VASCO DA GAMA 20

USER MANUAL

Create compelling travel routes

From your first route to a sophisticated travel animation with cameras, objects, text and atmospheric effects

Manual edition 1
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Information about this manual

This manual explains Vasco da Gama 20 step by step. It is aimed at both users creating a travel route for the first time and experienced users who want to look up a specific setting. No special computer skills are required.

The instructions are primarily designed to be read on the screen. The table of contents and PDF bookmarks take you directly to a chapter. You can also print the PDF on DIN A4. All important information remains easy to read.

It's best to start with **Chapter 2** to get to know the interface. **Tutorial 1** then takes you through a first complete route. If you want to recreate a more extensive example later, use **Tutorial 2** in Chapter 14.

This is how operating instructions are written

- Names of buttons, tabs and fields appear **highlighted**.
- Numbered lists contain specific work steps.
- **Notes** explain additional connections.
- **Tips** make work easier or show a recommended procedure.
- **Caution** indicates possible data loss, inappropriate settings or longer calculations.
- **Notes** briefly summarize a particularly important rule.

> **NOTE**
> Leave the mouse pointer briefly over a control. When Mini Help is turned on, Vasco da Gama 20 displays an additional explanation directly at the switch.

Illustrations and program variants

The illustrations show the German program interface of Vasco da Gama 20. Depending on the program package you purchased or the additional map and object package you installed, your selection may look slightly different. The basic operation remains the same.

If an image appears immediately after an explanation, it belongs to this section. Colored markings show which control the text refers to.

Legal information

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MotionStudios reserves the right to change program functions and information in this manual without prior notice. There is no guarantee that the program is suitable for every conceivable purpose or compatible with every combination of hardware and software.

Brands used

Windows is a trademark of Microsoft Corporation. Other product and brand names may be trademarks or registered trademarks of their respective owners.

> **NOTE**
>
> The range of functions, included base maps and available 3D objects may depend on the respective Vasco da Gama package and additionally installed extensions.

Preface

Dear customer, dear customer,

Thank you for choosing Vasco da Gama 20. With this program you can create clear route animations for travel videos, documentaries, presentations and many other projects. Your journey can be across a flat map or a three-dimensional Earth. Vehicles, planes, ships, texts, sights, times of day and atmospheric effects turn a simple line into a living story.

The large number of options is one of Vasco da Gama's strengths. At the beginning, the interface can appear larger than it actually is. Almost every task follows the same basic idea: you first select the area, then determine the element in question and control the change directly in the editor or camera view.

This manual will accompany you in small, comprehensible steps. It not only explains which switch you press, but also what a setting is intended for, what visible effect it has and when it is useful to use it. Take your time. It's completely normal to read a section a second time or try out a setting in a small test project first.

The two tutorials show complete workflows. In the first tutorial, a simple route is quickly created. The second tutorial builds a more sophisticated journey with multiple stages, different head objects, texts, sights, stop times and fly-in/fly-out.

We hope you enjoy discovering, designing and telling stories about your travels.

Your MotionStudios team

> **TIP**
> Save a new project version after larger work steps. This means you can return to a functioning interim status at any time.

What is Vasco da Gama 20?

Vasco da Gama 20 is specialized software for animated itineraries. You set a starting point, intermediate stops and a destination. The program calculates a time-controlled route from this and outputs it as a video for your editing program or presentation.

Typical tasks

With Vasco da Gama 20 you can, among other things:

- display car, train, flight, ship, bicycle and hiking routes,
- connect several travel stages in one project,
- Import GPS tracks and use them as a route,
- move head objects along the track,
- Highlight breakpoints with text, images or 3D objects,
- place free objects and points of interest regardless of the route,
- Design camera movements from automatic to completely manual,
- Use time of day, clouds, water, shadows, depth of field and other effects,
- Check preview sections and output the result as a video.

The basic workflow

1. Create a new project and select Easy Assist or Expert mode.
2. Set image size, frame rate and map display.
3. Set or import the route.
4. Select header objects, texts and additional objects.
5. Design the camera, lighting and atmosphere.
6. Check the result in the preview.
7. Output a short test section and then the full video.

> **NOTE**
> The editor view provides an overview. The camera view shows how the scene will appear later in the video. You can work in both views and switch between them at any time.

What's new in Vasco da Gama 20? - Light and atmosphere

Vasco da Gama 20 primarily expands the image effect, object animation and operation. Some improvements have their own switches. Others work automatically in the background. Both types of innovations are important for the result.

New cloud and atmosphere system

Clouds can be tailored more precisely to the desired scene. Depending on the variant you choose, you can influence cloud type, height, strength, position, wind direction and wind strength, among other things. Cloud shadows connect the sky and landscape more believably. The atmosphere reacts to the time of day and the position of the sun, so that morning, day, twilight and night flow into one another more naturally.

New light reflections and atmospheric sun rays

Additional lens flare styles create different reflections, stars, rings or warm lighting moods. This means that the same scene can appear factual, cinematic or particularly atmospheric.

Atmospheric sunrays are often called **Godrays**. This refers to visible bundles of light that arise when sunlight falls through clouds or other obstacles. They can add depth and atmosphere to a backlit scene.

Improved shadows and times of day

Shadows from terrain, clouds and objects blend more accurately into the scene. Transitions between day, twilight and night appear more even. Night lighting, city lights and luminous object components are thus better integrated into the surroundings.

> **NOTE**
> Complex clouds, shadows and light calculations require computing power. The **Balance** preview quality is recommended for smooth work. For final output, select **Highest Quality** or, if available, **Max. Quality**.

What's new in Vasco da Gama 20? - Vehicles and objects

Vehicles follow the terrain more naturally

Suitable vehicles align themselves more precisely with inclines and declines. Multiple contact points of the model help to calculate tilt and tilt more believably. The function works automatically and depends on the 3D model used.

Light sources and luminous materials

Supported vehicles can use headlights at night and illuminate the area in front of the vehicle. Position, signal or vehicle lights are automatically taken into account for suitable models. These lights can be reflected on water surfaces.

Emission maps mark areas of a model that should illuminate themselves, for example windows, displays or position lights. Height maps provide additional height information for surfaces. Both functions work in the background if the selected model contains the corresponding additional files.

New particle system

Particles allow smoke, steam, dust, exhaust or similar moving effects. The particles evolve over time. Therefore, the timeline must be played or moved forward from the beginning. If you jump backwards from the end, previously created particles will be discarded and may not be visible.

Better selection and smoother transitions

Selected objects are highlighted more clearly. For holding objects, free objects, text and images, smoother fades in and out are available at the beginning and end of their visible period.

> **NOTE**
> Not every model supports vehicle lights, ground contacts, emission maps or other additional information. Missing effects are therefore not automatically a program error.

What's new in Vasco da Gama 20? - Route, camera and presentation

Smoother movement

Speed differences at successive waypoints are connected more smoothly. This means that the head object and camera change their movements less suddenly. Acceleration, braking or stopping that have been explicitly set still have priority.

During strong zoom movements with simultaneous lateral movement, Vasco da Gama 20 takes the respective height into account more. This means that the movement remains more consistent over the entire route and does not accelerate unnaturally near the ground.

Orientation when editing

The orientation line can remain visible even if the actual route line is turned off. This makes it easier to set and move new waypoints. Processing close to the terrain has been made more reliable.

Keep texts and images reliably visible

Text and images can either be hidden by mountains and terrain or always appear in front of the terrain. The second setting doesn't just help behind mountain ranges. It also prevents text from appearing to sink into the ground if the camera angle is unfavorable.

Missing image files from a project are also searched for in the project folder and in appropriate image folders. This makes postponed projects easier to reopen.

> **TIP**
> Use **Yes, always visible** if you want a place name to remain readable regardless of terrain and camera angle. Natural occlusion, on the other hand, makes sense if the text is deliberately intended to be part of the spatial scene.

What's new in Vasco da Gama 20? - Operation and technology

Mini help directly on the control element

The mini help appears directly on the relevant switch or input field. The waiting time can be adjusted in the program settings or the help can be turned off completely. For beginners, it is recommended to leave the mini help switched on initially.

Serve lists faster

Long selection lists can be operated with the mouse wheel, the arrow keys and **Home** and **End**. By entering an initial letter or a number you jump to matching entries. Pressing the same character repeatedly switches to the next matching entry. This is an initial character search and not a full text search.

Separate quality for work and output

The preview quality determines how elaborately Vasco da Gama calculates the working view. Output quality only applies to the finished file. This means you can work smoothly and still output in high quality. **Max. Quality** is only available for output because a real-time preview with this level of calculation would not be reliably possible on current graphics cards, especially in clouds.

Background improvements

- JPEG-XL tiles are processed more efficiently.
- Complex projects, animations, particles, clouds and visibility checks are calculated faster.
- The cooperation between processor and graphics card has been improved.
- Compatibility with different graphics cards has been expanded.
- Elevation data can be processed in finer tiles.
- Map paths are easier to automatically adjust for suitable projects.
- Water reflections and ship wave movement have been improved.

> **NOTE**
> These technical changes usually do not require their own switch. They are noticeable through shorter waiting times, quieter movements, more stable display or higher image quality.

Chapter 1: Install, activate and start

Vasco da Gama 20 is installed using a standard Windows installer. For most users, the suggested settings can be adopted.

1.1 Before installation

Before starting, check:

- Windows is fully started and all important updates are installed.
- There is enough free space on the target drive.
- You have the necessary installation files and your personal serial number.
- The power supply is connected to a mobile computer.
- Other programs are closed if possible.

> **NOTE**
> Two different storage locations can be specified for program and map data. This decision is important because the map data requires significantly more space than the actual program.

1.2 The two installation paths

Two locations are requested during installation.

Program path

The first path is for Vasco da Gama 20 itself. The program requires comparatively little storage space. The suggested folder on Windows hard drive `C:` can usually be kept.

Data path

The second path is for maps, models and other extensive data. To do this, choose a drive with enough free space. Suitable are:

- a large internal hard drive or SSD,
- a second internal drive,
- a permanently connected external hard drive.

> **WARNING**
> If an external hard drive is used, it should always be available under the same drive letter when working with Vasco da Gama. Otherwise, the program may not be able to find the installed data.

1.3 Perform installation

1. Start the installer with a double click.
2. Confirm the Windows security prompt if it appears.
3. Read and confirm the license terms.
4. Accept the suggested program path or select another folder.
5. Select a drive with enough free space for the data.
6. Start the installation and wait for it to complete completely.
7. Exit the installer with **Finish**.

Each Windows window may look slightly different depending on the version of Windows. The two separate storage locations for program and data are crucial.

1.4 Activation

When you first start, you may be asked to enter your serial number. Enter the number exactly as it appears in your documents.

- Look for letters and numbers that look similar.
- Avoid extra spaces.
- Keep the serial number in a safe place.

If activation is not possible, first check your Internet connection, the Windows date and time, and the exact spelling of the serial number. If the error message still occurs, use the support options listed in the program.

1.5 Start Vasco da Gama

Start Vasco da Gama 20 via the Windows start menu or the shortcut created during installation. After starting, you can create a new project or open an existing project.

To get to know us for the first time, select **New Project**. Then you specify the work mode and map display.



Illustration for this step

The exercises in this manual use different settings depending on the chapter. The first tutorial works in Easy Assist mode. The later specialist chapters predominantly use the expert mode.

1.6 Basic settings of the first projectIn the Project Settings window you can determine, among other things, the aspect ratio, resolution, frame rate and runtime. To get started, you can use an existing video template.



Illustration for this step

1. Choose a video template that suits your eventual goal.
2. Control resolution and aspect ratio.
3. Accept the suggested frame rate to start.
4. Set a manageable term.
5. Confirm the settings.

TIP

A short running time is sufficient for initial exercises. A short project can be checked more quickly and calculated as a test video.

1.7 If the program does not start

Check in this order:

- Has the installation been completely completed?
- Is the data drive connected and accessible?
- Is there enough free storage space?
- Was Vasco da Gama blocked by a security program?
- Does a specific error message appear that you can note down for support?

Restart Windows and try starting the program again. If the problem persists, have the serial number, Windows version, and the exact wording of the error message ready.

1.8 Next step

After successfully starting the program, in Chapter 2 you will get to know the work interface, the main tabs and the most important operating options.

2. Get to know Vasco da Gama

Before you create your first travel route, it's worth taking a quick look at the work interface. You don't have to remember any switches or settings. This chapter first shows you how the program is basically structured and where you can find the most important areas.

This is what you will learn in this chapter

After this chapter you will know:

- what is the difference between **Easy Assist** and **Expert Mode**,
- where you edit map, route, objects, texts and camera,
- how editor view, settings area and navigation work together,
- how the **Mini Help** explains unknown controls directly,
- which mode is recommended for getting started.

> **NOTE**
> You don't have to memorize the interface. First, only search for the area that relates to your current task. The individual functions are explained step by step in the following chapters.

Choose the appropriate work mode

When creating a new project, Vasco da Gama opens the **Mode Selection** window. Here you make two independent decisions:

1. You choose between **Easy Assist Mode** and **Expert Mode**.
2. You choose between the display as a **globe** and as a **flat map**.



Illustration for this step

Easy Assist for an easy start

The **Easy Assist mode** clearly summarizes the frequently required settings. Many technical details are managed automatically by the program. This allows you to initially focus on the route and appearance of your itinerary.

Easy Assist is particularly suitable if you:

- working with Vasco da Gama for the first time,
- want to quickly create a complete itinerary,
- initially only need the most important design options,
- want to carry out the fine work later in expert mode.

Expert mode for precise design

The **Expert Mode** provides all workspaces and advanced settings. It is suitable for extensive projects and for users who want to specifically customize each part of the route.

In expert mode, for example, you can edit individual waypoints, line sections, objects, text, camera points and visual effects independently.

> **TIP**
> If you're not sure yet, start with Easy Assist. Create the basic route there first. For finer work, you can then switch to expert mode using the **Expert Mode** button.

> **WARNING**
> Changing from Easy Assist to expert mode is permanent for the project in question. After that, this project can no longer be edited in Easy Assist mode. It is best to save the project under a new name before changing if you want to keep the Easy Assist version.

Earth globe or flat map

The **Earth Globe** is the right choice for most travel animations. It shows the natural curvature of the earth and is suitable for short distances as well as for traveling across countries and continents.

The **flat map** is suitable for special map projects where the entire display should be on a flat surface. Setting up a flat map is explained in detail later in the **Selecting and Setting Up Maps** chapter.

The Easy Assist interface

Easy Assist only shows the areas you need for a quick and clear workflow. The following illustration initially gives you an orientation. The numbers are explained immediately below.

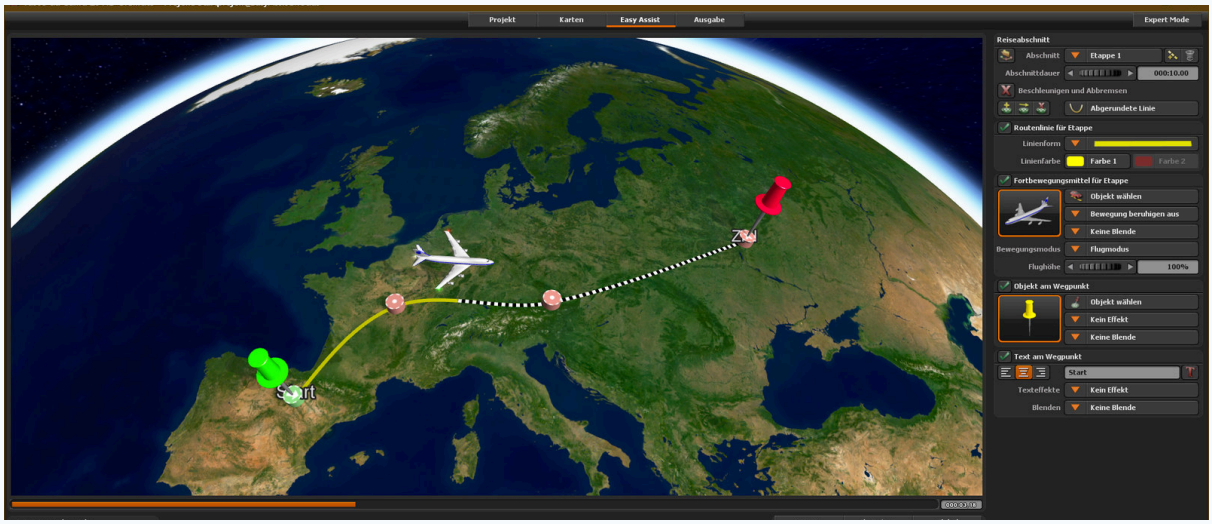


Illustration for this step

number	Area	Task
1	Main tab	Switches between Project, Maps, Easy Assist and Output.
2	Editor view	Shows the map, route and all visible design elements.
3	Settings of the current stage	Edits route, vehicle, object and text of the selected stage.
4	Navigation and View	Moves between waypoints and stopping points and switches between the editor and camera views.
5	Camera and global settings	Determines camera work, fly-in and fly-out as well as common sizes and display values.
6	Expert Mode	Permanently switches the current project to expert mode.

Work with Easy Assist

The right side is based on the currently selected waypoint or stopping point. This means that the most important settings are available where they are needed. Among other things, you can set the duration of a stage, design a route line, select a vehicle and add an object or text to the waypoint.

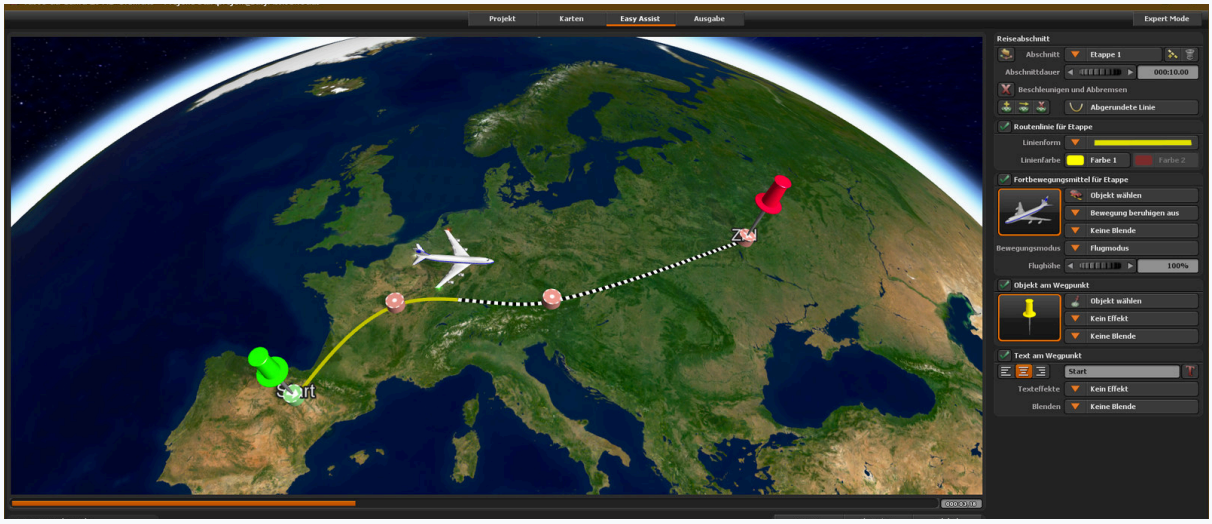


Illustration for this step

In the lower middle area you will find settings that do not only apply to a single waypoint. This includes camera work, fly-in and fly-out as well as common sizes for lines, objects and texts.

> **NOTE**
>
> Not every setting is available at all times. Switches shown in gray cannot yet be used in the current work step. Often a waypoint, an object or another requirement is initially missing.

The expert mode interface

In expert mode, the editor view, navigation and bottom toolbar basically stay in the same place. However, the main tabs at the top of the window provide all functional areas.



Illustration for this step

number	Area	Task
1	Main tab	Open Project, Maps, Route, Objects, Text, Camera, Visual Effects, Tools and Output.
2	Editor view	Shows and edits the current scene.
3	Setting range	Shows the settings of the selected main area and the selected element.
4	Navigation and View	Controls navigation between waypoints and stopping points, the view and magnification.
5	Navigation aid	Shows on a small world map which area of the earth is currently visible.
6	Bottom toolbar	Contains, among other things, project commands, preview and general program functions.

The main tabs

The main tabs divide the work by topic. They are located at the top of the program window:

- **Project** manages basic project data and project settings.
- **Maps** determines the map used and its display.
- **Route** edits stages, waypoints and route lines.
- **Objects** manages vehicles as well as objects at waypoints and free objects.
- **Texts** creates labels at waypoints and freely placed texts.
- **Camera** designs the tracking shot and its viewing direction.
- **Optical Effects** changes light, shadows, atmosphere, clouds and other scene effects.
- **Tools** contains additional editing functions for the route.
- **Output** calculates the finished animation as a video file or image sequence.

When you select a main tab, the setting area on the right changes. The map and the project itself remain unchanged. You just switch to a different set of tools.

The editor view

The large display in the middle of the window is the **editor view**. Here you can see the map and the elements that make up your animation. These include, for example:

- Start, way and stopping points,
- the route line,
- the vehicle or another head object,
- texts and images,
- objects at waypoints,
- free objects and camera points.

The editor view provides a freely adjustable overview of the project. Guides, markers and editing points may be visible there even though they do not appear in the finished video. You can edit the route, objects, texts and other elements directly in this view.

You can also edit the project in the **camera view**. In this view, objects, texts and other design elements appear as they will in the finished video. This makes it easier to judge their position, size and overall effect. You can switch between the editor view and camera view at any time and use whichever view is more suitable for the current task.

> **NOTE**
> The editor view provides the better overall overview. The camera view shows the future video image. You can edit the project in both views.

Navigation and view

The **Navigation and View** area is located below the large view on the left. Its navigation buttons take you to the previous or next waypoint or stopping point. Other buttons take you directly to the beginning or end of the currently selected stage. You cannot start a preview from this area. The preview button is located in the lower toolbar.

You can also change the exact time position using the timeline directly below the large view.

The two percentage values change the size of the editing points and the magnification of the free editor view. They do not change the camera movement or the resolution of the finished video.

Use the **Editor view** button to switch between the freely adjustable editor view and the camera view at any time. Both views are available for editing.

The navigation aid

The **Navigation help** is located below the large view on the right. The small white target circle shows which area of the Earth is currently displayed in the large window. This is particularly helpful when you have zoomed far into the map and need to regain your bearings.

The small world map also contains dots in different colours. They mark the positions of 3D objects and texts on the Earth. This helps you see where other project elements are located, even when the main map is highly magnified.

The navigation aid does not control the later camera movement. It serves solely as orientation during processing.



Illustration for this step

Use the mini help

Vasco da Gama 20 shows the mini help directly at the relevant control element. This means you no longer have to look at a distant line of information.

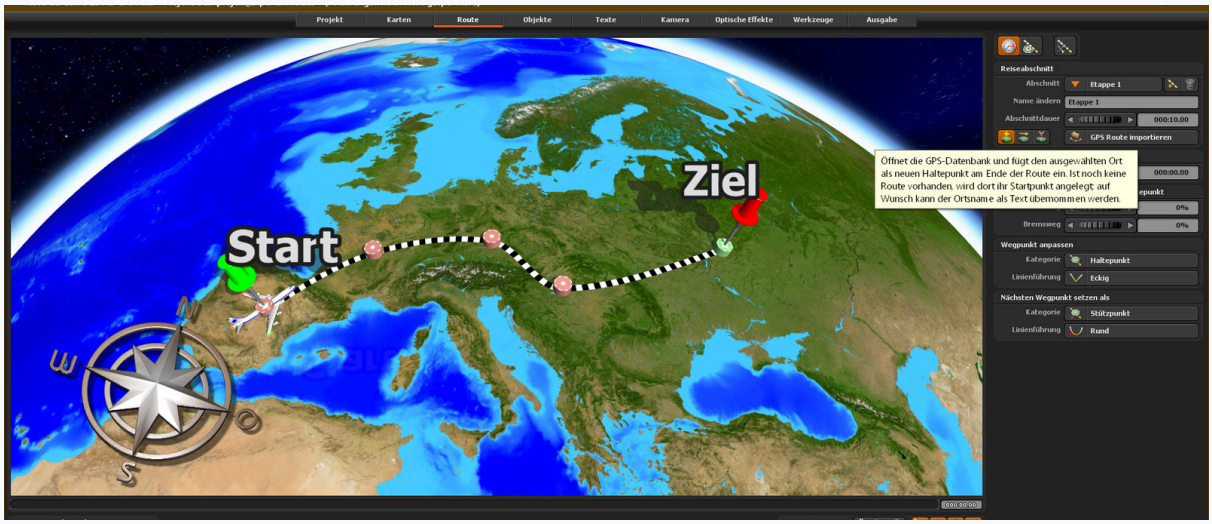


Illustration for this step

How to use Mini Help:

1. Move the mouse pointer to a switch or input field.
2. Leave the mouse cursor there for a moment.
3. Read the explanation that appears.
4. Continue moving the mouse or click to hide the notice again.

Many clues not only explain the immediate function. They also list requirements, possible effects and important differences between Easy Assist and expert mode.

The waiting time until the mini help appears can be set in the program settings. There you can also switch off the mini help completely. For the first few steps it is recommended to leave it switched on.

> **TIP**
>
> If a switch is grayed out or its purpose is not immediately understandable, check the mini help first. You will often also find out which requirements are still missing for the function.

This makes it easier for you to find your way around at the beginning

- Start with Easy Assist if you want to create a complete route first.
- Only switch to expert mode for targeted fine work.
- Only work on one subject area at a time.
- Check changes regularly in the camera view or preview.
- After larger work steps, save the project under an understandable name.
- Use the mini help before changing an unknown setting.

In the following tutorial you will create your first complete itinerary. You will get to know the areas presented here in a fixed and easy-to-understand order.

3. Tutorial 1: The First Itinerary

In this tutorial you will create a short itinerary from **Bremen to Cádiz** step by step. A plane follows the route, the automatic camera accompanies the flight and at the end you save the result as an MP4 video file.

You don't need any prior knowledge of Vasco da Gama's advanced features. Simply follow the steps in the order given. After important work steps, a control image shows you what your project should look like.



Illustration for this step

This is what you will create in this tutorial

- a new project in **Easy Assist** mode,
- a route from Bremen to Cádiz,
- an airplane as a means of transport,
- an automatic tracking shot,
- a preview for checking and
- a finished MP4 video file.

1. Start a new project

Create the new project

1. Launch Vasco da Gama 20.
2. Click on **New Project** at the bottom left. The switch is marked blue in the following image.



Illustration for this step

Easy Assist and select the globe

The **Mode Selection** window opens. For this first project we will use Easy Assist. This mode only shows the settings needed for a quick travel route.

1. Select **Easy Assist Mode** above.
2. Select **Ground** below.
3. Click **OK**.



Illustration for this step

NOTE

The working mode is selected before the project settings. An Easy Assist project can later be transferred to expert mode.

2. Set the project settings

In the **Project Settings** window you determine the size and technical properties of the later video. For this tutorial we will use a common Full HD format.

Check the following values:

- **Video template:** HDTV 1080/25p
- **Width:** 1920
- **Height:** 1080
- **Images per second:** 25
- **Image Type:** Full Screen (Progressive Scan)
- **Pixel Ratio:** Square (1,000)
- **Camera focal length:** 70 mm (standard)
- **Always visible:** Yes, always visible

Then click **OK**.

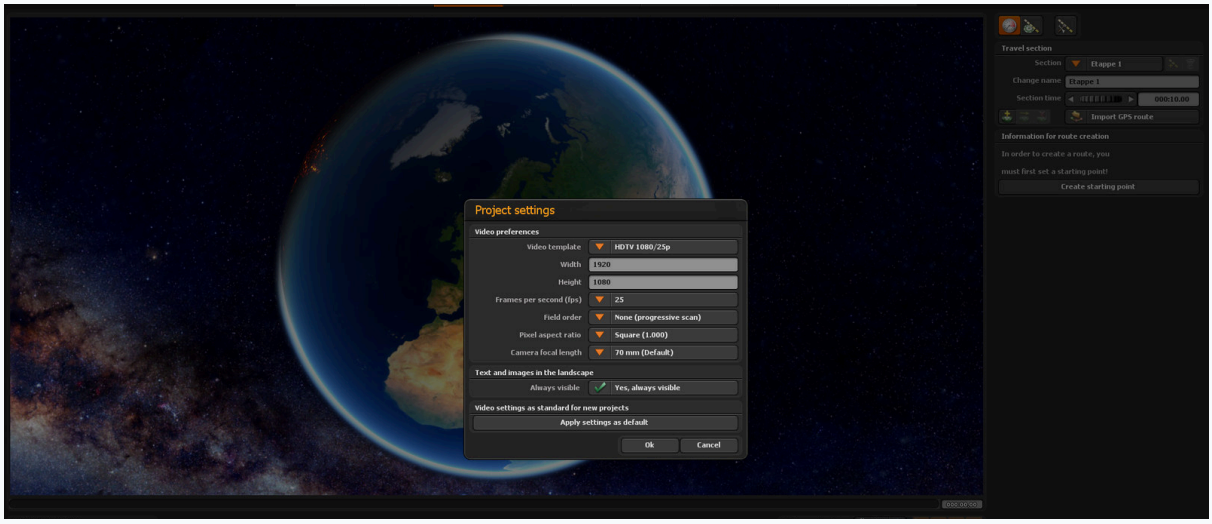


Illustration for this step

You will then see the still empty project. The title bar initially says **no project open** because the project has not yet been given a file name. That's normal. We'll save it later once the basic route is ready.



Illustration for this step

3. Use Bremen as a starting point

Open the location search

1. Stay in the main **Easy Assist** tab.
2. Click the Add Location button in the top right corner. The **Search Location** window opens.



Illustration for this step

Enter Bremen and start the search

1. Enter **Bremen** in the search field.
2. Click on the magnifying glass to the right of the search field.

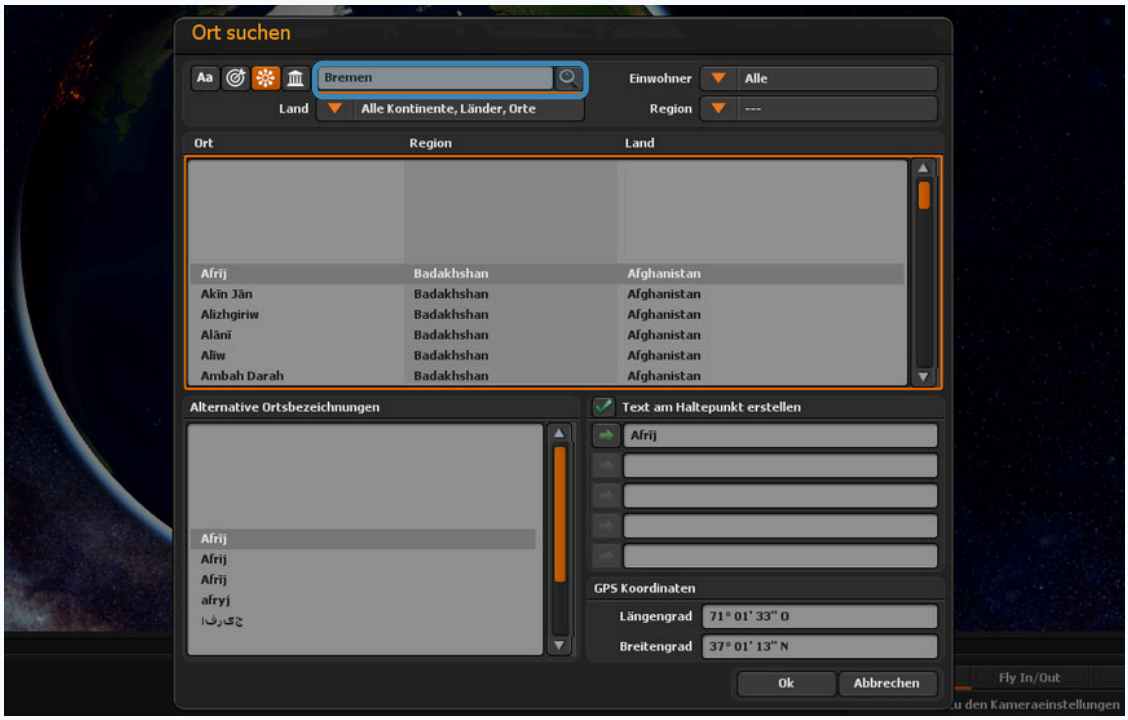


Illustration for this step

Choose the right place

Several places with the same or a similar name may appear in the results list. Therefore, pay additional attention to the region and country.

1. Select **Bremen - Bremen - Germany**.
2. Leave **Create text at breakpoint** turned on. This will automatically display the place name on the map.
3. Click **OK**.

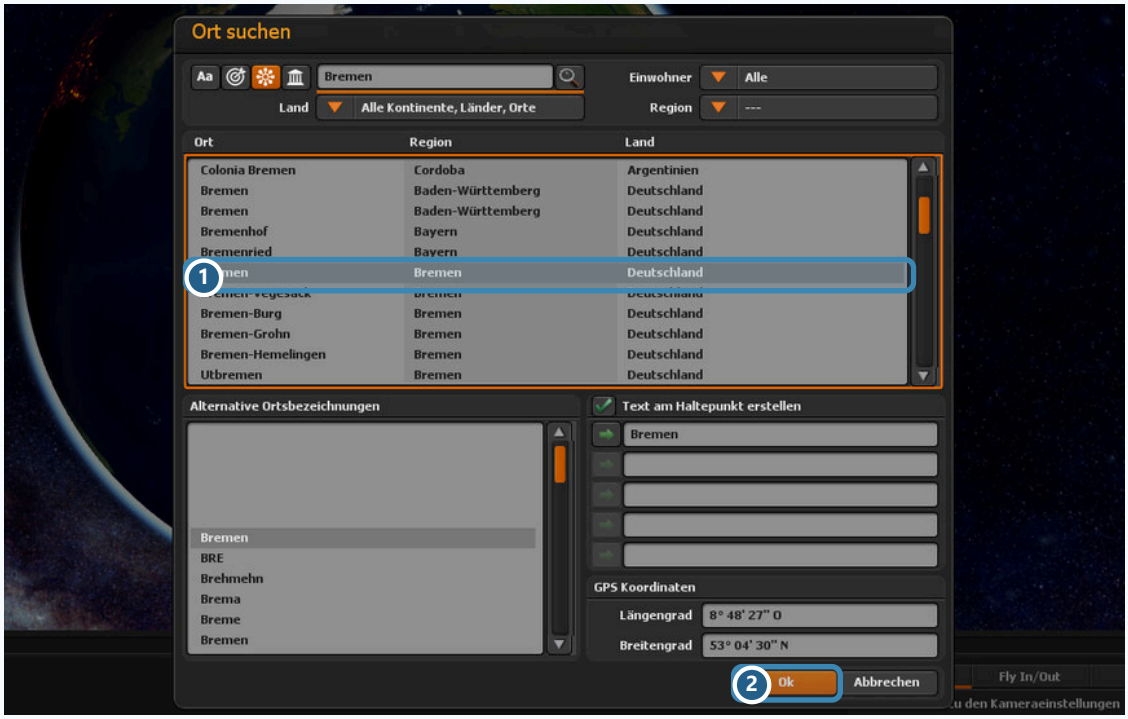


Illustration for this step

Check the starting point

Vasco da Gama sets Bremen as the first stop on the route. The point is displayed on the globe and is already labeled **Bremen**.



Illustration for this step

Check now:

- Is the point in northern Germany?
- Is the name **Bremen** visible?
- Is the point marked as the start of the route?

If these three characteristics are correct, you can proceed to the destination.> **Tip:** If you accidentally entered the wrong location, undo the last step using the undo switch at the bottom left and repeat the location search.

