Bentley Map V8i (SELECTseries 3)

A quick overview
Why Bentley Map…

- Viewing and editing of geospatial data from file based GIS formats, spatial databases and raster
- Assembling geospatial/non-geospatial data to produce thematic maps and reports
- Advanced Point Cloud Processing
- Large Terrain Model Visualization
- Decision making using spatial analysis (2D/3D)
- Advanced Map Finishing
- Cadastral Fabric Editing and Maintenance
- Producing data models and editing tools for different geospatial applications
- Creating industry specific GIS applications through customization
Bentley Map V8i (SELECTseries 3) At-a-Glance

• Spatial Database and Web Services Enhancements
  – SQL Server Support
  – Direct Database Access
  – Spatial Data Streaming
  – WFS support

• Engineering
  – Scalable Terrain Model (Map Enterprise)
  – Advanced Point Cloud tools (Map Enterprise)
  – MicroStation Terrain Model support

• Coordinate systems
  – Custom Datum/Ellipsoid Definition
  – Coordinate read-out in any alternate coordinate system

• Mapping
  – Redesign of Grid Generation tool, better integration with Print Preparation
  – Export Bentley Map Manager thematic to DGN

• 3D GIS Enhancements
  – 3D Geometry clean-up (MicroStation)
  – Solar Analysis (MicroStation)
  – CityGML Application Template

• Feature Engine Performance Enhancements
  – New more efficient polygon type
  – Better memory management
  – Streamlined relationships support

• More API (including Direct Database Access)
Bentley Map V8i

Visualization and editing of 2D/3D geospatial information

Editing, analysis and management of 2D/3D geospatial information

Enterprise editing, analysis and processing of 2D/3D geospatial information

*Standalone or with MicroStation
## Bentley Map

### Bentley Map Enterprise- Standalone

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentley Map PowerView and Bentley Map Functionality</td>
<td></td>
</tr>
<tr>
<td>Edit Oracle Spatial - Long Transaction/Time</td>
<td></td>
</tr>
<tr>
<td>View Oracle GeoRaster</td>
<td></td>
</tr>
<tr>
<td>Transform/Edit Rasters</td>
<td></td>
</tr>
<tr>
<td>View Raster DEM</td>
<td></td>
</tr>
<tr>
<td>3D Modeling</td>
<td></td>
</tr>
<tr>
<td>3D Analysis/Make Decisions</td>
<td></td>
</tr>
<tr>
<td>3D Texturing</td>
<td></td>
</tr>
<tr>
<td>Advanced CAD tools</td>
<td></td>
</tr>
<tr>
<td>Advanced Point Cloud Processing</td>
<td></td>
</tr>
<tr>
<td>3D Geometry Clean-Up</td>
<td></td>
</tr>
<tr>
<td>Scalable Terrain Model</td>
<td></td>
</tr>
<tr>
<td>Solar/Shadows Analysis</td>
<td></td>
</tr>
</tbody>
</table>

### Bentley Map- Standalone or For MicroStation

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentley Map PowerView Functionality</td>
<td></td>
</tr>
<tr>
<td>Edit Oracle Spatial - Short transaction</td>
<td></td>
</tr>
<tr>
<td>2D Analysis/Make Decisions</td>
<td></td>
</tr>
<tr>
<td>Advanced Interoperability</td>
<td></td>
</tr>
<tr>
<td>Export Thematic Map Symbology</td>
<td></td>
</tr>
<tr>
<td>Advanced Map Finishing</td>
<td></td>
</tr>
<tr>
<td>Cadastral Mapping</td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td></td>
</tr>
<tr>
<td>CAD tools</td>
<td></td>
</tr>
<tr>
<td>Edit SQL Server Spatial - Short transaction</td>
<td></td>
</tr>
</tbody>
</table>

### Bentley Map PowerView- Running Standalone

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark-up/View/Edit DGN/XFM</td>
<td></td>
</tr>
<tr>
<td>Create Maps/Reports</td>
<td></td>
</tr>
<tr>
<td>View Oracle Spatial</td>
<td></td>
</tr>
<tr>
<td>Feature Modeling</td>
<td></td>
</tr>
<tr>
<td>View SQL Server Spatial</td>
<td></td>
</tr>
<tr>
<td>Assemble/Integrate</td>
<td></td>
</tr>
<tr>
<td>View Rasters</td>
<td></td>
</tr>
<tr>
<td>Basic CAD tools</td>
<td></td>
</tr>
<tr>
<td>GPS</td>
<td></td>
</tr>
<tr>
<td>View WMS/WFS</td>
<td></td>
</tr>
<tr>
<td>Point Cloud Viewing</td>
<td></td>
</tr>
</tbody>
</table>
Architecture
Spatial Data Streaming – SQL Server Spatial

- Connect directly to SQL Server Spatial
- Query, modify and post features
- Standard SQL Server spatial data. No required tables or columns
- Seamless access to spatial data at display time
Benefits – Spatial Data Streaming SQL Server Spatial

- Supports standard SQL Server Spatial features
- Spatial support for Microsoft standard environments
- Simpler and more intuitive end user experience
Demo – SQL Server Spatial Spatial Data Streaming

- Query SQL Server Spatial
- Locate features from Data Browser
- Attach features seamlessly
- Pan and zoom seamlessly

