

CARBOTRAF

Decision Support System for Reducing CO₂ and Black Carbon Emissions by Adaptive Traffic Management



The goal of the CARBOTRAF project is to realize an integrated system combining real-time traffic monitoring, simulation and prediction of total CO₂ and black carbon emissions to derive on-line recommendations for alternative ITS measures and scenarios. The system will be tested in two European cities.

At a Glance

Project acronym:

CARBOTRAF

Project type:

Specific Targeted Research Project (STREP)

Programme:

7th EU Framework Programme

Project coordinator:

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Project partners:

Start date:

Sept. 1st, 2011

End date:

Aug. 31st, 2014

Total cost:

4,472,545 €

EU funding:

3,060,000 €

Project website:

www.carbotraf.eu

Objectives

Traffic congestion causes substantial CO₂ and black carbon (BC) emissions due to the waste of fuel in the “stop & go” flow state. Reducing road congestion through a variety of ITS measures, including adoption of intelligent traffic management technologies, is an effective means of reducing both CO₂ and black carbon emissions. CARBOTRAF aims to realize an integrated method and system combining real-time traffic monitoring, on-line simulation and prediction of total CO₂ and BC emissions to reduce total emissions by imposing alternative ITS measures (adaptive traffic management).

CARBOTRAF will not only evaluate the effects of the imposed ITS measures on total greenhouse relevant emissions but also on local immission concentrations of BC and other pollutants. The evaluation will be performed by test installations of the CARBOTRAF system in Glasgow and Graz.

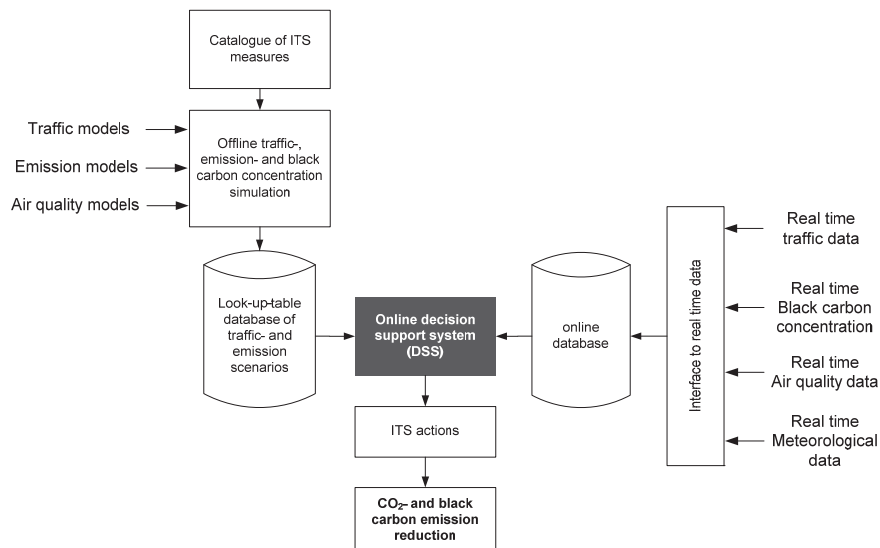
Description of Work

The project work will focus on two main investigations:

1. Combined CO₂ and BC emission optimisation. Existing air quality modeling does not consider CO₂ emissions as the carbon dioxide is not toxic and therefore not yet regulated (with threshold) by the EC. CARBOTRAF will combine CO₂ and BC emission analysis for a real-time traffic

related emission simulation, and alongside simulation of local air quality.

2. Environmentally aware real-time traffic management: Based on the 3D sensing technology of AIT the collection of real-time emission-relevant traffic information (vehicle counts, classes, traffic flow state) will be developed and made available as input to the online decision support system of IBM.



THE CARBOTRAF CONCEPT

The diagram depicts the general CARBOTRAF concept. On the left side, there are the emission- and traffic models based on a set of measured and simulated parameters. On the right side, there are the real-time traffic-, air quality- and meteorological data. In the middle, the CARBOTRAF “decision-support system and tools” are depicted, which will bring together the pre-calculated and the online data to derive real-time ITS recommendations for the traffic control centres of the test cities.

CONSORTIUM

The goals of CARBOTRAF will be reached by a complementary and coherent consortium of 8 European partners including research institutes and universities (AIT, VITO, IMPERIAL COLLEGE LONDON, Österreichisches Forschungs- und Prüfzentrum Arsenal) and companies (IBM, Air Monitors, European Tech. Serv., EBE Solutions) from 3 European Members States. Taking into account the participation of IBM’s Dublin Technology Centre, which will contribute as third party, the project work is conducted in 4 European countries. The expertise of these organisations is sorted from the intersecting areas of smart

sensors, traffic telematics, air quality, numerical analysis and computational intelligence.

DISSEMINATION

CARBOTRAF will not only disseminate results to the scientific community and the wider public by, but will also actively involve the stakeholders in the cities by setting up stakeholder panels in each of the test cities.

Expected results

The first result that will be available in the project is the handbook of ITS actions for each of the test cities, resulting from traffic models and simulation of emissions for different scenarios for the selected test area. The handbook will be valuable information on optimal ITS strategies. The test operation of the CARBOTRAF system will evaluate the performance of the online Decision Support System and the actual effect of the ITS recommendations on the total CO₂ and BC emissions. The result will be compiled in a handbook for cities regarding diminution of CO₂ and BC. It will provide guidelines, recommendations and “best practice” solutions for emission reduction by adaptive traffic management regarding both, technical and operational issues.

For further information:

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