SIGMA
Improving railroad track visibility

GI’s SIGMA is an award-winning, state-of-the-art system that gives railroad administrators the ability to see a geographic and schematic representation of a railroad track network.

Extensive graphic overview of tracks and their surroundings
SIGMA combines information about a railroad track’s design and dimensions and develops a generic data model that represents the track as well as different objects around the track, such as signs or platforms. Track switches are also depicted. The geographic and schematic representation generated by SIGMA can be used to develop an even more extensive graphic overview of the track using ArcGIS Schematics.

Graphic overview of Netherlands rail network

Multiple scenario views
SIGMA uses track data to develop multiple scenarios. Users can view scenarios for the entire track or a subset of the track. The system reconstructs the track’s surface and surroundings to sub-centimeter precision, including location, cant, slope, height, curvature, design-speed and other dimensions.

CAD/GIS integration through FME server

BENEFITS:
- One data model for track and surrounding objects
- Highly interactive interface
- Based on proven technology (COTS)
- CAD/GIS integration through FME
- Multiple scenarios for design and analysis
A key feature of SIGMA is its ability to import and export data in various formats with a feature manipulation engine (FME). The FME is used to export track information to .dgn files for use in a Bentley MicroStation or with 3D models.

**Solid technology base**

SIGMA is based on proven technologies combined with a custom designed interface for track representation. The system consists of an Oracle Spatial database with ArcSDE schema. ArcGIS Server is used to disclose data to the client application. The client application is built in Microsoft Silverlight, enabling it to be easily accessed from a browser but still allowing for a highly responsive, interactive GUI. It uses a layered architecture and follows Microsoft best practices.

**Flexible platform**

Security within the SIGMA system is role/permission based, and the system can be linked to an Active Directory domain to provide a single sign-on experience. Using open standards, the system can be extended with third-party GIS services.

**Winner of 2014 Esri Partner Conference Award**

Each year, the Esri Partner Conference Awards recognize partners that develop innovative and practical uses of the ArcGIS platform’s latest features and take geographic visualization to the next level. In 2014, CGI received the Esri "Internal Web Application" award for SIGMA. CGI developed SIGMA with ProRail, which is responsible for the management and safety of the Dutch railway network.

Jort Engels, Esri partner manager, noted: "This award is a recognition of the partnership between CGI and Esri Netherlands. This shows that our partner uses the power of the ArcGIS platform and creates value for its customers. In the future, we will continue to work with CGI to deliver solutions to our customers."