RepliMap Documentation

Description	User documentation for RepliMap — unified mapping and scene editing
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1 RepliMap

RepliMap is a unified platform designed for HD map editing and 3D scene editing for autonomous driving, enabling engineers to create, customize, and enrich road networks with precision.

This documentation covers everything you need to efficiently create, edit, and manage maps using the RepliMap, from importing data sources to building complete, validation-ready environments.

RepliMap is built around **ASAM OpenDRIVE (.xodr)** as its core format, allowing seamless integration into existing simulation toolchains while reducing manual effort and rework.

1.1 Why RepliMap?

ADAS and autonomous driving workflows often require rebuilding HD maps for each project, leading to inconsistent data and high manual effort. RepliMap addresses this by enabling:

- Reusable map assets across projects and programs
- Consistent data models across engineering, simulation, and validation
- Reduced manual preparation effort through structured workflows
- Support for regulation-driven validation (e.g., NCAP, GSR2, ISA)

Instead of creating isolated simulation scenes, RepliMap helps you build persistent digital twins that can be continuously improved and reused.

1.2 Documentation Sections

1.2.1 Getting Started

Set up your environment, understand the UI, and create your first map project.

1.2.2 Data Sources & Conversion

Import reference data or convert HD data into **ASAM OpenDRIVE (.xodr)** format, including:

- GeoJSON
- Mapbox
- HERE → XODR

- Sensor and imagery data

1.2.3 Road Tool

Create and edit road geometry, lanes, junctions, and connectivity.

1.2.4 Objects

Place and configure static and semantic objects in your map.

1.2.5 Signals

Define traffic lights, signs, and rules that control traffic behavior.

1.2.6 Elevation Tools

Adjust terrain, slopes, and vertical alignment of roads.

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Model tram networks and integrate them with road infrastructure.

1.2.8 Advanced Tools

Use power features for alignment, validation, batch operations, and optimization.

1.2.9 Troubleshooting

Find answers to common issues and frequently asked questions, helping you quickly identify and resolve problems encountered during map creation, editing, and data workflows.

1.2.10 Shortcuts

Keyboard shortcuts and productivity tips for faster editing.

1.2.11 Releases

Release notes and version history for RepliMap.

1.3 Workflow Overview

A typical RepliMap workflow looks like:

1. Import data from supported sources
2. Convert existing HD map data to **ASAM OpenDRIVE (.xodr)** format if needed
3. Edit and refine roads, objects, and signals
4. Validate the map for consistency and correctness
5. Export or integrate into simulation and validation environments

This structured workflow helps reduce errors and ensures consistency across teams.

1.4 About This Documentation

This documentation is being developed incrementally. Each section will include:

- Step-by-step instructions
- Visual examples and screenshots
- Best practices and common pitfalls
- Cross-links between related workflows

Content will evolve alongside the product to reflect the latest capabilities of the RepliMap editor.

2 Getting Started

Getting Started

Welcome! This guide helps you get up and running quickly with the platform. By the end of this chapter, you'll have everything set up and be ready to start exploring and working with your maps.

▶ What's Included in This Chapter

This chapter covers the essential steps and concepts to get you started

- Installation — Download, install, and check system requirements
- Login, Profile & Preferences — Sign in and configure your account settings
- Maps overview — Understand the Maps dashboard and available map types
- Main screen overview — Get familiar with the editor layout, tools, and workspace

Installation

RepliMap is available through the official **AAI Innovations GmbH** website. Get in touch via the contact form on our website:

- **Product page:** Get RepliMap on the AAI website

Once you have access, download the latest RepliMap build from the Software Download Portal

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▶ Installation Steps

1. Download the RepliMap build.
2. Run the installer and follow the on-screen instructions.
3. Accept the license terms and conditions to proceed with installation.
4. The installer sets up RepliMap in your user directory, for example `C:\Users\YourName\RepliMap`.
5. During setup, the installer creates a **Start Menu** shortcut for quick access.
6. When installation is complete, launch RepliMap from the desktop shortcut or from the Start Menu.

▶ After Installation

When you launch RepliMap for the first time, sign in with the credentials provided via email. The application verifies your license and activates your workspace.

> **Tip**
>
> Use the latest RepliMap version for new features and bug fixes.

▶ System Requirements

	Minimum	Recommended
CPU	Core i5 (7th gen or newer)	Core i7 (9th gen or newer)
RAM	16 GB	32 GB
GPU	4 GB VRAM	6 GB VRAM
Platform	Windows 10 / 11 (64-bit)	Windows 10 / 11 (64-bit)

Supported platforms

RepliMap is officially supported on **Windows 10** and **Windows 11** (64-bit). Ubuntu/Linux builds can be provided for specific user or project requests—contact our support team at support@aai-innovations.com.

Login, Profile & Preferences

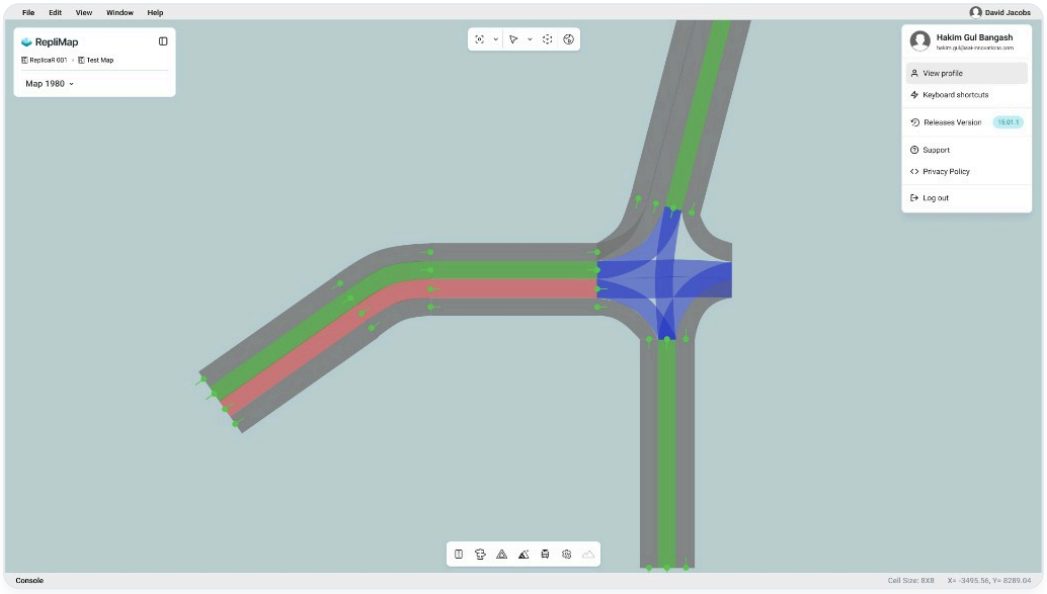
▸ Login

1. Open RepliMap (see Installation if you have not installed it yet).
2. On the Login screen, enter the e-mail and password provided via email.
3. Use Remember me if you want the app to keep you logged in on this machine (only on trusted devices).
4. If you forgot your password, use Forgot Password? and follow the instructions, or contact support.

New users without credentials should use **Contact Support** on the login screen or reach out through the RepliMap Website.

▸ User Profile Menu

After you log in, your **name** and **avatar** appear in the **top-right** of the window. Select them to open the profile menu.



Typical entries include:

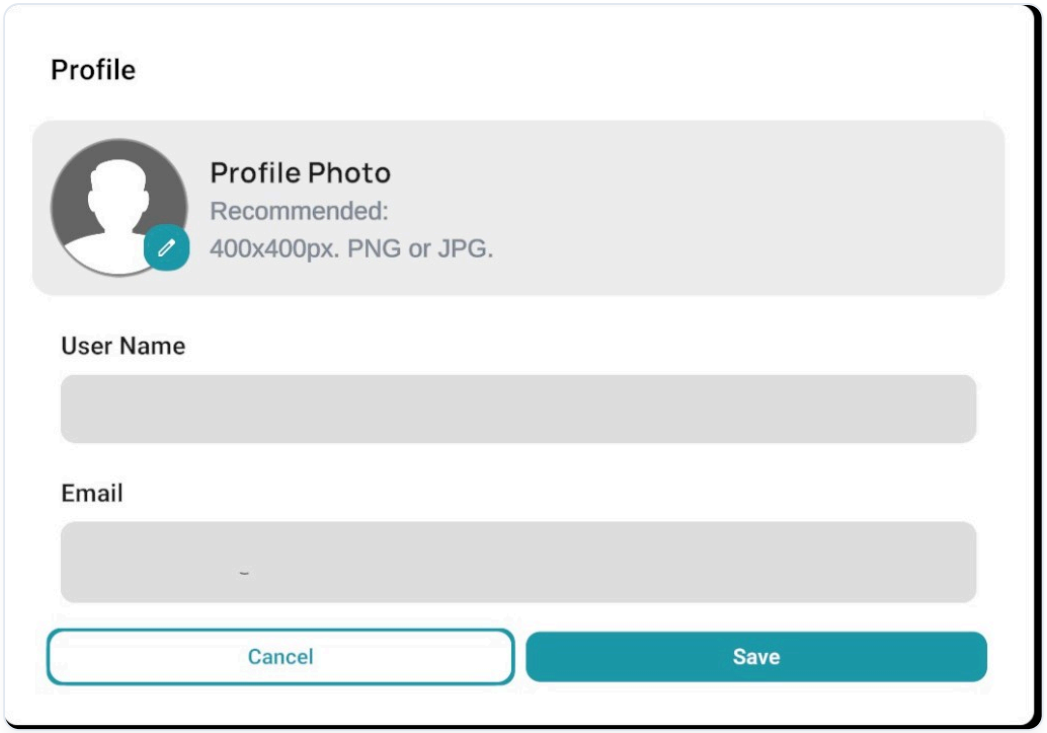
Item	Purpose
View profile	Open your account details and profile photo. See View Profile below.

Item	Purpose
Preferences	Change theme, language, and instruction panels. See Preferences below.
Keyboard shortcuts	Links to the shortcut pages in the documentation. The shortcuts help speed up your mapping journey.
Releases / version	See the RepliMap versions available on the download portal.
Support	Links to help resources or contact options.
Privacy Policy	Legal information for the product.
Log Out	End your session on this computer.

▶ View Profile

Select **View profile** from the profile menu to open your account details.

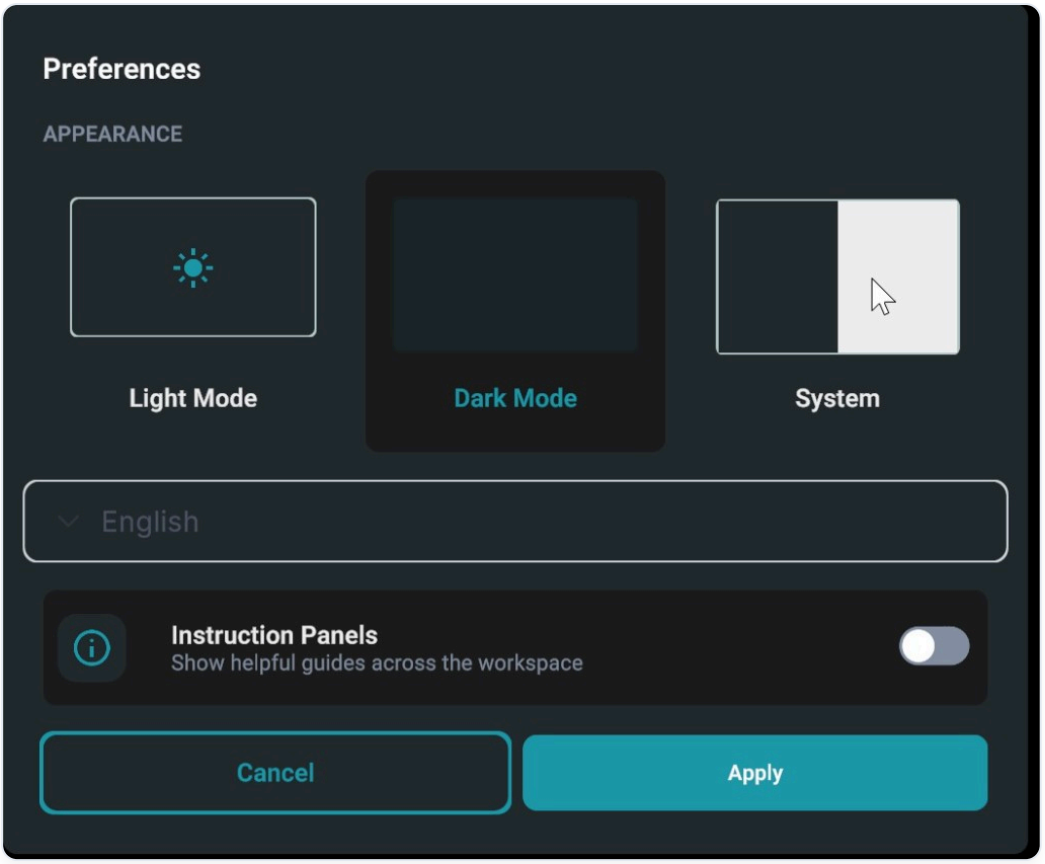
You can update your **profile photo** here (recommended size: 400×400 px, PNG or JPG). **User name** and **email** are shown for reference only and cannot be changed in the app.



▸ Preferences

Open **Preferences** from the **User Profile** menu: click on your **name** or **avatar** in the **top-right** corner, then select **Preferences** from the dropdown.

There you can switch between **Light**, **Dark**, and **System** theme, choose the display **language**, and turn **Instruction Panels** on or off.



Note

The current beta does not yet include full multi-language support and keyboard shortcuts. Both are planned for an upcoming release.

Home Overview

The Home screen, also called the **Maps screen** or **Dashboard**, is displayed after login and shows the list of all available maps, including RepliMap sample maps, NCAP-oriented maps, and user-created maps. From this screen, users can open existing maps, import maps, or create new maps before entering the editing canvas.

▸ Map Categories (Tabs)

Tabs at the top of the Maps view allow users to navigate between different map categories:

Tab	What it shows
User Maps	Maps created, imported, and saved by you or your team are listed in the User Maps tab.
NCAP Maps	Curated maps oriented toward **Euro NCAP** (or similar) scenarios—useful starting points for regulated test layouts.
Sample Maps	Built-in **RepliMap** examples for exploring features and workflows without using production data.

User maps are local

User maps are stored on **this computer**. Signing in on another machine with the same account does **not** transfer those files; maps do not follow your login automatically.

▸ Actions: Import and New Maps

- **Import** — Bring in an existing XODR map file from disk. You may import different versions of XODR map into the tool. The features not supported in version 1.6 are ignored or dropped.
- **New Map** — Create a **new** map and land on the mapping editor canvas.

▸ Maps List

The main table usually includes columns such as:

Column	Meaning
Maps	Name of the Map (for example `RepliMap_001`).
Path	Location of the Map on the machine.
Creation date	When the Map was created. This date is taken directly from the XODR map date.
Last modified	When the Map was last edited.

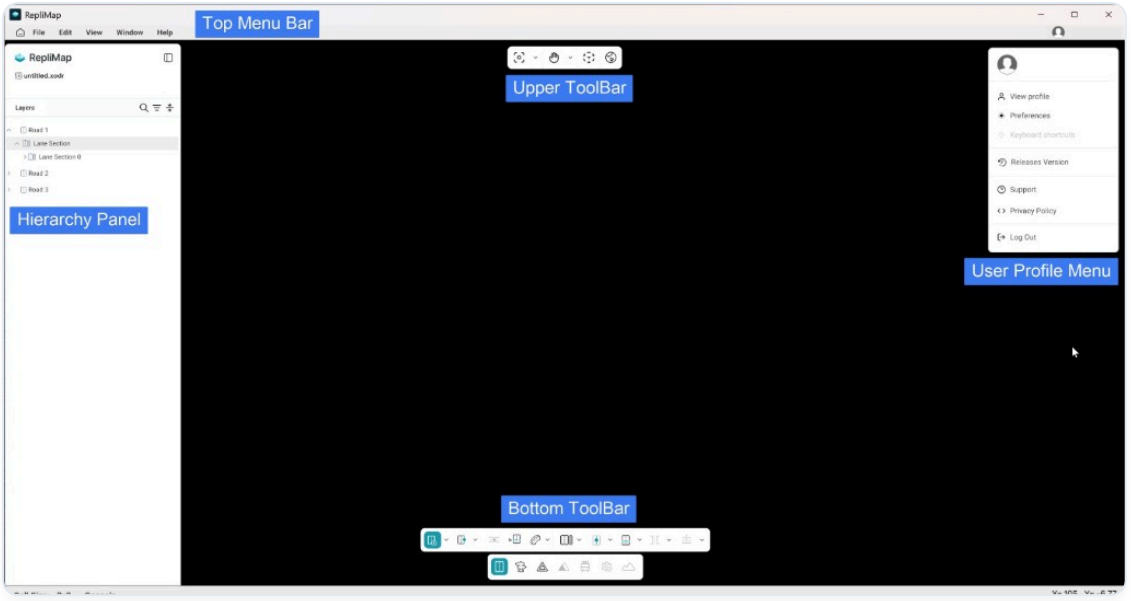
Each row often includes a **delete** control (for example a trash icon). Use it only when you are sure you no longer need the Map in RepliMap—this removes the map from the **User Maps** list and from RepliMap's database view; it does **not** delete the file from disk (see **Path**).

▸ Map Selection and Navigation to Canvas.

Select the desired map from the list to enter the Main screen overview and explore fast and efficient tools to create or edit the map according to your needs.

Main Screen Overview

After opening a map from the Maps overview, RepliMap displays the Editor, featuring a central Canvas, side Panels, and Toolbars for navigation and editing.
This section provides an overview of each area.



▸ Top Menu Bar

At the top of the interface, you will find the main menu bar:

- **Home Button** — Returns you to the Maps overview page.
- **Application menus** — Includes File, Edit, View, Window, and Help options.
- **User profile (right side)** — Provides access to Preferences and other account settings; see Login, profile & Preferences for more details.

Each menu covers the following:

Menu	What's inside
File	**New** — Create a new project **Open** — Open an existing project **Import** — Import external data (Sensor data, Reference Image, GeoJSON) **Conversion Pipelines** — Run data conversions (e.g., HERE HD to ODR)

Menu	What's inside
	Save — Save the current project **Save As** — Save the project with a new name or location **Export** — Export project data in the required format **Quit** — Close RepliMap
Edit	**Undo** and **Redo** for basic editing steps.
View	**Grid** — Toggle grid visibility on the canvas **Zoom Handle** — *(disabled for now)* **Map Colors** — Changes how the canvas is drawn (e.g., transparent roads); used when reference data is visible to distinguish primary and connecting roads clearly **Helper Roads** — Hides helper roads on the canvas *(explained in a later section)* **Editor Slots** — *(disabled for now)*
Window	**Console**; **Validator** *(disabled for now)*; **Mapbox** panel.
Help	**Documentation**; **Shortcuts** *(disabled for now)*; **Contact us**

▸ Hierarchy Panel (Top Left)

The **Hierarchy (or Project) panel** shows your current position within the project structure.:

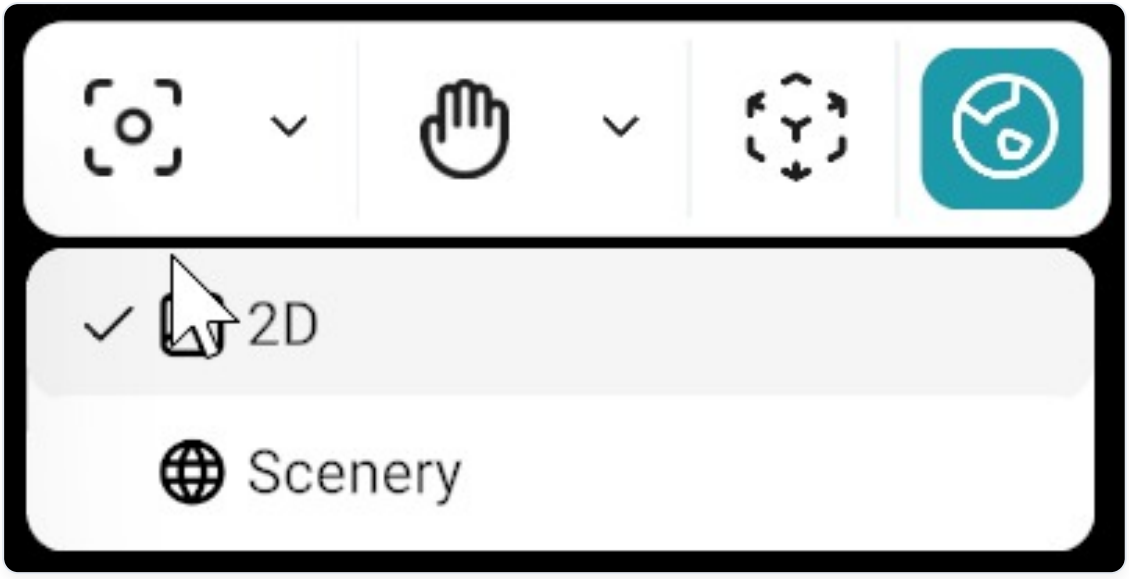
- Shows the active map name.
- Lists roads so you can search by road ID and focus quickly on a specific road.
- Lets you inspect road-level content such as objects and signals.
- Provides controls to hide or show roads on the canvas.
- Lets you open the saved **XODR/XML** view for roads, objects, and signals.
- You can collapse the panel to make canvas editing easier.

