Welcome to
Bentleyuser.dk Annual Meeting
&
Nordic Civil User Conference



Iben Rue
COWI

Civil SIG Chairman

ibru@cowi.dk

Hotel Munkebjerg, Vejle, Denmark, 10. - 12. November 2014

bentleyuser.dk

Nordic Civil User Conference 2014

1. Welcome

Civil SIG Chairman

The Bentley Team

Hotel Munkebjerg, Vejle, Denmark, 10. - 12. November 2014

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The hotel

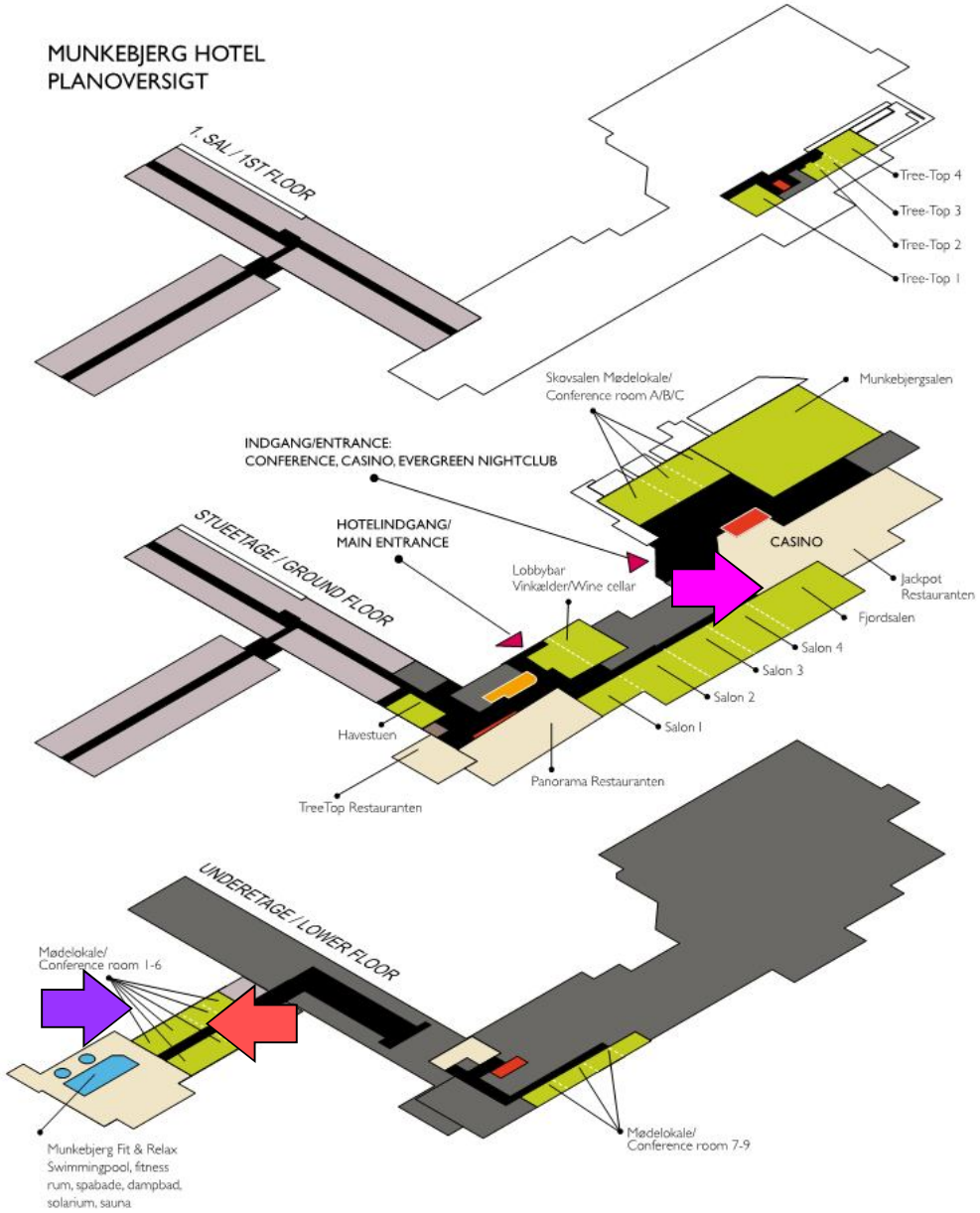
Presentations:

Fjordsalen

Mødelokale 4+6

Workshops:

Mødelokale 3+5



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Mandag

E1 - Bentley Civil Keynote

An overview of new features in Bentley Civil V8i (SELECTseries 3) products and their benefits. This session discusses key forthcoming releases and new features in Bentley's road, rail, site, water, transportation operations, bridge, and geotechnical applications.

Ian Rosam, Bentley

E2 - Ringsted-Femern 3D bane grænseflader

I denne præsentation gennemgås håndteringen af tværfaglige grænseflader i forbindelse med Ringsted-Femern Banen projektet. Herliblandt håndtering af filer gennem ProjectWise, udnyttelsen af dets muligheder i forbindelse med projekteringen og en kort gennemgang af to muligheder for templatedrops ved sporprojektering.

Troels Kaare Hallgren og Lene Møller Westh, Rambøll

F2 - Introduction to Subsurface Utilities Engineering

Urban road and highway projects have a high potential of utility conflicts that must be addressed. This session introduces Bentley's new Subsurface Utility Engineering software for consolidating and managing buried utilities in a single model, ultimately decreasing design projects uncertainty.

Jonathan Smith, Bentley

X1 - WORKSHOP OpenRoads Technology: Corridor Modeling (Beginner)

This hands-on training provides Bentley civil users with initial training on the Corridor Modeling capabilities. If you have mastered Roadway Designer, nothing is lost; it just got a lot easier and more interactive. If you have struggled with Roadway Designer, struggle no more! Corridor Modeling is here.

Rob Nice, Bentley

E3 - Simpel jernbanedæmning i InRoads SELECTseries 3

I denne præsentation gennemgås opbygningen af en simpel banemodel ved hjælp af InRoads SELECTseries 3. Præsentationen viser, hvordan man anvender funktioner som point controls, parametric constraints, end condition exeptions og clipping references i SELECTseries 3.

Mie Haugsted Flindt, Orbicon

F3 - Why should I Upgrade to the OpenRoads Technology (SELECTseries 3) Software?

Come see how OpenRoads technology advances, what's possible in road design, construction, and operations through the use of immersive modeling, design-time visualization, design intent capture and persistence, information mobility across engineering disciplines and project phases, and construction-driven engineering.

Joe Waxmonsky, Bentley

X3 - WORKSHOP QuickStart for Subsurface Utility Modeling

This hands-on training guides you through the Subsurface Utility Engineering tools used to create 3D models of storm, sanitary and other underground utility networks. Topics covered include modeling of storm water networks and creating models of utilities from survey data.

Jonathan Smith, Bentley

Pause / Break

E4 - Grundlæggende projektering af jernbanelinjeføring

Denne præsentation giver dig en indføring i grundlæggende projektering af jernbane linjeføringer i Bentley Power Rail Track. Præsentationen indeholder en gennemgang af den proces, der skal til, fra man modtager opmålingen, til der foreligger en færdigprojekteret linjeføring. Særligt vil præsentationen indeholde udveksling af to sporskifter i en transversal.

Kenneth Jegstrup Jensen, COWI

F4 - Best Practice: Terrain

This presentation provides instructions for transitioning standards and workflows and developing your implementation plans. Learn how to utilize the exciting new tools in SELECTseries 3 of the civil products.

Ian Rosam, Bentley

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Tirsdag

E5 - Best Practice: How to Move Project Data from SELECTseries 2 to SELECTseries 3

This presentation discusses the best practices for moving existing project data from SELECTseries 2 into SELECTseries 3. While importing the data is easy, there are considerations you need to make depending how the data will be used. We will discuss terrain, geometry and Roadway Designer corridors.

Joe Waxmonsky, Bentley

F5 - Bentley Rail Update

This presentation provides an overview of the recent maintenance release and the included enhancements.

Ian Rosam & Rob Nice, Bentley

X5 - WORKSHOP Advanced Subsurface Utility Modeling

This hands-on training guides you through the more advanced tools in Bentley Subsurface Utility Engineering, including clash detection, use of Model Builder for sharing data to GIS systems, and how to configure feature definitions to drive the 3D models. It is recommend that participants take the Subsurface Utility Engineering Quick Start course first.