4. Set Cadiz as a destination

1 Click the Add Location switch again.



Illustration for this step

Find and take over Cádiz

1. Enter **Cadiz** in the search field and start the search.
2. In the results list, select **Cadiz - Andalusia - Spain**. The name will later appear on the map as **Cádiz**.
3. Leave **Create text at breakpoint** turned on.
4. Click **OK**.

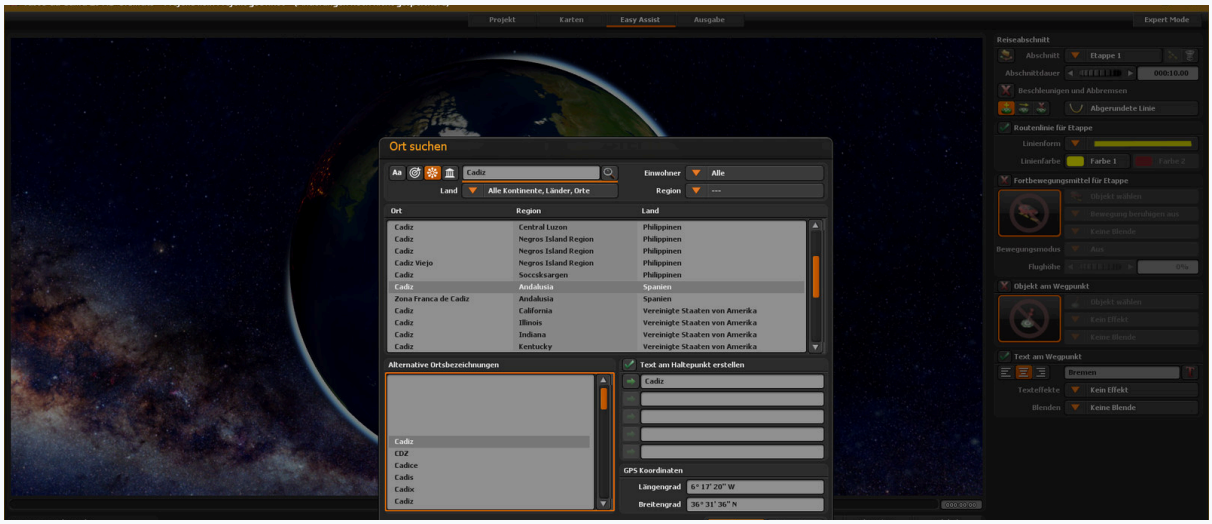


Illustration for this step

Vasco da Gama automatically connects the starting point Bremen with the new destination point Cádiz. The basic route has already been laid out.

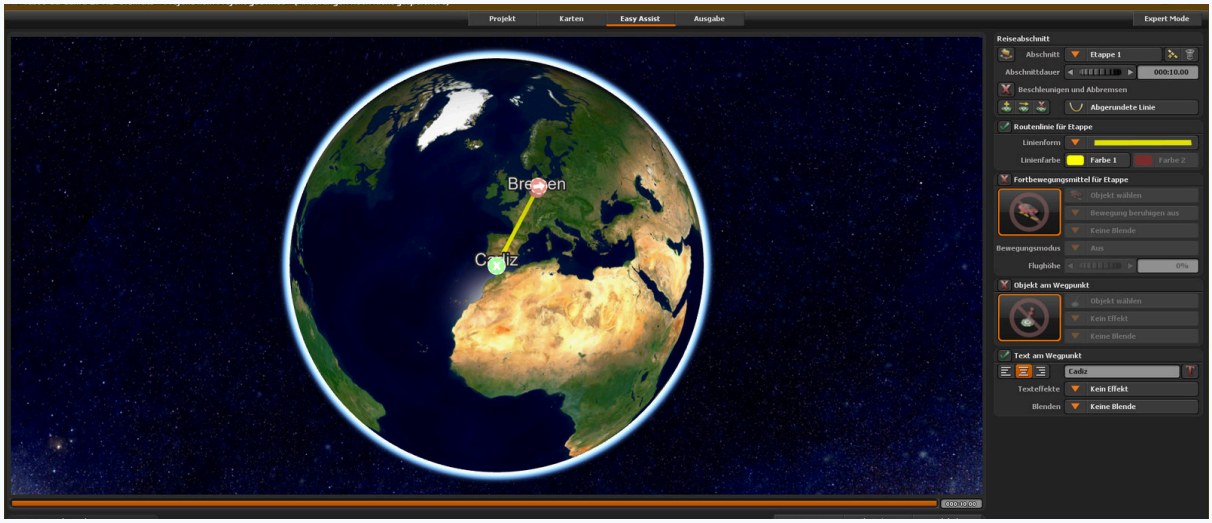


Illustration for this step

5. Check the route

Orient the map view so that Bremen, Cadiz and the entire connecting line are clearly visible. The representation does not have to match the following image to the exact pixel.

Move the mouse pointer into the editor view. Turn the **mouse wheel** to zoom the map in or out. Hold down the **left mouse button** and move the mouse to shift the visible map section in the required direction.

> **TIP**
>
> A complete overview of these and other controls can be found in the chapter **Mouse and keyboard controls**.

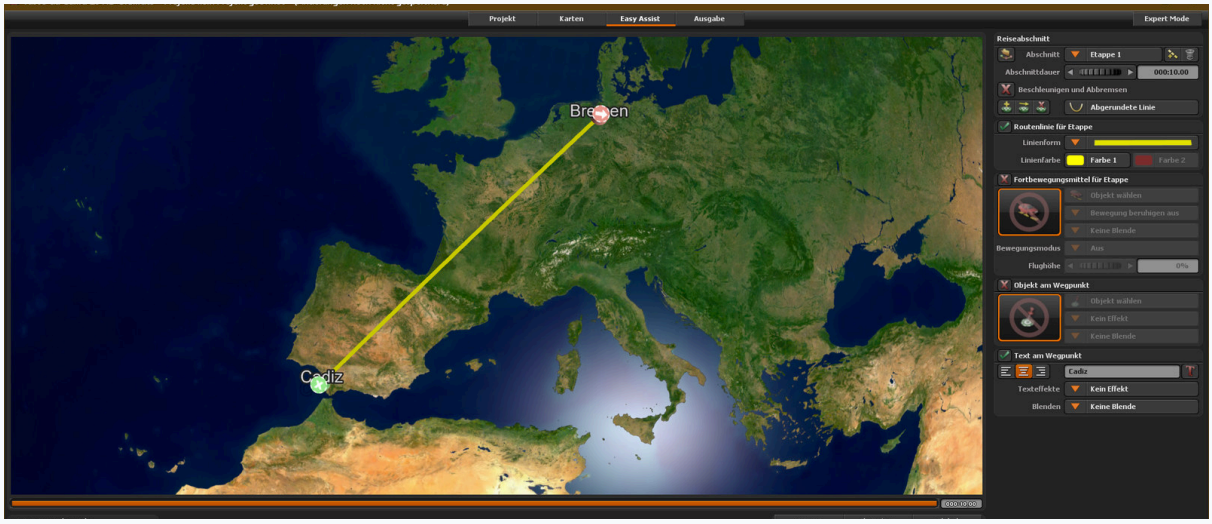


Illustration for this step

The yellow line shows the part of the route that has not yet been played. During a preview, the section already covered is displayed differently. This change helps you see what position the aircraft is currently in.

Check:

- Bremen is the starting point,
- Cádiz is the destination point,
- both place names are visible and
- the line connects both points without interruption.

> **NOTE**
> For this first tutorial we don't need any additional waypoints. Further stops and support points are explained in detail in the chapter **Creating and editing routes**.

6. Select an aircraft

In the **Means of transport for stage** area you specify which object travels along the route.

1. Right click on **Select Object**.

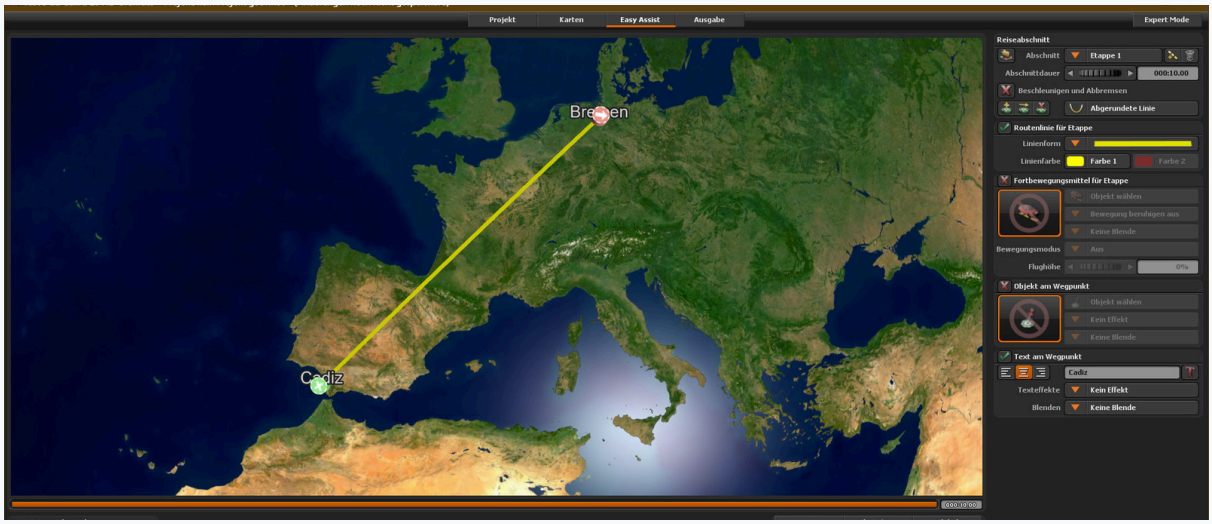


Illustration for this step

Take over the plane

1. In the object selection, select the category **Aircraft**.
2. Click on the **Airplane** object below.
3. Click **OK**.

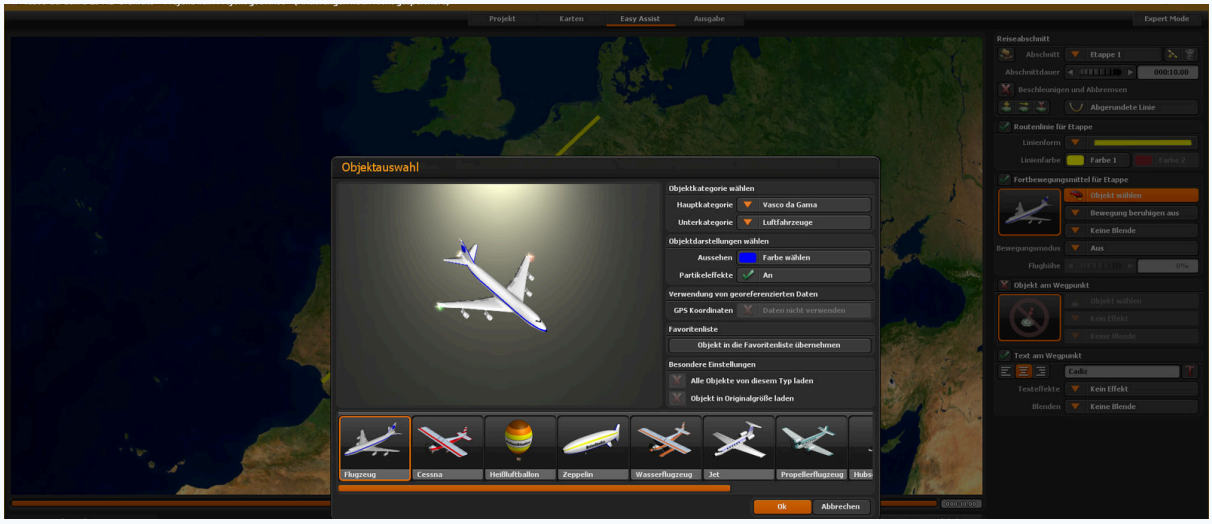


Illustration for this step

The aircraft now appears on the route. At the same time you can see at the bottom right that the **Camera control Automatic** is set. This setting is suitable for the first project and does not need to be changed.

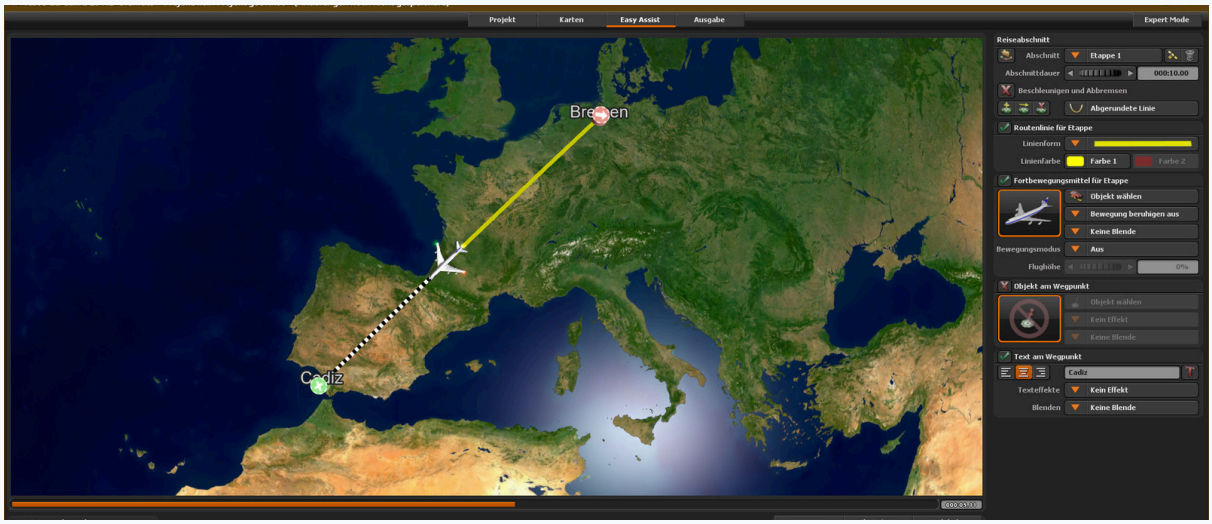


Illustration for this step

NOTE

The means of transport that moves along the route is also referred to as a **head object** in Vasco da Gama.

7. Preview the itinerary

The preview shows how route, aircraft, labels and camera work together. No video file is created yet.

1. Click on the **Real-time preview** button at the bottom left.
2. Wait a moment for the preview window to fully open.



Illustration for this step

Playback starts in the preview window. The plane moves from Bremen towards Cádiz and the automatic camera follows the journey.

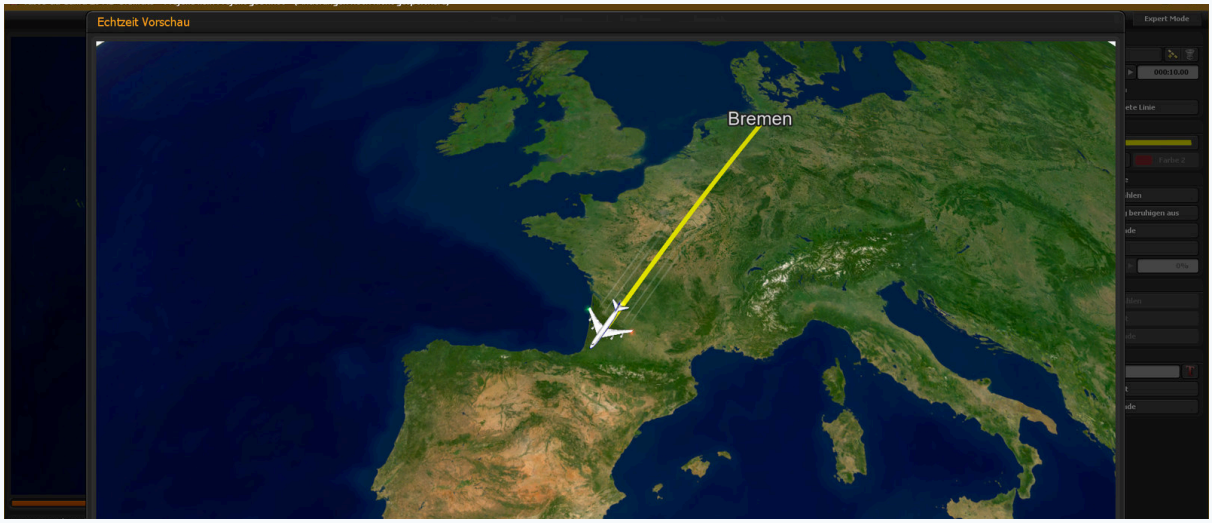


Illustration for this step

During playback, check:

- The plane is moving in the right direction.
- The place names are legible.
- The camera shows the route completely.
- The movement runs without any visible interruption.

After checking, close the preview with **Cancel**. This will return you to the editor; Nothing is deleted from the project.

8. Save the project

Save the project now before rendering the video. The project file contains your route and all settings. It is not identical to the video file created later.

1. Click on **Save Project As** at the bottom left.

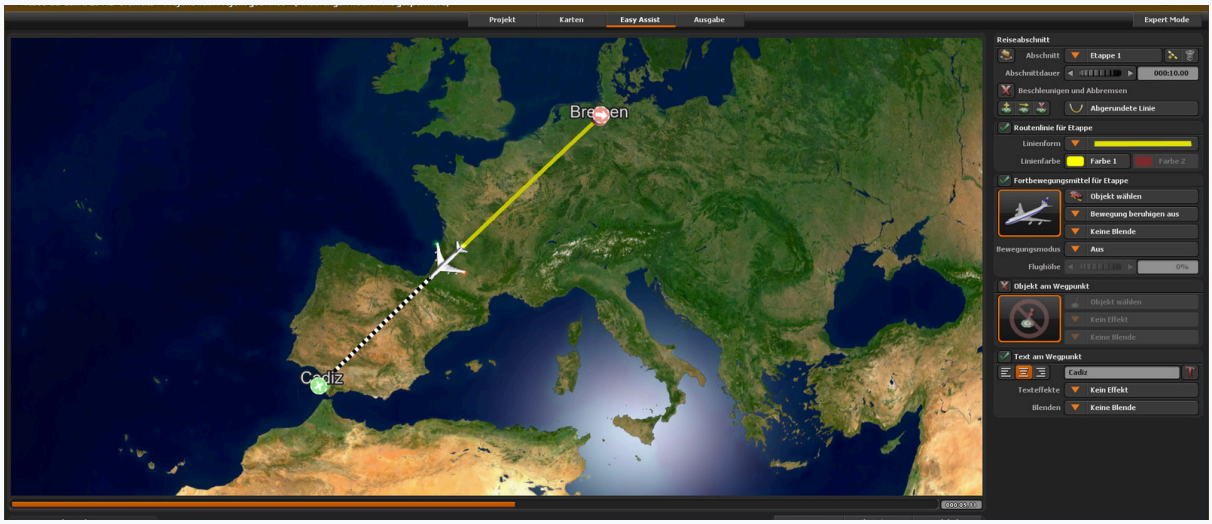


Illustration for this step

1. In the Windows window, select the desired folder.
2. Enter **Tutorial01_Bremen_Cadiz** as the file name.
3. Click **Save**.

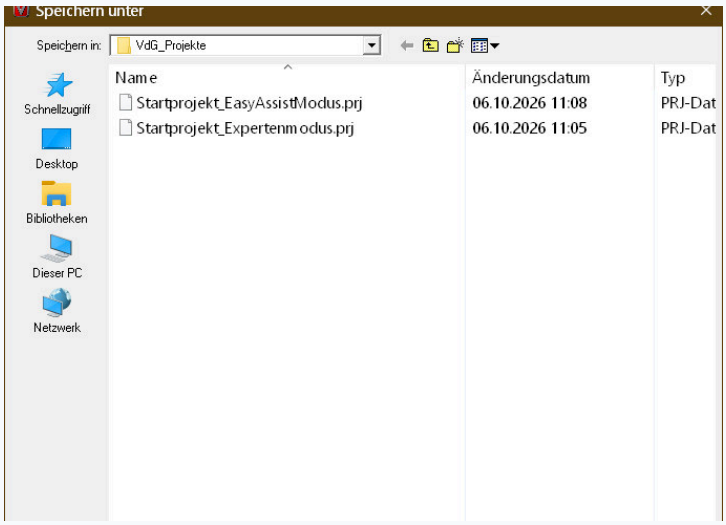


Illustration for this step

After the first save, you can use the normal **Save Project** switch for further backups. The same project file is updated.

> **TIP**
> Save a larger project regularly. This makes it easier for you to return to a safe working status after an unwanted change.

9. Output the video

Select the output format

1. Click on the main **Output** tab at the top.
2. Select **MP4 video file** as the **Video output format**.
3. Select **H.264** as the **Codec** setting.
4. Set this short tutorial to **Highest Quality**.
5. Leave **DeInterlace** and **Stereo3D Mode** turned off.



Illustration for this step

MP4 with H.264 can be played on many current computers and playback devices. The highest quality level requires more computing time and produces a larger file, but provides a clearly visible result for this short example.

Start the calculation

Click **OK** to start video calculation.



Illustration for this step

10. Wait for the calculation and check the result

During the calculation, Vasco da Gama shows the progress in percent. The time required depends on the performance of your computer, the video length and the quality chosen.



Illustration for this step

WARNING

Do not cancel the calculation or close Vasco da Gama. Wait until the editor appears again. An additional completion message does not appear.

After the calculation you are back in the editor. Then open the generated MP4 file with a video player and check the result.



Illustration for this step

Done

You have completely created your first itinerary and output it as a video. You have already gotten to know the most important basic process:

1. Create project,
2. Insert locations
3. Check route and means of transport,
4. Preview,
5. Save project and
6. Calculate video.

In the following chapters you will learn how to specifically use additional waypoints, individual route lines, other vehicles, texts, tracking shots and optical effects.

4. Understand project settings

The project settings determine the technical basis of your itinerary. These include the image size, the number of images per second and the angle of view of the camera. In Vasco da Gama you don't have to search for these values individually. For most projects, a suitable **video template** is sufficient.

In this chapter you will learn which settings make sense for a modern video and when you should deviate from the recommended default values. Opening and saving project files is deliberately only treated briefly because the usual Windows file windows are used for this.

This is what you will learn in this chapter

After this chapter you will know:

- which values a video template automatically sets,
- why **HDTV 1080/25p** is a good starting point for many projects,
- how image size, aspect ratio and pixel ratio differ,
- how frame rate and image type influence the later video,
- how the camera focal length changes the visible image section,
- when texts and images should always remain visible,
- how to save a project or save it as a variant.

> **NOTE**
> The project file contains your route and all settings. The finished video will be created later in the **Output** area. The project file and video file are therefore two different files.

Open the project settings

When creating a new project, the **Project Settings** window appears automatically after selecting the mode. If a project is already open, you can access it via the main **Project** tab.

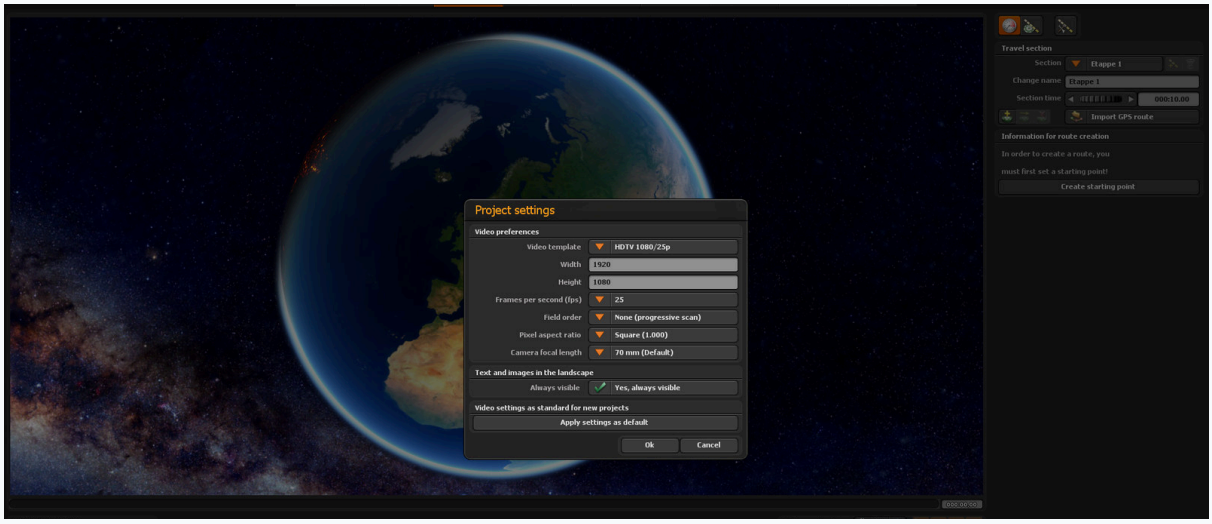


Illustration for this step

The window is divided into three areas:

1. Under **Video Settings** you determine the image size, frame rate, image type, pixel ratio and camera focal length.
2. Under **Display of texts and images in the terrain** you specify whether labels can be obscured by mountains or terrain.
3. Use **Apply settings as default** to save the current video settings as initial values for future projects.

Click **OK** to apply the values to the current project. Click **Cancel** to close the window without applying the remaining changes.

Use a video template

The video template is the safest and easiest way to achieve technically matching settings. It automatically determines:

- width and height of the image,
- frames per second,
- full screen or half screen,
- Pixel ratio.

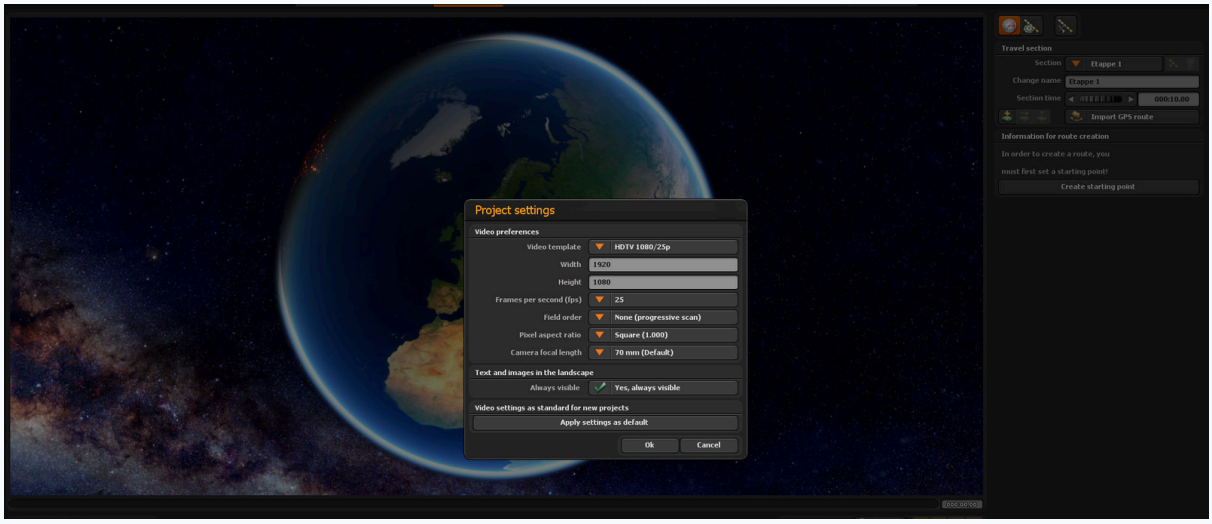


Illustration for this step

For a normal Full HD video in Europe, **HDTV 1080/25p** is a good starting point. The template uses an image size of 1920 x 1080 pixels, 25 frames per second, full frames and square pixels.

Understand the name of the video template

The name **HDTV 1080/25p** can be read like this:

- **1080** means the image height of 1080 pixels.
- **25** means 25 frames per second.
- **p** stands for full frame, also called progressive scan.
- **i** stands for fields and is primarily required for older video processes.

TIP

If possible, use a ready-made video template. **Own format** only makes sense if further processing explicitly requires a specific image size or frame rate.

NOTE

When you select a video template, Vasco da Gama resets the camera focal length to the default **70mm**. Check the focal length if you had previously deliberately set a different value.

Understand image size and aspect ratio

The **Width** and **Height** fields indicate the number of image points in pixels. For Full HD, this is 1920 pixels wide and 1080 pixels high.The width and height determine the aspect ratio of the entire image. 1920 x 1080 corresponds to today's common widescreen format of 16:9. The larger the image dimensions, the more detail can be seen. At the same time, however, computing time and storage requirements increase.

The following sizes are sufficient for most travel videos:

- **1920 x 1080:** Full HD, good standard for monitor, TV and video editing.
- **3840 x 2160:** Ultra HD or 4K, significantly higher detail resolution and longer calculation time.
- smaller PC formats: only for special applications or very small output files.

> **NOTE**
> A larger resolution does not automatically improve every display. Map material, textures and embedded images must also contain sufficient detail.

Set your own format

Select **Custom Format** if you need to enter the width and height yourself. Make sure that both values match the desired aspect ratio. For example, 1920 x 1080 or 3840 x 2160 pixels are suitable for a 16:9 image.

Don't change these values just to eliminate black edges from an already rendered video. First check which aspect ratio the subsequent playback device or editing program expects.

Set the frames per second

The frame rate determines how many frames a second of video consists of. The abbreviation **fps** is also used in the interface. It means “frames per second”, i.e. images per second.

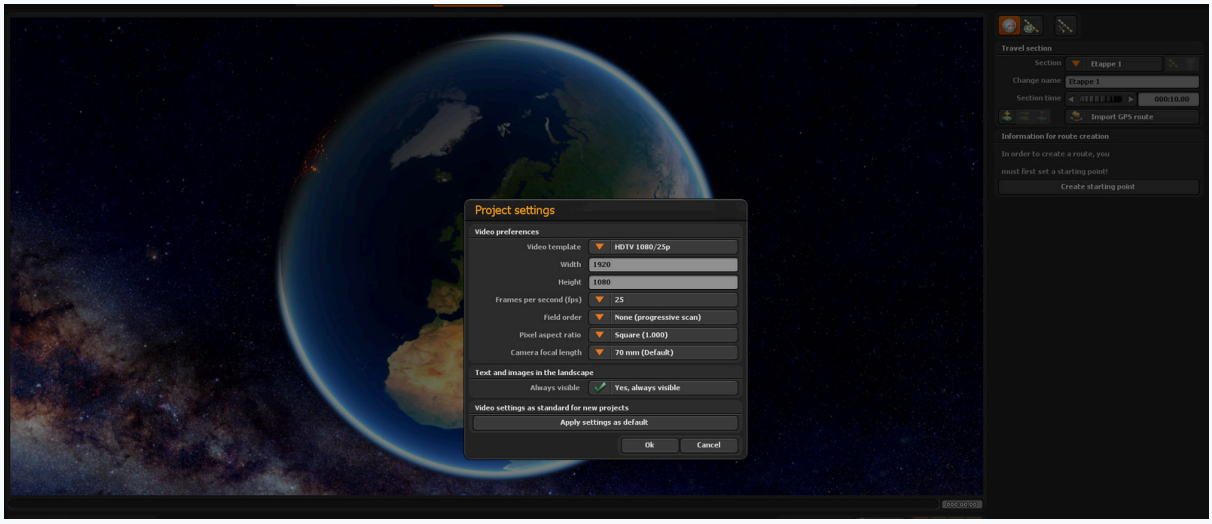


Illustration for this step

Choose the appropriate frame rate

The following guidelines help with the selection:

- **25 fps:** proven standard for many travel videos in Europe.
- **50 fps:** smoother movements, but about twice as many frames to calculate as with 25 fps.
- **24 fps:** often used in cinematic productions.
- **30 or 60 fps:** common for systems and workflows tuned to these frame rates.

If possible, use the frame rate that your editing program and the subsequent output format expect. Different frame rates may require additional conversions during further processing.

> **WARNING**
>
> If you change the frame rate of an existing project and confirm the project settings with **OK**, Vasco da Gama will adjust the existing time values accordingly. Then check the route and the preview.

Differentiate between full images and fields

The **image type** determines whether a video image is constructed as a complete single image or as two time-offset fields.

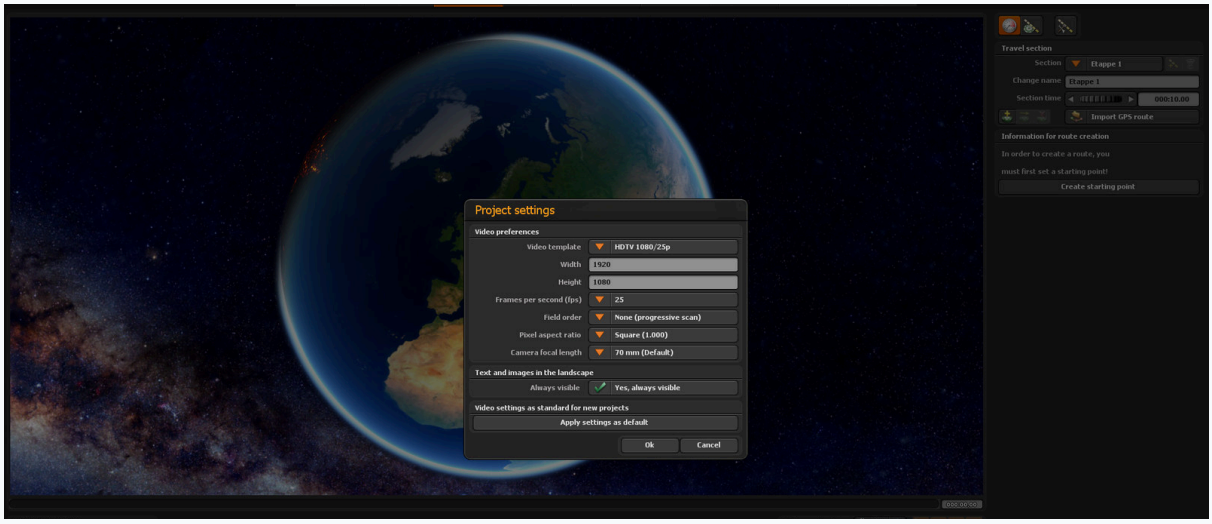


Illustration for this step

Full screen for modern playback

Full Screen (Progressive Scan) is the right choice for most applications today. Each calculated frame contains a complete image. This is particularly suitable for:

- computer monitors,
- modern televisions and projectors,
- Internet videos,
- current video editing programs.

Fields only with a specific specification

Lower field first and **Upper field first** come from older television and video processes. Only use these settings if a specific output format, playback device or editing program explicitly requires a field order.

Incorrect field order can produce jittery or comb-like image edges when moving. Unless there is a specific requirement, stick with **Full Screen (Progressive Scan)**.

Choose the pixel ratio correctly

The **pixel ratio** describes the shape of a single pixel. It is not the same as the aspect ratio of the entire image.

