CARBO TRAF

EUROPEAN FP7 PROJECT

CARBOTRAF

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

Dr. Wolfgang Ponweiser, AIT Austrian Institute of Technology GmbH

SEVENTH FRAMEWORK PROGRAMME

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY · AIR MONITORS · EBE SOLUTIONS · ETS · IBM · Imperial College London · vito vision on technology

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Project Facts

- EC collaborative research project in the 7th framework program:
  - submitted January 2011
  - project started Sept. 1st 2011
  - planned project end Aug. 31st 2014
- Project Coordination: AIT Austrian Institute of Technology GmbH
- Project Partners: 8 organzations from 4 different countries (Austria, Belgium, UK, Ireland)
- Budget: € 4,4 Mio. (€ 3,0 Mill. EC funding)
- Pilot cities: Graz & Glasgow

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Project partners and their roles in the project

- **AIT Austrian Institute of Technology GmbH**
  coordination, air quality monitoring Graz, traffic monitoring technology provider
- **AIT Austrian Institute of Technology GmbH - Mobility**
  requirements analysis, traffic simulation and ITS actions selection
- **IBM Österreichische Büromaschinengesellschaft mbH with IBM Research Irland (as "third party")**
  Decision Support System (situation prediction and ITS actions proposal)
- **EBE Solutions GmbH, Austria**
  User Interface for traffic centres, installation of equiptment in Graz, hosting of DSS
- **Imperial College London, UK**
  Traffic simulation, emission models
- **VITO, Belgium**
  Emission models, planning of pilot installations, evaluation of results
- **Air Monitors Ltd., UK**
  Installation of equiptment in Glasgow, air quality monitoring Glasgow
- **European Tech. Serv., Belgium**
  Dissemination and exploitation of project results

Project Idea and Innovation

- Idea
  - CO_2 and back carbon (BC) reduction by smart traffic management
  - Pilot operation in Graz and Glasgow
- Innovation
  - Linking of CO_2 - aspects and ITS measures (focus not on reduction of congestion but rather "CO_2-reduced" traffic)
  - BC is the second most important greenhouse factor and is also dealt with in the project
  - ITS aspect: Not only traffic development prediction but also decision support for ITS counter measures
- Goals
  - → Development of methods and tools to reduce emission of CO_2 und BC by e.g. re-routing traffic
  - → Evaluation of the concept in two pilot installations/test operations

Decision Support System (DSS)

- Step 1: real time monitoring of traffic situation
  Traffic monitors (existing devices and additionally installed by the project) **measure speed, volume and composition of vehicles and detect emission relevant traffic states (e.g. stop/start situation). Air quality is also monitored.**
- Step 2: prediction of traffic and air quality situation 30-60 mins. into the future
- Step 3: computing **CO_2 & BC emissions (current and prediction) from traffic**
- Step 4: an improved traffic scenario is selected that is able to satisfy the traffic demand at reduced total CO_2 & BC emissions (and improves further defined key performance indicators)
- Step 5: ITS action options are displayed to the traffic centre operator who finally deceides on their implemetation („human in the loop“)

