

## Powerful tools for design and maintenance of rail infrastructure

Bentley's InRail® is the world's leading solution for rail engineering professionals to design, construct and maintain the world's rail infrastructure. InRail can increase the efficiency and productivity of any rail project team.

Built on InRoads® technology, InRail provides robust tools for alignment regression and design, turnout placement, light-rail manufacturing and more. With InRail, you can create content, report on data and generate project deliverables with an easy-to-use tool set that layers on top of your design engine – MicroStation® or AutoCAD®. Combined with Bentley's content management and publishing tools, InRail provides a complete engineering solution for rail transportation projects of any size.

### Alignment Regression

InRail uses regression points derived from centerline survey coordinates then sorted and sequenced based on your criteria. With these points, regression analysis can be performed to establish a "least squares" solution for straight and circular elements. You can perform both horizontal and vertical regression on the survey data. The regressed alignments serve as the basis for redesign or maintenance activities.

### Alignment Design

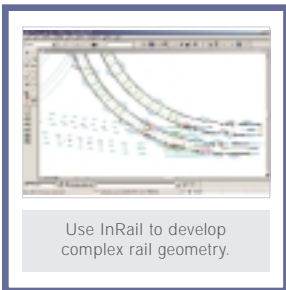
InRail provides tools for interactive creation of design geometry. These tools allow you to design, edit, copy and extend alignments on screen using methods and principles specific to civil engineering. Both horizontal and vertical geometry can be created and associated. Interactive tools enable you to track alignments on-the-fly, providing visual station and offset feedback as you work. A connection editor automatically resolves complex horizontal elements.

### Turnouts

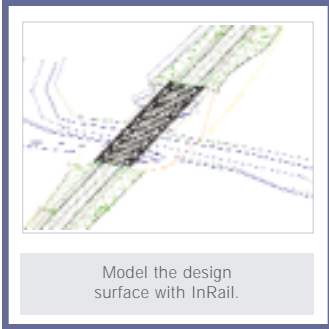
InRail's ability to handle difficult design scenarios is unmatched. You can use InRail to place special track work, like turnouts and crossings. Turnout types include single and double branch, as well as single and double slip. Solving the geometry for such track design can be tedious. InRail offers easy setup of your turnout library. In turn, placement of turnouts in a design session is very intuitive. All geometry is accounted for, whether the condition is straight, on a curve or in a transition spiral.

### Light Rail Manufacturing

InRail's light rail manufacturing tools provide for the specific requirements of light rail design, fabrication and construction. InRail includes functionality to support the design, drafting, detailing and manufacturing of rails and distance keepers required by the light rail industry. This functionality greatly enhances your ability to provide detail drawings of all rails and distance keepers for both simple and complex rail layouts.



## INRAIL AT-A-GLANCE



Model the design surface with InRail.



InRail provides a comprehensive solution for your entire workflow, from start to finish.

### INRAIL SYSTEM REQUIREMENTS

- Prerequisites:  
MicroStation® v8.1 or higher,  
AutoCAD 2000i & 2002
- Processor:  
Intel® Pentium® II 400Mhz minimum,  
500Mhz recommended
- Operating System:  
Microsoft® Windows® XP Professional,  
Microsoft Windows 2000, Microsoft  
Windows NT® (SP6), Microsoft  
Windows Me, Microsoft Windows 98  
(2nd edition)
- Memory:  
128 Mb minimum,  
256 Mb recommended
- Disk Space:  
75 Mb minimum, 100Mb or more  
recommended
- Input Device:  
Mouse

### Data Interoperability

- Seamless integration between CAD platforms - in both DGN and DWG environments
- Imported from almost any source, including CYRA, Plasser-Theurer and versine

### Centralized Data Model

- Single data source for all modules within the InRoads family of products
- All InRoads modules interoperate directly and seamlessly
- Multi-user access to data facilitates workgroup collaboration

### Interactive Coordinate Geometry

- Robust sets of interactive geometry tools for alignment generation on screen
- Tools using methods and principles specific to civil engineering and rail design
- Check Integrity tool for location and removal of discontinuities
- Multiple spiral transition definitions, including:
  - Clothoid
  - Bloss
  - Sinusoidal
  - Cubic parabola
  - Biquadratic parabola
  - Cosine
- Support for circular vertical curves
- Design feature development using automated COGO commands
  - Center lines, horizontal and vertical alignments
  - Right-of-way, property boundaries and property takes
  - Rail yard layout, track interlockings and multi-track configurations
  - Multi-centered curves and spiral transition curves

### MAGLEV design tools

- Support for high speed magnetic levitation system design

### Regression Analysis Tools

- Horizontal and vertical alignments from survey data utilizing "least squares" solutions
- Transition points using the InRail Curvature Diagram
- Simultaneous regression of individual or multiple elements with the InRail Connection Editor
- Accurate establishment of existing conditions with regressed alignments
- Geometry realignment from regressed alignments

## CALL TODAY FOR MORE INFORMATION

Bentley Systems, Incorporated, is a global provider of collaborative software solutions that enable our users to create, manage and publish architectural, engineering and construction (AEC) content. As a part of those solutions, Bentley provides professional services including implementation, integration, customization and training.

Visit us on the Web for more information about Bentley solutions and services. [www.bentley.com](http://www.bentley.com)

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### Turnouts

- Interactive placement of turnouts along alignments
- Custom libraries for existing and future projects
- Turnouts in the most popular configurations:
  - Single branch
  - Double branch
  - Single slip
  - Double slip
- Diamond crossings

### Profile Generator

- Easy profile creation across multiple surfaces
- Display and annotation of profiles and associated data such as vertical curves, superelevation diagrams and DTM features

### Feature-based Digital Terrain Modeling

- Flexible, double-precision
- Intelligent features
- Representation and labeling of the DTM based on feature definition
- Proper display and labeling of terrain features throughout the model

### Typical Section Libraries

- Custom creation of typical sections for generating cross sections on the fly
- Cut-fill tables and decision tables for automatic adjustment of the model to predefined conditions

### Design Checks

- Automatic flagging of conditions that do not meet the design standard
- Choice of delivered or custom-generated design checks

### Integration with Bentley Content

#### Management and Publishing Solutions

- Tight integration with Bentley content management and publishing solutions to bring collaborative design data to the entire project team in a secure environment
- Integration of Digital InterPlot™ at the production end, enabling automated plot set generation and Web-based access to plot archives

### Industry Standards

- Support for industry standards, such as LandXML
- Exporting of alignments, surfaces and other pertinent design information to other systems via XML

### Bentley International Headquarters

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