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News

Communications with CERC during the COVID-19 pandemic

During this period of reduced social interaction and home working, all at CERC are making sure we continue to interact with and support our model users and clients.

We are handling all email [helpdesk](#) and [enquiries](#) as usual, but we have suspended telephone support for the time being, so please email us for everything. Please see our [contact](#) page for details.

Face-to-face training courses are currently suspended. We are in the final stages of setting up online training courses; these are currently on trial and will be available from September. Full details including online course dates and fees will be published on our website in September. Please email us if this interests you.

We will update our [website](#) if there are any changes to the above. Please get in touch by email if you have any questions.

Major new release of ADMS-Urban, ADMS-Roads & ADMS-Airport

Version 5 was released in April 2020 and is a major update of ADMS-Urban, ADMS-Roads and ADMS-Airport with many powerful new features to aid modelling, data processing and visualisation. All the new features are described in detail in the [What's New?](#) guides and several new features are highlighted in this newsletter in more detail.

A patch update is also coming soon. There will be a new feature for modelling elevated roads, which was funded by Highways England. The patch will also include improvements to make managing licences in the interface and online easier.

ADMS-Urban and ADMS-Roads User Group meetings

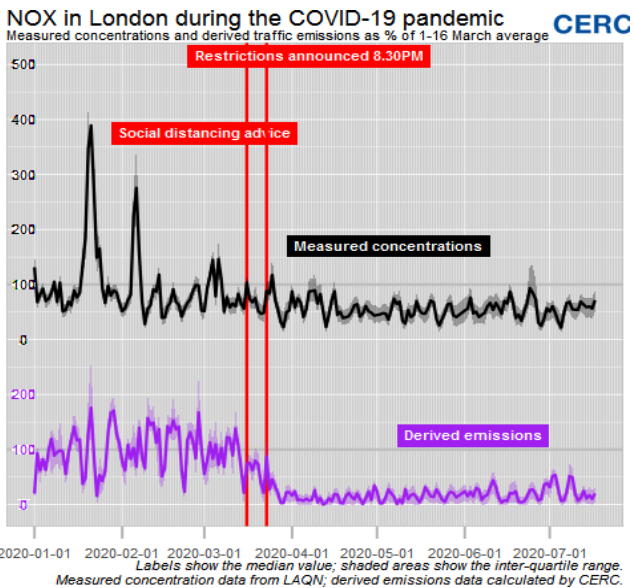
The 2019 ADMS User Group Meetings took place in Oxford on 13-14 November. Talks encompassed a range of themes including modelling tips and case studies. Special thanks to Jovanna Arndt from AECOM, Jamie Clayton from Bureau Veritas, Kevin Delaney from the Irish EPA and Richard Claxton from Aether for their talks.

The presentations are available to [download](#) from the CERC website User Area.

The 2020 User Group Meetings will take place on 18th-19th November and will be held online due to the ongoing uncertainty around the COVID-19 situation. Registration will open soon.



London road traffic NOx emissions still below 50% of pre-COVID-19 levels



CERC continues to run its inverse modelling system to determine NOx emissions in London as easing of the lockdown progresses.

The latest model calculations up to July 17 show that whilst there has recently been some increase in emissions, they typically remain below 50% of the pre-COVID values. Consistent with this, London road traffic NOx emissions for our airTEXT air quality forecasting using our ADMS-Urban model are currently set at 40% of 'normal'. Resultant forecasted NO₂ concentrations are low compared with usual levels but on average are showing a slight overestimate compared with measured values.

UK road traffic Emissions Factors Toolkit (EFT) 10.1

[EFT version 10.1](#) has now been released by Defra and the Devolved Administrations (August 2020). We have begun reprocessing the data for our products; this process is likely to take two or three weeks. We will make an announcement on the CERC website when this becomes available for download.

MAQS-Health: Multi Model Air Quality System for Health Research

CERC is leading a major new and ambitious project, MAQS-Health, which will provide a high resolution prediction capability for outdoor air quality, to support research on personal exposure and health impacts. The 2-year project is developing a coupled air quality modelling system spanning national to urban street scales and accounting for physical and chemical processes at all relevant temporal and spatial scales. The system will be flexible, linking established regional chemical transport models including CMAQ, CAMx, EMEP and WRF-Chem and a new street-scale model ADMS-Local derived from the widely used model [ADMS-Urban](#). A verification module will enable validation of model predictions. The project is funded under the Clean Air Programme of the Strategic Priorities Fund (SPF). The coupled system and ADMS-Local will be available to the UK research community via the SPF Clean Air Framework platform and will have an open structure facilitating system development and modification. The project team brings together CERC's experts in software development and application of local dispersion models (ADMS), and regional model experts from the universities of Birmingham, Edinburgh, Hertfordshire and Lancaster. The team are working closely with the Met Office who led the call for this project, and will continue to liaise with stakeholders as the project progresses.

