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 slopes and vertical alignment of roads.

1.2.7 Trams

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 Product Releases

Release notes and version history for RepliMap.

1.2.12 RepliCat AI Assistant

Ask RepliCat AI Assistant about RepliMap, the current map, or actions to perform, and let it apply supported map-editing changes for you.

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:

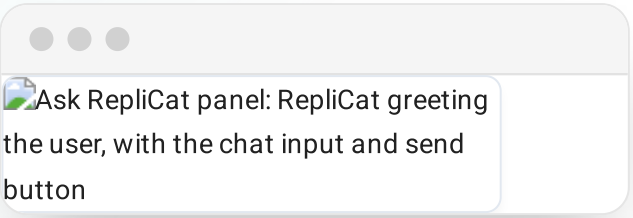
- Step-by-step instructions
- Visual examples and screenshots
- Best practices and common pitfalls
- Cross-links between related workflows

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

✦ BUILT INTO REPLIMAP

RepliCat AI Assistant

RepliCat AI Assistant is built into RepliMap. Ask RepliCat AI Assistant about RepliMap, about the map you have open, or ask it to make the change for you.



- **Reads your live map**
- **Shows changes before applying**
- **Every change is undoable**

▹ Ask About RepliMap

- Understand how a tool works.
- Find where a tool or feature is located.
- Find the relevant information in the RepliMap manual.
- Navigate directly to the corresponding panel or tool in RepliMap.

Try asking: *"Where is the Lane Height tool?"*

▹ Ask About Your Map

- Number of roads and junctions.
- Total road length.
- Details about a specific road, junction, object, signal, or controller.
- Road elevation and point elevation.
- Roads with missing or invalid data, such as missing lanes, missing elevation, or zero length.
- Current selection and active tool.
- Available objects, signs, and traffic lights.

Try asking: *"How many junctions does this map have?"*

▹ Ask RepliCat AI Assistant to Make Changes

RepliCat AI Assistant can perform supported map-editing actions, such as:

- Add, delete, or rename roads.
- Add, remove, or resize lanes.
- Change lane markings.
- Add or adjust objects, signs, and traffic lights.
- Create and configure signal controllers.
- Flatten, smoothen, or equalize junctions.
- Adjust junction height.
- Select or frame a road.
- Switch to a different tool.

Before applying a map change, RepliCat AI Assistant shows the proposed change to the user. The change is applied only after the user accepts it. The accepted change can be undone as a single step.

▸ Navigate to Panels and Tools

RepliCat AI Assistant can open the relevant panel or tool based on the user's request. Examples include:

User Request / Intent	RepliCat AI Assistant Action
Import a map	Opens the Import Map panel
Import GeoJSON data	Opens the Import GeoJSON panel
Use Mapbox	Opens the Mapbox panel
Import sensor data	Opens the Import Sensor Data panel
Add or manage objects	Opens the Objects / Painting panel
Add or manage repeatable objects	Opens the Repeatable Objects panel
View or find junctions	Opens the Junction List
Add or manage stop lines	Opens the Stop Lines panel
Export a map	Opens the Export Map panel
Find information about a RepliMap feature	Opens the relevant section of the Full Manual

User Request / Intent	RepliCat AI Assistant Action
Access the complete documentation	Opens the Full Manual

Continuous Improvement — RepliCat AI Assistant is under active development. With each upcoming release, its capabilities will continue to mature, becoming increasingly stable and reliable.

▸ Related

Product Releases | Release notes | Advance tools overview

3 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
- Left Hand Traffic Rule (LHT) — Enable and work with Left-Hand Traffic maps
- Validator — Validate maps before export and review validation reports
- Export Map — Export maps in different formats for external tools and simulation platforms
- FBX Export — Export the 3D scene to FBX, including CARLA export *(in development)*
- Export XODR to GeoJSON — Convert XODR maps to GeoJSON *(coming soon)*

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

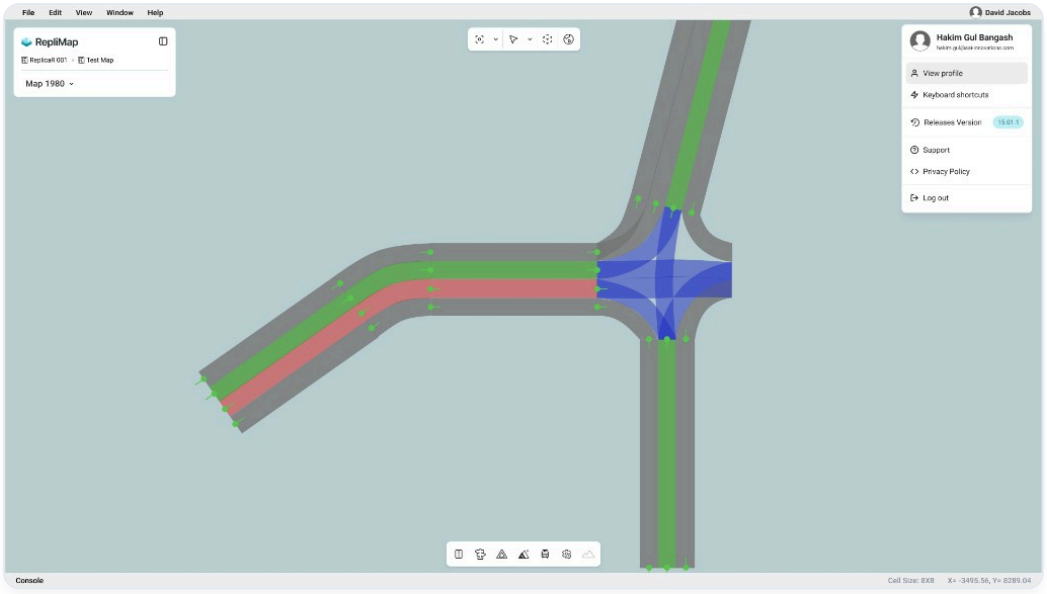
▸ Login

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:

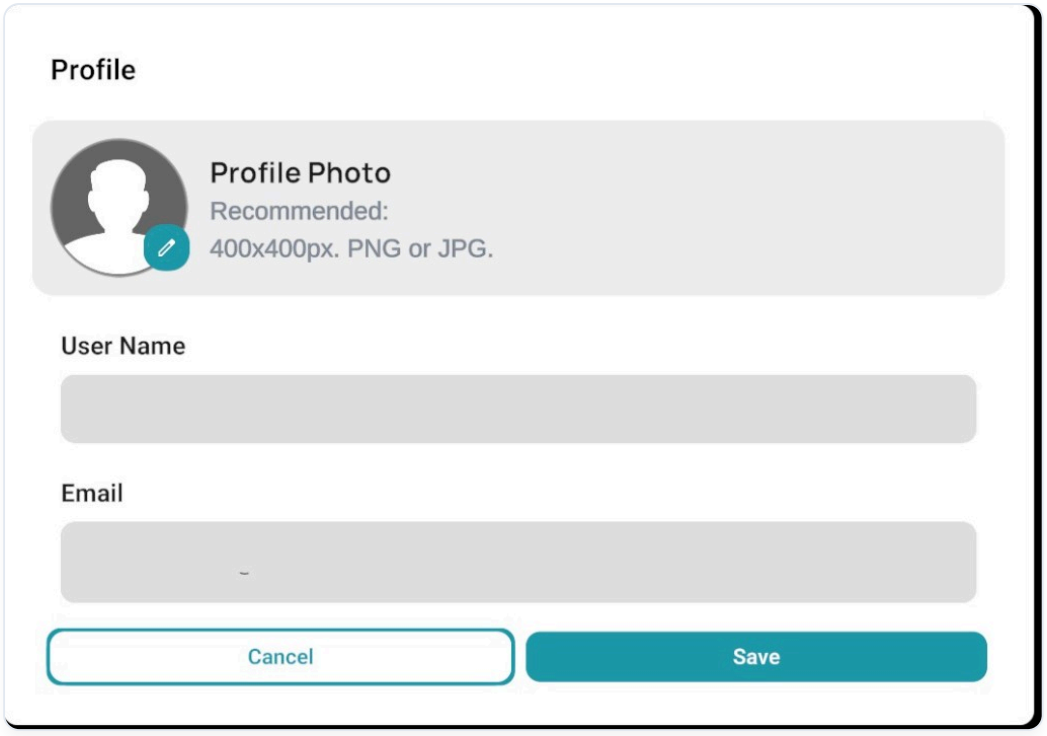
Item	Purpose
View profile	Open your account details and profile photo. See View Profile below.

Item	Purpose
Preferences	Change theme, language, instruction panels, and 3D scenery camera speed. 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.

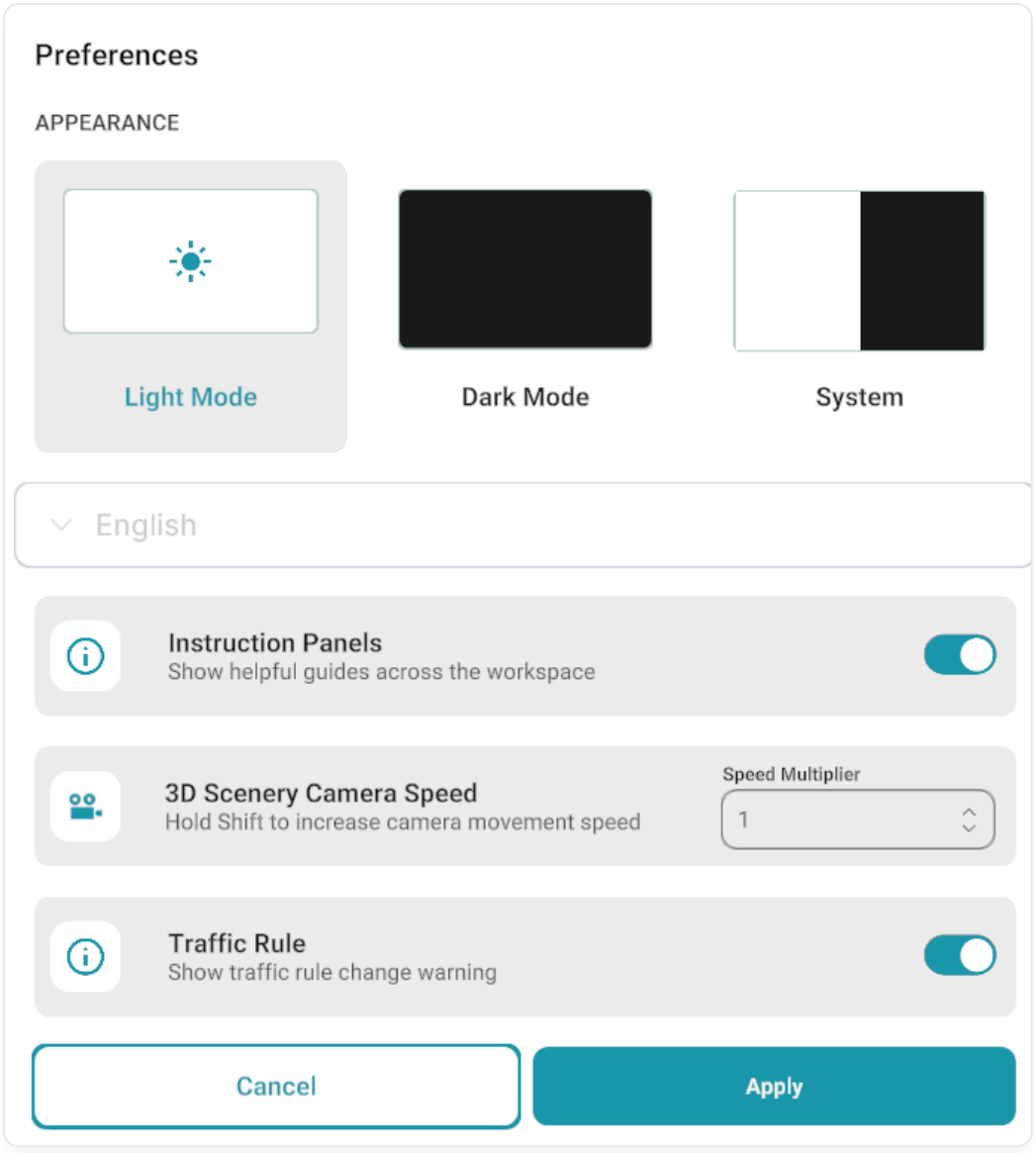


▸ Preferences

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

In the Preferences window, you can configure:

- **Appearance** — Switch between **Light**, **Dark**, and **System** theme.
- **Language** — Choose the display language. *Currently not Available*
- **Instruction Panels** — The **Instruction Panel** toggle allows users to enable or disable instructional tooltips for the **Bottom Toolbar**.
- **3D Scenery Camera Speed** — Camera movement speed can be adjusted in Preferences, with support up to **10x** for improved navigation in 3D scenes. Hold **Shift** to increase camera movement speed while navigating.
- **Traffic Rule** — Displays a confirmation dialog when switching to the Left-Hand Traffic (LHT) rule. See Left Hand Traffic Rule (LHT).



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.

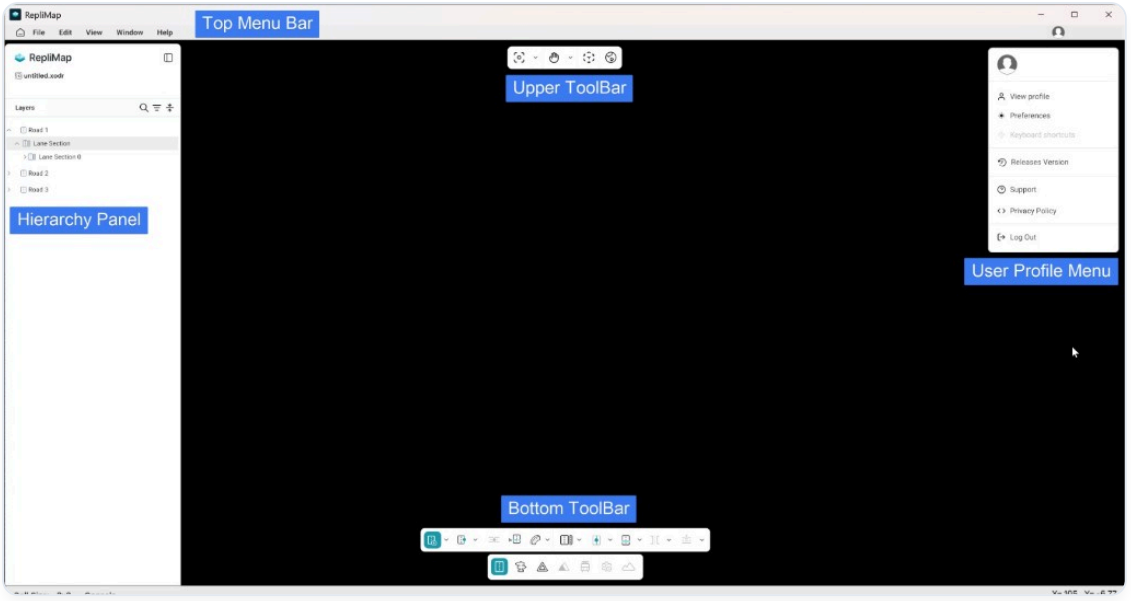
Each row often includes a **delete** control (for example a trash icon). Use it only when you are sure you no longer need the Map in RepliMap—this removes the map from the **User Maps** list and from RepliMap's database view; it does **not** delete the file from disk (see **Path**).

▸ 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**, **LiDAR Point Cloud**, **Reference Image**, **GeoJSON**) **Conversion Pipelines** — Run data conversions (e.g., **HERE HD to XODR**

Menu	What's inside
	(H2O), GeoJSON to OpenDRIVE (G2O)) **Save** — Save the current project **Save As** — Save the project with a new name or location **Export** — Export Map; Export XODR to GeoJSON **Quit** — Close RepliMap
Edit	**Undo** and **Redo** for basic editing steps. **Left-Hand Traffic Rule** — switch the active traffic rule to LHT. See Left Hand Traffic Rule (LHT).
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 **Map Icons** — Hides the icons of map elements/items on the canvas **Helper Roads** — Hides helper roads on the canvas *(explained in a later section)* **Editor Slots** — *(disabled for now)*
Window	Console; Validator; 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.:

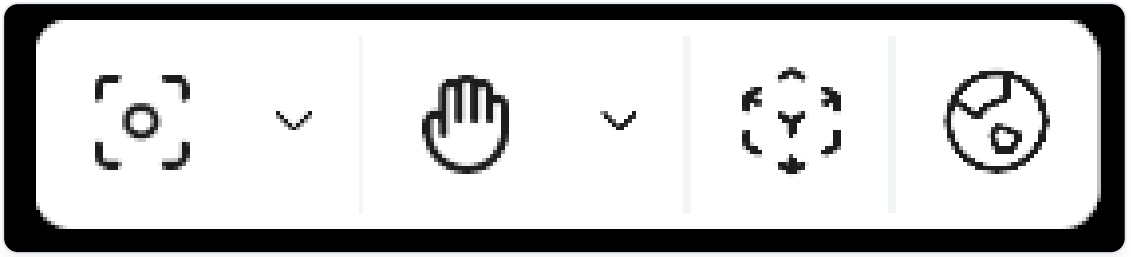
- Shows the active map name.
- Lists roads so you can search by road ID and focus quickly on a specific road.
- Lets you inspect road-level content such as objects and signals.
- Provides controls to hide or show roads on the canvas.
- Lets you open the saved **XODR/XML** view for roads, objects, and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

Hierarchy panel screenshot



▸ 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.



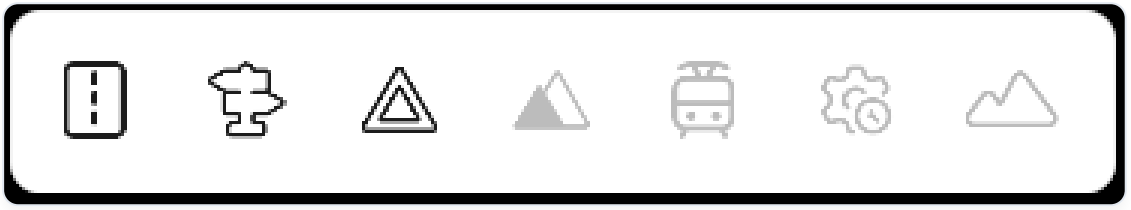
Groups include:

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.
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.)*



▸ 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.
- From the **Console**, users can export log output to a `.txt` file using the **Export** icon in the console panel.
- **Bottom-right** — Context data such as **cell size**, **cursor coordinates** (**X**, **Y**), or scale—useful for precise placement and debugging.

Console log export screenshot



▶ Related

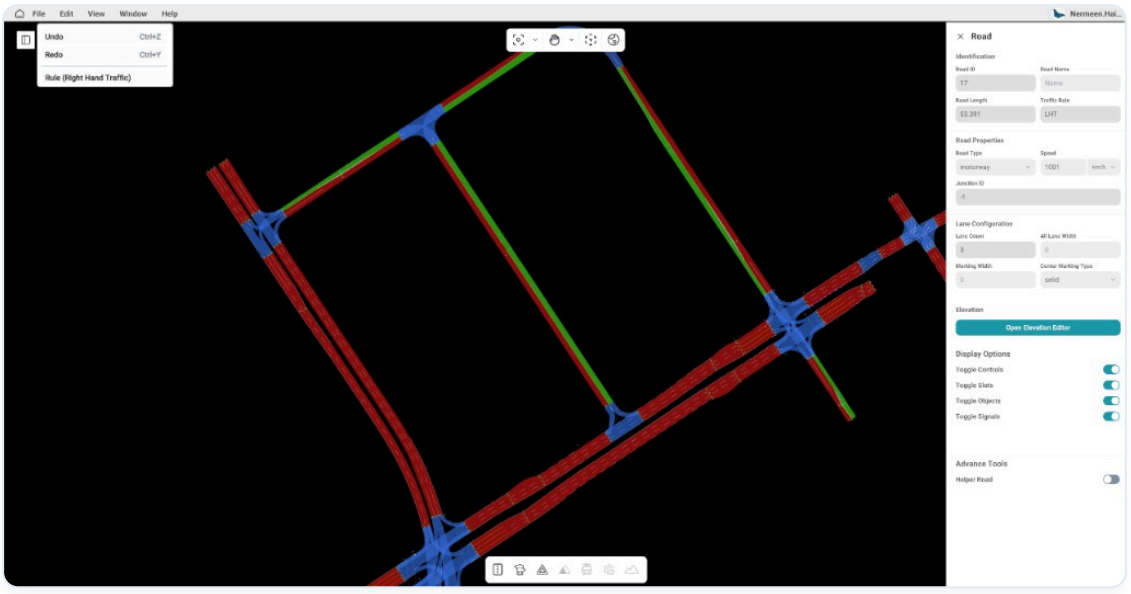
- Account, login & preferences — profile menu and settings.
- Maps overview — switching between user, NCAP, and sample maps.
- Left Hand Traffic Rule (LHT) — enable and work with Left-Hand Traffic maps.