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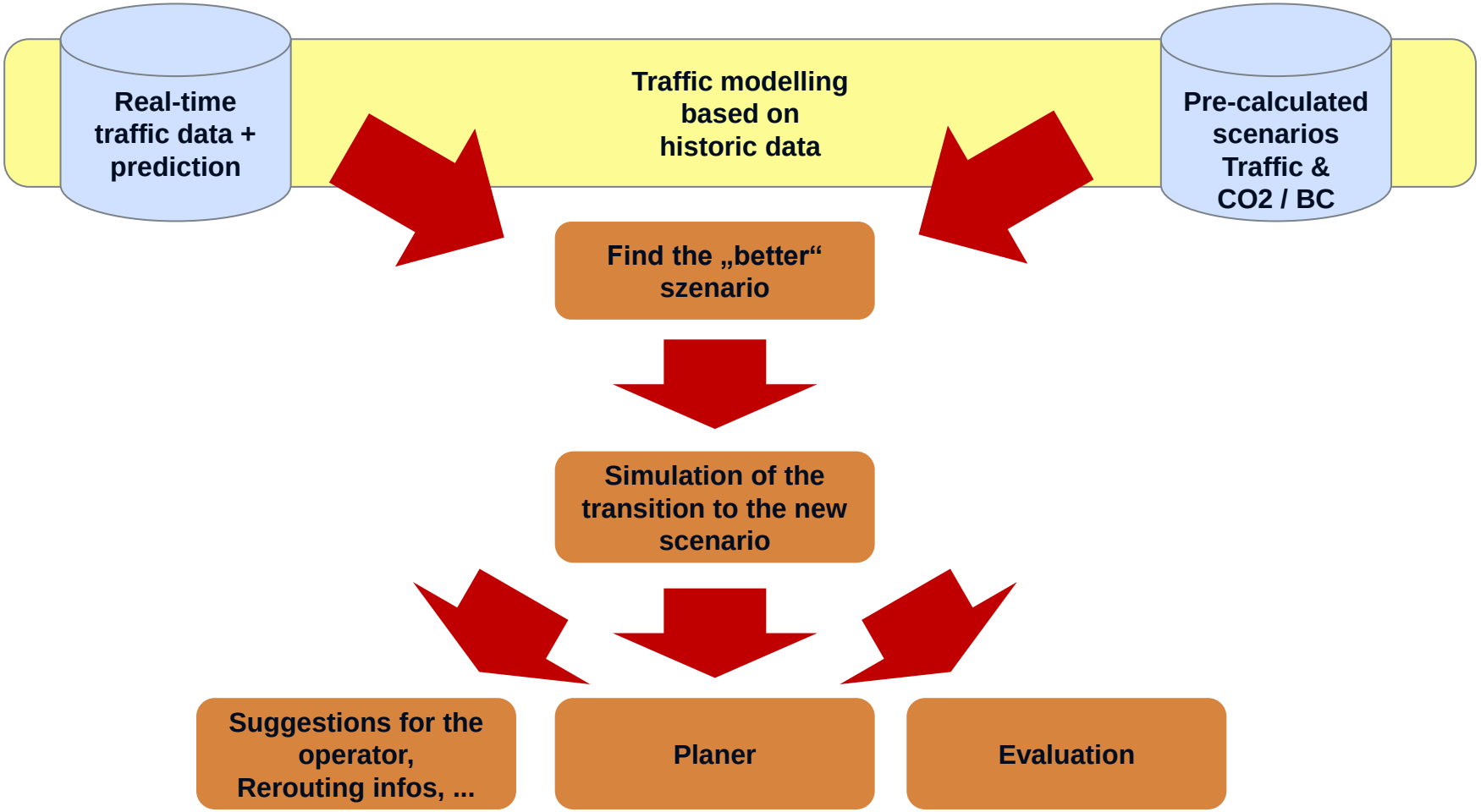
Decision Support System