Highways England fund study for modelling elevated roads with ADMS-Urban & ADMS-Roads

We are delighted that Highways England has funded our proposal "Tool to assess air quality impacts of elevated roads within the Strategic Road Network (SRN)".

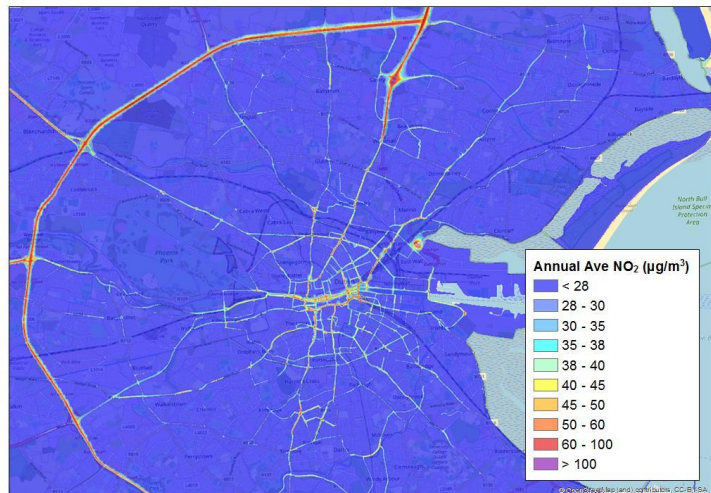
Populations are most exposed to pollution from the SRN in urban areas where the road geometry often includes complex features to improve traffic flow at junctions, such as flyovers and underpasses. There is therefore an urgent need to understand the detailed local air quality impacts of these road features on neighbouring communities, but currently even state-of-the-art models such as ADMS-Roads have limitations with regard to modelling elevated sections of road.

During this project, CERC's scientific experts developed methodologies for improving the modelling of pollutant dispersion in the vicinity of elevated roads and bridges. These have been implemented as a sub-module of ADMS-Roads and ADMS-Urban specifically designed to predict the air quality impact of elevated road sections, which will be available to users in a patch release soon.

Irish EPA assesses NO₂ in Dublin using ADMS-Urban

The Irish Environmental Protection Agency has [published](#) new evidence on NO₂ levels in Dublin. The report has been widely covered including by [The Irish Times](#) and [RTE](#).

The EPA report draws on a [modelling study](#) carried out by CERC using ADMS-Urban. CERC used traffic data provided by Dublin City Council, and emissions data from the EPA and the [MapElre](#) project. LIDAR height data was analysed to derive building parameters for the ADMS-Urban advanced street canyon module. Modelled concentrations were compared with measurements from continuous monitors and a [diffusion tube study](#); overall, the model performed well.



Dublin: Annual average NO₂ concentrations modelled using ADMS-Urban

The report identifies areas likely to exceed the EU 40µg/m³ limit value for annual average NO₂ concentrations: several streets in the city centre, the M50 motorway and the area around the entrances to the Dublin Port Tunnel.

The EPA is using both of the studies to help expand the national monitoring network as part of the National Ambient Air Quality Monitoring Programme 2017-2022. If further monitoring confirms exceedences of the EU limit value, the local authorities will be required to produce an Air Quality Action Plan.

Breathe London wins Smart 50 Award

The [Breathe London](#) project has won a [Smart 50 Award](#) from Smart Cities Connect, in the Digital Transformation category. These annual awards recognize global smart cities projects, honouring the most innovative and influential work.

In the project Google Earth Outreach have equipped two of their iconic Street View cars with air quality sensors. These have taken pollution readings approximately every 30 metres whilst they travelled through London's streets over one year. Meanwhile, 100 state-of-the-art fixed sensor pods have been mounted on lampposts and buildings across London.

ADMS-Urban modelling is being used together with the sensor data to generate hyper-local air quality mapping both for nowcasts and forecasts, and to deliver new insight into the sources of pollution. The data generated by this new network is available for the public to view on an interactive online [map](#) built by CERC on the Breathe London website. The map shows Londoners the condition of the air they are currently breathing.