Hierarchy panel screenshot


RepliMap
untitled.xodr
Layers
Road 1
Lane Section
Lane Section 0
Road 2
Road 3

▸ Upper Toolbar

The **Upper Toolbar** sits above the canvas (**centred**). It groups **view**, **navigation**, and **reference data** tools, and lets you switch between **2D** and **Scenery** views.



Groups include:

Area	Examples
View / Focus	**Focus** centres the map and gives you an overall view of it (**Shortcut: F**). **Ruler** Shortcut (**Ctrl+R**) *is currently disabled*.
Pan/Gizmo Tool	**Palm** is used for panning across the map canvas. **Move**, **Rotate**, and **Scale** are gizmo tools that become active when an object is selected, enabling easier editing of objects and signals when required.
Reference Data Panels	Panels such as **Sensor**, **GeoJSON**, and **Reference image** let you reopen loaded reference data; if data is not loaded, they guide you to import it. See Data sources & conversion for details.

Area	Examples
2D and Scenery View	Quickly switch between **2D** (orthogonal) and **Scenery** (3D) views. Use **2D** for most road-network editing; objects and signals can be added from either view.

▸ Bottom Toolbar

The **Bottom Toolbar** is the main area for map editing. It includes the following tools groups:

Tool group	What it is used for
Road	Road-level editing, including lane editing, lane markings, lane height, and road elevation adjustments. See Road tools.
Objects	Asset-library workflows and object-editing tools, including items such as road marks and polygon objects. See Objects.
Signals	Signal-library tools for traffic control elements, including traffic lights and traffic signs. See Signals.
Elevation Tool	Junction-level elevation tools to adjust entire junctions. See Elevation tools. *(Currently disabled.)*
Trams	Tram-network tools for tram road creation, connections, power lines, and related setup. See Trams.
Advanced Tools	Extra quick tools for editing automation. See Advance tools. *(Currently disabled.)*
Terrain	Terrain setup for the 3D environment. See Terrain. *(Currently disabled.)*

▶ Map Canvas

The **centre** of the window is the main canvas, where you view and edit the road network, lanes, junctions, objects, and signals in **2D** (and **3D/Scenery**, if available).
You can:
- **Pan and zoom** using the palm tool, mouse wheel, or zoom handle. - **Select** lanes, nodes, objects, and signals for editing.
- Switch between **2D** and **Scenery** views to inspect the map from different perspectives.

▶ Status Bar and Console

- **Bottom-left** — **Console** (or log): opens messages, warnings, or a command line depending on configuration.
- **Bottom-right** — Context data such as **cell size**, **cursor coordinates** (**X**, **Y**), or scale—useful for precise placement and debugging.

▶ Related

- Account, login & preferences — profile menu and settings.
- Maps overview — switching between user, NCAP, and sample maps.

3 Data Sources & Conversion

Data Sources & Conversion

RepliMap supports real-world map workflows with reference data from multiple sources, including **sensor-drive data** (for example LiDAR, camera imagery, and trajectory), **GeoJSON**, and **raster/satellite imagery**. **Mapbox** satellite context is also available directly in the editor.

This section also covers conversion workflows that speed up map generation. The **HERE to XODR** pipeline is integrated, and additional pipelines (such as **NDS to XODR**) may be available depending on your license and product version.

Use the pages below to understand what each source is used for, how it fits into the editing workflow, and how it connects to OpenDRIVE export.

▸ Topics

Topic	What it covers
GeoJSON	GeoJSON as reference geometry and attributes: CRS, layers, validation.
Mapbox	Mapbox satellite map layers for context and alignment in the editor.
Image	Reference **raster imagery** (orthophotos, scans): georeferencing and use as a backdrop.
Sensor data	Sensor-derived inputs used to position or refine the map (where supported).
HERE to XODR	End-to-end **HERE** → **OpenDRIVE** conversion pipeline: stages, inputs, and XODR output.

▸ See Also

- Maps overview — opening maps and projects before editing.

- Road tool — editing road networks after data is loaded.

GeoJSON

GeoJSON is a common format for vector geodata (points, lines, polygons) with properties. In RepliMap, GeoJSON often appears as **reference geometry** or **imported layers** that you align with roads, lanes, and junctions, or merge into your map pipeline.

▸ Typical Uses

- **Road centrelines** or **boundaries** from GIS tools or open data.
- **Area features** (zones, polygons) that constrain or annotate the map.
- **Point features** (signs, poles, landmarks) as hints for placement or validation.

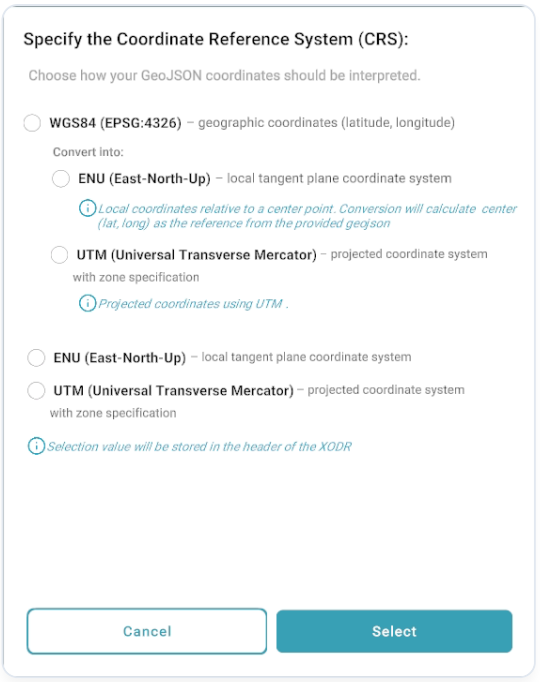
▸ Coordinate Reference (CRS)

GeoJSON is usually **WGS 84** (longitude/latitude). Your project may use a **local** or **projected** CRS internally. When importing:

- RepliMap can convert **WGS 84** GeoJSON to **UTM** (after zone detection) or to **ENU** (using the first GeoJSON coordinate, or the loaded XODR georeference when available).
- If your GeoJSON is already in metre-based coordinates, select the matching CRS option (**ENU** or **UTM**) during import.
- Always choose the correct CRS when aligning to an existing map; a wrong CRS causes visible misalignment and editing errors.
- Preserve **accuracy** near the origin; very large coordinates may need a projected CRS for stable editing.

When you import GeoJSON, RepliMap opens **Specify the Coordinate Reference System (CRS)** so you can choose how coordinates are interpreted.

The dialog offers **WGS84 (EPSG:4326)** (latitude/longitude) with **Convert into: ENU** (local tangent plane from a computed centre) or **UTM** (zone-based projection). You can also pick **ENU** or **UTM** at the top level when your GeoJSON is already in metre-based coordinates in that system. The chosen CRS is stored in the **XODR** header when the map is saved.

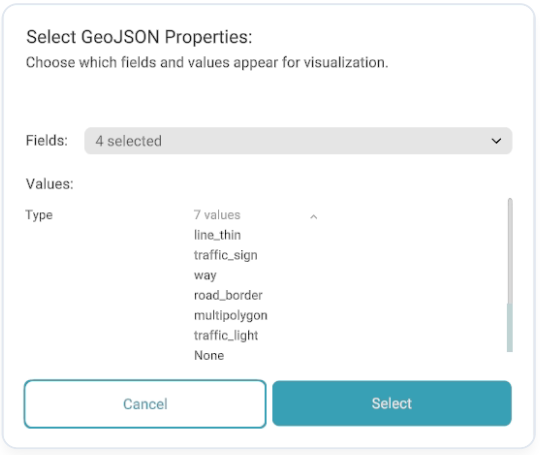


▹ Properties for Visualization

After CRS selection, RepliMap can open **Select GeoJSON Properties:** so you can choose which fields and values are used for drawing the GeoJSON on the canvas. That choice drives how features are grouped for **colouring**: for example, if your features use a property key such as `type`, you can assign a separate colour to each value (`way`, `road_border`, `traffic_sign`, `traffic_light`, and so on).

Use **Fields** to choose which property keys control styling. Under **Values**, RepliMap lists the distinct values for each selected key; only the combinations you include are drawn as separate categories, which keeps complex GeoJSON readable while you align and edit the map.

Keys with **more than 30** distinct values are not available for categorical colouring—high-cardinality fields such as `id` would assign a different colour to almost every feature, which is not useful for visual grouping.



▸ GeoJSON Panel

After GeoJSON is loaded, the **GeoJSON** sidebar keeps reference data under control while you edit: feature styling and visibility, elevation workflows, signals, filtering, and reset actions. The panel follows this broad layout:

1. **GeoJSON features** — display and style features by property.
2. **Elevation** — add or compare elevation and manage deviations.
3. **Signals** — add signal-related data from GeoJSON where supported.
4. **Reset** — clear numeric offsets or related settings.

▹ GeoJSON Features

At the top, the **Field** dropdown chooses which GeoJSON property drives categories (for example `type`). For each distinct value under that field, the list shows a **colour swatch** (edit to change how that category is drawn on the canvas) and a **visibility** toggle so you can show or hide whole categories without removing data.

This matches the property keys and values you chose during import; use it when you want to tune colours or hide clutter while aligning the map.

▹ Elevation

Solid buttons support elevation workflows:

- **Add Elevation** — apply elevation from the GeoJSON or associated processing (behaviour depends on your data and import pipeline).
- **Compare Elevation** — compare against another elevation source or baseline.
- **Save Deviations** — store elevation adjustments you have made.
- **Clear Elevation Markers** — remove elevation markers from the view.

A numeric field with **Reset** clears or zeroes the associated offset or adjustment (for example after experiments).

▹ Signals

Add Signals uses GeoJSON properties to place or derive signals. Because feature properties differ between datasets, reliable automation often needs field mapping—see the **GeoJSON customizations** note at the end of this section.

▹ GeoJSON Filtering

Use the **GeoJSON filtering** master toggle to turn filtering on or off. When enabled, **Z Mean** and **Window** sliders adjust how features are filtered—typically refining which geometry is emphasised using vertical (Z) statistics. Exact behaviour depends on your data and version.

> **GeoJSON customizations**
>
> GeoJSON has no universal property schema, so imports often need source-specific field mapping. Out-of-the-box automation may not support elevation or signal generation for every dataset. Contact us to define the right mapping for safe, reliable import.

▸ Validation

Before relying on GeoJSON in production:

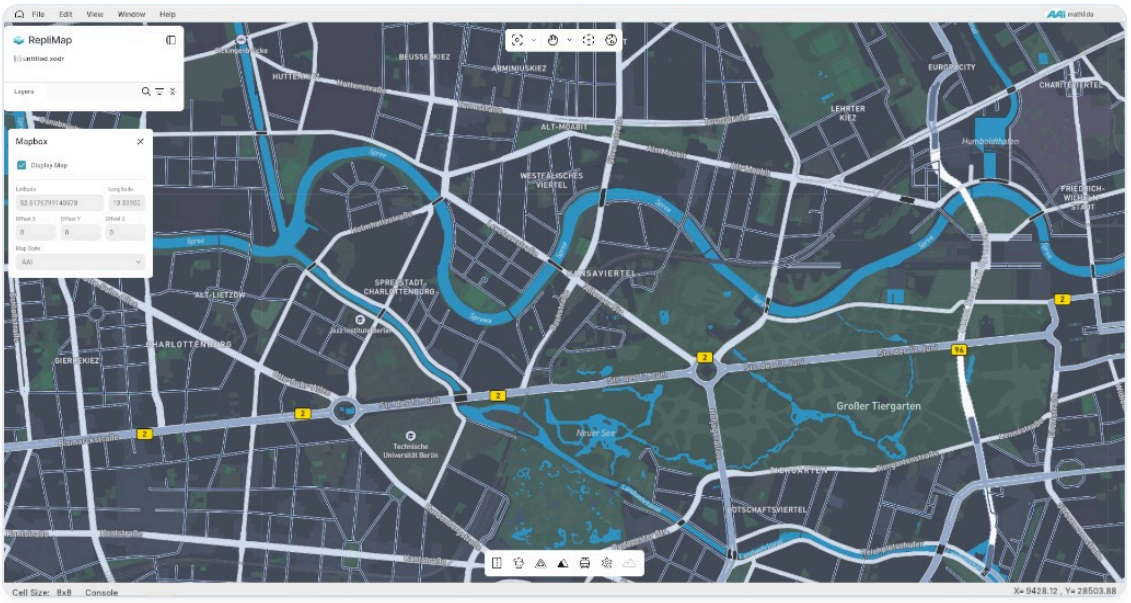
- Check for **invalid geometries** (self-intersections, unclosed rings).
- Ensure **attributes** you need for automation are present in `properties`.

▶ Related

- HERE to OpenDRIVE pipeline — when GeoJSON is an intermediate or sidecar to OpenDRIVE export.
- Sensor data — combining vector reference with sensor-driven refinement.

Mapbox

Mapbox-style layers (raster or vector tiles, or compatible services) give **visual context** while you edit: streets, labels, terrain, or custom styles. They help you **align** RepliMap geometry to the real world without replacing your authoritative HD map data.



▸ Role in RepliMap

- **Basemap** under your editable layers.
- **Orientation** when georeferencing projects or checking drift.
- **Optional** dependency: many workflows work fully offline once imagery or tiles are cached—this depends on your deployment.

▸ Integration Notes

- Respect **terms of use** and **attribution** for any third-party tiles.
- **Performance:** tile zoom levels and cache size affect editor responsiveness on large scenes.
- **Projection:** Mapbox-style maps typically use **Web Mercator** (often **EPSG:3857**). Your project may use a local **ENU**, **UTM**, or another CRS, so the basemap may not match geometry pixel-perfect out of the box. Use the Mapbox **offsets** (below) to fine-tune alignment in **X** and **Y** when needed.

▸ Mapbox Panel

In the **Mapbox** panel you can:

- **Show or hide** the basemap. By default the map display is **disabled** until you turn it on.
- See **latitude** and **longitude** at the top of the panel. These describe the reference location for the Mapbox view (for example the centre used for the layer).

▸ Alignment Using Offsets

If the Mapbox layer does not line up with your road network or reference data, adjust **Offset X**, **Offset Y**, and **Offset Z**:

Offset	Effect
Offset X	Shifts the basemap **left or right** relative to your map.
Offset Y	Shifts the basemap **along the north–south axis** (forward/back in map terms).
Offset Z	Adjusts **vertical** placement (height): moves the basemap **up or down** for a better match to your scene.

Small iterative adjustments are usually easier than a single large correction, especially after changing zoom or pan.

▶ Related

- Image — static orthophotos vs tiled basemaps.
- Main screen overview — where map view and tools interact with the canvas.

Reference Imagery

Raster images—orthophotos, satellite scenes, scanned plans—are often used as a **georeferenced backdrop** so you can trace roads, verify topology, and compare against reality.

▶ Georeferencing

To use an image as a reference you typically define:

- **Position** (translation) and **rotation** in map space.
- **Scale** or **ground resolution** (meters per pixel).
- Sometimes **GCPs** (ground control points) for non-linear correction.

Poor alignment causes **lane drift** at junctions; always verify against **independent** control points when possible.

▶ Formats

Supported formats are currently **PNG** and **JPEG** image files.

▶ Usage in the Editor

- Toggle visibility so vector edits stay readable.
- Adjust **opacity** when tracing over imagery.
- Prefer **recent** imagery for layout; use **design intent** where the photo is outdated (construction, seasonal change).

▶ Improvements

Reference imagery support is an active area of improvement in RepliMap. Use this page together with Releases to track updates to image alignment, visualization, and editing workflows.

▶ Related

- Mapbox — continuous tiled context vs single images.
- GeoJSON — vector overlays on top of imagery.

Sensor Data

Sensor data (LiDAR point clouds, camera imagery, trajectory / pose) helps you **align** and **validate** the HD map against the physical world. RepliMap expects sensor datasets to follow the **folder layout and naming rules** below before import.

▶ Sensor Panel Overview

After sensor data is loaded, use the **Sensor** and **LiDAR configuration** areas to control what appears in the view:

1. **Ego trajectory** — show or hide the driven path (typically **red**) over the map or point cloud.
2. **Camera views** — show or hide camera-frame markers along the trajectory (**green** icons for each captured frame).
3. **LiDAR point cloud** — toggle the **.las** point cloud in the 3D view.

Use the **playback / frame** controls (slider and step buttons) to move through frames; the range matches the rows in the job's metadata CSV. In **LiDAR configuration** you can adjust **height cutoff**, **max tiles**, **sensor height** (see Road height offset below), elevation actions (**Add Elevation**, **Compare Elevation**), and related options so the point cloud lines up with the road model.

The layout groups **layer visibility** (trajectory, cameras, LiDAR) with **playback** and **LiDAR** settings. **Sensor height** should match your rig; it works together with **road height offset** so the point cloud matches the road model.

▶ Supported Folder Layout

To load sensor data into RepliMap, organise files under a **single root folder** you select in the application (below it is called `MyDataFolder`).

```
MyDataFolder
├── MyPointCloud.las              # REQUIRED – at least one .las file
└── MyImagesFolder                # REQUIRED – all camera images and metadata
    └── MyImagesSubFolder         # REQUIRED – one subfolder per SphereCam job
        ├── Job_xxxxx_Sphere.csv  # REQUIRED – metadata for the job (one or more CSVs if
multiple objects)
        ├── Job_xxxxx_Sphere_000001.jpg
        ├── Job_xxxxx_Sphere_000002.jpg
        ├── Job_xxxxx_Sphere_000003.jpg
        └── …
```

▷ Mandatory Checklist

- At least one `*.las` file in the **root** folder.
- An **images** folder (name can match your app configuration).
- Inside that folder, a job subfolder.
- Inside the job subfolder:
- At least one **SphereCam-style CSV** (`Job_<JobId>_Sphere.csv`).
- All `Job_<JobId>_Sphere_*.jpg` images for that job.

> **Keep folder names stable after tiling**
>
> Do **not** rename the main sensor-data folder or child folders after tiles have been generated. Renaming can break references between tiled data, images, and metadata.

▷ Root Folder (`MyDataFolder`)

- This is the directory you choose when loading the dataset.
- Must contain **at least one** LiDAR file in **LAS** format.
- Must contain the **images** folder; its name must match what you configure in the application.

▷ Point Cloud (`.las`)

- Extension: `.las`
- **At least one** file is required in the root folder.

- If several LAS files are present, RepliMap loads all of them and breaks the data into tiles for processing and display.

▹ Images Folder (`MyImagesFolder`)

Contains a single job subfolder for the **camera job** / capture session.

▹ Image Subfolder (`MyImagesSubFolder`)

The job subfolder must include:

- One or more **CSV** files with camera metadata (**SphereCam CSV** is required for that workflow).
- **All** JPEG images belonging to that job.

Do **not** remove or rename individual images relative to the CSV: the application assumes **each CSV row** matches **one image file**, and that **every image** for the job is listed in the CSV.

▶ File Naming

▹ CSV Metadata

Pattern:

`Job_<JobId>_Sphere.csv`

Examples: `Job_01234_Sphere.csv`, `Job_20241015_Sphere.csv`

The `<JobId>` must be consistent with the image filenames in the same folder.

▹ Camera Images (SphereCam)

Pattern:

`Job_<JobId>_Sphere_XXXXXX.jpg`

Examples: `Job_01234_Sphere_000001.jpg`, `Job_01234_Sphere_000002.jpg`

The `<JobId>` in each image name must match the `<JobId>` in the CSV filename for that job.

▶ SphereCam CSV — General Rules

- **Delimiter:** semicolon (`;`) by default (may be configurable in settings).
- **Decimal separator:** dot (`.`).
- **Header row:** not required; columns are read **by position**. Header-like rows that cannot be parsed numerically may be **skipped**.
- **Encoding: UTF-8** recommended.
- **Each row** describes **one image** and its pose.

▸ SphereCam CSV — Full 17-Field Row (Leica-Style Export)

Many SphereCam exports use **17 fields** per line. The index mapping below is **zero-based**:

#	Field	Description
0	**Image file name**	Must match the JPEG in the same folder (e.g. `Job_…_Sphere_00001.jpg`).
1	**Time**	Timestamp.
2–4	**X, Y, Z**	Global camera position (survey / project coordinates).
5	**H**	Camera **height** (ellipsoidal or survey height, depending on export).
6–8	**OmegaDeg, PhiDeg, KappaDeg**	Orientation angles in **degrees** (rotations about X, Y, Z).
9–17	**R11–R33**	**3×3** rotation matrix for camera orientation, usually **row-major** order.