Left-Hand Traffic Rule (LHT)

RepliMap supports **Left-Hand Traffic (LHT)** road networks, enabling you to create, import, edit, validate, and export maps that comply with left-hand traffic regulations.

With LHT support, you can:

Capability	Description
Create	Create new maps using Left-Hand Traffic (LHT) rules.
Import	Import existing LHT maps in supported formats, such as OpenDRIVE XML (`.xodr`).
Edit	Edit map geometry and road network elements while preserving LHT rules.
Validate	Validate maps using RepliMap's built-in validation tools.
Export	Export maps without changing the selected traffic rule.



> **Note**
>
> By default, RepliMap uses **Right-Hand Traffic (RHT)** rules. You can switch between RHT and LHT at any stage based on your map requirements, ensuring the traffic rule is maintained throughout the editing and export workflow.

▶ Enabling the Left-Hand Traffic Rule

By default, RepliMap uses the **Right-Hand Traffic (RHT)** rule. You can switch to **Left-Hand Traffic (LHT)** at any time.

To enable the LHT rule:

1. Open RepliMap.
2. From the **Menu Bar**, select **Edit**.
3. Click **Left-Hand Traffic Rule**.

Once enabled, all newly created and edited road network elements follow Left-Hand Traffic (LHT) rules.

> **Note**
>
> A confirmation dialog is displayed when you switch to LHT. The display of this dialog can be configured in User Preferences.

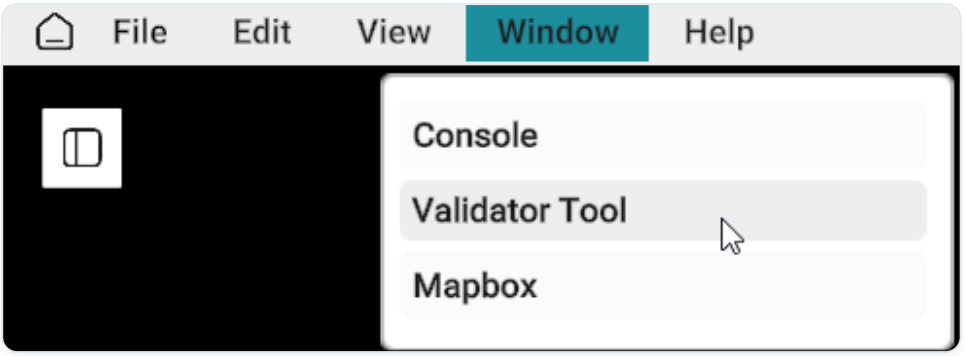
> **Note**
>
> When you import a map configured for Left-Hand Traffic (LHT), RepliMap automatically detects the traffic rule and switches to LHT. A notification is displayed in the **Console** panel to indicate that the traffic rule has been updated based on the imported map.

▶ Related

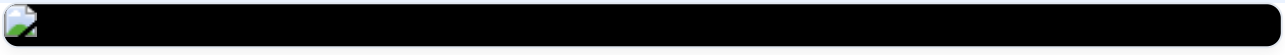
- Main screen overview — editor layout, menu bar, and workspace.
- Login, Profile & Preferences — configure confirmation dialogs and other user settings.

Validator

The **Validator** checks your open map (`.xodr`) before export. It runs four validation **bundles** — each bundle looks at a different part of map quality — and gives you a **PASS** or **FAIL** summary plus detailed reports.



▶ How to Use Validator

Method	Steps
Validator Tool	1. Open **Window** → **Validator Tool**. 2. Click **OK** on the confirmation dialog to start validation.
Validator Tool — confirmation dialog 	
Save As	1. Open **File** → **Save As**. 2. Choose a location. 3. Enable **Run Validation**.
Save As — Run Validation 	

Method	Steps
Export Map	1. Open **File** → **Export** → **Map**. 2. Choose location and map type. 3. Enable **Run Validation**.

Export Map — Run Validation



▸ Validation Bundles

When validation runs, these four bundles are checked:

Bundle	Main focus	Pass when
ASAM QC OpenDRIVE	Standard OpenDRIVE quality	Schema OK, failures within limit
Continuity	Smooth geometry along roads	No C0/C1 errors
Traffic Simulation	Ready for traffic simulation	Zero errors
Additional Validation	Extra RepliMap data rules	Zero errors and warnings

Expand each bundle below for full details.

ASAM QC OpenDRIVE

What it checks

- Whether the map file is valid OpenDRIVE XML (schema check)
- Standard ASAM quality rules for OpenDRIVE maps

Why it matters

- Industry-standard quality check for OpenDRIVE files
- Catches structural and compliance issues early

Result

- **PASS** — Schema is valid and failed checks stay within the allowed limit
- **FAIL** — Schema problems or too many failed quality checks

Where to look

- `opendrive_result.xqar` — detailed ASAM report

Continuity

What it checks

Smooth connections along each road — no gaps or sudden jumps in:

- Road centerline geometry (position and heading)
- Lane offsets
- Elevation (height and slope)

Why it matters

- Discontinuities cause visible jumps, wrong lane shapes, or bad elevation in the map and in simulation

Result

- **PASS** — No continuity errors (C0/C1 errors)
- **FAIL** — One or more continuity errors found

Where to look

- `continuity/error_log.log` — list of errors
- `continuity/summary_log.log` — short summary
- `continuity/error_points.geojson` — map locations of problem points

Traffic Simulation

What it checks

- Basic file validity (readable XML with OpenDRIVE root)
- Road geometry is complete and usable:
  - Roads have a plan view and geometry
  - Geometry parameters (lines, arcs, spirals) are valid
  - Roads meet minimum length requirements
- Lane layout and junction references are correct
- Connections between roads at junctions:
  - Linked road geometry aligns
  - Surface overlap at connections
  - Endpoints do not penetrate into the wrong road surface

Why it matters

- The map must pass these checks to run reliably in traffic simulation

Result

- **PASS** — No errors
- **FAIL** — One or more errors (warnings may still be reported)

Where to look

- `traffic_simulation/validation_result.json`

Additional Validation

What it checks

Extra data-quality rules for RepliMap maps:

- Valid OpenDRIVE root element
- Numeric values are valid (no invalid or non-finite numbers)
- Station values (`s` , `sOffset`) are not negative
- Object IDs are unique
- Signal IDs are unique
- No duplicate placement of static objects
- Poles or street lights should not sit on driving lanes (warning)

Why it matters

- Catches data issues not covered by the other bundles

Result

- **PASS** — No errors and no warnings
- **FAIL** — Any error or warning

Where to look

- `internal/additional_validation.log`
- `internal/validation_result.json`

▶ Overall Result

The master summary is saved to `master_validation.log` .

Overall PASS currently requires:

Bundle	Required
ASAM QC OpenDRIVE	PASS
Traffic Simulation	PASS

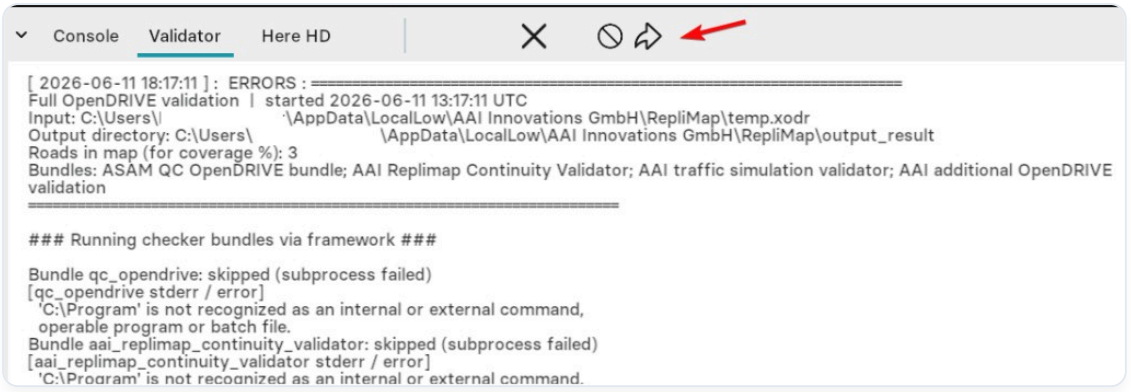
Continuity and Additional Validation are still run and reported. Fix their issues even when the overall result is **PASS**, so map quality is complete.

▸ Viewing & Exporting Reports

After validation, the **Map Validator** tab opens automatically in the console.

1. Open the **Console**.
2. Select the **Map Validator** tab.
3. Click **Export** and choose a save location.

The exported `.txt` file contains the full validation report for review, troubleshooting, or sharing with your team.



> **Note**
>
> Validation results are also saved in the output directory. View the full report in the `output_result` file.

▸ Related

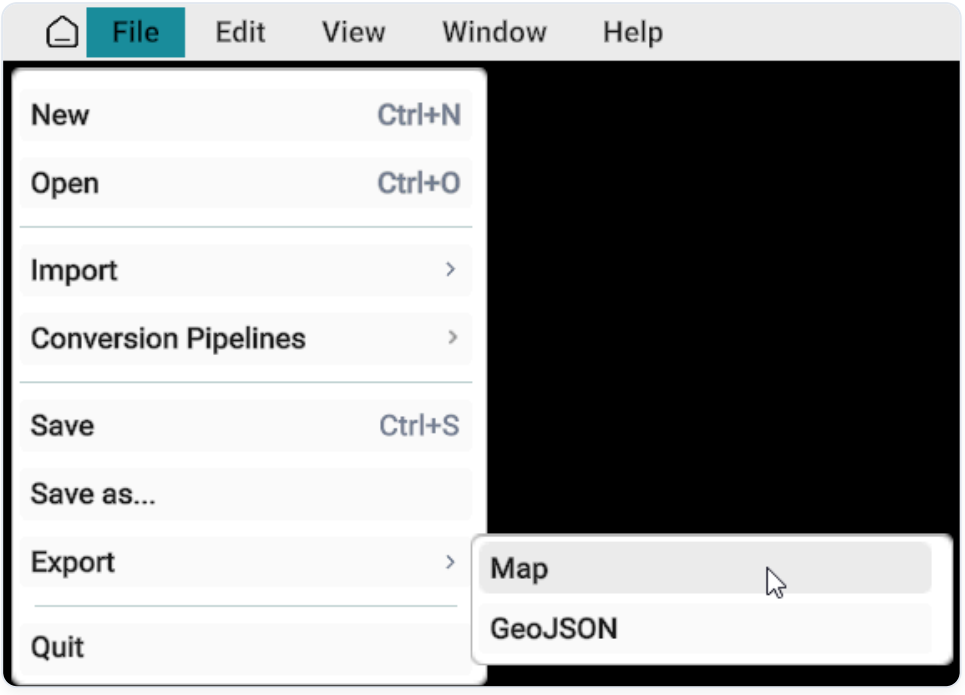
- Export Map — validate maps before export
- Main screen overview — Window menu and console access
- Troubleshooting — resolving issues and error messages

Export Map

The **Export Map** workflow allows users to generate map files in different formats based on project requirements. Users can export the complete map or create format-specific variants optimized for external tools and simulation platforms.

▹ How to Export the Map (XODR)

1. Go to **File menu** from the top menu bar.
2. Select **Export** from the drop-down menu.
3. Click **Map**.
4. The **Export Map** window will appear.



▸ Export File Types

The following export formats are available:

- **Full Map** (.xodr)
- **Road Runner**
- **CARLA**
- **Esmini**

- ModelDESK

Export file types screenshot



▶ Full Map

The **Full Map** export generates the complete map without applying any modifications or filtering. This export preserves the map exactly as it exists in the project.

Primary Roads	**Connecting Roads**	**Junctions**
Traffic Signs	**Traffic Lights**	**3D Objects**
Repeatable Objects	**Trees and Vegetation**	**Road Markings**
All Map Assets and Metadata		

Exports: The Items/ elements selected from "Custom Export"

▶ Road Runner

The **Road Runner** export generates a map compatible with Road Runner workflows. This export is intended for users who require a simplified map for Road Runner environments.

Exports: The Items/ elemenets selected from "Custom Export"

▶ CARLA

The **CARLA** export generates a map compatible with the CARLA simulator.

Exports: The Items/ elements selected from "Custom Export"

▶ Esmini

The **Esmini** export generates a map compatible with the esmini scenario player.

Exports: The Items/ elements selected from "Custom Export"

▶ ModelDESK

The **ModelDESK** export generates a ModelDESK-compatible map variant. During export, the map is processed to remove unsupported elements and improve road connectivity.

Exports: The Items/ elemenets selected from "Custom Export"

Additional Processing:

- Non-drivable roads are removed.
- Connecting roads are converted to primary roads when the lane count matches.
- Connecting roads remain unchanged when lane counts do not match.

ModelDESK export screenshot



▶ ModelDESK Tools

▷ Current Roads List

The **Current Roads List** allows users to manage roads that require attention before export.

Users can:

- Upload a list of road IDs.
- Maintain a list of problematic roads.

- Save road IDs for future use.

Option	Description
Junction to Direct Links	Add the IDs of drivable roads whose connecting roads have connectivity or offset issues. The specified roads are processed during export to correct the associated connecting road connections
Roads Disconnection	Add the IDs of problematic non-drivable roads, such as shoulder roads, sidewalks, or other non-drivable road types. These roads are treated as disconnected during export processing.
Remove Specified Roads List	Add road IDs that cannot be corrected through standard methods. These roads are removed from the generated ModelDESK map during export.

▹ Load / Save

Option	Description
Load	Load a previously saved JSON file containing road IDs and export configuration data.
Save	Save the current road IDs and export configuration data to a JSON file for future use.

▸ Custom Export

The **Custom Export** option provides complete control over the export content. Users can manually select which map components should be included in the exported file.

- Displays a checklist of all exportable map elements.
- Allows selection of the required items for export.
- Only items present in the current map are enabled and selectable.

- Items that do not exist in the map are displayed as disabled (greyed out) and cannot be selected.

Custom export screenshot



▶ Related

- Main screen overview — File menu and export access from the editor.
- Export XODR to GeoJSON — convert exported XODR maps to GeoJSON *(coming soon)*.
- Validator — validate maps before export.

FBX Export

FBX Export sends the current 3D scene — geometry, materials, and textures — out as an **FBX** file, ready to bring into other tools like **Unity** or **Unreal Engine**.

Prerequisite

You must be in **Scenery (3D) view** to use FBX Export. It's not available in other views.



‹ 1 / 2 ›

▸ How to Export

File menu screenshot



1. Switch to **Scenery (3D) view**.
2. Open **File** → **Export** → **FBX**.
3. Set the **Output Location** for the exported file(s).
4. Turn on whichever options you need (see Export Options below).
5. Click **Export**.

▸ Export Options

FBX Export dialog screenshot



Option	Default	What it does
Include Materials	On	Exports material assignments and colors.
Include Textures	On	Exports embedded PNG textures (needs **Include Materials** on).
Export for Carla	Off	Tags objects for CARLA's semantic segmentation.
Include Collision Proxies	Off	Blocks vehicles/pedestrians from passing through objects.
Exclude Signal Meshes	Off	Leaves out traffic sign/light meshes — use when signals come from the `.xodr` file instead.
Exclude Scene Objects	Off	Leaves out street lamps and other light/sign-named scene objects.
Split into Tiles	Off	Exports as multiple files instead of one.

▸ Related

- Export Map — export the map itself in OpenDRIVE-based formats.
- Main screen overview — switching between editor views, including Scenery (3D) view.

Export XODR to GeoJSON

Coming soon

This feature will be available soon.

▶ Related

- Export Map — export maps in different XODR formats for external tools and simulation platforms.
- GeoJSON — GeoJSON reference data and import workflows.

4 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 HD to XODR (H2O)** and **GeoJSON to XODR (G2O)** pipelines are 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

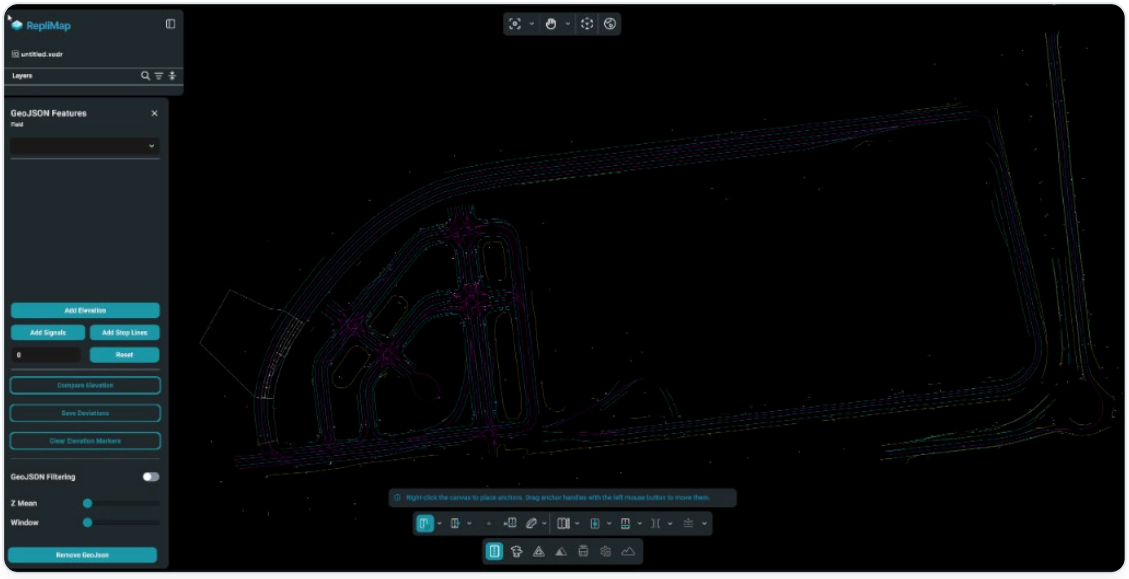
Topic	What it covers
GeoJSON	GeoJSON as reference geometry and attributes: CRS, layers, validation.
Mapbox	Mapbox satellite map layers for context and alignment in the editor.
Image	Reference **raster imagery** (orthophotos, scans): georeferencing and use as a backdrop.
Sensor data	Sensor-derived inputs used to position or refine the map (where supported).
LiDAR Point Cloud Data	Import and align `.las` / `.laz` point cloud data in the workspace.
HERE HD to XODR (H2O)	End-to-end **HERE HD** → **OpenDRIVE** conversion pipeline: stages, inputs, and XODR output.
GeoJSON to XODR (G2O)	Convert road-network GeoJSON into an ASAM OpenDRIVE (`.xodr`) map in RepliMap.

▶ 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.

CRS dialog screenshot



▹ 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 properties dialog screenshot



▸ GeoJSON Panel

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

1. **GeoJSON features** — display and style features by property.
2. **Add Elevation** — add or compare elevation and manage deviations.
3. **Add Signals** — import traffic signals from GeoJSON where supported.
4. **Add Stop Lines** — add stop lines from GeoJSON where the dataset supports it.
5. **Reset** — clear numeric offsets or related settings.

GeoJSON panel screenshot



▹ 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.

▹ Add 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).

▹ Add Signals

Add Signals imports traffic signals from a GeoJSON file and places them on the map. Signal properties are read from the GeoJSON and mapped using a configurable settings file.

Because GeoJSON datasets may use different property names and values, you can customize the signal mapping without modifying the application.

Configuration file

```
<RepliMap Installation Folder>
└── StreamingAssets
    └── geojson_settings
        └── geojson_signals_config.json
```

Update **geojson_signals_config.json** so the property names and values match your GeoJSON dataset. Then use **Add Signals** to import traffic signals with the configured mapping.

> **Note**
>
> - The file must remain named **geojson_signals_config.json**. If it is renamed, RepliMap will not read the configuration.
> - Before you change the configuration, create a backup of the original **geojson_signals_config.json** file.