Changes to the CERC website User Area

We have moved our [User Area](#) downloads to a new system that will make it much easier for you to find what you are looking for. You will still be able to use links on our website, but once logged in you can browse everything there is to download in a simple folder structure.

If you are currently registered for the User Area, with a login and password, you will have already received an email inviting you to sign up to the new User Area downloads. Just click the link, which will take you to the 'Welcome' screen containing your details where you can enter a new password to gain access to the latest software releases, technical guidance, modelling support documents and more. For any of our users who are not yet taking advantage of the User Area, you can sign up via the [online form](#). The User Area is for all customers with current support for one of more of our products.

ADMS-Urban and ADMS-Roads 5 highlights

Run splitting

Run splitting is a new option to automatically break a large modelling region into smaller spatial regions, demonstrated in the adjacent picture. Each smaller region can be distributed across your available processors to significantly reduce turnaround times. The results from all regions can then be automatically recombined when creating contour plots.

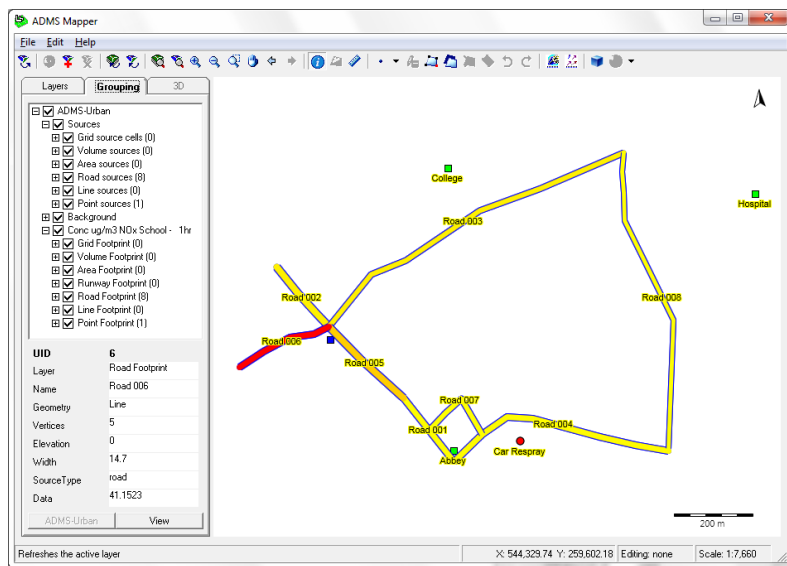
This approach is ideal when using [Run Manager](#), a tool to help you manage your model runs and make the most of your CERC licence. Run Manager will automatically run all regions, running as many as possible simultaneously.



Source exclusion

Source exclusion is an option to exclude low-impact sources from the model run, which can help to reduce run times. Sources can be excluded either by emission rate or by distance from receptors. When excluding sources by emissions, it is recommended that grid sources are not excluded (ADMS-Urban). In ADMS-Roads, the emission rate cut-off may need to be lower in order to include more sources due to the lack of a grid source.

Source apportionment



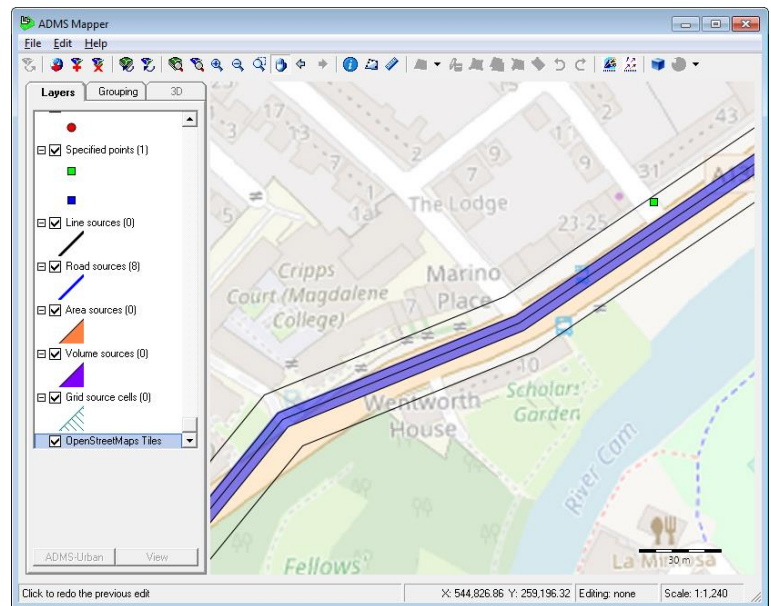
The contribution of each source to each receptor can be output, along with visualisation in the Mapper. New output files will be created, .ssf files (short-term output) and .slt files (long-term output), which will contain data at each receptor point for each source.