Example excerpt (two lines):

```
Job_20230313_1303_Track01_Sphere_00001.jpg;130466.7118700000;547873.1150645602;5250450.853867861
4;406.9785299627;-106.7567456456;-33.7278665642;195.3433317765;-0.8606026865;-0.0630628213;-0.50
53573949;-0.5089119455;0.0689277990;0.8580545380;-0.0192781671;0.9956264556;-0.0914128721
Job_20230313_1303_Track01_Sphere_00002.jpg;130467.3881470000;547874.4756802312;5250448.300331190
2;407.0071701808;-106.5458193538;-28.6132552230;195.6047250798;-0.8985378447;-0.0621345425;-0.43
44755923;-0.4382320551;0.0725814574;0.8959266699;-0.0241331221;0.9954251507;-0.0924465345
```

Some pipelines produce a **shorter** trajectory-oriented CSV (see below). Use the format that matches your export tool; RepliMap expects **consistent** column counts within a file.

▶ Trajectory CSV — Simplified Five-Column Layout

Some imports use a **minimal** semicolon-separated row with **at least five** fields:

Index	Role	Meaning
0	Image name	JPEG filename for the frame
1	Time	Timestamp for the sample
2	**E**	UTM **easting** (or X in the projected frame)
3	**N**	UTM **northing** (or Y in the projected frame)
4	**U**	Elevation / “up” coordinate

Processing behaviour:

- **Zone-encoded easting:** If column **E** is **≥ 1 000 000**, it may be interpreted as `zone × 1 000 000 + easting`; the zone and true easting are derived from that value.
- **Georeferencing:** The **first** row’s UTM **E/N** can seed lat/long alignment for the trajectory.
- **Road height offset:** Column **U** may be adjusted by `roadHeightOffset` (default often **−2.15 m**) so displayed height follows **road level** rather than the raw sensor height. Align **Sensor height** in the LiDAR panel with your vehicle / rig.

▹ Road Height and Sensor Height

The **Sensor height** value in the LiDAR configuration panel should reflect your sensor mounting height above the road **after** applying any `roadHeightOffset` logic used in your pipeline—so the point cloud and trajectory stay consistent with the OpenDRIVE surface you edit.

▸ Typical Roles

- **Trajectory / pose** — align road geometry to driven paths or logged poses.
- **Ego-centric perception** — cross-check lane markings, boundaries, or objects against map content.
- **Fusion** — combine multiple passes or sensors to reduce noise before export.

▸ Data Handling

- Expect **calibration** metadata (sensor extrinsics, time sync); incorrect calibration misaligns features.
- **Privacy / compliance:** strip identifiers if logs leave controlled environments.

> **Try public sample data**
>
> Want to explore what sensor data looks like in RepliMap?
> Use the public **Berlin HD map sample** on GitHub: automotive-ai/berlin-hd-map-sample.
>
> It includes OpenDRIVE map content and drive-data assets you can load to test sensor-data workflows in the tool.
>
> **Important:** follow the repository license terms. The sample is **not for commercial use** and must not be reused beyond the allowed license conditions.

▸ Related

- GeoJSON — vector layers derived from or compared to sensor outputs.
- HERE to XODR — pipeline outputs may incorporate sensor-corrected geometry.

HERE to OpenDRIVE (XODR)

The **HERE to XODR** pipeline converts HERE source data into **ASAM OpenDRIVE** (`.xodr`) inside RepliMap.

Current pipeline scope:

- Supports **HERE HD Live Maps** input.
- Converts **road geometry** and **traffic signs** layers (including elevation handling in the generated road model).
- Is designed to be extendable to additional layers in future releases.

> **Credentials and coverage required**
>
> RepliMap does **not** include default HERE licenses or API keys.
> You must provide valid HERE credentials and ensure your account has area coverage for the region you want to convert.

▶ Before You Run Conversion

Prepare the following:

1. **HERE credentials** (API/user/client/access keys required by your deployment).
2. **Area definition in GeoJSON** for the region to convert.
3. **Output folder** where RepliMap should write the generated map files.

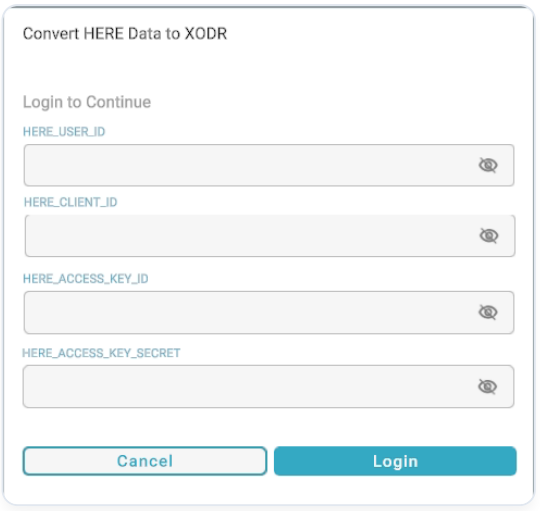
You can create the area polygon quickly with geojson.io and save it as a `.geojson` file.

▶ How It Works

In the conversion flow:

1. Enter your HERE credentials.
2. Select the input `.geojson` area file.
3. Select the output folder for converted map data.
4. Start conversion.

RepliMap then fetches HERE data for the selected bounds, runs conversion, and applies internal geometry optimization/fixes.



▶ Conversion Behavior and Quality Notes

- Conversion can take time because it includes **data fetch**, **conversion**, and **post-processing**.
- The map output on the main canvas is **fully automated** (no manual intervention required during generation).
- Generated maps may still contain minor imperfections (for example small mesh overlaps or local gaps).
- The pipeline aims for **continuous drivable geometry**, but some errors are expected depending on source data and bounds.

After conversion, the map is loaded directly into the canvas. You can then use RepliMap tools to review, fix, and further enhance roads, signs, and other elements.

▶ Related

- Data sources overview — where the pipeline sits in the reference-data workflow.
- GeoJSON — preparing area bounds for conversion.
- Road tool — refining the generated map after import.

4 Road Tool

Road Tool

Use the **Road** workflow to create, edit, and manage drivable road networks. The workflow allows you to place roads, adjust anchors and connections, split geometry where needed, and shape lanes with offsets, sections, widths, markings, and height controls.

▸ Road Tool Active Interface.

While road editing is active, the UI combines:

Component	Description
Canvas	Main area for creating and editing roads. Road elements can be selected and lanes/markings viewed in context. **2D** view is used for layout work, while **3D** view is used for visual checking.
Road / Lane Panel	Displays and allows editing of properties for the selected road or lane, such as size, structure, layout, and markings.
Hierarchy View	Helps locate and navigate roads by ID, especially useful in large projects. See the **Hierarchy panel**.

▹ Selection of Road and Lane

Clicking the **same place** on a road steps through **what is selected**:

Clicks	Selection
Single click	**Road**

Clicks	Selection
Double-click	**Lane section**
Triple-click	**Lane**

> **Important — selection and available tools**
>
> **Tools** in the Road tool group apply according to that selection. If the wrong level is active, an action may be unavailable—for example you generally cannot use **lane height** while only a **road** is selected; switch to a **lane** (triple-click) first.
>
> The **side panels** also change with the selection: **road**, **lane section**, and **lane** each open their own property panel (titles and fields differ by level).

▸ Road Tool Categories

Topic	Description
Create Road	**Adding** and **deleting** roads; default lanes for new roads.
Road anchor	**Anchors** that pin geometry, direction, or continuity along a road.
Connecting road	Dedicated **connecting road** workflow (**coming soon**); until then use **lane slots** on **Create Road**.
Cut road	**Splitting** the road geometry.
Lane offset	**Lateral offset** of the lane centre relative to the reference line.
Lanes	**Add** / **delete** lanes and lane-level editing workflow.
Width tags	**Width along the road**: canvas anchors, **s**-based rules, effect on neighbouring lanes.

Topic	Description
Lane sections	**Boundaries** along the road; **add**, **move**, or **delete** section breaks on the canvas.
Lane marking	**Markings** (lines, colours, meaning) on the pavement.
Lane height	**Vertical** lane / road surface height and transitions.
Road Properties Panel	Identification, road and lane settings, elevation, display options, and advance tools for the selected road.
Lane Properties Panel	Identification, lane configuration, lane properties, and advanced tools for the selected lane.

▶ Related

- Data sources & conversion — importing context before you edit roads.
- Main screen overview — toolbars used with road editing.

Create Road

The **Create Road** tool allows users to add or remove road geometry within the scene. This page explains how to use the tool and manage road geometry effectively.

For details about the main Road tool, the **Road Editing Bar**, and its integration with other sub-tools, refer to the Road Tool Overview.

▸ Add / Delete Roads

Use the **Add/Delete Road** option in the **Road Editing Bar** to create or remove roads. When the **Create Road** tool is selected, **Add Road** is enabled by default.

Action	Steps
Add Road	1. Select the **Create Road** tool from the **bottom toolbar**. 2. **Right-click** on the canvas to place anchor points and define the road path. 3. Continue adding anchors to shape the road as needed. 4. Drag the **blue anchor handles** to adjust the road's curvature and length.
Delete Road	1. Select the **Road tool** in the bottom toolbar. 2. Choose **Add/delete road**, then **Delete road** from the same tool's menu. 3. **Left-click** the road on the **canvas** to remove it.

When a road is created or selected, the **Road Properties panel** opens automatically. The road also appears in the hierarchy panel, allowing you to quickly select and focus it by name or ID.

▸ Default Lanes

A newly created road is configured by default as a **two-lane** road. The lanes are placed on the **right** side of the reference line when viewed in the direction of travel.

In **ASAM OpenDRIVE** terminology, these lanes use lane positions **-1** and **-2**, arranged successively outward from the reference line.

For lane-level modifications such as lane order, width, and lane links, use the **Lanes** workflow and the **Lanes** tools available in the **bottom toolbar**.

▸ Junctions with Lane Slots

Dedicated connecting road segment tool is not available in RepliMap yet (Connecting Road tool).

Until this feature is introduced, junctions are created using the standard Road workflow by connecting lanes through lane slots, instead of using a separate connecting segment

▹ Steps to Create a Junction

1. Place and align the incoming and outgoing roads so their ends meet at the junction point.
2. Click the **lane slot** on an incoming lane to start the connection.
3. Click the **lane slot** on the outgoing lane to complete the connection.
4. Repeat for all lane pairs to complete the junction.

5. Check all connections before finishing.

If lane slots are not visible, turn on **Toggle Slots** in the Road Properties panel under **Display Options**.

▶ Related

- Road tool overview · Road Properties Panel
- Road anchor

Road Anchor

Road anchors are fixed points placed along a road's reference line.

They keep specific locations stable by controlling position (and sometimes direction), even when you edit nearby parts of the road. This helps preserve smooth connections or intentional shapes while you modify the road network.

Reference line drives the map

In **ASAM OpenDRIVE (.xodr)**, geometry and lane topology are anchored to the **reference line**. Moving **anchors** reshapes that line, so **almost everything tied to the road**—lanes, lane sections, links, and related content—moves or updates with it. Adjust anchors deliberately and re-check lanes and junctions after large edits.

▸ Add / Delete Anchor

Action	Description
Select a Road	**Left-click** on the road to select it for editing. When a road is selected, the **Anchor Tool** becomes active by default.
Add an Anchor	With the **Anchor Tool** active and the road selected, **left-click** along the road at the desired location to add a new anchor point.
Move an Anchor	**Left-click** an anchor handle to select it, then drag it to a new position. The reference line and all dependent geometry update automatically in real time.

Action	Description
Delete an Anchor	Open the **dropdown** menu next to the **Anchor Tool** in the **Road Editing** toolbar and select **Delete Anchor**. Then, **left-click** on the desired anchor you want to delete.

▸ When to Use Anchors

- **Stabilize** a bend or straight segment while moving nearby control points.
- **Pin** the start or end of a road to a **junction** or **connecting road**.
- **Constrain** edits so imported geometry does not drift.

Good Practice

- Use the minimum number of anchors needed for your curvature—too many make edits brittle.
- After moving anchors, verify lane offsets and lane sections still make sense along the whole road.

▸ Related

- Create Road · Connecting road · Cut road

Connecting Road (Currently Not Available)

> **Coming soon**
>
> A dedicated **connecting road** tool and workflow in RepliMap are **not available yet**—documentation for that feature will land here when it ships.

A **connecting road** is the road inside a **junction** that joins an **incoming** road to an **outgoing** road. It provides a continuous path for vehicles to travel smoothly through the junction while keeping the road network properly connected.

For Current workflow go to **Create Road — Junctions with lane slots**.

▸ Related

- Create Road · Junctions with lane slots · Lanes · Lane sections

Cut Road

Cut Road (or **Split Road**) is used to divide a road into multiple sections at a selected point. This helps you modify different parts of the road independently, insert junctions, change road properties for specific segments, or remove unnecessary sections from the road network.

▶ Road Cut / Split Editing

Action	Description
Activate Cut Road Tool	Select the **Cut Road Tool** from the **Road Tool** group.
Choose Split Position	Left-click on the road reference line at the position where you want to split the road.
Edit Split Roads	After splitting, two separate road elements are created in the hierarchy. Select each road individually to adjust anchors, lane sections, or other properties independently.
Check the Split Area	Zoom in near the split position to ensure there are no gaps or overlapping zero-length segments between the two road sections.

▶ When to Use Split Roads

- **Insert a Junction** — Split a long road to create space for a junction between road sections.

- **Change Road Properties** — Separate road segments that require different lane counts, speed limits, or other settings.
- **Remove Unnecessary Sections** — Cut out short or unwanted road segments from the drivable network.

▶ After a Cut

- Re-check **lane sections** and **width tags** on each new segment.
- Update **connecting roads** and **anchors** so there are no gaps at the cut position.

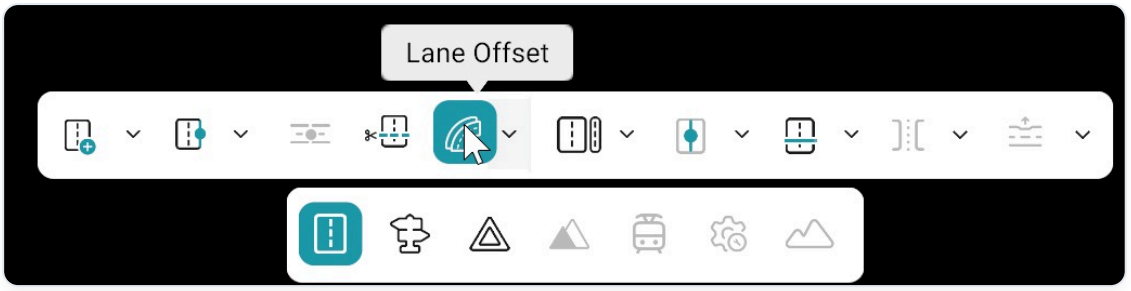
> ⚠ **Topology**
>
> A bad cut can leave **zero-length** segments or **broken** predecessor/successor links. Inspect the junction graph after editing.

▶ Related

- Create Road · Road anchor · Connecting road

Lane Offset

Lane offset is the **lateral distance** between the road's **reference line** (often the centre line or a baseline) and the **centre** of a given **lane**. Offsets define how lanes sit side by side without overlap.



▶ Add / Delete Lane Offset Anchor

Action	Description
Add lane offset anchor	Click on the Lane Offset tool **(Add Lane Offset Anchor mode is enabled by default)**, then left-click on the red reference line to add a new lane-offset anchor
Delete lane offset anchor	Click the dropdown menu next to the Lane Offset tool, then select **"Delete Lane Offset"** option and left-click on anchor to remove
Move lane offset anchor	Select an anchor, drag an anchor point to move it **along the road or across the road**

⚠️ *Rules*

- *Lane-offset anchors modify only lateral geometry; the reference line remains fixed.*
- *Start and end lane-offset anchors cannot be deleted. Only user-added intermediate anchors can be removed.*

▶ When to use Lane Offset

- Use lane offset when you need to move lanes slightly left or right without changing the main road path (reference line).
- Use it to fine-tune or correct lane alignment across the road.
- Make small, step-by-step adjustments to keep the road shape stable and predictable.

Warning

- Large or sudden offset changes between adjacent anchors may cause lane distortion or overlaps.

Good Practice

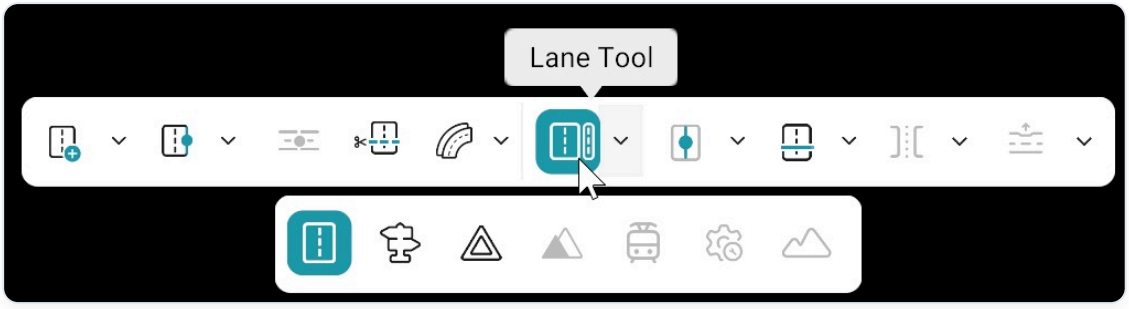
- After moving purple offset anchors, check neighbouring lanes for width and marking rules.
- Offset interacts with lane width and markings. Adjust them together when redesigning a cross-section.
- After large offset edits, re-check junction connectivity, as lane links may need updating.
- Always verify adjacent lane alignment after edits to ensure correct geometry.

▶ Related

- Road anchor

Lanes

A lane is a single drivable strip within a road, defined relative to the road's center line (left or right in OpenDRIVE). Each lane has an ID, type, markings, and width, and it connects to predecessor and successor lanes to define how traffic flows through the network.



▸ Add / Delete Lanes

Use the Add/Delete Lane option in the Road Tool Bar to add or delete lanes. When the Lane tool is selected, Add Lane is enabled by default.

Action	Description
Add lane	1. Select a road from the canvas (Lane Tool will become active). 2. Select the Lane Tool (Add Lane is active by default). 3. Click on either the left or right side of the reference line to add a lane. 4. The lane will be added to the road's lane structure.
Delete lane	1. Select a road from the canvas (Lane Tool will become active). 2. Select the Lane Tool. 3. Open the dropdown and choose **Delete lane**. 4. Left-click on the lane you want to remove.

> **Warning**
>
> This updates OpenDRIVE lane indices and may break junction links, so connectivity should be rechecked after deletion.

▸ Lane Direction and Rules

Category	Description
Direction of Travel	**Arrows** appear on the lane when a road is selected and hovered, showing the Lane's direction relative to the reference line.
Lane Indexing	**Lane indexing follows OpenDRIVE conventions**: • **Negative** indices represent lanes to the left of the reference line. • **Positive** indices represent lanes to the right of the reference line. • **Index** `0` represents the reference line itself.
Restricted / Forbidden Lanes	Any forbidden or restricted lanes should be clearly documented in the scenario description, not just visually represented in the drawing.

Relationships

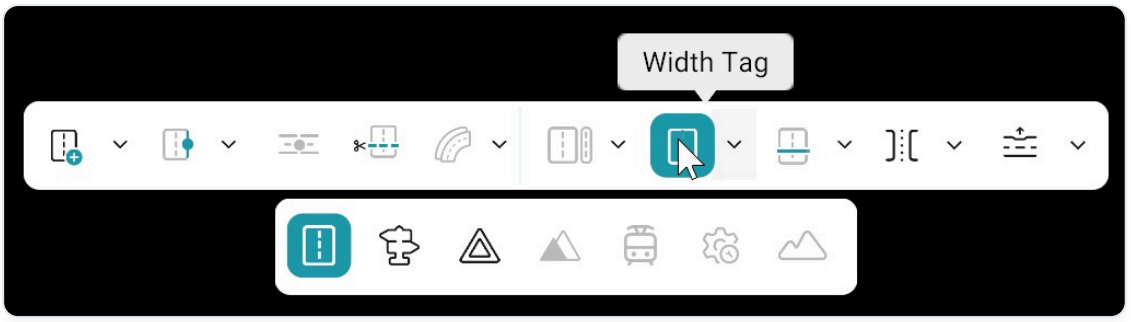
- Each lane is part of a **lane section** along the road.
- **Lane markings** define and separate individual lanes.
- **Lane offset** and **width tags** together describe how lane shape changes along the road.