▹ 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:

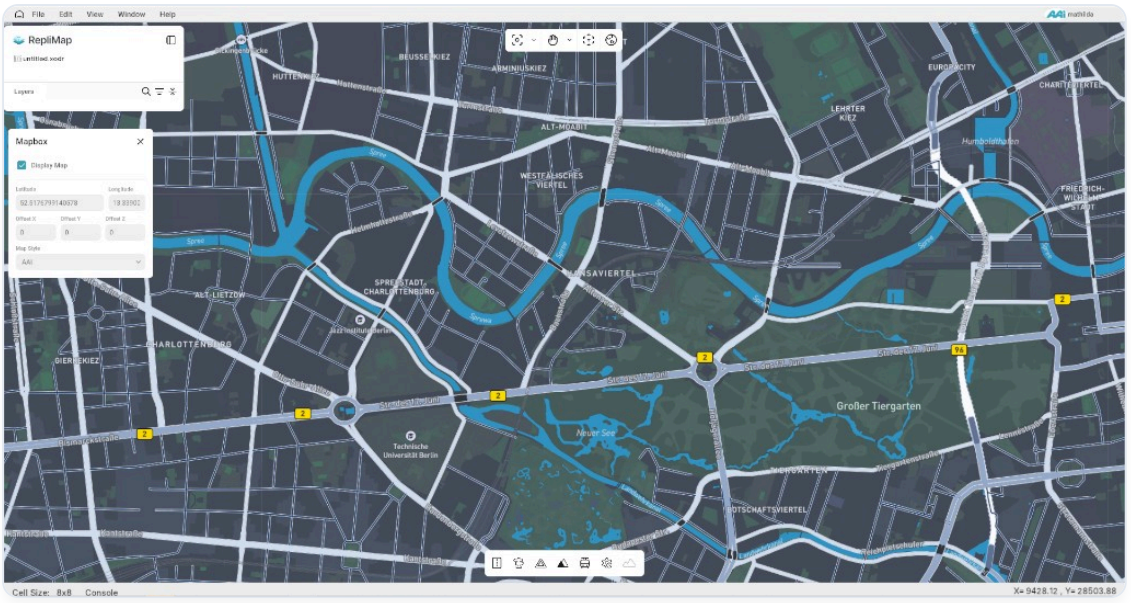
- Check for **invalid geometries** (self-intersections, unclosed rings).
- Ensure **attributes** you need for automation are present in `properties`.

▸ Related

- HERE HD to XODR (H2O) — when GeoJSON is an intermediate or sidecar to OpenDRIVE export.
- GeoJSON to XODR (G2O) — convert road-network GeoJSON into OpenDRIVE (`.xodr`).
- 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, 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.

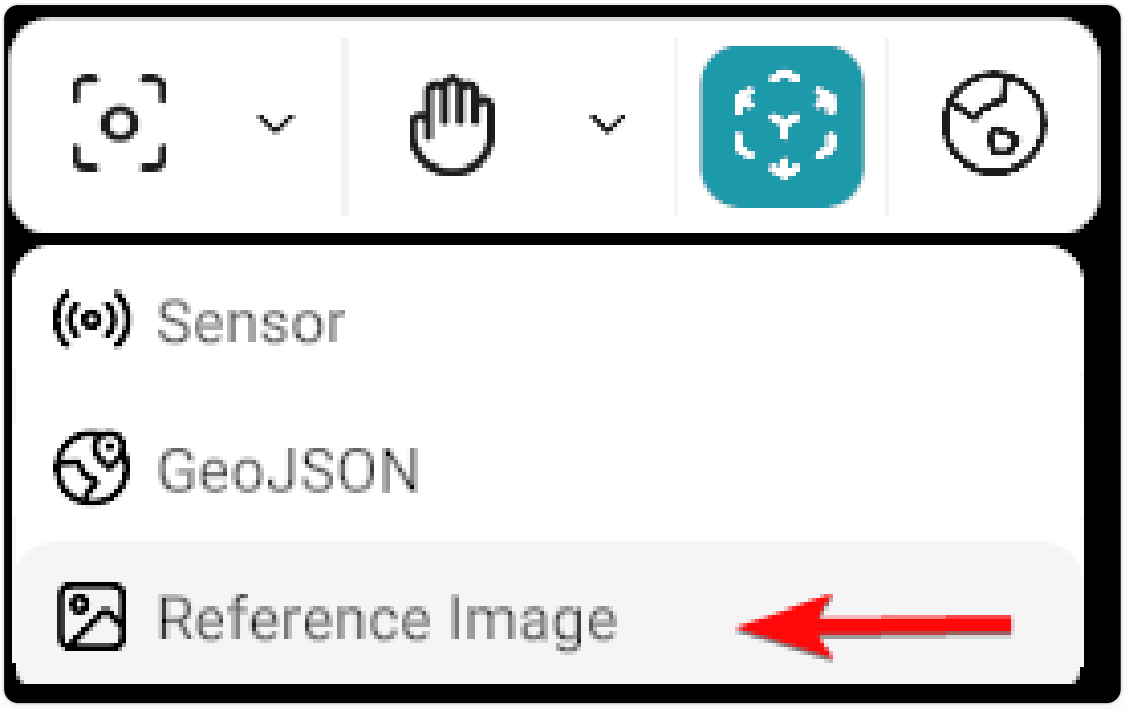
Small iterative adjustments are usually easier than a single large correction, especially after changing zoom or pan.

▶ Related

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

Reference Image

Reference Image is a raster image used as a georeferenced background layer in the editor. It helps users trace map features, verify alignment, and compare designed data with real-world visuals.



▸ Georeferencing

To accurately place a reference image in the map, the following parameters are used:

Parameter	Purpose
Position (X, Y, Z)	Defines the location of the image in map space.
Rotation (T)	Defines the orientation of the image.
Scale (X.SC, Y.SC)	Defines the scaling of the image in X and Y directions.

Proper georeferencing ensures correct alignment with map geometry. Incorrect values may lead to misalignment and distortion.

▸ Supported Formats

Reference images support the following file formats:



- **PNG**
- **JPEG**
- **BMP** *Currently Not Supported*
- **TIFF**

▸ How to Import a Reference Image

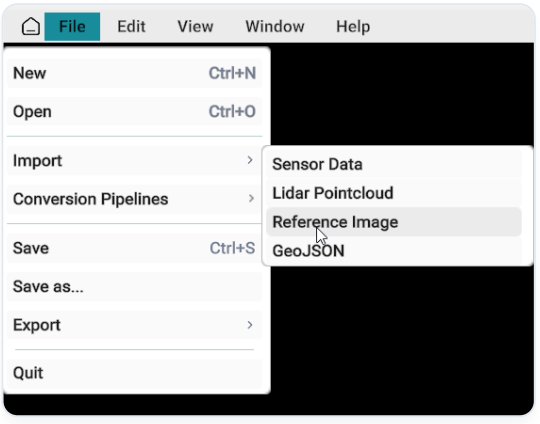
A reference image can be imported using either of the following methods:

- **Top-Center Toolbar** — Click the **Reference Image** button in the top-center toolbar.
- **File Menu** — Navigate to **File** → **Import** → **Reference Image**.

> **Note**
>
> If no reference image is currently loaded, clicking the **Reference Image** button in the top-center toolbar will open the **Import Reference Image** window.
>
> If a reference image is already loaded, clicking the same button will open the **Reference Image Panel** instead of the import window.

To import via the **File** menu:

1. Go to the **File** menu from the menu bar.
2. Click **Import** from the dropdown list.
3. Select **Reference Image** from the import options.



An import window will appear:

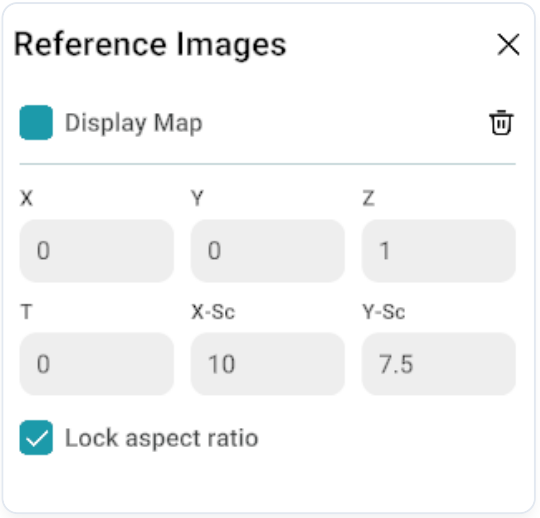
1. Select the location of the image file.

2. Choose the image format from the format dropdown (bottom-right side).
3. Click **Load**.

After loading, the **Reference Image Panel** will open.

▶ Reference Image Panel

The **Reference Image Panel** contains the following values:



- **X**
- **Y**
- **Z**
- **T**
- **X.Sc**
- **Y.Sc**
- **Lock aspect ratio**

The panel displays transformation and scaling parameters of the imported image. Each parameter can be adjusted to control placement and alignment.

▹ Image Selection

- A **checkbox** is available before the image name in the panel.
- This checkbox is used to **highlight** the image in the map view.

▹ Image Modification & Size Adjustment

Users can adjust the reference image **width, height, scale, and position** using:

- **Reference Image Panel**
- **Gizmo tool**
- **Border handles** around the image

All methods provide direct control over image placement and sizing in the map.



▹ Aspect Ratio Toggle

Aspect Ratio Toggle for Reference Images allows the image's width-to-height ratio to remain fixed during resizing, preserving its original proportions.

Use the **Lock aspect ratio** checkbox at the bottom of the Reference Image Panel to enable or disable this behavior. It is **checked by default**, so proportions are preserved unless you turn the option off. When enabled, resizing via the panel, gizmo, or border handles keeps the original image proportions.

> **Warning**
>
> There is **no undo option** for reference image transformations. Any changes to size, position, or scaling must be done carefully.

> **Note**
>
> Reference images are **not visible in Scenery View**.

▸ Related

- Mapbox — continuous tiled context vs single images.
- GeoJSON — vector overlays on top of imagery.
- Main screen overview — reference data panels and import from the File menu.

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;5250450.8538678614;406.9785299627;-106.7567456456;-33.7278665642;195.3433317765;-0.8606026865;-0.0630628213;-0.5053573949;-0.5089119455;0.0689277990;0.8580545380;-0.0192781671;0.9956264556;-0.0914128721
Job_20230313_1303_Track01_Sphere_00002.jpg;130467.3881470000;547874.4756802312;5250448.3003311902;407.0071701808;-106.5458193538;-28.6132552230;195.6047250798;-0.8985378447;-0.0621345425;-0.4344755923;-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

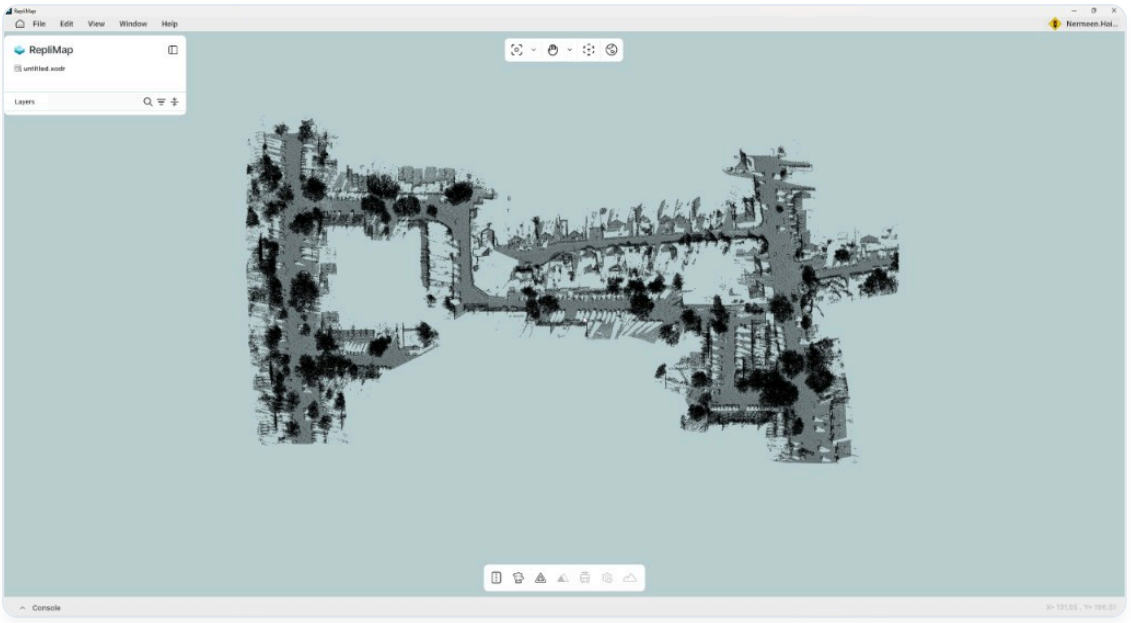
- GeoJSON — vector layers derived from or compared to sensor outputs.
- LiDAR Point Cloud Data — standalone `.las` / `.laz` import workflows.
- HERE HD to XODR (H2O) — pipeline outputs may incorporate sensor-corrected geometry.

LiDAR Point Cloud Data

LiDAR point cloud data is a 3D dataset captured using a **LiDAR** (Light Detection and Ranging) sensor. It represents real-world surfaces as a dense collection of spatial points.

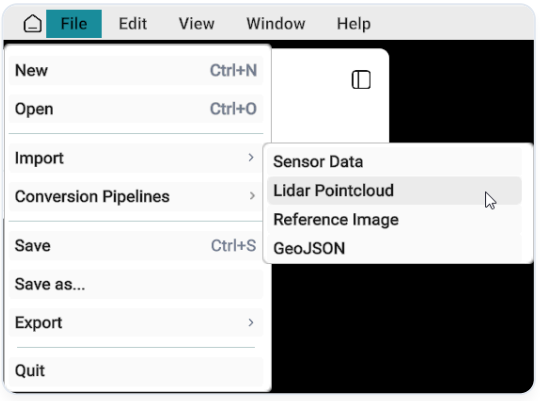
Each point may include:

- **X, Y, Z coordinates** (3D position)
- **Intensity** (surface reflectivity)
- **Optional classification** (ground, building, vegetation, objects)



▶ How to Import LiDAR Point Cloud Data

1. Go to the **File** menu from the menu bar.
2. Click **Import** from the dropdown list.
3. Select **LiDAR Point Cloud** from the import options.



An import window will appear:

1. Select the location of the `.las` file.
2. Choose the file format (**.las** / **.laz**) from the format dropdown (bottom-right side).
3. Click **Load**.

Load LAS/LAZ Point Cloud import window



After loading, the LiDAR point cloud will open in the workspace.

▶ Warnings

Warning

- LiDAR point cloud may **not be visible in Translucent View**.
- Use **Light Theme** for proper visibility of point data.
- Do **not interrupt** the import process while data is being loaded.

▶ Recommended Workflow (with Other Reference Data)

If importing multiple datasets together, follow this order:

1. Load existing map (if available)
2. Import **LiDAR Point Cloud Data**
3. Import **GeoJSON** Data
4. Import **GeoTIFF (TIF) Reference Image**

All datasets will align correctly only if they share the **same coordinate system**.

▶ Recommended Verification

> **Note**
>
> After import:
>
> - Verify LiDAR point cloud aligns with the **road network**
> - Ensure consistency with **GeoJSON** features
> - Confirm correct spatial relationship with **reference imagery**
> - Validate overall layer overlap before editing

▶ Related

- Sensor data — camera imagery, trajectory, and combined sensor folder workflows.
- GeoJSON — vector reference layers aligned with point cloud data.
- Reference Image — raster backdrop for spatial verification.
- HERE HD to XODR (H2O) — conversion pipelines after reference data is loaded.

HERE HD to XODR (H2O)

The **HERE HD to XODR (H2O)** pipeline converts HERE HD Live Maps source data into **ASAM OpenDRIVE** (`.xodr`) format for use in RepliMap.

The pipeline:

- Supports **HERE HD Live Maps** as the input source.
- Converts **road geometry** and **traffic sign** layers, including elevation information in the generated road model.
- Generates a corresponding **HERE HD Data** (`.geojson`) file in the **WGS 84** Coordinate Reference System (**CRS**) during the conversion process.
- Is designed to be extended with additional HERE data layers in future versions.



▶ HERE HD Data (GeoJSON)

In addition to the OpenDRIVE map, the pipeline generates a **HERE HD Data** (`.geojson`) file in the **WGS 84** CRS that represents the converted HERE HD map data.

▷ Output Files

File	Description
`.xodr`	ASAM OpenDRIVE map generated from the HERE HD Live Maps data.

File	Description
`.geojson`	HERE HD Data in the **WGS 84** CRS, generated alongside the OpenDRIVE map. This file can be used for visualization and as input to the GeoJSON to OpenDRIVE (G2O) pipeline.

▹ Output Location

Both the `.xodr` and `.geojson` files are saved in the same output directory specified for the conversion.

> **Note**
>
> The generated HERE HD Data (`.geojson`) uses the **WGS 84** Coordinate Reference System (CRS).

> **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** (**WGS 84**) for the region to convert.
3. **Output folder** where RepliMap should write the generated map files.

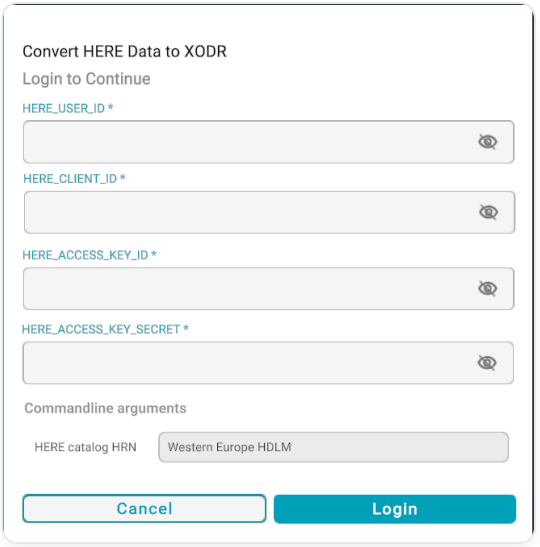
You can create the area polygon quickly with geojson.io and save it as a `.geojson` file in **WGS 84**.

▸ How It Works

In the conversion flow:

1. Enter your HERE credentials.
2. Select the input `.geojson` area file (**WGS 84** CRS).
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.

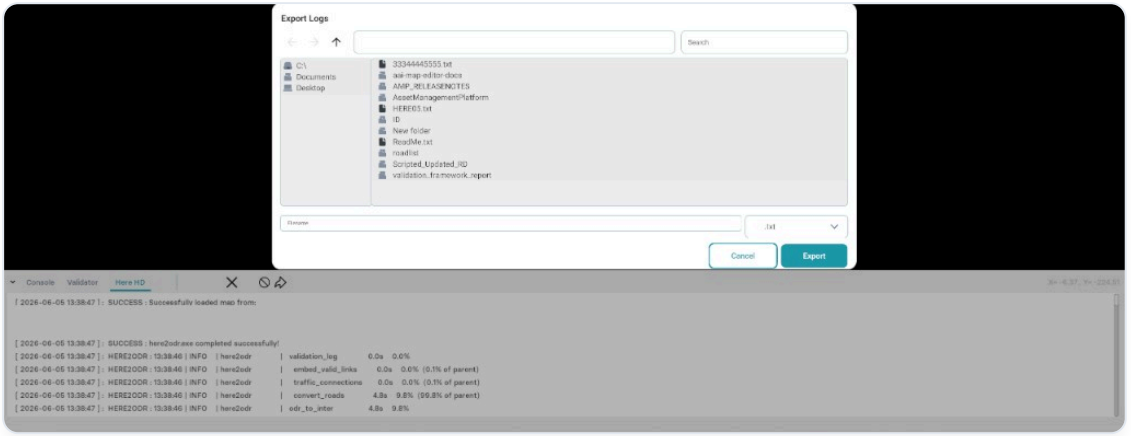
After conversion, the map is loaded directly into the canvas. You can then use RepliMap tools to review, fix, and further enhance roads, signs, and other elements.



▸ Here-to-ODR Console — Log Export

The **Here-to-ODR conversion console** provides a dedicated logging panel that records the complete conversion workflow. It helps users analyze processing behavior, detect lagging issues, and review system activity during conversion.