The output can then be viewed in the Mapper using the Display Footprint feature, as demonstrated opposite.

Road geometry file

A new optional output file (.rds file) containing road segment geometry allows you to visualise road sources in the Mapper easily. You will be able to check road and receptor geometry as the road centreline, edge and canyon walls (for advanced canyons) are shown.

For example, you can see whether a modelled receptor lies within or outside a street canyon (as shown opposite). The new option is available from the UAI file.



EFT 9 emissions and road gradients

ADMS-Urban and ADMS-Roads 5 come with the EFT 9 dataset included. This new emissions dataset can take account of road gradients, adjusting the emission rates accordingly. In order to use this feature, you can specify the gradient of a road source and the percentage of vehicles travelling uphill. Note that the emissions adjustments only affect HDV emission rates.

Recent Publications

Biggart M, Stocker J, Doherty RM, Wild O, Hollaway M, Carruthers D, Li J, Zhang Q, We R, Kotthaus, Grimmond S, Squires FA, Lee J and Shi Z, 2020: *Street-scale air quality modelling for Beijing during a winter 2016 measurement campaign*. Atmospheric Chemistry and Physics, vol. 20, issue 5, pp. 2755-2780. [Article online](#)

Carruthers D, Stidworthy A, Clarke D, Dicks J, Jones R, Leslie I, Popoola OAM and Seaton M, 2019: *Urban emission inventory optimisation using sensor data, an urban air quality model and inversion techniques*. International Journal of Environment and Pollution, vol. 66, issue 4, pp. 252-266. [Article online](#)

Che W et al., 2020: *PRAISE-HK: A personalized real-time air quality informatics system for citizen participation in exposure and health risk management*. Sustainable Cities and Society, vol. 54, article 101986. [Article online](#)

Shi Z et al. (APHH-Beijing Collaboration), 2019: *Introduction to the special issue "In-depth study of air pollution sources and processes within Beijing and its surrounding region (APHH-Beijing)"*. Atmos. Chem. Phys., vol. 19, pp. 7519-7546. [Article online](#)

Stocker J, Carruthers D, Johnson K, Hunt J and Chan PW, 2019: *Modelling adverse meteorological conditions for aircraft arising from airflow over complex terrain*. Meteorological Applications, vol. 26, issue 2, pp. 182-194. [Article online](#)

Wang K, Aktas YD, Stocker J, Carruthers D, Hunt J and Malki-Epshtein L, 2019: *Urban heat island modelling of a tropical city: case of Kuala Lumpur*. Geoscience Letters, vol. 6, no. 1, pp. 1-11. [Article online](#)

A comprehensive list of all our publications may be found on the [publications](#) section of our website.

Products and Services

CERC has been developing world-leading air dispersion and complex flow modelling solutions since 1985. Our consultancy team was established to apply our expertise to a wide variety of applications for a diverse client base.

Other software solutions



ADMS 5

Local scale air quality modelling for industrial sources



GASTAR

Modelling emergency releases of dense gases



ADMS-Urban Regional Model Link

Automated nesting of ADMS-Urban within a regional air quality model



FLOWSTAR-Energy

Modelling wind energy and airflow at high spatial resolution for wind farm planning and other airflow-related applications



ADMS-Airport

Urban scale modelling with detailed treatment of aircraft emissions



ADMS-STAR

Short-term accidental release modelling

For custom-made software solutions, see www.cerc.co.uk/research or [email CERC](mailto:help@cerc.co.uk).

Consultancy services



Our consultancy services include:

- Air quality assessments, e.g. odours, LAQM, planning and permitting
- Specialised modelling, e.g. dioxins, accidental releases, wind energy
- Compilation of emissions inventories and forecasting for large urban areas
- Project support and review services
- Research with complex atmospheric flows and air quality

For more details, see www.cerc.co.uk/consultancy or [email CERC](mailto:help@cerc.co.uk).

Contacting the helpdesk



The CERC helpdesk is on hand to provide model support. Contact us:

- From the ADMS-Urban or ADMS-Roads interface, select Help, Email CERC
- Email help@cerc.co.uk