

RAILER® GIS Integration

RAILER® Sustainment Management System (SMS) is an asset management system that stores information about the railroad network inventory attributes, inspection data, condition assessment, and maintenance and repair (M&R) requirements. After implementation of the RAILER program and initialization of the RAILER database at a network location, that information can be displayed spatially using companion 3rd party commercial GIS software (ArcView version 9 by ESRI®).

To create a GIS instance displaying RAILER data spatially, you need:

- RAILER database (in MS Access Format)
- Route coverage of the rail network

The RAILER database is created by collecting information about the track network and entering that information into the RAILER system. Collected information includes track inventory and inspection data. This information is used to analyze track condition and generate M&R requirements.

The Route coverage can be created from a digital drawing or GIS shapefile geographically representing the track network. This digital track layout should be georeferenced to a specific geographic coordinate system so that additional coverages representing other assets can be easily layered with the track coverage.

The track network route coverage is created using ESRI® ArcInfo software where lines and arcs are assembled to represent a route, or “track”, as defined in the RAILER database. Each route in the network route coverage has a corresponding track record in the RAILER database, and this serves as the common link between the track related information housed with RAILER and the geographic representation of the track in the GIS.

In addition, each route has an established linear referencing system that corresponds with the track stationing scheme designated during the RAILER implementation. This stationing scheme establishes location along a track, which helps to locate features, attributes, or track defects as identified in the RAILER program. The GIS route coverage is calibrated as specific physical points along the route to match the stationing at the corresponding features on the track. These features may be where two track intersect (rail crossing), where two tracks diverge (turnout), or where a road crosses the track (grade crossing). The route’s linear reference system is then interpolated between these feature calibration points. See figure 1 as example.

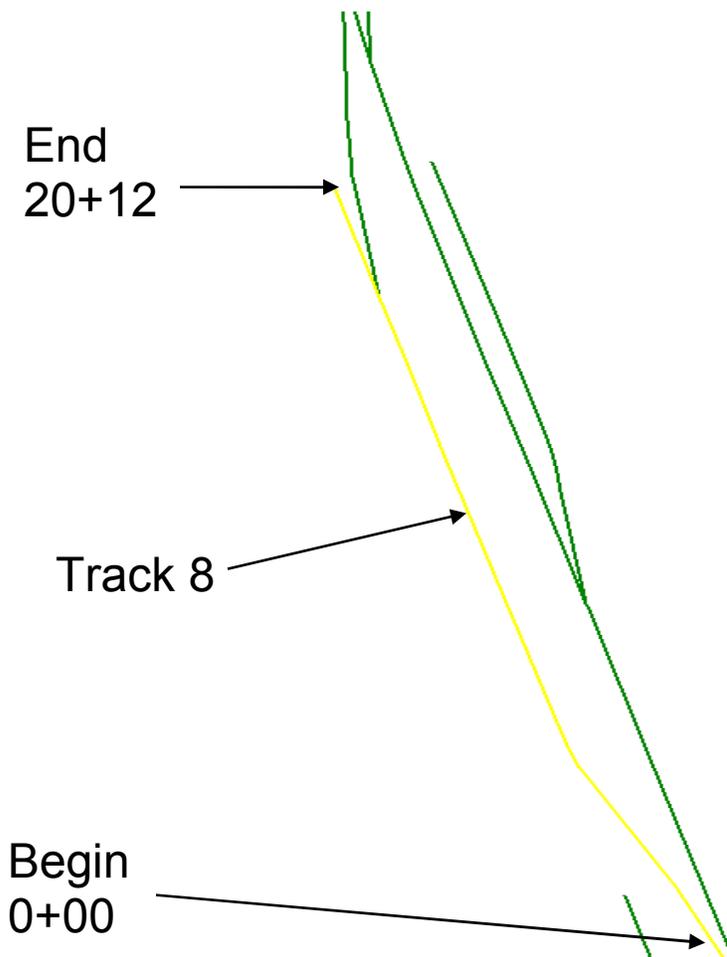


Figure 1. Representation of route coverage designation with stationing for linear referencing.

