



*Be Inspired 2010*

# 3D to Mobile to Integrated Data Model

*Top users of Bentley software get invited to participate in the Be INSPIRED Awards 2010. Interesting, innovative and sometimes mindboggling projects fight for their moment of fame.*

By Remco Takken



*CEO Greg Bentley and Resilience, the recurring theme from his assessment of everything Bentley.*

Approximately four hundred invitees from all over the world gathered around the fifty five finalists for the Be INSPIRED Awards 2010, held in Amsterdam. It soon became apparent that this was not some cooked-up awards meeting. According to Bentley, the quality of the live presentations of top Bentley users was to be judged by a panel of former winners, journalists and skilled users. However, at least one of the winners, Odense Kommune, had not been presenting.

While the track 'Innovation in Government', hosted by Bentley's Richard Zambuni, focused mainly on geospatial issues during the two-day event,

many aspects of spatial information were seen in other categories.

An interesting observation was that all nominees in the 'Government category' were Danish. This might be due to the firm legislation and forward-looking attitude of the geospatial community in that country.

### Odense Kommune

The winner was the on-the-Fly 3D City and Urban Modeling of Odense Kommune. This Danish municipality devised a method for dynamically updating their 3D models so they can be used in future workflows. The process retrieves existing GIS data and generates objects on the fly. These objects automatically update when changes are made in the data register or base map.

Using the GenerativeComponents element sensor, any object with a geographical representation can be generated, such as buildings, roads and street furniture like benches and lamp posts. The 3D objects inherit the attribute links or semantic data, so they can be used for GIS enquiries and analysis. This produces a simplified 3D city model which can be generated quickly for large areas.

### GIS4Mobile

Of the finalists, the GIS4Mobile project was deceptively simple, and thereby the one with the broadest appeal. The solution, presented by GeoSite, connected an online mobile GPS-enabled device to MicroStation allowing users to send and receive data wirelessly. This can be any smartphone, tablet PC or handheld (like the Trimble Juno they showed in their example).

The system can be dissected in three parts: Mobile (cellphone, handheld GPS), webserver (Geobox using GML) and GIS, synchronizing the service and application.

Using a spatial Web service developed for this project, municipal work crews can use mobile phones to capture and submit photos and attributes from the field. The background default when working online is Google aerial photo material. However, the live demo fell flat because only Danish data had been uploaded, which was invisible during the conference.

A nice feature was the manual map adjustment tool. When registering dangerous regions where surveyors typically don't want to go, registration is still possible by shuffling the map around. Managers can transmit design file data from MicroStation to mobile phones to indicate locations for inspection.

The MicroStation application GeoSync, imports and exports data from the GIS4Mobile spatial server, such as position, attributes and images. It synchronizes deleted items and adds time stamps, while maintaining a local link (shad-



*Bentley's Bhupinder Singh during his overview of current Bentley products like Asset Wise and Project Wise.*

ow file). Modified elements are detected automatically using checksum.

### Tvilum

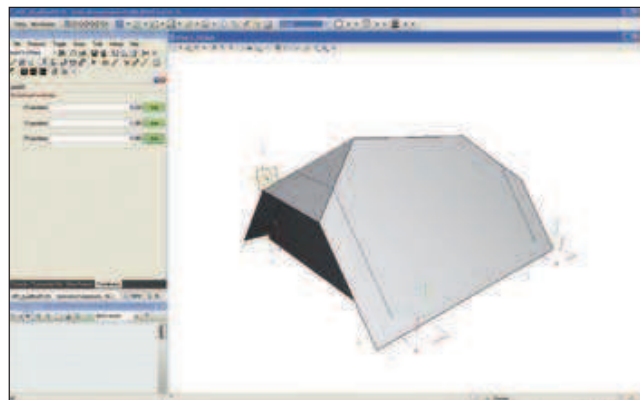
The third Danish nominee, geodetic company Tvilum Landinspektørfirma, showed its solution for mapping using Web Feature Services (WFS). This Danish surveyor routinely checks cadastral and construction drawings to ensure they conform to restrictions. The challenge is to retrieve these restrictions from multiple servers, which requires manual retrieval and tracking when the data is updated.

Tvilum uses national vector base maps with attributes from different map providers: cadastral, topographic, nature and environmental, municipality and local area plans, and administrative boundaries.

The goal of this \$100,000 project was to develop a workflow that saves time and ensures that official and up-to-date data is used. Typical problems that arose in the existing workflow were based around outdated maps. End users typically worked from locally stored copies, and no one knew whether the map was up to date or not. Now all map providers in Denmark are able to deliver maps through WFS and a map area can be requested by bounding box. The preferred Microstation application of use here is WFS Booster. Multiple maps from different providers can now be downloaded simultaneously in just a few seconds, and with a single click.

### XFM Moves Maps to Integrated GIS

Telefónica O2, a major operator of voice and data services in the Czech Republic, talked about its implementation of Oracle Spatial and MicroStation V8i plus XFM. The operator consistently maintains accurate and complex documentation for its network. The goal of the project was to provide more efficient documentation. Therefore, the geodetic style of data capture was abandoned in favour of a data model based on the description of real objects. Also, there was a very strong wish to be able to handle mass data updates and to allow offline data updates done by external suppliers.



*On-the-Fly 3D City and Urban Modeling of Odense Kommune, Denmark, BE INSPIRED winner in the category Innovation In Government. Bentley's GenerativeComponents product offers a parametric modeling capability that leverages GIS data to swiftly create 3D City models. Image courtesy of Bentley.*

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Cable tracks, schematics and information from other OSS systems were to be integrated. As for the storage of the data, duplication was to be avoided, so an open standard had to be applied for all users to access the data. The open data model was built around Bentley's own XFM schema, itself based on XML. The new data model was dramatically simplified from 3000 to 189 features. The data is now stored in SDO DB instead of DGN files, complete with XFM feature (SDO\_Geometry plus XML Fragment) and history tracking. Data migration was pulled off automatically from DGN V7 to SDO\_XFM. In this way, more than 140,000 DGN files were scattered into 250,000,000 features.

### Whole Event

The grand total of more than 50 finalists, representing 21 countries, is one of the more overwhelming facts surrounding the Be INSPIRED Awards 2010 event. Over the course of 2011, many best practices, case studies and examples from those finalists will appear in the media.

Because not all participants seemed to welcome huge press coverage, and because none of the presentations is available online, the Award event itself will maintain its position as a unique gathering of exceptional minds, all Bentley users. In the near future, Bentley will publish its 2010 edition of the book 'The Year in Infrastructure'. This will no doubt be a valuable handbook for those who were unfortunate enough not to be there. With so many presentations going on in two days, one easily misses a vast amount of them. That is exactly what happens if you choose to showcase only four examples for an article like this. So stay tuned for more detailed, in-depth reports on some of the other exceptional finalists of Be INSPIRED 2010.

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