Users can export the log file using the **Right Arrow** icon available in the console panel. This generates a text-based log file, and the user can select the desired location for saving it.



The export process also displays:

- **Total processing time** consumed during conversion
- **Export completion status**

▹ Log Content Included in Export

The exported log file contains the following key sections:

Logs	Description
Pipeline Logs	Records step-by-step execution of the conversion pipeline, showing the processing flow and intermediate stages.
Profile Report Logs	Contains detailed profile-level information, including execution tracking and reference to the profile report path. The related JSON files can be accessed from this path.
Warning Logs	Displays system warnings generated during conversion, helping identify potential issues or irregular behavior.

▹ Additional Export Information

Includes supplementary details such as:

- Profile report path stored in a reference text file within the exported log, used to locate detailed JSON-based logs.
- Authentication credentials status shown at the end of the exported log file for verification purposes.

▹ File Handling & Naming Behavior

Users must use a **unique GeoJSON file name** during conversion (including the generated HERE HD Data `.geojson` in **WGS 84**).

If a file with the same name already exists in the selected export folder:

- The system will automatically **overwrite** the existing file.
- It is recommended to avoid duplicate naming to prevent accidental data replacement.

Notes

- Log export is intended for **debugging**, **validation**, and **performance analysis**.
- It is recommended to review logs when:
  - Conversion is slow or lagging
  - Unexpected warnings or issues occur
- Always verify the **export location** before saving the file.
- Maintain **unique file names** for each conversion to ensure data integrity.

▶ Related

- Data sources overview — where the pipeline sits in the reference-data workflow.
- GeoJSON — preparing area bounds for conversion (**WGS 84**).
- GeoJSON to XODR (G2O) — convert road-network GeoJSON (**WGS 84**) into OpenDRIVE (`.xodr`).
- Road tool — refining the generated map after import.

GeoJSON to OpenDRIVE (G2O)

The **GeoJSON to OpenDRIVE (GeoJSON2ODR / G2O)** pipeline converts a supported road-network GeoJSON into an **ASAM OpenDRIVE (`.xodr`)** map that can be opened, edited, validated, and exported in RepliMap.

The pipeline accepts road-network GeoJSON containing the road geometry and metadata required to reconstruct an OpenDRIVE road network.

> **Note**
>
> The GeoJSON2ODR pipeline currently converts **road geometry only**. Road and lane attributes such as speed limits, road markings, road objects, traffic signs, traffic lights, and other road properties are **not** included in the generated OpenDRIVE map.

▶ How to Run the G2O Conversion Pipeline in RepliMap

Follow these steps to convert a supported road-network GeoJSON into an ASAM OpenDRIVE (`.xodr`) map.

> **Note**
>
> The GeoJSON2ODR pipeline currently supports road-network GeoJSON that uses the **WGS 84 (EPSG:4326)** Coordinate Reference System (CRS).

1. **Open the G2O Import panel:** Use either of the following methods:

   Option 1 - **File → Import → GeoJSON to OpenDRIVE (G2O)**

   Option 2 - **Reference Data → GeoJSON to OpenDRIVE (G2O)**
2. **Select the input GeoJSON:** Browse to and select the road-network GeoJSON to convert.
3. **Choose the output folder:** Select the folder where the generated files will be saved.
4. **Start the conversion:** Click **Convert**.
5. **Review the output:** After the conversion completes, the output folder contains:
   - The generated **ASAM OpenDRIVE (`.xodr`)** file.
   - A pipeline log file containing conversion details.

Output files

File	Description
odr_map.xodr	The generated ASAM OpenDRIVE map.
pipeline.log	Complete conversion record containing the conversion steps, processing messages, warnings, and output information.
WarningLog.log	Contains conversion warnings, including roads that were skipped because of geometry or lane-related issues.
AtlasDrive_internal.json	An intermediate file generated during the conversion process and used internally to generate the final OpenDRIVE map.

1. **Verify the generated map:** The generated OpenDRIVE map and the imported GeoJSON are displayed on the RepliMap canvas.

   Use the visibility toggles in the **G2O Visualization** panel to compare the datasets.

Toggle	Description
GeoJSON Visibility	Shows or hides the imported GeoJSON.
XODR Visibility	Shows or hides the generated OpenDRIVE map.

   These toggles help you visually compare the generated OpenDRIVE map with the original GeoJSON.

G2O Visualization panel



▶ G2O Console

The **G2O** section in the **Console** (bottom panel) displays the complete conversion log, including the conversion steps, processing messages, warnings, errors, and the input/output paths.

The console log can also be exported for future reference or troubleshooting.

▶ Configure the G2O Pipeline for Your Custom GeoJSON

Different GeoJSON datasets may use different property names and structures. Before converting your own GeoJSON, you may need to configure the GeoJSON2ODR pipeline so that it can correctly interpret your dataset.

The configuration files are located in:

```
<RepliMap Installation Folder>
└── RepliMap_Data
    └── StreamingAssets
        └── geojson2odr
            ├── geojson2odr.exe
            ├── config
            │   ├── mapping.json
            │   ├── settings.json
            │   ├── advanced.json
            │   └── README.md
            └── output
```

Before making any changes, it is recommended to create a **backup** of the configuration files.

Configuration files

Configuration File	Purpose
mapping.json	Maps the properties in your GeoJSON to the fields expected by the GeoJSON2ODR pipeline. This is the primary configuration file and the one you will modify most frequently.
settings.json	Contains optional pipeline settings that control the conversion behavior. In most cases, the default settings can be used.
advanced.json	Contains advanced conversion and geometry settings. Most users do not need to modify this file.

▶ Configure mapping.json

The **mapping.json** file tells the GeoJSON2ODR pipeline how to interpret the properties in your GeoJSON. When using a new road-network GeoJSON, this is the configuration file you will update most frequently.

Open your GeoJSON in a text editor and compare its property names with those defined in **mapping.json**. Update the mapping wherever the property names or values do not match your dataset.

The **mapping.json** file is divided into several sections, each responsible for mapping a specific type of road information.

mapping.json sections

Section	Purpose
how_features_are_typed	Defines which GeoJSON property identifies the feature type (for example, road boundary, reference line, or lane).
roads	Maps the road identifier and other road-related properties.
boundaries	Maps lane boundaries and the properties that identify the left and right sides of the road.
reference_lines	Maps the road reference (center) lines.
lanes	Maps lane-related properties, including lane identifiers and lane boundaries.
lane_links	Maps lane-to-lane connection information.
road_links	Maps road-to-road connection information.
road_edges	Maps road edge information, when available.
markings	Maps road-marking properties, if present.
speed	Maps speed-related properties, if available.

> **Warning**
>
> When updating **mapping.json**, make sure that:
>
> - The road identifier matches the property used in your GeoJSON.
> - The feature type values match those used in your GeoJSON.
> - The left and right lane boundary properties are mapped correctly.
> - Any optional lane or connection properties are mapped if they are available in your GeoJSON.

Once the mapping has been updated, save the file and run the GeoJSON2ODR pipeline.

▶ Run the GeoJSON2ODR Pipeline from Command Prompt

After updating the `mapping.json` file, you can run the GeoJSON2ODR pipeline from the Command Prompt.

1. **Open the GeoJSON2ODR folder:** Navigate to:

   ```
   <RepliMap Installation Folder>
   └── RepliMap_Data
       └── StreamingAssets
           └── geojson2odr
   ```

2. **Open Command Prompt:** Click on the address bar, type `cmd`, and press **Enter**.

   A Command Prompt window opens in the `geojson2odr` directory.

3. **Run the conversion command:**

   ```
   geojson2odr geojson-to-here --config-dir "<Path to your mapping.json file>" --input "<Path to input GeoJSON>" --output "<Output folder>"
   ```

4. **Review the output:** After the command completes successfully, the output folder contains:

   - The generated **ASAM OpenDRIVE (`.xodr`)** file.
   - A pipeline log file containing conversion details.

Output files

File	Description
odr_map.xodr	The generated ASAM OpenDRIVE map.
pipeline.log	Complete conversion record containing all processing steps, progress, warnings, and output information.
WarningLog.log	Contains conversion warnings and roads that were skipped because of geometry or lane-related issues.
AtlasDrive_internal.json	Intermediate file generated during the conversion process and used internally to create the final OpenDRIVE map.

The generated **odr_map.xodr** can be opened directly in RepliMap for further editing, validation, and export.

Note

Road-network GeoJSON generated by the HERE HD to XODR (H2O) pipeline is an example of a supported input format.

▸ Related

- Data sources overview — where the pipeline sits in the reference-data workflow.
- GeoJSON — GeoJSON reference data and import workflows.
- HERE HD to XODR (H2O) — HERE HD Live Maps conversion pipeline.
- Road tool — refining the generated map after import.

5 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.

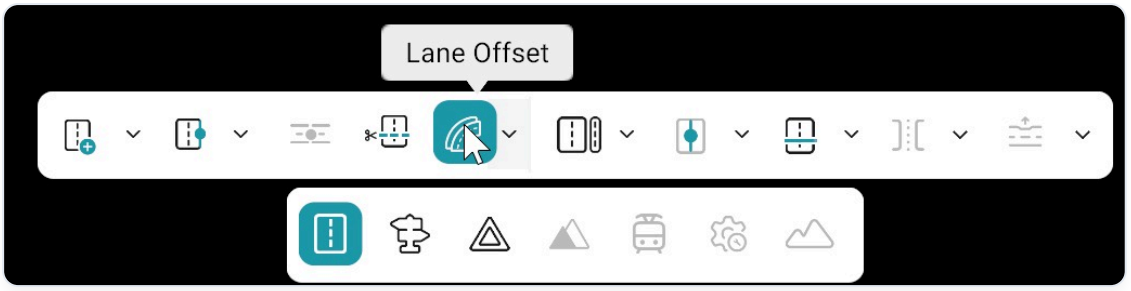
> ⚠ **Topology**
>
> A bad cut can leave **zero-length** segments or **broken** predecessor/successor links. Inspect the junction graph after editing.

▶ 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

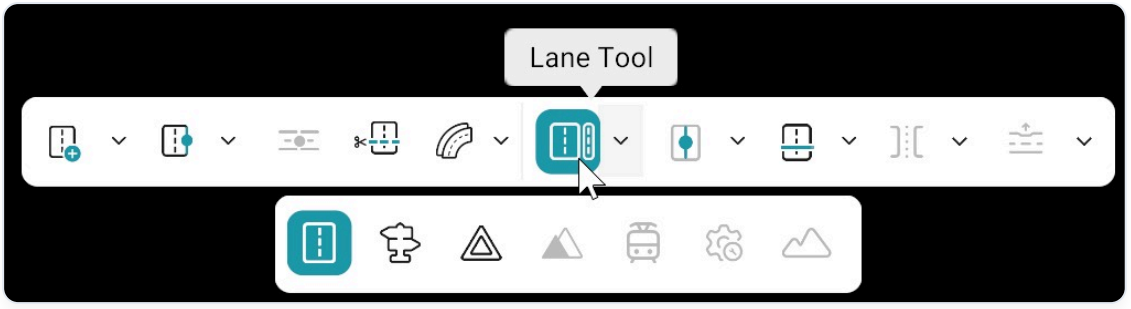
- After moving purple offset anchors, check neighbouring lanes for width and marking rules.
- Offset interacts with lane width and markings. Adjust them together when redesigning a cross-section.
- After large offset edits, re-check junction connectivity, as lane links may need updating.
- Always verify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

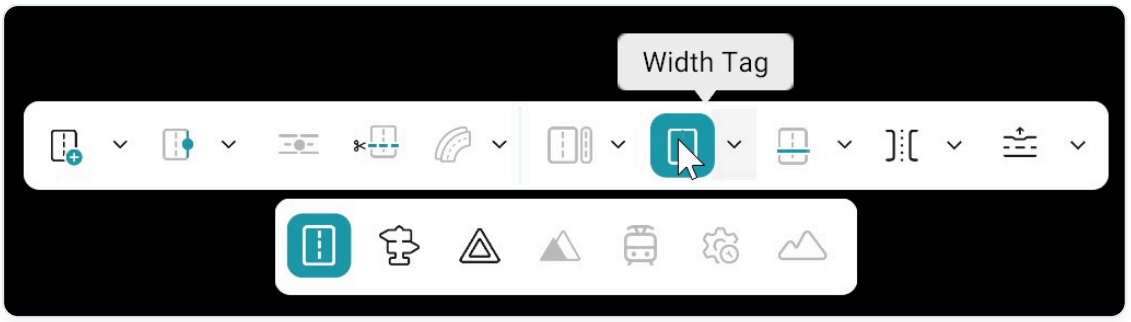
- Each lane is part of a **lane section** along the road.
- **Lane markings** define and separate individual lanes.
- **Lane offset** and **width tags** together describe how lane shape changes along the road.

▸ Related

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

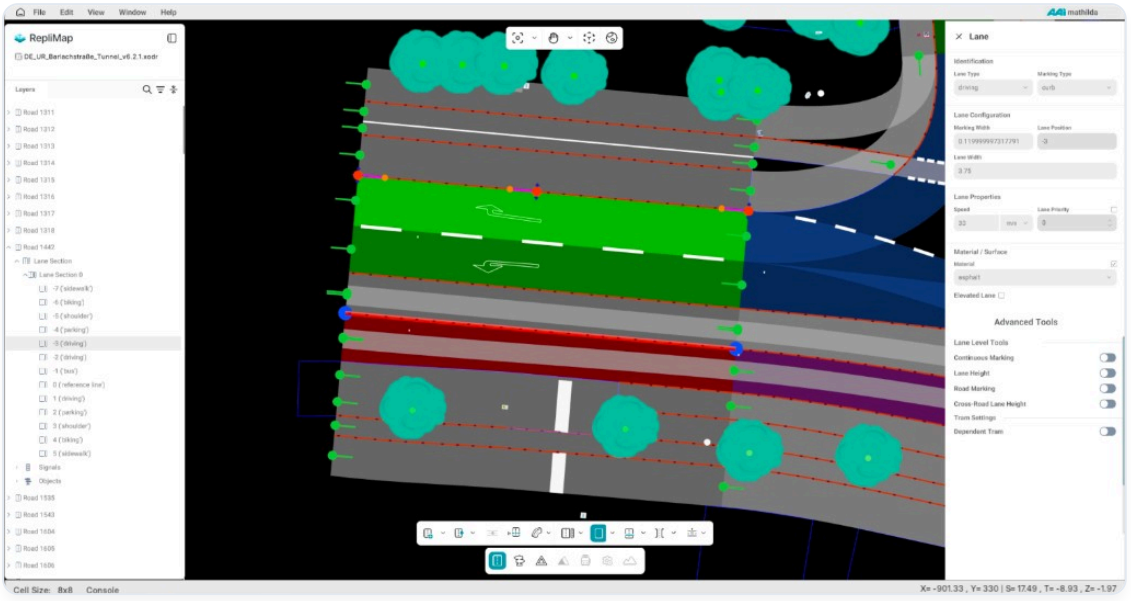
Width Tags

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

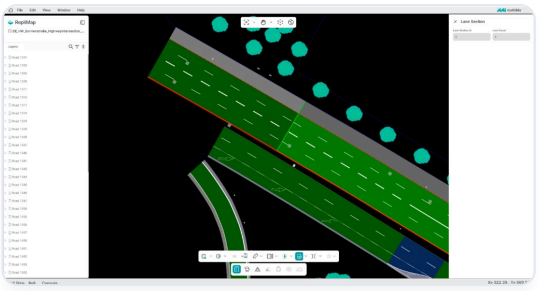
Select the **road** on the canvas, then turn on the **Lane Section** tool from the **Road editing bar** (above the canvas, in the **Road** tool group). The screenshot in the next section shows a **lane section boundary** on the road and the **Lane Section** sidebar.

- **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



▸ 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).
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 elevation 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.

Field	Purpose
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



▸ 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**).
Elevated lane	When enabled, marks elevated or bridge-style lane behaviour.

▹ Advanced Tools

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

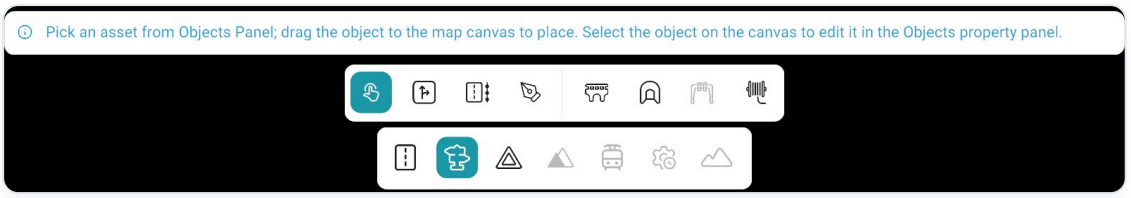
▸ Related

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

6 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.

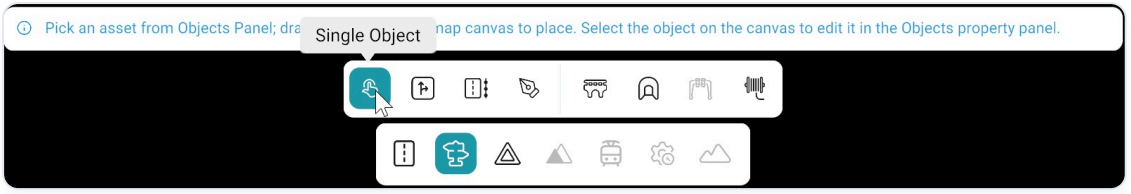
▶ Related

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

Single Object

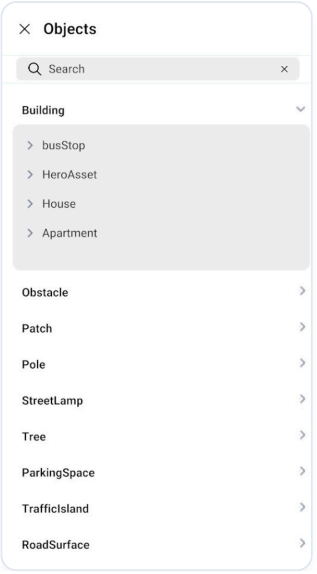
Clicking **Single Object** opens the **Objects Panel** on the right side of the RepliMap canvas, enabling users to add individual objects or assets directly to the map or scene.

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

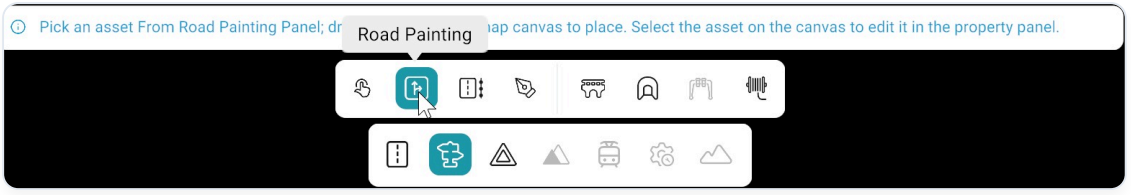
- Objects overview · Object Properties Panel · Repeatable objects · Pen tool

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.