Jonathan Smith, Bentley

E6 - Dansk standardopsætning til InRoads/PowerCivil SELECTseries 3

Gennemgang af hvad der skal til for at migrere fra SELECTseries 2 til SELECTseries 3, når de nye DDA-lag og Vejregler skal indarbejdes samtidig.

Marianne Reak, DTU Transport

F6 - Bentley Rail integrating with OpenRoads

This presentation looks at integrating Bentley Rail with Openroads SELECTseries 3 and considers the future development of Bentley Rail.

Ian Rosam & Rob Nice, Bentley

Frokost / Lunch

E7 - Brug af SUE [illegible]svej

Hør hvordan det gik med at bruge SUE til at udføre afvandingssystemet på en ny omfartsvej. Hør også om erfaringerne med at anvende SUE sammen med InRoads SELECTseries 3.

Morten Severinsen, Rambøll

F7 - Best Practice: Corridor Modeling

This presentation will provide the best practices to use Corridor Modeling successfully in the OpenRoads environment. The highlights will range from the fundamentals of this new technology leading into tips and tricks, and other advance topics

Joe Waxmonsky, Bentley

X7 - WORKSHOP Railway Design

This workshop provides hands-on training for Railway Users

E8 - Best Practice: Geometry

This presentation provides best practices for working with OpenRoads geometry. Learn why design intent is important, when and how to use Civil AccuDraw, how to control the rules as well as import / export native geometry.

Ian Rosam, Bentley

F8 - Best Practice: Civil Model to Plan Set

This presentation discusses best practices for documenting the civil model with cross section sheets, earthwork quantities, and reports and how to save the model back to InRoads, GEOPAK, and MXROAD formats for use by traditional tools and workflows.

Joe Waxmonsky, Bentley

Rob Nice, Bentley

Pause / Break

E9 - Havbundsmodellering i InRoads

Se hvordan man modellerer havbundsmodifikationer til en pipeline krydsning ved hjælp af non-corridor modellerings-værktøjer og horisontal geometri i InRoads SELECTseries 3.

Christian Ilum, Rambøl

F9 - Best Practice: Creating Civil Cells

Civil cells are a new and powerful capability of the OpenRoads Technology. This presentation shares best practices to help you create efficient and effective civil cells.

Ian Rosam, Bentley

X9 - WORKSHOP Defining Template Side Slopes

This hands-on training teaches how to create and make major modifications to template side slopes (end conditions). This training focuses on the side slopes connecting the template hinge to the tie down point. You will learn how to create end conditions with multiple cut and fill slope solutions, cut slopes with a ditch adjacent to the hinge, walls, and a varying-slope clear zone. You should complete the Using and Editing Templates course before attending this course.

Ernst Vanbaar, Bentley

E10 - Modellering af fritrumsprofiler

Vigtigheden af at modellere fritrums-profiler i 3D samt modellernes mange anvendelsesmuligheder afdækkes i dette indlæg, som tager udgangspunkt i København-Ringsted projektet.

Amir Bigdeli, Banedanmark

F10 - SUDA. Next generation for Storm and Sanitary Drainage

SUDA is Bentley's next generation software for S&S design and analysis to provide 3D layout, with peak flow design and dynamic wave analysis. This session will show the software, which is scheduled for release next spring, for the first time in Europe.

Jonathan Smith, Bentley

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Onsdag

Fjordsalen

F11 - Conceptual Modelling - Keynote revisited

We will revisited the Civil Keynote to explores best practices for Conceptual Modelling to rapidly and realistically view the design. Validate the engineering by finding errors and omissions early in the design process, check for clash detections, or use MicroStation to create animated drive through of the model.

Ian Rosam, Bentley (Fjordsalen)

Mødelokale 3+5 & 4+6

F12 - WORKSHOP
QuickStart: OpenRoads Technology Geometry

This hands-on training teaches how to create roadway geometry and work with the heads-up display and element manipulators that are part of the OpenRoads Technology.

Centerline geometry is created using both PI and element methods. Edge of pavement geometry is created as offset geometry from the centerline.

Design Standards are used to validate compliance of the geometry.

Ernst Vanbaar, Bentley

X12 - WORKSHOP
Connecting corridors

This hands-on training teaches how to model and connecting corridors along a mainline alignment.

Joe Waxmonsky, Bentley

F14 - WORKSHOP
Creating and Editing Alignment Geometry

This hands-on training teaches how to create and modify alignment geometry.

You will learn to work with the OpenRoads Technology heads-up display to create horizontal and vertical geometry and validate the geometry for compliance with appropriate design standards.

You will also learn how to modify alignment geometry by creating an alternative section in the middle of the alignment and extending an alignment.

Throughout the training you will learn to use the geometry rules the OpenRoads Technology uses to capture your design intent.

Ernst Vanbaar, Bentley

X14 - WORKSHOP
Modeling of a 4-lane, controlled access divided highway with Superelevation

This hands-on training teaches how to model a four-lane, controlled access divided highway.

You will learn to control the location of the edges of pavement and apply superelevation to the model.

You should complete the QuickStart for Roadway Designers using OpenRoads Technologies course before attending this course.

Joe Waxmonsky, Bentley

Er du den næste Civil SIG formand?

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Bentley
Sustaining Infrastructure

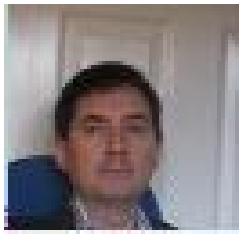
Civil Keynote

November 2014

Introducing the international Civil Team

Ian Rosam – Senior Product Manager

Joe Waxmonsky – Senior Product Engineer



Robert Nice – Senior Application Engineer

Ernst Vanbaar – Application Engineer

Jonathan Smith - Senior Product Engineer

Bentley Sustaining Infrastructure

Agenda

- Advancing BIM for Infrastructure
- Bentley Civil Update

- Question & Answers

About Bentley

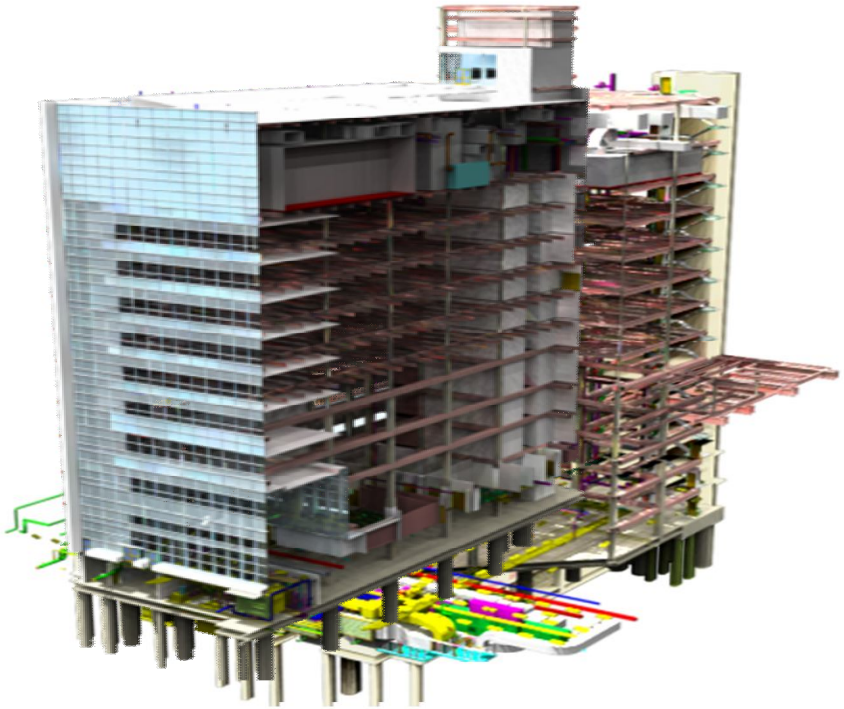
Bentley's mission is to provide innovative software and services for the enterprises and professionals who design, build and operate the world's infrastructure - sustaining the global economy and environment, for improved quality of life.

