

## ROAD TRAFFIC AND INFRASTRUCTURE IMPACT ON AIR QUALITY

**fluidyn-PANROAD** is the module of **fluidyn-PANACHE** specially dedicated to simulate the dispersion of pollutants emitted by vehicles on roads and highways, to evaluate air quality and health impact.

Designed for highway planners and environmental engineers, **fluidyn-PANROAD** evaluates the impact of modifications in existing infrastructures and the environmental impact of upcoming projects.

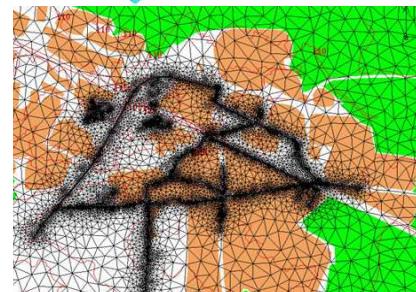
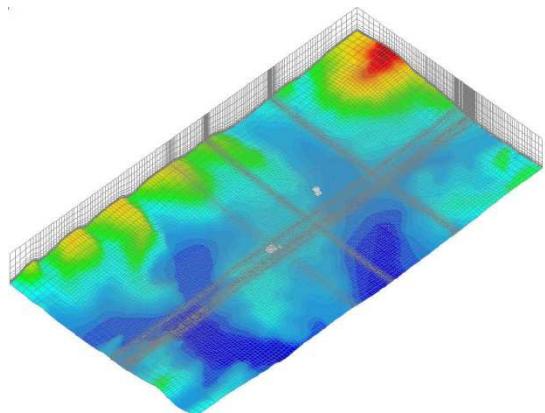
**fluidyn-PANROAD** helps to determine:

- impact of any changes in the layout of roads (construction of deviations, crossroads), modifications in existing roads (addition of lanes, traffic lights, u-turns, crossings);
- impact of installation of acoustic barriers (prediction aspect) ;
- reasons for the peak pollution values outside tunnels.

**fluidyn-PANROAD** has been developed in collaboration with ADEME. It is a part of the **fluidyn-PANACHE** family, and integrates all its features; it takes into account the topography, obstacles (for e.g. acoustic barriers), high buildings, influence of the vegetation and nature of the terrain on dispersion, effects of solar radiation and the ambient temperature conditions.

Due to the integration of rapid and advanced numerical techniques, this software can simulate dispersion for the complete wind rose, which provides a good representation of the local meteorology.

**fluidyn-PANROAD** also calculates Pollution index. Moreover, its user-friendly menu interface is very easy to use.



In addition, it can be coupled with **fluidyn-VENTUNNEL** to study the pollutant dispersion inside and outside tunnels by taking into account specific phenomena (piston effects, natural or forced ventilation).

An integrated model **fluidyn-PANTRAFFIC** evaluates the emissions of gaseous pollutants (NO<sub>x</sub>, CO, HC...) or particulate matter (PM10, Pb, etc.) for a standard fleet of vehicles from the available traffic data (hourly flux, type and speed of vehicles...). **fluidyn-PANTRAFFIC** conforms to the directives laid down by the Copert III European program. This traffic data can be integrated from the yearly average, hourly average (temporal evolution) and peak hour average.



The results of the calculations are displayed on a background map in the form of colour concentration contours, concentration profiles on traffic routes, wind fields etc.

The concentration data in air and in the deposits provide the quantification elements of health effects due to inhalation or ingestion. Les données de concentrations dans l'air et de dépôt fournissent les éléments de quantification des effets sanitaires (RD, ERU, ERI) en inhalation, ingestion.

A video animation tool to view the successive stages of the dispersion is also integrated in the software

### GAUSSIEN MODEL IN **fluidyn-PANROAD**

The Gaussian model ISCST (Industrial Source Complex Short Term) developed by the USEPA (US Environmental Protection Agency) solving probabilistic equations is available in **fluidyn-PANROAD**, thus providing a simplified approach for the atmospheric dispersion.

### APPLICATION FIELDS

Risk studies for environmentally sensitive sites, complying with the statutory directives (air quality laws), health impact studies, authorisations for infrastructure and industrial modification.



### CUSTOMERS

Industries, environmental consultancy firms, consultants, pollution control boards, city councils, government construction firms .....

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