Data provided by Quebec City
Spatial Data Streaming – Oracle Spatial

• Connect directly to Oracle Spatial

• Query, modify and post features

• Standard Oracle Spatial data. No required tables or columns

• Seamless access to spatial data at display time
Spatial Data Streaming – Oracle Spatial

- Supports standard Oracle Spatial features
- Spatial support for Oracle standard environments
- Simpler and more intuitive end user experience
Demo – Oracle Spatial Spatial Data Streaming

• Query Oracle Spatial
• Locate features from Data Browser
• Attach features seamlessly
• Pan and zoom seamlessly

Data provided by Quebec City
Direct Large Database Access

• Query millions of rows quickly to Data Browser

• Sort and filter records at database speeds

• Minimal memory required for very large databases
Benefits – Direct Database Access

- Fast operation with very large databases
- Save time by not creating smaller project databases
- Reduce local machine memory requirements
- Reduce network traffic by sending only the data being viewed to the workstation
Demo – Direct Database Access

• Query Canadian road network database; almost 1.9 million rows

• Sort records

• Locate single and then multiple rows and locate in Bentley Map
### Web Feature Service

- Access WFS sources through Internet
- All Bentley Map query and symbology options supported
- WFS features behave as any Bentley Map feature
  - Annotate
  - Thematic
  - Analyze
  - Query
  - Report
Benefits – Web Feature Services

- Take advantage of public WFS data
- Industry standard tool for spatial data access
- Enhances interoperability in multi-vendor installations
Demo – Web Feature Service

- Query WFS server from NASA World Wind
- Create thematic map on features
- Review feature properties
- Query features with attribute constraint

Data provided by NASA World Wind
Export Bentley Map Data to DGN

- Allows to export data from inside the Map Manager using the currently defined symbology
- Creates standard DGN elements (no attributes)
- Elements can be used in any CAD based workflows as the Bentley Map features are decomposed into their constituent base elements
Improved Grid Generation Tool

- Automatically create grids and graticules using Wizard
- Combine multiple grids and graticules in the same instance
- Alternate coordinate system supported
- Grid automatically updated based on changes to grid definition
- Drop grid to simple elements
API

- New APIs to support new functionality
- Provide better integration between MicroStation and Bentley Map models
3D Geometry Clean-up

- New tools to create valid solid models from existing geometry
- Correct and stitch surfaces
- Automatically fix some data errors
- Identify other data errors
- Extrude down to terrain
Benefits – 3D Geometry Clean-up

- Produce complete solid models from existing 3D surfaces
- Reduce time remodeling existing data
- Produced models will be suitable for storing in Oracle Spatial, texturing, etc.
- Move from visualization to GIS data
Demo – 3D Geometry Clean-Up

- Automatically fix some data errors
- Identify other data errors
- Extrude down to terrain

Data provided by Quebec City
Solar Analysis

- Calculates total solar exposure over a user defined time period
- Takes weather patterns into account
- Specify different solar intensity to take atmospheric conditions into account
- Produces shadow elements that can be used for further analysis or intersection with proposed building models
Benefits – Solar Analysis

• Calculate total solar exposure to help locate solar panels

• Solar exposure provides a better indicator of sun on public lands than simple time-of-day shadow studies

• Shadow objects show precise shadow areas and, optionally, the color of the shading object to easily assess the effect of new development on the surrounding area
Demo – Solar Analysis

- Calculate total solar exposure
- Visualize exposure on 3D model
- Calculate shadows as volume elements

Data provided by Quebec City
CityGML Application Template

- Bentley Map XFM model based on CityGML data model
- Supports all CityGML features
- Includes placement and promote tools
Benefits – CityGML Application Template

- Create CityGML models from existing 3D models using Promote tools
- Placement methods to create certain components directly
- Standard Bentley Map format means interoperability with supported GIS data types
- Support from FME for many other formats
Demo – CityGML Application Template

- Modeling tools to build LOD 1 model
- Use custom VBA to assign hierarchy to model
- Export using FME
- View CityGML model in FME viewer
Scalable Terrain Model (STM)

- High-performance display of digital terrain models (DTMs)
  - very large areas
  - billions of points

- View huge DTMs at geospatial scale
  - City, Region, State, Country

- Potential users
  - Municipal, States, Federal agency and government
  - EPC working in GIS
  - Large infrastructure project
Benefits – Scalable Terrain Model

- Use city and region scale DTM, no requirement to extract project size DTM
- Full access to every point
- New workflows possible with large scale DTMs
- High resolution image draping for high quality visualization
- Easy synchronization with original terrain sources
Demo – Scalable Terrain Model and High-Resolution draping

- Scalable Terrain Model display
- Triangle and contour display
- High-resolution draping

Data provided by Quebec City and Images provided by Aero-Photo (1961) Inc, Quebec, Canada
Summary: Bentley Map V8i (SELECTseries 3)

- Improved spatial data base support
  - SQL Server Spatial
  - WFS
  - Direct Data Access
  - Spatial Data Streaming

- Improved performance

- More tools
  - Improved grid tool
  - Export to DGN
  - More MicroStation tools
  - Datum/Ellipsoid definition
  - Alternate GCS read-out