Bentley Sustaining Infrastructure

BIM

Bentley Sustaining Infrastructure

Building Information Modeling / Management

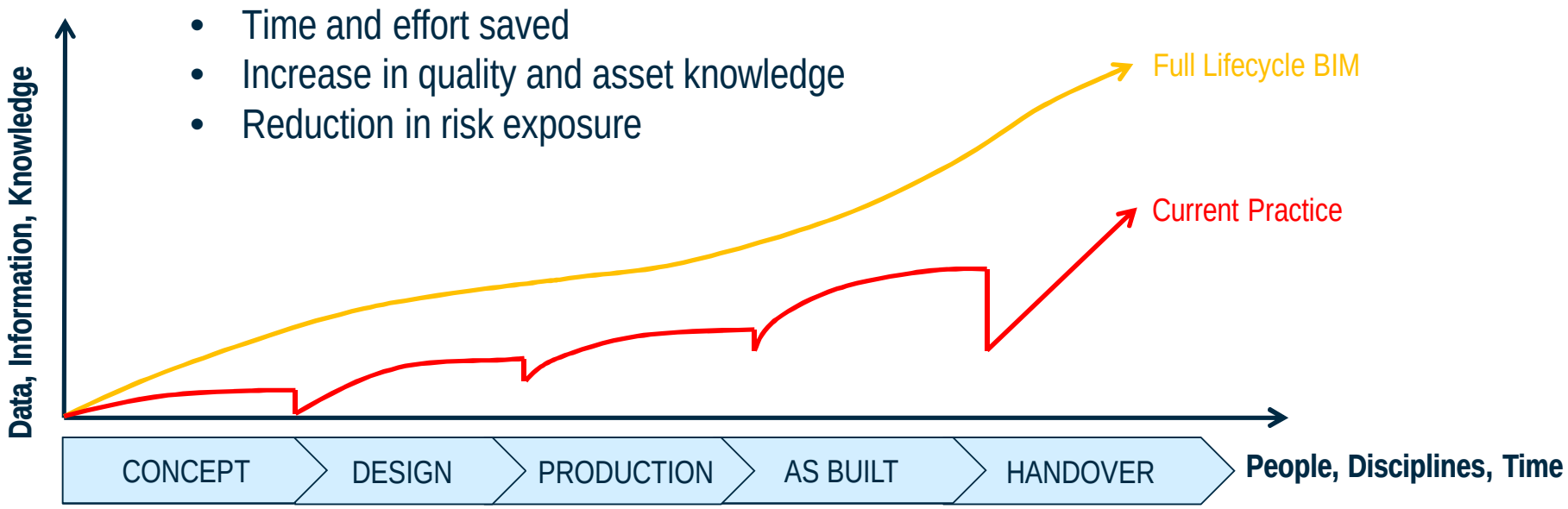


BIM in 60 Seconds

- Iain Miskimmin
  - Bentley Industry Consultant
  - Crossrail Information Academy Manager
  - Director and Technology Chairman for COMIT
  - Government BIM Task Group

BIM in 60 Seconds...

Building Information Modeling / Management



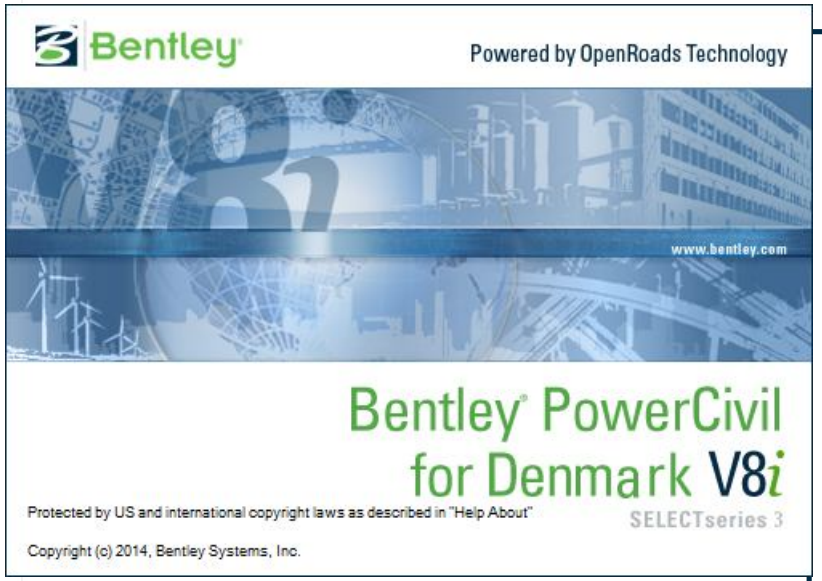
Owners Are Asking for BIM, but..

- BIM is NOT
  - A product, solution, data format or vendor owned initiative
  - A monolithic 3D model or GIS database
  - Just about buildings
- BIM is a process that
  - Must be understood and embraced by people
  - Supported by IT systems

How is Bentley Advancing BIM for Infrastructure ?

- Ability to support and **integrate all design, and engineering disciplines** on a project
- Ability **to collaborate and share information** throughout the project lifecycle **regardless of asset type** for all stakeholders
- Ability to be **scalable** in terms of project team, project size, project complexity and geographic distribution
- Benefit from **proven technology and industry** expertise to help users address their design, engineering and construction challenges

Bentley Civil V8i (SELECTseries 3)



Continuous development

Maintenance Release 1 – March 2014

Maintenance Release 2 – August 2014

02 April 2013

Advancing 'BIM' Objectives Through Information Modeling for Multi-disciplinary Roadway Teams

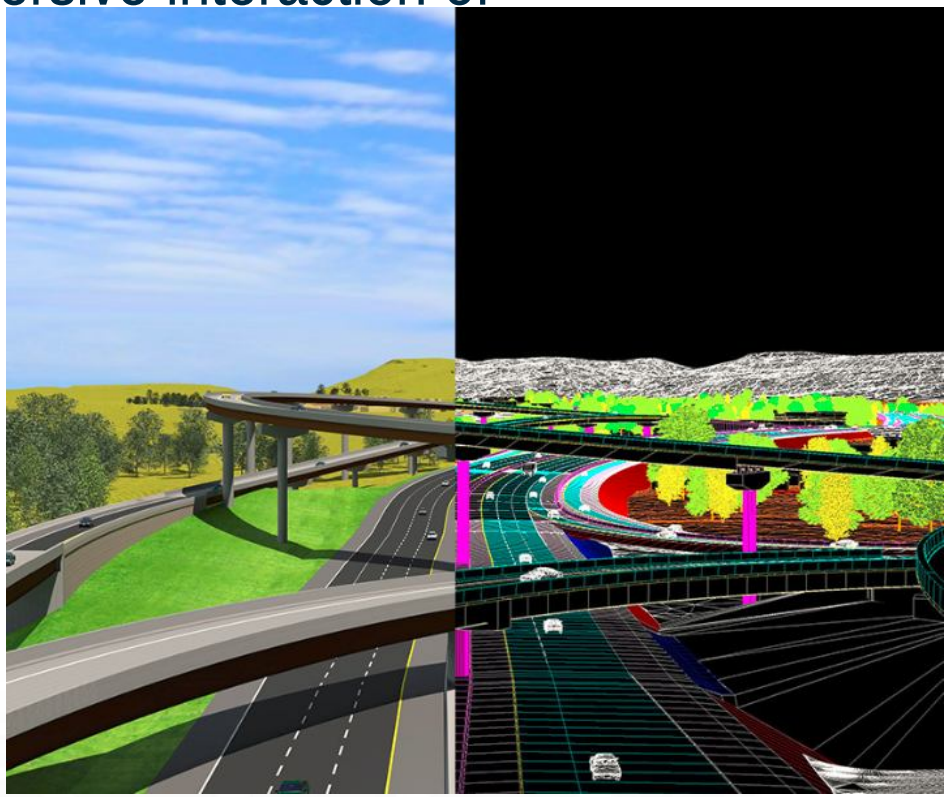
EXTON, Pa., U.S.A. – Bentley Systems, Incorporated, the leading company dedicated to providing comprehensive software solutions for sustaining infrastructure, today announced the immediate availability of the ***V8i (SELECTseries 3) releases of its InRoads, GEOPAK, and MXROAD products***, and the forthcoming SELECTseries 3 releases of its country-specific PowerCivil products throughout 2013. All of the products now share the powerful and unifying capabilities of Bentley's OpenRoads technology, advancing through information modeling for multi-disciplinary roadway teams "BIM" objectives such as better design decisions, increased construction awareness, and interoperability for asset management.

OpenRoads Technology

OpenRoads provides a common **technology** for InRoads, GEOPAK, MXROAD, and PowerCivil for “Country”.

