Bentley Systems recently released a new version of Bentley Map V8i (SELECTseries 3), the software product for the creation of reliable and realistic 3D GIS models in support of infrastructure engineering workflows. Richard Zambuni, global marketing director at Bentley, explained some of the new capabilities of this release and related recent Bentley software product releases, Bentley Descartes V8i (SELECTseries 3) and Bentley Geo Web Publisher V8i (SELECTSeries 4).

Bentley Map is both a standalone product and one that’s also embedded in a lot of Bentley’s industry applications e.g. for communications, civil engineering, water, and so on. Says Zambuni: “basically, it works as a standalone product or as the foundation for geospatial workflows within a project concerned with a specific class of infrastructure such as roads, water networks, electricity networks, or communications networks – in the utility applications for example, you can design and execute your engineering routines with all the power of Bentley Map working in the background.”

Spatial Databases and OGC support
Overall, Bentley Map focuses strongly on 3D model creation, editing, and spatial analysis, says Zambuni. “This is because the technology is there now to create and manage 3D geospatial models both on the desktop and at the server level.” The latest version of Bentley Map also offers support for advanced point cloud processing and the manipulation of large scalable terrain models (STMs). But additional 3D firepower is not all, there’s new support for Microsoft SQL Server Spatial and the OGC’s Web Feature Service (WFS) and indeed CityGML through a CityGML application template.

In this release, Bentley will support Microsoft SQL Server Spatial as well as Oracle Spatial. For Microsoft SQL Server users, this means more interoperability and enterprise integration. Zambuni: “we have been very good supporters of Oracle Spatial in the past and won an award last year for our groundbreaking technical support of Oracle Spatial over a long period of time. We’ve had a lot of requests to support Microsoft SQL Server Spatial from smaller organizations and from people who don’t have access to Oracle Spatial in their organization.”

Direct data access to large databases is also a new capability. Zambuni: “here the issue is being able to query the richly attributed spatial information in a very time-effective way. You can imagine that, particularly in our environment with infrastructure, managing and querying those attributes is critical. Now we have vastly improved the performance aspects of these large-scale data queries.”

Bentley has been very strongly and deeply engaged with the OGC, says Zambuni: “we’ve implemented a lot of OGC standards in both our desktop and server geospatial products. With Bentley Map’s WFS client support, users can access spatial data that is published in the WFS standard and the obvious advantage there is that it increases the interoperability capabilities of Bentley Map. It’s something for which we’ve had quite a lot of demand.”

CityGML
Another OGC-linked topic and about 3D is a new CityGML application template which is a pre-configured Bentley Map XFM model based on the OGC’s CityGML data model. This new application template supports all the CityGML features and includes placement and promote tools. With Bentley Map, users can now import, export and produce data that conform to the CityGML standard.

Zambuni: “we have a number of application templates that we have developed using the XFM feature modeling technology, to give people a start point for dealing with airport models and now city models. We expect to deliver
an application template for roads in due course too."

Although the technology is there now, Zambuni is surprised that the adoption of 3D city models is gradual rather than aggressive: “3D city models are real and CityGML is important in that. I think people have concerns about the potential cost of 3D city models, but Bentley products are already used in local government geospatial workflows to support these 3D projects, whether on the desktop or on the server. I think the greater issue is modifying workflows to not only create the 3D model but to ensure that it stays current.”

**Advanced point-cloud processing**

For an infrastructure company, point clouds are utterly critical, in both engineering design and geospatial workflows. “We believe point clouds have become a fundamental engineering data type much like surfaces and solids. We really want to have a strong and progressive strategy for delivering new functionality to make them more usable” states Zambuni: “we acquired the Pointools products, for standalone workflows for viewing, editing, and animation. For advanced point-cloud processing in MicroStation workflows we have Bentley Descartes and Bentley Map —, and now we also have ProjectWise Point-cloud Services for managing point clouds on the server.”

The latest version of Bentley Map takes greater advantage of point-cloud data engineering workflows with a number of advanced point cloud tools, such as classification editing, line draping, geometry extraction, smart snapping and more. These tools are brought into the product from Bentley Descartes. Bentley Descartes is an extension for MicroStation that now allows the combination point clouds, raster image processing, and geometry for 3D modeling. “We have now included all the new Bentley Descartes capabilities into Bentley Map Enterprise” says Zambuni.

In order to support the consumption of 3D spatial information over the web, Bentley Geo Web Publisher is now capable of handling 3D publishing, says Zambuni: “we’ve had lots of requests from all sorts of infrastructure owner-operators to make sure that we can publish 3D models that can be navigated and queried as easily as 2D models. Crossrail is a very good example of this requirement, where all their engineering data is modeled in 3D and they want to make sure they can publish that 3D information to more casual users.”

**Scalable Terrain models (STM)**

For those who want to go ‘big data all the way’, manipulation of very large terrain models is now possible with Bentley’s scalable terrain model (STM) technology: users can maintain a single terrain model for an entire region or even a country, keep the model up-to-date and navigate it intuitively. These scalable terrain models will be used by national mapping agencies, municipalities, and government agencies at the state/provincial and national level.

Zambuni: “Canada currently serves as a test case, so it’s billions of points we’re dealing with. The model is extremely accurate and we have the ability to drape the model with high-resolution orthoimagery at impressive speed.”

STMs can be built from the terrain models provided by Bentley’s civil packages, LiDAR, and a number of other sources. The STM keeps track of which files were used as input to the model. If any of those files change, then the user is advised and can they can rebuild the STM as required. Users can merge design data from a very large area or from many projects into one model for visualization. In addition to high resolution orthoimagery display, users can also show contours at selected intervals, hill shading and aspect, as well as elevation displays. The scalable terrain model always displays at interactive speeds. Zambuni: “Our customers work with some of the largest projects in the world. Our software needs to work with the types of data required to support those projects.”

For more information, have a look at: [www.bentley.com/en-US/Products/Bentley+Map](http://www.bentley.com/en-US/Products/Bentley+Map)