Real-time decissions to affect traffic



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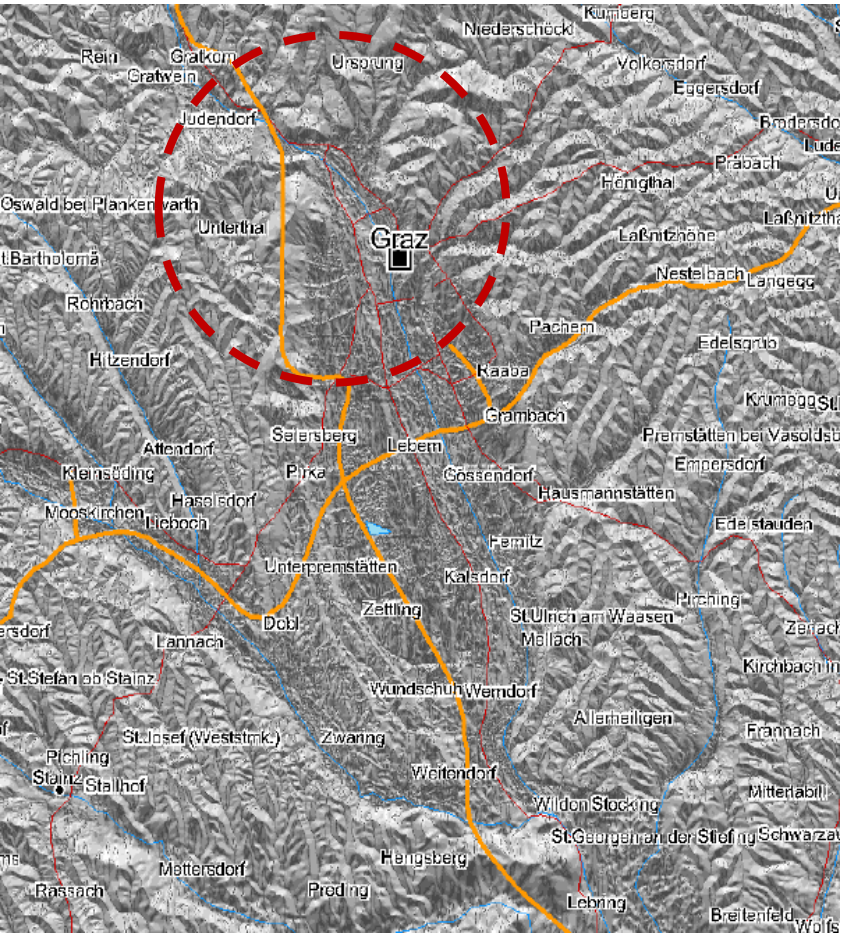
Pilot - Graz



Altitude profile of the city of Graz demonstrating the basin location.
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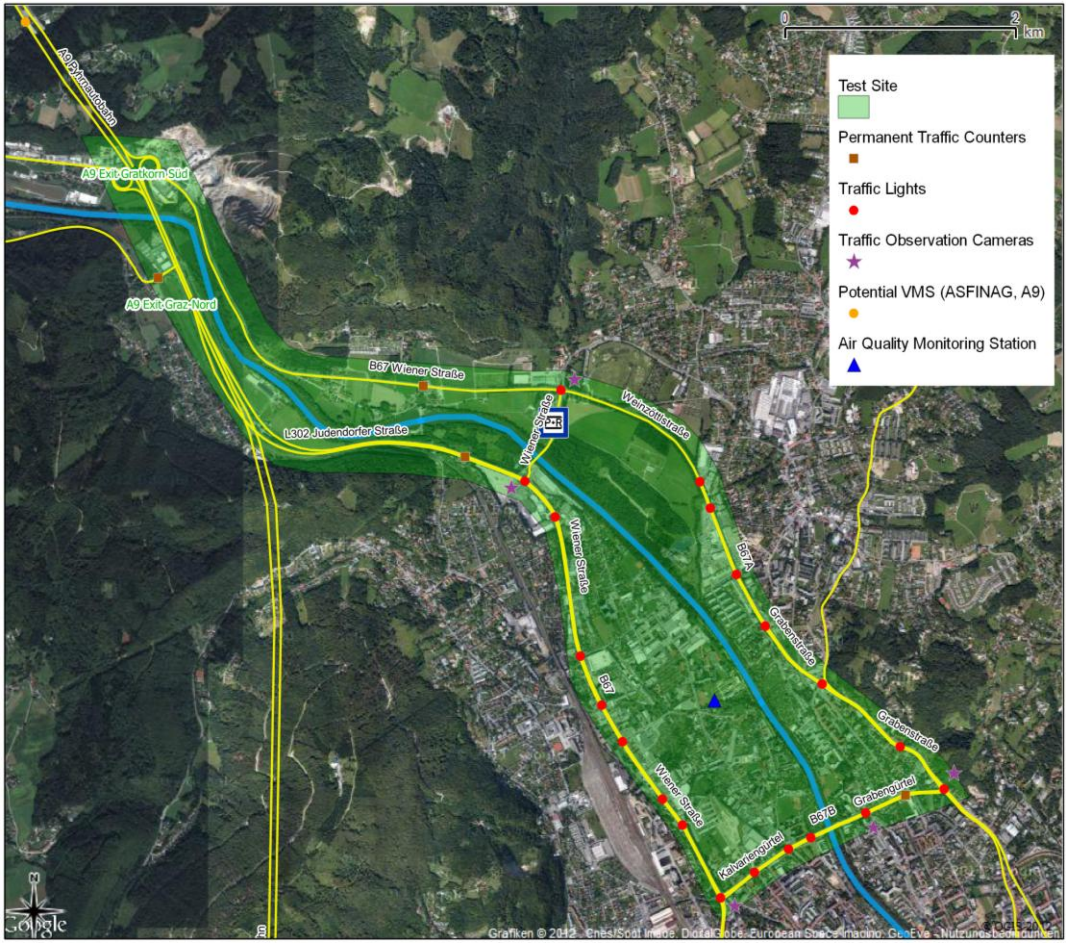