▸ Related

- Width tags · Lane sections · Lane offset
- Lane marking · Lane height · Lane Properties Panel

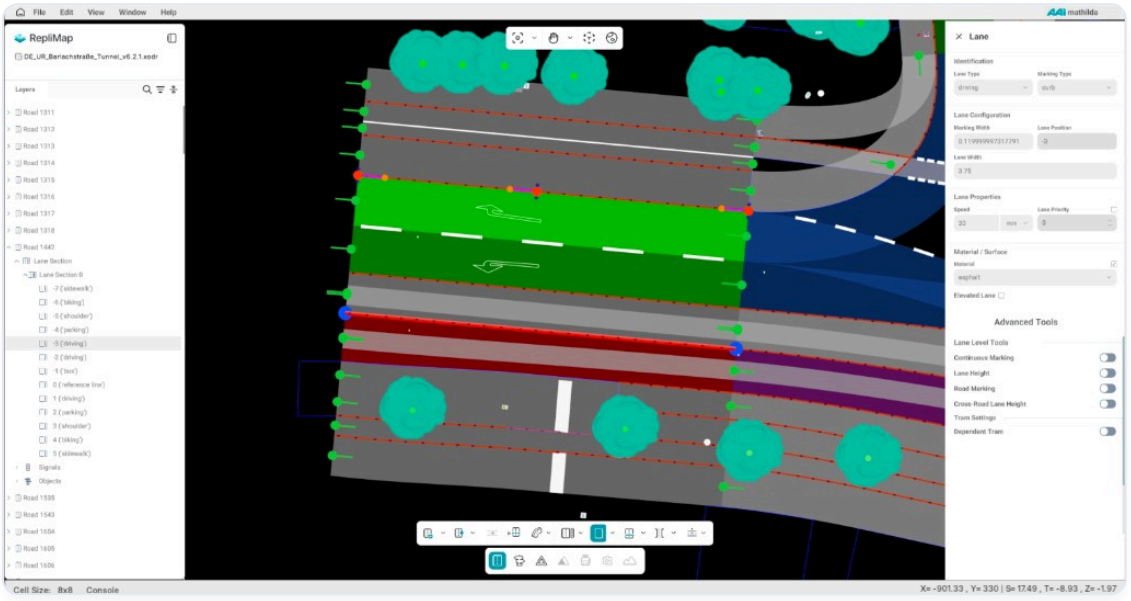
Width Tags

Width tags describe how **lane width** varies with **distance along the road** (station **s** in **OpenDRIVE** terms): **tapers**, **widening**, and **narrowing**. In the editor you often control this with **width anchors** on the canvas while a **lane** is selected.



▸ Canvas: Width Anchors and Lane Width

With a **lane** selected (see Lanes), use **width anchors** on the canvas to align how **width** is distributed along the road.



- **Add and delete width anchors** — **Add** anchors where the cross-section should change along **s**; **remove** anchors you no longer need. Use **Delete anchor** from the **dropdown** next to the tool in the **Road editing bar**, same pattern as other anchor tools.
- **Curvature / path handles** — Use the **large circle** on an anchor to **move** its **position**; use the **small circle** (heading control) to adjust **curvature** / **heading** at that station.

- **Orthogonal to the reference line** — Width edits follow **OpenDRIVE**: lateral offsets are **perpendicular** to the road **reference line**, not arbitrary screen directions.

▹ How Width Changes Affect Neighbouring Lanes

Lane widths are defined **in order** outward from the reference line. Changing the width of an **inner** lane (for example **1** or **-1**) shifts **outer** lanes (**2**, **-2**, …), because each outer boundary builds on the previous lane. Expect neighbouring lanes to move on the canvas when you edit widths near the centre.

▸ Road Panel and Tables

- Width rules are often shown as values keyed by **distance along the reference** (station **s**), per **lane** or road, depending on your UI.
- Values you set in the **Lane** panel's **Lane width** field and related controls stay consistent with **width-anchor** edits on the canvas when the product links them—see **Lane Properties panel** for panel fields.
- Combine width tags with **lane sections** so transitions fall where your scenario needs them.

▸ Usage

- Attach width information to **lane** geometry.
- Keep consistency with **Lane offset** so the total cross-section stays plausible.

▸ Export

OpenDRIVE represents width through **width** entries along lanes; ensure stations (**s**) align with what you author in the editor before export.

▸ Related

- Lanes · Lane sections · Lane offset

Lane Sections

Lane sections partition a lane or road along its length into **stretches** where properties—**width**, **type**, **marking**, **height**—stay **uniform** or follow a defined rule. They are essential for **tapers**, **turn pockets**, and **junction approaches**.

▶ Lane Section Tool on the Canvas

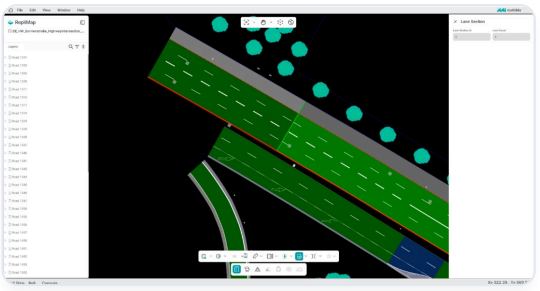
Select the **road** on the canvas, then turn on the **Lane Section** tool from the **Road editing bar** (above the canvas, in the **Road** tool group). The screenshot in the next section shows a **lane section boundary** on the road and the **Lane Section** sidebar.

- **Add a lane section** — **Left-click** on the **selected road** on the canvas to place a new section boundary.
- **Move a lane section** — **Drag** the **handle** on the section boundary (the divider across the road) to slide it along the **length** of the road.
- **Delete a lane section** — Use **Delete lane section** from the **dropdown** next to the **Lane Section** tool in the **Road editing bar** (same idea as **Delete anchor** on other road tools). With delete mode active, **click** the **lane section boundary** on the canvas to remove it.

When you **Cut road**, review lane sections on **both** new segments.

▶ Lane Section Panel

When a **lane section** is selected (often **double-click** the road to select **lane section** level—see selection), the **Lane Section** sidebar lists identifiers for that section. The image shows the canvas with a section boundary and the panel together.



Field	Purpose
Lane section ID	Identifier for this section along the road (often **0**, **1**, … along the reference).
Lane count	Number of lanes covered by this section on that road.

Boundaries should sit at **clear** stations—often aligned to markings or geometry. After moving or deleting sections, update **Width tags** and **Lane marking** if the cross-section or paint rules change.

▶ Why Sections Matter

- Road rules often change **before** and **after** a junction—sections capture that.
- Simulation and AD tools rely on **consistent** lane properties within a section.

▶ Related

- Lanes · Width tags · Lane marking
- Cut road

Lane Marking

The **Lane marking tool** is used to define and customise **lane markings** along the **selected road lane**. You can apply different marking **styles**, **colours**, **widths**, and **patterns** on the same lane according to road design requirements.

On the **canvas**, lane markings are driven by **anchors** placed along the selected lane. Each anchor marks where a lane marking configuration **starts** or **changes**.

▸ Lane Marking Anchors

Lane marking anchors sit **on the lane** and define lane marking **regions** and **transitions**.

- **Several anchors** can exist on the same lane.
- **Different styles** can apply **between** anchors (segment by segment).
- Anchors give **precise control** over how markings change along the road.
- You can **select** an anchor and **drag** it along the road to move its position.

▸ Enable the Lane Marking Tool

You can turn on lane marking in either of the following ways.

▹ 1. From the Lane Property Panel

1. Open the **Lane property** panel (with the target **lane** selected).
2. Go to the **Advanced tool** section.
3. Enable the **Road Marking** toggle.

4. **Add an anchor** at the desired position on the lane.

▹ 2. From the Road Toolbar

1. **Triple-click** the target lane on the canvas so **lane** selection is active (see selection on the canvas).
2. The **Lane marking** icon becomes available in the **Road toolbar**.
3. Select the **Lane marking** tool.
4. Click the **dropdown** arrow next to the tool icon. Two options appear:
   - **Add lane marking**
   - **Delete lane marking**
5. Choose **Add lane marking**.
6. **Click** on the lane where you want to place a lane marking **anchor**.

▶ Delete a Lane Marking Anchor

Anchors can be removed from the **Road toolbar**.

1. Select the **Lane marking** tool in the **Road toolbar**.
2. Open the **dropdown** next to the tool icon.
3. Choose **Delete lane marking**.
4. **Click** the lane marking anchor you want to remove.

▶ Open the Lane Marking Panel

How you open the panel depends on **how** you activated the Lane marking tool.

Activation	Action
From the **Lane property** panel	**Left-click** the anchor to open the **Lane marking** panel.
From the **Road toolbar**	**Right-click** the anchor to open the **Lane marking** panel.

▶ Lane Marking Panel Attributes

The **Lane marking** panel exposes the following properties.

Property	Description
Lane marking type	Lane marking style.
Lane marking colour	Colour of the lane marking.
Lane width	Width of the lane marking.
Lane height	Height / elevation of the lane marking.

▶ Define Line Option

Enable the **Define line** toggle to build **custom** lane marking patterns—for example **dashed** or **segmented** lines.

When **Define line** is on, these extra properties appear:

Property	Description
Length	Length of each lane marking segment.
Space	Gap between lane marking segments.
S offset	Start offset of the marking pattern along the lane (**s**-based position).

▶ Scope and Quality

- Markings cover **longitudinal** lines along lanes (solid, dashed, double, custom dash via **Define line**) and fit **lane sections** and **junction** context.

- Prefer markings that match **local highway rules** for your scenario; misalignment with **lane width** or topology can show up in review and in simulators.

▶ Related

- Lanes · Lane sections · Road tool overview
- Main screen overview

Lane Height

The **Lane height tool** adds height values to the **inner** and **outer** corners of a lane so the selected lane can be **elevated** relative to other lanes on the road.

▸ Lane Height Anchors

Lane height anchors **add** and **control** height transitions along the selected lane.

- **Several anchors** can exist on the same lane.
- Each anchor stores separate **Inner** and **Outer** height values.
- You can **select** an anchor and **drag** it along the lane to move its position.
- When the Lane height tool is **active**, all lane height anchors on the relevant lane become **visible**.

▸ Enable the Lane Height Tool

You can turn on lane height in either of the following ways.

▹ 1. From the Lane Property Panel

1. Open the **Lane property** panel (with the target **lane** selected).
2. Go to the **Advanced tool** section.
3. Enable the **Lane height** tool.
4. **Add an anchor** at the desired position on the selected lane.

▹ 2. From the Road Toolbar

1. **Triple-click** the target lane on the canvas so **lane** selection is active (see selection on the canvas).
2. The **Lane height** tool becomes available in the **Road toolbar**.
3. Select the **Lane height** tool.
4. **Single left-click** on the desired location on the lane to place a lane height **anchor**.

▶ Add or Delete Lane Height Anchors

A **dropdown** arrow next to the Lane height icon in the **Road toolbar** opens a popup menu:

Option	Purpose
Add lane height	Place new anchors (default mode).
Delete lane height	Remove existing anchors.

By default, the tool is set to **Add lane height** mode.

▶ Delete a Lane Height Anchor

1. Choose **Delete lane height** from the dropdown menu.
2. **Click** the lane height anchor you want to remove.

▶ Open the Lane Height Panel

When the Lane height tool is **active**:

- All lane height anchors on the selected lane are **visible**.
- **Left-click** a lane height anchor to open the **Lane height** panel.

▶ Lane Height Panel

The **Lane height** panel exposes the following properties.

Property	Description
Inner	Height offset for the **inner** corner of the lane.
Outer	Height offset for the **outer** corner of the lane.
Linked	Keeps **Inner** and **Outer** height values **synchronised**.

▹ Linked Height Values

- By default, **Linked** is **enabled**—both **Inner** and **Outer** stay the same.
- To use **different** inner and outer heights (for example a **sloped** or **tilted** lane surface):
  a. **Disable Linked**.
  b. Enter separate values in **Inner** and **Outer**.

▶ Lane Height Toolbar Functions

Extra actions appear when the Lane height toolbar is **active**.

▹ Apply Default Height

Applies the **default** lane height values to **all** lane height anchors on the selected lane.

Default	Value
Inner	0.12
Outer	0.12

▹ Reset All Height

Sets **Inner** and **Outer** on **all** lane height anchors for the selected lane to **0**.

▹ Copy Height to Current Group

If the selected lane type is **Curb**, copies lane height values to **all lanes on the right side** of the selected lane.

▹ Copy Height to Both Groups

If the selected lane type is **Curb**, copies lane height values to:

- All lanes on the **right** side of the selected lane.
- All lanes on the **left** side of the selected lane.

▶ Editing Tips

- Use lane height anchors for **smooth** elevation transitions along the road.
- Keep **Inner** and **Outer linked** for **uniform** lane elevation.
- Turn **Linked off** when you need **sloped** or **tilted** lane surfaces.
- After changing heights, check **road continuity** near **junctions** and **adjacent** lanes.
- Use **Reset all height** before **redesigning** lane elevation.

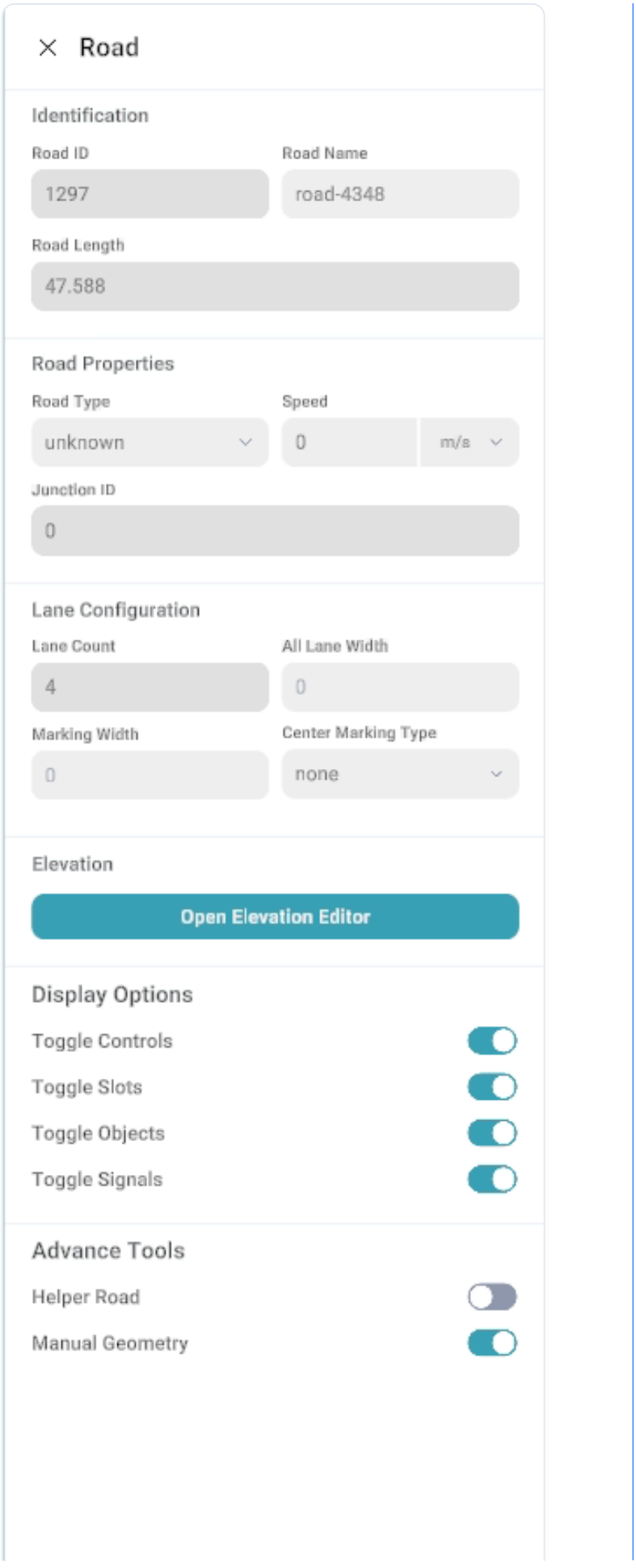
▶ Related

- Lanes · Lane sections · Road tool overview
- Lane marking · Create Road

Road Properties Panel

When you single-click a road with the left mouse button, the corresponding **Road Properties** panel opens on the right side of the canvas.

Road Properties panel screenshot


Road
Identification
Road ID
1297
Road Name
road-4348
Road Length
47.588
Road Properties
Road Type
unknown
Speed
0
m/s
Junction ID
0
Lane Configuration
Lane Count
4
All Lane Width
0
Marking Width
0
Center Marking Type
none
Elevation
Open Elevation Editor
Display Options
Toggle Controls
Toggle Slots
Toggle Objects
Toggle Signals
Advance Tools
Helper Road
Manual Geometry

▶ Sections in the Panel

▹ Identification

Field	Purpose
Road ID	Unique system ID for the road (read-only).
Road Name	Editable name of the road.
Road Length	Total length of the road (read-only, updates automatically).

▹ Road Properties

Field	Purpose
Road type	Category for the road (for example motorway vs urban).
Speed	Design or legal speed with a **unit** (for example **m/s** or **km/h**—check the dropdown).
Junction ID	Associates the road with a junction when applicable (**-1** or empty often means “no junction”).

▹ Lane Configuration

Field	Purpose
Lane count	Number of lanes on this road (road-level default; you can still refine per lane later).

Field	Purpose
All lane width	A uniform width applied across lanes when using this shortcut (use **0** or leave default if you set width per lane elsewhere).
Marking width	Width used for painted markings (centre line, lane separators) where the product applies it at road level.
Center marking type	Style of the **centre marking** between opposing directions (for example **none**, **solid**, **dashed**).

▹ Elevation

Opens the elevation editor for the road's vertical profile. This is used to define and adjust road heights and slopes, and to align the road with terrain or design requirements.

Road Elevation editor screenshot

▹ Display Options

It controls what is shown for the selected road in the editor. They only affect visibility and do not change or delete any data.

Field	Purpose
Toggle Controls	Show or hide edit handles and control points on the canvas.
Toggle Slots	Show or hide lane slots and connection points used for linking roads and lanes.
Toggle Objects	Show or hide objects placed on the road.
Toggle Signals	Show or hide signals such as traffic signs and lights.

▹ Advance Tools

Field	Purpose
Helper road	An extra support path used while creating or editing a main path or shape. It helps guide the process but is not part of the final result.
Manual geometry	Lets you directly control and shape the path yourself instead of the system automatically adjusting it.

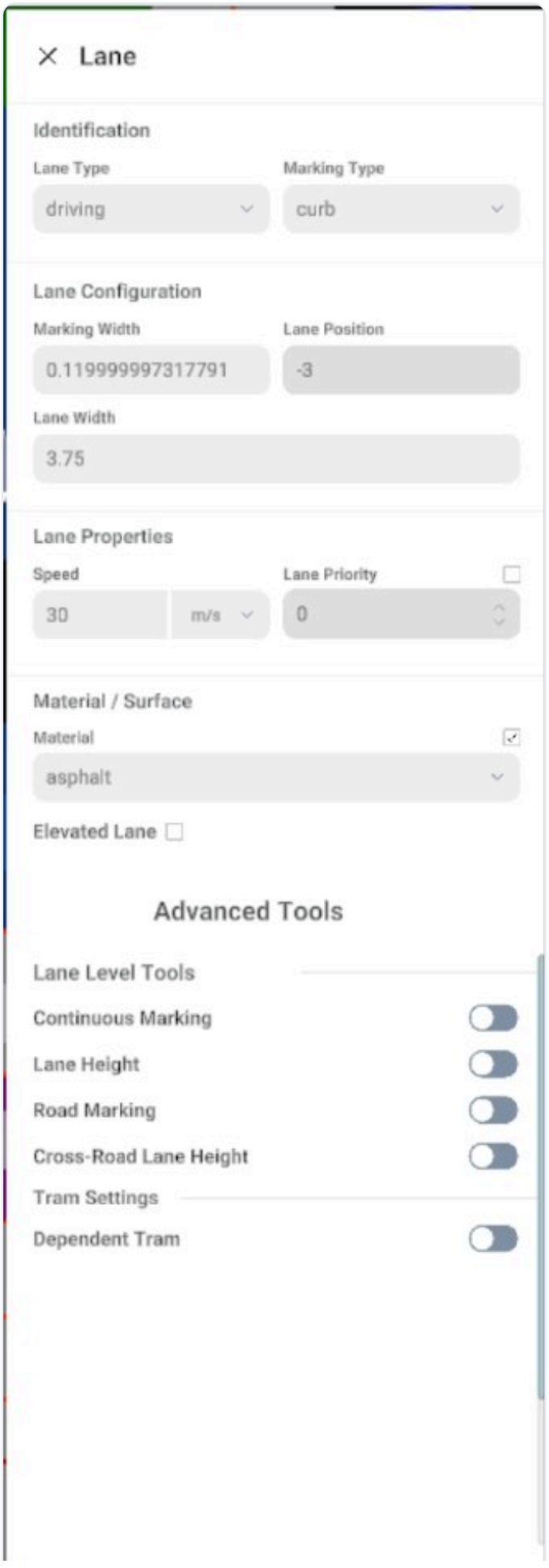
▸ Related

- Road tool overview · Create Road · Road anchor · Lanes

Lane Properties Panel

When you select a lane on the canvas (typically by triple-clicking the road), the **Lane Properties** panel opens on the right side of the editor.