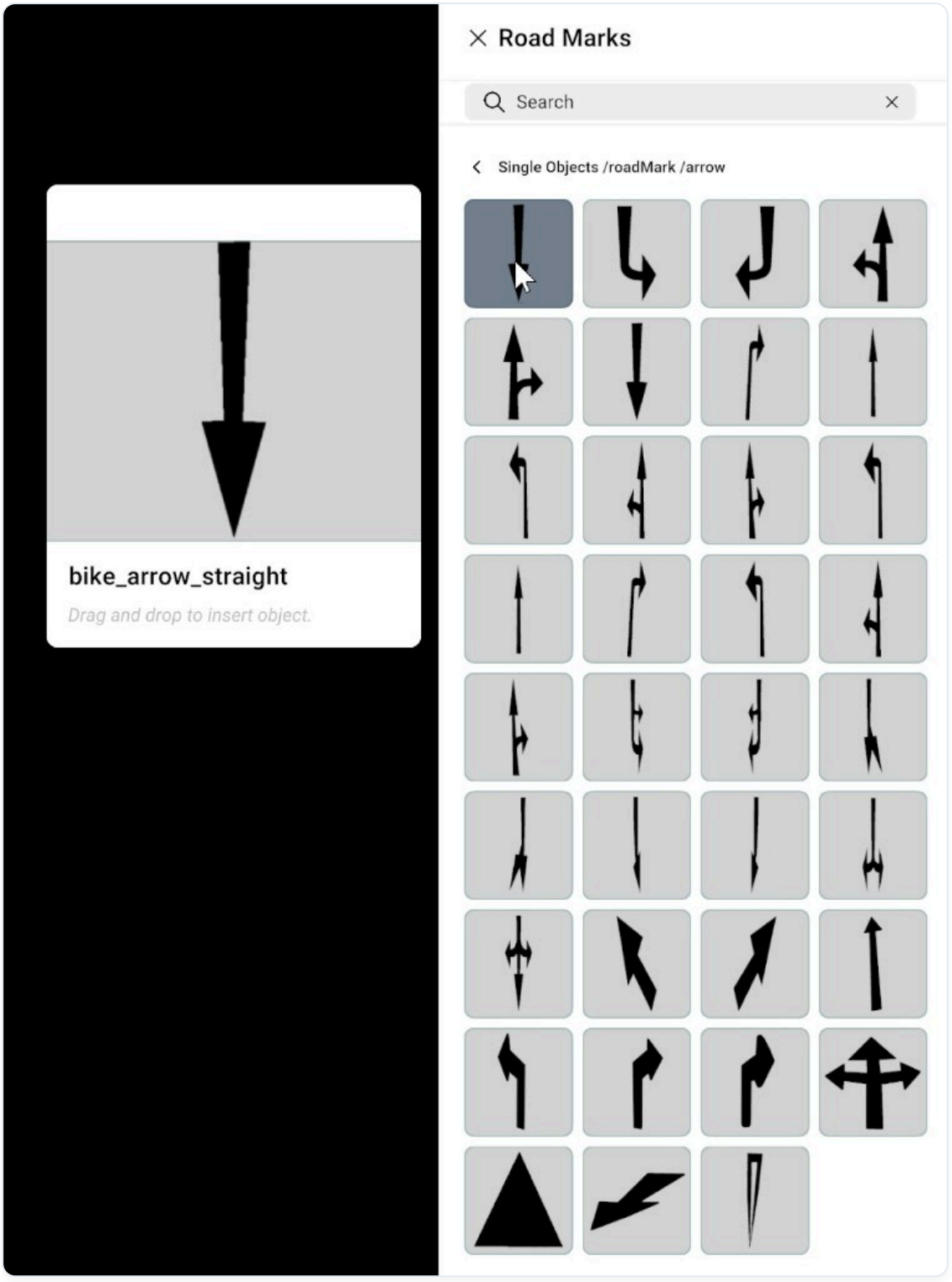


▶ How to Use Road Marks

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

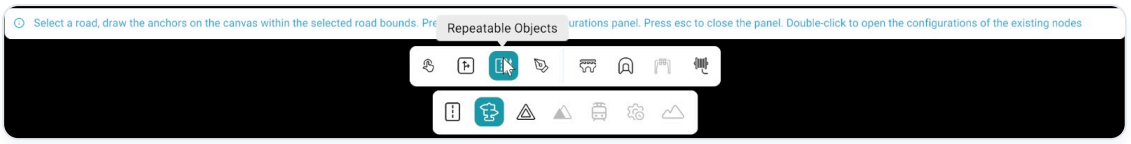


▸ Related

- 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.



> **Note**
>
> The Repeatable Objects tool is not available in **Scenery View** for editing or creation. Switch to **2D View** to add or edit repeatable objects.

▶ 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



▶ 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

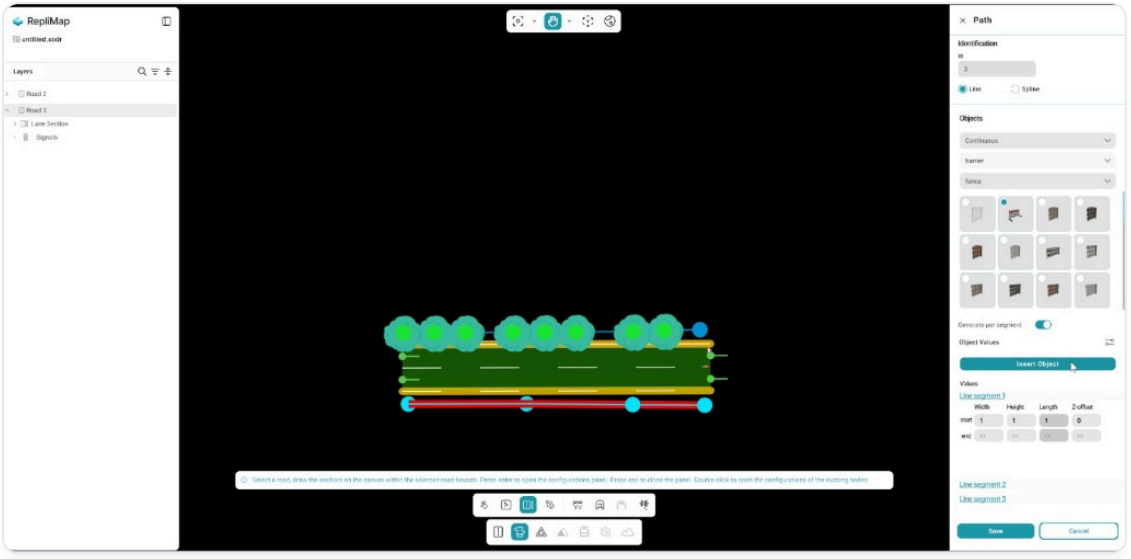
▸ Generate Per Segment Feature

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.

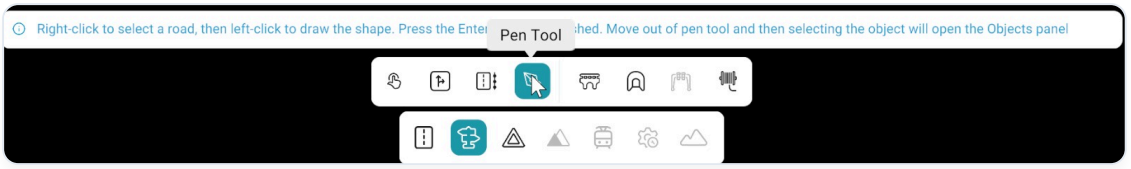
▶ Related

- 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



Note

The Pen Tool is not available in **Scenery View** for editing or creation. Switch to **2D View** to create or edit polygon objects.

▶ 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

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.

Property	Type	Description
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

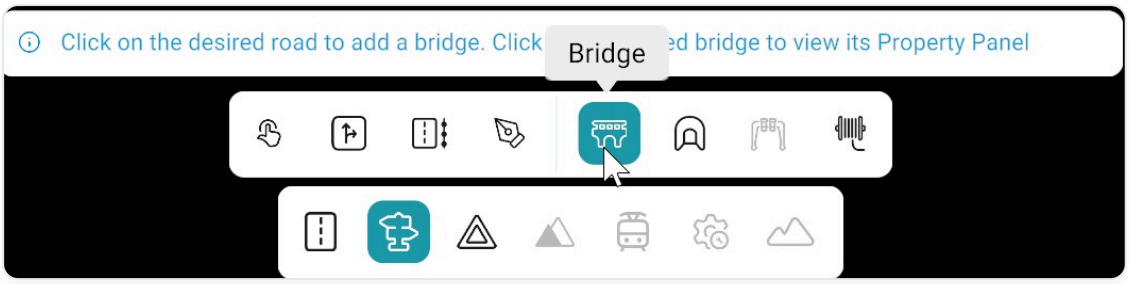
Object-wide **Z** / **Height** is not required for gantry creation and should not be used for gantry objects.

▸ Related

- Objects overview · Gantry · Road painting · Single object

Bridge

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



Note

The Bridge tool is not available in **Scenery View** for editing or creation. Switch to **2D View** to add or edit bridges.

▶ 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

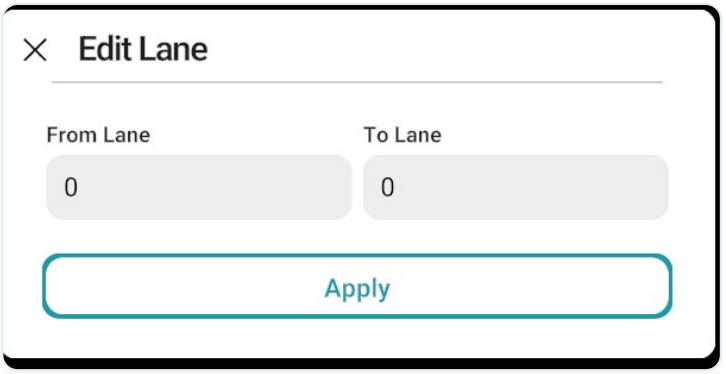
Right-click on a bridge to open the **Bridge Properties Panel**. This panel allows modification of the bridge properties.

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

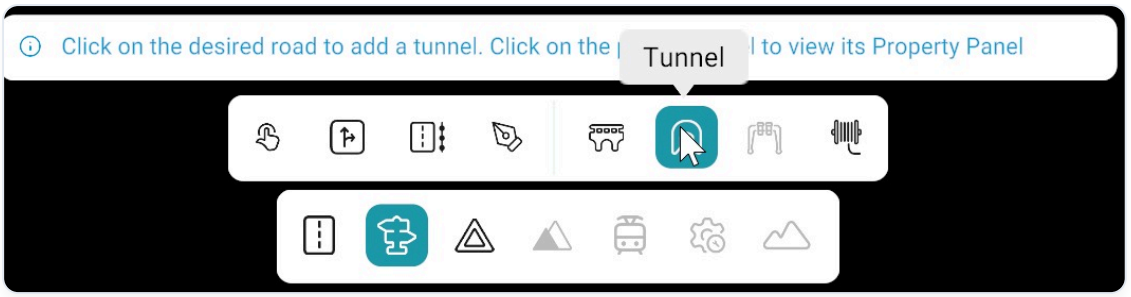


▶ Related

- Objects overview · Tunnel · Road tool · Elevation tools

Tunnel

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



> **Note**
>
> The Tunnel tool is not available in **Scenery View** for editing or creation. Switch to **2D View** to add or edit tunnels.

▸ 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

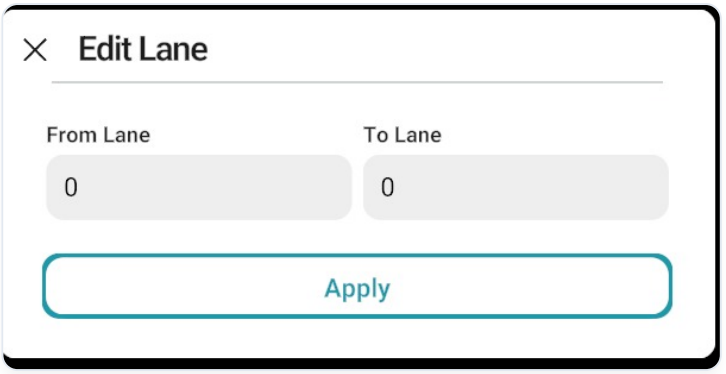
Right-click on a tunnel to open the **Tunnel Properties Panel**. This panel allows modification of the tunnel properties.

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

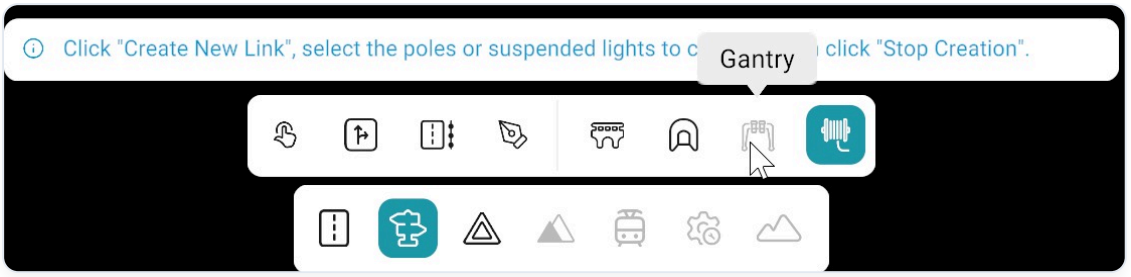
Gantry Tool (Currently Not Available)

> **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.

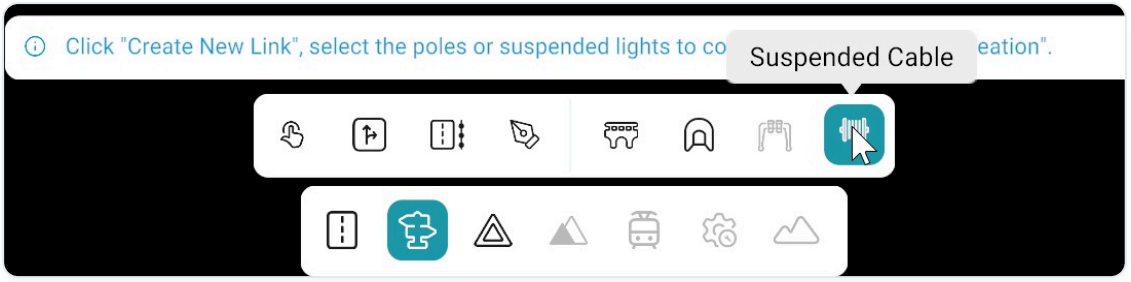
▶ Related

- 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.

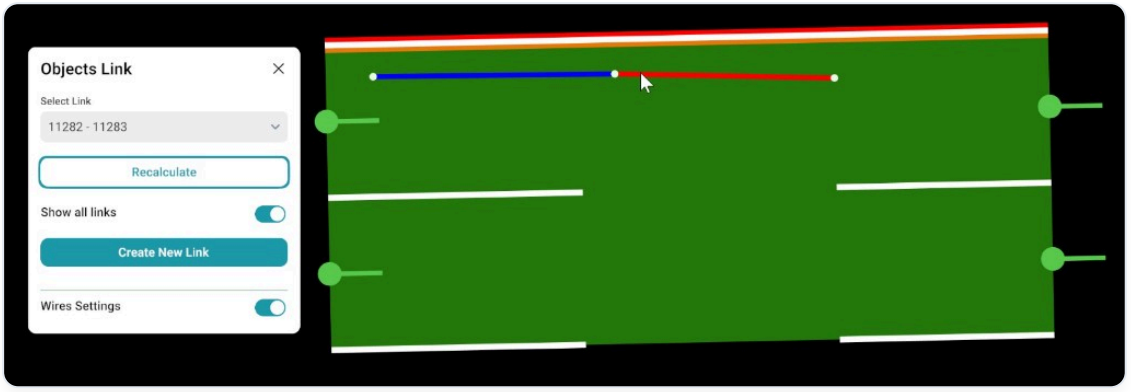
These cables represent real-world overhead wiring systems and help improve infrastructure realism in RepliMap.



▶ 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



▶ 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.
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).

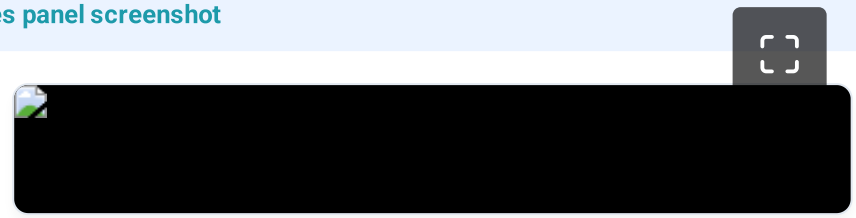
Exact behaviour options depend on the asset and product version.

▹ 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).

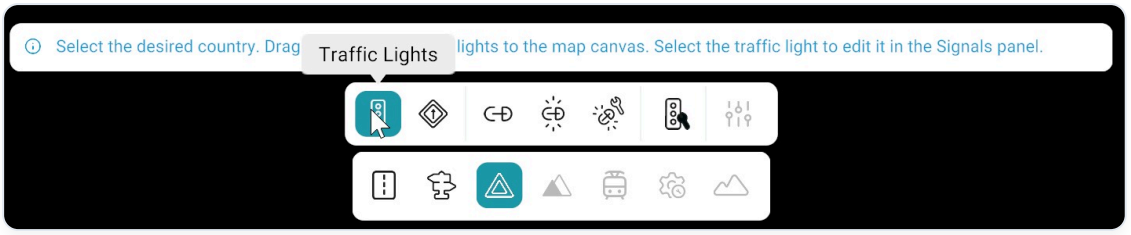
▸ Related

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

7 Signals

Signals

The **Signals** tool (available in the **Bottom Toolbar**) contains **Traffic Light**, **Traffic Sign**, and **Stop Line** panels, from where you can add traffic lights, signs, and stop lines on the 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, sign, or stop line 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.
Stop Line	Tool for creating and managing stop lines on roads, including lane validity and positioning.
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.

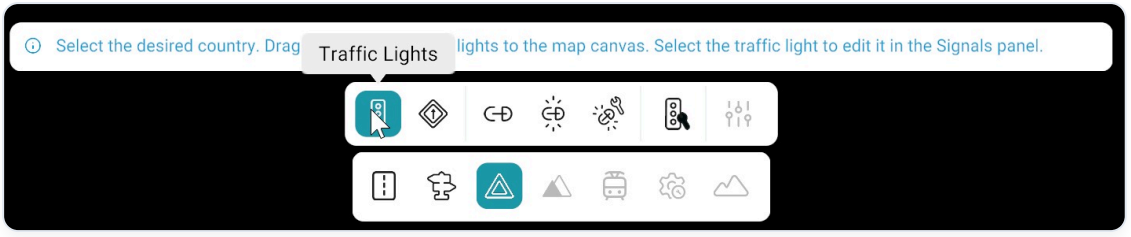
Feature	Description
Adjust All	Adjusts the vertical positioning of all linked signs and signals across the map at once.
Controllers	Assigns signals to a junction controller for managing signal behavior within a junction.
Signal Properties Panel	Provides detailed configuration including identification, preview, geometry, attributes, advanced settings, lane validity, and controllers linked to the signal.

▸ 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



▶ 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



▶ Related

- Signals overview · Traffic lights · Signal Properties Panel

Stop Line

A **Stop Line** is a road marking that indicates where vehicles must stop before entering an intersection, pedestrian crossing, or other controlled area.

In the latest **ASAM OpenDRIVE** standard, Stop Lines are represented as **Signals** instead of road objects. This enables Stop Lines to use **Lane Validity**, allowing users to control which lanes the Stop Line applies to.

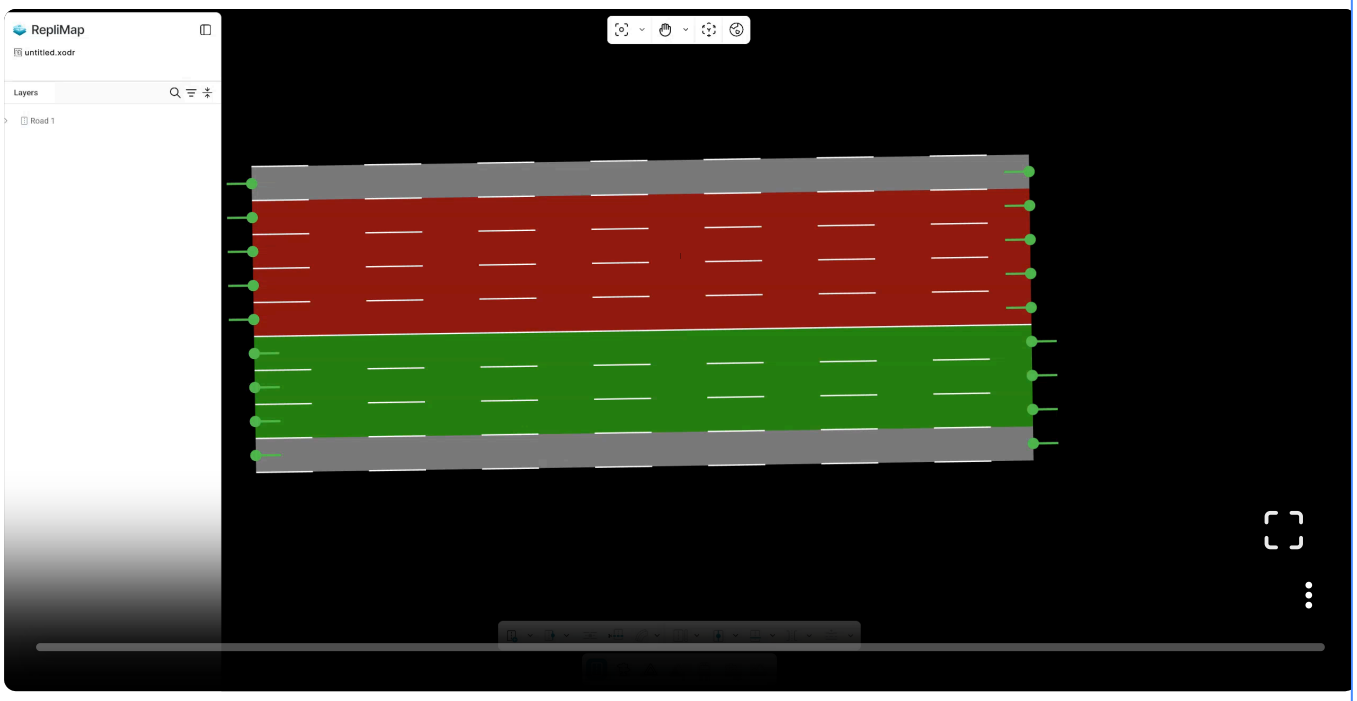


▸ How to Add Stop Lines

Follow these steps to place a Stop Line:

1. Select **Signals** from the bottom toolbar.
2. Click **Stop Line** from the Signals toolbar.
3. The **Stop Line** panel opens on the right side of the canvas.
4. In the **Stop Line** panel, click **Create New Stop Line**.
5. The cursor changes to a **+** icon, indicating that creation mode is active.
6. Click anywhere on the desired road.
7. A Stop Line is created across all drivable lanes of the selected road.
8. The **Signal Properties** panel opens automatically for the newly created Stop Line.