OpenRoads technology offers immersive interaction of

- Survey
- Geometry
- Terrain modeling
- Corridor modeling
- Dynamic cross sections
- Civil cells
- Design intent
- Design-time visualization



Bentley Sustaining Infrastructure

Thoughts on OpenRoads from adopters

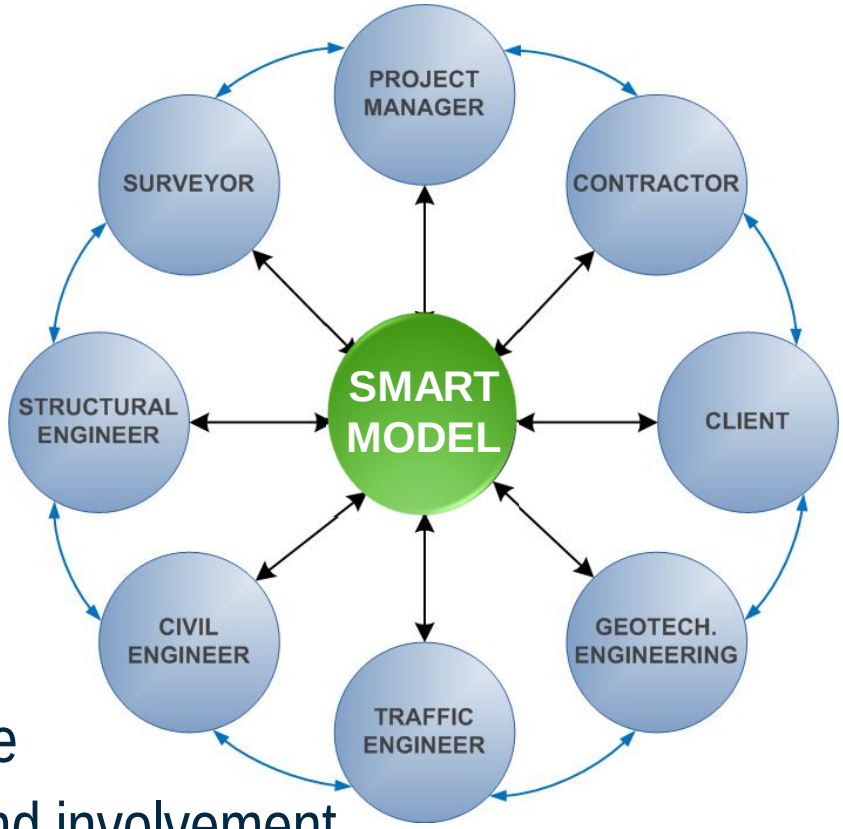
"Smart models help create a more robust and cost effective design, while mitigating risk throughout the entirety of the project.

Ultimately, the increased productivity and utilization of the model can be leveraged over the lifecycle of the project … "

Michael P. Noonan, PE,
Director, Design Technology AECOM Transportation

OpenRoads Helps Create Smart Models

- Advantages
  - Claim reduction
  - Schedule optimization
  - Virtual Design Construct
  - Fosters teamwork
  - Conflict detection
- Keys to success
  - Open communication
  - Collaborative and innovative
  - Stakeholder coordination and involvement

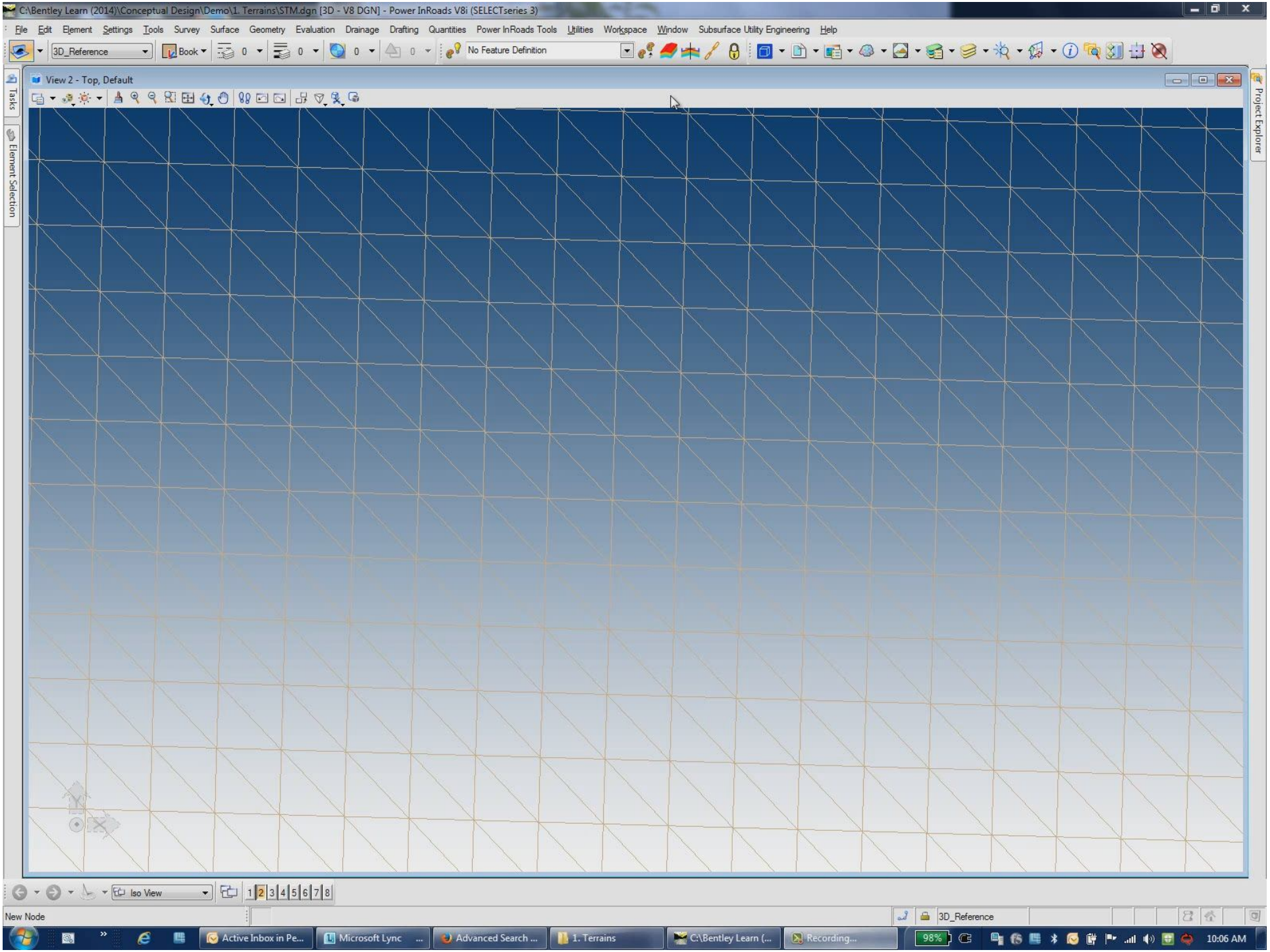


Slide courtesy of AECOM

Bentley Sustaining Infrastructure

OpenRoads and Conceptual Design

Bentley Sustaining Infrastructure

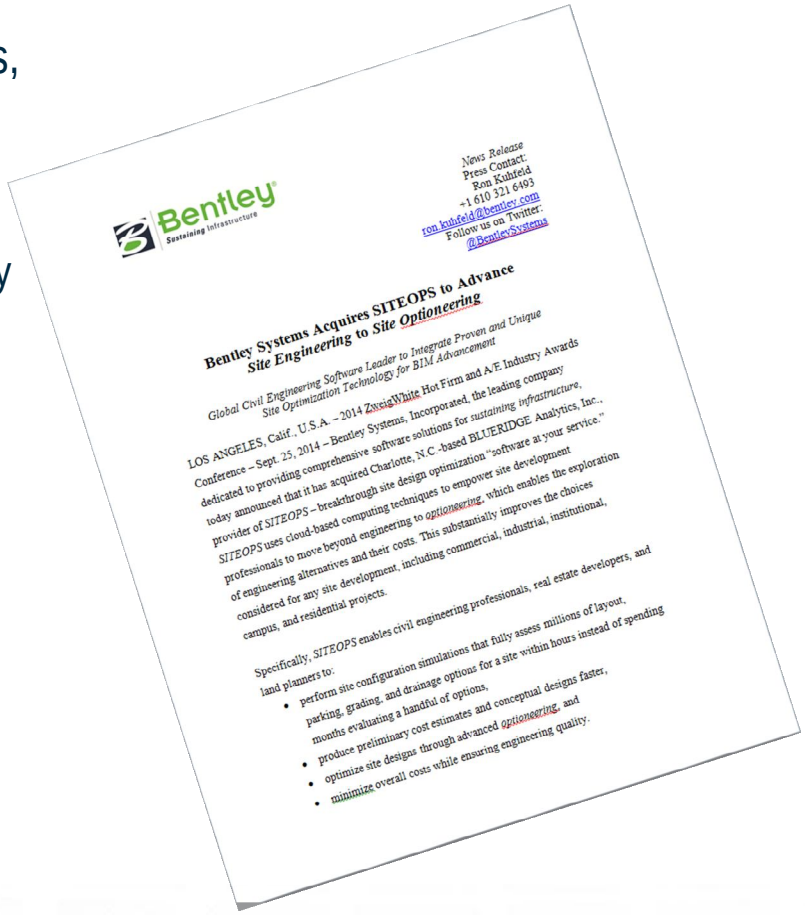


Bentley Acquires SITEOPS

Bentley Sustaining Infrastructure

The Power of SITEOPS

- Enables engineers, architects, developers, and planners to:
  - Create conceptual site designs on the fly
  - Increase project ROI
- Optimizes site design for BIM
- Advances site optioneering