Lane properties panel screenshot


Lane
Identification
Lane Type
driving
Marking Type
curb
Lane Configuration
Marking Width
0.119999997317791
Lane Position
-3
Lane Width
3.75
Lane Properties
Speed
30
m/s
Lane Priority
0
Material / Surface
Material
asphalt
Elevated Lane
Advanced Tools
Lane Level Tools
Continuous Marking
Lane Height
Road Marking
Cross-Road Lane Height
Tram Settings
Dependent Tram

▶ Sections in the Panel

▷ Identification

Field	Purpose
Lane type	Role of the lane (for example **driving**, **sidewalk**, **bus**).
Marking type	Boundary style toward the adjacent lane or shoulder (for example **curb**, line style).

▷ Lane Configuration

Field	Purpose
Marking width	Width of the marking strip at the lane boundary (when applicable).
Lane position	OpenDRIVE **lane index** relative to the reference line (often read-only).
Lane width	Width at the current edit context; detailed width-along-road behaviour is covered under **Width tags**.

▷ Lane Properties and Surface

Field	Purpose
Speed	Design speed with **unit** (for example **m/s**).
Lane priority	Priority hint for routing or simulation.
Material	Surface type (for example **asphalt**).

Field	Purpose
Elevated lane	When enabled, marks elevated or bridge-style lane behaviour.

▹ Advanced Tools

Optional toggles include **lane height**, **road marking**, and **tram**-related options.

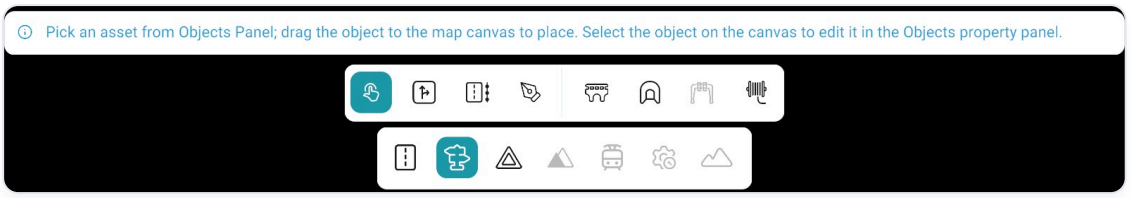
▶ Related

- Road tool overview · Lanes · Width tags
- Lane sections · Lane marking · Lane height

5 Objects

Objects

The **Object Tool** in the **Bottom Toolbar** allows you to add and place different types of objects/Assets in the scene. When activated, the **Object Bar** opens on the screen, providing access to options such as single objects, road painting, repeatable objects, Pen Tool, bridges, tunnels, gantries, and suspended cables.



▸ Objects Tool Active Interface

While object editing is active, the UI combines:

Component	Description
Canvas	Main workspace for placing, selecting, moving, and managing objects in both 2D and 3D views.
Object Tools	Provides object creation and placement tools such as Single Objects, Road Painting, Repeatable Objects, Pen Tool, Bridge, Tunnel, and related editing features (availability may vary by build and licence).
Object Property Panel	Displays and allows editing of the selected object's properties, including position, dimensions, deletion options, and type-specific parameters.

▸ Objects Tool Categories

Topic	Description
Single object	Opens the Objects panel, which contains the complete inventory of individual assets organized into categories such as buildings, poles,

Topic	Description
	trees, signs, barriers, and more.
Road painting	Create and edit road markings using preset markings or custom shapes drawn directly on the surface.
Repeatable objects	User selects a road, creates segments within the road boundary/length, then chooses assets from the Repeatable Objects panel to automatically place them across the selected sections.
Pen tool	The Pen Tool is used to create polygon objects on the map. It allows users to draw custom shapes and freeform layouts directly on the canvas.
Bridge	Allows users to place premade bridges on selected roads.
Tunnel	Allows users to place premade tunnels on selected roads.
Gantry	Allows users to place gantries on selected roads. (Currently disabled.)
Suspended cable	Allows users to add suspended cables between poles and suspended lights.
Object Properties Panel	Identification, preview, placement, dimensions, behaviour, repeat list, and delete object for selected assets.

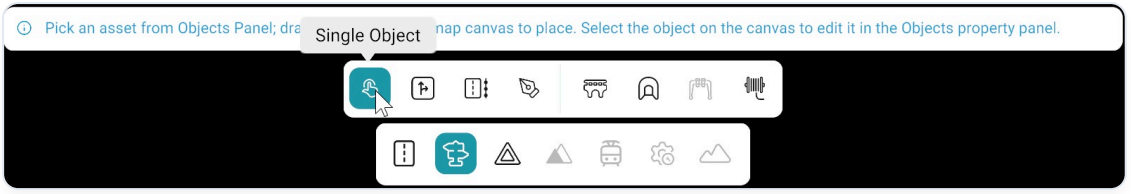
▶ Related

- Road tool — tool used to create and edit roads, including drivable paths, lanes, and road markings.

Single Object

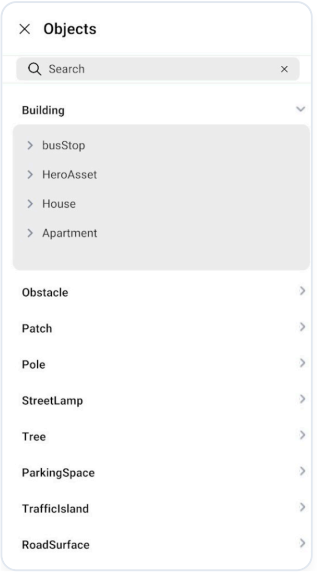
Clicking **Single Object** opens the **Objects Panel** on the right side of the RepliMap canvas, enabling users to add individual objects or assets directly to the map or scene.

Each object is defined according to its type and subtype as specified in the **OpenDRIVE** document, ensuring consistency with the road network model.



The panel provides a variety of object categories, including:

- Buildings
- Obstacles
- Patches
- Poles
- Streetlamps
- Trees
- Parking spaces
- Traffic islands
- Road markings
- Road surfaces



▸ How to Add Single Objects

1. Open the **Objects Panel** to view all available object categories.
2. Browse objects by category or use the **Search Bar** to quickly find an object by name.
3. Select the desired object and **drag** it onto the canvas.
4. **Drop** the object at the preferred location on the map.
5. Click the placed object to open the **Object Properties Panel** on the right side.
6. Configure and update the object's attributes from the properties panel.

▹ Auto Road Selection Tool

The **Auto Road Selection** tool controls which road receives the object when you place it on the canvas.

Setting	Behaviour
Enabled	Objects are automatically added to the **nearest** road.
Disabled	Select the road using **Right-Click** before placing; the object is placed only on the **selected** road.

For complex junctions where automatic detection may be wrong, turn Auto Road Selection off, Right-Click the road you want, then place the object with drag and drop.

▸ Related

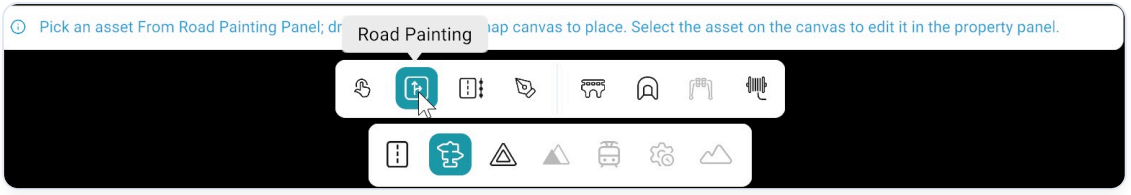
- Objects overview · Object Properties Panel · Repeatable objects · Pen tool

Road Marks (Road Painting Tool)

The **Road Marks** tool is used to place all types of road surface markings on the map. These markings represent real-world traffic guidance elements such as:

- Arrows
- Symbols
- Text markings
- Crosswalks (zebra crossings)
- Lane direction indicators

Road Marks are essential for creating accurate and readable road layouts in RepliMap.

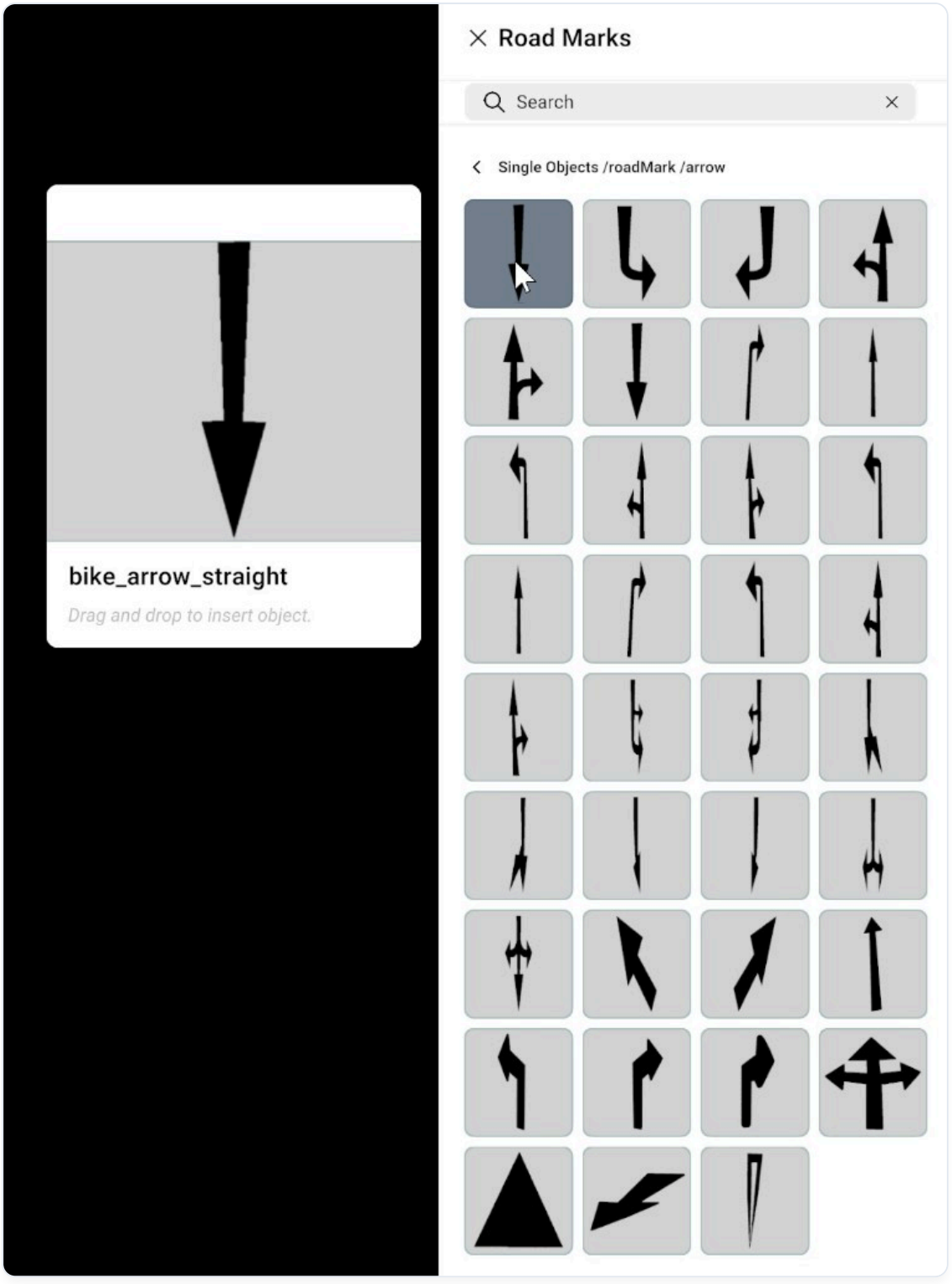


▶ How to Use Road Marks

Road Marks are added using a simple drag-and-drop workflow.

▹ Step-by-Step Process

1. Open the **Road Marks** panel from the bottom bar.
2. Browse through available categories or search by name using the search bar.
3. Select the required road mark object (for example arrow, text, or crosswalk).
4. Drag the selected object onto the canvas.
5. Drop it at the desired position on the road surface.
6. Click the placed object to open the **Object Properties Panel** on the right side.
7. Adjust and configure the object settings as needed.



▸ Auto Road Selection

The **Auto Road Selection** tool controls which road receives the road mark when you place it on the canvas.

Setting	Behaviour
Enabled	Road marks are automatically added to the **nearest** road.
Disabled	Select the road using **Right-Click** before placing; the road mark is placed only on the **selected** road.

For complex junctions where automatic detection may be wrong, turn Auto Road Selection off, Right-Click the road you want, then place the road mark with drag and drop.

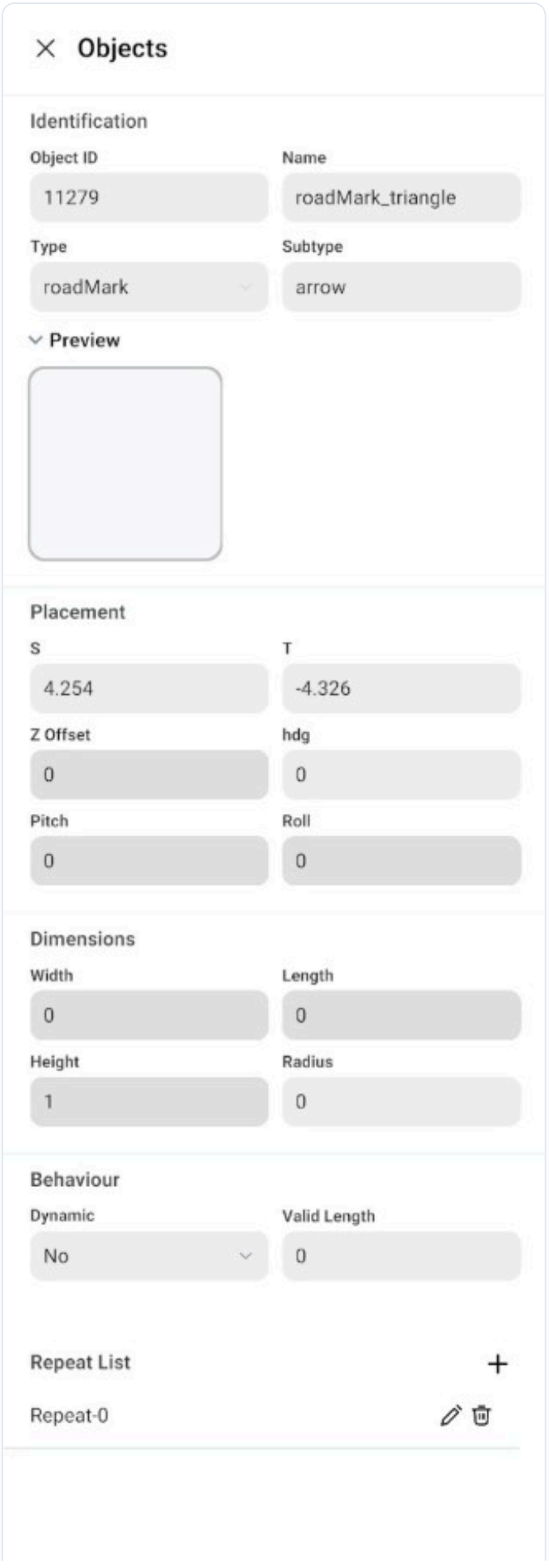
▸ Object Properties Panel

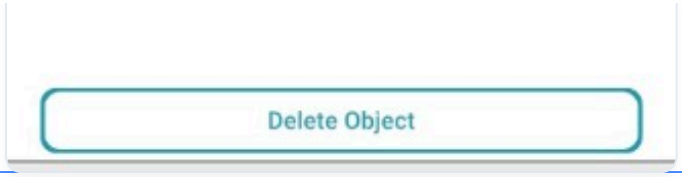
After placing a Road Mark, the **Object Properties Panel** allows you to modify its attributes. It is the same panel as the Object Properties Panel used for other objects.

You can adjust:

- Position alignment
- Rotation (direction of markings)
- Scale (size adjustment)
- Visibility settings
- Style and appearance (depending on object type)

Road mark object properties screenshot


Objects
Identification
Object ID
11279
Name
roadMark_triangle
Type
roadMark
Subtype
arrow
Preview
Placement
S
4.254
T
-4.326
Z Offset
0
hdg
0
Pitch
0
Roll
0
Dimensions
Width
0
Length
0
Height
1
Radius
0
Behaviour
Dynamic
No
Valid Length
0
Repeat List
Repeat-0

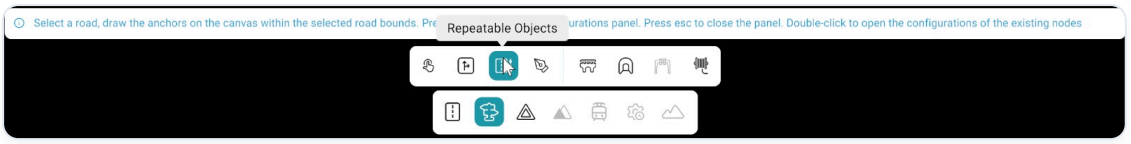


▶ Related

- Objects overview · Pen tool · Single object · Road tool — Lane marking

Repeatable Objects

Repeatable Objects are used to place objects repeatedly along a road path, such as fences, walls, guardrails, hedges, trees, and parking spaces.
These objects can be customized with different spacing, alignment, and repetition settings.

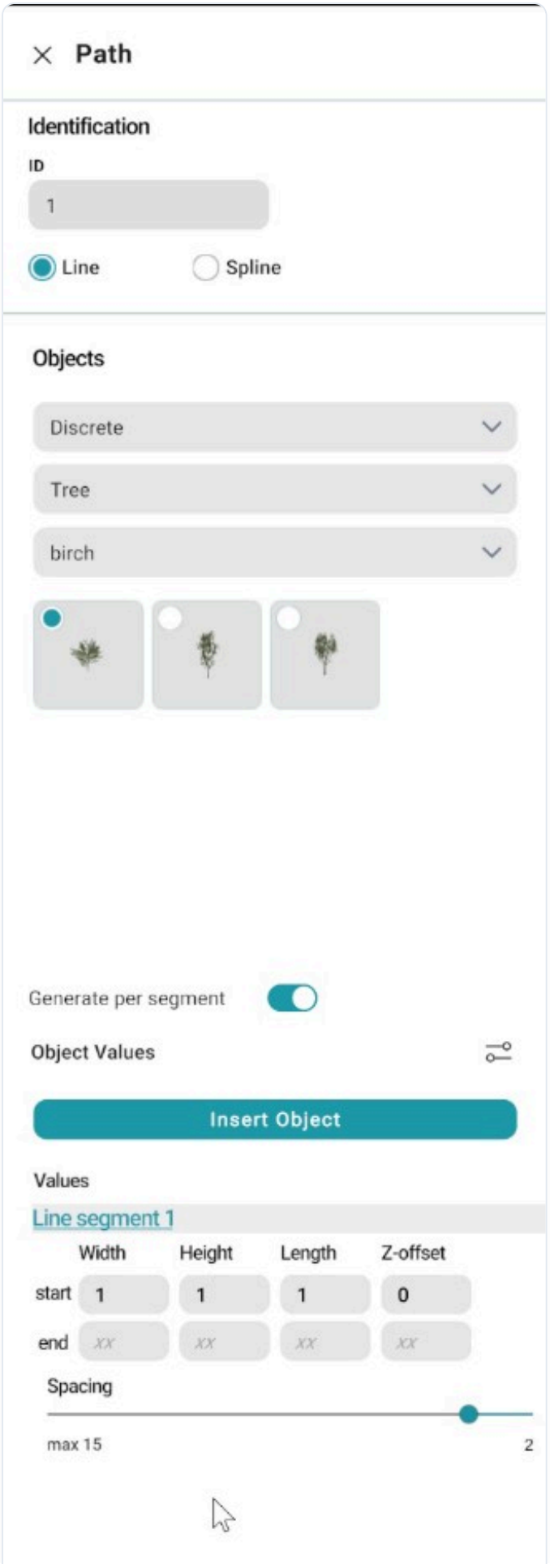


▸ How to Add Repeatable Objects

1. Select the road by **left-clicking** on the location where you want to place the repeatable object.
2. Draw the outline or path of the object along the road using **left-clicks**.
3. After completing the outline, press the **Enter** key.

   Place anchors within the selected road bounds. When the path is complete, **Enter** opens the **Path** configuration panel on the right.
4. In the **Path** panel, configure the required object properties such as:
   - Spacing
   - Alignment
   - Width
   - Height
   - Length
   - Z-offset
5. Choose the required segment type:
   - **Line** — for straight segments
   - **Spline** — for curved segments (available only for Discrete objects)
6. Select the object category:
   - **Discrete** — for spaced objects such as trees and parking spaces
   - **Continuous** — for connected objects such as fences, hedges, and guardrails
7. If required, enable **Generate Per Segment** to edit each segment individually.
8. After configuring all settings, click **Insert Object** to create the repeatable object on the road.

Path panel screenshot


Path
Identification
ID
1
Line
Spline
Objects
Discrete
Tree
birch
Generate per segment
Object Values
Insert Object
Values
Line segment 1
Width
Height
Length
Z-offset
start
1
1
1
0
end
xx
xx
xx
xx
Spacing
max 15
2

▶ Types of Segment

Segment Type	Description
Line	Creates segments in a straight-line format along the selected path.
Spline	Creates segments in curved paths. This option is available only for the **Discrete** object category and is commonly used for placing objects such as trees along curved roads or paths.