Create Stop Line



Note

- Stop Lines can only be created in **2D View**.
- By default, a Stop Line is applied to all drivable lanes of the selected road.

▶ Manage Lane Validity

By default, a Stop Line is displayed on all drivable lanes. Use **Lane Validity** to specify the exact lane range where the Stop Line should appear, including non-drivable lanes if required.

▷ Edit Lane Validity

Follow these steps to edit Lane Validity:

1. Select **Signals** from the bottom toolbar.
2. Click the **Stop Line** tool.
3. Select the Stop Line on the map. The **Signal Properties** panel opens on the right side of the canvas.
4. In the **Signal Properties** panel, locate the **Lane Validity** section.

5. If no Lane Validity exists, click the **+** icon to create one. If a Lane Validity already exists, select the existing entry to edit it.
6. In the **Lane Validity** panel, specify the **From Lane** and **To Lane** values.
7. Click **Apply**. The Stop Line updates immediately according to the specified lane range.

> **Note**
>
> - If the specified lane IDs exceed the available lanes on the selected road, the system automatically adjusts them to the nearest valid lane IDs.
> - A Stop Line can only be selected and edited when the **Stop Line** tool is active.

▶ Stop Line Visualization

The Stop Line visualization is automatically updated whenever the **Lane Validity** is modified.

▷ Example: Stop Line Visualization

Field	Value
Road Lanes	1, 2, 3, 4, 5
Lane Validity	**From Lane:** 1 · **To Lane:** 3
Stop Line Visualization	The Stop Line is displayed only on **Lanes 1, 2, and 3**. It is not displayed on **Lanes 4 and 5**.

> **Note**
>
> - The Stop Line visualization is updated immediately in both **2D View** and **Scenery View** based on the configured Lane Validity.

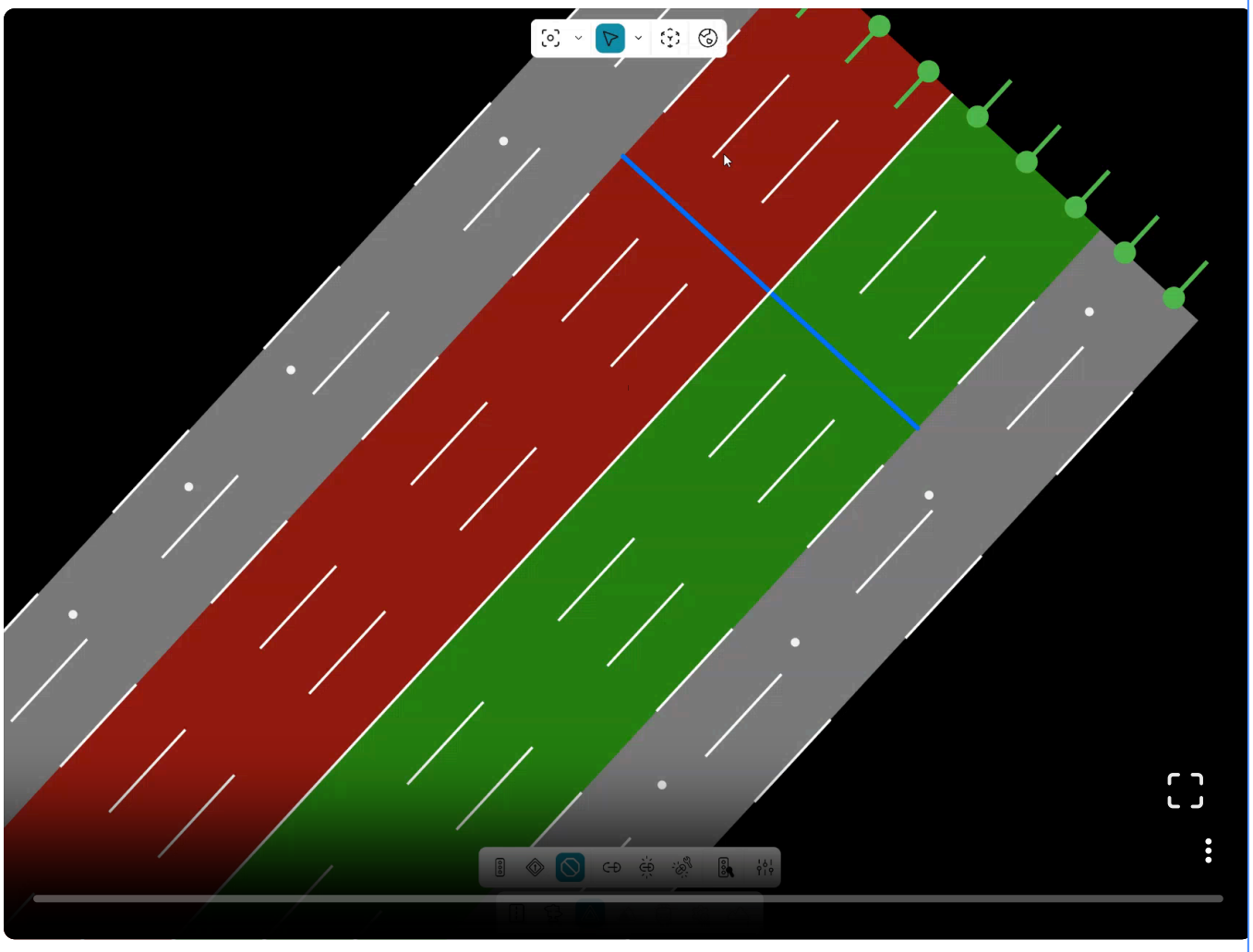
▶ Move a Stop Line

After a Stop Line has been created, its position can be modified without recreating it.

Follow these steps to move a Stop Line:

1. Select **Signals** from the bottom toolbar.
2. Click the **Stop Line** tool.
3. Select the Stop Line on the map.
4. Drag the Stop Line to the desired position along the selected road.
5. In **Scenery View**, use the **Gizmo** to reposition the Stop Line along the road.

Move Stop Line



Note

- Stop Lines can only be moved along the selected road.
- They cannot be moved beyond the road boundaries.
- Existing Stop Lines can be viewed in both **2D View** and **Scenery View**.

▶ Stop Line Panel

The **Stop Line** panel displays all Stop Lines available in the current map.

Each Stop Line entry includes the following information:

Field	Description
Stop Line ID	Unique identifier of the Stop Line.
Road ID	Road on which the Stop Line is created.
Lane Validity	Current lane validity assigned to the Stop Line.

Stop Line panel



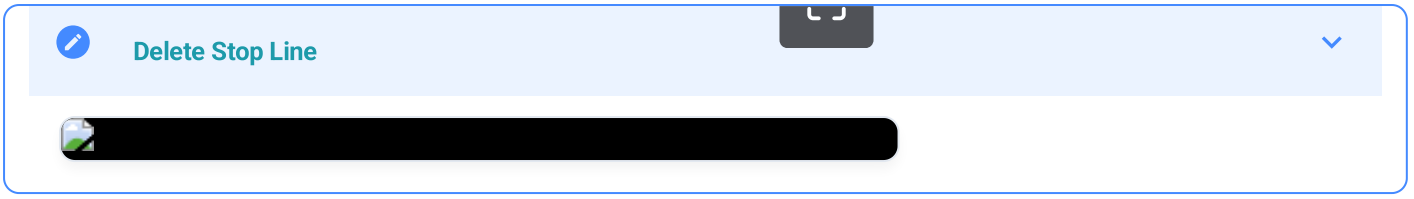
Selecting a Stop Line from the panel automatically selects it on the map and opens its **Signal Properties**.

▶ Delete a Stop Line

A Stop Line can be removed from the map using any of the following methods.

Method	Steps
Stop Line Panel	Click the **Delete** icon beside the required Stop Line.

Method	Steps
Delete Button	If a Stop Line is selected, press the **Delete** button to remove it.
Signal Properties	Select the Stop Line and click **Delete Signal** in the **Signal Properties** panel.

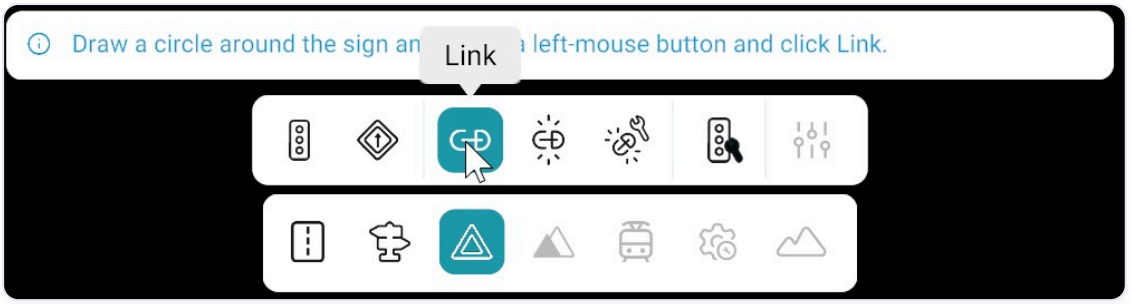


▸ Related

- Signals overview · Traffic signs · Controllers · Signal Properties Panel · Road tool

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.

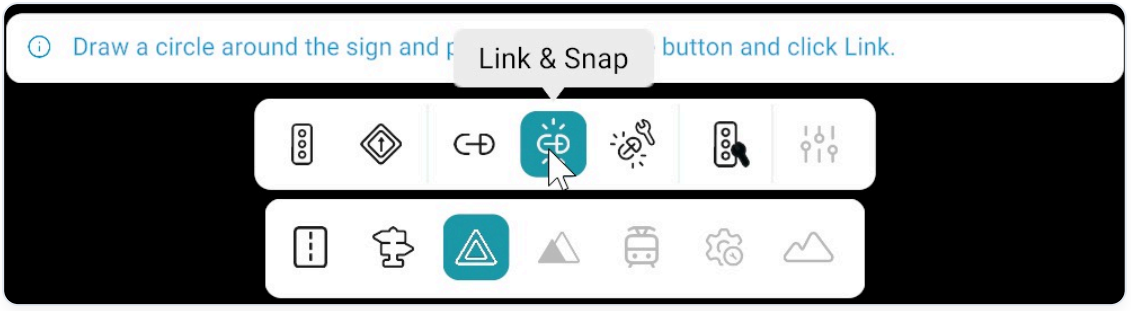
▸ Related

- 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

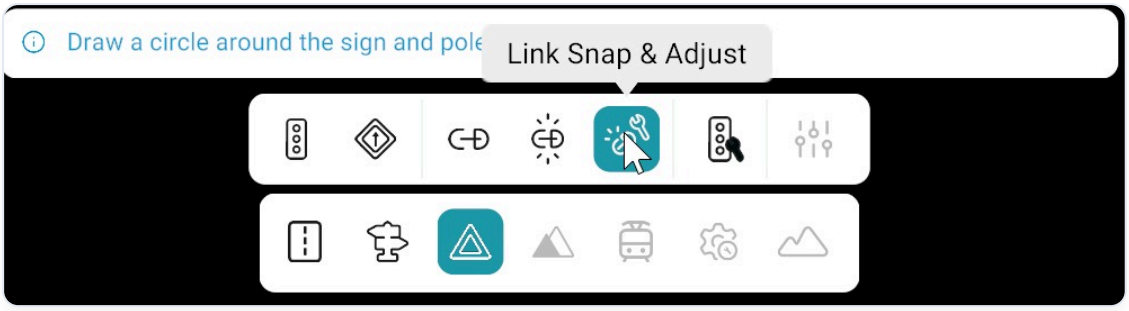
Adjust **Z-offset** for each linked sign or light to fine-tune height on the pole. Horizontal placement is handled by the snap step.

▶ 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

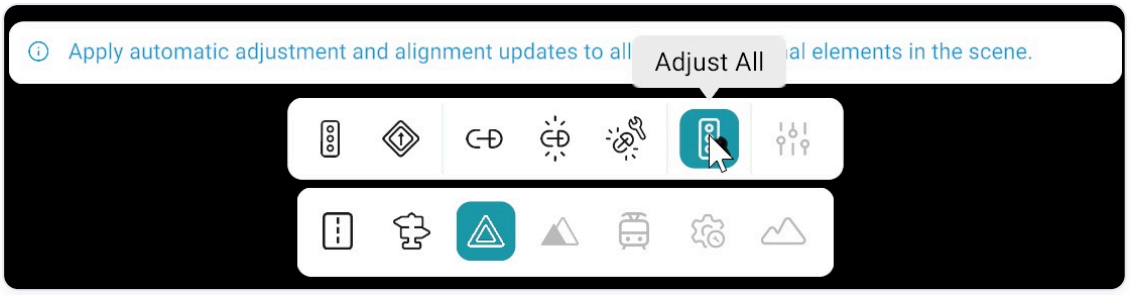
Set **Z-offset** for the **bottom Traffic Light** or **Traffic Sign** only. All other linked items follow the pole's vertical alignment automatically.

▶ 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

Traffic Controllers

Traffic Controllers manage traffic signals within a junction by grouping multiple traffic lights under a single controller. They define which signals belong to a specific junction, making it easier to organize, monitor, and coordinate signal behavior and timing.

Open the tool from the **Signals** toolbar, then work in the **Controllers** panel on the right.



▸ How to Use Controllers

Step	Action
1	Select **Signals** from the bottom toolbar.
2	Click **Controllers** from the Signals toolbar.
3	The **Controllers** panel opens on the right side of the canvas.

Controllers panel



▹ Manage Controllers

Action	Steps
Create	1. Click **Create New Controller**. 2. Enter **Controller Name**, **Sequence Number**, and **Junction ID**. 3. Click **Create**.
	Create New Controller dialog 
Edit	1. Click the **Edit** icon beside the controller. 2. Update **Controller Name**, **ID Sequence**, or **Junction**. 3. Save the changes.
	Edit controller 
Delete	Click the **Delete** icon in the list, **or** open controller details and click **Delete Controller**.
	Delete icon in controller list 
	Delete Controller from details panel 

▸ Link Signals to a Controller

Open the required **Controller** from the **Controllers** panel to display its details.

Method	Steps	Result
Add Signals from Signal List	1. Click **Add Signal**. 2. The **Add Signal** window appears. 3. Select one or more traffic lights. 4. Click **Add**.	Selected traffic lights are linked to the controller.
Add Signals from Canvas	1. Open the **Controller Details** panel. 2. Select the desired traffic light(s) directly from the canvas.	Selected traffic lights are automatically linked to the controller.

Link signals demo



Note

Multiple traffic lights can be linked to a single controller.

▸ Remove Signals from a Controller

Action	Steps	Result
Remove one signal	Click the **Delete** icon beside a linked traffic light.	That signal is unlinked from the controller.
Remove all signals	Click **Delete All**.	All linked traffic lights are removed from the controller.

Remove signals



▶ Search and Filter

Tool	Options	Behaviour
Filter	**Show All**	Displays all controllers.
	Junction	Displays controllers with an assigned Junction ID.
	Sequence	Displays controllers with an assigned Sequence ID.
Search	**Controller Name**, **Sequence ID**, **Junction ID**	The list updates automatically as you type.

Search and filter



Save Validation

Before saving the map, the system validates all configured controllers.

Check	What happens
Linked signals required	Every controller must have at least one linked traffic light.
No linked signals	If a controller has no assigned traffic lights, a warning message is displayed.
Auto-removal	Controllers without linked traffic lights are automatically removed during the save process.

Remove empty controllers dialog



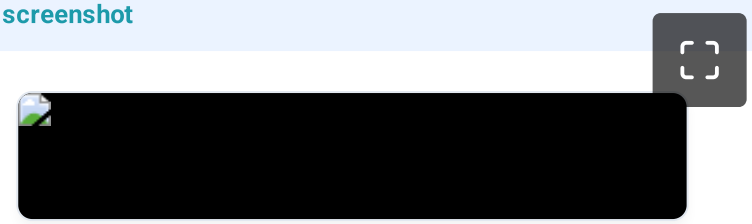
▶ Related

- Signals overview · Traffic lights · Signal properties panel · Road tool

Signal Properties Panel

When a **Traffic Light**, **Traffic Sign**, or **Stop Line** is selected on the canvas, the **Signal Properties** panel opens on the side. The sections below follow the panel layout from top to bottom.

Signal Properties panel screenshot



▸ Sections in the Panel

▹ Identification

Field	Purpose
Signal ID	Unique identifier assigned to the signal (e.g., `0`).
Name	Label for the signal (e.g., `1000001`).

▹ 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.

Field	Purpose
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).
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.

▹ Advanced

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.

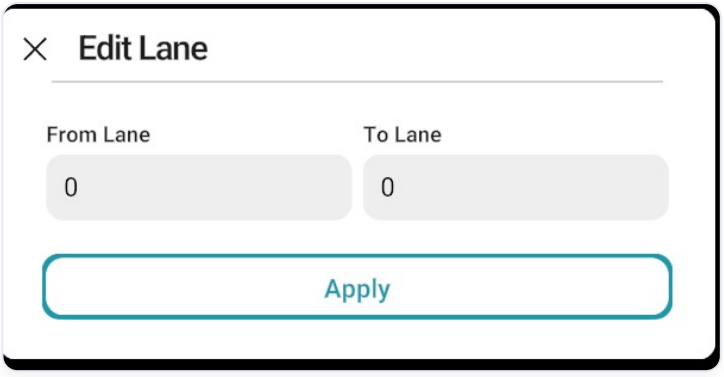
Field	Purpose
Pitch	Forward or backward tilt of the signal (in degrees).
Roll	Side-to-side tilt of the signal (in degrees).

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 a 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**.



▹ Controllers linked to the Signal

Lists the traffic controllers associated with the selected signal. Expand this section to view controller assignments linked to the signal.

▹ Delete Signal

Removes the selected signal or sign from the map. Click **Delete Signal** at the bottom of the panel.

▸ Related

- Signals overview · Traffic lights · Traffic signs · Stop Line · Controllers · Object Properties Panel

8 Elevation Tools

Elevation Tools

The **Elevation tools** give control over a road's vertical profile by adding and adjusting elevation values along its length.

