City of Montreal Uses Bentley Products to Create and Maintain 3D City Model

Bentley 3D City GIS Provides Secure, Centralized Database for Rapid Access to Intelligent 3D Data

**Intelligent Modeling to Support Internal Needs**
With a population of approximately 1.6 million, the City of Montreal, in the province of Quebec, is Canada’s second-largest city. The city’s geomatic engineering department is responsible for providing geospatial data for all stakeholders in this extensive municipality as well as for external users. Surveyors and technicians working for the city deliver data with engineering-grade accuracy in both 2D and 3D.

The City of Montreal has taken a leadership role in the development of processes and in the use of software for managing an accurate and intelligent 3D city model. This enables the city to maintain consistency of its entire infrastructure. For years, it has accomplished this using Bentley’s MicroStation®, and the geomatic department has used DGN-based modeling to support most internal needs.

Today, the city wants to model features as intelligent objects and make this information available to a wider audience. It elected to store this information in Oracle Spatial 11g. Oracle was already recognized as a database environment supporting 3D object-oriented data structures and it can be deployed city-wide as a centralized database.

**Fast Facts**
- Over 1.6 million people reside in Montreal
- City of Montreal has been using Bentley technology for several years
- The geomatic department stores 3D object-oriented data in Oracle Spatial 11g
- Centralized data management provides fast and secure access to intelligent 3D city model

**Optimized Tools for Accurate 3D Data**
An accurate and precise 3D model is the key to supporting complex urban modeling applications. Bentley’s survey-accurate 3D GIS applications (which include MicroStation, Bentley Map®, Bentley® Descartes, Bentley® Geospatial Server, and Bentley® Geo Web Publisher”) are at the forefront of 3D city modeling initiatives.

Bentley Map is an extension to MicroStation that provides the tools necessary to accurately model intelligent 3D GIS features while working directly within the Oracle Spatial 11g database. Bentley Map also includes productivity tools for documenting attributes, editing smart objects in 3D, and performing analysis.

**Bentley Descartes** is an extension to MicroStation that supports the accurate creation and application of advanced textures for 3D buildings – which enables local government and contractors to create realistic 3D scenes.

“The City of Montreal technical staff likes working with MicroStation for editing the 3D model,” said Richard Mongeau, geomatic department, City of Montreal. “We now look forward to using Bentley Descartes and Bentley Map in the very near future to make our work even more efficient.”

As the City of Montreal’s 3D City GIS expert, Mongeau is one of the authors of the 3D Ethics Charter (www.3dok.org/en/the-charter), which Bentley recently signed. The charter promotes several principles for the responsible creation and maintenance of 3D land information data and imagery. It focuses on accurate 3D infrastructure representation.
that includes well-documented metadata and encourages collaborative networking among its members. Mongeau is a strong believer in ethical 3D and believes 3D modeling goes far beyond pretty pictures and animations.

To support the production of more accurate and realistic 3D scenes, the City of Montreal recently initiated a plan to use Bentley Descartes V8i for the creation of advanced raster textures in the city model. These scenes will be used by various city departments and applications to present projects in context for improved communication and expedited approvals. The City of Montreal chose Bentley Descartes over other software because it was well integrated into its existing 3D city creation processes. Additionally, the software works well with all digital photography formats, which enables the city to process scenes and cityscapes more quickly than when it used a stand-alone photo editing program.

When creating models, the City of Montreal utilizes wide spectrum data capture techniques including terrestrial point cloud data.

**Sharing the 3D Model Across the Organization**

Open and interoperable data and applications are critical to all those who work with geospatial technology. In particular, 3D models must be available and accessible to people and professionals who may be in different departments or organizations.

By using Bentley Descartes V8i for texturing the 3D city model, the city will realize a tremendous boost in efficiency, enabling faster scene creation. It will also achieve greater usage of the 3D city model as it transitions into a Bentley Map V8i and Oracle Spatial 11g environment. The centralized data management and storage enables the entire organization to access 3D intelligent objects faster and more securely.

In some areas of the city, photogrammetric stereo photography tools are used to build the 3D city model.