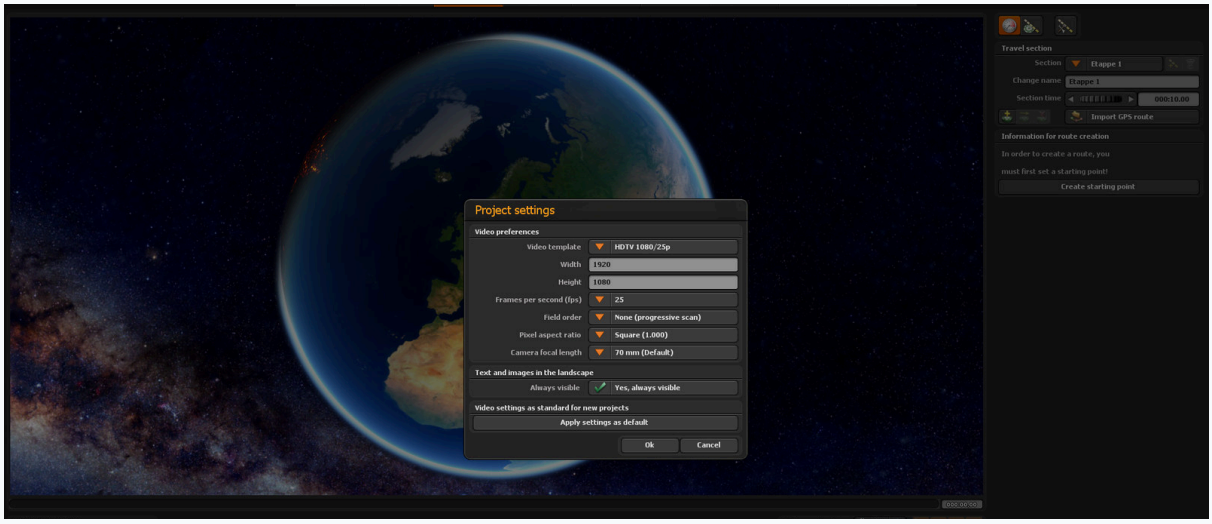


Illustration for this step

In modern HD and Ultra HD formats, the pixels are usually square. To do this, use **Square (1,000)**. A value of 1,000 means that a pixel is as wide as it is high.

The entries PAL 4:3, PAL 16:9, NTSC 4:3, NTSC 16:9 and HDV 16:9 are required for older or special video formats. There, pixels can be wider or narrower than their height.

> **EXAMPLE**
> A Full HD image with 1920 x 1080 square pixels has an aspect ratio of 16:9. The pixel ratio still remains 1,000. Aspect ratio and pixel ratio therefore describe two different properties.

Set the camera focal length

The **camera focal length** determines the angle of view of the camera. It doesn't change the resolution of the video, but rather how much of the scene is visible in the camera image.

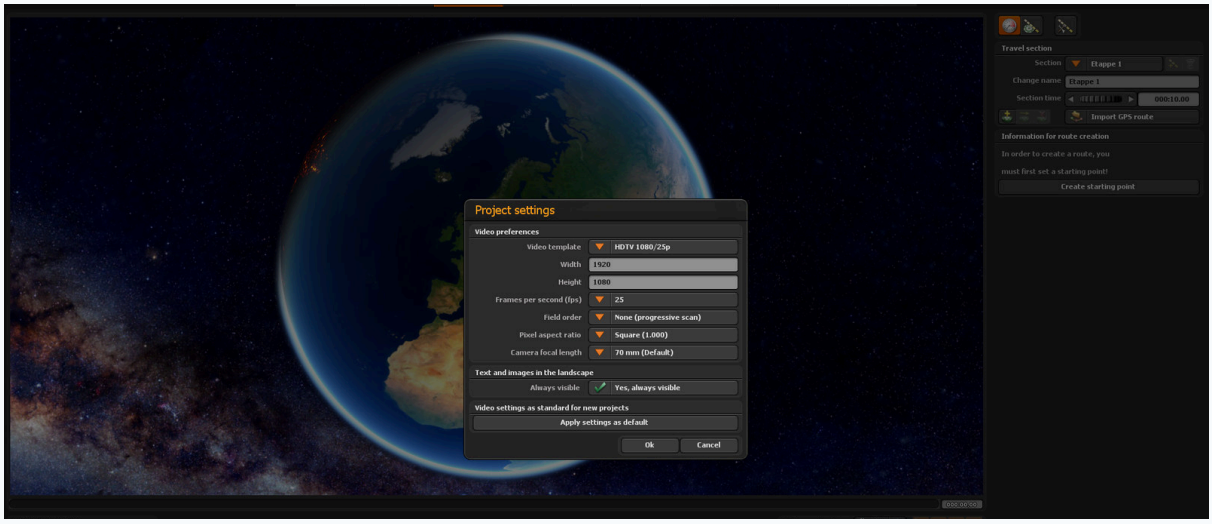


Illustration for this step

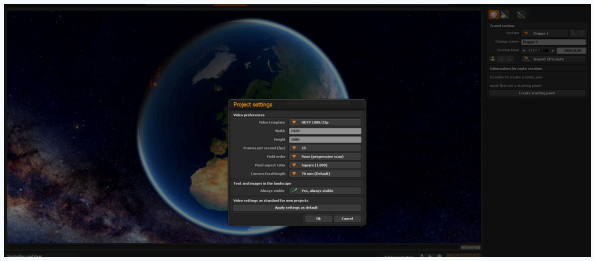
- A small focal length shows a wide image section. This means more of the landscape is visible.
- A large focal length shows a narrower image section. Distant areas appear more brought in.
- **70mm (standard)** is a balanced starting value for many travel routes.

Very small focal lengths can greatly emphasize the spatial effect. Very large focal lengths only show a narrow section and require particularly careful camera movement.

Start with 70 mm and only change the value if the desired image composition is not well achieved with the camera settings. The exact design of camera movements is explained in the chapter **Designing the camera movement**.

Display text and images in front of the site

Texts and images can either always appear in the foreground or fit spatially into the landscape. The setting **Always visible** is used for this.



Yes, always visible



No, text and images may be hidden

Yes, always visible

This setting is recommended for most projects. Text and images remain completely legible, even if there is a mountain or other part of the terrain in front of it from the camera's perspective. This is particularly helpful for place names, headings and explanatory labels.

With certain orientations and camera angles, text or images can also sink into the ground and partly or completely disappear even though no mountain is in front of them. **Yes, always visible** prevents this common problem and helps keep labels reliably legible.

No, can be hidden

With this setting, texts and images behave as if they were actually in the landscape. If there is a mountain in front of them, the labeling will be partially or completely obscured. Depending on the orientation and camera angle, it may also sink into the ground. This means that side camera views from a low height can appear more natural and spatial.

> **TIP**
>
> First use **Yes, always visible**. Only choose spatial occlusion consciously for scenes in which immersion behind terrain is desired.

Apply settings for new projects

If you regularly work with the same video settings, you can save them as default for new projects.



Illustration for this step

1. Set video template, frame size, frame rate, frame type, pixel ratio and focal length as desired.
2. Click **Apply settings as default**.
3. New projects then start with these values.

The default values make it easier to start the project, but do not change existing project files.

WARNING

The default values are saved immediately when the switch is clicked. If you then close the window with **Cancel**, the new default values will still be retained.

TIP

A good starting point is **HDTV 1080/25p**, full screen, square pixels and 70 mm focal length. Only adjust this default if you regularly use a different target format.

Open and save projects

The four most important project commands are located on the left in the lower toolbar.



Illustration for this step

1. **New Project** starts a new itinerary and opens its basic settings.
2. **Open Project** loads an existing project file with its routes, objects, text and settings.
3. **Save Project** updates the current project file. If the project does not yet have a file name, the Windows file selection appears.
4. **Save Project As** creates a new project file with a different name or in a different location. The previous project file remains intact.

The Windows file windows work like in other programs. Select a folder, enter a understandable file name and confirm the selection.

WARNING

When opening another project or creating a new project, the currently open project will be replaced. Save important changes beforehand.

Create project variants clearly

Use **Save Project As** before attempting major changes. This means you can return to the previous version at any time. Understandable names help with assignment, for example:

- `Italyvoyage_01_Basic route`
- `Italyvoyage_02_Objects`
- `Italyvoyage_03_camera`
- `Italyvoyage_04_Final`

The project file is not a video file. You will need it again later if you change the route or want to calculate the video with different settings.

Recommended workflow

The following sequence has proven successful for a new project:

1. Choose the appropriate work and map mode.
2. Use an appropriate video template.
3. Check image size, frame rate and full screen display.
4. For modern HD formats, leave the pixel ratio to **Square (1,000)**.
5. Start with the standard focal length of 70mm.
6. Initially, always leave text and images visible.
7. Save the project early on with a clear name.
8. Before major changes, create a new project variant.

The most important things in brief

- For most projects, a ready-made video template is safer than individual manual values.
- **HDTV 1080/25p** is an easy-to-understand starting point for Full HD travel videos.
- Full frames and square pixels fit most modern playback devices.
- Frame rate changes can affect a project's existing time values.
- **Yes, always visible** keeps texts and images readable in front of mountains and prevents them from sinking into the ground.
- **Save As** is suitable for backup copies and project variants.
- The finished video will be calculated later in the main **Output** tab.

In the next chapter you will learn how to select the appropriate map, use additional map data, and find locations reliably.

5. Select and set up cards

The map forms the visible basis of your travel route. It decides whether the journey is displayed on a globe or on a flat surface and what additional information can be seen. These include, for example, country borders, city names, city lights, mountain shapes, your own maps and country masks.

In this chapter you will get to know the card selection at your leisure. You will also learn how to import your own image map, fit it geographically and later remove it from the map list.

This is what you will learn in this chapter

After this chapter you will know:

- when the globe and when a flat map makes sense,
- how to select a base map and additional map information,
- what maps, country masks and country flags are used for,
- how maps are shown or hidden depending on the camera zoom,
- how to import your own map and fit it geographically,
- how to quickly find a specific point using the location search,
- how to safely remove self-added card data.

NOTE

The base map depicts the earth. Additional maps, country masks and country flags are further layers above. This allows several map displays to be combined with each other.

Choose globe or flat map

The map display is set in the **Mode Selection** window when a new project is created. This decision determines the spatial structure of the project and therefore cannot be changed while working on an existing project.



Illustration for this step

1. **Sphere:** The journey takes place on a spherical earth. This representation is suitable for global, cross-country and regional travel routes.
2. **Flat Map:** The journey is shown on a flat image surface. This variant is particularly suitable for historical maps, theme maps, city maps or other custom map images.

The choice between **Easy Assist mode** and **Expert mode** is independent of this. Both working methods can be used with the globe or a flat map.

> **WARNING**
> If you want to use the other map display, create a new project. Save the current project beforehand.

The map selection for the globe

Globe mode allows you to combine a global base map with several additional layers. To do this, open the main **Cards** tab and then the **Card selection**.



Illustration for this step

The window consists of four important areas:

1. Above select the worldwide **base map**.
2. Under **Show additional information** you can set boundaries, city names, city lights and mountain landscapes.
3. Use the **Maps**, **Country Masks** and **Country Flags** tabs to select additional levels.
4. In the lower area you can delete map data you have added yourself from the hard drive.

With **OK** you accept the selected map and display settings. **Cancel** discards the settings for this window that have not yet been applied.

Important: Map imports, confirmed deletions and confirmed visibility settings are retained even after **Cancel**.

Select a base map

The base map covers the entire globe. Open the **Select base map** list and click on the desired representation. The preview below helps with the selection.

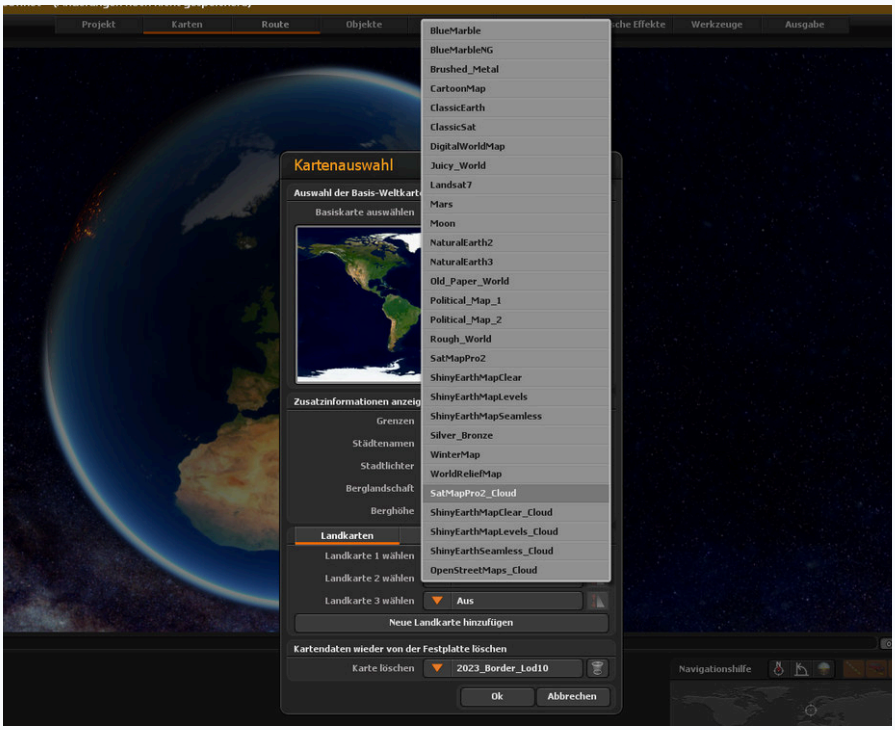


Illustration for this step

The base maps differ in colors, surface structure, labeling and display style, among other things. For example, a factual satellite map is suitable for realistic travel routes. A political, drawn or historical map, on the other hand, can fit better into a correspondingly designed film.

NOTE

The illustration shows all base cards available on the system used. The base maps displayed on your computer depend on your edition of Vasco da Gama and the additional map packs installed. Your selection list may therefore be shorter or structured differently.

TIP

First select the base map and then add additional layers step by step.

Show borders and city names

Country borders and city names make geographical orientation easier. Both pieces of information can be switched on and off independently of each other.



Illustration for this step



Illustration for this step

The following settings are available for **Limits**:

- **Off:** No country borders are displayed.
- **Land:** Borders only appear on land areas.
- **Land & Sea:** Borders also continue over sea areas.

For **City Names** you can choose between **Off**, **Fade** and **Level**. **Fade** softly blends the city names when the map level changes. **Level** switches the names depending on the visible map level.

You can use **Color** to adjust boundaries and city names to match the selected base map. Make sure there is clear contrast so that the information remains clearly visible even when the camera is moving.

Use city lights and mountain landscape

City Lights are displayed only on the night side. They simulate the illumination of larger settlement areas as seen from a high altitude. They are not visible in a bright daytime scene. Turn off City Lights if the night side should also be shown without city illumination.



Illustration for this step

With **mountain landscape** the terrain is given a spatial height. The **Mountain Height** value determines how strong the elevations are displayed. **100%** corresponds to the normal height. A larger value emphasizes mountains more, but can also appear exaggerated with flat camera angles.

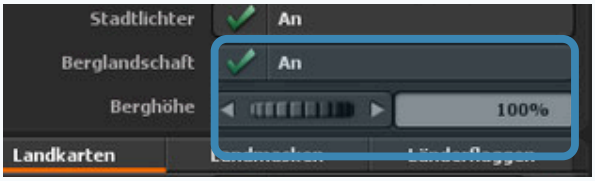


Illustration for this step

TIP

Start with the mountain height at 100%. Then check the effect in the preview from the camera position actually used.

Use additional maps

Additional maps appear as layers above the base map. Depending on the program output, up to three map levels can be selected. For example, regional detailed maps, historical map sections or thematic information can be placed over the world map.

In the **Maps** tab, select a map for each required level. With **Off** the relevant layer remains empty. The small switch to the right of a map layer opens its **visibility settings**.

The order of the layers is important: a higher map can obscure underlying map areas. Therefore, only use the layers that are really needed for the project.

> **NOTE**
> Your own map will be permanently entered in the selection list after the successful import. It remains there even if you then close the card selection with **Cancel**.

Country masks and country flags



Illustration for this step

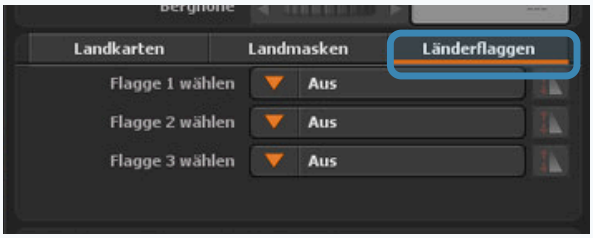


Illustration for this step

A **land mask** determines which areas of a map are considered land. This is particularly important for your own maps with coasts, islands, lakes or rivers. With a suitable mask, water and land areas can be clearly separated from each other. Water waves or reflections only work in the intended areas.**Country flags** are ready-made additional image layers. They can clearly mark a trip or a country. You can also specify the camera zoom at which flags become visible.

Set the visibility of a map layer

Additional maps and country flags do not have to be visible during the entire tracking shot. The visibility settings can be used to softly show or hide them depending on the camera zoom.



Illustration for this step

Three modes are available for each level:

- **Always visible:** The layer remains visible at every camera zoom with the set maximum visibility.
- **Show:** The layer is invisible at the start value. Up to the final value, it is displayed continuously up to maximum visibility.
- **Hide:** The layer has its maximum visibility at the start value. It is continuously hidden until the final value is reached.

The **Maximum Visibility** limits the strongest opacity of the layer. A value below 100% allows the underlying card to continue to show through.

Set start and end of crossfade



Illustration for this step



Illustration for this step

Start at camera zoom determines when the transition begins. **End at camera zoom** determines when it is completed. The further apart the start and end are, the longer and smoother the transition.

A typical use is a regional detailed map: in the broad overall view it remains invisible. As the camera approaches the target area, it will slowly fade in. This means there is no sudden change in the map image.

> **TIP**
> Test the start and end values in the preview. The most useful values depend on the camera height and the course of your route.

> **NOTE**
> Visibility settings confirmed with **OK** are retained, even if you close the **Map selection** window with **Cancel**, which is then visible again.

Add your own map

In the **Maps** tab, click **Add new map**. First, select the map image in the Windows file window. The **Choose your own map** window will then appear.

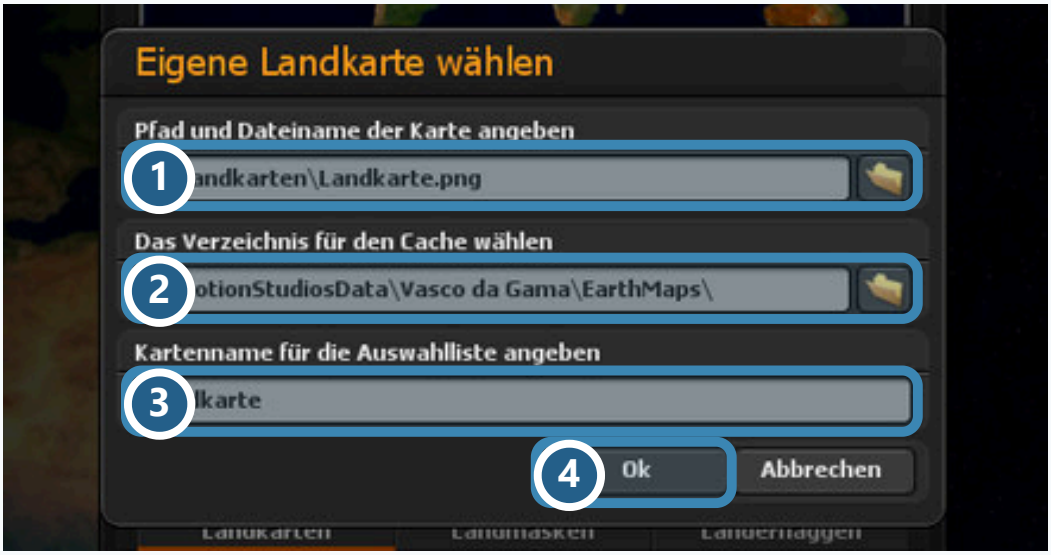


Illustration for this step

1. The selected image file is listed under **Specify path and file name of the card**.
2. Under **Select the directory for the cache** you specify where Vasco da Gama stores the prepared map data.
3. Under **Specify card name for the selection list** enter a short, unique name.
4. Click **OK** to start the import and preparation.

The image must be at least 1024 x 512 pixels in size and be an appropriate 24 or 32 bit image. BMP, JPG, PNG, TIFF and WebP are supported, among others. The card name can be up to 29 characters long.

WARNING

Choose a drive with enough free space and write permissions for the cache. Vasco da Gama creates a subfolder there with the specified card name.

Fit a map geographically

If the imported image does not have usable geodata, a geographic area must be assigned to it. To do this, Vasco da Gama opens the **Fit Map** window. The map image is initially semi-transparent over the global base map.

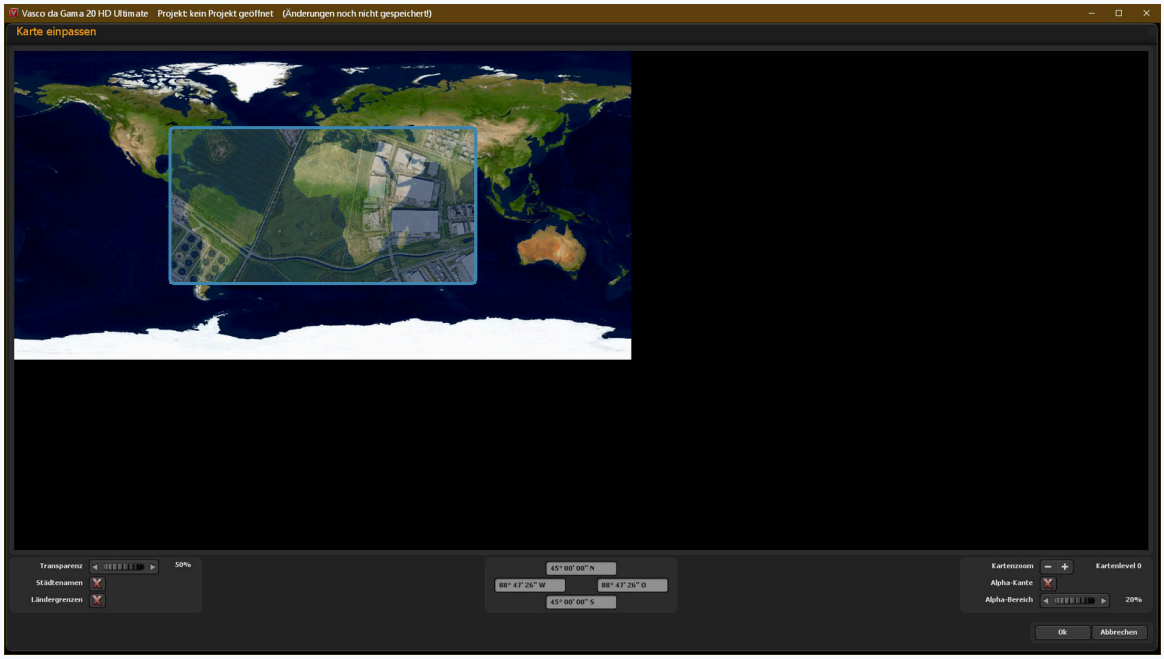


Illustration for this step

The light frame determines which area the imported image is assigned to:- Drag an edge or corner with the left mouse button to enlarge or reduce the frame.

- Drag within the frame to move the entire map section.
- Hold **Ctrl** while dragging a corner if you want to preserve the existing aspect ratio.
- Right-drag on the base map to view a different area of the world. The geographical allocation of the frame is retained.

> **NOTE**
> With a georeferenced map, for example a suitable GeoTIFF file, the coordinates contained can already specify the assignment. Manual alignment is then not required or only required for control purposes.

Check the alignment carefully

Use **Map Zoom -** and **Map Zoom +** to change the map level of the base map. A higher level shows a smaller area with more detail, making accurate alignment easier.

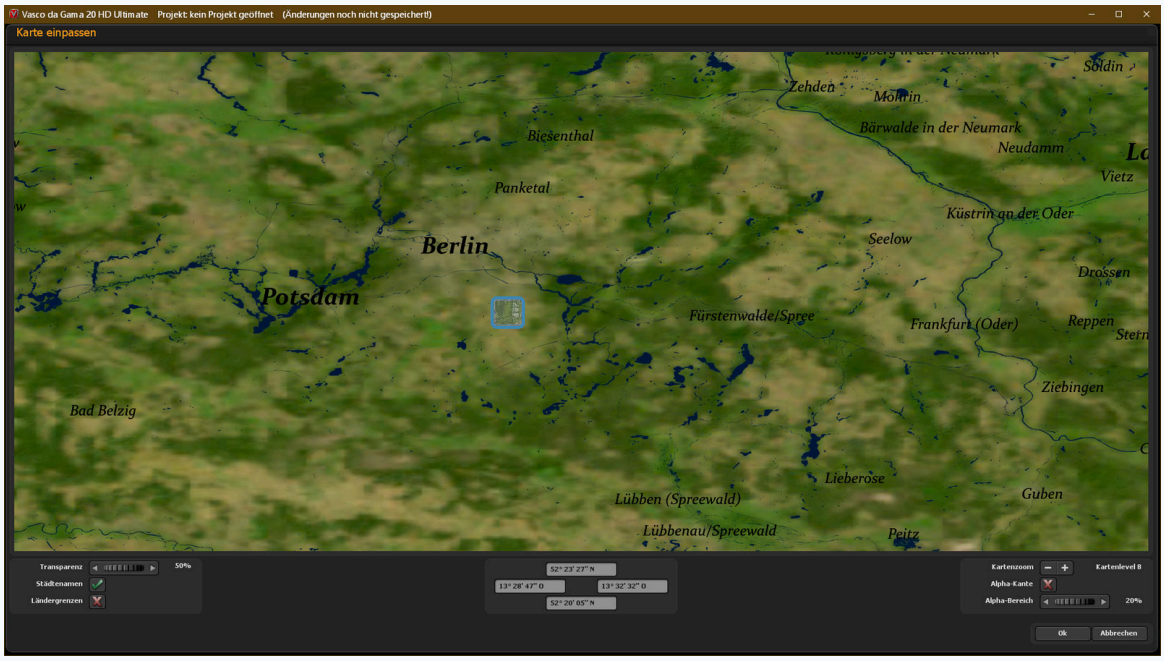


Illustration for this step

Further help is available for detailed work:

- **Transparency:** Determines how clearly the imported image can be seen over the base map. A middle value makes features of both cards visible at the same time.
- **City names:** Shows place names as a guide. They are not included in the imported map image.
- **Country borders:** Shows borders as a further alignment aid.
- **GPS coordinates:** The four fields define the western, eastern, northern and southern edges of the map. Use these fields if you know the exact corner coordinates.
- **Alpha Edge:** Makes the edge of a suitable 32-bit image fade to a soft, transparent appearance. This setting has no effect on a 24-bit image.

Check prominent points such as coastlines, rivers, road intersections or town locations. Only click **OK** when the image map and base map match as closely as possible.

Select the imported map

After the successful import, the specified map name appears in the selection list. Select it in a free map layer.

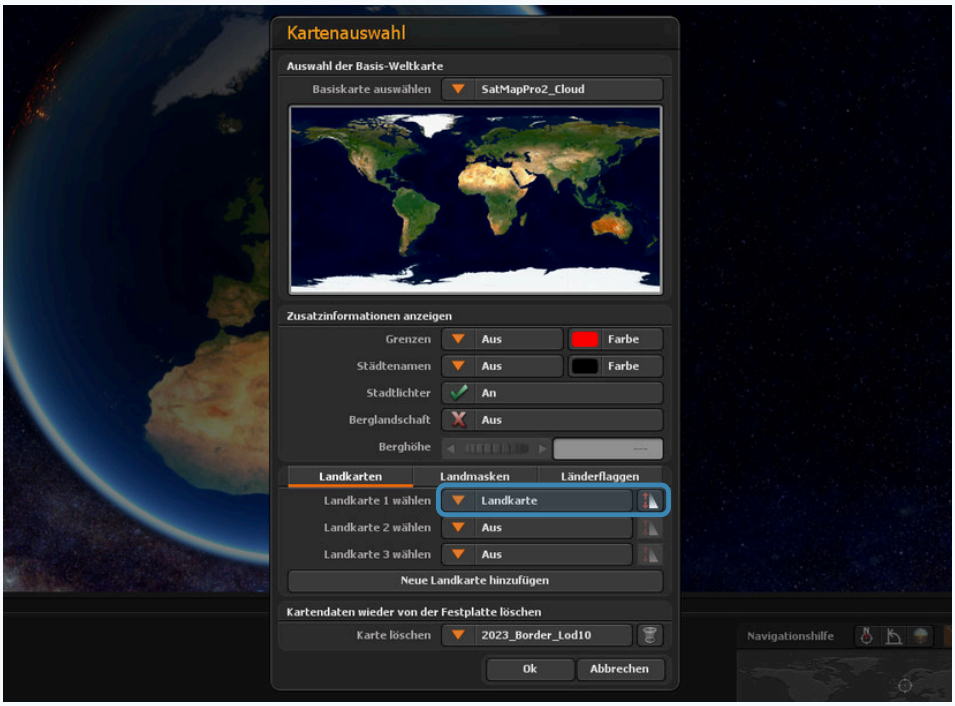


Illustration for this step

You can then use the switch to the right of the map layer to determine whether the map always remains visible or whether it is shown or hidden depending on the camera zoom.

If the map appears in an incorrect geographic location, reimport it with a new name and align the section more carefully. Only delete the test version that is no longer required after the new card has been tested.

> **NOTE**
> Removing a map layer with **Off** does not delete any files. The card remains in the selection list and can be used again later.

Delete self-added map data

Your own maps and land masks that are no longer needed can be removed from the selection list and deleted together with their cache.

1. In the **Delete map data from the hard drive** area, select the map in question.
2. Click the delete button to the right of the selection.
3. Check the name carefully again.
4. Confirm the warning only if the map data is really no longer needed.

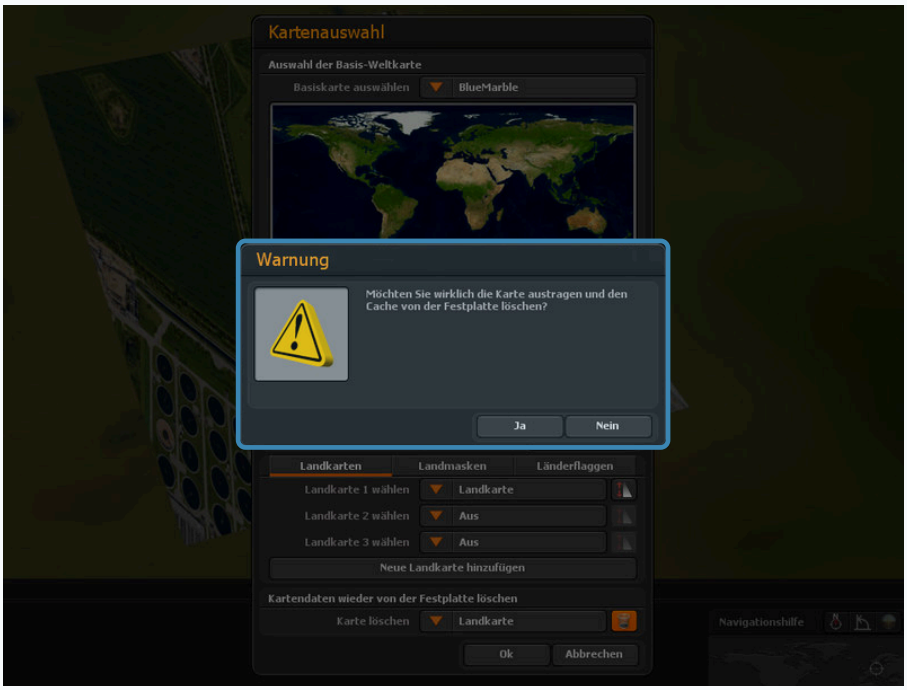


Illustration for this step

> **NOTE**
>
> If you select **Yes**, the entry and the associated cache files will be permanently deleted from the hard drive. This operation cannot be undone using **Cancel** in the map window.

The original map image at its own storage location is normally separate from this. Only the map data registered and processed by Vasco da Gama in the selected cache directory is deleted.

Set up a flat map

A flat map does not use a spherical earth. Instead, a separate card forms the flat work surface. After selecting **Flat Map**, a simplified map selection appears.

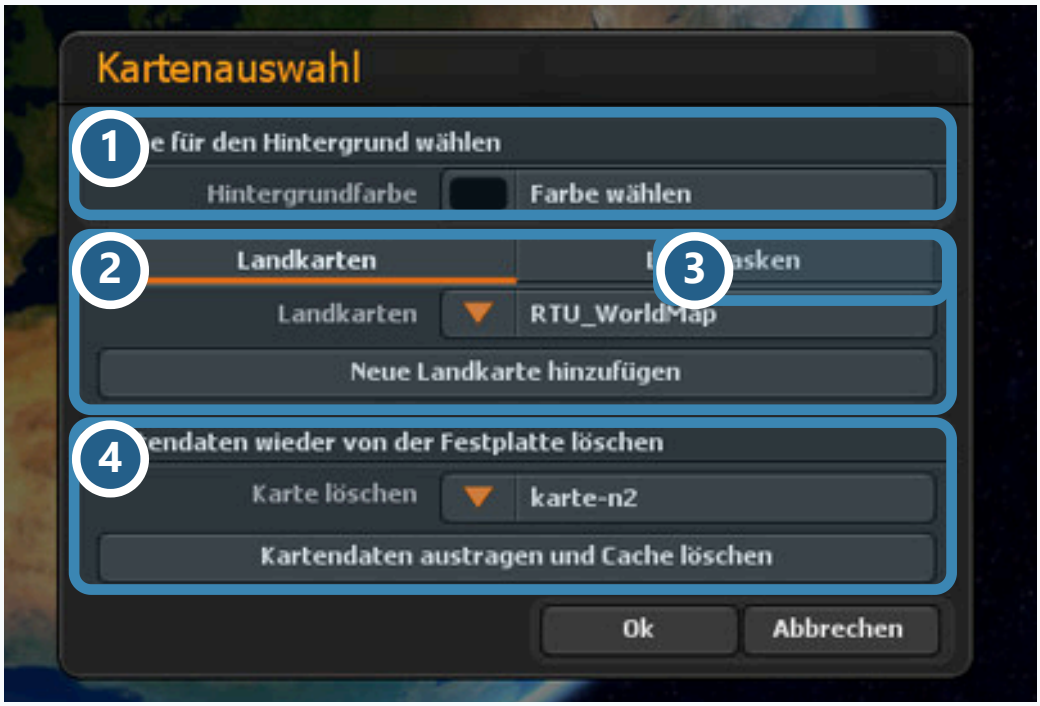


Illustration for this step

1. With **background color** you determine the color outside of the actual map.
2. In the **Maps** tab, select or import the image map.
3. You can add a suitable mask in the **Land Masks** tab.
4. In the lower area you can manage and delete card data that you have added yourself.

Adding your own map works the same as in globe mode. Use an image file that is large enough so that enough detail remains visible even when the camera is moved closely.

> **TIP**
> Choose the background color to match the edge of the card. This means that areas outside the image are less noticeable.

Earth globe and flat map in comparison



Illustration for this step



Flat map as a level work surface

The **earth globe** is the right choice if you are traveling over longer distances or if you want the curvature of the earth to be visible. Worldwide maps, national borders, city lights and mountain landscapes are available as a coherent display.

The **flat map** focuses on a single map image. It is suitable, for example, for a city map, a fantasy map, a historical map, a site plan or a limited subject area.

> **NOTE**
> Globe for geographically connected travel - flat map for a single map image with your own design.

Find a location

With **Search for location** you can jump specifically to a city, region or country. Enter the full name or just part of it in the **Search term** field. The search begins when you click on the magnifying glass or when you leave the input field with **Enter** or with a mouse click.

