu un zāles ziedputekšņu prognoze, un tā var būt ZEMA, VIDĒJA, AUGSTA vai ĻOTI AUGSTA.

Gaisa kvalitātes prognoze attēlo paredzamos līmeņus nākamajām trīs dienām, lai Jūs varētu plānot savas aktivitātes. Pašreizējās gaisa kvalitātes mērījumu dati ir pieejami Rīgas domes Mājokļu un vides departamenta mājaslapā (<http://mvd.riga.lv/parvaldes/vides-parvalde/gaisa-kvalitate/gaisa-kvalitate-sobrid>). Prognozes tiek sagatavotas, izmantojot CERC izstrādāto pasaules vadošo ADMS-Urban gaisa kvalitātes modeli. UV, bērzu un zāles ziedputekšņu un temperatūras prognozes tiek nodrošinātas, izmantojot CAMS. Temperatūras prognozes sniedz informāciju par minimālajām un maksimālajām stundas temperatūrām turpmākajām 24 stundu periodam.

Projekta vajadzībām Rīgas pilsēta ir sadalīta 7 zonās. Informācijas par apkaimēm, kas ir iekļauti katrā no zonām ir pieejama [šeit](#).

Clean Air Greater Manchester

<https://cleanairm.com/air-quality-data/forecast-and-alerts>

Clean Air Greater Manchester | What's air pollution? | Your health | What you can do | What we're doing | Join the conversation

Forecasting and alerts

Daily forecast

The map shows a forecast of expected air quality over the next three days, for a number of different air pollutants, so that you can plan ahead. You can find out more about how poor air quality may affect your health on our [health](#) page. The map is produced by CERC.

You can also see hourly measurements from our monitoring stations across Greater Manchester, here.

Search for your address

Enter your postcode, town or city...

Select your date: Sunday (02/06/2019) | Select pollutant: Overall, NO₂, O₃, PM_{2.5}, PM₁₀

Daily air quality index

Low: 1, 2, 3 | Moderate: 4, 5, 6 | High: 7, 8, 9 | Very high: 10

About the daily air quality index

Sign up for air pollution alerts

You can receive text messages, emails and recorded calls, by signing up to our alerting services.

The messages are free and are based on a forecast of expected air quality for today or the next day. To receive free alerts by text message, email or recorded call just enter your details by clicking on one of the buttons below.

You'll receive an alert if the pollution is forecast to be moderate or above on the daily air quality index scale either the same day or the next day, depending on your preference.

When you have signed up, you can unsubscribe at any time.

Select your date: Sunday (02/06/2019) | Select pollutant: Overall, NO₂, O₃, PM_{2.5}, PM₁₀

Daily air quality index

Low: 1, 2, 3 | Moderate: 4, 5, 6 | High: 7, 8, 9 | Very high: 10

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How we use CAMS products

- Air quality:
 - CAMS Regional Ensemble forecasts for PM₁₀, PM_{2.5}, Ozone, NO₂, NO, NMVOC
 - Download in netCDF format using the CAMS web API between 8am and 11am each day – **currently migrating to using the ADS**
 - Our 3-day forecasts are updated twice per day:
 - 7am update: forecast calculations begin at 00:00, so we use the CAMS forecasts from the previous day
 - 7pm update: forecast calculations begin at 12:00, so we use the CAMS forecasts for the current day
- UV: CAMS ‘total sky’ (cloud-adjusted) UV index forecast
- Pollen:
 - Download birch and grass pollen in the same way as air quality data
 - CAMS pollen forecast data in units of grains per cubic metre
 - For Riga airTEXT pollen data are converted to a 4-point index scale from ‘Low’ through to ‘Very high’, using pollen concentration thresholds already in use in Latvia

Summary

- CERC provide local air quality forecasting services that use the CAMS Regional Ensemble air quality and pollen forecasts and the CAMS global UV forecast
- CERC's services predict local air quality at very high resolution using the ADMS-Urban model, developed by CERC
- Residents of London, Riga and Manchester can sign up for air quality alerts by SMS text, email or recorded message
- Air quality forecasts and alerts don't solve air quality problems, but they help to mitigate short-term health effects by helping people to prepare

Thank you for your attention