The test site of Graz including existing traffic lights and sensor locations

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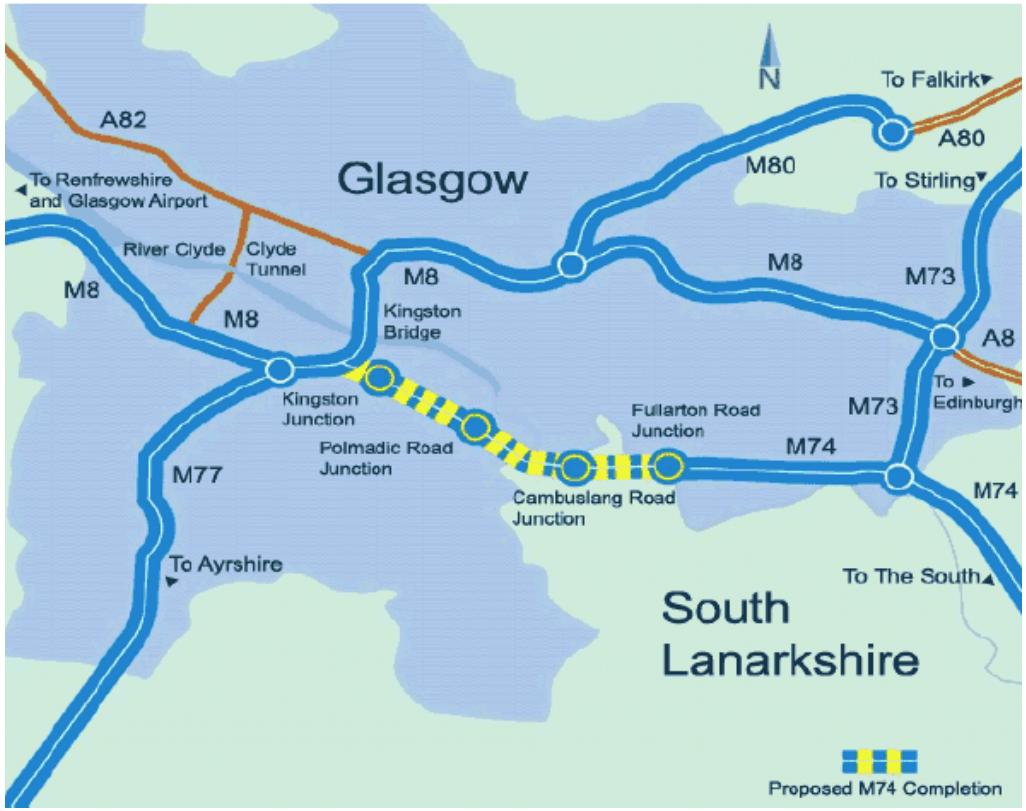
Pilot - Glasgow

