What is Subsurface Utility Design and Analysis?
What is Subsurface Utility Design and Analysis?

- Storm Drainage Design and Analysis Tools
- Some of the SUE Tools
- OpenRoads

Subsurface Utility Design and Analysis
Part of OpenRoads
3D modeling of all underground utilities
Hydraulic Analysis and Design for Storm gravity networks
What is Subsurface Utility Design and Analysis?

- Storm Drainage Design and Analysis Tools
- Some of the SUE Tools
- OpenRoads

Subsurface Utility Design and Analysis
Part of OpenRoads
3D modeling of all underground utilities
Hydraulic Analysis and Design for Storm gravity networks
Bentley’s Pedigree in H&H

We’ve been doing this for years…

SewerGEMS

CivilStorm

StormCAD

SewerCAD

SUDA hydraulic analysis engine will contain all this functionality.

StormCAD is included in OpenRoads license.

CivilStorm or SewerGEMS license required for advanced functionality.
Storm/Sanitary Product Functions

• StormCAD – Rational Method storm water design and analysis

• SewerCAD – Gradually varied flow sanitary sewer design and analysis package

• CivilStorm – Storm water management and dynamic modeling

• SewerGEMS – Complete storm and sanitary sewer modeling analysis and design package with geospatial integration. Superset of SewerCAD, CivilStorm, and StormCAD.
# SUDA Licensing

<table>
<thead>
<tr>
<th>If you own this license</th>
<th>It will include these SUDA functions:</th>
<th>SUE functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOPAK Suite</td>
<td>Storm water peak flow design and analysis (“StormCAD”)</td>
<td></td>
</tr>
<tr>
<td>InRoads Suite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MX Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PowerCivil for Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power GEOPAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power InRoads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>InRoads S&amp;S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One of the above plus either:</td>
<td>Unlocks additional functionality in the same SUDA Installation</td>
<td></td>
</tr>
<tr>
<td>CivilStorm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SewerGems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUE</td>
<td>Unlocks Conflict Management tools and SUE attribution</td>
<td></td>
</tr>
</tbody>
</table>
What about the current Drainage tools?

- GEOPAK Drainage, GEOPAK Water-Sewer, MX Drainage and InRoads S&S will:
  - Coexist with SUDA for a time.
  - Will eventually be deprecated.

- StormCAD, SewerCAD, CivilStorm, SewerGEMS:
  - Will continue as separate products
  - Will be able to access SUDA data directly from the DGN
Current Drainage Workflow for SUE users

Hydraulic Calcs in GEOPAK, InRoads or MX Drainage Tools

Hydraulic Sheeting and Annotation in GEOPAK, InRoads or MX

OR
Hydraulic Calcs in StormCAD, CivilStorm, SewerCAD, SewerGEMS

Drainage, Sanitary Import

Geospatial Import to build out model

Design of Utility Relocations

Modeling of other pipes, cables, ducts, etc. from Survey data

Conflict Detection and Utility Coordination

Synch model to geospatial

Future Project

Geospatial Data Sources
New Drainage Workflow in SUDA

You may need to use Hydraulic Sheeting and Annotation tools in GEOPAK, InRoads or MX.

Hydraulic Calcs in SUDA

Future Project

Bentley Subsurface Utility Design and Analysis

Drainage, Sanitary Import

Geospatial Import to build out model

Design of Utility Relocations

Modeling of other pipes, cables, ducts, etc. from Survey data

Conflict Detection and Utility Coordination

Synch model to geospatial

Geospatial Data Sources
Advantages of SUDA

- Layout, design, and simulation all in the same product
- Includes laterals
- Creates realistic, attributed, 3D models
- Don’t lose data by changing file formats
- Makes collaboration easier
- Can use the SWMM analysis engine
- Integration with OpenRoads
Integration with OpenRoads

• Get gutter sections for inlet capacity calculations
• Get cover levels from terrain models or meshes
• Ensure minimum depth of cover along pipes
• Use OpenRoads ditches and ponds (it isn’t just for roads…)
Demonstration
Questions?

Jonathan Smith, Senior Product Engineer
Jonathan.Smith@bentley.com