▸ Elevation Tools Categories

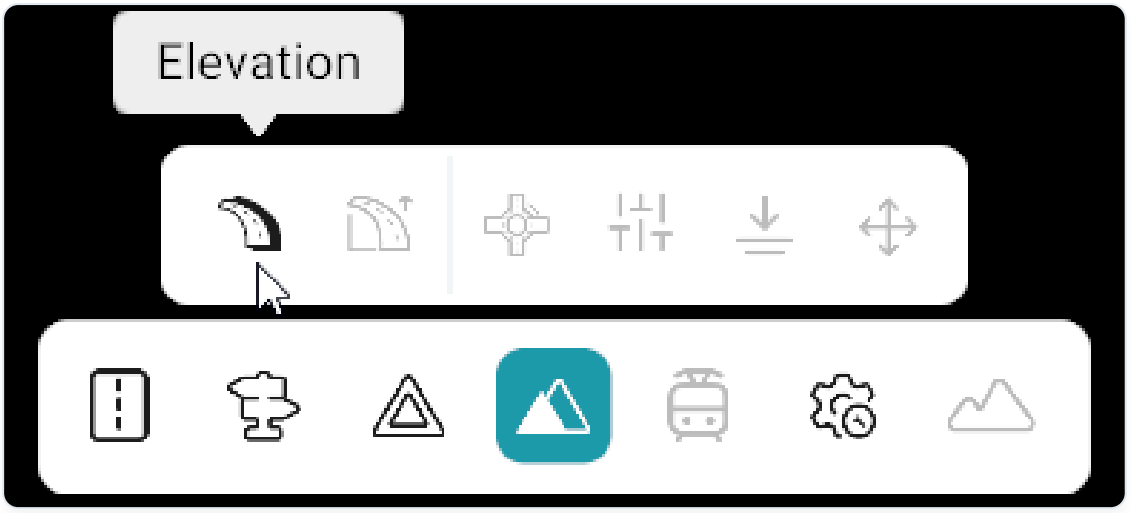
Topic	Description
Elevation	Adds and modifies elevation along a road by defining elevation values at specific points along its length.
Super Elevation	Defines and modifies the lateral inclination (tilt) of a road using Angle, Slope, and Vertical Offset values.
Smoothen Junction	Smooths the elevation of all roads within a junction to create a smoother elevation transition between connecting roads.
Equalize Junction	Equalizes the elevation of all roads within a junction to create a more consistent elevation across the junction.
Flatten Junction	Flattens the elevation of all roads within a junction to create a flat elevation across the junction.
Adjust Z	Adds a specified Z value to the existing elevation of all connecting roads within a selected junction.

▸ Related

- Road tool overview · Road Properties Panel

Elevation

The **Elevation tool** adds and modifies elevation along a road, giving control over the road's vertical profile by defining elevation values at specific points along its length.



The Road Elevation editor can be opened two ways: through the **Elevation tool**, or through the **Road Properties panel**. Both paths open the same editor.

▸ How to Use Elevation Tool and Open Elevation Panel

Method	Steps
1. Using the Elevation Tool	1. Activate the **Elevation** tool. 2. Select a **road**. 3. The **Road Elevation** panel opens. The Elevation tool can be activated whether or not a road is already selected. If no road is selected yet, select one after activating the tool to open the panel.
2. Using Road Properties	1. Select a road to open the **Road Properties** panel. 2. Click **Open Elevation Editor**. 3. The **Road Elevation** panel opens.

▸ Set the Road Elevation

When the panel opens, a road at zero elevation shows a red elevation node at its start and at its end.

1. Select an elevation node.
2. Enter the required value in the **Height** field — height values are specified in **meters**.
3. To add an elevation point elsewhere along the road, **right-click** at the desired position.
4. Select the newly added point and set its **Height** value.
5. Add and adjust further elevation points the same way.

▸ Elevation Parameters

Parameter	Controls	Range
Height	The elevation at the selected point	−1000 m to 1000 m
S Offset	The selected point's position along the road	—
Angle	The twist, or rotation, of the road at the selected point	—

Road Elevation panel screenshot



Notes

- **Reset Elevation:** Restores the road to its default elevation i_e 0.
- **Unselect Elevation Tool:** Press **Esc** to unselect the Elevation tool.

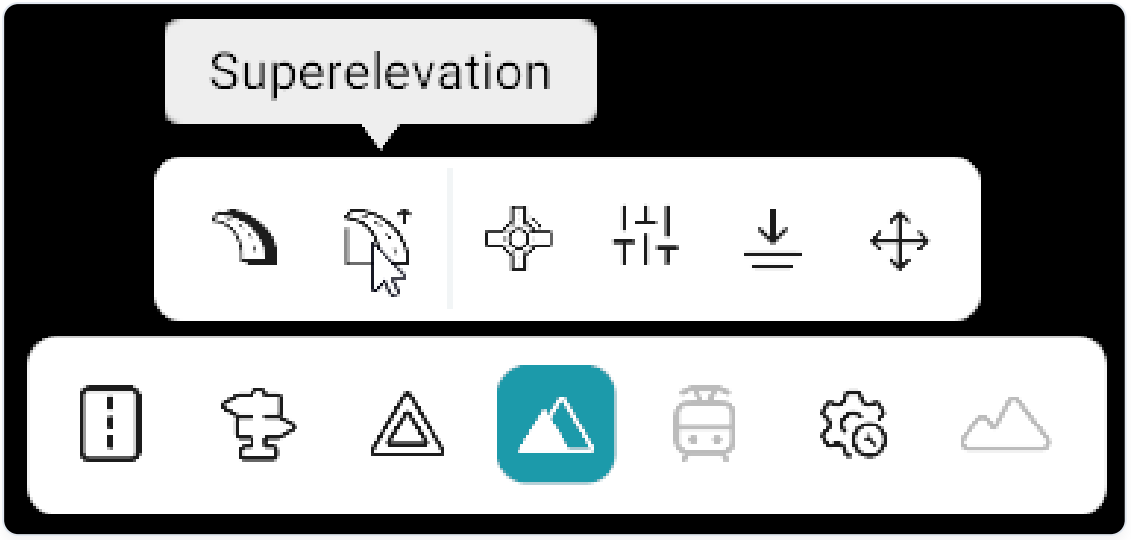
▶ Related

- Elevation tools overview · Road Properties Panel · Road tool overview

Super Elevation

The **Superelevation tool** allows users to define and modify the lateral inclination of a road. It controls how the road surface is tilted along the road by defining **Angle** and **Slope** values at specific positions.

The tool also supports defining an **Angle from Vertical Offset**, allowing the road's tilt to be set using a vertical offset value.



> **Warning**
>
> A road must be selected before using the Superelevation tool. The tool remains inactive until a road is selected.

▸ Select a Road and Activate the Superelevation Tool

1. **Left-click** on the road you want to edit.
2. Click the **Superelevation** tool.
3. **Right-click** on the selected road.
4. Yellow superelevation points appear at the start and end of the road.

▸ Set Superelevation Values

1. **Left-click** a superelevation point.

2. The **Superelevation** panel opens.
3. Enter the required **Angle** and **Slope** values.
4. Press **Enter** to apply the values.

▸ Add and Remove Superelevation Points

Action	How to Perform
Add Node	Move the cursor to the desired position on the road and press **A**.
Remove Node	Select the point and press **D**. The first and last superelevation points cannot be removed.

▸ Superelevation Parameters

Parameter	Purpose
Angle	Controls how much the road is tilted at the selected point.
Slope	Controls how the road's elevation changes between superelevation points.
Vertical Offset	Defines the vertical difference used to set the road's angle.

Superelevation panel screenshot



Notes

- **Angle:** Allowed values are −75 to +75. Positive values tilt the road counterclockwise, while negative values tilt it clockwise.
- **Slope:** Allowed values are −15 to +15. The first and last points cannot have a Slope value.

▸ Angle from Vertical Offset

1. Select the required superelevation point.
2. Press **Ctrl + Left-click** on the point.
3. The **Vertical Offset** panel opens.
4. Enter the required offset value.
5. Click **Set**.

Vertical Offset panel screenshot



Notes

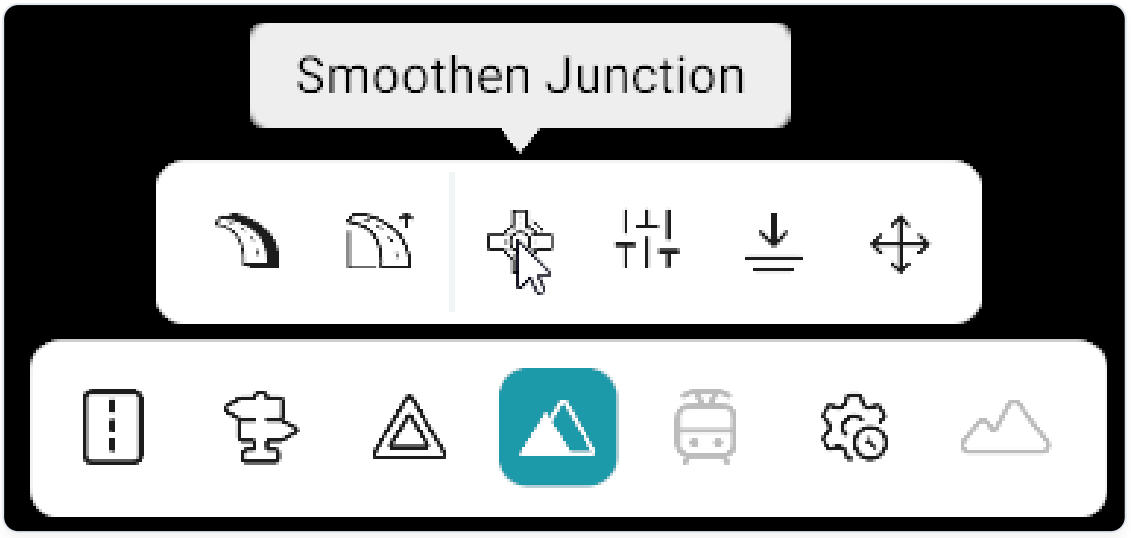
- Press **Esc** once to unselect the current road.
- **Left-click** another road to select it and continue editing its superelevation without activating the tool again.
- Press **Esc** again to unselect the Superelevation tool.

▸ Related

- Elevation tools overview · Elevation · Road Properties Panel · Road tool overview

Smoothen Junction

The **Smoothen Junction tool** allows users to smooth the elevation of roads within a junction. It adjusts the elevation of the connecting roads to create a smoother elevation transition within the junction.



> **Warning**
>
> When creating a map from scratch, the junction/Junction ID will not appear until the map is saved.

▸ Open the Smoothen Junction Tool

1. Click **Elevation Tools**.
2. Click a road in the junction.
3. Select **Smoothen Junction**.
4. Click any road that is part of the junction.
5. The **Junction** panel opens on the left side of the screen.
6. All roads present in the junction are listed in the Junction panel.
7. Click a **Road ID** in the Junction panel to highlight the corresponding road on the map.

▸ Smoothen Junction Elevation

1. Click **Smoothen**.
2. The elevation of all roads present in the junction is smoothed to create a smoother transition between the connecting roads.

▶ Reset the Elevation

1. Click **Reset**.
2. The elevation is restored to the value that was present before the smoothing operation was applied.

▶ Tool Actions

Action	Description
Smoothen	Smooths the elevation of all roads present in the junction to create a smoother elevation transition.
Reset	Restores the elevation to the value that was present before smoothing was applied.

Notes

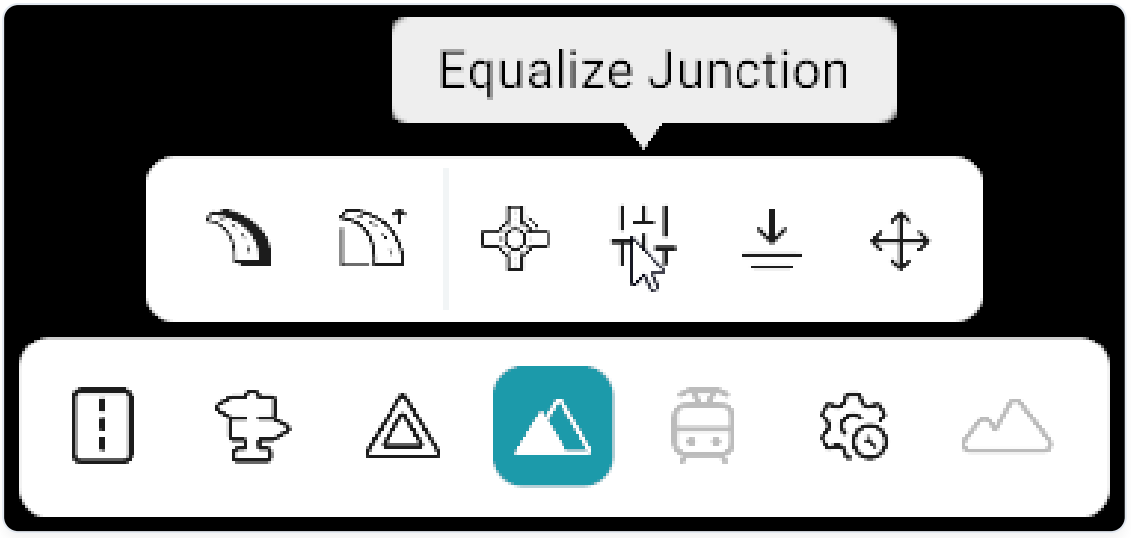
- Selecting a Road ID from the Junction panel only highlights the corresponding road on the map; it does not limit the smoothing operation to that road.
- **Reset** does not reset the elevation to 0. It restores the elevation value from before the smoothing operation.
- The required junction can be searched using the **Junction ID** search bar in the left-side Junction panel.
- **Smoothen** applies to the entire selected junction.

▶ Related

- Elevation tools overview · Elevation · Super Elevation · Road tool overview

Equalize Junction

The **Equalize Junction tool** allows users to equalize the elevation of roads within a junction. It adjusts the elevation of the connecting roads to create a more consistent elevation across the junction.



Warning

When creating a map from scratch, the junction/Junction ID will not appear until the map is saved.

▶ Open the Equalize Junction Tool

1. Click **Elevation Tools**.
2. Click a road in the junction.
3. Select **Equalize Junction**.
4. Click any road that is part of the junction.
5. The **Junction** panel opens on the left side of the screen.
6. All roads present in the junction are listed in the Junction panel.
7. Click a **Road ID** in the Junction panel to highlight the corresponding road on the map.

▶ Equalize Junction Elevation

1. Click **Equalize**.
2. The elevation of all roads present in the junction is equalized to create a consistent elevation across the connecting roads.

▶ Reset the Elevation

1. Click **Reset**.
2. The elevation is restored to the value that was present before the equalization operation was applied.

▶ Tool Actions

Action	Description
Equalize	Equalizes the elevation of all roads present in the junction to create a consistent elevation across the connecting roads.
Reset	Restores the elevation to the value that was present before equalization was applied.

Notes

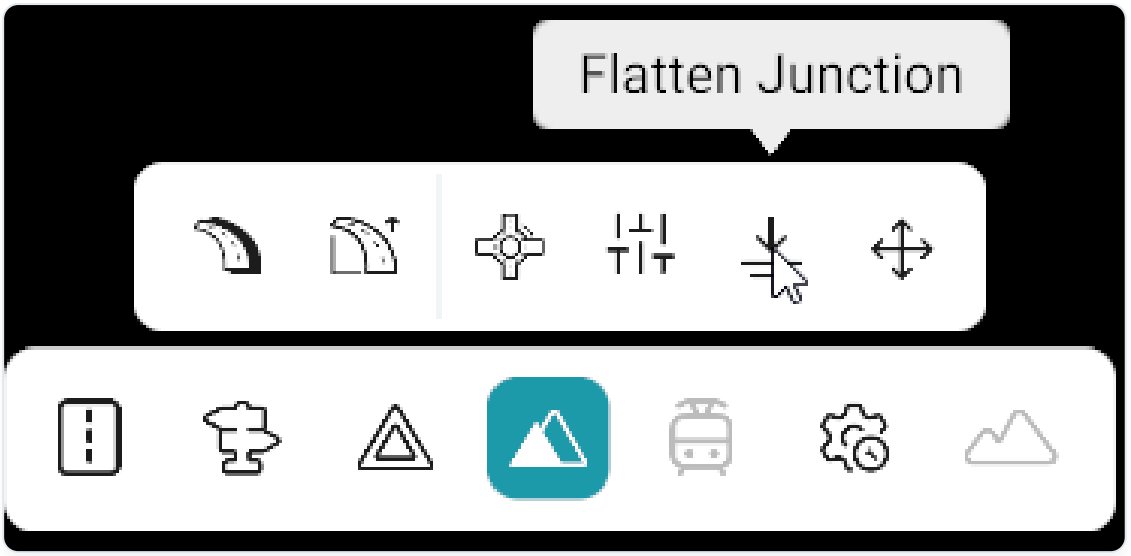
- Selecting a Road ID from the Junction panel only highlights the corresponding road on the map; it does not limit the equalization operation to that road.
- **Reset** does not reset the elevation to 0. It restores the elevation value from before the equalization operation.
- The required junction can be searched using the **Junction ID** search bar in the left-side Junction panel.
- **Equalize** applies to the entire selected junction.

▶ Related

- Elevation tools overview · Elevation · Super Elevation · Smoothen Junction · Road tool overview

Flatten Junction

The **Flatten Junction tool** allows users to flatten the elevation of roads within a junction. It adjusts the elevation of the connecting roads to create a flat elevation across the junction.



Warning

When creating a map from scratch, the junction/Junction ID will not appear until the map is saved.

▸ Select the Junction

1. Click **Elevation Tools**.
2. Click a road in the junction.
3. Select **Flatten Junction**.
4. Click any road that is part of the junction.
5. The **Junction** panel opens on the left side of the screen.
6. All roads present in the junction are listed in the Junction panel.
7. Click a **Road ID** in the Junction panel to highlight the corresponding road on the map.

▸ Flatten the Junction

1. Click **Flatten**.
2. The elevation of all roads present in the junction is flattened to create a flat elevation across the junction.

▶ Reset the Elevation

1. Click **Reset**.
2. The elevation is restored to the value that was present before the flattening operation was applied.

▶ Tool Actions

Action	Description
Flatten	Flattens the elevation of all roads present in the junction.
Reset	Restores the elevation to the value that was present before flattening was applied.

Notes

- Selecting a Road ID from the Junction panel only highlights the corresponding road on the map; it does not limit the flattening operation to that road.
- **Reset** does not reset the elevation to 0. It restores the elevation value from before the flattening operation.
- The required junction can be searched using the **Junction ID** search bar in the left-side Junction panel.
- **Flatten** applies to the entire selected junction.

▶ Related

- Elevation tools overview · Elevation · Super Elevation · Smoothen Junction · Equalize Junction · Road tool overview

Adjust Z

The **Adjust Z tool** allows users to adjust the elevation of all connecting roads within a selected junction. The specified Z value is added to the existing elevation of each connecting road.



Warning

When creating a map from scratch, the junction/Junction ID will not appear until the map is saved.

▸ Select a Junction

1. Click **Elevation Tools**.
2. Select **Adjust Z** from the toolbar.
3. Click any road that is part of the required junction.
4. The **Junction** panel opens on the left side of the screen.

▸ Adjust the Z Value

1. Enter the required **Z** value.
2. Click **Adjust Z**.
3. The specified Z value is added to the existing elevation of all connecting roads in the selected junction.

▶ Reset the Elevation

1. Click **Reset**.
2. The elevation values are restored to their values before the Z adjustment.

▶ Tool Actions

Action	Description
Adjust Z	Adds the specified Z value to the existing elevation of all connecting roads in the selected junction.
Reset	Restores the elevation values from before the Z adjustment.

Notes

- The required junction can be searched using the **Junction ID** search bar in the left-side Junction panel.
- **Adjust Z** applies to the entire selected junction.
- The specified Z value is added to the existing elevation of all connecting roads in the selected junction.
- **Reset** restores the elevation values from before the Z adjustment.

▶ Related

- Elevation tools overview · Elevation · Super Elevation · Smoothen Junction · Equalize Junction · Flatten Junction · Road tool overview

Trams

Coming soon

Trams are **not yet available** in RepliMap. Documentation for this feature will be published here when it is released.

10 Advance Tools

Advance Tools

The **Advance Tools** provide additional capabilities for junction and lane editing.

