

# GEDO NovaTrack

## INTELLIGENT TRACK DESIGN BASED ON AS-BUILT CONDITION

Today's requirements for as-built track quality evaluation, line speed increase or routine tamping operations are raising the need for high quality and consistent track alignment data. This requires the definition of track geometry elements within a geodetic reference system.

Due to irregular maintenance or absence of a track trajectory reference in an absolute coordinate system, the track position is often negatively affected by deformations and settlements. This leads to a situation requiring the recalculation and optimization of the track alignment to best fit the existing track position.

### INTELLIGENT APPROACH

To solve this, Trimble GEDO technology offers fast and efficient solutions for recording detailed information about existing tracks.

As part of the workflow, Trimble GEDO NovaTrack software automatically processes and analyzes GEDO track measurement data, such as coordinates, cant and track gauge, and creates a track alignment solution that fits best.

### SMART FEATURES

The Trimble GEDO NovaTrack calculation engine contains advanced algorithms for approximating alignment elements and representing them graphically. These include approximate position definition based on curvature and directional methods as well as automatic sequencing of alignment elements - transition curves, circular arcs and tangents (straight lines).

### Automatic process

Trimble GEDO NovaTrack's statistical calculation includes regression analysis of track measurement data and conversion into alignment elements. It offers several scenarios for adjusting the alignment elements to the existing track position. With the help of robust regression methods, the parameters of the individual elements are determined and optimized by a calibration process.

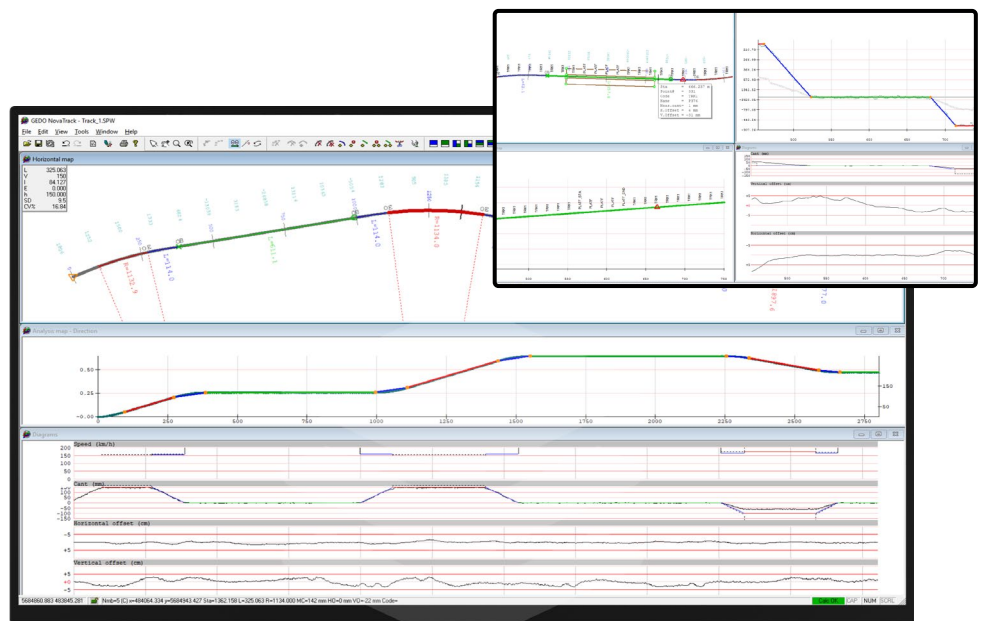
Interactive tools like curvature analysis diagrams provide intuitive support throughout the element fitting process. For quality evaluation and acceptance the calculated data is continuously updated graphically and in tabular form. The design alignment deviations from existing track position and height are visible during the entire editing process.

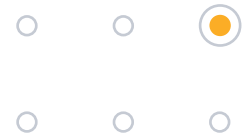
### Data exchange

New horizontal, vertical and cant alignments are exported directly into the GEDO exchange format. This simplifies the direct alignment data import into the office software Trimble GEDO Office and Trimble GEDO Scan Office, as well as into field applications such as GEDO Vorsys, GEDO IMS and Trimble Access Rail modules Stakeout and GEDO Track.