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News Release
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Follow us on Twitter:
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Bentley Systems Acquires SITEOPS to Advance Site Engineering to Site Optioneering

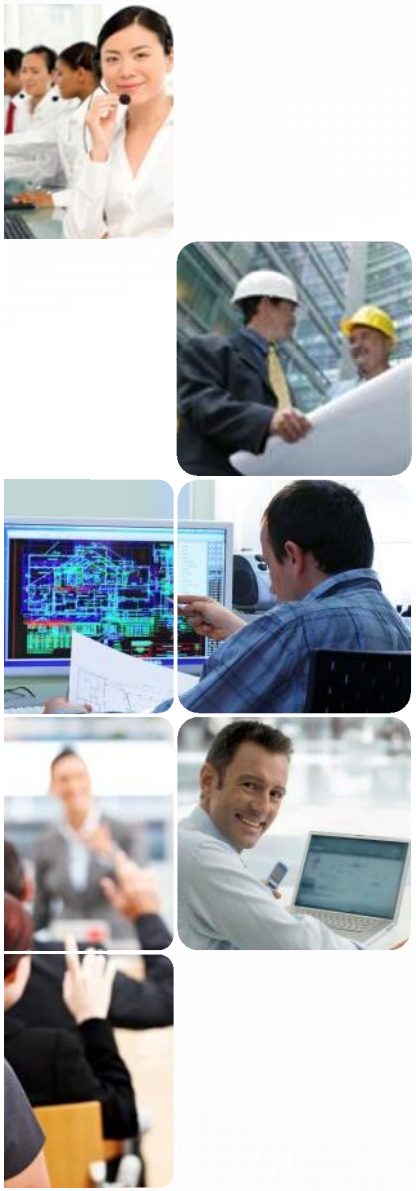
Global Civil Engineering Software Leader to Integrate Proven and Unique Site Optimization Technology for BIM Advancement

LOS ANGELES, Calif., U.S.A. – 2014 ZweigWhite Hot Firm and A/E Industry Awards Conference – Sept. 25, 2014 – Bentley Systems, Incorporated, the leading company dedicated to providing comprehensive software solutions for *sustaining infrastructure*, today announced that it has acquired Charlotte, N.C.-based BLUERIDGE Analytics, Inc., provider of *SITEOPS* – breakthrough site design optimization "software at your service." *SITEOPS* uses cloud-based computing techniques to empower site development professionals to move beyond engineering to *optioneering*, which enables the exploration of engineering alternatives and their costs. This substantially improves the choices considered for any site development, including commercial, industrial, institutional, campus, and residential projects.

Specifically, *SITEOPS* enables civil engineering professionals, real estate developers, and land planners to:

- perform site configuration simulations that fully assess millions of layout, parking, grading, and drainage options for a site within hours instead of spending months evaluating a handful of options,
- produce preliminary cost estimates and conceptual designs faster,
- optimize site designs through advanced *optioneering*, and
- minimize overall costs while ensuring engineering quality.

Bentley Sustaining Infrastructure



Highlights from the Civil Product Releases

Bentley Civil Road Map – November 2014

SELECTseries2 – Rail products

Bentley Rail Track (BRT)

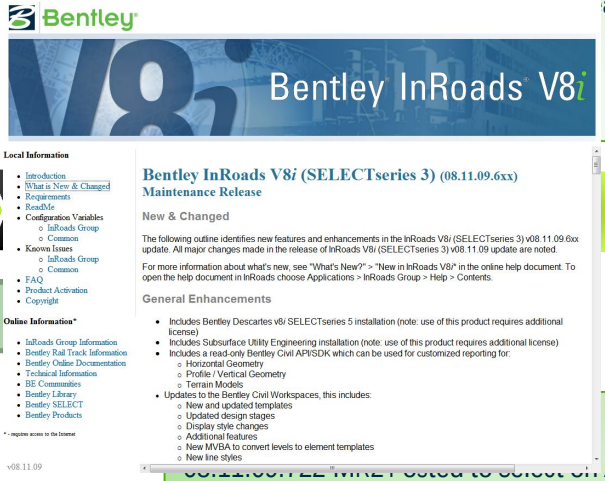
Power Rail Track (PRT)

Power Overhead Line (PROL)

Maintenance Release 1 Highlights

08.11.09.674 MR1 Posted to Select on March 2014

- Added value with SUE / Descarte #
- Adopter feedback
- Geometry – complex redefine and copy
- Geometry – healing improvements
- Terrain – graphical filters enhancements
- a templates



2013 | 2014

Ongoing Development / Maintenance Release program

MR1 | MR2

Highlights

August, 2014

- Civil Model Component Quantities
- Design to Construction with ICM
- Workspace enhancements

SELECTseries3 - 4 Road products - a single Modelling Solution

- Terrain model (replaces TRIA / TIN / DTM)
- Data acquisition becomes Survey (Terrain model extracted)
- Horizontal & Vertical Geometry
- Reusable Geometry
- Corridor Tools (replaces Roadway Designer)