After the route coverage is created for a track network, route events are created in an ArcView project file to establish different data views based on pre-established queries in the RAILER database. These views include:

- Network Info – Track Use, Year Built, Const Type, Track Category
- Segment Info
- Track Inventory – Turnouts, grade crossings, rail crossings, grades, curves, bridges, clearance restrictions, appliances, drainages
- Track Structure – Rail Weight, Rail Length, Tie Material, Tie Size, Tie Spacing
- Condition Assessment – Standard Operating Restrictions, Condition Index values
- Detailed Inspection Defects – Ballast, Geometry, Drainage, Ties, Rail, Fastenings and Other Track Material, Grade Crossings, Turnouts, Rail Crossings, Appliances
- Last Inspection Date
- Safety Issues – Work Orders Issued, Safety Defects Fixed

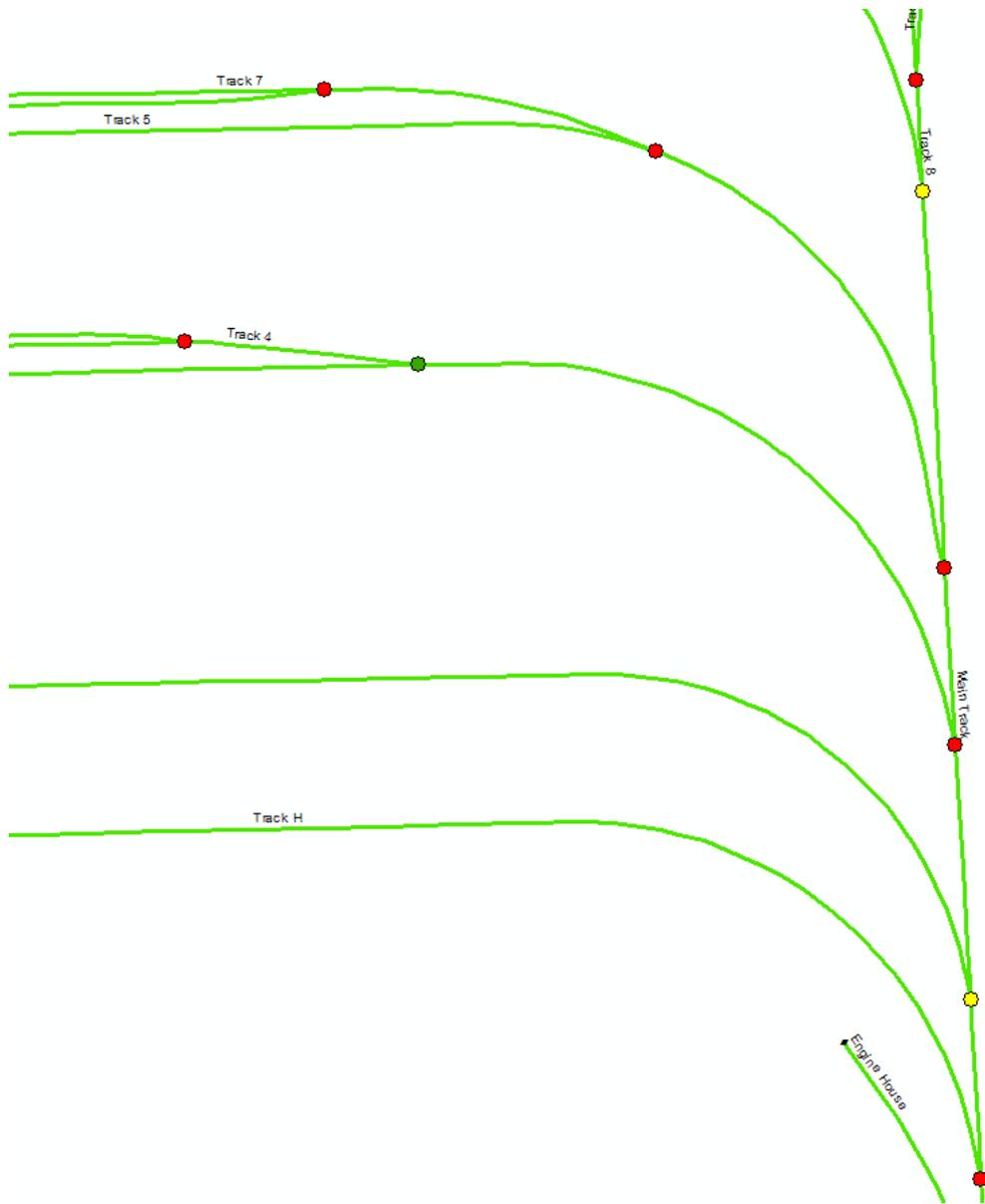


Figure 2. GIS representation of track layout showing location of turnouts (diverging tracks)