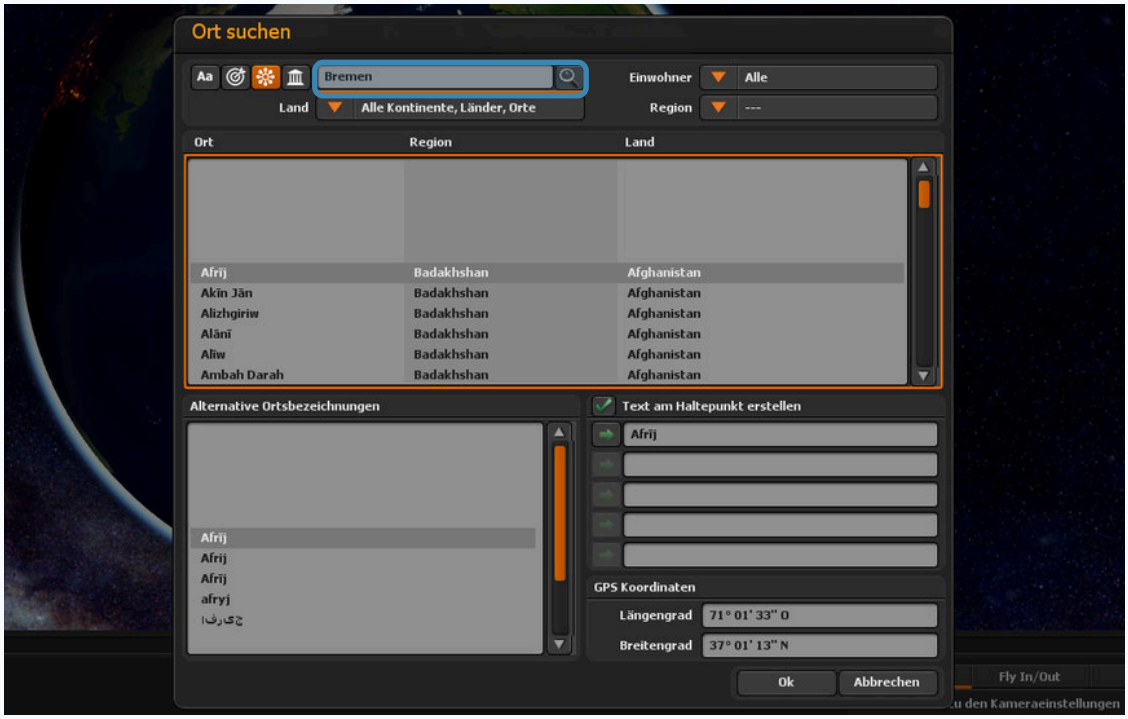


Illustration for this step

You can use the filters to reduce the number of hits:

- consider upper and lower case letters,
- only search exact matches,
- include alternative and different language place names,
- limit the search to capital cities,
- select country or continent,
- Define region and minimum number of inhabitants.

If a search returns too many hits, select the country first or increase the minimum number of inhabitants. If no match appears, turn off exact match and only search for a unique part of the place name.

Select a hit and apply it

The hit list shows the place name along with the region and country. The dark middle line is selected. After selection, the GPS coordinates and the available location names are automatically entered.

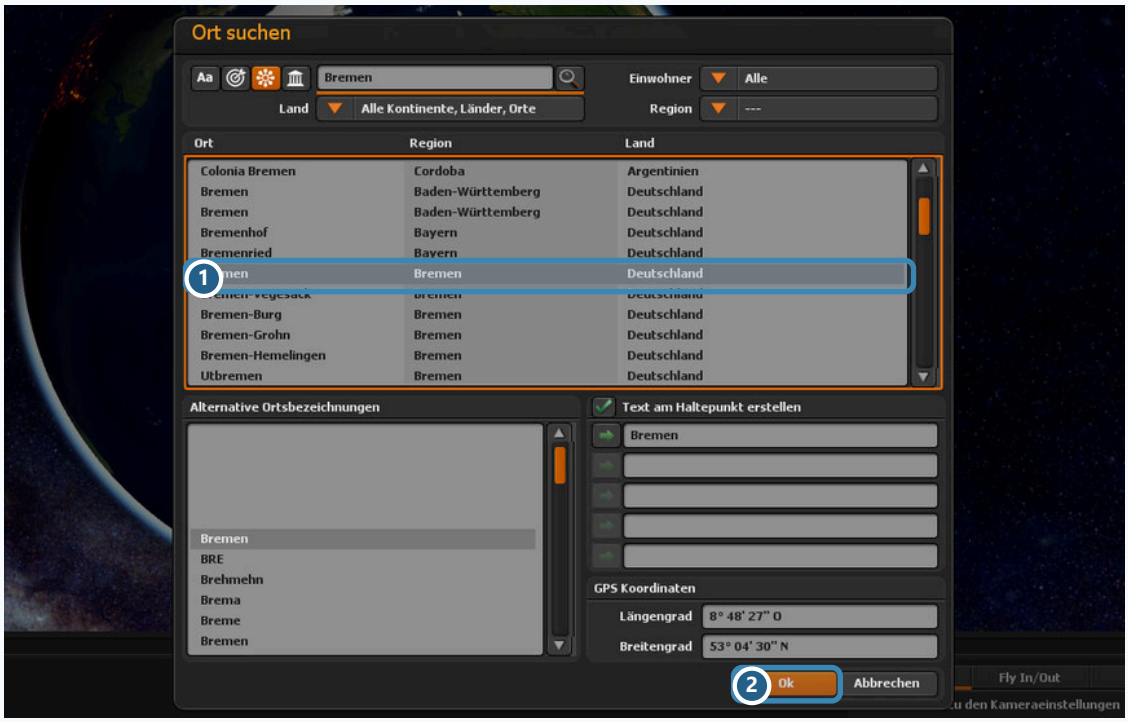


Illustration for this step

You can operate the list in several ways:

- Click on the desired entry with the mouse.
- Rotate the **mouse wheel** to select the previous or next hit.
- Use the **Up Arrow** and **Down Arrow** keys.
- With **Pos1** you jump to the first entry, with **End** you go to the last entry.
- Use **F6** to switch between the hit list and the list of place names.

Alternative or different language place names can be added to an available name line using the green arrow. If **Create text at breakpoint** is switched on, the selected place name will be created as text when a breakpoint is created.

Click **OK** to pass the selected location and its coordinates to the calling function.

Hover over the desired list before using the mouse wheel. A frame in the current accent color shows which list is currently being served.

Recommended workflow

The following sequence has proven successful for setting up a map:

1. When starting the project, decide between a globe and a flat map.
2. First select a suitable base map for the globe.
3. Add borders, city names, city lights, and mountain scenery only as needed.
4. Add additional maps, country masks or country flags individually.
5. Set the desired visibility for each additional layer.
6. When importing your own maps, use unique names and a cache drive with enough space.
7. Check geographic alignment with several clearly visible landmarks.
8. Find important places and control their position on the map.
9. Save the project before attempting major map changes.

The most important things in brief

- The choice between globe and flat map is made when creating a new project.
- The visible list of base maps depends on the program output and installed map packages.
- Additional maps, land masks and flags are displayed as layers above the base map.
- Visibility settings allow smooth fading in and out depending on camera zoom.
- Custom maps require an image file, a cache directory and a unique map name.
- Non-georeferenced maps will be geo-aligned in the **Fit Map** window.
- The location search can be operated quickly with filters, mouse wheel and keyboard.
- Clearing card data and cache is permanent and should be confirmed carefully.

In the next chapter you will learn how to create, edit and time routes and waypoints.

6. Create and edit routes

A route determines where your journey begins, which stops it takes and where it ends. It also determines how long individual travel sections last, at which locations the route object stops and how the visible route line is designed.

In this chapter you will build a route in **Expert Mode** on the **Sphere**. The work steps are deliberately explained one after the other. This allows you to check the route at any time and makes it easier to see which setting has just been changed.

This is what you will learn in this chapter

After this chapter you will know:

- how to set the starting point, additional waypoints and the destination of a route,
- how base points and stopping points differ,
- how to divide a route into several stages,
- how section duration, stopping time, acceleration distance and braking distance interact,
- how to design different line sections,
- when smart mode and expert mode make sense for the route line,
- how the global display of the route line works,
- how to reverse, copy or move a route,
- What you should pay particular attention to when making far-reaching changes.

> **NOTE**
> Bases form the path. Stop points structure the journey and can contain a break, a text or an object.

Before you begin

Open a project in **Expert mode** and with the **Sphere** map view. Then switch to the main **Route** tab. If there is no route yet, only the earth will initially be shown on the map.

Save the project before making extensive changes to an existing route. This is especially important before reversing, copying, or moving, because some of these actions cannot be undone using **Undo**.

The most important terms

- **Route:** The complete travel route from the starting point to the final destination.
- **Waypoint:** Collective term for all points that determine the course of the route.
- **Base:** A waypoint that influences the shape of the route. The journey doesn't stop there.
- **Breakpoint:** A waypoint where the route object can stop. Text and objects can also appear there.
- **Stage:** A travel section within the route that can be set separately in time.
- **Route object:** The moving object that follows the route, such as a vehicle, ship or airplane. In the program it is also called a head object.

A route requires at least two points. The first point is the start. The last point in each case forms the current end of the route. As you add more points, the previous end point becomes a point within the route.

Set the starting point

The starting point determines where the journey begins. In a new project, it is the first point you place on the map.

1. Open the main **Route** tab.
2. Select the function to create the starting point.
3. Move the mouse pointer to the desired position on the globe.
4. Click once with the left mouse button.

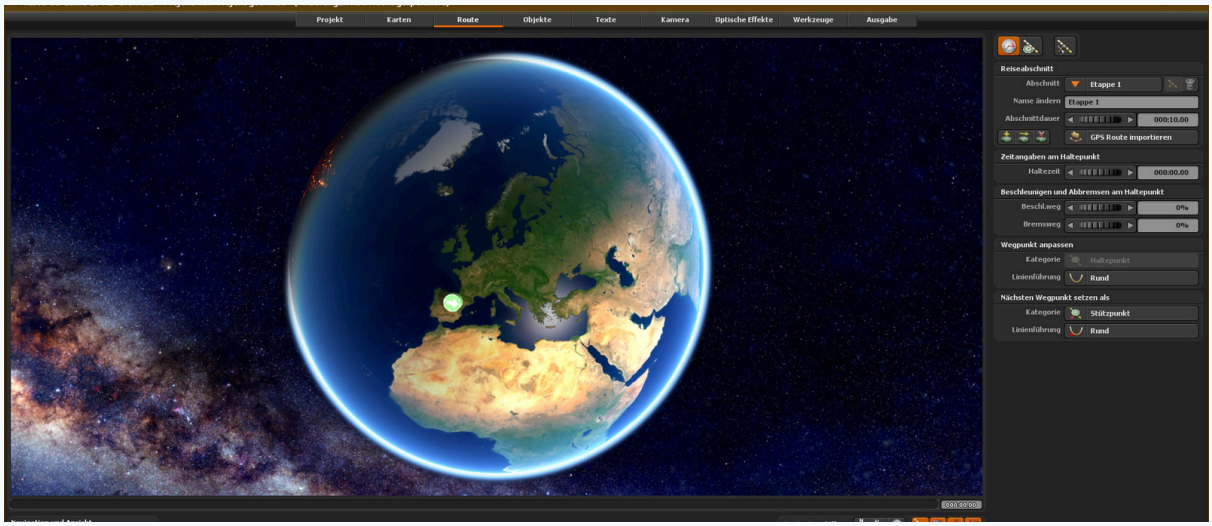


Illustration for this step

The starting point appears on the map and is immediately selected. The settings for the current point are displayed on the right. Not all properties of the starting point can be changed because it is also the fixed beginning of the first stage.

Under **Set next waypoint as** you can determine what type of point will be created before the next click. For easy construction, you can initially leave **base** and a round line set.> **Note:** If you don't hit the point exactly where you want, you can move it later. To do this, first enlarge the map section and then drag the point to the correct location while holding down the left mouse button.

Set the second waypoint

The second point creates the first visible travel section. This point is initially the end of the route. Additional points can be added later or inserted into an existing line section.

1. Move the mouse pointer to the desired second position.
2. Click once with the left mouse button.
3. Check whether both points are connected by a line.

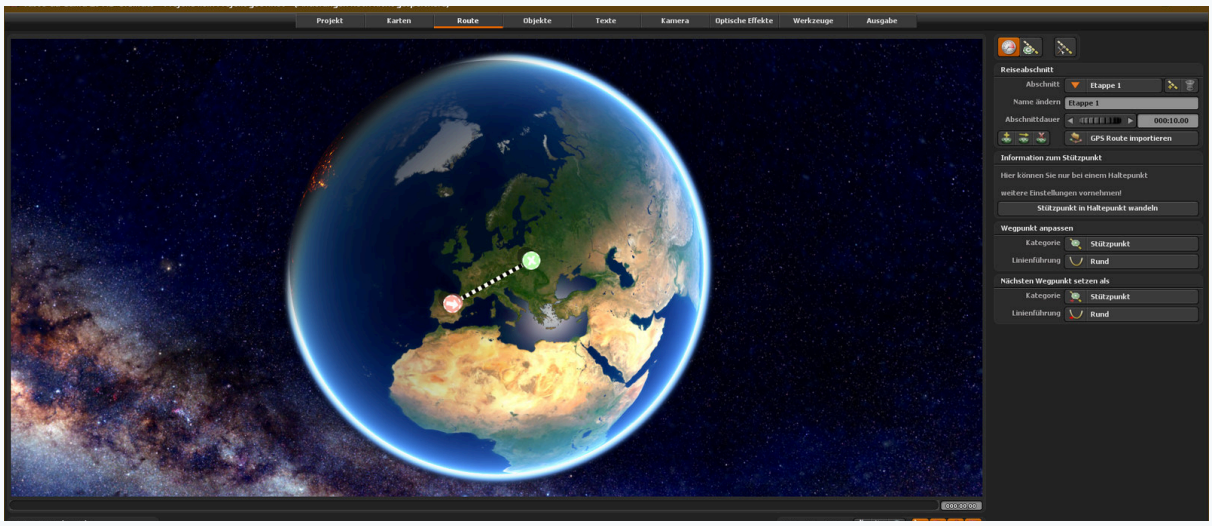


Illustration for this step

The last point set is highlighted. The dashed representation between the points helps you with structure and orientation. The final route line will be designed separately later.

Each additional click on the map extends the route at the end. In this way you can first create the most important stations in their later order.

> **TIP**
>
> Only set the most important stations at the beginning. Additional points for a more precise route can later be inserted directly into an existing route section.

Control the entire route

After several points have been set, you should take a complete look at the route. This allows you to see early on whether the order is correct and whether a point is accidentally in the wrong place.

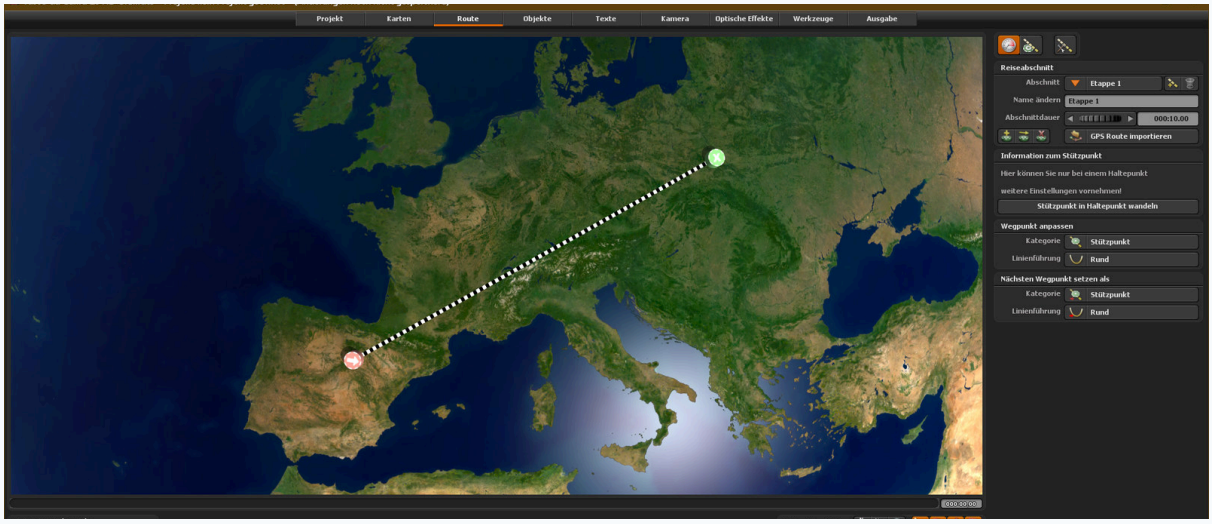


Illustration for this step

For a better overview, you can move the editing view or change the zoom. The selected point is highlighted in color. The other points remain visible along the gradient.

To move an existing waypoint:

1. Move the mouse pointer to the desired point.
2. Hold down the left mouse button.
3. Drag the point to its new position.
4. Release the mouse button.

The adjacent route sections are automatically adjusted to the new position.

> **WARNING**
> Before moving, check whether the desired point is actually selected. If the points are close together, you should first enlarge the map area.

Insert a new base

A base serves to shape the path more precisely. The route object passes through this point without pausing there. Base points are therefore particularly suitable for curves, detours or a more precise adjustment of the course.

1. Under **Set next waypoint as**, select the **Base point** category.
2. Select the desired line, for example **Round**.
3. Click on the existing route section where you want to insert the point.
4. If necessary, move the new point to the desired location.

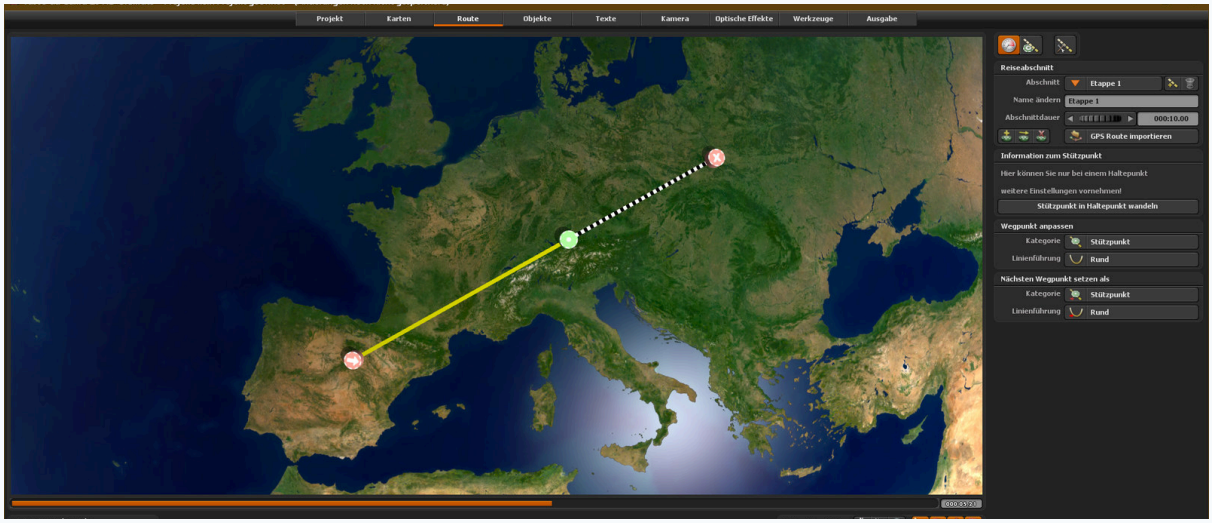


Illustration for this step

The new base is selected. In the **Information about the breakpoint** area, the program points out that further settings are only available for a breakpoint. Under **Adjust waypoint** you can see the current category and the lines.

With **Round** the gradient is smoothly guided through the point. With **Angular** the route changes direction significantly at the waypoint. Which option is better depends on the style you want and the distance between the points.

> **NOTE**
> A base changes the route, but not the timing of the journey.

Convert a vertex to a breakpoint

If you want the journey to stop at an existing base, you do not need to set a new point. Simply convert the selected vertex into a breakpoint.1. Click on the relevant support point.

1. Click on **Convert base to breakpoint** or select the entry **Breakpoint** under **Category**.
2. Set the desired pause under **Hold time**.
3. Adjust **acceleration travel** and **braking travel** if necessary.

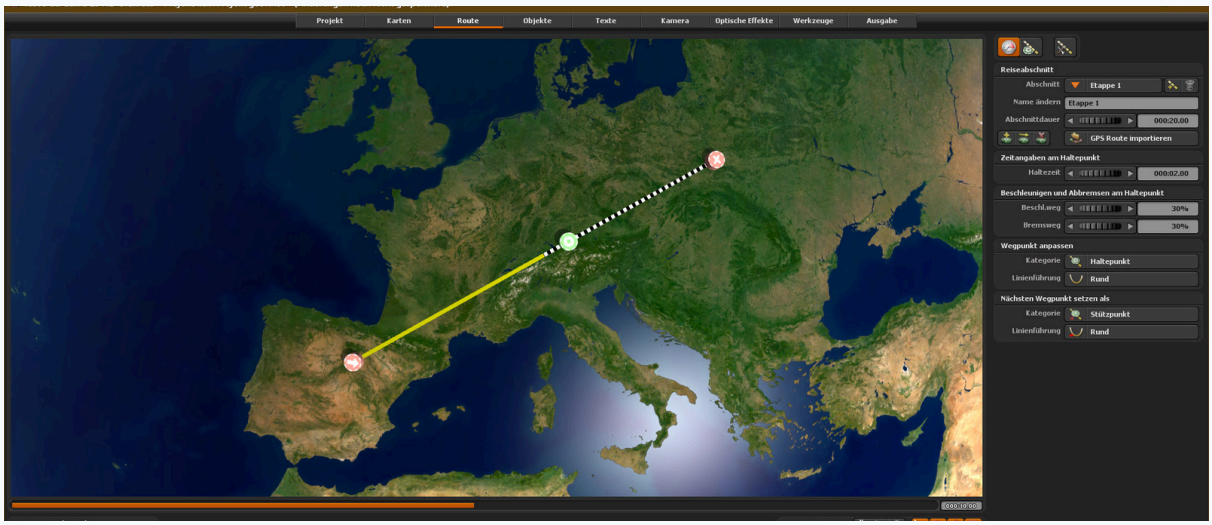


Illustration for this step

In the example, the route object waits two seconds. An acceleration distance and a braking distance of 30% each ensure that it does not start or stop abruptly.

A breakpoint makes sense when:

- a recognizable station on the journey is reached,
- the viewer needs time to read a place name,
- an object, image or text is to be displayed later,
- a new stage should begin at this position.

NOTE

Stopping time, acceleration distance and braking distance are only available for a stopping point. At a base point, the route object continues without stopping.

Understand stopping time, acceleration and braking distance

The three values affect different parts of the movement:

- **Hold Time:** Determines how long the route object waits at the selected stopping point.
- **Acceleration distance:** Determines over what portion of the following distance the object picks up speed. At 0% the start is immediate. A higher value ensures a longer and smoother start.
- **Braking distance:** Determines over what portion of the incoming distance the object slows down. At 0%, braking only occurs immediately at the stopping point. A higher value starts braking earlier.

The two percentage values refer to the respective route section and not to seconds. Therefore, always check the effect in the preview. The same value can have a different effect on a very short route than on a long route.

Vasco da Gama 20 also compensates for different speeds at successive waypoints more smoothly. This means that the route object and camera switch more evenly between faster and slower sections. This improvement works automatically in the background; You don't have to operate an additional switch for this.

> **TIP**
> Change only one value first and replay that section. This makes it easier to see which setting improved the movement.

Divide the route into stages

A stage is a separate section of the journey with a separately adjustable duration. Multiple stages are particularly helpful if individual parts of the journey take place at different speeds or need to be specifically worked on later.

In expert mode, a new stage boundary is created at the currently selected waypoint.

1. Select the waypoint or stopping point where the new stage should begin.
2. In the **Trip Leg** area, click the Add Leg button.
3. Enter a understandable name under **Change name**.
4. At **Section**, open the selection list to switch between stages.

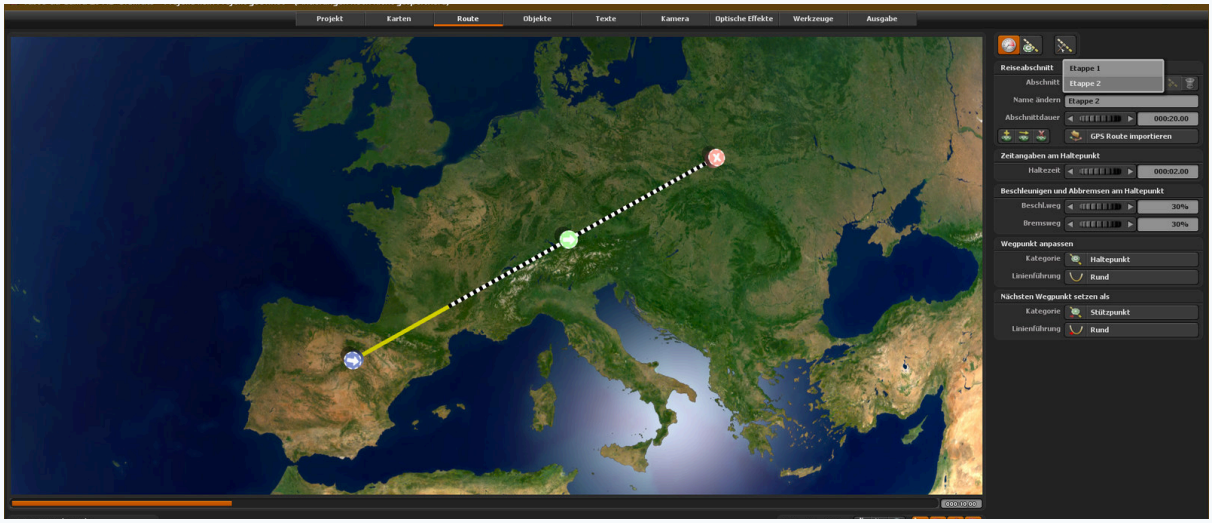


Illustration for this step

Selecting a stage does not change the route. It only determines which part of the journey you are currently working on. The editing view jumps to the first waypoint of the selected stage.

Assign names that make the content recognizable, for example **Madrid - Alps** and **Alps - Destination**. A unique name is easier to find later than the general name **Stage 1**.

> **WARNING**
> If the only remaining stage is deleted, the entire route will be removed. Save the project before deleting stages or extensive restructuring.

Set the duration of a stage

The **section duration** determines how long the route object needs for the selected stage. A longer duration makes the movement appear slower. A shorter duration speeds up the journey.The time is displayed in the format **minutes:seconds.frames**. The smallest possible change corresponds to a single frame and depends on the frame rate of the project.

1. Select the desired stage.
2. Set the required time under **Section Duration**.
3. Start the preview just before the start of the stage.
4. Watch the movement until the end of the section.

Always judge the speed together with the length of the route. Ten seconds can seem slow for a short city journey, but very fast for a long cross-country journey.

> **TIP**
> First agree on the section duration. Then set the holding time, acceleration distance and braking distance. This makes it easier to assess the behavior at the stopping point.

Start your own line section

The route line can change appearance within the same route. To do this, a new line section begins at a selected waypoint. All subsequent points use this design until a change is made again at a later point.

Select a waypoint and open the route line settings.

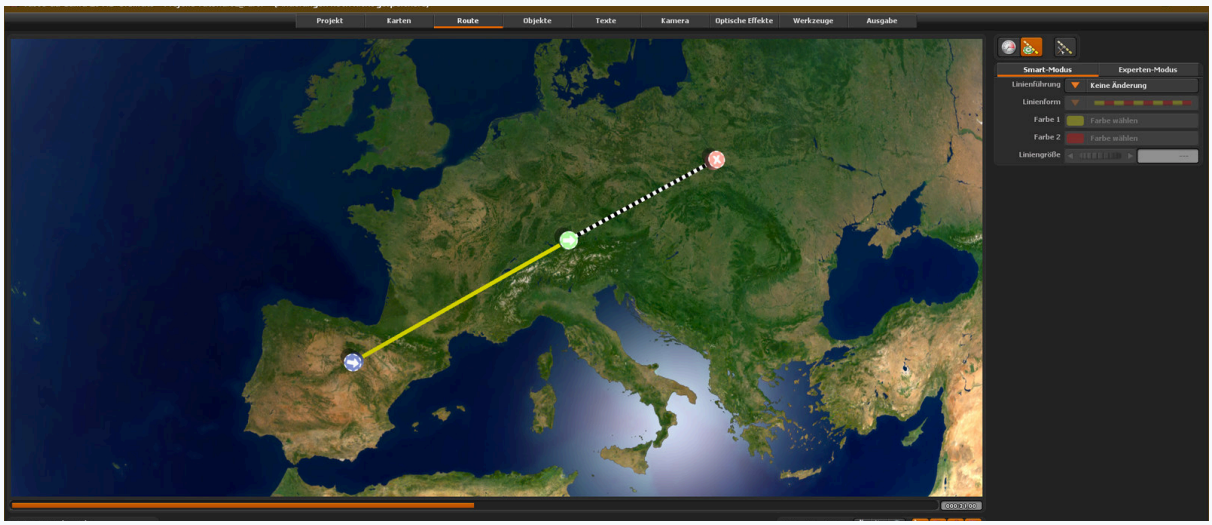


Illustration for this step

In **Smart Mode** you choose a finished line shape, two colors and a common line size. Vasco da Gama sets the corresponding detailed values automatically. This mode is suitable if you want to quickly get to a clearly visible line.

The common line size can use values from 0.1 to 1000.0%. Note that making a change will adjust the width and height of all route line styles throughout the project. This can also affect lines that have already been designed in expert mode.

Determine what happens to the line at the waypoint

Open the selection list under **Line guidance**.

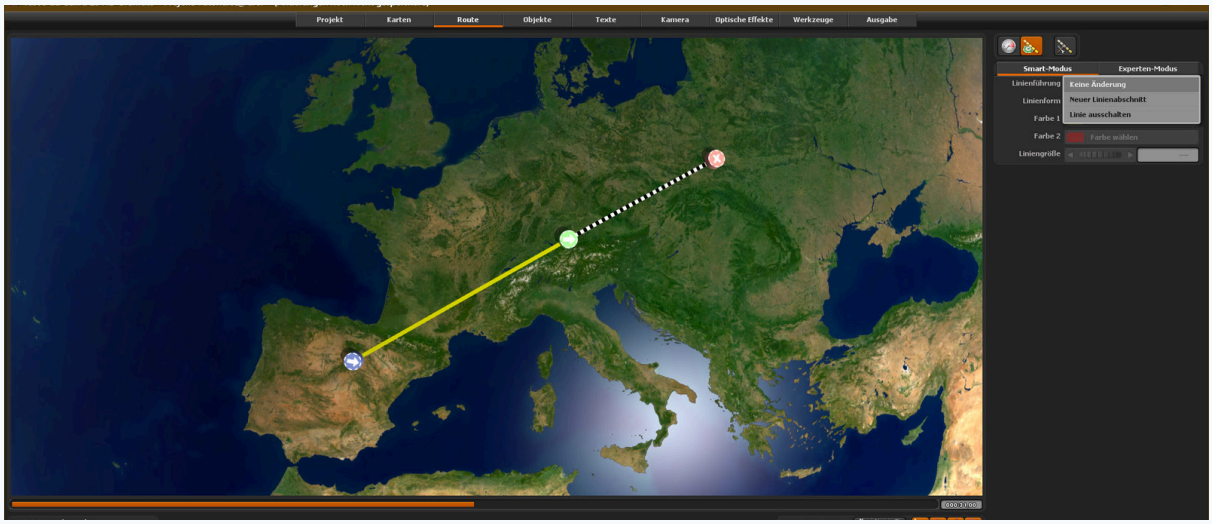


Illustration for this step

- **No change:** The previous line will continue with its existing settings.
- **New line section:** A line with its own design begins from this waypoint.
- **Turn off line:** From this waypoint, no route line will be displayed until the next change.

Select **New Line Section** if you want the color, shape or structure of the line to change. Such a change can, for example, make the transition from a car journey to a boat or plane route visible.

> **WARNING**
> If you set an individually designed line section back to **No Change**, its own design values will be discarded.

Select a finished line shape

Numerous pre-designed shapes are available in Smart mode. These include solid and multi-colored lines, arrows, dots, stars and other symbols.

1. Set **Line Guide** to **New Line Section**.
2. Open the **Line Shape** selection.
3. Click on the desired preview.
4. Then adjust the colors and line size.

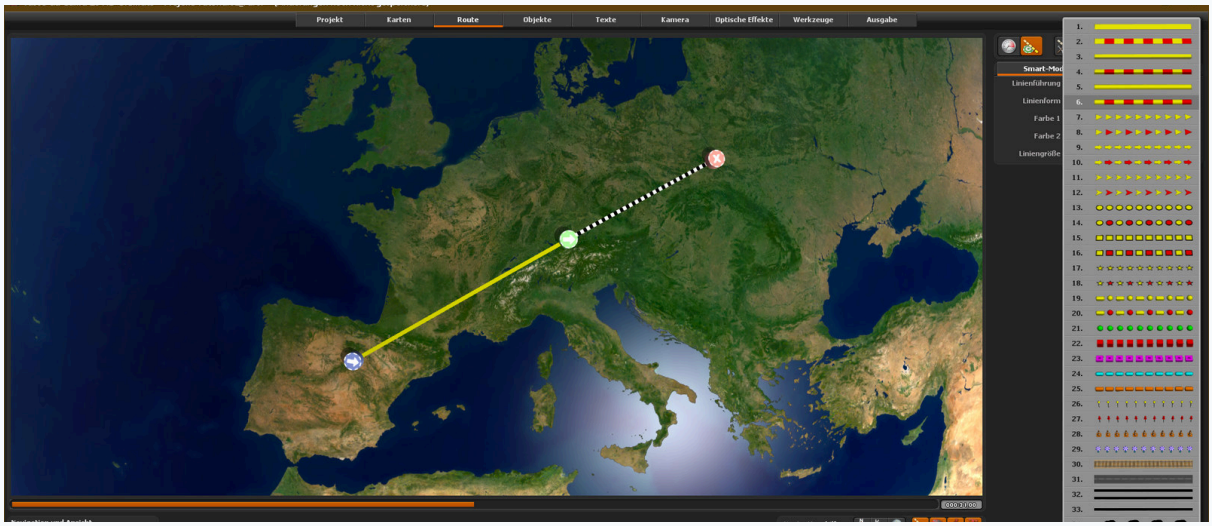


Illustration for this step

Choose a shape that remains easily recognizable even at the later camera height. Very small individual objects can disappear in a wide view. A solid or clearly dashed line is usually good for long distances.

The first color determines the main part of the line. The second color is only used on two-color shapes. Transparency can also be set using the color selection.

Switch from Smart mode to Expert mode

Expert Mode provides access to composition, shape, texture, gloss, width, height, pattern spacing and colors. Switching from Smart mode to Expert mode takes over the current design and does not reset it.

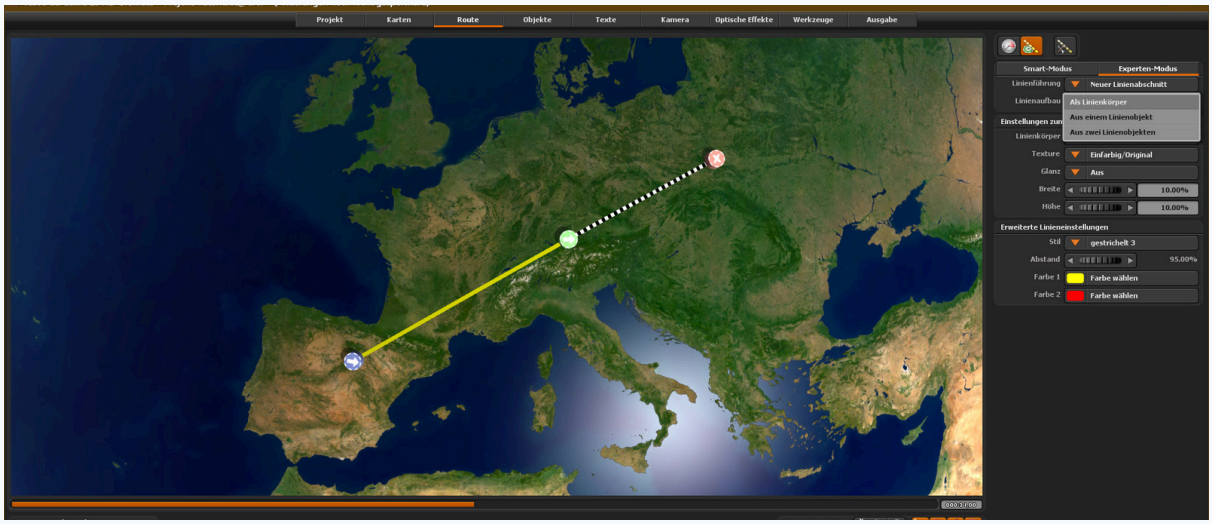


Illustration for this step

There are three options available for line structure:- **As a line body:** A connected three-dimensional line body follows the route.