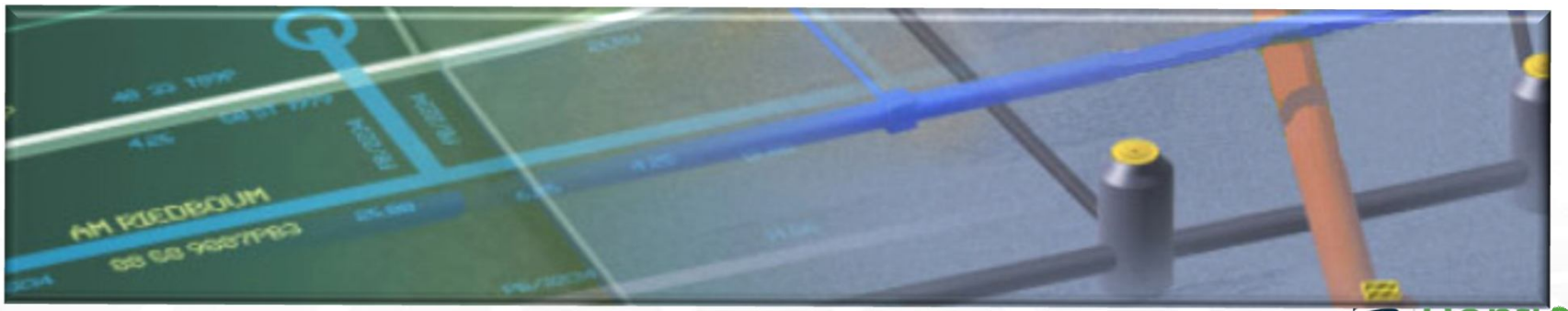
Civil Modelling Improvements

Bentley Sustaining Infrastructure

Bentley Subsurface Utility Engineering

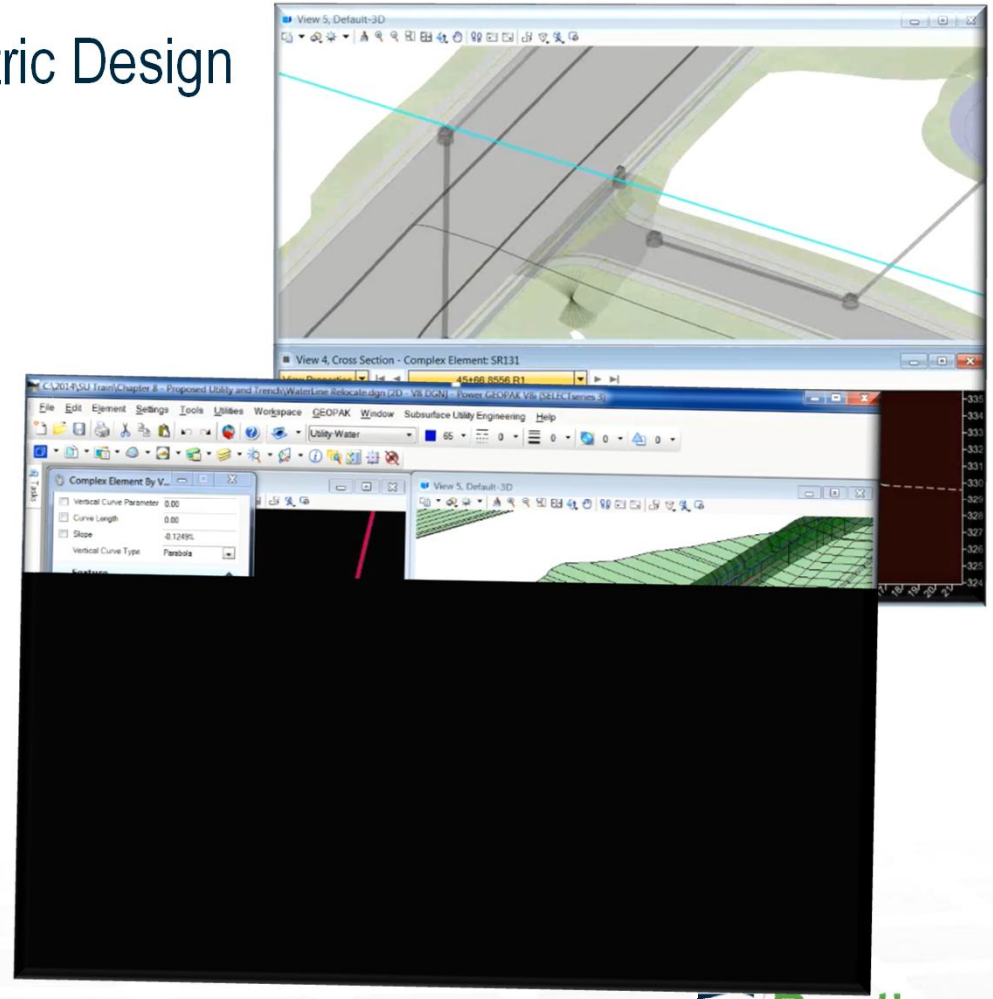
Bentley Subsurface Utilities Engineering

- Provides tools for building intelligent 3D feature-based models of buried construction zone.
- Creates 3D models automatically from survey information, CAD artifacts, GIS, Oracle databases, and more.
- Maintains relationship between CAD and GIS utility source and targets civil features to ensure data is always synced.



Bentley Subsurface Utilities Engineering

- Provides Benefits of OpenRoads technology
  - Immersive Modeling Parametric Design
  - Enhanced User Experience
  - Design Intent
  - Information Mobility
  - Design-time Visualization



Bentley Sustaining Infrastructure

Bentley Subsurface Utility Engineering

Michigan DOT Uses Bentley Subsurface Utility Engineering to Manage and Model Underground Utilities

Bentley Sustaining Infrastructure

Geospatial Utility Infrastructure Data Exchange

- Michigan DOT created GUIDE to align with FHWA Every Day Counts Initiatives
  - Innovation
  - Ingenuity
  - Invention
  - Imagination

U.S. Department of Transportation
Federal Highway Administration

MDOT Michigan Department of Transportation

innovation ingenuity invention imagination Every Day Counts

Bentley Sustaining Infrastructure

ICM (Infrastructure Consensus Model)

Added the ability to create the ICM (*Infrastructure Consensus Model*).

This enhancement expands the Bentley's i-model file format (i.dgn) with an embedded Civil Consensus Model (icm.dgn).

The ICM uses a schema that includes the geometric makeup of the civil model and can be accessed by other applications using Bentley's Design Sync SDK.

The schema, in conjunction with the Design Sync API, provides compatibility for round trip modification and differencing in future releases.

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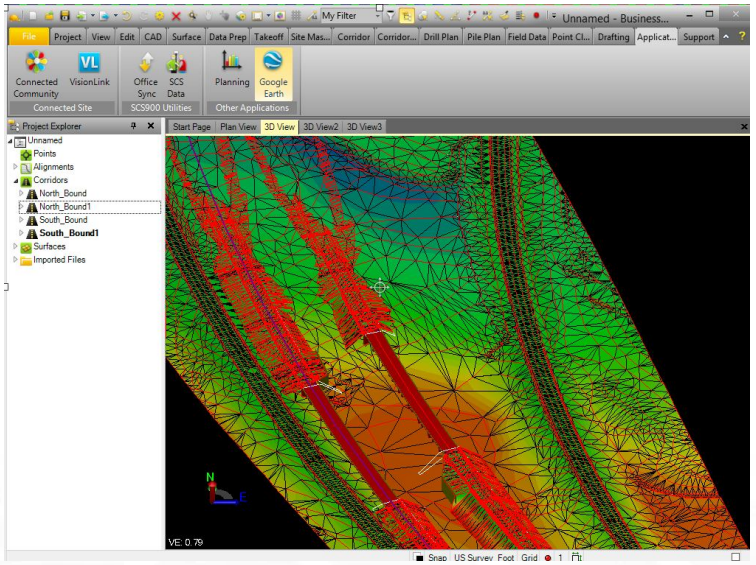
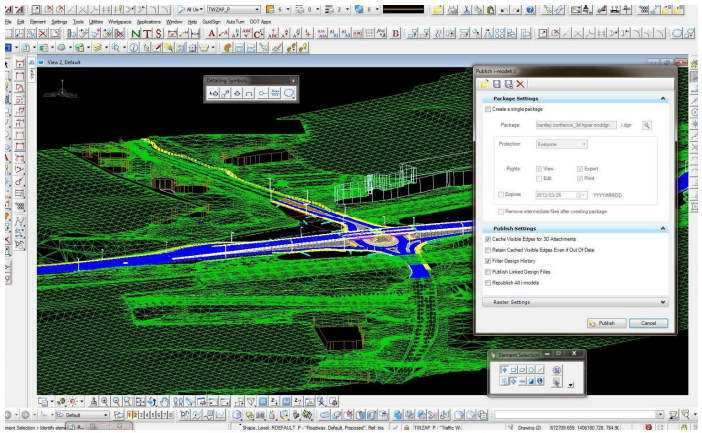


Bentley Sustaining Infrastructure

i-Model

The *i*-Model, at its most basic, is a container for open infrastructure information exchange. It allows a user to publish their model so that it can be used by downstream consumers without the need for the original editing application.

- Portable
- Combines disparate data into a single model
- Contains intelligent engineering data
- Protects the sanctity of the model
- Time persistent
- Etc.



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Trimble Integration

INFORMED INFRASTRUCTURE
The construction engineer's source for projects, products and technology.

Trimble DIMENSIONS 2014
NOVEMBER 3-5 LAS VEGAS, NV

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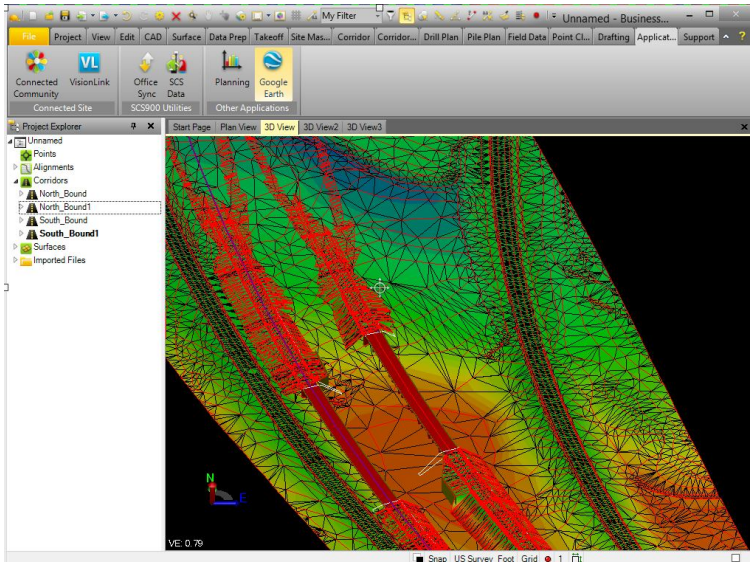
/ Construction / Trimble and Bentley Accelerate Information Mobility with an Integrated Workflow for Road and Site Construction

