HOW TO MAKE A BETTER CITY

SMARTER CITIES NEED SMARTER TOOLS. MARIA LEMPER REPORTS ON THE EUROPEAN-FUNDED URBANAPI SYSTEM, DESIGNED TO LET CITY PLANNERS CREATE APPLICATIONS TO SUPPORT DECISION-MAKING AND ENGAGE CITIZENS

Today, European cities are increasingly challenged by various socio-economic and environmental issues, undermining the quality of life of the citizens. In response, city managers are developing visions for the future shape of an urban Europe, and are seeking to manage city-regions to ensure that the benefits gained so far are passed on to future generations of inhabitants.

Over the past few years, the governance of cities has increasingly been supported by the application of smart city solutions, based on tools and methodologies that provide an effective basis for the assessment of urban complexity, support of decision-making, and the creation of robust solutions. In this context, the urbanAPI project, funded by the 7th Framework Programme of the European Commission, developed three tools that provide interactive analysis, simulation and visualisation tools for urban agile policy implementation.

The hypothesis of the urbanAPI system is that the huge amounts of public sector data that already exist – as well as formal and informal data collected every day by all types of stakeholders – can be integrated and made accessible for activities related to policy-making.

The first, the Fraunhofer Institute for Computer Graphics Research IGD's 3D Scenario Creator, is based on CityServer3D, an interoperable GIS especially suited for processing and maintenance of 3D city data. It uses 3D virtual reality visualisations of cities to show the general effects and the visual impact of urban development plans. The user interface (built on Java 6 and OSGi) can be customised with different views, depending on the customers' requirements, and geospatial datasets in standard GIS formats. Furthermore, a rule editor allows the user to define not only data sources to be processed, but also rules containing several workflow steps, such as colourising all objects of a certain type.

These virtual representations of planning decisions are the most convenient and understandable solutions for presenting spatial planning alternatives to the public. Allowing interactive modifications of alternatives supports stakeholders in understanding the proposed actions and endorsing the anticipated effects. To guarantee the best possible user experience, high quality 3D geodata and rich interaction elements are used, especially to provide feedback on planning in

various forms. This means that special emphasis is put on user-friendly client interfaces and an easy-to-understand simulation. Users can view the service using a common internet browser.

In the cities of Vienna in Austria and Vitoria-Gasteiz in Spain, 3D Scenario Creator is used to directly address the issue of stakeholder engagement in city planning by visualising development proposals. City administrators and architects can view or reshape their proposals, or even perform visibility and shadow analysis interactively during a meeting. This allows different stakeholders to fully engage in decision-making.

Mapping mobile phones

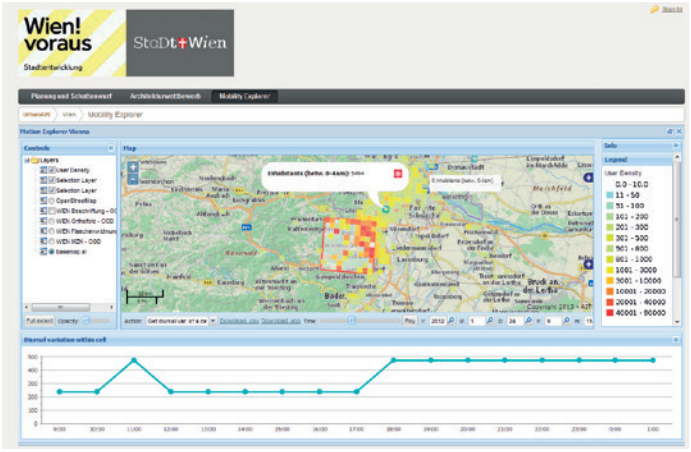
The Austrian Institute of Technology's Mobility Explorer is used for exploring mobile device location data and socio-economic data. It is designed as a web application capable of visualising the diurnal dynamics of distribution patterns of pre-processed mobile device data. It has been developed from scratch, from the parser for the binary mobile device log data to the web interface of the application, and allows users to select any source cell (where mobile device users start) or any target cells (where they move to) and visualise their motion over the day. This is made possible by a 2D web mapping client within the urbanAPI system. Larger-scale explorations will enable the monitoring of access preferences in public places in detail. Line graphs allow the visitor occupation of single cells during a day to be explored. It is also possible to retrieve this information in CSV and shapefile format for further processing in GIS applications.

The mobile phone location data will significantly enhance the data pool of the city of Vienna for traffic and open space planning. Knowing when and how many people travel from one borough to another will provide much deeper insights in the way the city works. In open space planning, estimating the attractiveness of large recreation areas, such as Prater, Wienerwald and Bisamberg forests, will be facilitated.

Understanding consequences

The Austria Institute of Technology's Urban Development Simulator is based on the simulation suite MASGISmo. It combines several modelling methods within one platform for spatial explicit agent-based and system dynamics modelling, and uses open source software such as PostgreSQL. This allows the development of multi-method models simulating land use changes and land use density changes in high-resolution. The approach uses a cellular landscape showing single actors' behaviour (households, entrepreneurs) in response to factors such as land attractiveness, suitability, accessibility and the legal spatial development framework.

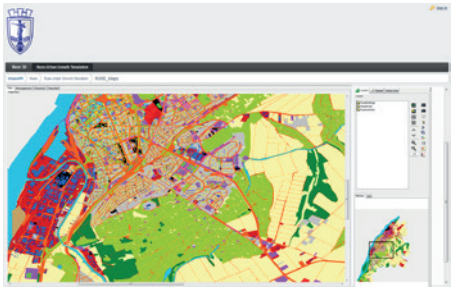
The virtual construction of new infrastructure and implementation of alternative land zoning regulations enables the resulting urban development effects to be observed.



The Mobility Explorer allows for dynamic mapping of motion patterns of mobile device users and population collectives of individual origins, targeting all destination raster cells in the Vienna region. Inside Vienna, 1x1 km raster cells are defined as target or destination cells. The graph below documents the visitor occupation of interactive single cells during a day

A 3D visualisation of the city of Vienna, Austria

Two 3D visualisations of Vitoria-Gasteiz in Spain. The example on the right side shows buildings and their shadows as well as potential greening of the street



One potential urban development scenario for the city of Ruse, Bulgaria, using the proposed 'master plan' for the city as the basis for simulation until 2031

The Urban Development Simulator will provide new opportunities for cities to better understand large-scale consequences of spatial planning decisions in a complex urban system. The possibility to interactively publish proposed planning interventions on the Internet supports planning authorities in interactively engaging with the public in planning processes and contributing to planning scenarios.

In the city of Ruse in Bulgaria, the information provided about planning decisions and the full transparency about the expected impacts are intended to support negotiations with citizens during planning and should increase public commitment to decisions.

A unique opportunity

The great potential of these urbanAPI tools is that they not only assist in managing urban problems that arise as the drivers of change, including climate change, economic transformation and migration of population, they also point the way towards developing generic solutions that can be universally applied in urban management. Thus, if you are interested in using our tools to support stakeholder engagement in your city, thereby making it more sustainable, please don't hesitate to contact us at info@geoville.com.

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