## Key Benefits

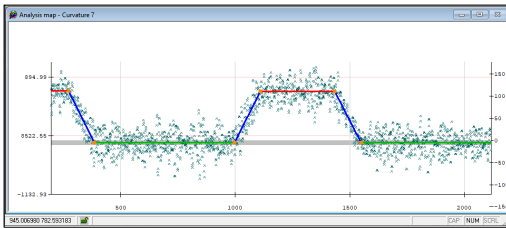
- ▶ Automatic and semi-automatic reverse calculation of track alignment
- ▶ Rebuilding an element geometry from curvature and directional diagrams
- ▶ Advanced field data filtering and geometry analysis using heuristic regression methods
- ▶ Import of background maps for horizontal and vertical clearance check
- ▶ Support of user profiles for geometry, speed, cant calculation and verification
- ▶ Calculation and graphics update on-the-fly
- ▶ Calculation of the design cant and speed
- ▶ Full compatibility with Trimble GEDO track surveying and scanning systems





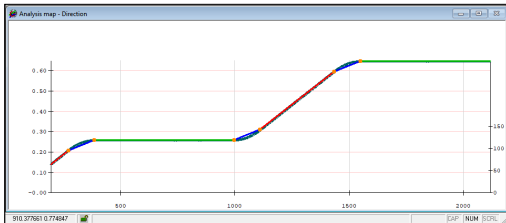
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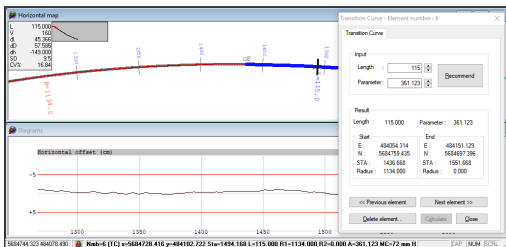
### Analysis diagrams for track curvature determination

- ▶ Intelligent analysis of track curvature for efficient alignment re-instatement to the original design state
- ▶ Support of horizontal curvature determination via 3, 5 and 7 point inverse radius analysis
- ▶ Analysis of long wave effects and reconstruction of geometry using direction analysis



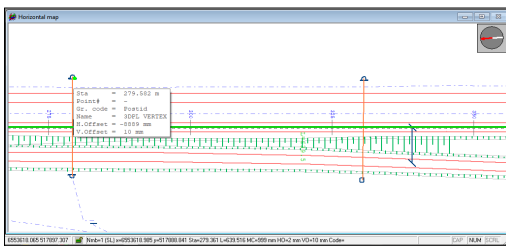
### Editing of an old design to best-fit the existing track alignment

- ▶ Flexible option to adjust and edit old alignment data
- ▶ Conversion of existing track geometry into curvature diagram for re-adjustment
- ▶ Direct editing of track alignment elements by editing parameters
- ▶ Exchange of alignment data via GEDO .TDT/.HDT/.UDT, NovaPoint .TIT/.NYL and .LandXML file formats



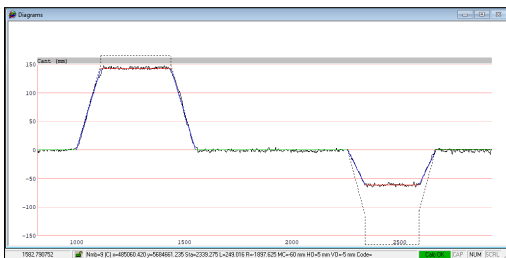
### Adding of supporting map information

- ▶ Import of point, map, and track alignment data from .KOF, .DXF, .GTD, and .LandXML file formats
- ▶ Verification of horizontal and vertical distances between the planned track alignment and adjacent infrastructure objects such as neighboring tracks, signals, masts, overhead lines, and other structures



### Utilizing an existing cant as a basis for the new design

- ▶ Imported, measured cant information can be checked in the curvature analysis diagram
- ▶ Efficient identification of track elements by simultaneous display of track curvature and cant
- ▶ Option to calculate averaged cant based on measured cant data



### Verification of track alignment geometry based on tolerances

- ▶ User-defined profiles are used to check the compliance of the proposed geometry with the design tolerances
- ▶ Horizontal and vertical geometry elements outside the tolerance limits are highlighted
- ▶ Geometry data can be checked using different profile settings available

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