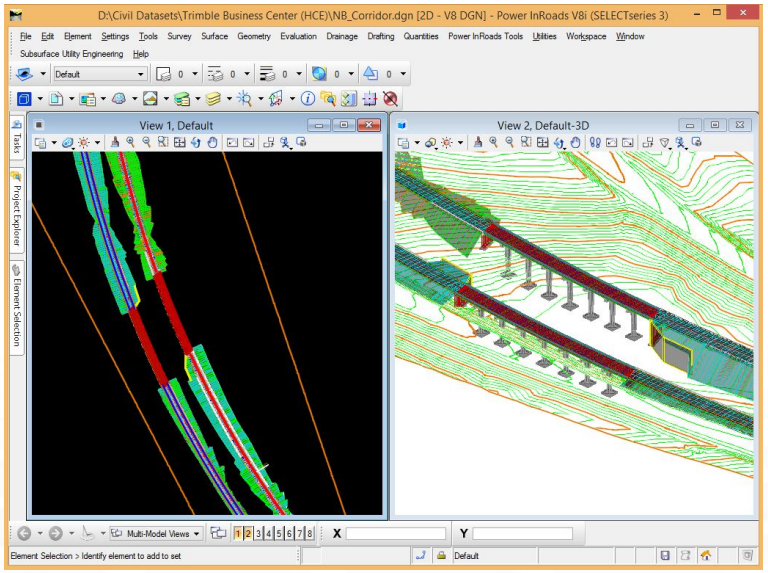
Trimble and Bentley Accelerate Information Mobility with an Integrated Workflow for Road and Site Construction

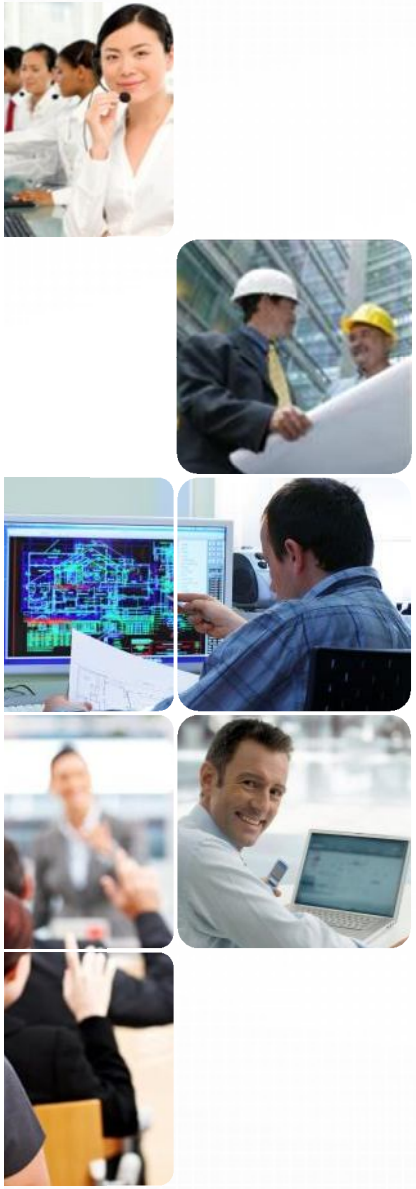
Matt Ball on August 3, 2014 - 9:09 pm in Construction, Corporate, Roads, Transportation

Trimble and Bentley Systems announced today the next advance of information mobility between project design and field construction. Using Bentley's ProjectWise collaboration servers and services, along with its i-model technology for the open exchange of infrastructure information, and Trimble's Business Center – HCE office software, an integrated workflow for road and site construction is now possible. The U.S. Federal Highway Administration, as part of its "Every Day Counts" vision, has recognised that using 3D models with GPS-enabled heavy equipment for road construction can increase productivity by up to 50 per cent. Trimble and Bentley are at the forefront of enabling this vision by joining forces to optimise the transfer of information-rich 3D engineered models to 3D constructible models.

The announcement was made today at the Transportation Research Board AFB80 2014 Summer Committee Meeting.







Civil Futures

Bentley
Sustaining Infrastructure

Bentley Civil Road Map – November 2014

SELECTseries2 – Rail products
Bentley Rail Track (BRT)
Power Rail Track (PRT)
Power Overhead Line (PROL)

SELECTseries4 – MR1 Rail products
Rail adoption of dynamic modeling technology
"OpenRail"
Dynamic cross sections
Design time visualisation
SUE / SUDA

SELECTseries 4 MR1

2013 | 2014 | 2015

Ongoing Development / Maintenance Release program

MR1 | MR2 | SELECTseries 4

SELECTseries4 –
Model Interoprability improvements
Drive through tools
LandXML import Geometry
Reporting and Analysis enhancments
User feedback

Civil Mobile

Future Releases -
'Bentley Connect Edition'
Product / technology consolidation
True 64bit
Drawing Production