- **From a line object:** A single object is repeated at regular intervals along the route.
- **From two line objects:** Two independently adjustable objects are combined along the route.

When changing the line structure, the pattern spacing is automatically adjusted: for a line body to 93%, for line objects to 10%. This automatic change cannot be undone.

> **WARNING**
> When you later switch from Expert mode back to Smart mode, the detailed settings of the current line section will be replaced by the Smart settings. This step cannot be undone.

Design a line body

A line body forms a connected spatial line. It is suitable for clear and quiet routes.

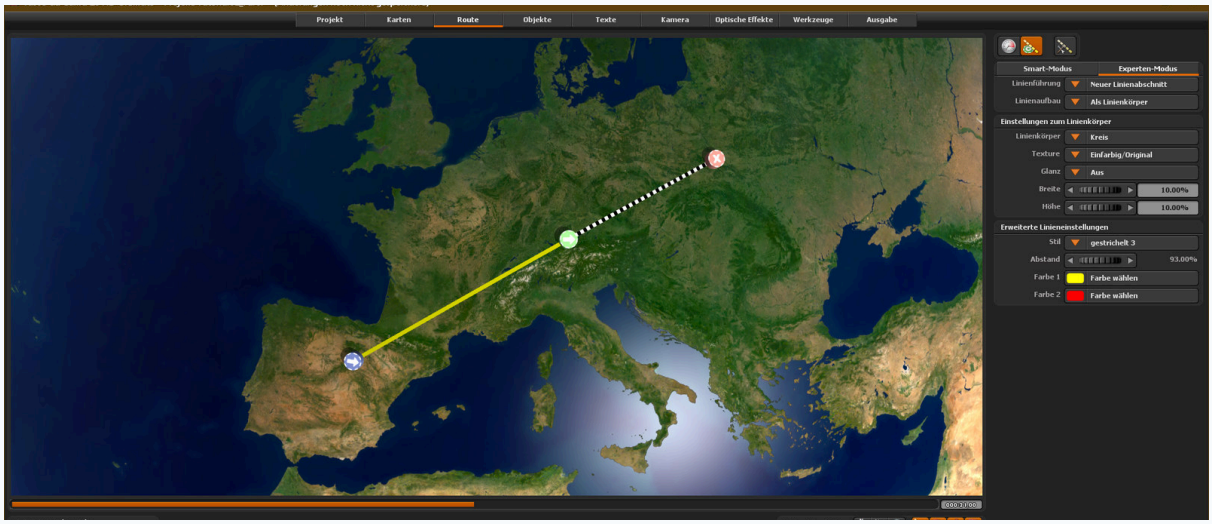


Illustration for this step

The most important settings are:

- **Line body:** Determines the cross section, for example flat, square or round.
- **Texture:** Sets the surface. **Single Color/Original** uses the selected line color or the original surface.
- **Gloss:** Determines how strongly the surface reflects light.
- **Width:** Changes the lateral extent of the line body.
- **Height:** Changes its spatial height.
- **Style:** Selects a solid line or one of four dash patterns.
- **Spacing:** Changes the space between the lines. With a solid line, this value has no visible effect.
- **Color 1 and Color 2:** Determine the colors of the current line section.

Width and height should be assessed from the later camera perspective. A line that looks appropriate in the editor view may appear too strong when the camera is very close.

Build a line from two objects

For **From Two Line Objects**, two shapes are repeated along the route. This allows you to create eye-catching patterns and changing symbols.

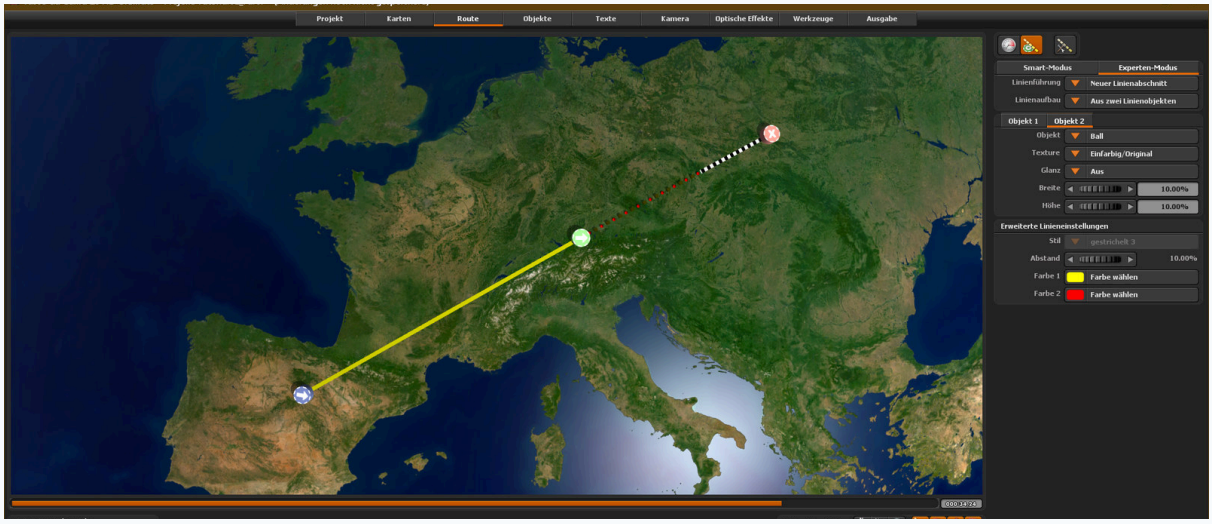


Illustration for this step

1. Select **From two line objects**.
2. Open the **Object 1** tab and select the first shape.
3. Open **Object 2** and select the second shape.
4. Set the shape, texture, shine, width and height for both objects separately.
5. Use **Distance** to regulate how close the objects are along the route.

The selection **Object 1** or **Object 2** always determines which object the underlying settings refer to. Therefore, before making any changes, check which of the two tabs is active.

> **TIP**
> Use two easily distinguishable colors. This means the pattern remains easier to see even when the camera is moving.

Solid and dashed lines

For a line body you can choose between a solid line and four dashed variants under **Style**.

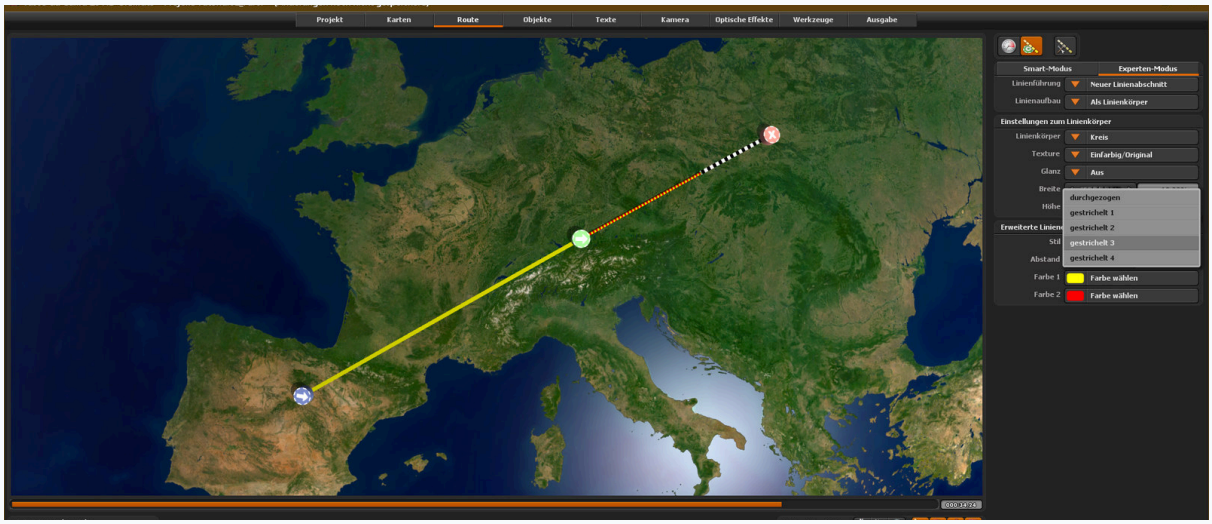


Illustration for this step

- **solid:** A closed line without a break.
- **dashed 1 to 4:** Different changes between the two colors or between visible and interrupted areas.

With **Distance** you change the length of the spaces. A larger value creates larger distances. Start with a medium value and then check the effect in the preview.

A dashed line can distinguish different types of transport or journey segments. However, use such changes sparingly so that the route does not appear jarring.

Set the global display of the route line

The global line settings do not only apply to a single waypoint. You determine how the line is calculated throughout the project and constructed during the journey.

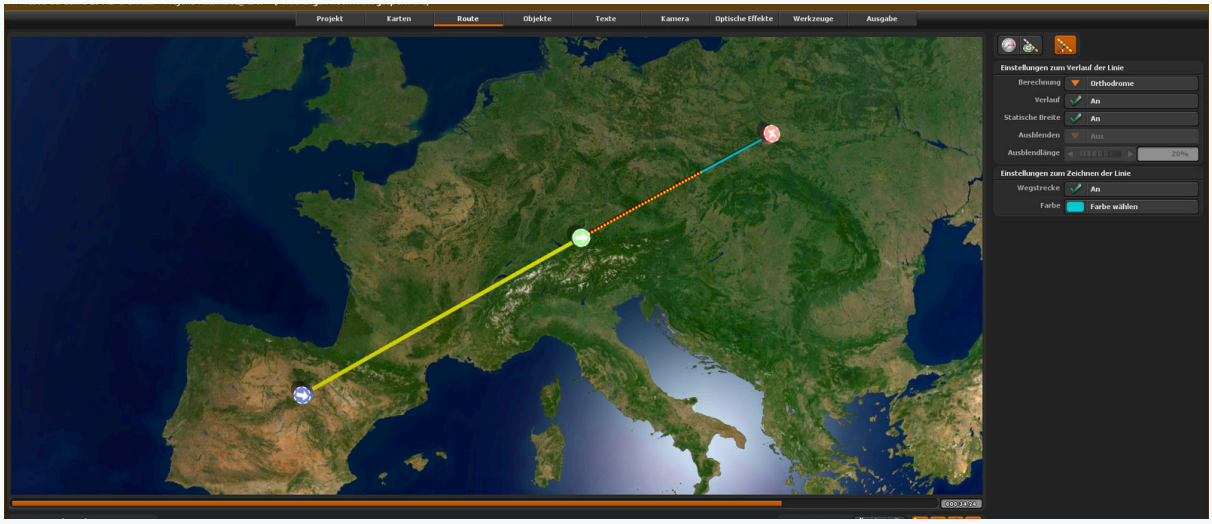


Illustration for this step

Calculation- Loxodrome: Connects the points with consistent compass direction. On long journeys this is not always the shortest route.

- **Orthodromic:** Follows the shortest path on the globe along a great circle. The compass direction changes over time.

The selection applies to all routes in the project and recalculates their lines.

History

If **History** is switched on, the line grows while driving up to the current position. The shape and colors of the respective line sections are used.

Static width

When **Static Width** is switched on, Vasco da Gama adapts the display to the camera height. The line remains approximately the same width in the image. If the setting is turned off, its size remains linked to the landscape and appears narrower from a distance.

History, hide and route

If **History** is on and **Distance** is off, the already drawn line behind the current position can be smoothly hidden.

- **Off:** The part already covered remains completely visible.
- **On (Silent):** Fade out follows travel motion and pauses during holds and fades.
- **On (Continuous):** Fade out continues even during holds and crossfades.

The **blank length** determines between 1 and 100% how long the soft area behind the current position is.

If **Distance** is switched on, the complete route is displayed in the selected color regardless of the journey progress. The growing line lies above it. In this case, the hiding is automatically switched off.

> **NOTE**
> As long as **Waypoint** is turned on, the orientation line for setting or moving waypoints is not displayed. Temporarily turn off **Distance** if you need this guidance. Once you have finished editing, you can turn the full route back on.

Reverse the course of a route

Use the **Reverse route** tool to swap the start and end as well as the order of the waypoints. To do this, open the main **Tools** tab and select the reversing function.

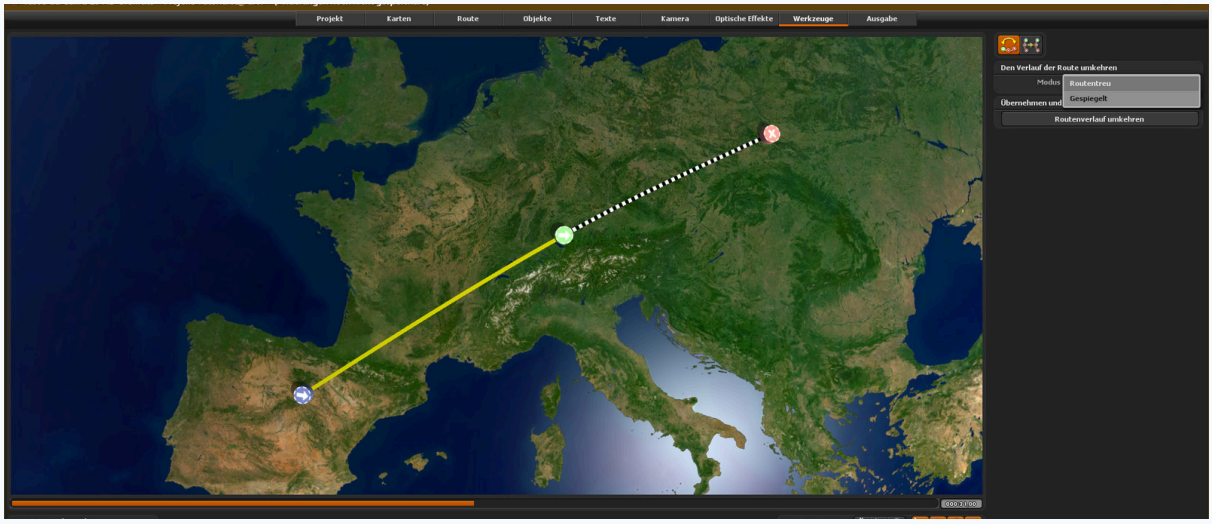


Illustration for this step

Two variants are available under **Mode**:

- **Follow route:** The route and the camera path are run in the opposite direction. Stop points, stage times, objects and texts remain in their previous geographical locations. This variant is suitable for most cases.
- **Mirrored:** The gradient is reversed, but the settings remain where they were within the point order. The last point so far receives the settings of the first point, the second to last those of the second and so on.

Typically select **Follow route** if you only want to change the direction of travel. **Mirrored** is a special function if the assignment of the settings within the point order should also be deliberately mirrored.

> **WARNING**
>
> **Reversing the route** is carried out immediately and without further query. Just clicking this button deletes the entire undo history. Be sure to save the project beforehand.

Copy or move a route

Vasco da Gama can manage up to ten route slots within a project. With **Copy or move route** you transfer an existing route to another free space.

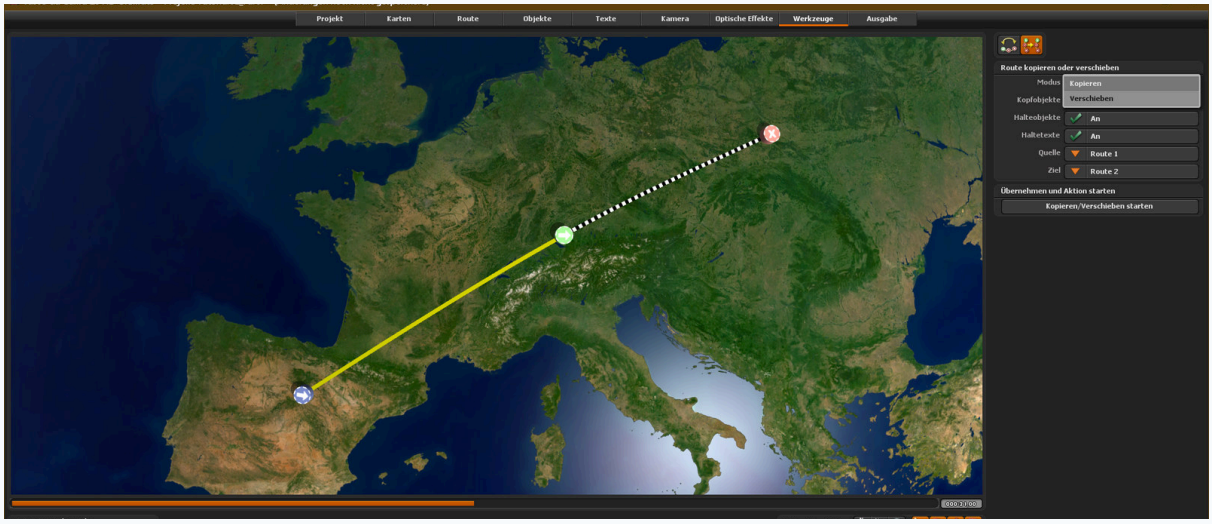


Illustration for this step

1. Under **Mode**, select between **Copy** and **Move**.
2. At **Source**, determine the route location that already contains a route.
3. Select an empty route slot for **Destination**.
4. Determine whether header objects, hold objects and hold texts are adopted.
5. Check all settings carefully.
6. Only then click on **Start copying/moving**.

With **Copy** the source route is retained and a second route is created at the destination. With **Move** the route is created at the destination and then removed from the source.

Source and target cannot be identical. An existing destination route will not be overwritten.

What content will be adopted?

The route, stages and times are transferred when copying or moving. **Camera settings, however, are neither copied nor moved.** They use a separate camera track and remain in their previous position. This is particularly important for a manually configured camera: existing manual camera settings are not changed when the route is copied or moved.

The **automatic camera** is a special case. It always uses **Route 1** as the basis for its calculation. If Route 1 is merely copied to another route slot, Route 1 remains available and the automatic camera can still be calculated from it. If Route 1 is moved to Route 2, for example, Route 1 is empty afterwards. In this particular case, no automatic camera is available because the required Route 1 no longer exists.

There are separate switches for further content:

- **Head objects:** Adopts the vehicles or other route objects moved along the route.
- **Holding objects:** Adopts the objects arranged at breakpoints.
- **Stop texts:** Adopts the texts arranged at break points.

When copying, content that is switched off is only retained in the source. Particular care is required when moving: Header objects, stop objects or stop texts that are switched off are not adopted and are lost when the source route is subsequently deleted.

> **WARNING**
>
> Copying or moving starts immediately and without further query. All undo history is deleted; The action itself cannot be undone with **Undo** either. Save the project beforehand with a unique name.

Alternative: Create a route from a GPS track

A route created manually on the map and an imported GPS track pursue different destinations. With the manual route, you only determine the stations required for the display. A GPS track, on the other hand, can contain a lot of recorded points and usually follows a route that has actually been driven.

Therefore, the GPS import is not performed within the previous workflow. To do this, use your own project or a saved copy of the project.

The basic process is:

1. Go to the last leg of the route.
2. Click **Import GPS Route**.
3. Select an appropriate GPS track file.
4. In the **Optimize Waypoints** window, check the original and desired scores.
5. Determine the route, stage structure, stage names and possible stopping times.
6. Start the import and then check the progress in the editor.

Vasco da Gama can reduce the number of track points, but does not add any additional points when optimizing. Stage markers remain intact. The target number is limited to the existing number of points and a maximum of 2500 points.

> **WARNING**
> A successful GPS import cannot be reversed. Save the project beforehand and check the selected import settings carefully before starting the process.

Recommended workflow

The following sequence has proven useful for setting up and designing a route:1. First set the starting point, important stations and the destination.

1. Check the entire route in a clear map view.
2. Add support points only where the path needs to be shaped more precisely.
3. Convert important stations into stopping points.
4. Divide the journey into stages at suitable stopping points.
5. Set segment duration and hold times.
6. Adjust the acceleration distance and braking distance and check the movement in the preview.
7. First design the route line in smart mode.
8. Only switch to expert mode for targeted detailed work.
9. Then specify the global display of the course and route.
10. Save the project before reversing, copying or moving.

The most important things in brief

- Bases form the route; Breakpoints allow for breaks and additional content.
- A longer section duration causes the route object to travel slower.
- Acceleration distance and braking distance ensure smoother movements at stopping points.
- Vasco da Gama 20 automatically compensates for different speeds between sections more smoothly.
- A new line section can have its own design starting from each selected waypoint.
- Smart mode offers ready-made shapes; The expert mode enables precise design.
- When the route is switched on, the orientation line is not displayed.
- Reverse, copy, move and GPS import should only be performed after saving.

Chapter 7: Creating a route from a GPS track

A GPS track contains a route that has already been recorded or planned in another program. Instead of setting the waypoints individually on the map in Vasco da Gama, you copy the existing history from a file.

This is particularly practical if the later animation is to follow an actual journey. However, a GPS track can contain several hundred or even several thousand points. Therefore, when importing, you have the option of reducing the number of waypoints and dividing them into stages.

In this chapter we use the example track **Bremen–Hamburg**. It contains **720 waypoints** and is divided into **three stages**.

WARNING

A successfully imported GPS track cannot be removed with **Undo**. Therefore, save a project that has already been edited before importing it or use a new project first.

GPS track and manually created route

A manually created route usually only contains the waypoints that you need to design the animation. The course between these points is calculated by Vasco da Gama.

A GPS track describes the route much more precisely. It can contain many points that are close together and therefore follows the recorded route. This accuracy has two consequences:

- The imported route can follow the actual route driven very closely.
- An unnecessarily high score makes later processing more difficult and can slow down the calculation.

Therefore, when importing, you should only import as many points as are required for the visible form of the route.

NOTE

The more winding and detailed a route is, the more waypoints are required. However, not every recorded GPS point is necessary for a smooth and easily editable course.

1. Start the GPS import

Open a project in **Expert Mode** and use **Sphere Mode**. Then switch to the main **Route** tab.

If the project already contains several stages, select the last stage before importing. The GPS track is appended to the existing route. For the first attempt, an empty project is the clearest.

1. Check that the main **Route** tab is open.
2. In the **Trip section** area, click **Import GPS route**.



Illustration for this step

2. Select the GPS file

In the Windows **Open** window, select the file with the recorded track.

1. Go to the folder where the GPS file is saved.
2. Mark the desired file.
3. Click **Open**.

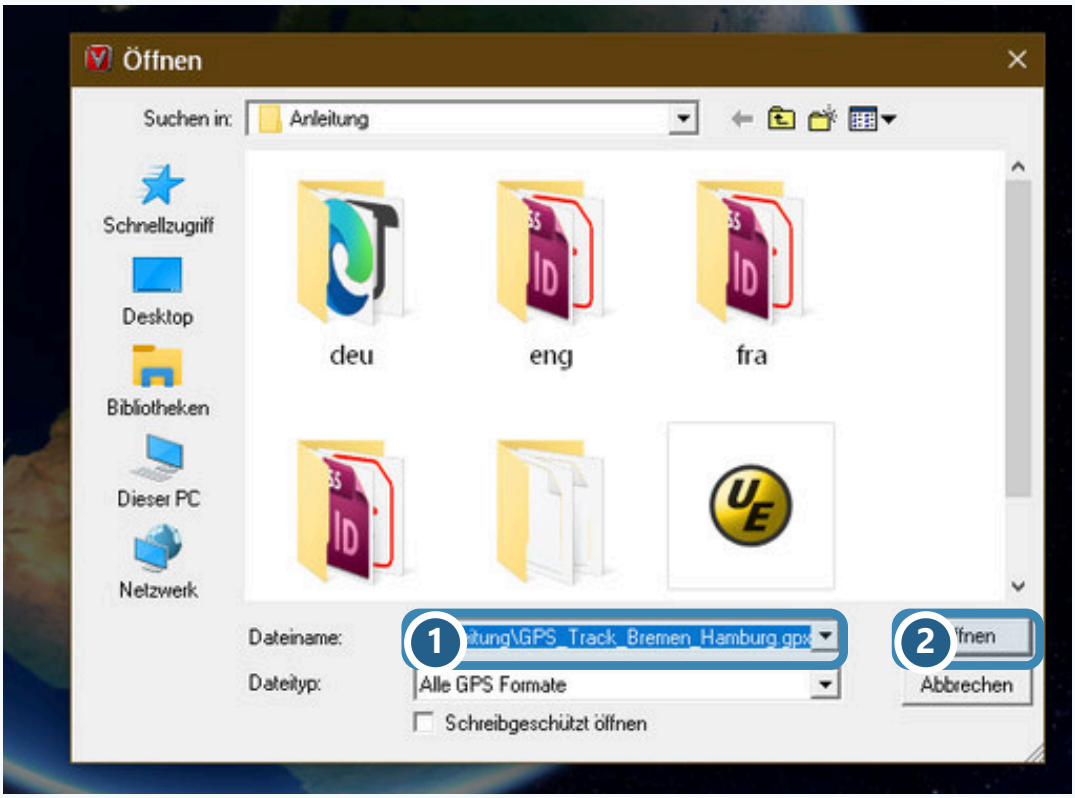


Illustration for this step

Vasco da Gama supports the GPS formats offered in the file type field, including **GPX, KML, KMZ, TCX, CRS, G7T, LOG, OVL, TK, TRK** and appropriate **TXT files**. If you don't know which format, leave **All GPS Formats** selected.

> **TIP**
> GPX is widely used for exchange between different GPS programs and is well suited as an output format. However, the quality of the subsequent gradient always depends on the points actually contained in the file.

3. Understanding the Optimize Waypoints window

After reading the file, the **Optimize waypoints** window opens. The main window remains visible in the background. Take some time for this window because this is where you determine how the GPS track will be included in the project.



Illustration for this step

The window is divided into three areas:- **Waypoint:** Shows the original score and determines how many waypoints are carried over. You also determine the route and the adoption of existing stage names.

- **Stages:** Shows how many stages were detected in the file. You decide whether this structure is retained.
- **Stop times:** Automatically creates breaks at the start point, at stage points and at the end point if desired.

The options offered depend on the content of the file. For example, if a track only contains one stage, it is not necessary to divide it into several adopted stages.

4. Reduce the number of waypoints sensibly

At the top of the window you can see the number of waypoints read. Our example track contains **720 waypoints**. Enter the desired target number in the **Optimize to** field.



Illustration for this step

For the example track we enter **160**. This means that the recognizable route remains intact, but the route is then much easier to edit.

Please note:

- Vasco da Gama can reduce existing track points, but does not add new points when optimizing.
- The target number entered cannot be greater than the existing score.
- A maximum of **2500 waypoints** can be transferred.
- Stage markers are retained during optimization.
- Too much reduction can visibly simplify tight curves and small detours.

> **TIP**
> For a very large track, start with about a quarter to a third of the original score. Then check the progression in the editor. On long straight routes fewer points are often enough, on winding routes more are needed.

5. Determine lines, stages and names

With **Line guidance** you determine how Vasco da Gama connects the adopted waypoints:

- **Round:** The route is guided smoothly between the points. This setting is suitable for most rides and results in smooth movements.
- **Angular:** The line runs straight from point to point. This can be useful if the GPS track intentionally contains sharp changes in direction.

With **Stage names** you determine whether the names existing in the GPS file are adopted. If the file contains understandable names, select **Adopt texts**. You can ignore unusable technical names and replace them later with your own names.

If multiple stages have been recognized, these options are also available:

- **multiple stages:** The existing structure is retained. This makes it easier to select individual travel sections later.
- **one stage:** The entire GPS track is imported as a continuous journey section.
- **Stage points round/square:** Determines the lines directly at the transitions between the stages.

> **NOTE**
> Stages are more than a visual division. Each stage has its own duration and can later be specifically selected, designed and provided with its own settings.

6. Create holding times automatically

Activate **Stop times at stage points** if you want the movement to pause briefly at important transitions. You can then set three times:

- **Starting point:** Pause before starting the first movement.
- **Breakpoints:** Break at the transitions between stages.
- **End point:** Pause after reaching the goal.



Illustration for this step

For the example track we use **3 seconds** at the start point, **2 seconds** at the stage points and **3 seconds** at the end point. This means the animation doesn't start and end abruptly, and the stage transitions remain visible to the viewer.

You can still change these times after import. However, the automatic default saves you from having to make repeated adjustments at several points.> **Tip:** Short holding times of two to three seconds usually seem more natural than very long pauses. If a detailed text is to be read at a stage point, a longer hold time can be set there later.

7. Confirm the import

Before confirming, check again:

1. Has the desired number of waypoints been entered?
2. Does the chosen line fit the route?
3. Should existing stage names be adopted?
4. Should the track appear in one or more stages?
5. Are the holding times chosen sensibly?

Then click **Ok**.



Illustration for this step

Depending on the size of the file, processing may take a moment. Wait until the window closes and the route appears in the editor again.

WARNING

With **Ok** the import will be carried out. The process cannot then be undone with **Undo**.

8. Check the imported route

After the import, Vasco da Gama shows the transferred stages and waypoints in the editor. In our example, three stages were created. The many visible waypoint symbols make it clear that the course comes from a GPS track and is structured much more precisely than a simple route created by hand.



Illustration for this step

Check the route at multiple map scales:

- Are the starting point and end point correct?
- Does the line follow the expected course?
- Are the stage boundaries in the right places?
- Was the route oversimplified by reducing the waypoints?
- Can the individual stages be reached via the stage selection?

If the progress is not satisfactory, close the project without saving or reopen the previously saved version of the project. Then run the import again with a different target number or different options.

Continue working after import

The imported GPS track is now a normal Vasco da Gama route. You can then, among other things:

- set the duration of the individual stages,
- Adjust stopping times and acceleration distances,
- design the route line,
- select vehicles or other head objects,
- add texts and other objects,
- check the camera movement in the preview.

> **NOTE**
> The GPS import provides the exact route. You continue to determine the understandable structure, the timing and the later presentation yourself in Vasco da Gama.

If the import does not look as expected

- **The route has too many waypoints:** Repeat the import with a smaller target number.
- **Curves are cut off:** Use more waypoints or choose a round line layout.
- **Only one stage is created:** Check whether the source file actually contains several tracks or track segments.
- **Stage names are incomprehensible:** Ignore the names when importing or rename the stages to Vasco da Gama afterwards.
- **The route starts or ends incorrectly:** Check the GPS file in the program from which it was exported.
- **The file is not offered:** Set **All GPS formats** in the Windows file dialog and check the file extension.

Chapter 8: Using vehicles and other objects

Vehicles and 3D objects turn a line on the map into a vivid journey. Vasco da Gama distinguishes three types of objects. This distinction is important because each type of object is associated with the route differently.

- The **head object** moves along the route. This is usually a car, plane, ship or other means of transport.
- A **holding object** belongs to a specific breakpoint. It will appear there when the journey reaches this point.
- A **free object** is placed anywhere regardless of the route.

> **REMEMBER**
> First select the appropriate object type. Then set the position, view, fade time and effects. This keeps the workflow clear.

8.1 Set the head object

Open the main **Objects** tab and select the first icon at the top right. In the **Head object** field you specify whether no object should be used, a 3D object should be used or an existing object should be retained.

1. In the **Head Object** field, select the **3D Object** entry.
2. Click **Select Object**.
3. In the object gallery, select a suitable category and then a model.
4. Confirm the selection with **OK**.

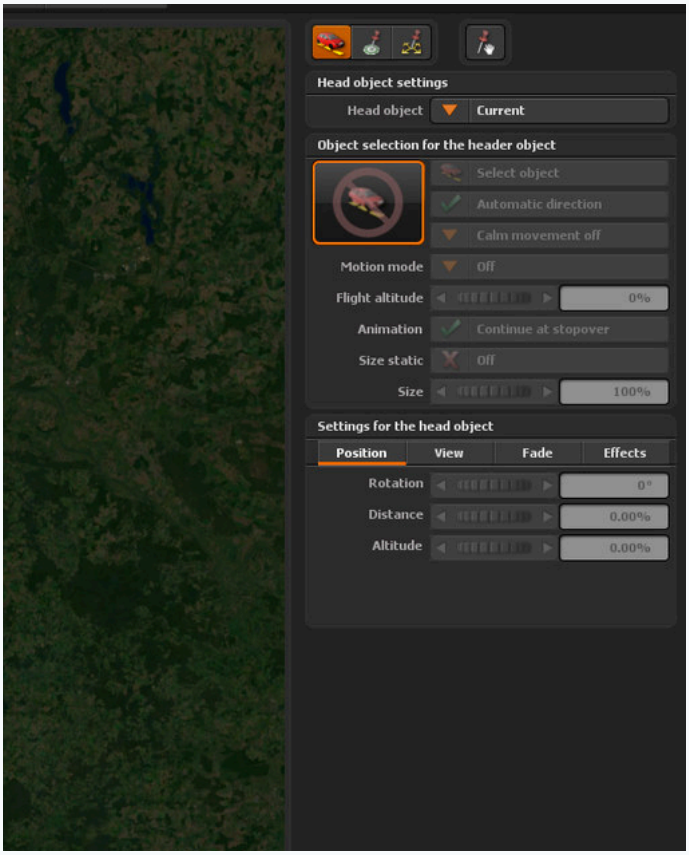


Illustration for this step

Controls for the head object

- **Head object** specifies what happens from the selected stop point onwards. **No change** continues the current object. **3D object** or **Image** inserts a new object. **Change settings** modifies the current object without replacing it. **Turn object off** ends it from this point onwards.
- **Select object** opens the appropriate selection for a 3D model or an image file.
- **Automatic direction** aligns the front of the object with the direction of travel. For vehicles, ships and aircraft, this function should normally remain enabled. It works only when **Face camera** is switched off in the **View** tab.
- **Movement mode** adds a special movement. In **Flight mode**, the object climbs, travels at the selected height and descends again. In **Motorcycle mode**, it leans into bends. **Off** follows the route without this additional movement.
- **Flight height** controls the height of the flight movement and is effective only in Flight mode.
- **Animation** determines whether the built-in animation of an animated 3D model pauses or continues at a stop point.
- **Static size** keeps the object approximately the same size in the picture. When switched off, the object follows perspective and therefore appears larger nearby and smaller in the distance.
- **Size** sets the basic size of the object as a percentage.

Using Calm movement correctly

A route with many closely spaced waypoints can contain numerous short, sharp bends within a very small area. The head object then tries to follow every change in direction immediately. In the camera view, this can make it turn hectically from side to side or switch rapidly between different tilts.

Calm movement calculates smoother transitions between these changes in direction and tilt:

- **Off** makes the head object follow every change directly. Use this setting for a clean route with wide, smooth bends.
- **Low** slightly smooths changes in direction and tilt. This is a good starting point when only a few bends appear restless.
- **Medium** applies more noticeable smoothing and is suitable for many short bends in a confined area.
- **High** not only calms the orientation, but also smooths the path travelled by the head object more strongly.

WARNING

Smoothing affects only the movement of the head object. The waypoints and the visible route line remain unchanged. With strong smoothing, the head object may cut bends more widely and visibly move away from the route line. This is not an error; it is a consequence of the smoothed object movement.