▸ Advance Tools Categories

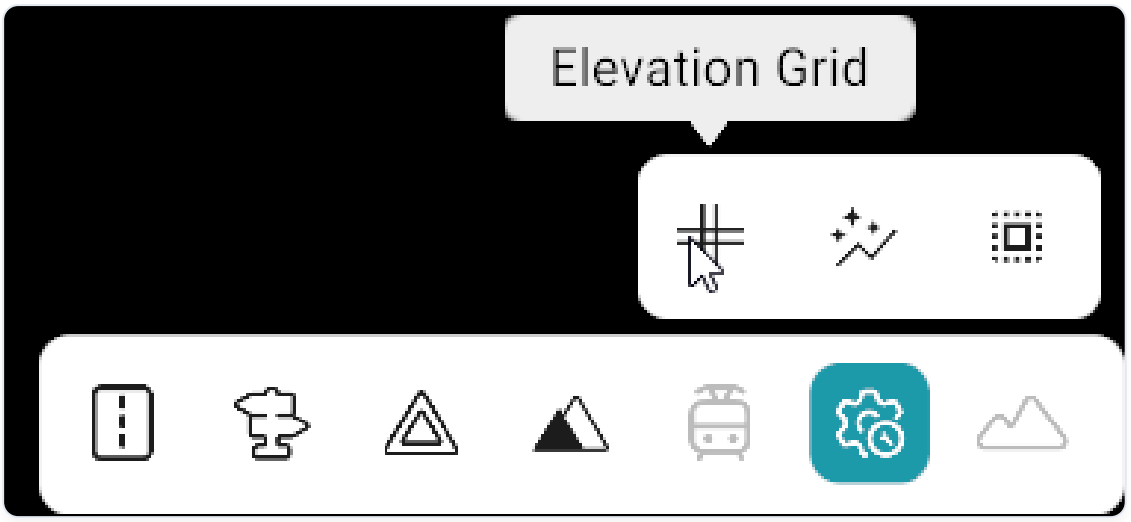
Topic	Description
Junction / Elevation Grid	Defines and manages elevation information around road junctions using a grid based on the junction outline.
Complex Lane Height	Sets or transfers different height values to lanes that overlap a specific area of a road using a Helper Road.
Buffer Area	Creates an open outline or closed loop along selected roads to define a specific area within the map.

▸ Related

- Elevation tools overview · Road tool overview

Junction / Elevation Grid

The **Elevation Grid** is used to define and manage elevation information around road junctions. It creates a grid based on the junction outline and allows elevation data to be recalculated when road geometry or elevation is changed.



▸ How to Use

1. Click **Advanced Tool** from the toolbar.
2. Select **Junction / Elevation Grid** from the sub-toolbar.
3. All junctions on the map will be listed in the **Junctions** panel.
4. Search for the required junction using its **Junction ID** or select it from the list.
5. If a junction already has a grid, it will show **Outline**; otherwise, it will show **No Outline**.
6. Select the required junction and click **Draw Outline**.
7. Draw the junction outline **anti-clockwise**.
8. Click **Close Outline** after completing the selection.
9. Select the required **grid size** and **smoothening value**.
10. Click **Save**.

▸ Junction Outline Creation

The junction outline must be created in an **anti-clockwise** direction.

Action	Description
Left Click	Draw a yellow line along the road/lane.
Shift + Left Click	Select a patch.
Right Click	Draw a red line across the road.
Shift + Right Click	Draw a red line across all lanes.
Ctrl + Shift + Right Click	Draw a red line across a single lane.

▸ Grid Management

The following actions are available for managing junction grids:

Action	Description
Recalculate All Grids	Recalculates all grids after road or elevation changes. This should be performed before exporting the map when road data has been modified.
Delete All Outlines	Deletes all created junction grids.
Show All Outlines	Displays all existing junction grids on the map. This is enabled by default.

▸ Junction / Elevation Grid Detail Panel

Section / Element	Description
Junction ID (J-0)	Displays the ID of the selected junction.
Anchors	Displays the anchors used to define the junction outline.
Draw outline	Starts the process of creating the junction outline.
Undo	Removes the most recent outline or anchor action.
Close outline	Completes and closes the junction outline.
Clear	Clears the current outline and selected anchors.
Grid	Contains the grid configuration options for the junction.
Cell size	Allows the user to select the grid cell size from the available options: 1 × 1, 0.5, and 0.25.
Cells – 22 × 21	Displays the number of cells generated for the current grid.
Visualize grid	Shows or hides the generated grid on the map.
Smoothen	Allows the user to adjust the smoothening level of the elevation grid using the slider.
Included Roads	Lists the roads included in the junction grid.
Delete outline	Deletes the existing junction outline.
Discard	Discards the current changes without applying them.
Apply	Applies and saves the current junction grid changes.

Junction / Elevation Grid detail panel screenshot



Notes

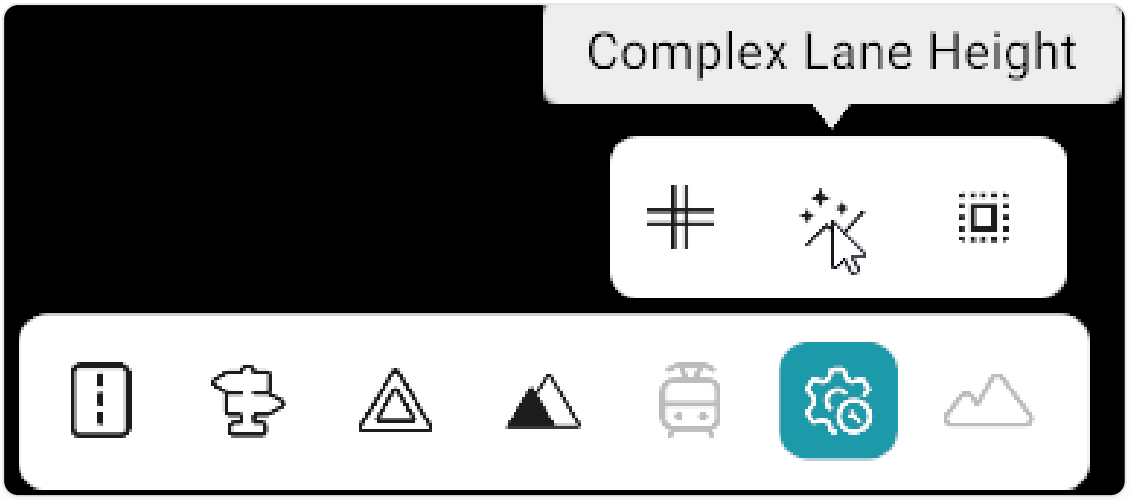
- Junction outlines must always be created in an anti-clockwise direction.

▸ Related

- Advance tools overview · Elevation tools overview · Smoothen Junction · Road tool overview

Complex Lane Height

Complex Lane Height is used to set or transfer different height values to lanes that overlap a specific area of a road. A **Helper Road** is used to define the required height and apply it to the selected lanes.



▸ How to Use

1. Click **Advanced Tool** from the toolbar.
2. Select **Complex Lane Height** from the sub-toolbar.
3. Click **Add Helper Road**.
4. Open the **Create Road** tool and create a road.
5. The created road will be used as the **Helper Road** and will have a single lane.
6. Adjust the Helper Road geometry to cover the required area.
7. Use the **Lane Height** tool to set the required height for the Helper Road.
8. Open **Advanced Tool** again and select the Helper Road.
9. All lanes covered by the Helper Road will be highlighted in blue.
10. **Left Click** to select a lane and **Right Click** to unselect a lane.
11. Click **Apply from Helper Road**.
12. The Helper Road's height will be applied to the selected overlapping lanes.

▸ Buttons

Button	Description
Add Helper Road	Adds a road to be used as the Helper Road.
Apply from Helper Road	Applies the Helper Road's height to the selected overlapping lanes.
Reset	Resets the height values of the lanes.
Clear Selection	Removes the selected lanes.

▶ Related

- Advance tools overview · Junction / Elevation Grid · Lane Height · Road tool overview

Buffer Area

The **Buffer Area tool** allows users to create an outline along selected roads to define a specific area within the map.

Users can create either an open outline that follows the selected roads or a closed loop that connects the beginning and end of the selected road sequence to create an enclosed area.



> **Note**
>
> The Buffer Area tool is available under Advanced Tools: **Bottom Toolbar** → **Advanced Tools** → **Buffer Area**

▶ How to Use the Buffer Area Tool

1. Open **Advanced Tools** from the bottom toolbar.
2. Select **Buffer Area** from the sub-toolbar.
3. In the **Buffer Area** panel, click **Create New Outline**.
4. Set the **Closed Loop** toggle as required.
5. **Left-click** the required roads in sequence, selecting them anti-clockwise.
6. Click **Complete** to finish the outline.
7. Repeat the road-selection process to create another buffer area.
8. Click **Stop Creation** when finished.

▶ Closed Loop

The **Closed Loop** toggle determines whether the outline remains open or forms an enclosed area.

Closed Loop	Behavior
ON	Connects the start of the first selected road to the end of the last selected road and fills the enclosed area.
OFF	Creates an open outline that follows only the selected roads.

▶ Buffer Area Panel

Option	Description
Buffer Area Dropdown	Displays and highlights the selected buffer area.
Show All Outlines	Displays all created buffer area outlines.
Closed Loop	Controls whether the outline is open or closed.
Complete	Completes the current buffer area outline.
Stop Creation	Stops the buffer area creation process.
Delete Selected Outline	Deletes the selected buffer area.

▶ Buffer Area Display

Buffer Area Status	Display
Selected Buffer Area	Dark green
Other Buffer Areas	Sea green

▶ Related

- Advance tools overview · Junction / Elevation Grid · Complex Lane Height · Road tool overview

Troubleshooting

Coming soon

This section will be updated soon.

Shortcuts

Coming soon

This section will be updated soon.

13 Product Releases

Product Releases

Release notes and installers for the RepliMap map editor. Version details are on **Release notes** (newest first).

▸ All releases

Version	Release Date	What's New	Build	Guide
v8.1.0	Oct 21, 2026	3D Scenery View (repeatable objects, traffic lights, junction grid, road markings), RepliCat editing tools, CARLA Map Export (beta), Hierarchy category visibility	⬇ Windows ⬇ macOS	⬇ PDF
v8.0.0	Oct 02, 2026	RepliCat map tools, Buffer Area visualization, GeoJSON traffic sign placement, Map Validator enhancements	⬇ Windows	Docs unchanged
v7.6.0	Sep 18, 2026	FBX Export (CARLA export, material/texture handling), GeoJSON import improvements, GeoReference zone fix	⬇ Windows	⬇ PDF

Click a **version** to open that release's notes on the Release notes page.

Release notes

Release notes for RepliMap versions. Installers and the full version table are on Overview.

Latest · RepliMap v8.1.0 · Oct 21, 2026 · Stable

Windows Build — Download
macOS Build — Download

▷ Overview

RepliMap 8.1.0 brings significant enhancements to **Scenery View**, **RepliCat**, and **map export** capabilities. Scenery View now supports 3D visualization of repeatable objects, L-poles, suspended cables, junction grids, and road markings. Repeatable objects implemented in this release are also included in **FBX Export**.

RepliCat introduces additional map editing tools, faster command execution, and an improved user interface. This release also introduces **click-to-place functionality** for traffic objects, road markings, traffic lights, and traffic signs, along with an updated supervision workflow. Additional enhancements include **screen size customization**, animated profile avatar selection, redesigned warning, information, and error screens, and improved road connectivity. **CARLA Map Export** is available in beta, while category-based visibility controls in the **Hierarchy panel** and various bug fixes further improve usability. Additional UI enhancements are planned for the next release.

> **Good News for Mac Users!**
>
> RepliMap is now available for macOS! Mac users can now download and use RepliMap through the dedicated macOS build.

▷ Features & Improvements

- **Scenery View:**
  - **3D Repeatable Objects:** Repeatable objects are now visualized as 3D models, including continuous objects such as guardrails, fences, and walls.
  - **L-Poles:** Added 3D visualization for L-shape traffic lights and wire poles.
  - **Suspended Cables:** Added visualization of suspended cables.
  - **Junction Grid:** Junction elevation grids are now displayed as 3D surfaces.
  - **Lane Marks & Stop Lines:** Now rendered as 3D meshes; 2D editing lines are no longer displayed in Scenery View.
  - **Curb Height:** Curb heights are now displayed in Scenery View.
  - **Road Markings:** Road markings are now rendered on top of the road surface.
- **FBX Export:**
  - **Repeatable Objects:** Repeatable objects implemented in this release are now included in FBX Export.
  - **Scene Export:** Exports the current 3D scene, including geometry, materials, and textures.
- **CARLA Map Export:**

    - CARLA Map Export is available in the Export Pipeline and is currently under testing. Further improvements to export compatibility are ongoing.
- **RepliCat:** RepliCat has been enhanced with a more user-friendly interface, faster command execution, and additional tools for map editing. It now supports view switching, save/export, undo, lane and road marking edits, and object selection and deletion.
- **Hierarchy Filter Panel:**
    - **Category Visibility:** Added visibility controls for individual categories and object types, including repeatable objects.
- **Validator Console:**
    - **Message Readability:** Validator console messages have been reworded for better readability.
- **Improved Notification UI:** Redesigned warning, information, and error screens to provide a more consistent and user-friendly experience.
- **UI Improvements:** Improved the overall user interface for a more consistent and streamlined experience. Further UI enhancements are planned for the next release.
- **Profile Avatar Selection:** Added the option to select an animated avatar as a profile image in RepliMap User Profile.
- **Screen Size Customization:** Added Small, Medium, and Large screen size options in Preferences, allowing users to adjust the interface size according to their preferences.
- **Updated Supervision Workflow:** Improved the supervision workflow to provide a more streamlined user experience.
- **Click-to-Place Objects:** Added a click-to-place toggle for traffic objects, road markings, traffic lights, and traffic signs, allowing users to place selected items directly on a road with a single click, without dragging and dropping.
- **General Improvements:** Various bug fixes, stability improvements, and usability enhancements.

▹ Known Issues

- **Link, Snap & Adjust – Traffic Signals:** May override traffic signal Z-offsets.
- **GeoJSON Sign Visibility:** Signs and signals may be visible from both directions, making placement difficult to verify.
- **GeoJSON Elevation:** Elevation may be assigned incorrectly where roads overlap.
- **Legacy GeoReference Header:** The toggle may not work as expected.
- **Properties Panel:** May remain open after deleting an item with the Delete key.
- **Junction Grid:** Road borders may appear uneven.
- **Scenery View – Traffic Lights:** Some traffic lights may not be visible because their 3D models are not yet available.
- **Export Pipeline – Crosswalks:** Crosswalks added from the Road Mark Objects list may be omitted from exports.
- **Dark Theme – Icons:** Repeatable object and road mark icons may have low visibility.

▹ Known Limitations

- **Screen Size – Right-side Panels:** Right-side panels may not display correctly when using the Large and Medium screen size options
- **FBX Export – Object Textures:** Textures for some objects, such as walls, may not be visible in FBX exports.
- **Console Panel:** Keep the Console panel closed while using the right-side Properties panel to avoid potential layout issues.
- **Georeference Tool:** Remains in beta, with further improvements planned.
- **USA Traffic Light Icon:** May appear as "AAI" after re-importing a map.
- **Lane Priority:** Not yet implemented.
- **CARLA Map Export:** Currently under testing.
- **FBX–CARLA Compatibility:** Further improvements to texture, mesh, and material compatibility are ongoing.
- **macOS Limitations:** Some features, e.g., Sensor Data, are not yet available in the macOS build. Further macOS-specific improvements and feature enhancements are planned for upcoming releases.

RepliMap v8.0.0 · Oct 02, 2026 · Stable

Download: RepliMapSetup_v8.0.0.56.exe

▷ Overview

RepliMap 8.0.0 introduces major improvements to **RepliCat**, enabling users to perform supported map creation and editing tasks directly through natural-language commands. This release also adds **Buffer Area visualization** in Scenery View, improves **GeoJSON traffic sign placement**, enhances **Map Validator** outputs, and adds **RepliMap version visibility** in the User Profile dropdown. Multiple bug fixes and usability improvements are also included to provide a smoother and more reliable RepliMap experience.

▷ Features & Improvements

- **RepliCat Map Tools:** RepliCat now supports the LLM Connect tool-calling workflow, allowing users to execute supported map tools through natural-language commands, including creating roads, adding objects, and editing map elements directly within RepliMap.
- **Buffer Area Visualization:** Buffer Areas are now visualized in Scenery View around the configured road or selected area, with support for closed-loop and open-loop Buffer Areas, live updates, and FBX export.
- **RepliMap Version Display:** The installed RepliMap version is now displayed in the User Profile dropdown.
- **GeoJSON Traffic Sign Placement:** Traffic signs now use the GeoJSON Z-value for height, with corrected facing direction when the road reference line is on the left side of the driving lanes.
- **RepliCat Composer:** Shift+Enter inserts a new line, while Enter sends the message.
- **Map Validator:** Validation results now include aggregated logs, detailed road-continuity results, and GeoJSON files identifying validation error locations.
- **Usability & Stability:** Multiple bug fixes and usability improvements are included to make RepliMap more user-friendly, stable, and reliable.

▷ Known Issues

- **GeoJSON Sign Visibility:** Most signs and signals placed via GeoJSON are visible from both directions, which can make their placement difficult to verify.
- **GeoJSON Elevation at Overlapping Roads:** Elevation from GeoJSON may be assigned incorrectly where roads overlap.
- **Legacy GeoReference Header:** The Legacy GeoReference Header toggle may not work as expected.
- **Properties Panel:** The Road/Objects Properties panel may remain open after deleting an item with the Delete key.
- **RepliCat – Typing Pad:** The RepliCat input field may become inactive after a response.
- **RepliCat – Dark Theme:** The RepliCat title may have low visibility in Dark Theme.

- **Notification Bar:** Success, Reset, and Warning bar text may not be consistent with the RepliMap theme.

▹ Known Limitations

- **RepliCat Map Tools:** RepliCat currently supports an initial set of map tools. Additional tools, including view, save, export, undo, lane and object editing, Buffer Areas, and GeoJSON import, are planned for upcoming releases.
- **CARLA Map Export:** CARLA map export in the export pipeline is still under development and will be completed in a future release.
- **CARLA Export – Traffic Light Controllers:** Exported OpenDRIVE files may not include controller elements for traffic lights, so lights are not grouped in CARLA.
- **Scenery View – Junction Grid:** Junction Grid visualization in Scenery View may not display correctly.
- **Scenery View – Repeatable Objects:** Continuous repeatable objects may not be visualized correctly in Scenery View.
- **Scenery View – Curb Height:** Curb height may not be visible on central lane markings.
- **FBX–CARLA Compatibility:** FBX compatibility with CARLA is being further improved, including compatibility for textures, meshes, and materials. Additional improvements are planned for upcoming releases.
- **Console Panel:** Keep the Console panel closed while working with the right-side Properties panel to avoid potential layout issues.
- **Georeference Tool:** The Georeference Tool remains in beta. Further improvements are expected in upcoming releases.

RepliMap v7.6.0 · Sep 18, 2026 · Stable

Download: RepliMapSetup_v7.6.0.40.exe

▷ Overview

RepliMap 7.6.0.40 introduces **FBX Export** as a new export capability, including **CARLA export** support and material and texture handling. This release also includes improvements to **GeoJSON traffic sign import**, **GeoReference zone handling**, and the user interface, along with various bug fixes and stability improvements.

▷ Features & Improvements

- **FBX Export:** Added FBX Export functionality to RepliMap. The export workflow supports:
  - Exporting the 3D scene to FBX.
  - CARLA export.
  - Material and texture handling during export.
  - Additional export options for greater control over exported content.
- **GeoJSON Import Improvements:** Improved GeoJSON import for traffic signs from Cedar GeoJSON data using the UTM coordinate system.
- **GeoReference Improvements:** Fixed the GeoReference zone issue to ensure the correct zone is applied based on the map location.
- **UI Improvements:** Enhanced the user interface, including improvements to text and font sizes for better readability and usability.

▷ Bug Fixes

- **General Bug Fixes:** Addressed various reported bugs and stability issues to improve the overall performance, reliability, and user experience.

▷ Known Limitations

- **RepliCat AI Guide:** Mo AI Guide is currently in the training phase. Further improvements and enhancements are planned for upcoming releases.
- **FBX Export:** As FBX Export is a new feature in RepliMap, further improvements, enhancements, and additional capabilities are expected in future releases.
- **Console Panel:** Keep the Console panel closed while working with the right-side Properties panel to avoid potential layout issues.
- **Scenery View Objects:** Additional object fill types, previews, and textures will be available in future releases.
- **User Interface:** Some UI panels may overlap or remain open unexpectedly during certain workflows.

- **Georeference Tool:** A beta version of the Georeference Tool is available for testing. Further improvements and enhancements are expected in upcoming releases.
- **Upcoming Features:** Some planned features are still under development and will be introduced in future releases.