▶ Object Types / Categories

Category	Description	Examples
Discrete	Used for objects that require spacing between each repeated object.	Trees, Parking spaces
Continuous	Used for objects that form an uninterrupted structure along the road.	Fences, Hedges, Guardrails

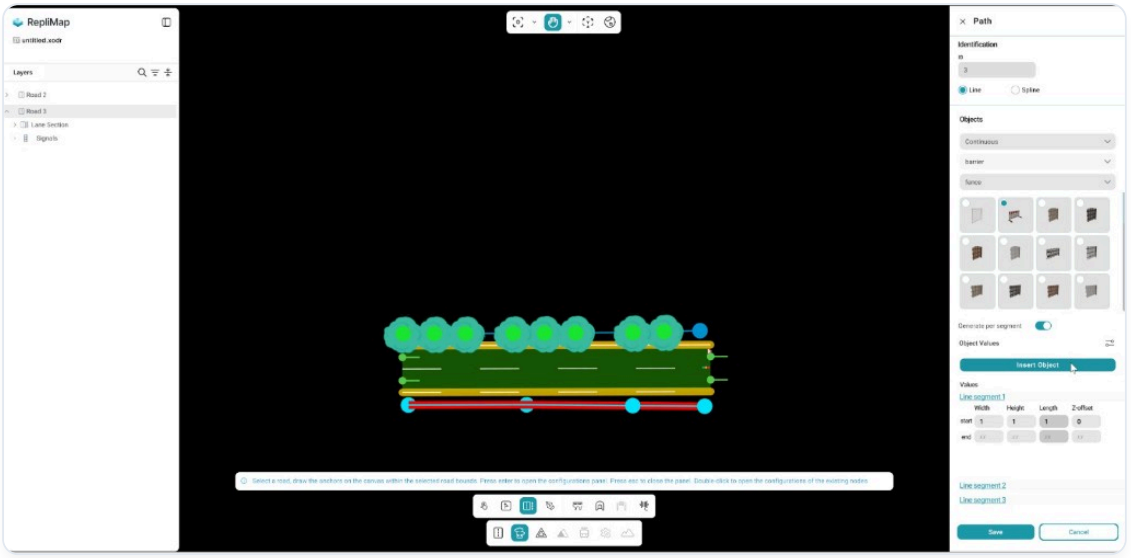
▶ Generate Per Segment Feature

The **Generate Per Segment** feature allows users to edit object properties either segment-by-segment or for the entire object.

Option	Description
Enabled	Allows users to edit each segment individually. Different values can be assigned to different segments. The **Values Bar** allows modification of **Width**, **Height**, **Length**, and **Z-offset** for both the starting and ending points of each segment. After making changes, click **Save** to apply the modifications.
Disabled	Allows users to edit the entire repeatable object as a single unit. Any changes made will apply to the complete object instead of individual segments. The **Values Bar** allows modification of **Width**, **Height**, **Length**, and **Z-offset** for the starting and ending points of the full object. After making changes, click **Save** to apply the modifications.

▸ Insert Object

After assigning the desired values and settings, click **Insert Object** in the **Object Values** section of the **Path** panel to create and place the repeatable object on the road.



▸ Repeatable Object Properties Panel

The **Repeatable Object Properties Panel** is the same as the Object Properties Panel.

After inserting the repeatable object along the road, clicking on the object opens the **Repeatable Object Properties Panel** on the right side of the editor. From this panel, users can modify and adjust the object properties.

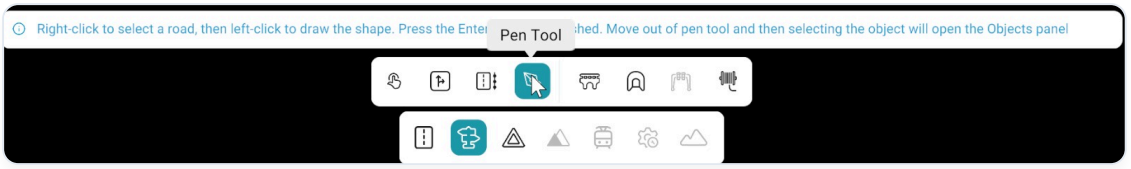
▶ Related

- Objects overview · Single object · Pen tool

Pen Tool

The **Pen Tool** is used to create polygon-based objects on the map. It allows users to draw custom shapes and corners using **left-click** points. The Pen Tool is commonly used for creating:

- Restricted Areas
- Traffic Islands
- Parking Lines
- Road Markings
- Gantries



▸ How to Create an Object Using the Pen Tool

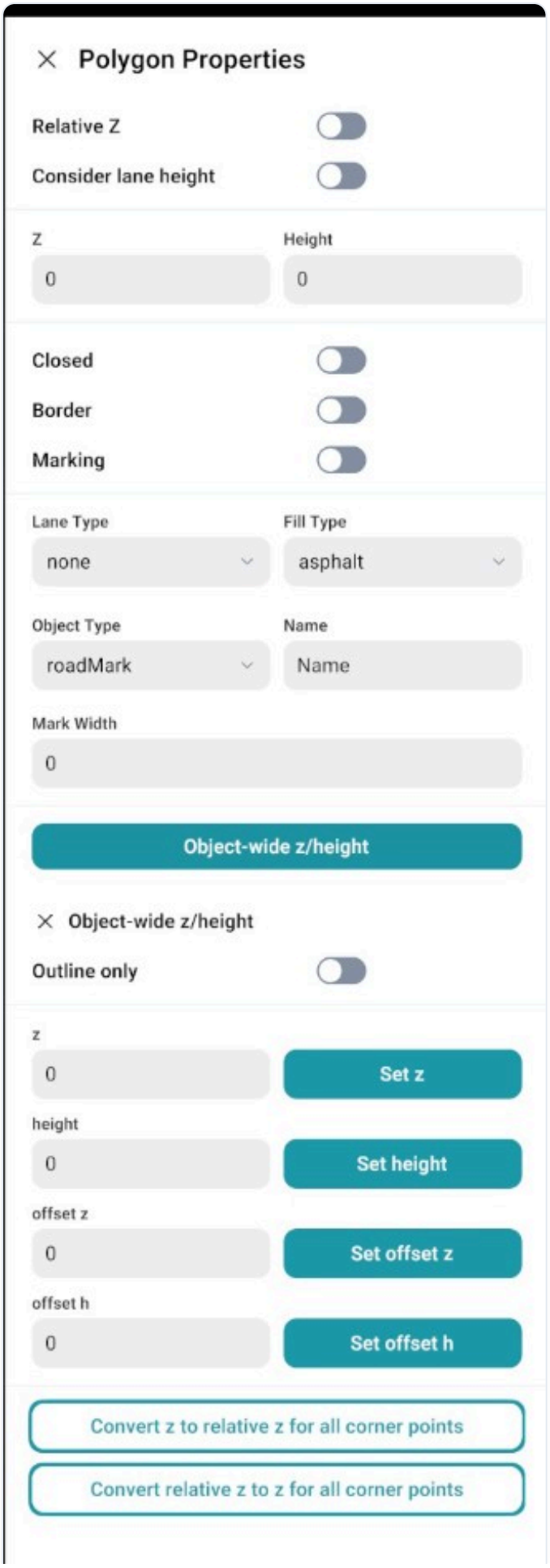
Follow these steps to create an object on the map:

1. **Right-click** on the desired road.
2. Use **left-clicks** to draw the outline of the object.
3. Continue placing points until the shape is complete.
4. Press **Enter** to finalize and create the object.

▸ Polygon Properties Panel

When the **Pen Tool** is selected, the **Polygon Properties Panel** appears on the RepliMap interface. This panel allows you to configure polygon properties.

Polygon properties panel screenshot


Polygon Properties
Relative Z
Consider lane height
Z
Height
0
0
Closed
Border
Marking
Lane Type
Fill Type
none
asphalt
Object Type
Name
roadMark
Name
Mark Width
0
Object-wide z/height
Object-wide z/height
Outline only
z
0
Set z
height
0
Set height
offset z
0
Set offset z
offset h
0
Set offset h
Convert z to relative z for all corner points
Convert relative z to z for all corner points

▹ Polygon Properties

Property	Type	Description
Relative Z	Toggle	Sets the polygon height (Z value) relative to the ground or lane level instead of using an absolute world height.
Consider Lane Height	Toggle	Automatically adjusts the polygon height according to lane elevation.
Z	Numeric field	Defines the vertical position of the polygon from the ground.
Height	Numeric field	Defines the thickness or vertical size of the polygon.
Closed	Toggle	When enabled, the polygon becomes a closed shape by connecting the first and last points. When disabled, the polygon remains open.
Border	Toggle	Adds a visible outline or border around the polygon.
Marking	Toggle	Enables road marking behaviour on the polygon.

▹ Type Selection Options

Option	Type	Description
Lane Type	Dropdown	Defines the lane category associated with the polygon (e.g., driving lane, sidewalk).
Fill Type	Dropdown	Specifies the polygon surface material (e.g., asphalt, grass).
Object Type	Dropdown	Defines the object category (e.g., Traffic Island, Roadmark, Gantry).
Name	Text field	Assigns a custom name to the polygon object.

▹ Polygon Object Properties Panel

The **Polygon Object Properties Panel** functions similarly to the Object Properties Panel.

After creating a polygon object, selecting it opens the **Polygon Object Properties Panel** on the right side of the editor. This panel allows users to view, modify, and adjust the polygon object properties.

▸ Adding a Gantry Using the Pen Tool

1. **Left-click** to select the **Pen Tool**. **Right-click** on the road to select it.
2. **For a single gantry:**
   - Draw three polygon points where you want to place the gantry.
   - Place the first two points at the same position where the gantry starts.
   - Place the third point where the gantry ends.
3. **For a double gantry:**
   - Draw two points on one side of the gantry.
   - Draw two more points on the other side (the opposite end).

After drawing the polygon, open the **Polygon Properties Panel** to set values.

▹ Important Note

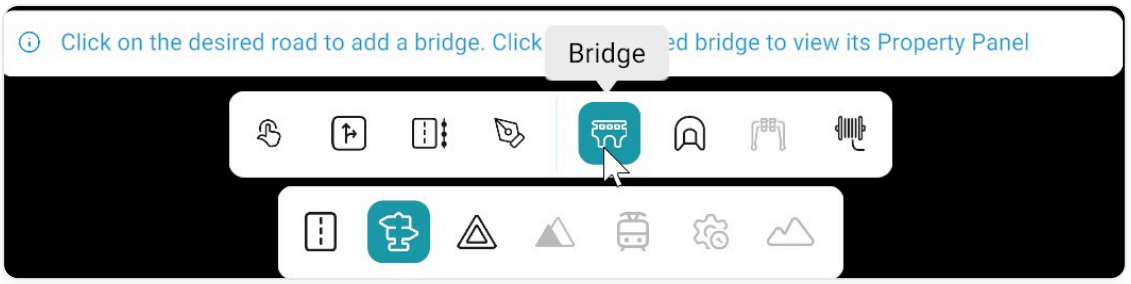
Object-wide **Z** / **Height** is not required for gantry creation and should not be used for gantry objects.

▶ Related

- Objects overview · Gantry · Road painting · Single object

Bridge

The **Bridge Tool** is used to add bridges to the road scene.



▶ Adding a Bridge

1. Select the **Bridge Tool**.
2. **Left-click** on the desired road location.
3. The bridge is automatically placed at the selected position.

▶ Bridge Properties Panel

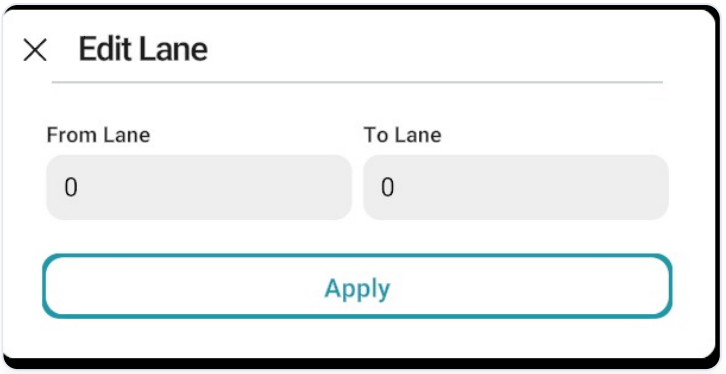
Right-click on a bridge to open the **Bridge Properties Panel**. This panel allows modification of the bridge properties.

Property	Description
S	Defines the starting position of the bridge along the road
Length	Controls the total length of the bridge
Type	Specifies the bridge material or style (for example, concrete)

▹ Lane Validity

Specifies which lanes the bridge applies to on the road. Use **+** to add lane validity rules and limit the bridge to selected lanes.

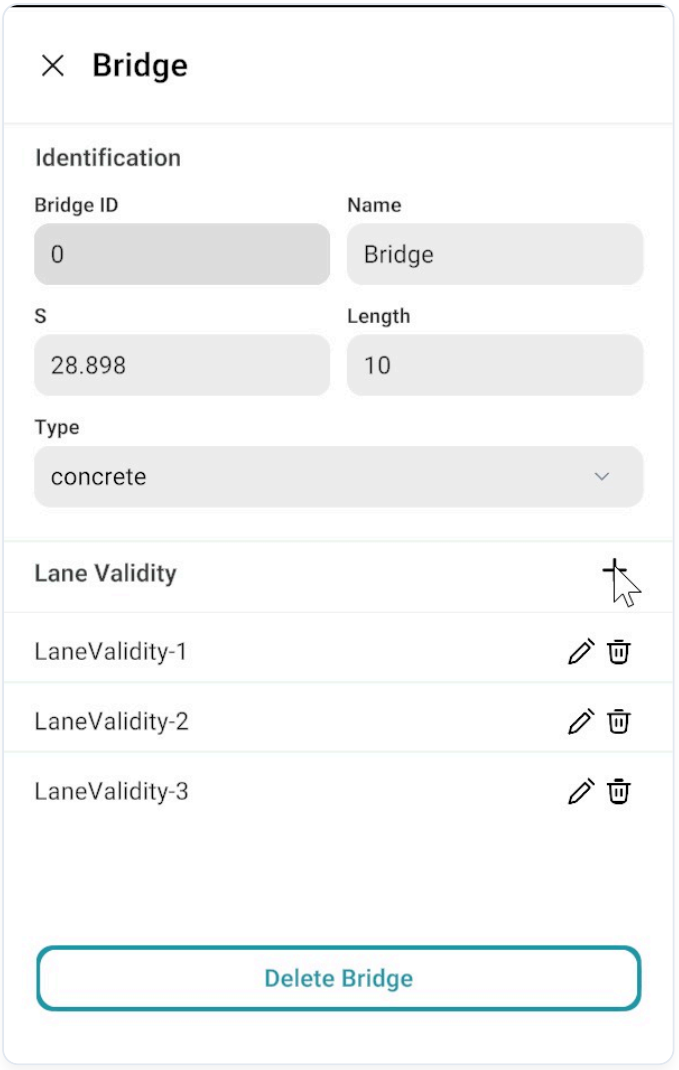
When a rule is added, open the **Edit Lane** dialog. Set **From Lane** and **To Lane** to define the lane range, then click **Apply**.



▶ Delete Bridge

The **Delete Bridge** option removes the selected bridge from the scene.

Bridge properties panel screenshot

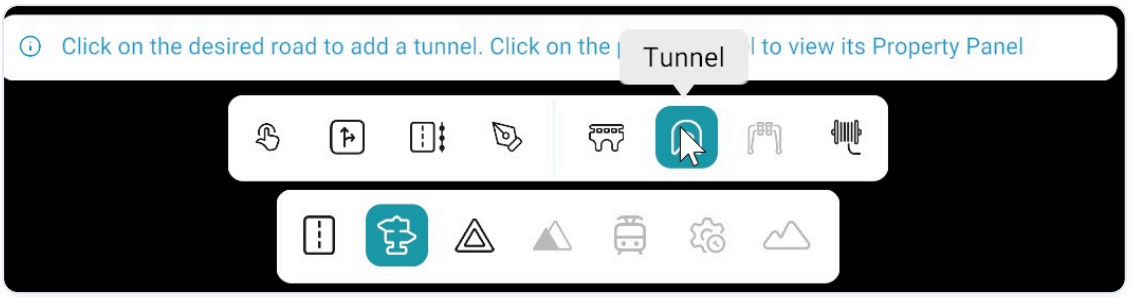


▶ Related

- Objects overview · Tunnel · Road tool · Elevation tools

Tunnel

The **Tunnel Tool** is used to add tunnels to the road scene.



▸ Adding a Tunnel

1. Select the **Tunnel Tool**.
2. **Left-click** on the desired road location.
3. The tunnel is automatically placed at the selected position.

▸ Tunnel Properties Panel

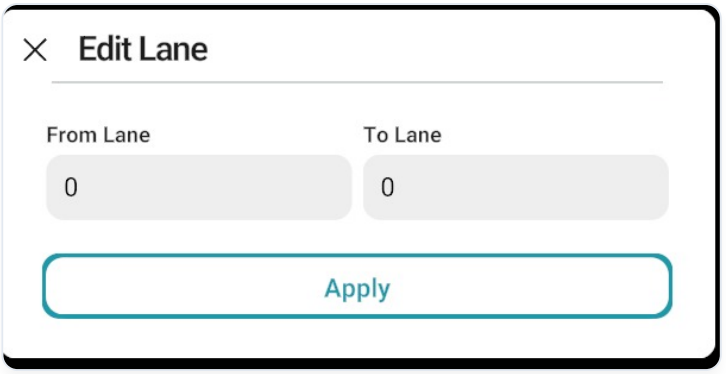
Right-click on a tunnel to open the **Tunnel Properties Panel**. This panel allows modification of the tunnel properties.

Property	Description
Type	Specifies the tunnel type
S	Defines the starting position of the tunnel along the road
Length	Defines how far the tunnel extends

▹ Lane Validity

Specifies which lanes the tunnel applies to on the road. Use **+** to add lane validity rules and limit the tunnel to selected lanes.

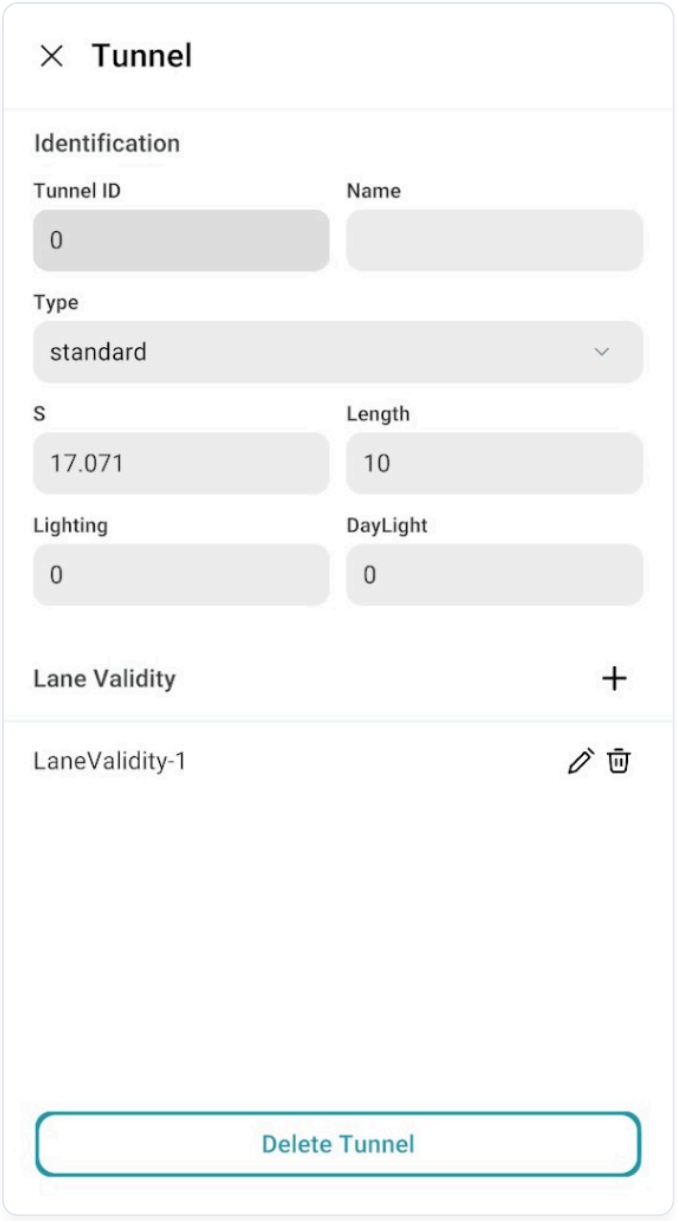
When a rule is added, open the **Edit Lane** dialog. Set **From Lane** and **To Lane** to define the lane range, then click **Apply**.