Use this function only when many small, sharp bends actually cause a restless image. It is normally unnecessary on a route that already has generous, smooth curves. Check the affected section in the camera view and increase the smoothing only until the movement looks pleasant while the object still follows the route closely enough.

TIP

Always check the size of the vehicle in the camera view. A model that appears small in the overview can appear very large in a close-up.

8.2 Select a model in the object gallery

The object gallery shows a large preview on the left and the available models below. On the right you select the main category, subcategory and special properties. This example deliberately uses an aircraft that is included with every Vasco da Gama 20 edition.



Illustration for this step

Proceed in this order:

1. Select **Vasco da Gama** as the **Main category** and **Luftfahrzeuge** as the **Subcategory**.
2. Click the first model, **Flugzeug**, in the row at the bottom. The large preview shows the selected object.
3. Confirm your selection with **OK**.

The aircraft used here is included in all Vasco da Gama 20 packages. The German package names **Luftfahrzeuge** and **Flugzeug** are therefore also shown in the English program interface. Other main categories, subcategories and models may depend on your edition and on additionally installed object packages. It is therefore normal if your gallery otherwise contains more or fewer models than the illustration.

8.3 Adjust position and view

In the **Position** tab you move the head object relative to its normal position on the route. Make small changes and check the result in the camera view.

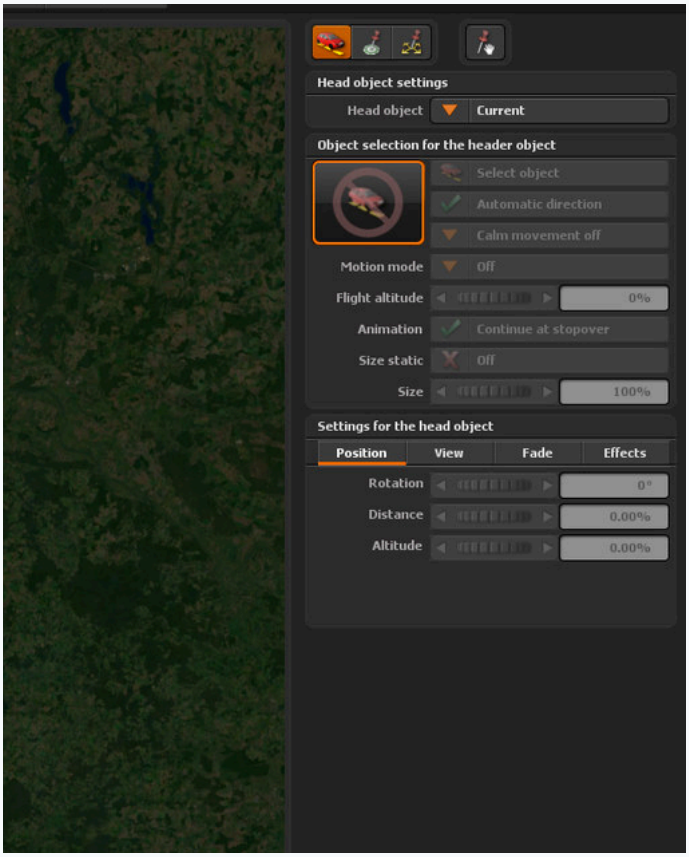


Illustration for this step

- **Angle** determines on which side of the route position the object is placed.
- **Distance** moves the object sideways away from the route. At 0.00%, it remains at its normal position.
- **Height** raises the object above the route position. This value is independent of the **Flight height** used by Flight mode.

Orienting the model

The **View** tab determines whether the model retains its own orientation or turns to face the camera. This setting changes the object, not the camera movement.

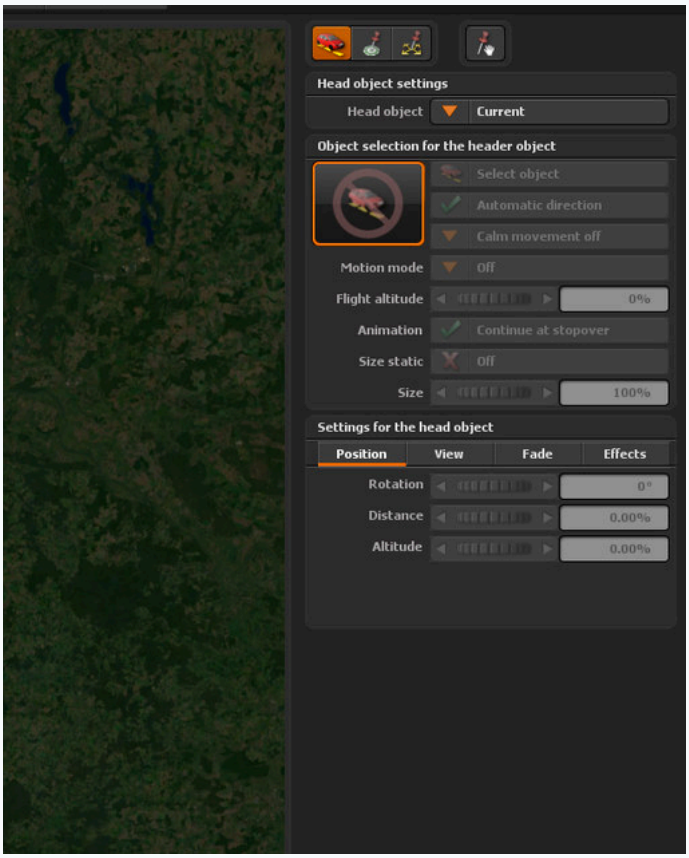


Illustration for this step

- **Face camera - Off:** The model retains its manual orientation. In this setting, **Automatic direction** can align the front of a vehicle with the route. This is the usual setting for cars, ships and aircraft.
- **On 3 axes:** The object turns fully towards the camera.
- **On 2 axes:** The object follows the camera in two directions while retaining one axis.
- **On 1 axis:** The object turns only sideways towards the camera. This can be useful for a sign or a flat image.
- **Angle X** tilts the object forwards or backwards.
- **Angle Y** turns it to the left or right.
- **Angle Z** rolls it sideways.

WARNING

Changing from **Off** to a camera-facing mode resets the manual X, Y and Z angles to 0°. Camera-facing orientation also takes priority over **Automatic direction**. For a vehicle travelling along the route, you should therefore normally use **Face camera - Off**.

NOTE

Vehicles in Vasco da Gama 20 can follow the gradient and lateral slope of the terrain. This creates more believable pitching and rolling on a mountain route. A fixed orientation may be more suitable for aircraft or deliberately floating objects.

8.4 Show and hide as well as effects

In the **Fade time** tab, you separately define how the previous head object disappears and how the next head object appears. These settings are applied at a stop point at which the head object is changed or switched off.

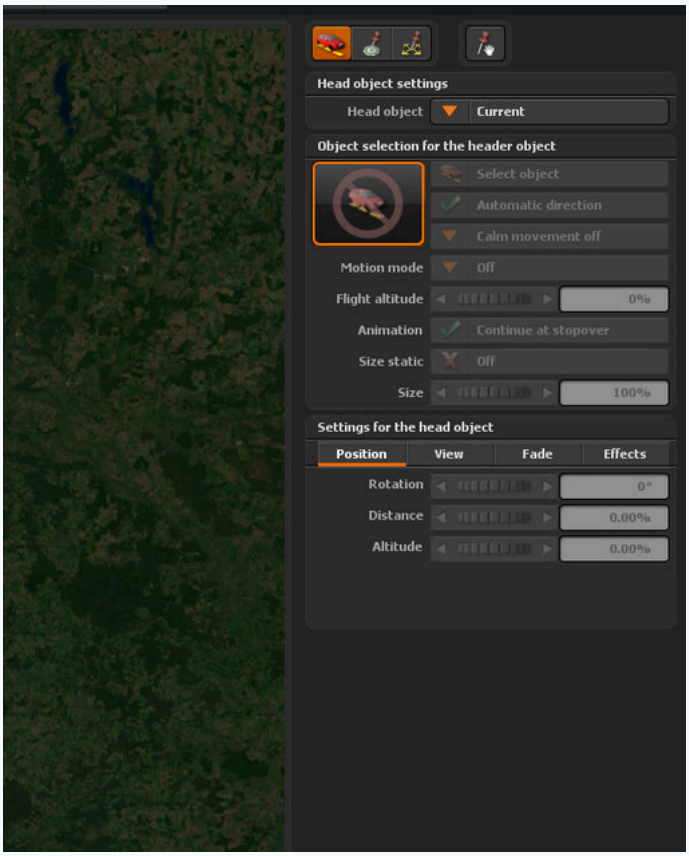


Illustration for this step

- **Fade-in effect** determines how the new head object appears after the stop: immediately, with a soft fade, by scaling, or by dipping into the scene.
- **Fade-in time** controls the duration. The display uses minutes, seconds and video frames.
- **Fade-out effect** determines how the previous head object disappears on arrival at the stop point.
- **Fade-out time** controls the duration of this process.

An abrupt change often appears restless. A short soft fade is therefore a good starting point. Check the transition in the preview so that the fade does not extend unnecessarily beyond the stop.

In the **Effects** tab, you can add continuous movement to the object. **Effect selection** initially only displays the settings for the selected effect; it does not switch the effect on.

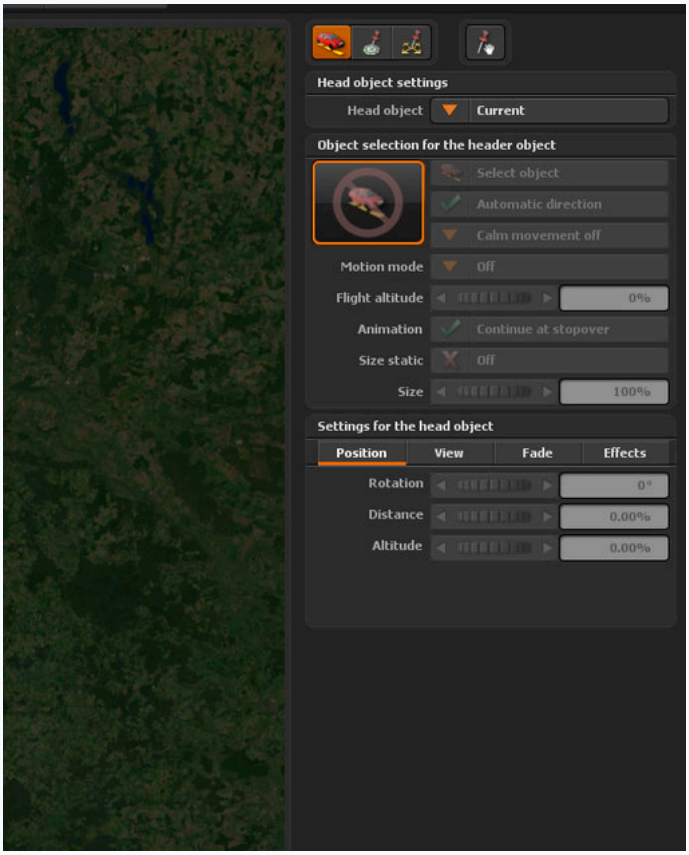


Illustration for this step

- **Rotate around the X, Y or Z axis:** The respective switch enables continuous rotation. **Speed** controls both the rate and direction; positive and negative values rotate in opposite directions.
- **Bounce:** The switch enables repeated up-and-down movement. Set its speed and movement height below.
- **Scale:** The object repeatedly becomes larger and smaller. Speed, range and mode determine the movement.
- **Orbit:** The object moves in a circle around its route position. Speed and distance define the circular movement.

Start with small values and enable only the effect you actually need. Several strong effects at the same time can quickly make a vehicle look restless or unnatural.

Vasco da Gama 20 also supports additional night-time rendering for suitable vehicles and objects:

- Vehicles can create a beam of light in front of the vehicle at night.
- Glowing object areas can remain visible even in the dark via an emission map.
- The effects are automatically adjusted to the time of day and model material, provided the model used has these properties.

> **NOTE**
> Not every older model has headlights or luminous material areas. A missing night effect is therefore not automatically a program error.

8.5 Objects at breakpoints

A break object is connected to the currently selected break point. Therefore, first select the desired stop point in the route and then open the second symbol in the main **Objects** tab.



Illustration for this step

1. Choose to use a 3D object at the desired breakpoint.
2. Open the object gallery and select the model.
3. Set size and orientation.
4. Set a blend time if necessary.
5. Check the result at exactly this breakpoint in the preview.

The **Position**, **View**, **Fade time** and **Effects** settings work in the same way as for the head object and are explained in sections 8.3 and 8.4. For a stop object, they apply only to the currently selected stop point.

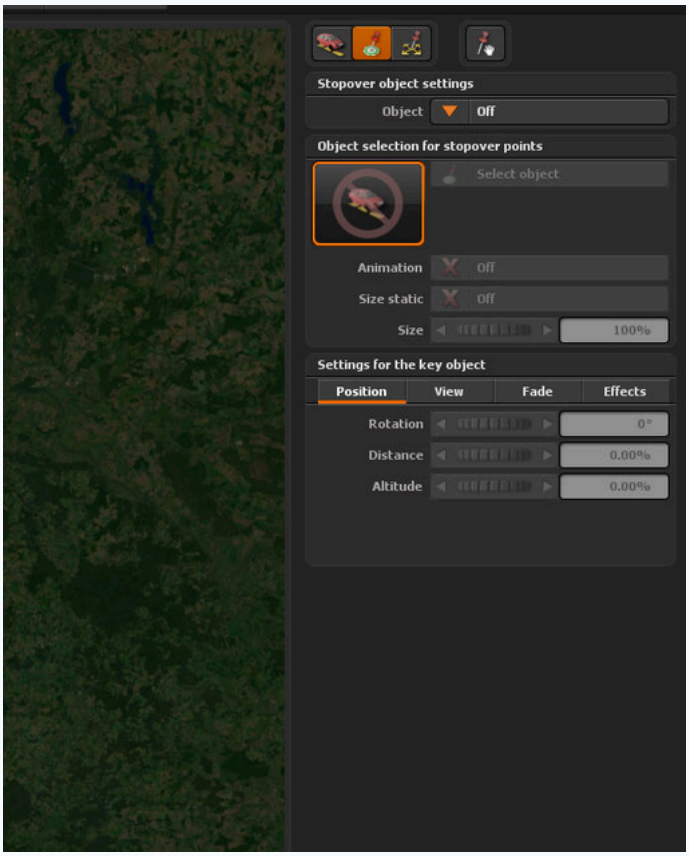


Illustration for this step

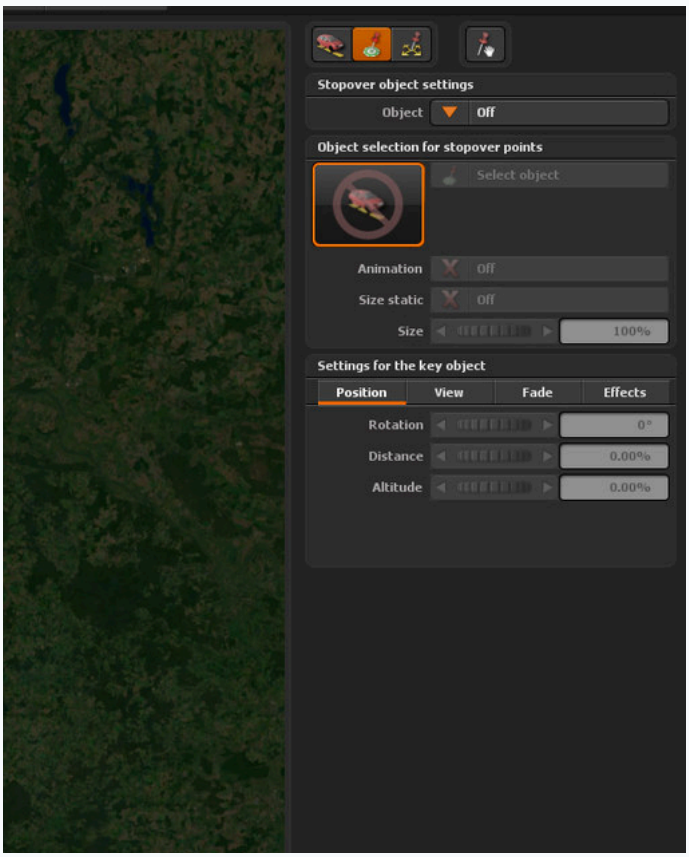


Illustration for this step

TIP

Have a stop object appear a little before it comes to a complete standstill and hide it again shortly before you continue driving. This makes the transition look more natural.

8.6 Use free objects

Free objects are not tied to a vehicle or a stopping point. They are suitable, for example, for buildings, signposts, decorations or additional vehicles alongside the route.

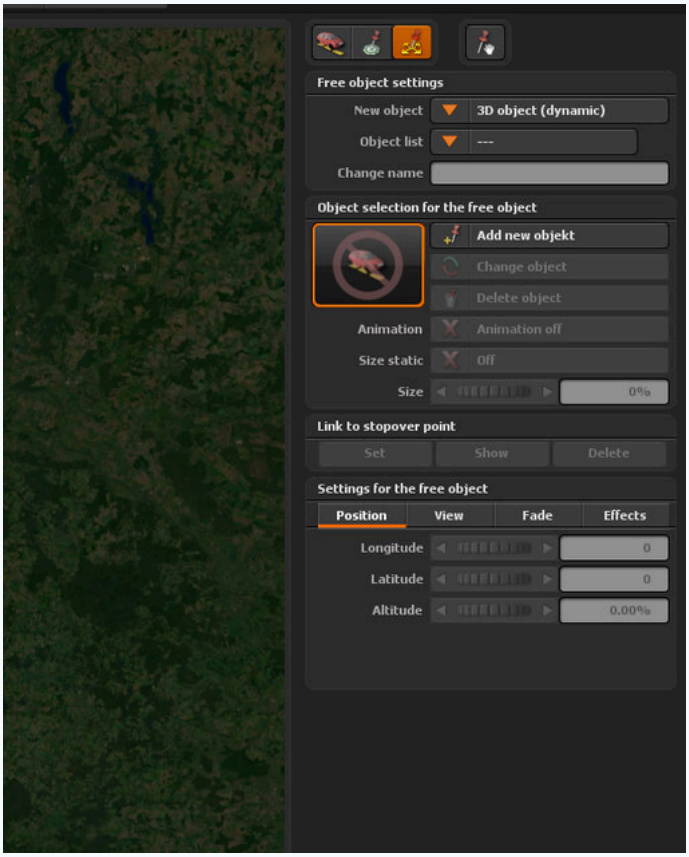


Illustration for this step

In the upper area you create and manage the free objects. In the lower area you edit the selected object.

- **Position** sets longitude, latitude and altitude.
- **View** determines rotation, orientation and size.
- **Blend time** limits temporal visibility.
- **Effects** contains additional model-dependent properties.

Position, camera-facing orientation, rotation angles, fade times and effects have the same meaning as described in sections 8.3 and 8.4. For a free object, these values act at its freely chosen position rather than along the route.

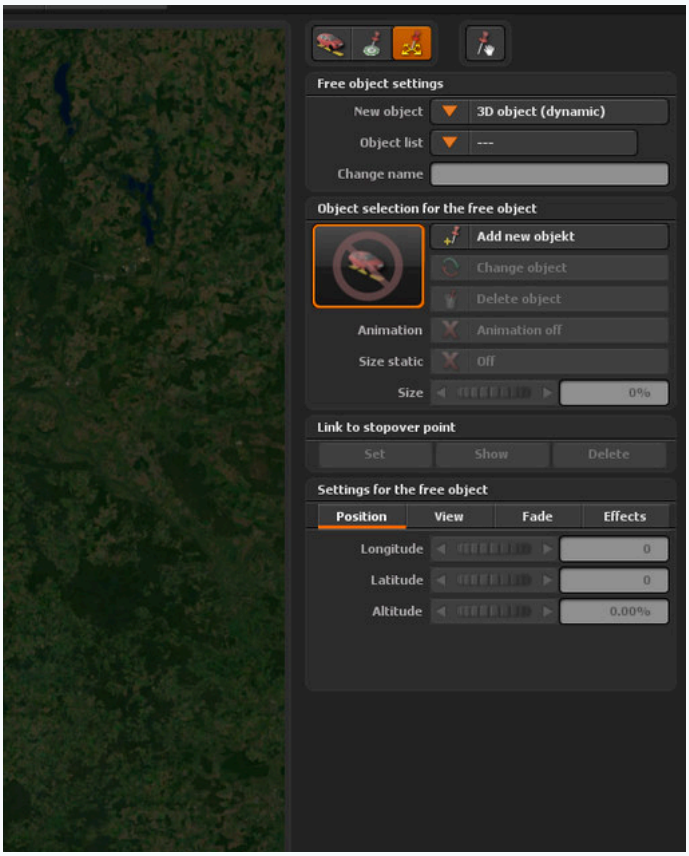


Illustration for this step

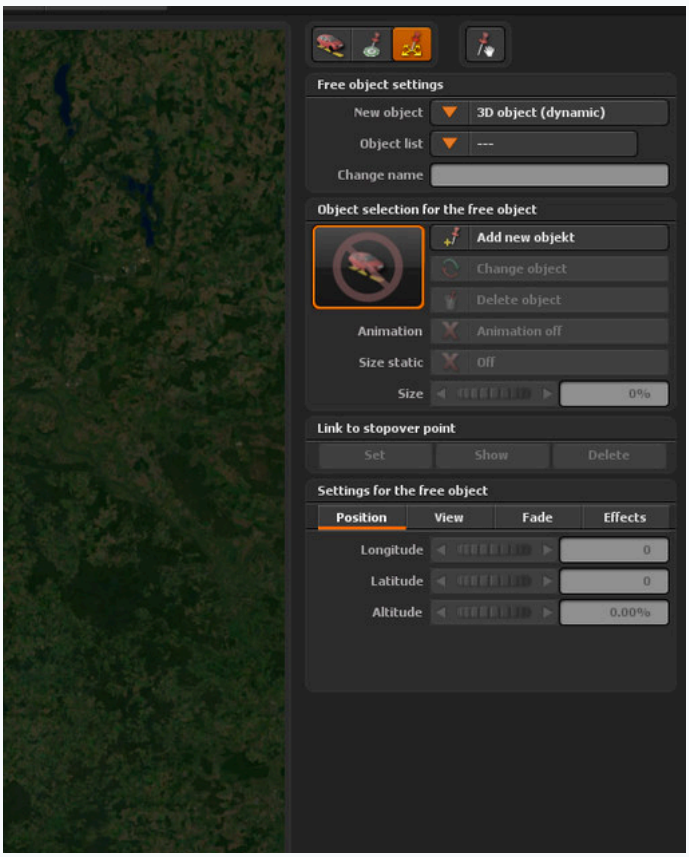


Illustration for this step

Free objects can also be placed directly on the map. This method of operation is quick, but requires careful control of the height. Once placed, check both a close-up and side camera perspective. This way you can tell whether the object is floating or sinking into the terrain.

8.7 Final check

Before the next chapter, check the following points:

- Is the head object moving in the correct direction?
- Does the size fit in close-up and distance views?
- Do vehicles follow the terrain as desired?
- Do stopping objects appear at the correct stopping point?
- Are free objects correctly placed on the site?
- Do fade-ins begin and end without a visible jump?
- Are headlights and glowing object areas visible in the night view?

Before trying multiple object types or extensive effects, save the project. This means you can return to a functioning status at any time.

Chapter 9: Designing texts and labels

Texts give a travel route names, explanations and chronological orientation. In order for a text to remain easy to read, the content, position, font size and background must match. It is better to use a few clear texts rather than many labels that are visible at the same time.

Vasco da Gama distinguishes two important types of text:

- A **Text at stopping point** belongs to a specific stop on the route.
- A **free text** can be displayed and positioned independently of a breakpoint.

> **NOTE**
> Write the content first. Then design the font and position. Finally, check the text in the moving preview.

9.1 Create a text at the breakpoint

First select the desired breakpoint. Then open the main **Texts** tab and the first symbol.

1. Turn on the text for the breakpoint.
2. Enter a short, clearly understandable text.
3. Choose alignment and font.
4. Adjust position and size.
5. Check the display in the preview.

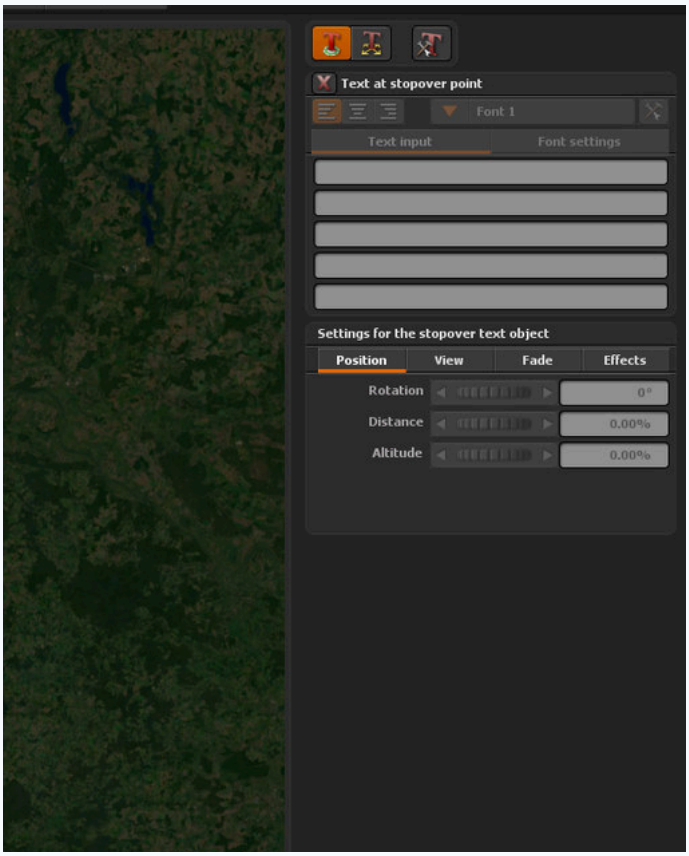


Illustration for this step

The input fields allow multiple lines. However, long sentences are difficult to read on a TV or smaller monitor. Divide longer information into multiple breakpoints or use short headings and a complementary subtitle.

> **TIP**
> Use a significantly larger font for place names than for explanatory additions. This means the viewer recognizes the most important information first.

9.2 Position and view

In the **Position** tab you determine where the text appears in relation to the selected stop point. The three controls work together:

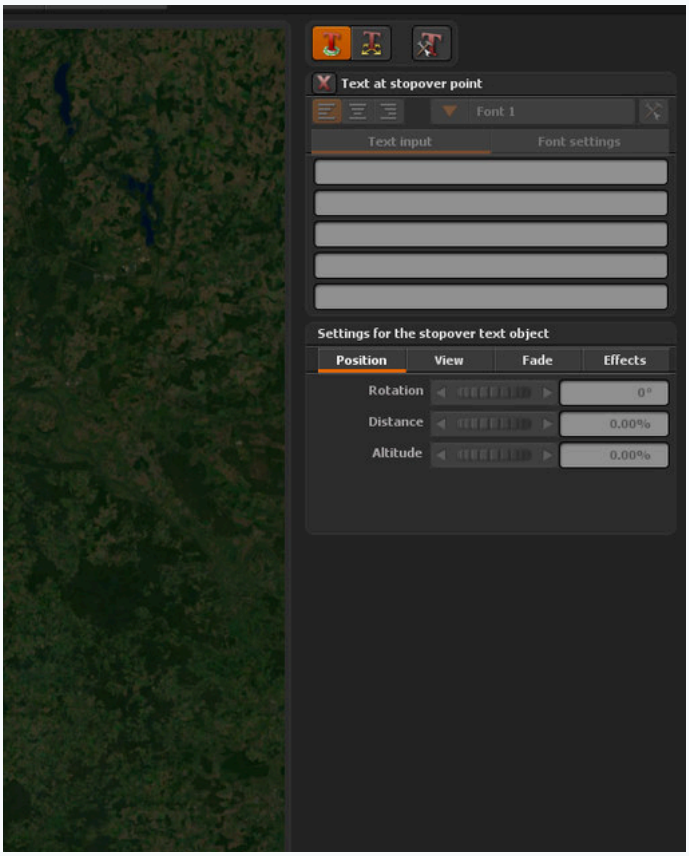


Illustration for this step

- **Angle** determines the direction in which the text is offset from the stop point. 0° points north, 90° east, 180° south and 270° west.
- **Distance** determines how far the text is moved sideways from the stop point. Start with a small value so that the connection with the point remains clear.
- **Height** raises the text above the terrain or above a holding object. Increase it when the text and object cover each other or the text is too close to the ground.

Check the position in both the editor view and the camera view. The camera view shows the text as it will appear in the finished video.

In the **View** tab you determine how the text is oriented towards the camera. This is important because spatial text may otherwise appear at an angle or from behind during a sideward camera movement.

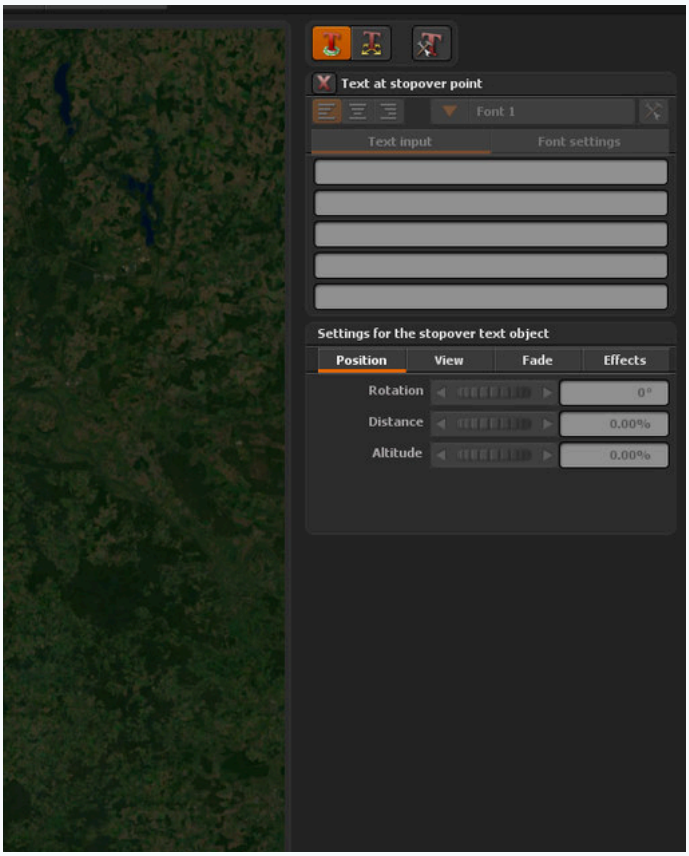


Illustration for this step

- **Face camera - Off:** The text retains the orientation set with **Angle X**, **Angle Y** and **Angle Z**. Use this when the text should deliberately remain fixed in the landscape.
- **3 axes:** The text faces the camera completely and therefore remains readable from almost every camera position. This is normally the safest choice for place names and important notes.
- **2 axes:** The text turns towards the camera but remains upright. This is particularly useful for side views.
- **1 axis:** The text follows the camera only sideways around one axis, retaining more of its spatial orientation.
- **Angle X**, **Angle Y** and **Angle Z** rotate or tilt the text manually. These controls are mainly relevant when Face camera is switched off.

> **TIP**
> Switch to the camera view and check several time positions. A text may be readable at the beginning but turn unfavourably during the camera movement.

> **NOTE**
> Do not place important text directly at the bottom or top of the image. TVs and some playback programs can cut off image areas there.

9.3 Blend time and effects

Text should not appear suddenly when the rest of the movement is quiet. A short fade-in leads the eye more gently to the text. The fade out should be completed before the next important text appears.

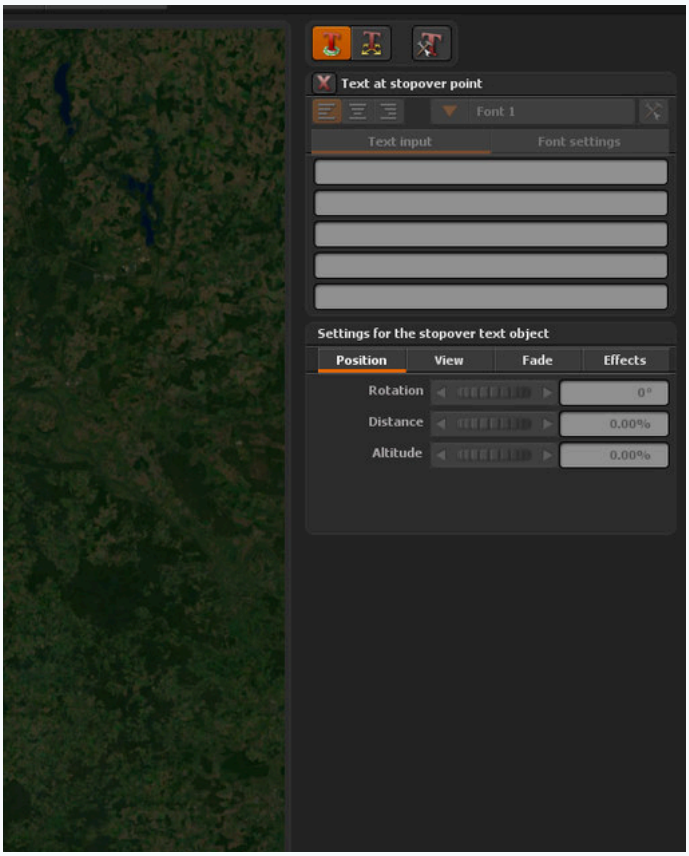


Illustration for this step

- **Fade-in effect** determines how the text becomes visible. **Off** displays it immediately; a soft fade produces a calmer transition. Other effects can draw attention to the text.
- **Fade-in time** sets the duration. Very short times appear abrupt, while very long times reduce the time available for reading.
- **Fade-out effect** determines how the text disappears again.
- **Fade-out time** sets the duration of that transition.
- **Hold time** extends the period during which the text remains fully visible at the stop point. It is added to the stop point's own hold time.

In the **Effects** tab you select an additional movement for the text. **Effect selection** initially determines only which effect is being edited. The switch underneath enables or disables that effect. **Speed** controls its tempo and direction; positive and negative values may move in opposite directions.

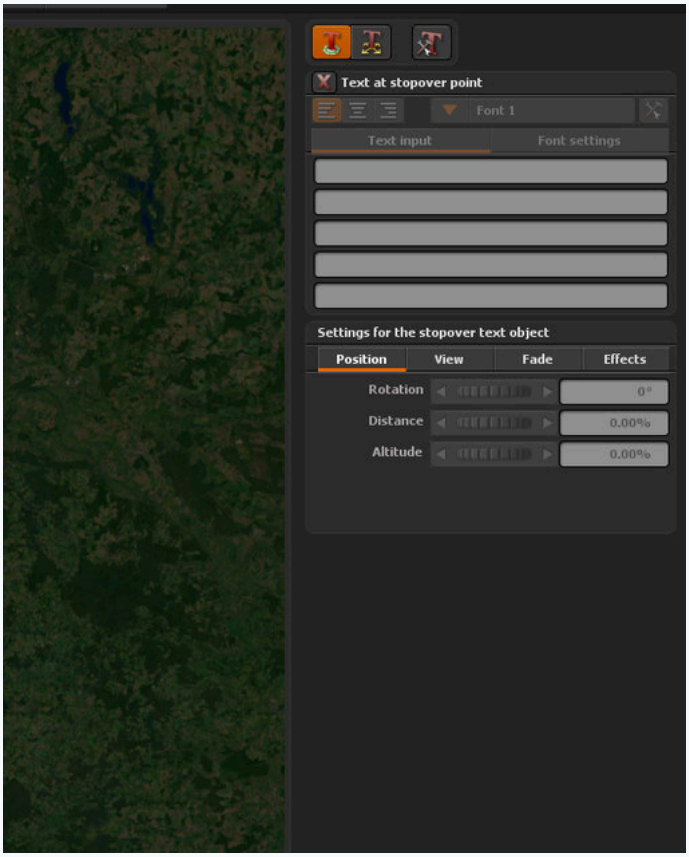


Illustration for this step

Use text effects sparingly. A slow rotation can emphasise a title, whereas fast continuous movement makes it more difficult to read.