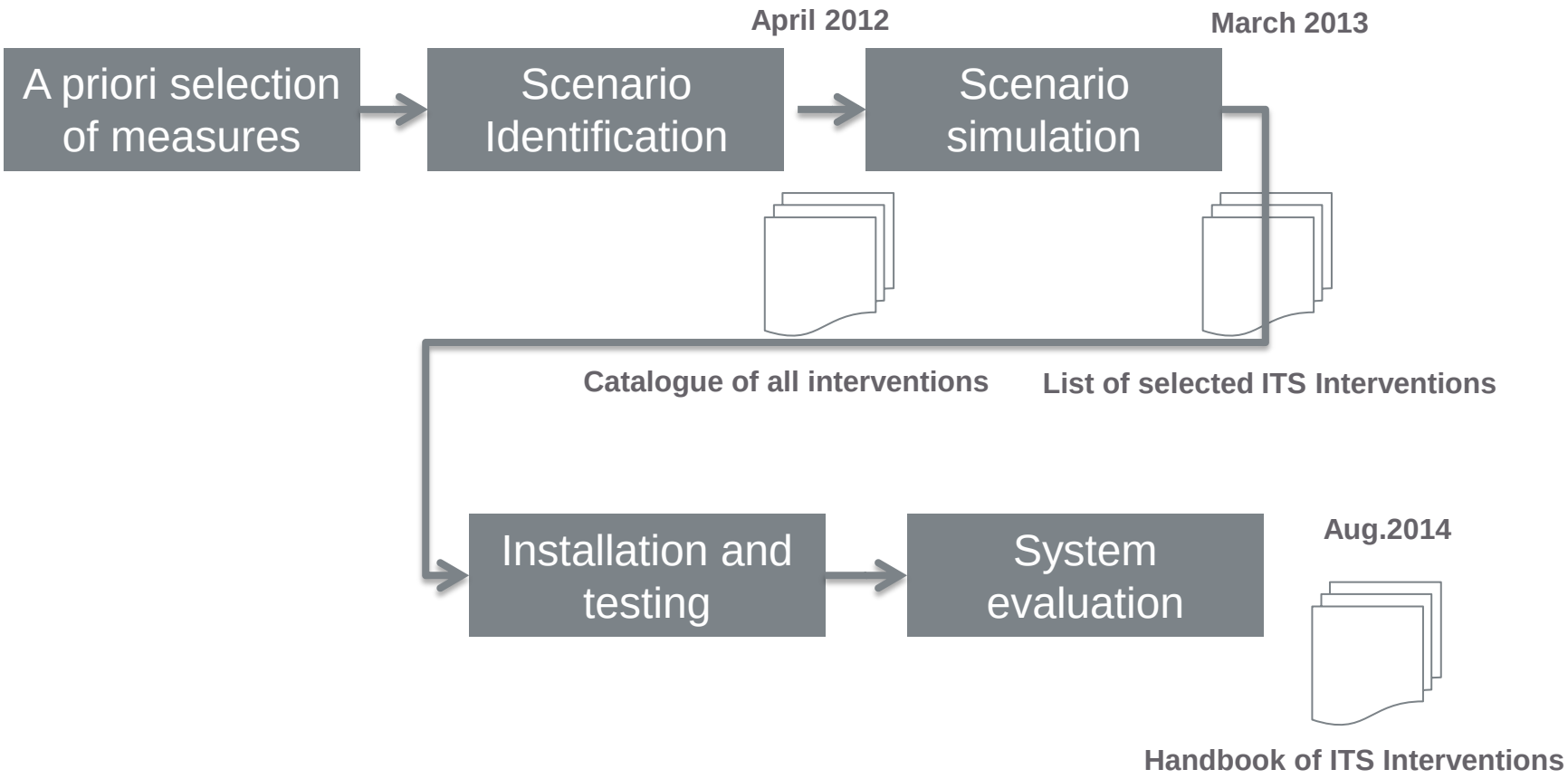
Geographical location of Glasgow (Local transport strategy Glasgow)



The transport infrastructure in Glasgow (Transport for Scotland)

Next project steps

- Next steps and planned results for Glasgow



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Benefits for Cities implementing CARBOTRAF

- Online system:
  - Analyses of the actual situation
  - Proposal of measures, which can be realized immedeatley
- Rapid effects:
  - Reuse of existing measures/infrastructure, where the use will be optimized
  - Applicable even without additional installation of sensors and measures
  - Can be configured for any new measure
- Final decission stays at the responsible person
  - Decision Support System
  - Operator still ‘calls the shots‘
  - BUT: Optimization of traffic, emission and pollution concentration
  - And the operator is relieved from time consuming data collection tasks

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