▶ Delete Tunnel

The **Delete Tunnel** option removes the selected tunnel from the scene.

Tunnel properties panel screenshot



▸ Related

- Objects overview · Bridge · Road tool · Terrain

Gantry Tool (Currently Not Available)

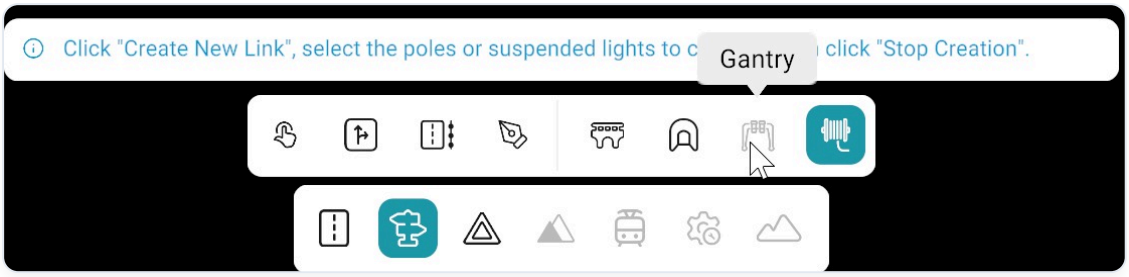
Coming soon

A dedicated **Gantry Tool** workflow in RepliMap is **currently not available**—documentation for that feature will be expanded here when it ships.

The **Gantry Tool** is used to add gantry structures to the map within the RepliMap interface.

Gantry structures are commonly used for:

- Overhead sign supports
- Traffic monitoring systems
- Highway information displays
- Road infrastructure elements



▶ Adding a Gantry

Currently, gantries can be created in two ways:

Method	Description
Gantry Tool	Dedicated tool for creating gantries directly.
Pen Tool	Gantries can also be created manually using the Pen Tool.

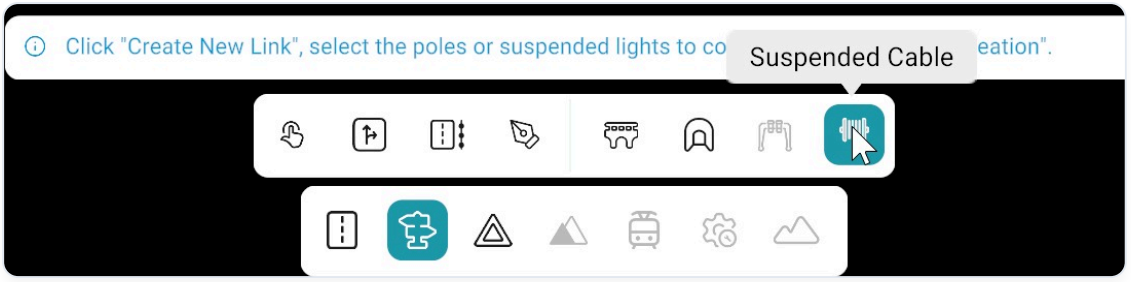
▶ Related

- Pen tool — Adding a Gantry · Objects overview · Signals

Suspended Cable Tool

The **Suspended Cable Tool** is used to create wire connections between poles and suspended lights.

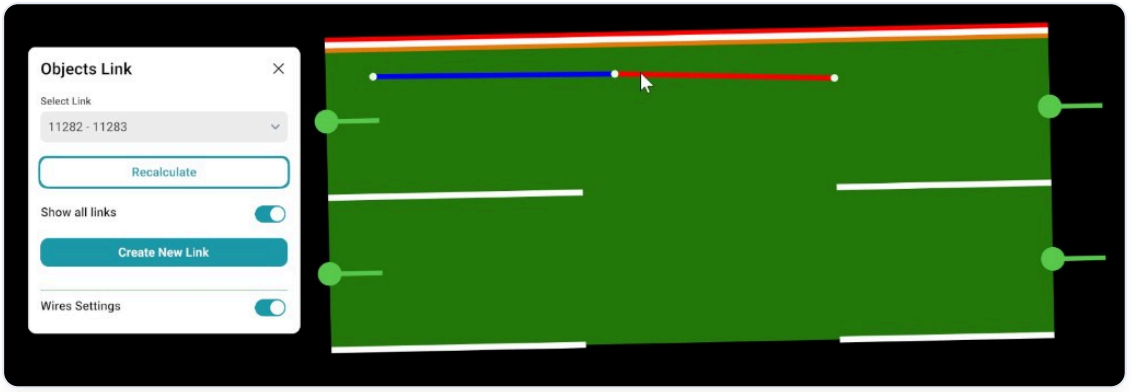
These cables represent real-world overhead wiring systems and help improve infrastructure realism in RepliMap.



▶ How to Create New Links

To create suspended cable connections:

1. Click **Create New Links** in the **Objects Link Panel**.
2. **Left-click** on the first pole.
3. **Left-click** on the suspended light or second pole to connect it.
4. A red link will appear, confirming the connection.
5. Repeat the process for additional connections if required.
6. Once finished, click **Stop Creation**.
7. Enable **Wire Settings**.
8. Adjust wire settings to match real-world appearance.



▶ Wire Settings

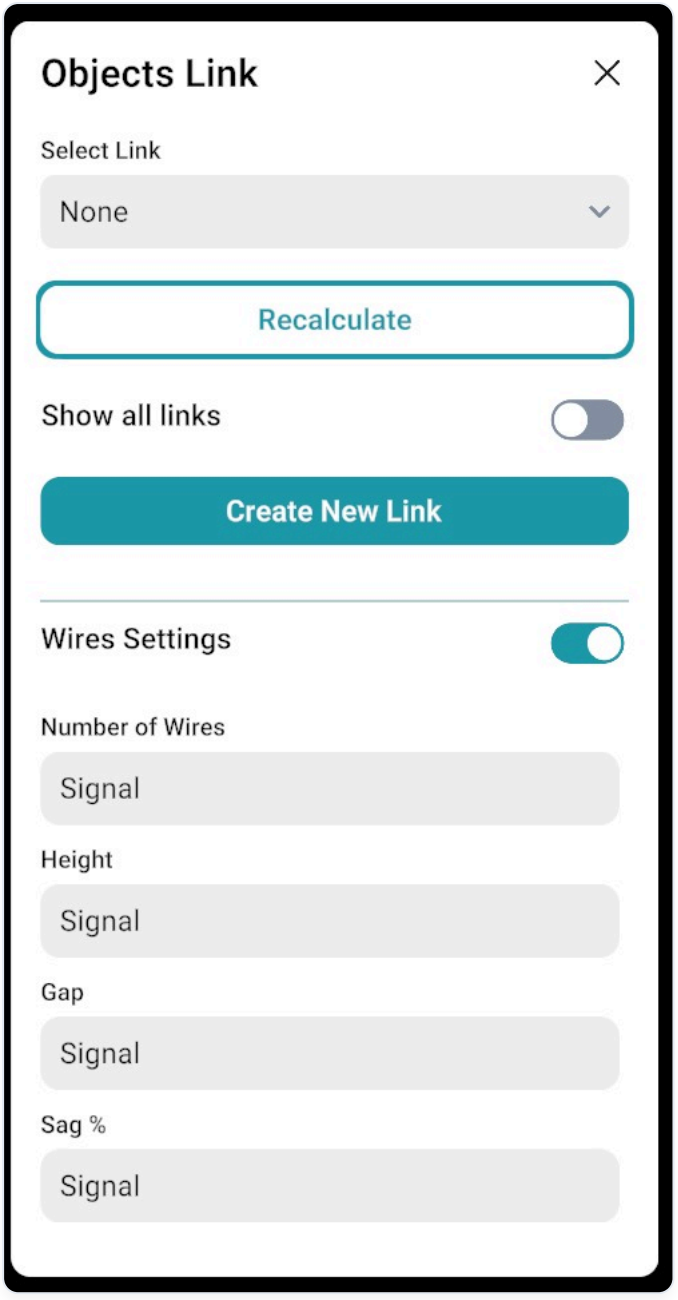
The **Wire Settings** option allows customization of cable appearance and behaviour.

Users can adjust settings to ensure realistic representation of suspended cables in the scene.

▶ Objects Link Panel

Option	Description
Select Link	Displays the list of existing links. Used to view or edit a specific connection.
Recalculate	Updates the selected link when objects are moved or modified.
Show All Links	Toggles visibility of all links in the scene.
Create New Links	Activates link creation mode to connect poles and suspended objects.

Objects Link panel screenshot



▸ Notes

> **Note**
>
> - A red line indicates an active cable connection.
> - Always click **Stop Creation** after finishing link creation.
> - Use **Recalculate** if object positions change.
> - Wire appearance can be adjusted using **Wire Settings** for realism.

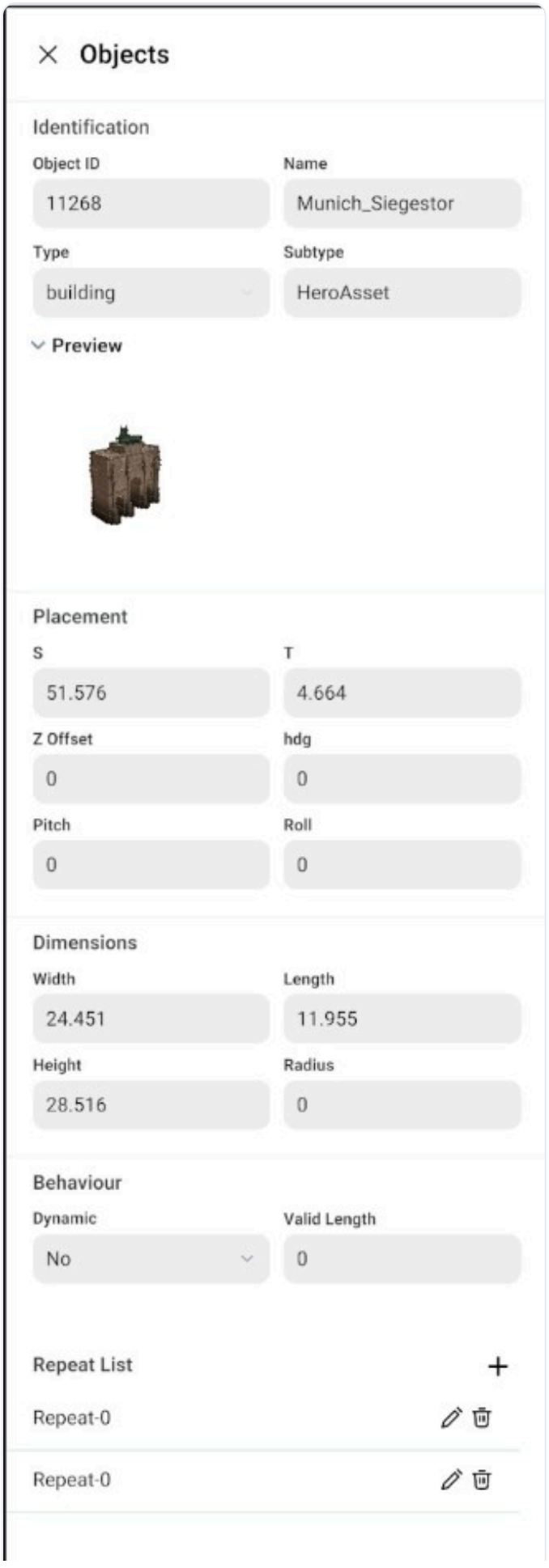
▶ Related

- Objects overview · Pen tool · Gantry

Object Properties Panel

When an object is selected, the **Object Properties Panel** opens on the right side of the editor. The available sections and fields are dynamically displayed based on the selected asset type.

Object properties panel screenshot


Objects
Identification
Object ID
11268
Name
Munich_Siegestor
Type
building
Subtype
HeroAsset
Preview
Placement
S
51.576
T
4.664
Z Offset
0
hdg
0
Pitch
0
Roll
0
Dimensions
Width
24.451
Length
11.955
Height
28.516
Radius
0
Behaviour
Dynamic
No
Valid Length
0
Repeat List
Repeat-0
Repeat-0

▶ Sections in the Panel

▹ Identification

Field	Purpose
Object ID	Internal identifier for this instance (read-only in normal editing).
Name	Asset or instance name as shown in the editor.
Type	High-level category (for example **pole**); often chosen from a dropdown.
Subtype	Finer classification for rules, export, or filtering (for example **bollard**).

▹ Preview

If present, Preview expands to a 3D thumbnail of the selected asset so you can confirm the prop before editing numeric fields.

▹ Placement

Field	Purpose
S	Station along the placement **reference** (longitudinal position), in map units.
T	**Lateral** offset from that reference (left/right), in map units.
Z Offset	Vertical offset measured from the road reference line.
hdg	**Heading** (yaw), in degrees.

Field	Purpose
Pitch	Tilt about the lateral axis, in degrees.
Roll	Twist about the longitudinal axis, in degrees.

For assets placed in world coordinates instead of road-relative S/T, the editor may show X/Y or equivalent fields instead—same meaning as elsewhere in the map.

▹ Dimensions

Field	Purpose
Width	Extent across the object's width, when editable.
Length	Extent along the object's length, when editable.
Height	Vertical extent.
Radius	Radial size for cylindrical or capsule-style props, when used.

Not every asset exposes all dimension fields; fixed templates may keep some values at zero or hide them.

▹ Behaviour

Field	Purpose
Dynamic	Whether the object participates in **dynamic** simulation behaviour (for example **No** for static props).
Valid length	Length used when behaviour or placement rules depend on a valid segment (often **0** when unused).

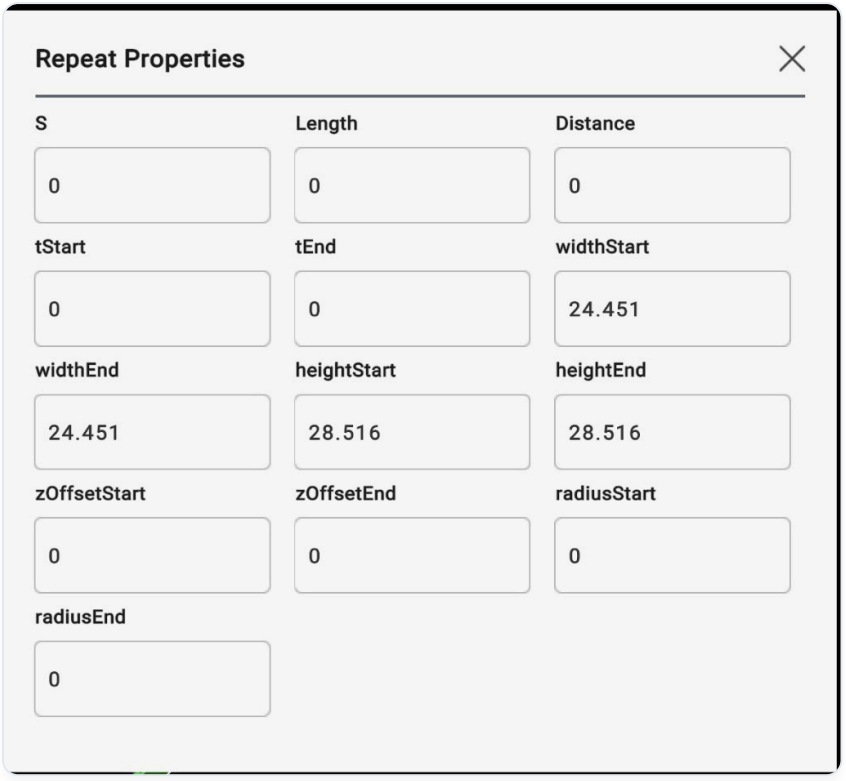
Exact behaviour options depend on the asset and product version.

▹ Repeat List

The **Repeat list** adds entries for objects that are placed multiple times along a path. Each entry controls how one instance is repeated and lets its settings be adjusted separately.

Below is an example of the Repeat List panel, showing how each repeated instance is set and managed.

Repeat properties panel screenshot



▹ Delete Object

Delete an object using the **Delete Object** option at the bottom of the panel, or by using the editor's delete action for the selected object. This removes the object from the scene.

The example below shows the property panel for **Munich_Siegestor** (building, HeroAsset).

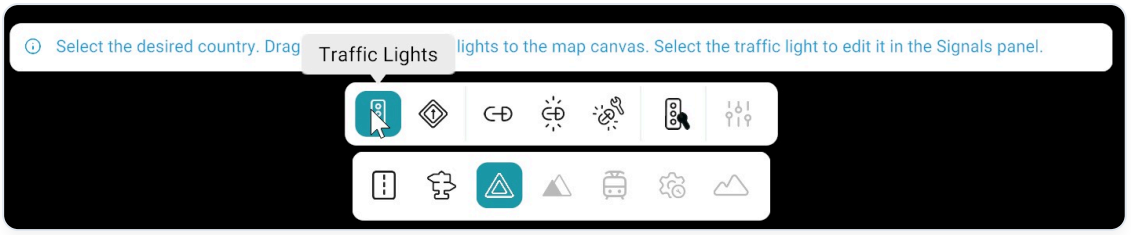
▸ Related

- Objects overview · Single object · Road painting · Repeatable objects · Pen tool

6 Signals

Signals

The **Signals** tool (available in the **Bottom Toolbar**) contains **Traffic Light** and **Traffic Sign** panels, from where you can add traffic lights and signs on canvas and use options such as **Link**, **Link & Snap**, and **Link, Snap & Adjust** to position and align them correctly on the map.
Additional editing options become available when a signal or sign is selected.



▸ Signals Tool Categories

Feature	Description
Traffic Lights	Tool for placing traffic lights with country selection, drag-and-drop placement, and automatic road association.
Traffic Signs	Tool for placing traffic signs using the same workflow as traffic lights, sharing the same properties panel.
Link	Links signs and signals to a pole, allowing manual positioning and Z-offset adjustment after linking.
Link & Snap	Links and automatically snaps items to the pole with support for Z-offset adjustments.
Link, Snap & Adjust	Links, snaps, and vertically aligns items automatically; Z-offset is applied only to the bottom item.
Adjust All	Adjusts the vertical positioning of all linked signs and signals across the map at once.

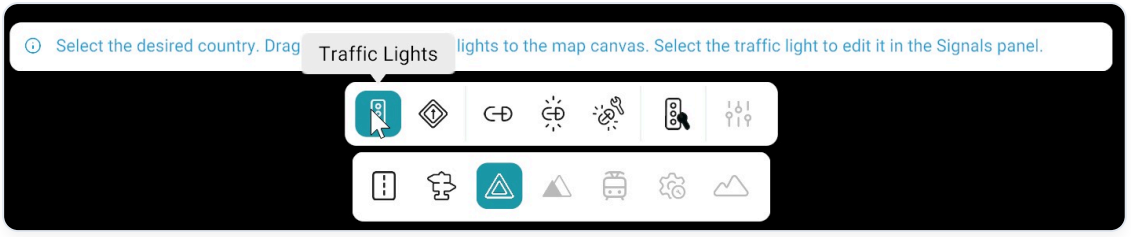
Feature	Description
Controllers	Assigns signals to a junction controller for managing signal behavior within a junction.
Signal Properties Panel	Provides detailed configuration including identification, preview, geometry, attributes, and advanced settings.

▶ Related

- Main screen overview — bottom toolbar and panels used with signal editing.
- Objects — poles and other props often used with linked signs and signals.
- Road tool — road network and lanes that signals reference.

Traffic Lights

Traffic lights can be added to the map using the **Traffic Lights** tool. This tool includes a **Country** selection option, which lets you choose the appropriate Traffic Light type based on a specific country. Traffic Light **types** and **subtypes** follow the **ASAM OpenDRIVE** standard.



▶ How to Add Traffic Lights

Follow these steps to place a Traffic Light:

1. Select the **Traffic Lights** tool.
2. Choose the required **Country** and Traffic Light **type**.
3. Place the Traffic Light on the map using **drag and drop**.

▶ Auto Road Selection

The **Auto Road Selection** tool controls which road receives the Traffic Light when you place it.

Setting	Behaviour
Enabled	Traffic Lights are automatically placed on the **nearest** road.
Disabled	Select the road using **Right-Click** before placing the Traffic Light.

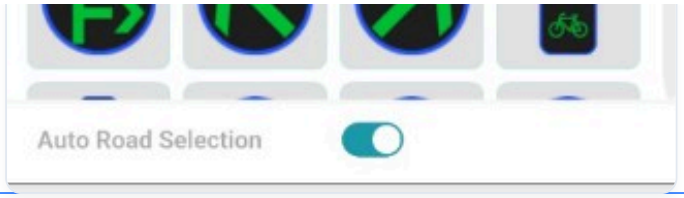
For complex junctions where automatic detection may be wrong, turn Auto Road Selection off, Right-Click the road you want, then place the traffic light with drag and drop.

▶ After Placement

Click on placed Traffic Light on the canvas to edit it in the **Signal properties panel**. The panel uses the same sections and fields described on that page.