9.4 Free texts

Free text is useful when you don't want a label to appear exactly at a breakpoint. For example, you can use it to create a chapter heading, a note about a longer section, or a freely placed location name.



Illustration for this step

1. Select the type of new text object.
2. Add a new text object.
3. Enter the text and select the font.
4. Set position and temporal visibility.
5. Check the beginning, middle and end of the fade.

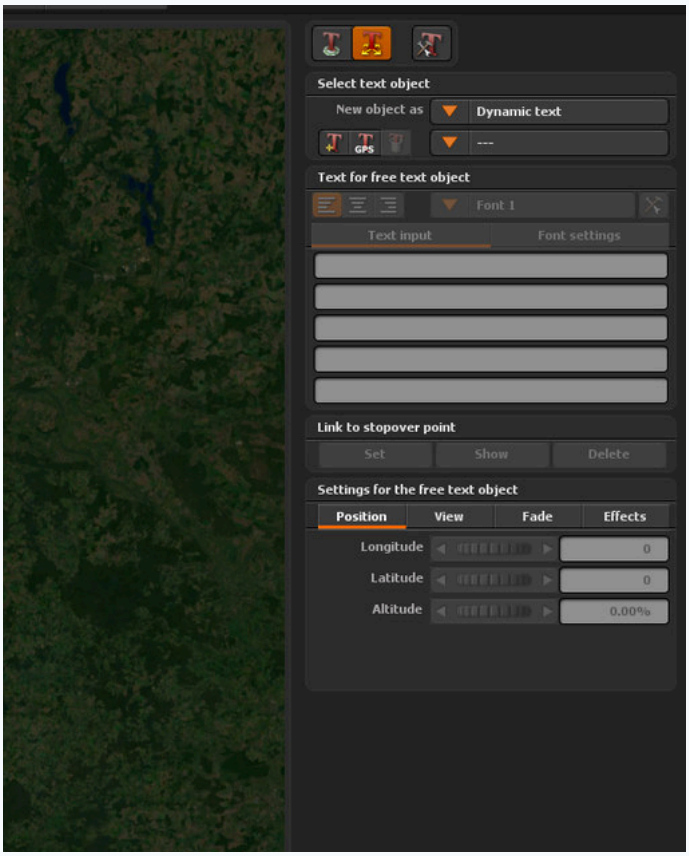


Illustration for this step

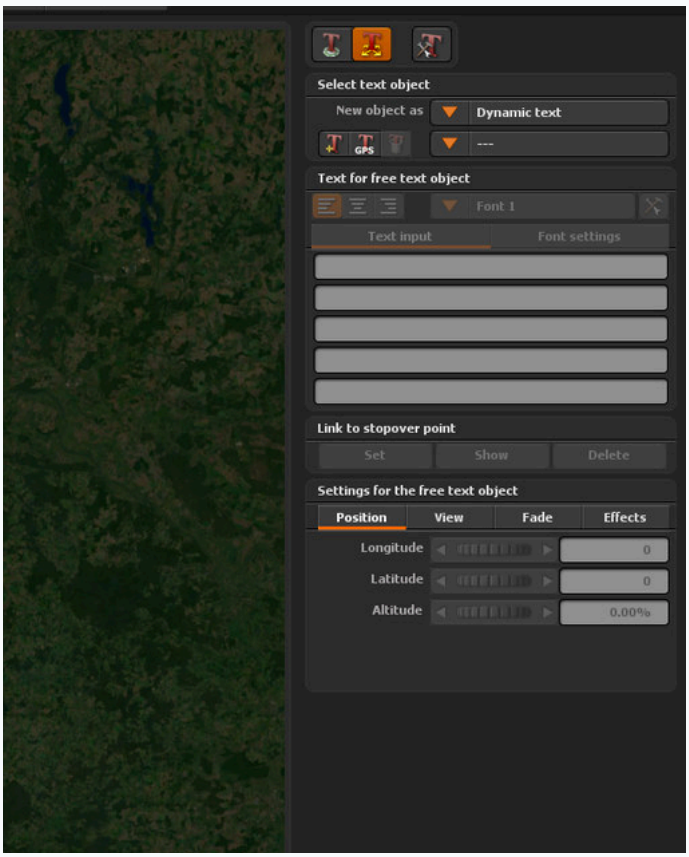


Illustration for this step

Free texts can be linked to a breakpoint. As a result, they take over the temporal reference of the stopping point, but remain freely positionable in space.

9.5 Keep texts visible in front of terrain

In a three-dimensional landscape, text may partially disappear behind a mountain or other object. Vasco da Gama 20 therefore offers two display types:

- With depth checking, the text behaves like a part of the 3D scene and can be hidden.
- Without depth checking, text remains visible in front of mountains and other scene elements.

The second variant is particularly suitable for place names, headings and important information. The first variant can be useful if the text is to be consciously integrated into the spatial scene.

This option is not set on the individual text object. It is located in **Project settings** and applies to both texts and images:

1. Open the main **Project** tab.
2. Click **Project settings**.
3. Find the **Display of texts and images in the terrain** section.
4. Set **Always visible** to **Yes, always visible** if texts and images must not disappear behind mountains or sink into the ground at unfavourable camera angles.
5. Confirm with **OK**.

Select **No, may be occluded** only when texts and images should deliberately behave like real elements of the 3D landscape.



Always visible in Project settings

> **NOTE**
> The technical term for depth checking is depthbuffer. In practice, the question is sufficient: Should the text be allowed to be covered by mountains or should it always remain visible?

9.6 Uniform text design

You can set recurring properties uniformly using the global text attributes. This saves time and prevents similar texts from looking different.

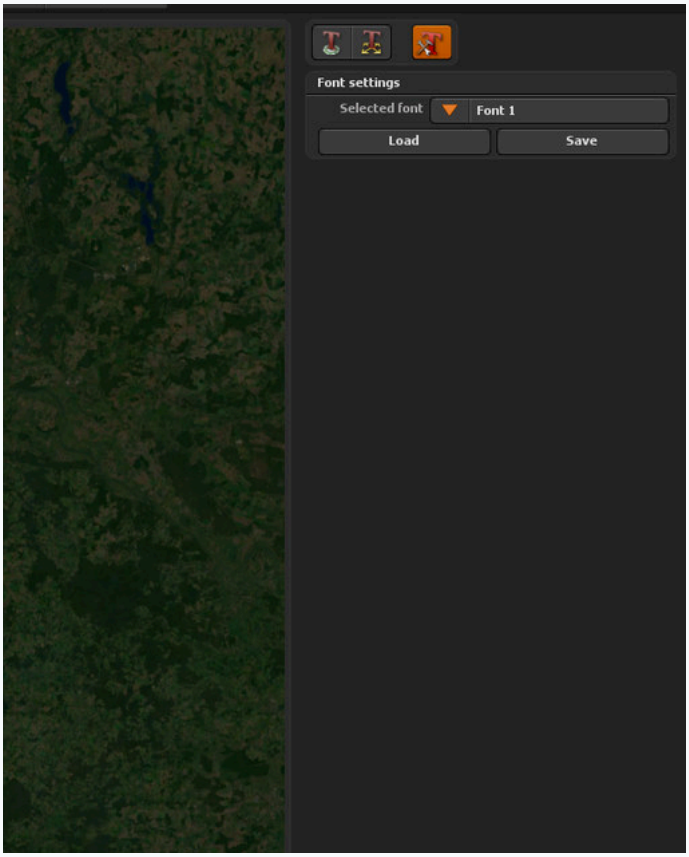


Illustration for this step

The following rules have proven to be effective for a calm design:

- Use a maximum of two easy-to-read fonts.
- Use light fonts on dark backgrounds or dark fonts on light backgrounds.
- Avoid very thin fonts.
- Leave enough time between two texts.
- Check the text at the later output resolution.

9.7 Final check

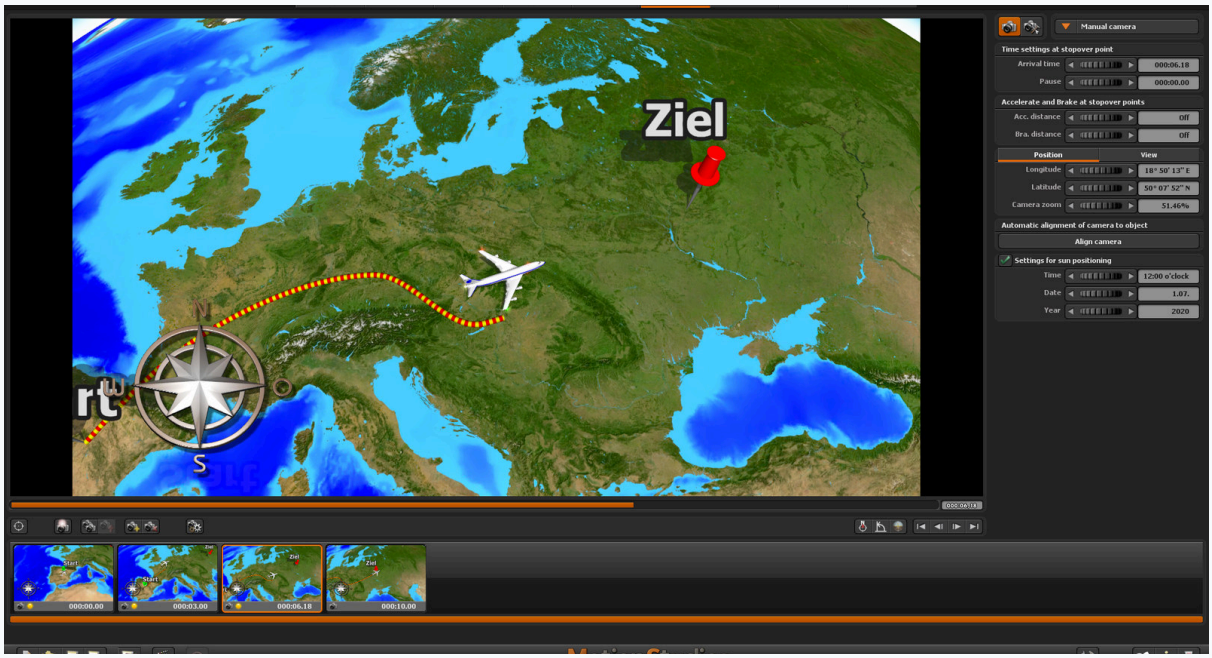
- Is each text visible long enough to read without haste?
- Is the font clearly visible in the preview?
- Aren't important texts obscured by terrain?
- Do fade-ins start and end quietly?
- Does the project use a uniform typeface?
- Have spelling, place names and special characters been checked?

> **NOTE**
> Text that is easy to read in the editor view may be difficult to capture during a fast tracking shot. Therefore, always check the complete movement.

Chapter 10: Designing the camera movement

The camera control determines what will be visible in the finished video. It defines the direction from which the route is viewed, the distance from the action and whether the camera follows the route or the head object.

Complete the route, waypoints, stop points and timing first. Set up the camera afterwards. If you make major changes to the route or the timing later, you will usually need to check the camera settings again.



Camera area with a selected camera point, visible route and head object

The camera points are shown on the timeline at the bottom. An orange border marks the currently selected point. The area on the right contains the camera mode and the settings for the selected point.

NOTE

The example images in this chapter deliberately show different time positions and settings. This makes the characteristic differences between the camera modes easier to recognise.

10.1 Which camera mode should I use?

- **Automatic:** a good starting point; Vasco da Gama calculates the camera from the route, camera profile and zoom correction.
- **Manual:** each camera point can be adjusted independently and provides the greatest direct control.
- **Static:** the camera remains at a fixed position and is useful for an unchanged overall view.
- **Simple:** the camera follows the route or head object; zoom and view apply to the entire route.
- **Drone:** works in a similar way to **Simple**, but also follows the direction and, if required, the roll of the head object.
- **Advanced:** combines an automatically guided camera with additional creative options.

> **NOTE**
> Switching to another camera mode can rebuild or discard existing camera settings. Save a separate project version first if you want to keep a successful camera movement.

10.2 Automatic camera tracking

Automatic camera tracking is particularly suitable for the first complete run. Vasco da Gama automatically positions the camera at the available camera points. You choose the basic appearance and then check the result at several positions along the journey.



Automatic camera tracking with a side view at the end of the route

Controls in Camera settings

- **Camera follows:** With **Route line**, the calculation is based on Route 1. With **Head object**, the current head object remains the focus. This is useful when an aircraft or another object travels above the route line and might otherwise move out of view.
- **Camera movement:** Three levels can reduce abrupt camera pans. Start with movement smoothing switched off. Increase it only if short, sharp changes of direction are distracting in the video.
- **Camera profile:** The profiles contain prepared viewing directions and tilts. Try several profiles and check not only the start and finish, but also the middle of the route.
- **Zoom correction:** Corrects the automatically calculated distance. Change the value in small steps so that the route, labels and head object remain visible.

The example uses the **70° side view** profile at the end of the route. The low perspective clearly differs from a fixed top view. For your project, always check the start, several intermediate positions and the end of the route.

10.3 Manual camera control

Use manual camera control when individual sections require a precisely defined composition. Each camera point can have its own position, view and time. Vasco da Gama calculates a smooth transition between the points.



Manual camera control at an intermediate camera point

Time and movement at the camera point

- **Arrival time:** the time at which the camera reaches this camera point.
- **Hold time:** the period for which the camera remains at the point.
- **Acceleration distance:** the distance over which the camera accelerates after the point.
- **Braking distance:** the distance over which the camera slows down before the point.

Long acceleration and braking distances normally produce calmer transitions. If camera points are close together, however, values that are too large can overlap. Always check the result as a moving sequence, not only as a still image.

Position and View

On the **Position** tab, set **Longitude**, **Latitude** and **Camera zoom**. These values determine the camera position above the earth and the size of the visible area.

On the **View** tab, adjust:

- **Viewing angle:** the direction in which the camera is looking.
- **Tilt:** from a flatter side view to a stronger top view.
- **Horizon:** the sideways tilt of the visible horizon.

Align camera aims the camera at the current head object or route again. Use this button if the subject has moved out of view, then fine-tune the view manually.

Recommended procedure

1. Select the required camera point at the bottom.
2. Set the camera zoom and position first.
3. Open **View** and adjust viewing angle, tilt and horizon.
4. Check a time position shortly before and shortly after the point.
5. Apply the camera settings to the selected point.

> **TIP**
> Change only one property during each check. This makes it easier to identify the setting that causes an unsteady transition.

10.4 Static camera control

With static camera control, the camera remains stationary during the actual journey. The route and head object move through a fixed image area, making the complete route easy to understand.



Static camera control with the complete route visible

Set longitude, latitude and camera zoom on the **Position** tab. On **View**, set viewing angle, tilt and horizon. These values apply to the complete route.

Static camera control is useful:

- for an overview at the beginning or end of a video,
- for short routes that fit completely within one image area,
- when the viewer should see the position of the start, finish and route at the same time.

It is less suitable when a long route would only appear as a very small line or when individual locations need to be shown in detail.

10.5 Simple camera control

Simple camera control automatically moves the camera position along the **Route line** or the **Head object**. Unlike manual control, you do not set a separate camera position for every point. Camera zoom and view apply to the entire route.



Simple camera control following the head object

- **Camera follows – Route line:** the route determines the guided position.
- **Camera follows – Head object:** the camera follows the current head object. This is useful for vehicles or aircraft that are visibly above or away from the line.
- **Camera movement:** reduces sharp pans in several levels.
- **Camera zoom:** sets the constant distance for the complete route.
- **Viewing angle, Tilt and Horizon:** define the common view for the complete route.

Longitude and latitude are guided automatically in this mode and therefore cannot be adjusted freely.

Simple camera control is a good choice when you want a consistent tracking movement quickly and do not need individually positioned camera points.

10.6 Drone camera control

Drone camera control is based on simple camera control. In addition, the directional movement of the head object is transferred to the camera. When the object travels through a bend, the camera turns with it.



Drone camera control with a rotated top view

The most important settings are:

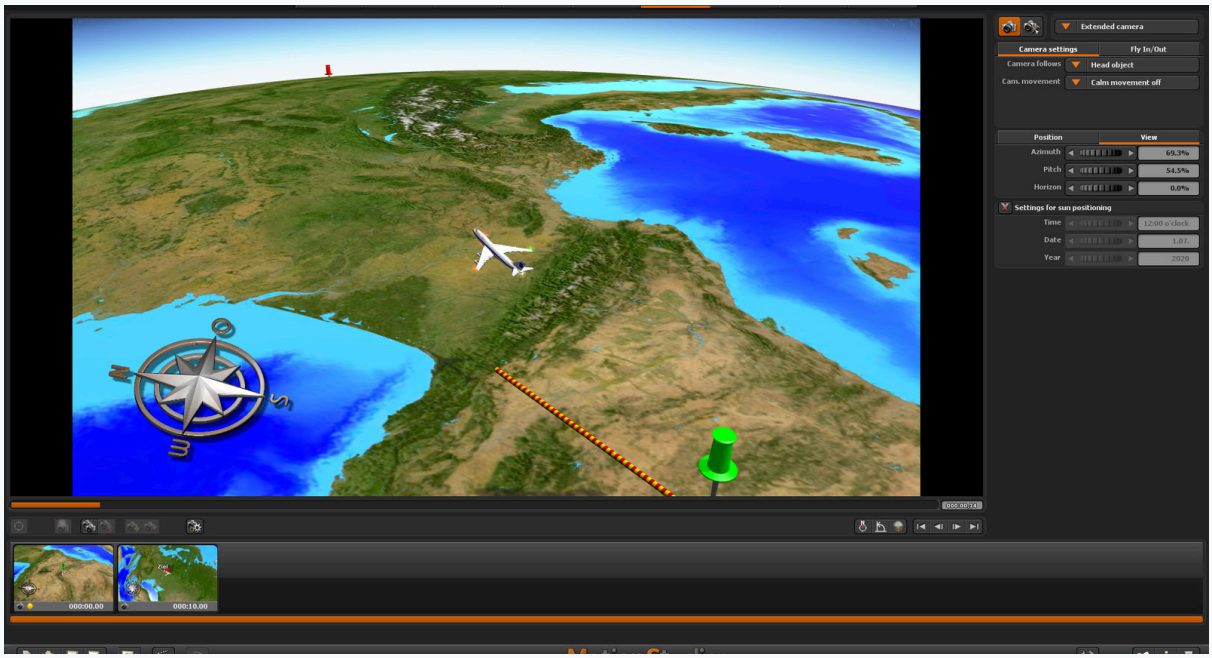
- **Camera follows:** choose between the route line and the head object.
- **Camera movement:** reduces rapid changes of direction.
- **Roll movement:** transfers the sideways tilt of the head object to the camera movement.
- **Camera zoom:** determines the distance; longitude and latitude are guided automatically.
- **View:** viewing angle, tilt and horizon determine the basic perspective.

Roll movement is especially effective with an aircraft that banks during a turn in flight mode. With road vehicles or very winding routes, strong roll can appear restless or tiring. Switch it off in this case or use stronger movement smoothing.

> **NOTE**
> A drone view can look calm on a straight section and tilt strongly only in a tight bend. Always inspect the most winding parts of the route.

10.7 Advanced camera control

Advanced camera control combines features of automatic and freely designed camera control. The camera remains linked automatically to the route or head object while providing additional creative options.



Advanced camera control at the end of the route with the route visible

Use this mode when simple or automatic control is basically suitable but individual creative requirements need more adjustment. Work step by step:

1. Under **Camera follows**, decide whether the route or head object is the reference.
2. Set camera zoom and the view.
3. Check the start, middle and end of the route.
4. Add **Fly In** or **Fly Out** only afterwards.

Advanced camera control is powerful, but changing many values at once makes the result difficult to judge. Save a separate project version before making major changes.

10.8 Fly In and Fly Out

With **Fly In**, the camera starts outside the actual starting view and moves into the scene. **Fly Out** begins after the end of the route and moves out of the scene. Each effect has its own selection and duration.



Fly In with a clearly more distant starting view

- **Fly In:** selects the animation before the actual start of the route.
- **Fly In time:** determines the duration of the entry.
- **Fly Out:** selects the animation after the actual end of the route.
- **Fly Out time:** determines the duration of the exit.

A short Fly In before a slow journey can look hectic. A very long Fly Out can delay the ending unnecessarily. Match the effect and duration to the speed of the rest of the camera movement.

> **NOTE**
> Manual camera control has no Fly In/Out area. Design the beginning and end there with your own camera points.

10.9 Large zoom movements

During a large zoom, the horizontal position often changes at the same time. Vasco da Gama 20 takes the current height into account and distributes the sideways movement over the complete distance. This creates a more even approach without sudden acceleration shortly before reaching the ground.

For a good result:

1. Use a sufficiently long time interval.
2. Check the middle of the zoom as well as its start and finish.
3. Avoid very strong simultaneous changes to zoom, viewing angle and horizon.
4. Check the movement in real time.

10.10 Time and sun position

Use **Start time** and **Arrival time** to set the time, date and year. If the two times differ, Vasco da Gama calculates the course of the sun between departure and arrival. If they are identical, the same sun position is used for the entire route.

In manual camera control, the sun position can be set at selected camera points. Intermediate values are calculated automatically. When changing from day to night, also check shadows, vehicle lights, illuminated object areas and the readability of text.

10.11 Final check

- Does the most important subject remain visible?
- Are the route and head object easy to recognise in the important sections?
- Are the transitions between camera points smooth?
- Are there unexpected fast turns or a strongly tilted horizon?
- Is a large zoom also even in the middle?
- Do Fly In and Fly Out suit the total duration?
- Does text remain readable for long enough during the camera movement?

After completing a successful camera movement, save a new project version. You can then try another camera mode without losing the working version.

Chapter 11: Creating a Scene and Atmosphere

Light, shadows, water and other optical effects determine the mood of your journey. Most of these settings do not change the route itself, but they do change how it looks. Work step by step: enable one effect, examine the result in **Camera view**, and check several points in the journey.

> **REMEMBER**
> An effect is well adjusted when it supports the journey without obscuring the route, text or important objects.

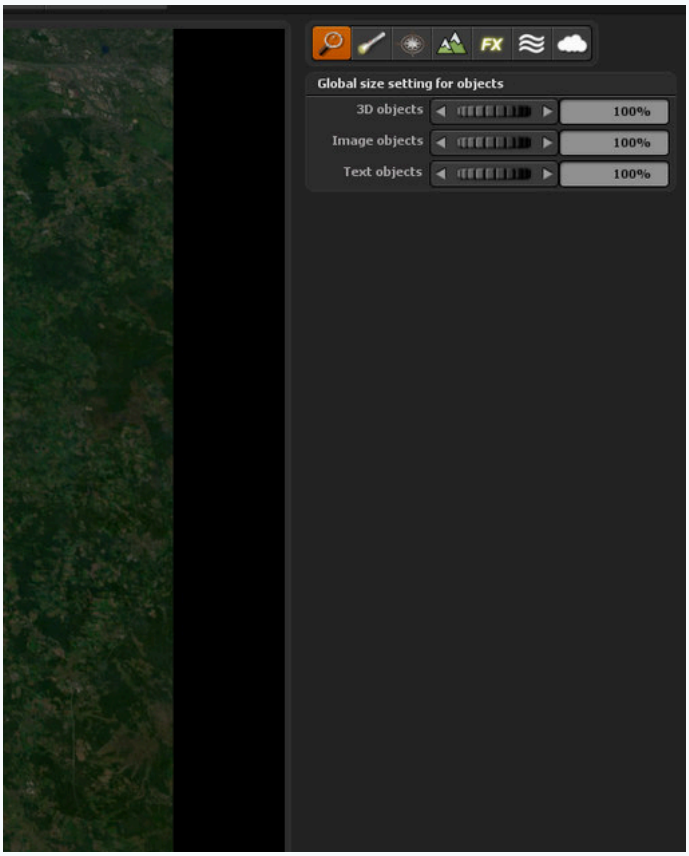
How to use the setting rows

Many settings have a slider in the centre and a number field on the right. The small left arrow reduces the value and the right arrow increases it. For an exact setting, click the number field and enter the required value directly. A green tick means **On**, and a red cross means **Off**. Grey controls are currently unavailable. In most cases, the corresponding effect must be enabled first.

The seven symbols at the top of the right-hand settings panel open **Global object sizes**, **Light and shadows**, **Compass rose and orientation aid**, **Elevation profile**, **Additional effects**, **Water**, and **Clouds** in that order. The orange symbol shows the section that is currently open.

11.1 Global object sizes

Global size control changes several object groups together. The size of each individual object is retained and combined with the global value.



Global size control for 3D objects, images and texts

Use this setting when, for example, all 3D objects throughout the project should appear slightly larger. To change only one model, use the size control on that object instead.

Each of the three controls applies to a separate object group:

- **3D Objects** changes the size of all three-dimensional models together, such as vehicles, aircraft and buildings.
- **Image Objects** changes the size of all objects inserted as images.
- **Text Objects** changes the size of all text objects in the project.

100% is the size originally set for each object. A lower value makes the whole group smaller and a higher value makes it larger. The individual size of an object is not deleted; it is combined with the global value.

11.2 Light, Earth's atmosphere and shadows

Open the main tab **Optical FX**, then open the **Light** section. This is where you adjust the light colour, ambient light, atmospheric depth and shadows.

Adjusting light and Earth's atmosphere

- **Light colour - Select colour** opens the colour selector for direct sunlight. A bright colour makes illuminated surfaces stronger. A slightly warm or cool tint changes the mood of the entire scene.
- **Ambient light - Select colour** sets the basic illumination. It also brightens surfaces that are not lit directly by the sun. Increase it carefully when shadow areas are too dark.
- **Earth's atmosphere** enables or disables atmospheric depth. When enabled, distant parts of the landscape become increasingly lighter through haze.
- **Objects** includes 3D objects and their particles in the atmospheric haze as their distance increases.
- **Images** includes inserted image objects in the atmospheric effect.
- **Texts** includes text positioned spatially in the landscape.
- **Route line** includes the route line in the haze. Disable this option if the route should remain clearly visible at a long distance.

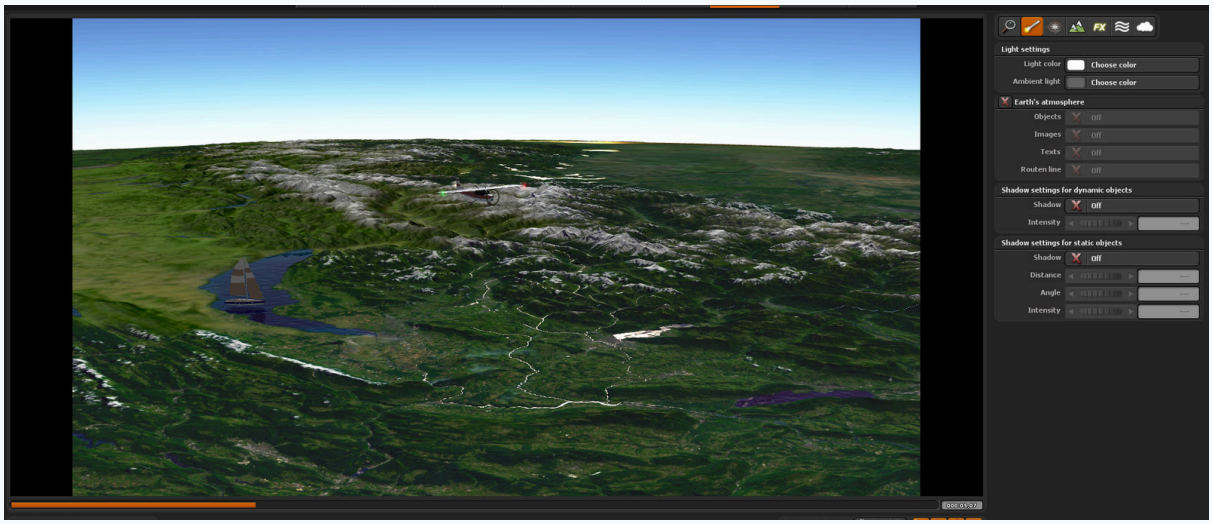
The last four switches are available only while **Earth's atmosphere** is enabled.

Adjusting shadows

- **Shadows for dynamic objects - Shadows** enables or disables shadows for route lines and clouds as well as for moving objects and text, or elements positioned spatially in the landscape.
- **Intensity** controls the strength of these dynamic shadows from 0 to 100%. A low value creates a subtle shadow; a high value makes it distinctly darker.
- **Shadows for static objects - Shadows** applies to objects, images and text fixed in the picture as well as to orientation aids.
- **Distance** moves a static shadow away from its element. A higher value increases the offset.
- **Angle** sets the direction in which the static shadow is offset, from 0° to 359°.
- **Intensity** controls the strength of the static shadow from 0 to 100%.

> **NOTE**
>
> The terms **dynamic** and **static** refer to different types of picture elements here. Static shadows are not an additional terrain shadow.

The next three images show the same scene, making the effect of each setting easy to compare.



Starting view without atmospheric depth or shadows

Without atmospheric depth, nearby and distant parts of the landscape appear similarly clear. The result can look clean, but it has less spatial depth.



Scene with Earth's atmosphere enabled

When **Earth's atmosphere** is enabled, distant areas become progressively lighter through haze. This gives the landscape a more convincing sense of depth. The switches for objects, images, texts and route lines determine which elements are included in the effect.



Scene with Earth's atmosphere plus dynamic and static shadows

The two shadow sections separately control shadows for moving or spatially positioned elements and for elements fixed in the picture. The precise assignment is explained below.

> **TIP**
> Check light and shadows in both a bright and a dark section of the journey. Their appearance depends strongly on the time of day, the position of the sun and the camera direction.

11.3 Compass rose and orientation aid

The compass rose and the orientation aid have different purposes. Both are found in the section marked with the compass symbol.

Compass rose

A compass rose shows the cardinal directions. It is particularly useful when the camera looks at the globe from an angle and north is not automatically at the top of the image.



Compass rose in a complete journey view

Set its position, size and transparency so that it remains easy to recognise without covering the route, place names or objects.

The controls have the following functions:

- **Compass rose** selects **Off**, **On (NOSW)** or **On (NESW)**. NOSW uses the German direction letters for north, east, south and west. NESW uses the international letters.
- **Position X** moves the compass rose horizontally. **0%** is the left edge and **100%** the right edge.
- **Position Y** moves it vertically. **0%** is the top and **100%** the bottom.
- **Size** sets the display size from 0 to 100%.
- **Opacity** sets how solid the compass rose appears. **0%** is completely transparent and **100%** completely opaque.

Orientation aid

The orientation aid shows the position and direction of travel on the globe. The small globe can help viewers retain their geographical bearings during strong camera movements or over long distances.



Orientation aid with globe in a complete journey view

Use it especially when the journey crosses several countries or continents. For a short regional route, a subtle or disabled display may look calmer.

The controls have the following functions:

- **Globe** selects **Off** or one of 15 visual styles for the small globe.
- **Marker** selects the current-position symbol: **Dot** shows a simple mark, **Arrow** also indicates a direction, and **Pin** displays an easily recognised map pin.
- **Position X** and **Position Y** set the horizontal and vertical picture position. Here, 0% means left or top, and 100% means right or bottom.
- **Size** sets the display size of the globe from 0 to 100%.

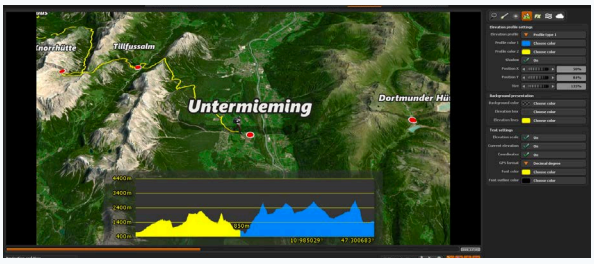
The marker and the three controls become available only after a globe style has been selected.

11.4 Elevation profile

The elevation profile shows the terrain along the route. It is particularly useful for mountain routes, because viewers can immediately recognise climbs and differences in altitude.



The same mountain route without an elevation profile



Elevation profile displayed along the same mountain route

The settings include profile colours, background, elevation scale and text information. Place the profile in a visually quiet part of the image and leave sufficient space around the compass rose, route and text. Its shape and values depend on the selected route and the available terrain data.

Adjusting the complete elevation profile

- **Elevation profile** selects **Off** or one of three profile types. The types use different graphic designs. Try the alternatives and choose the one that best suits the scene.
- **Profile colour 1** and **Profile colour 2** jointly define the colour appearance of the elevation curve.
- **Shadow** adds a shadow that separates the profile more clearly from the map image.
- **Position X** and **Position Y** set its position in the picture. 0% means left or top, and 100% means right or bottom.
- **Size** sets the size of the profile. The available range extends to 150%.
- **Background colour** sets the area behind the profile. Transparency can also be selected in the colour window.
- **Elevation scale box** sets the colour and transparency of the area behind the elevation scale.
- **Elevation scale lines** sets the colour and transparency of scale lines and marks.
- **Elevation scale** shows or hides the labelled scale.
- **Current elevation** displays the elevation at the current route position.
- **Coordinates** shows or hides the geographical position.
- **GPS format** selects the notation: **Degrees, minutes, seconds**, **Degrees and decimal minutes**, or **Decimal degrees**.
- **Font colour** sets the colour of numbers and labels.
- **Outline colour** sets the outline around the lettering. A contrasting outline improves readability over changing map colours.

All controls below **Elevation profile** are available only when a profile type is enabled.

11.5 Depth of field

Depth of field keeps a selected distance range sharp while areas in front of or behind it appear blurred. This can direct attention to a vehicle, a building or a particular part of the landscape.



View with depth of field disabled



View with depth of field enabled

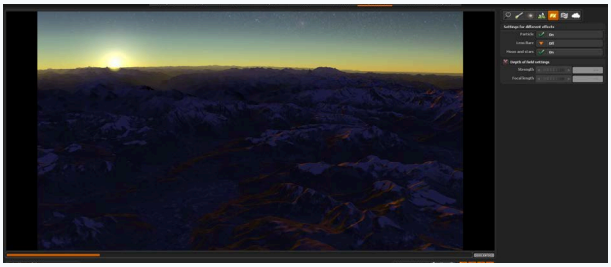
Strength controls how clearly the blur is visible. **Focal length** moves the area that appears sharp. Change both values in small steps and judge the result in Camera view. Excessive blur can make place names, routes and important objects difficult to read.

- The switch to the left of **Depth of field settings** enables or disables the complete effect.
- **Strength** sets the blur outside the sharp area from 0 to 100%. The higher the value, the more obvious the difference between sharp and blurred parts of the picture.
- **Focal length** sets, from 0 to 100%, the distance at which the sharp-looking area lies. This value must suit the current camera position, so check it directly in Camera view.

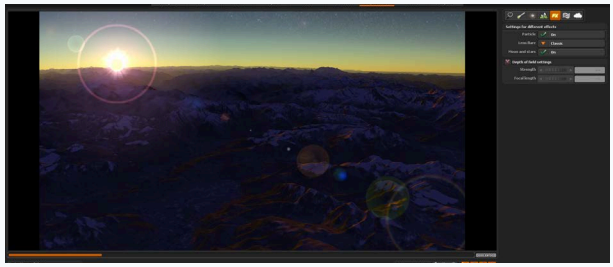
When depth of field is disabled, **Strength** and **Focal length** are grey and cannot be changed.

