

General Workflow for Railway Extraction

1. Data acquisition with sensor (if applicable)
2. Point cloud generation with LP360 Drone (if applicable)
3. Geometrical corrections
4. Remove the noise
5. Create Feature for starting centerline of the Railway
6. Extract the rails automatically using "Rail extractor"

Video tutorial



Information about the parameters

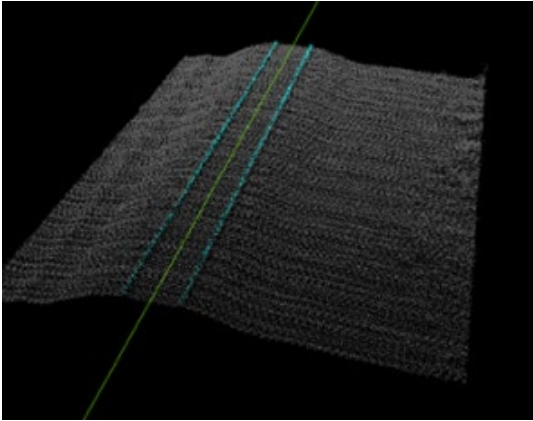


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Rail Extraction in LP360

In this exercise, we will review the workflow for performing rail extraction using LP360.





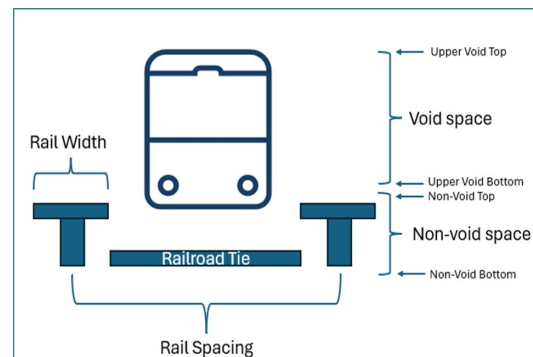
Understanding Your Rails and its Parameters

There are several input options available. This tool has the option to “Extend Until Lost”, meaning the algorithm will search for rails until it can no longer detect any candidate points.

There is also an option to change the Parameter Set which is specific to the type of railroad being extracted. The Rail Extractor tool comes with two default Parameter Sets: American Rail (Meters) and American Rail (Feet). These two default Parameter Sets have preset values that are derived from the American Railway measurements.

Rail Extraction Parameter Set

There are 13 unique parameters for the Rail Extraction Parameter Sets that allow for processing and classification of different rail ways around the world. There are 4 parameters that are directly derived from the specific, physical railroad measures. The **Rail Width, Rail Spacing, Non-Void Top, and Upper Void Bottom** parameters are **pre-determined** based on the **specific railway** you are looking to classify. For a better understanding of what these parameters represent, see the figure below.



About the Rail Extractor PCT

The Rail Extractor Point Cloud Task (PCT) automatically extracts a rail alignment (centerline) feature as a polyline as well as classifies “top of rail” from LAS files derived from Laser Intensity Detection and Ranging (LIDAR) points.

This will need to be executed on a RAW LAS dataset. If smoothing is performed prior to extraction, the shape of the rails can be lost, making it more difficult to detect and classify the rails using the PCT.

Before executing the tool, it is helpful to create a new feature at the start of your rail centerline using the Create Feature tool on the Feature Edit ribbon. This ensures that, with each execution of the tool, the centerline is started in the exact same location.

Extracting Rails

Important things to consider for this tool are the use of Void and Non-Void space. These “spaces” allow the algorithm to determine a relative elevation range that the rails themselves would be found and eliminate candidate points that may have obstacles or points in the areas that should be void of all objects (the area in which the rail cars would travel).

Executing the Rail Extractor

If a feature layer was created for the start of the railway centerline, the **By Feature Layer** tool on the Point Tasks Ribbon can be used.

This ensures the tool can be executed multiple times with the same starting point if the parameters need to be adjusted.



The PCT can also be executed using the **By Line** tool on the Point Tasks Ribbon.

The start of the centerline will need to be estimated using this tool to begin the rail extraction.

Contact Us

GeoCue
520 6th Street Madison
AL 35756

1-256-461-8289

Visit us on the Web:
<https://www.lp360.com/>