Traffic Lights panel screenshot


Traffic Lights
Search
Country
Germany
All
40
50
60



▶ Related

- Signals overview · Traffic signs · Signal properties panel

Traffic Signs

Traffic signs can be added to the map using the **Traffic Signs** tool. This tool includes a **Country** selection option, which allows you to choose the appropriate traffic sign type based on a specific country. Traffic sign **types** and **subtypes** follow the **ASAM OpenDRIVE** standard.

▸ How to Add Traffic Signs

Follow these steps to place a Traffic Sign:

1. Select the **Traffic signs** tool.
2. Choose the required **Country** and Traffic Sign **type**.
3. Place the traffic sign on the map using **drag and drop**.

▸ Auto Road Selection

The **Auto road selection** tool controls which road receives the Traffic Sign when you place it.

Setting	Behaviour
Enabled	Traffic Signs are automatically placed on the **nearest** road automatically.
Disabled	Select the road using **Right-Click** before placing the Traffic Sign.

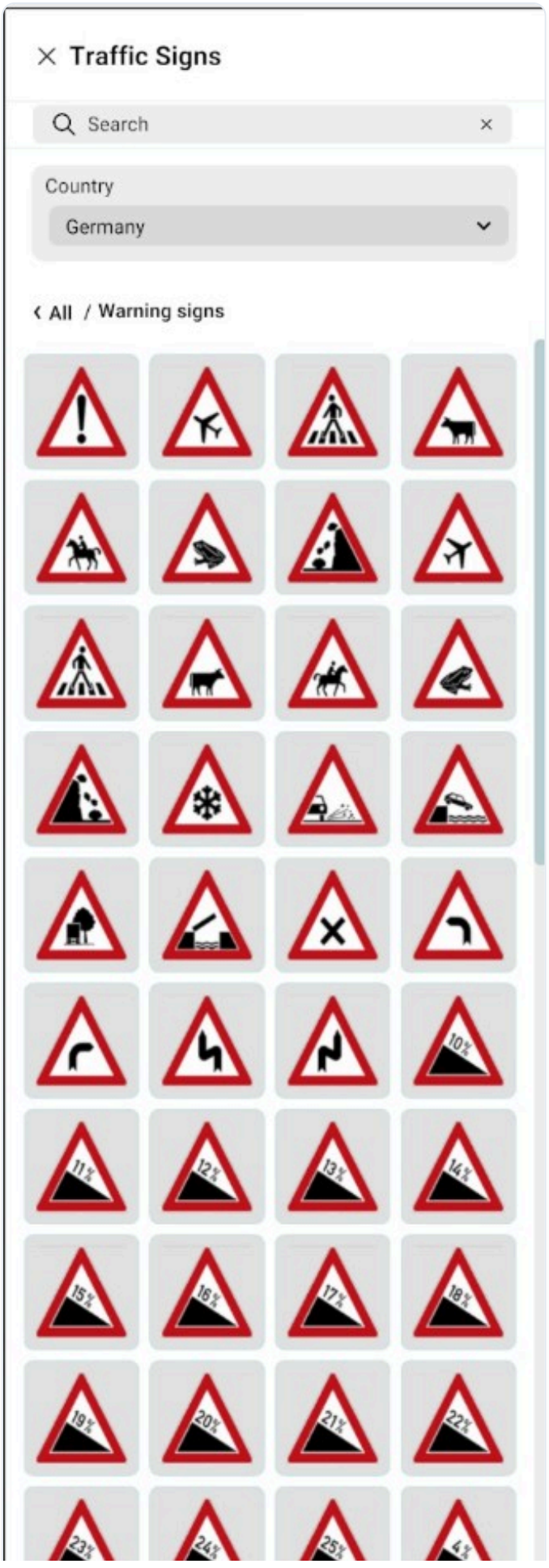
For complex junctions where automatic detection may be wrong, turn Auto road selection off, Right-Click the road you want, then place the traffic sign with drag and drop.

▶ Signal Properties Panel

The **Signal Properties** panel is used to configure and manage selected Traffic Signs. It uses the **same sections and fields** as for Traffic Lights.

For field-by-field details, see **Signal Properties Panel**.

Traffic Signs panel screenshot

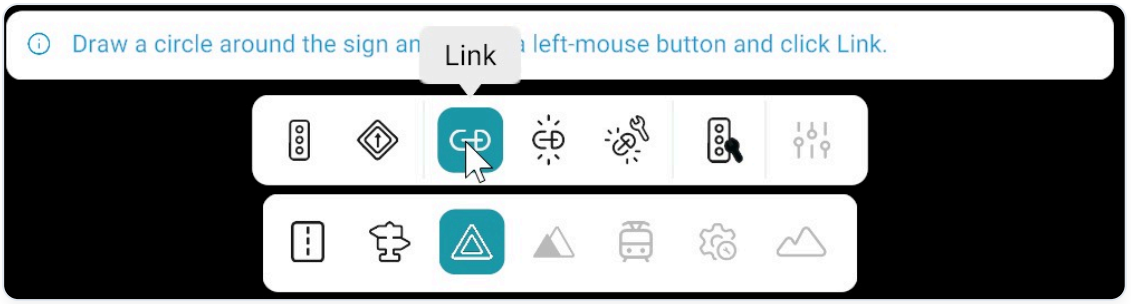

Traffic Signs
Search
Country
Germany
All / Warning signs

▶ Related

- Signals overview · Traffic lights · Signal Properties Panel

Link

The **Link** tool connects multiple **traffic signs** and **traffic signals** to a **single pole**. It links the items without changing their position, allowing you to manually adjust their placement and **Z-offset** after linking.



▶ How to Use Link

Follow these steps to link signs and signals to a pole:

1. Activate the **Link** tool in the **Signal bar**.
2. Draw a **circular selection** around the pole and all signs and signals you want to link.
3. Click **Link** from Right side panel.

The selected signs and signals are linked to the pole.

▶ After Linking

Adjust **position** and **Z-offset** for **each** linked sign or signal so they sit correctly on the pole. RepliMap does not snap or align them for you when you use **Link** alone.

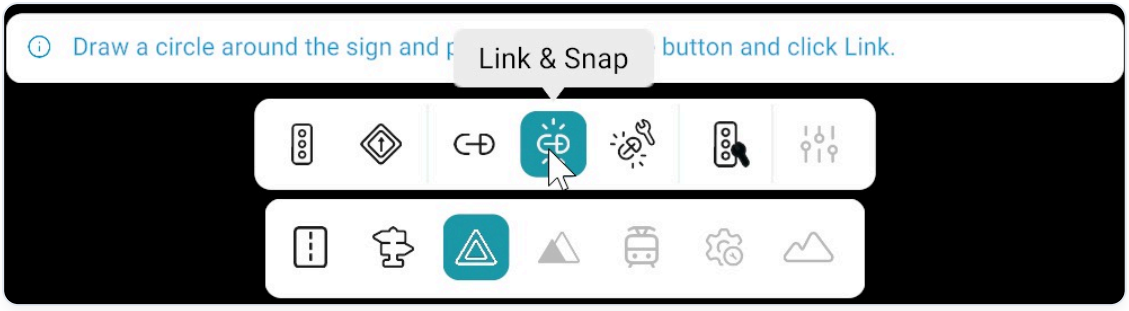
▶ Related

- Signals overview · Link & Snap · Link, Snap & Adjust · Objects — Single object

Link & Snap

The **Link & Snap** feature allows you to connect multiple **Traffic Signs** and **Traffic Lights** to a pole and automatically position them in a structured way. After linking, you may still need to adjust the **Z-offset** for proper vertical placement of all items.

For linking without snapping, see Link. For automatic vertical alignment, see Link, Snap & Adjust.



▸ How to Use Link & Snap

Follow these steps:

1. Activate the **Link & Snap** tool from **signal bar**.
2. Draw **circular selection** around the desired pole, traffic signs, traffic lights.
3. Click on **Link** button from right panel.

All selected **Traffic Signs** and **Traffic Lights** will be linked and automatically snapped to the Pole.

▸ After Linking

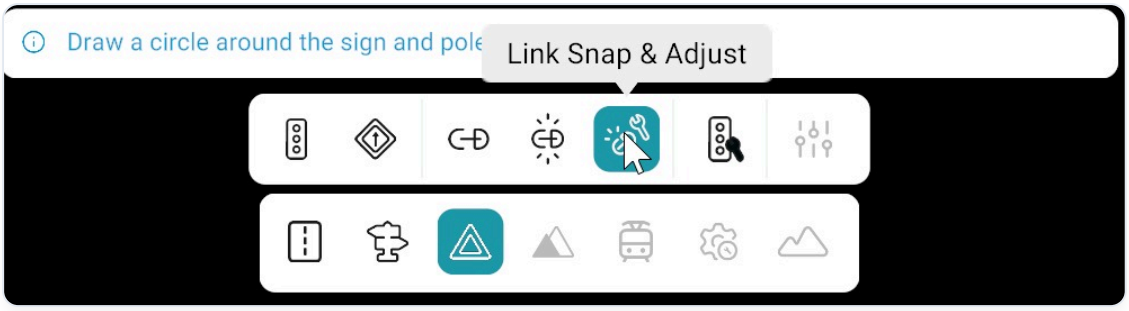
Adjust **Z-offset** for each linked sign or light to fine-tune height on the pole. Horizontal placement is handled by the snap step.

▸ Related

- Signals overview · Link · Link, Snap & Adjust

Link, Snap & Adjust

The **Link, Snap & Adjust** feature allows you to connect multiple **Traffic Lights** and **Traffic Signs** to a pole and automatically position them with accurate vertical alignment.
Only the **Z-offset** of the bottom **Traffic Light** or **Traffic Sign** needs to be adjusted, as all other linked items are automatically aligned with the pole.



▶ How to Use Link, Snap & Adjust

Follow these steps:

1. Activate the **Link, Snap & Adjust** tool from the **signal bar**.
2. Draw a circular selection around the desired pole, **Traffic Signs**, and **Traffic Lights**.
3. Click **Link** from Right panel.

Selected **Traffic Signs** and **Traffic Lights** will be linked, snapped, and aligned to the pole.

▶ Comparison: Link Tools at a Glance

Tool	Links to Pole	Snaps to Pole Position	Auto Vertical Alignment	Manual Adjustment Required
Link	Yes	No	No	Position + Z-offset of all signals

Tool	Links to Pole	Snaps to Pole Position	Auto Vertical Alignment	Manual Adjustment Required
Link & Snap	Yes	Yes	No	Z-offset of all signals
Link, Snap & Adjust	Yes	Yes	Yes	Z-offset of bottom signal only

---

▶ After Linking

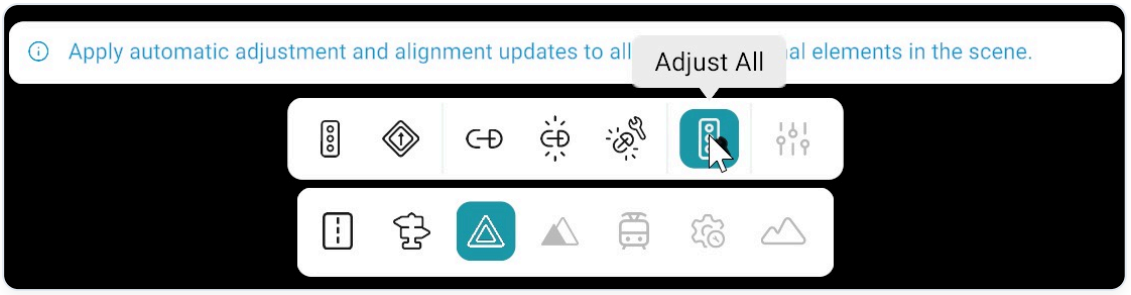
Set **Z-offset** for the **bottom Traffic Light** or **Traffic Sign** only. All other linked items follow the pole's vertical alignment automatically.

▶ Related

- Signals overview · Link · Link & Snap

Adjust All

Adjust all lets you adjust the **vertical** position of Traffic Signs and Lights across the whole map in one action, instead of editing each instance separately.



▶ How to Use Adjust All

Follow these steps:

1. Click on **Signals** tool and open the **Signal bar**.
2. **Left-click** on **Adjust all** from signal bar.

RepliMap applies the vertical adjustment to **every** sign and signal on the map at once.

▶ Related

- Signals overview · Signal properties panel · Link, Snap & Adjust

Controllers (Currently Not Available)

Controllers are used to manage Traffic Signals within a Junction. They define which signals belong to a specific Junction and help coordinate their behaviour and timing.

▶ Controller Panel

In the **Controller panel** (available from the **Left sidebar**), you can create and manage controllers. The map displays all available **Junction IDs**, which can be assigned to controllers for signal management.

▶ How to Assign Signals to a Controller

Follow these steps:

1. View the available **Junction IDs** on the map.
2. Select the required **Junction ID** from the **Map Junction** list.
3. The selected junction will appear in the **Junction bar**.
4. Add all **Traffic Signals** that belong to this junction.
5. The selected signals will appear in the **Signals bar**.

> **Note**
>
> This feature is currently disabled.

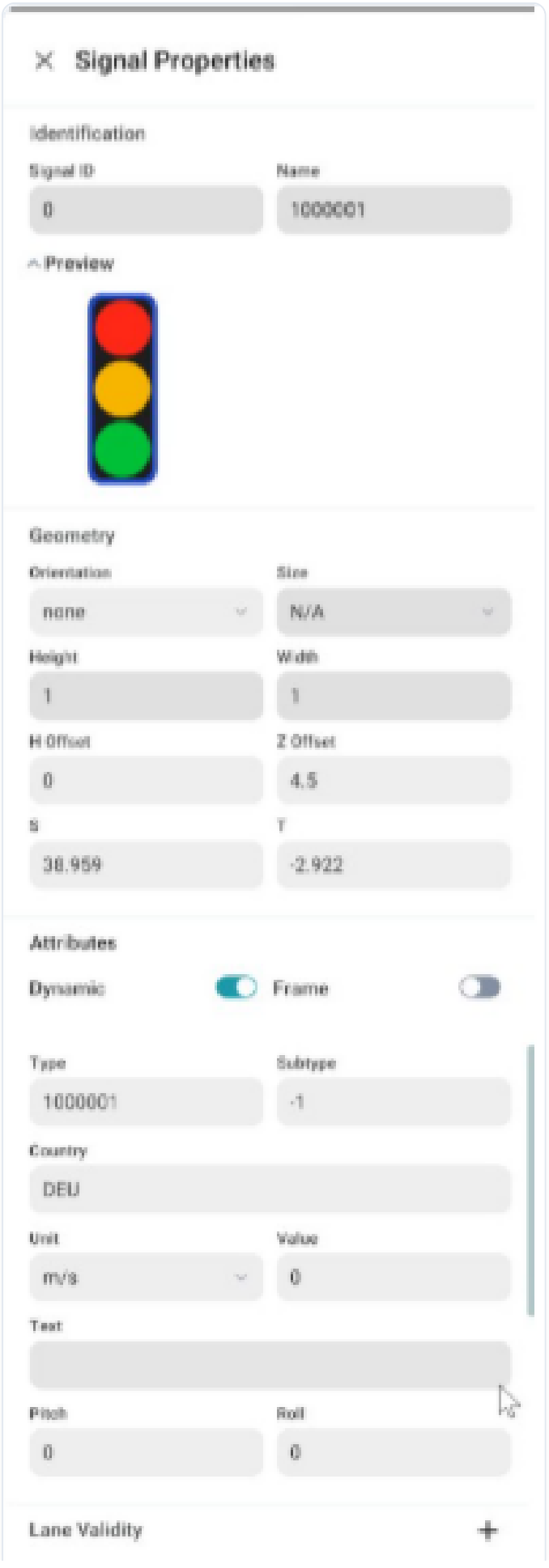
▶ Related

- Signals overview · Traffic lights · Road tool

Signal Properties Panel

When a **Traffic Light** or **Traffic Sign** is selected on the canvas, the **Signal Properties** panel opens on the side. The sections below describe the usual layout for both lights and signs.

Signal Properties panel screenshot


Signal Properties
Identification
Signal ID
0
Name
1000001
Preview
Geometry
Orientation
none
Size
N/A
Height
1
Width
1
H Offset
0
Z Offset
4.5
S
38.959
T
-2.922
Attributes
Dynamic
Frame
Type
1000001
Subtype
-1
Country
DEU
Unit
m/s
Value
0
Text
Pitch
0
Roll
0
Lane Validity

▶ Sections in the Panel

▷ Identification

Field	Purpose
Signal ID	Unique identifier assigned to the signal (e.g., 0)
Name	Label for the signal, often combining type and subtype (e.g., 1000001_00)

▷ Preview

Shows a visual representation of the selected signal or sign to help confirm the asset before editing properties.

▷ Geometry

Field	Purpose
Orientation	Direction or alignment of the signal
Size	Overall display size (e.g., Small, Medium, Large), when applicable
Height	Physical height of the signal object
Width	Physical width of the signal object
H Offset	Horizontal offset from the reference position
Z Offset	Vertical height above the ground or reference surface
S	Position along the road reference line (longitudinal)

Field	Purpose
T	Lateral offset from the road reference line (left or right)

▹ Attributes

Field	Purpose
Dynamic	Enables state changes during simulation (e.g., traffic light cycle: red, yellow, green)
Frame	Controls frame-related display or behaviour for the signal, when applicable
Pitch	Forward or backward tilt of the signal (in degrees)
Roll	Side-to-side tilt of the signal (in degrees)

▹ Advanced Settings

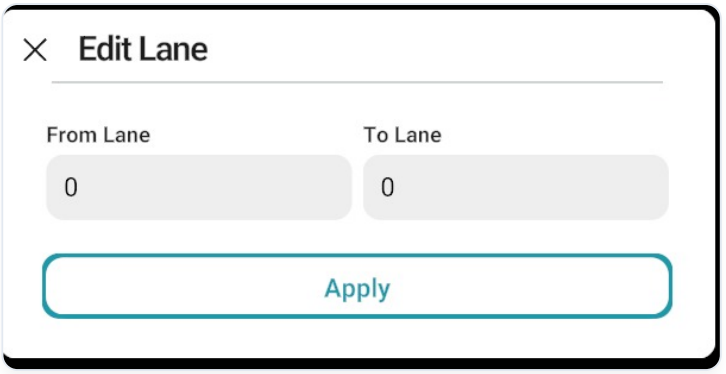
Field	Purpose
Type & Subtype	OpenDRIVE classification (e.g., type 1000001, subtype 00)
Country	Country standard used (e.g., DEU for Germany)
Unit & Value	Measurement unit and value when required by the asset
Text	Additional label or text on the signal

Exact fields may vary depending on the asset and product version.

▹ Lane Validity

Specifies which lanes the signal applies to on the road. Use **+** to add lane validity rule and limit the signal to selected lanes.

When a rule is added, open the **Edit Lane** dialog. Set **From Lane** and **To Lane** to define the lane range, then click **Apply**.



▹ Delete Signal

Removes the selected signal or sign from the map.

▸ Related

- Signals overview · Traffic lights · Traffic signs · Object Properties Panel

Elevation Tools

Explain terrain height, grading, brushes, and any elevation or mesh tools that affect the vertical model.

Add subpages under `06_Elevation-tools/` as this area grows.

Trams

Document tram-specific track, stops, electrification, and scheduling or simulation hooks if applicable.

Add subpages under `07_Trams/` as this area grows.

Advance Tools

Use this section for power-user workflows: batch operations, diagnostics, plugins, import/export, and other tools that go beyond day-to-day editing.

Add subpages under `08_Advance-tools/` as this area grows.

Terrain

Use this section for 3D terrain setup and ground-shaping workflows around the map environment.

The Terrain tools are currently disabled.

Add subpages under `12_Terrain/` as this area grows.

Troubleshooting

Common issues, error messages, and how to fix them when using the map editor.

Add subpages under `09_Troubleshooting/` as this area grows.

Shortcuts

Keyboard shortcuts and quick actions in the map editor.

Add subpages under `10_Shortcuts/` as this area grows.

13 Releases

Releases

Release notes and version history for the RepliMap map editor.

Add version entries and highlights here as releases are published.

Downloads

▶ All Releases

Version	Release Date	Type	What's New	Download	Release Notes
v7.0.0	May 10, 2026	Stable	New terrain tools, performance improvements, bug fixes	⬇ Download	View Notes
v6.3.0	Apr 01, 2026	Stable	Road tool enhancements, UI improvements	⬇ Download	View Notes
v6.2.8	Mar 15, 2026	Stable	Bug fixes and stability improvements	⬇ Download	View Notes
v6.2.7	Feb 20, 2026	Minor	Signal tool updates and optimizations	⬇ Download	View Notes
v6.2.6	Feb 02, 2026	Minor	Elevation tools improvements	⬇ Download	View Notes

Version	Release Date	Type	What's New	Download	Release Notes
v6.2.5	Jan 18, 2026	Minor	Object library updates and fixes	⬇ Download	View Notes
v6.2.4	Jan 05, 2026	Minor	Tram tool improvements	⬇ Download	View Notes
v6.2.2	Dec 05, 2025	Minor	Data import/export fixes	⬇ Download	View Notes
v6.2.1	Nov 18, 2025	Minor	Performance and stability improvements	⬇ Download	View Notes