Civil Modelling Improvements

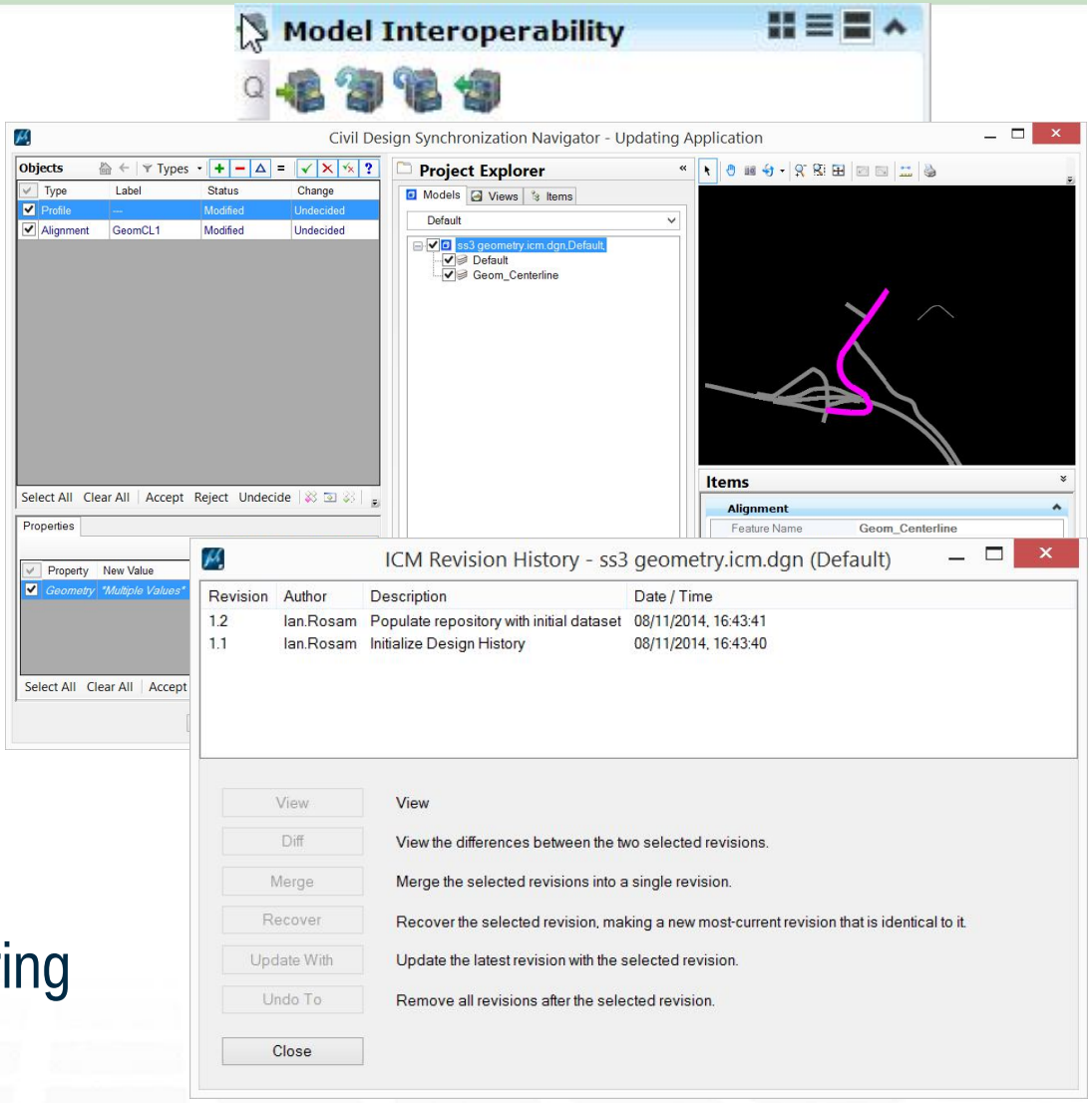
Bentley Sustaining Infrastructure

SELECTseries 4

Bentley Sustaining Infrastructure

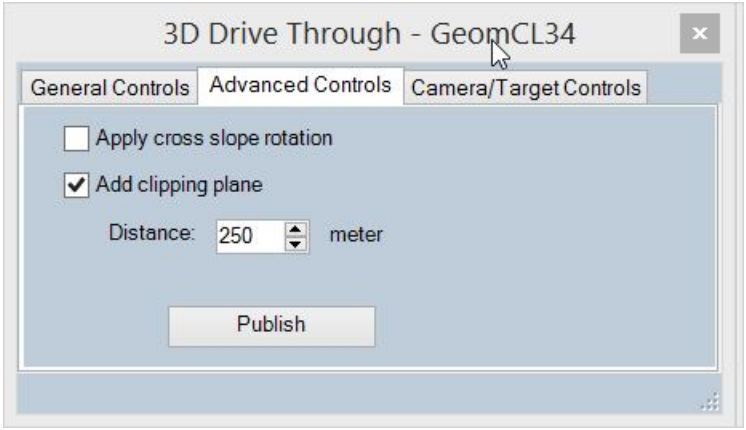
SELECTseries 4 highlights

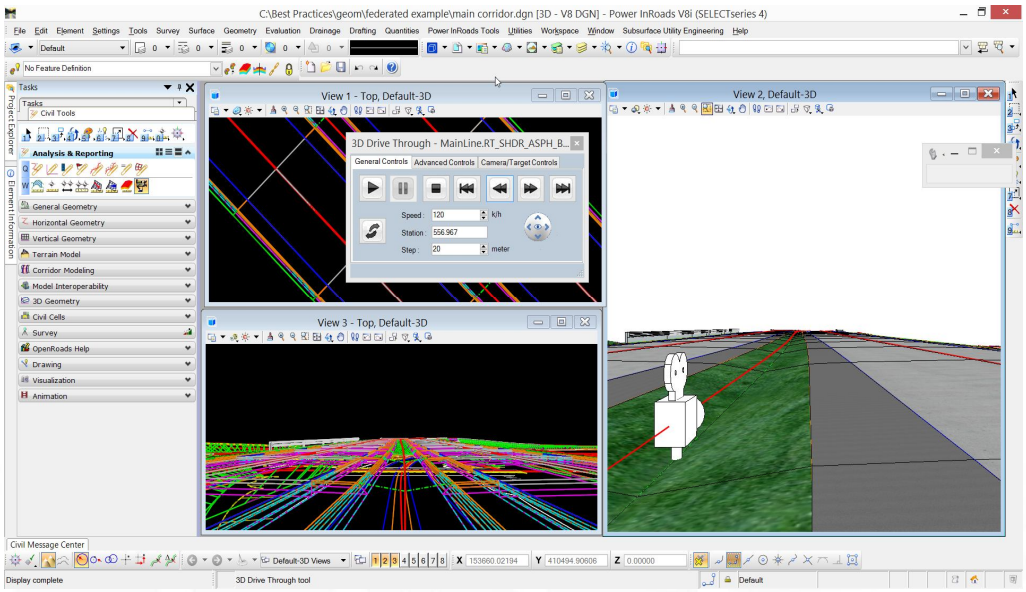
- Model Interoprability improvements
- ICM Read / Write
  - Provides optioneering capability
  - Graphical differencing of revisions
  - Revision / Audit Trail
  - Projectwise Integration
  - Integration with Trimble Quantm for value engineering



SELECTseries 4 highlights

- 3D Drive through
  - Design time drive through
  - Editable camera / target controls
  - Clipping plane for larger models
  - Publishes animation scripts to MSTN for more advanced animation
    - Model population
    - Lanes
    - Cars



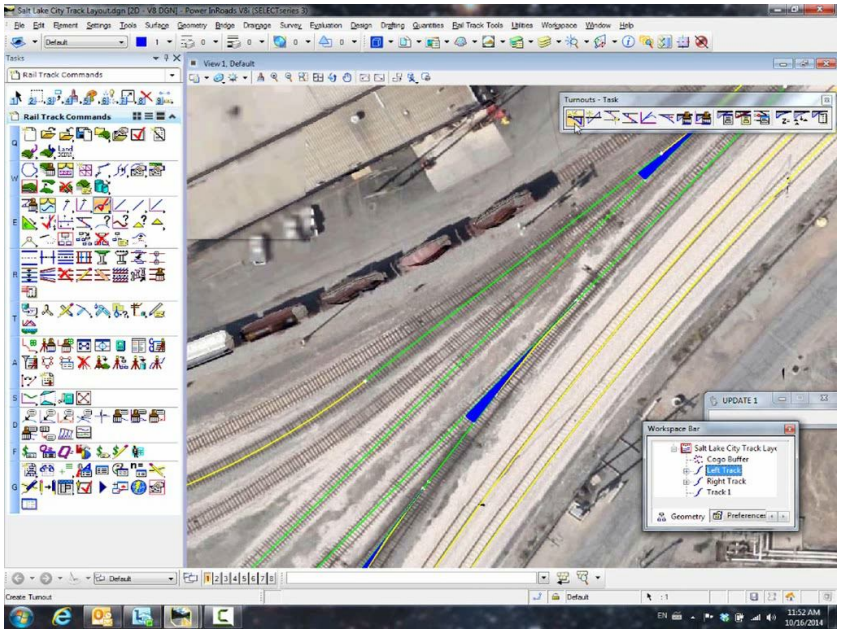


SELECTseries 4 Maintenance Releases

Bentley Sustaining Infrastructure

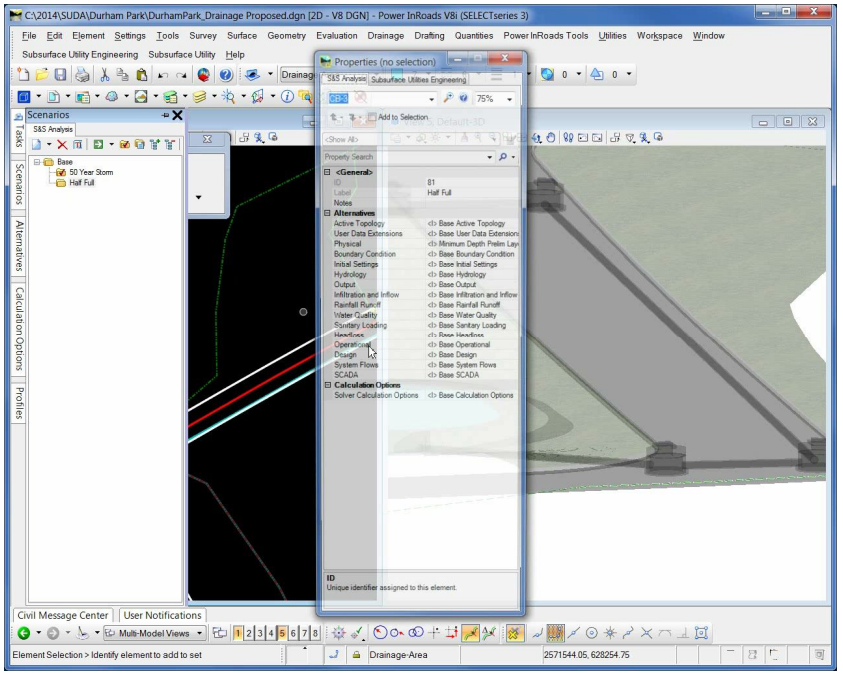
Power Rail Track V8*i* SELECTseries 4

- Early in 2015
- Builds on core 3D rail design capability
- Advances support for BIM processes
  - Interoperability
  - Dynamic modeling
  - Subsurface Utility Engineering
  - Design to construction workflow



Bentley Subsurface Utility Design and Analysis

- 3D modeling of all underground utilities
- Hydraulic analysis and design
- Shared format all civil and H&H products



Bentley Sustaining Infrastructure

CONNECT Edition

MicroStation®
CONNECT Edition

ProjectWise®
CONNECT Edition

Navigator®
CONNECT Edition

i-model

SELECT
Subscriptions

Bentley® Sustaining Infrastructure

Bentley Civil Connect Edition

- **In development now**
- Builds on core model / design capability of Openroads
- Leverages and extends Bentley Connect Edition Documentation Centre
- Performance and Scalability a major focus areas
- Extended business data capability

- Civil needs an icon !!
- Want in ? EAP's planned in 2015

Bentley
Sustaining Infrastructure

Thankyou

November 2014