11.6 Lens flare

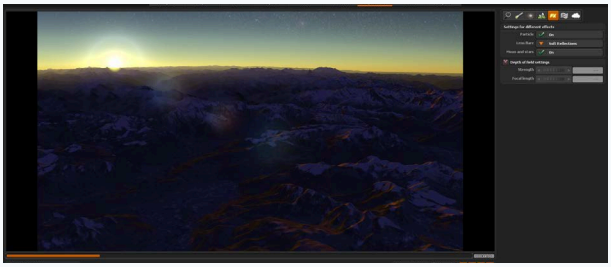
Lens flares simulate reflections that can occur inside a camera lens when it points towards a bright light source. Vasco da Gama provides several styles.



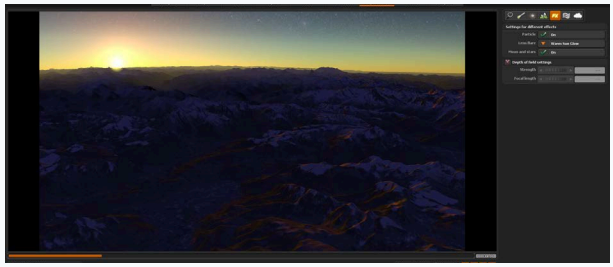
View without lens flare



Classic lens flare



Lens flare with soft reflections



Lens flare as a warm sun glow

Choose a style that suits the scene. **Classic** is clearly visible, **Soft Reflections** is more restrained, and **Warm Sun Glow** emphasises a warm evening mood. The effect is convincing only when the sun is visible or close to the camera's viewing direction.

Lens flare is a selection field. **Off** removes the effect. The other entries choose different shapes and lighting styles. Pause the preview and compare them at the same time position. A selected style may remain invisible unless the sun is close to the camera's viewing direction.

11.7 Particles

Particles can represent smoke, dust or other moving trails. In the following example, the ship creates a visible smoke plume. The difference becomes fully visible only while the scene is moving.



Moving ship with particles enabled



The same scene with particles disabled

Do not judge particles from a single still image alone. Start the preview a few seconds before the required position so that the particle trail has time to develop. Moving backwards on the timeline discards the previously calculated trail; it is then rebuilt as playback moves forwards.

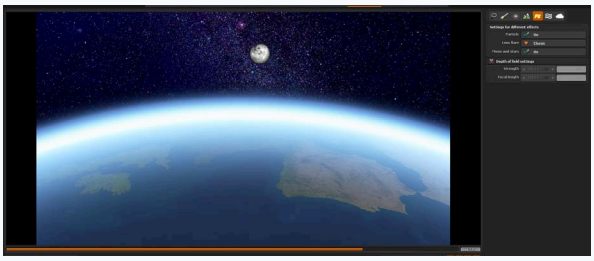
The **Particles** switch enables all particle effects in the project together or disables them together. It does not add smoke or dust by itself. Particles are visible only on 3D objects that contain an enabled particle effect. If no trail appears even though this switch is **On**, first check the relevant object and then let the timeline run forwards.

11.8 Moon and stars

Moon and stars complete night and twilight scenes. They are not visible, or are barely visible, in a bright daytime scene. Their effect therefore depends strongly on the time of day, camera angle and horizon.



Night scene with moon and stars disabled



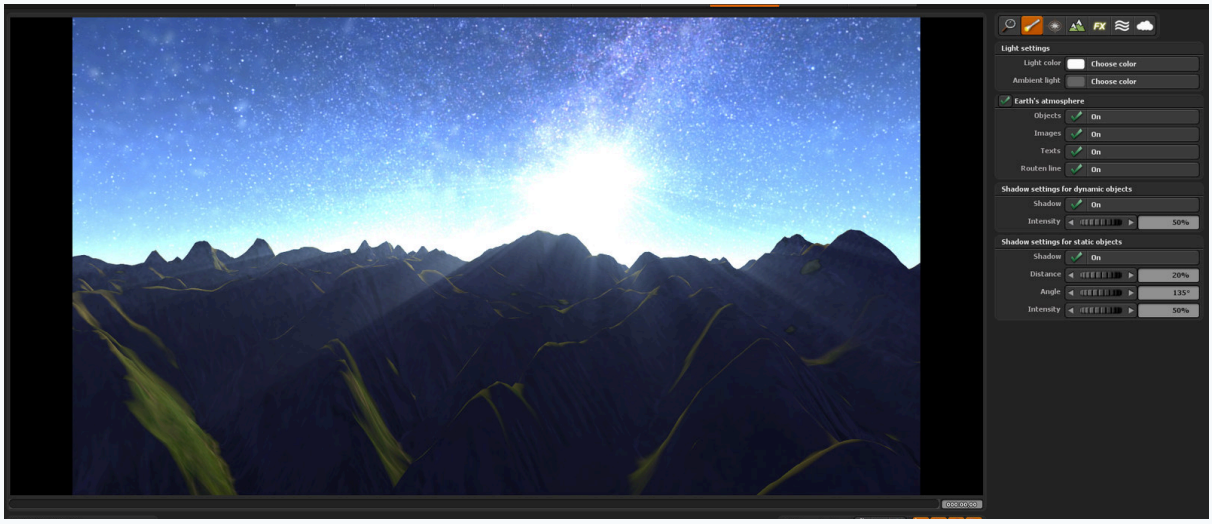
Night scene with moon and stars enabled

Check that the sky matches the rest of the lighting. A bright moon and many stars can look unnatural if the landscape and objects are still illuminated like a daytime scene.

The **Moon and stars** switch displays or hides the moon, stars and Milky Way together. It does not change the time of day or darken the landscape automatically. Visibility is also determined by the sun position, time and camera direction.

11.9 Atmospheric sun rays

Atmospheric sun rays are also often called **Godrays**. They become visible when light passes through haze or around parts of the landscape towards the camera. The rays add depth and a distinctive lighting mood to a scene.



Automatically calculated atmospheric sun rays

There is no separate on/off switch for this effect. Vasco da Gama calculates its strength and visibility automatically from daylight, the position of the sun and the viewing direction. The rays are usually more noticeable when the sun is low; at night or from an unsuitable camera direction, they may disappear completely.

> **NOTE**
> Turning off lens flare does not turn off atmospheric sun rays. The two effects are calculated separately.

11.10 Water waves and reflections

Open **Water** under the main tab **Optical FX**. Water waves and water mirroring are separate functions and can be adjusted independently.

Water waves



Water surface with water waves disabled



Water surface with water waves enabled

For **Water waves**, select **Off**, **On: Manual** or **On: Automatic**. Manual mode lets you set the wave height and direction yourself. In automatic mode, Vasco da Gama adjusts the wave height to the camera height; the direction remains adjustable.

The individual settings work as follows:

- **Water waves - Off** removes the moving wave structure. **Wave height** and **Wave direction** are locked.
- **Water waves - On: Manual** uses a fixed wave height and direction set by you.
- **Water waves - On: Automatic** adjusts the wave height to the camera height. Detail remains visible with a close camera, while the effect is adapted automatically at greater height.
- **Wave height** sets the size of the waves from 0.1 to 200.0 in manual mode. This control is unavailable in automatic mode.
- **Wave direction** sets the direction of travel from 0° to 359°. It is available in manual and automatic mode.

Match the waves to the size of the body of water. Very high waves may look unnatural on a small lake. Check the result close to a shoreline or ship, where surface movement is especially easy to see.

Mirroring of water



Water surface with mirroring disabled



Water surface with mirroring enabled

Mirroring of water reflects the landscape and other visible elements on the surface. It is separate from the bright surface reflections. Depending on the map and camera angle, mirroring may be very clear or visible only in certain areas.

- **Mirroring of water** enables or disables true reflections of the landscape and visible objects on the water surface.
- **Water reflection** controls only the bright light gloss on the water. **Off** removes this additional gloss, **Medium** makes it clearly visible, and **High** strengthens it. Do not confuse this setting with mirroring of water.

NOTE

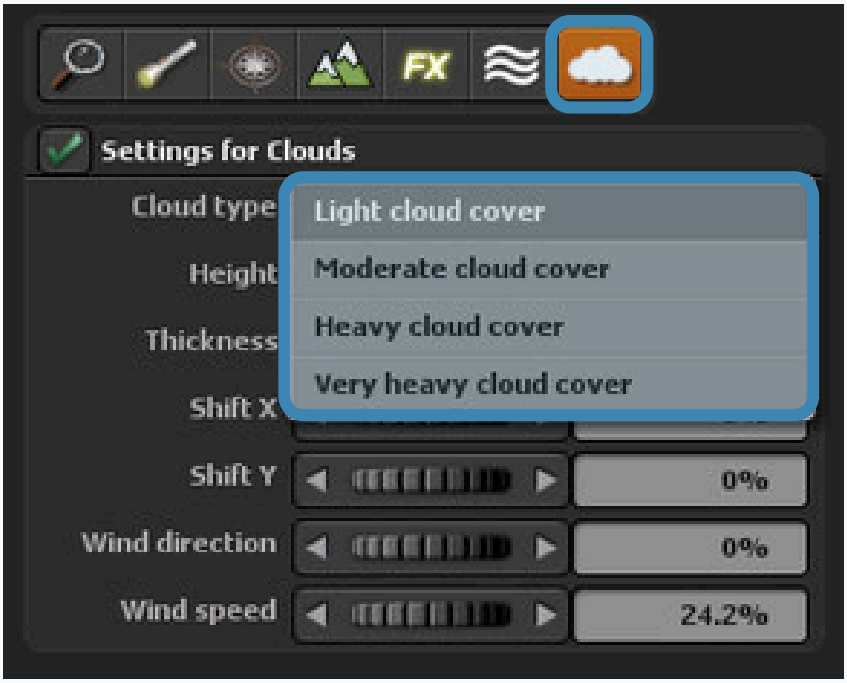
A reflection of the sun on the water is visible only when the sun, water surface and camera are at a suitable angle to one another. If no light gloss appears with **Medium** or **High**, the switch is usually not the cause. Try a different sun time or change the camera's viewing direction.

NOTE

On a simple map without a suitable land mask, water waves or reflections cannot always be displayed correctly.

11.11 Clouds

First enable the cloud system. Then select the cloud type, height, thickness, displacement and wind.



Enabled cloud system with the four levels of cloud cover

The cloud controls in detail

- The switch to the left of **Settings for Clouds** enables or disables the complete cloud layer. When it is **Off**, all controls below are locked.
- **Cloud type** offers four levels of cloud cover. **Light cloud cover** creates scattered, relatively thin clouds. **Moderate cloud cover** shows a medium level of cloud cover with more closely spaced cloud fields. **Heavy cloud cover** creates dense clouds over large areas. **Very heavy cloud cover** shows particularly dense, extensive cloud fields. The selection is available only when the cloud system is enabled.
- **Height** moves the cloud layer up or down, using values from 1 to 1000.
- **Thickness** controls how substantial the cloud layer appears, using values from 10 to 400. It is not the same as height.
- **Shift X** moves the cloud pattern horizontally from 0 to 359.
- **Shift Y** moves the pattern vertically from 0 to 179. Both shift controls change the cloud distribution without rotating the entire layer.
- **Wind direction** sets the direction in which the clouds move, from 0° to 359°.
- **Wind speed** controls cloud speed from 0.0 to 100.0. At 0.0, the clouds remain stationary.

Change only one control at first. This makes it easier to recognise which value is responsible for the visible difference.

Increase cloud thickness gradually and check the scene at several points in time. Cloud shadows can make the landscape look more vivid. Very dark or substantial clouds must not obscure the route, vehicle or text.

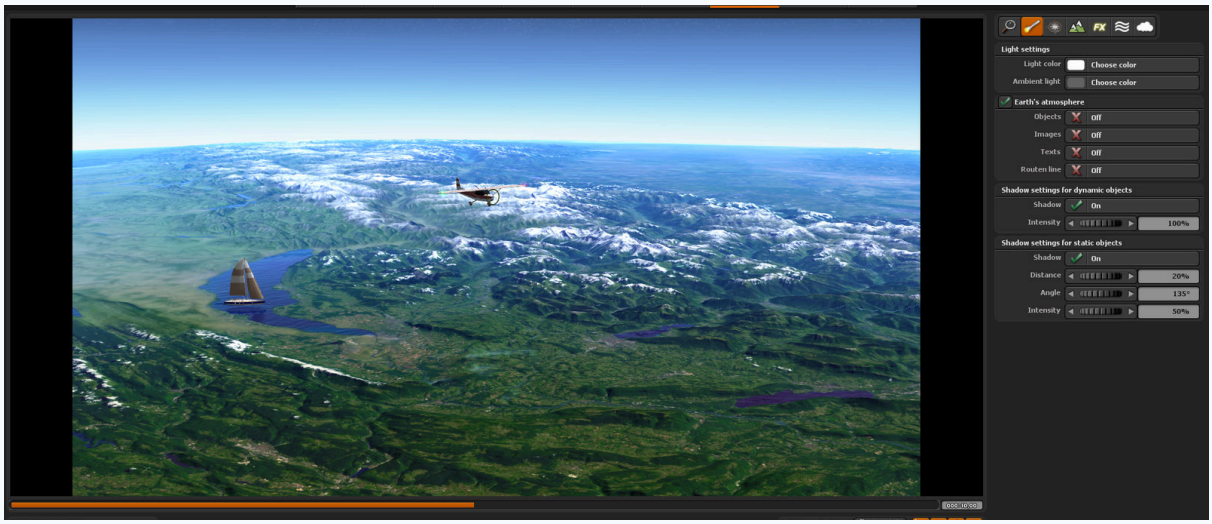


Clouds in a twilight scene with visible light and dark areas

If the landscape becomes too dark, reduce the cloud thickness first. It is often unnecessary to change the map colours or the lighting of the entire scene.

11.12 Day, twilight and night

The time of day changes more than brightness. The position of the sun, shadow length, light colour and the visibility of stars or illuminated object parts all change together. The following images show the same project at three different times.



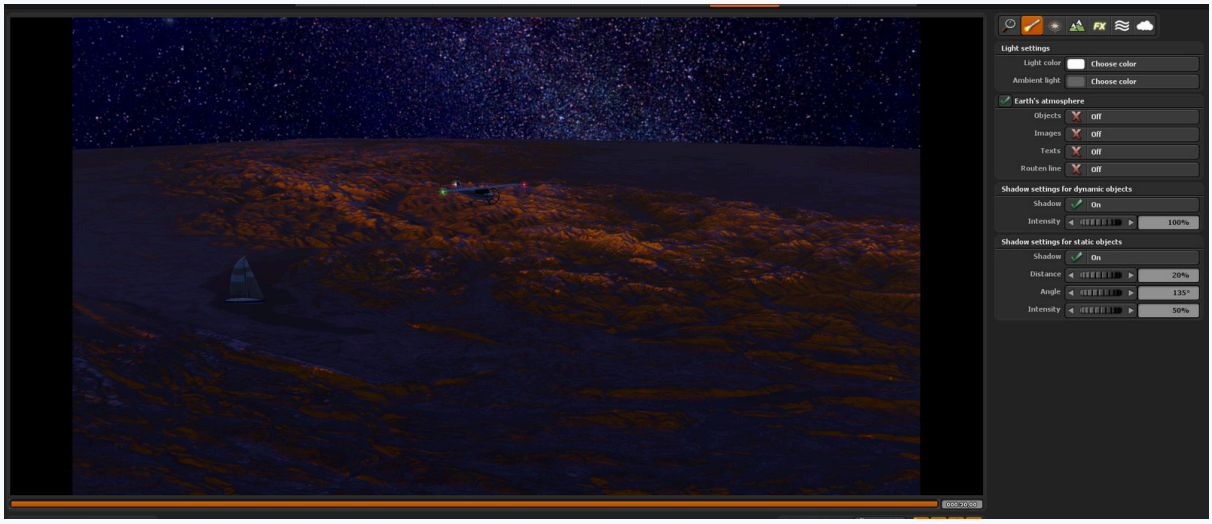
Daytime view at 10:00 seconds

During the day, the map, route and landscape are most prominent. Make sure that bright areas do not overpower text and lines.



Twilight view at 17:12 seconds

At twilight, the light colour and shadows change particularly noticeably. This period is well suited to an atmospheric transition, but it should last long enough to avoid an abrupt change.



Night view at 20:00 seconds

At night, the moon, stars, city lights, vehicle headlights and emission maps become visible. Check especially carefully that the head object, route and text can still be recognised.

There is no separate **Day**, **Twilight** or **Night** switch in this section. The lighting mood is created by the sun time in the camera settings. There you set the time, date and year, and choose whether the time is interpreted as local time or GMT. Change the sun time in small steps and check the transitions in the preview. **Moon and stars** and other night effects become visible as a result, but they must also be enabled in their own sections.

11.13 Quality and performance

Clouds, reflections, particles, depth of field and high-quality shadows require additional processing power. A slower editor view does not automatically mean that the final video will stutter. Final output is calculated frame by frame.

> **NOTE**
>
> Open **Main settings**, then **Graphic card setting**. Set **Preview quality** to **Balanced**. This helps the program respond smoothly and does not change the quality of the finished video. Set **Output quality** to **max. Quality**. This separate control determines the display quality of the finished video or exported images. A higher output quality can increase the calculation time.

The following workflow is recommended:

1. Design the scene using medium preview quality.
2. Check the timing and readability.
3. Increase the quality for a short test section.
4. Only then start the complete video output.

11.14 Final check

- Does each effect support the journey, or does it distract from the subject?
- Are light and shadows consistent in all important sections?
- Do the text, route and head object remain easy to recognise?
- Do water, particles and clouds look natural while moving?
- Does the selected lens flare suit the position of the sun?
- Are the moon, stars and illuminated object parts visible only in suitable night sections?
- Is the selected preview and output quality practical for the computer?

Chapter 12: Process, preview and quality control

The preview is the most important control before video output. Individual settings can be clearly seen in the editor view. However, only the running preview shows whether transitions, reading time, speed and camera movement match.

12.1 Open real-time preview

Click the **Real-time preview** button in the bottom toolbar. Vasco da Gama opens its own preview window.



Real-time preview with playback and range controls

The example shows the **Tutorial_03_FlyInOut** project at **31:08**. Below the preview image you can see the timeline, the current time position on the left and the playback controls in the centre. The controls are arranged from left to right:

Control	Purpose
Go to beginning	Shows the first frame of the project.
10 frames back	Moves back ten individual frames. This takes you to the required position more quickly than moving one frame at a time.
One frame back	Shows the previous individual frame. This is useful when you want to examine a transition precisely.
Play entire preview	Plays the project from the beginning and starts again after the end. Click again to stop playback.
One frame forward	Shows the next individual frame.
10 frames forward	Moves forward ten individual frames.
Go to end	Shows the last frame of the project.
Set start of playback range	Uses the current frame as the start of a freely selectable test range. The marker is used only for the preview and does not change your project.
Play marked range	Plays only the selected range and repeats it. Click again to stop playback.
Set end of playback range	Uses the current frame as the end of the test range.

Repeatedly check only one scene

You do not need to play the entire video from the beginning after every change:

1. Move to the first frame of the scene that you want to check.
2. Click **Set start of playback range**.
3. Move to the last frame of the scene.
4. Click **Set end of playback range**.
5. Click **Play marked range**.

Vasco da Gama now repeats only this section. This is particularly useful when you are adjusting a camera movement, an object change, or the fade-in and fade-out of a text.

> **TIP**
> First check only a short section. This is faster and makes errors easier to spot. Then check the entire trip.

12.2 Check in sensible sections

A complete check is best carried out in three passes:

1. **Procedure:** Are the order, holding times and speeds correct?
2. **Image design:** Do the route, vehicle, texts and important objects remain in the image?
3. **Atmosphere:** Do lights, shadows, clouds and night effects work together?

Note the time position of a conspicuous place. Then return to the editor and only change the relevant area.



Three different checkpoints within a journey

Do not check only the beginning and the end. The three examples deliberately use very different perspectives. Add checkpoints in bends, during large zoom movements, at stop points and when light or weather changes. This reveals problems that cannot be seen in a single still image.

12.3 Use mouse and keyboard

The real-time preview can be controlled entirely with the mouse. Click a position on the timeline to jump approximately to that point. For precise checking, then use the controls for one frame or ten frames. The current time position is shown on the left below the timeline.

The following keyboard commands are also available in the real-time preview:

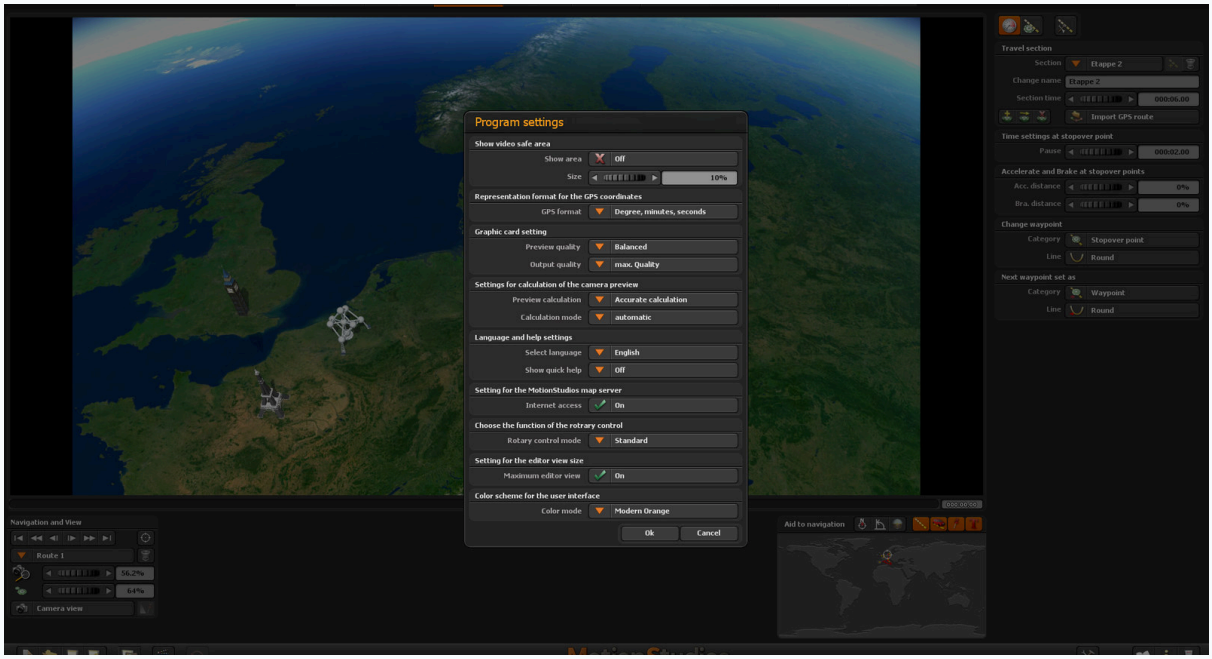
Key	Function
Minus (-)	Ten frames back
Left arrow	One frame back
P	Start or stop the entire preview
Right arrow	One frame forward
Plus (+)	Ten frames forward
I	Set the start of the playback range
Ctrl+P	Start or stop the marked range
O	Set the end of the playback range
Esc	Close the preview

NOTE

These keyboard commands work only while the real-time preview is the active window. If necessary, click once inside the preview window.

12.4 Set preview quality

Open the **Program settings** using the button with the spanner. In the **Graphic card settings** section, preview quality and output quality are set separately.



Program settings for preview and output quality

For **Preview quality**, the available options are **Performance**, **Balanced** and **Quality**. A higher level shows more detail but also requires more processing power and graphics memory. We recommend **Balanced** for normal editing.

Only **Output quality** also offers **max. Quality**. This highest setting is intended for calculating the finished video or exported images. It is deliberately not available for the preview: no current graphics card is fast enough to calculate this display quality reliably in real time for every scene. This is especially true when complex clouds are used.

We therefore recommend the following settings for most projects:

- **Preview quality:** Balanced
- **Output quality:** max. Quality

> **NOTE**
>
> Preview quality and output quality are two different things. A simplified preview can save time without reducing the quality of the final rendered video.

12.5 Recognize typical problems

The preview runs slowly

Temporarily reduce preview quality, shadows, reflections, or elaborate effects. Close other programs that use a lot of graphics memory.

The camera suddenly jumps or rotates

Check the camera points immediately before and after the location. Pay particular attention to the zoom, viewing direction and roll movement.

An object jerks at a waypoint

Check speed, hold time and movement calming. Vasco da Gama 20 calculates smoother transitions at different speeds. Points that are very close together or extreme values can still appear unsettling.

A text disappears behind a mountain

For important texts, choose the display without depth checking so that they always remain visible in front of the scene.

Night objects remain dark

Check whether the model has headlights or an emissions map. Not every older object supports these properties.

12.6 Checklist before output

- Has the entire journey been played at least once?
- Have the start, stopping points and finish been checked?
- Do texts remain visible long enough?
- Are large zooms quiet even in the middle?
- Do day-night transitions work without a hard jump?
- Are vehicle lights and illuminated object areas visible?
- Are there no unintentional blank or black areas of the image?
- Was the last working project status saved?

If all points are met, the project can be output as a video.

Chapter 13: Output the project as a video

When it comes to video output, Vasco da Gama calculates each image of the trip and saves it into a video file. The calculation can take some time depending on the resolution, runtime, effects and computer performance.

> **NOTE**
> Save the project first. Then check a short section and only then start the full video output.

13.1 Open output

Click the main **Export** tab at the top. The **Video output settings** window opens.

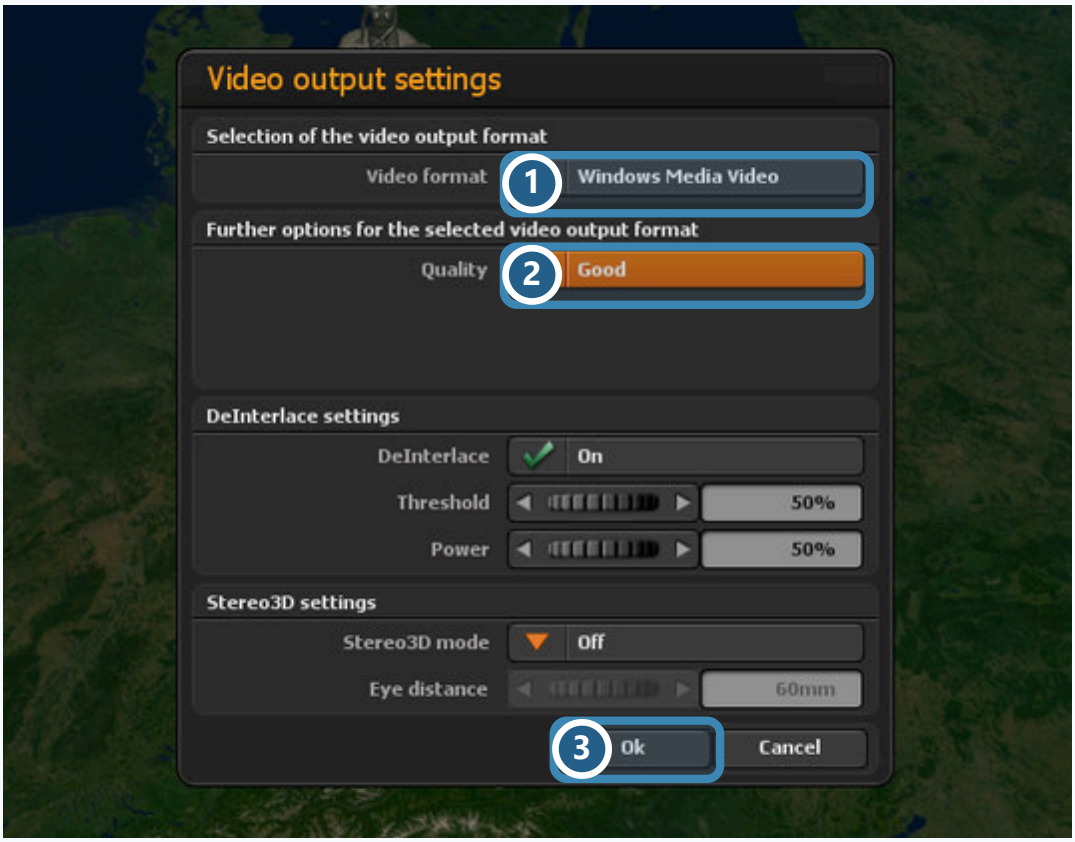


Illustration for this step

The window is divided into three areas:

Area	Purpose
Video format	Specifies the video or image format in which the result is saved. The selection affects compatibility, file size and the additional options shown below it.
Other options	Contains settings that apply to the selected format, such as codec, codec quality, image format or JPEG quality. This area may therefore change when you select a different format.
DeInterlace / Stereo3D	Contains special settings for flicker reduction and stereoscopic videos. For a normal 2D output, you can keep the usual default settings.

Proceed in this order:

1. Open the **Video format** list and select the required format.
2. Check the additional options that now appear and set the required codec quality.
3. For a normal video, leave **Stereo3D mode** set to **Off**.
4. Click **OK** to apply the settings. **Cancel** closes the window without using the selection.
5. In the following Windows window, enter the file name and destination folder.

The choice of format depends on where the video will later be played or processed. If you use an editing program, check beforehand which formats it can read reliably.

Video format and format-dependent settings

- **Video format:** Selects the storage format. A video format creates a playable video file; **Single images** creates a consecutively numbered image sequence instead.
- **Codec:** If this selection appears, it determines the method used to compress the video frames. The codec affects image quality, file size and whether the video can be played on other devices.
- **Image format:** Appears when outputting single images and determines the file format of the individual frames.
- **Full frames/fields:** Full frames are the correct choice for modern screens and most editing programs. Fields are only required for older interlaced video systems.
- **JPEG quality:** Appears for a JPEG image sequence. A higher value preserves more detail, but creates larger files.

13.2 Select codec quality

The **Quality** setting shown here belongs to the selected video codec. Depending on the codec, it primarily controls the bit rate and compression strength. A higher codec quality reduces visible compression artefacts, but usually creates a larger video file and may take longer to encode.

> **NOTE**
> This **Quality** setting is not the render-engine quality setting in the program settings. Render quality controls how accurately Vasco da Gama calculates items such as clouds, shadows, reflections and anti-aliasing. Codec quality controls how strongly the already rendered frames are compressed when the video is saved. The two settings work independently.

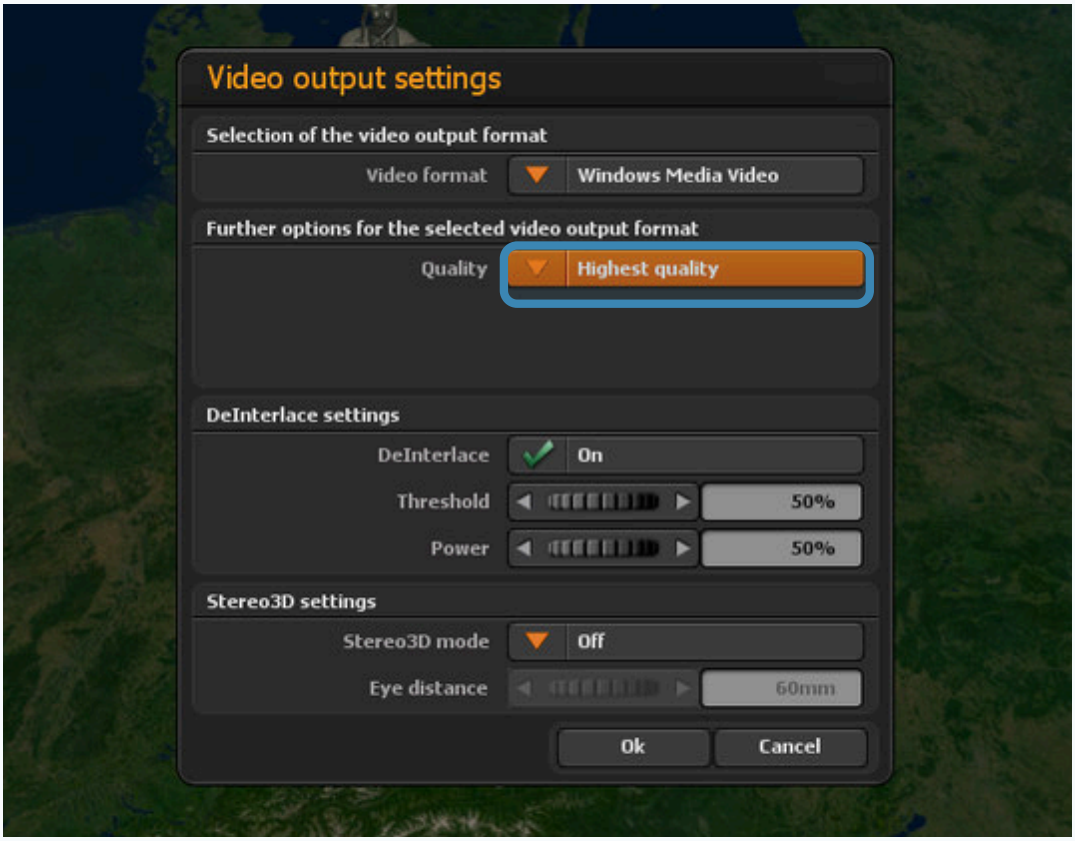


Illustration for this step

For most workflows we recommend:

- Use **Good** or a comparable intermediate codec level for short test videos. The files remain smaller and are quicker to check.
- Use **Highest quality** for the final version if sufficient storage space is available and the selected codec offers this level.
- Calculate a short difficult section with clouds, water, shadows or night light before a long output.

> **TIP**
> A quick test calculation often saves more time than it costs. You'll spot format or quality issues before several hours have passed for the full video.

13.3 Set DeInterlace and Stereo3D

DeInterlace

The DeInterlace settings reduce flicker on fine horizontal lines and high-contrast edges. This can be useful for older interlaced video systems. This processing is usually not required for modern progressive output.

- **DeInterlace:** Switches flicker reduction on or off. Enable it only if distracting edge flicker is visible in the test video or if the target system requires this processing.
- **Threshold:** Determines the brightness or colour difference from which smoothing is applied. A low value affects more areas of the image; a high value mainly processes clearly visible differences.
- **Power:** Determines the strength of the smoothing. A high value can reduce flicker more strongly, but may also make fine image details look softer.

Change **Threshold** and **Power** in small steps and check a short test section. This shows whether the flicker is reduced without making the image unnecessarily soft.

Stereo3D

Stereo3D creates separate views for the left and right eye. This output is intended only for suitable 3D playback equipment or specific further processing.

- **Stereo3D mode: Off** creates a normal 2D video. The two **Side-by-Side** variants arrange the left and right eye next to each other; depending on the variant, the partial images are saved at half or full width. **Left eye only** and **Right eye only** output only the respective eye view.
- **Eye distance:** Determines the distance between the two virtual camera positions and therefore the strength of the spatial effect. A value that is too high can be uncomfortable to watch. Start with the default and change it only carefully.

> **NOTE**
> If you are not creating a special 3D video, leave **Stereo3D mode** set to **Off**. Eye distance then has no effect.

13.4 File name and destination folder

After confirmation, a normal Windows window opens. Choose an easy-to-find folder and a unique file name.

Suitable names include, for example, project, resolution and version:

- `Bremen-Hamburg_FullHD_Test.mp4`
- `Bremen-Hamburg_4K_Final.mp4`

Avoid accidentally overwriting a final version that has been reviewed. For new variants, use an additional version number or date.

13.5 During calculation

While Vasco da Gama is calculating the video, the computer can be significantly busy. Leave the program open and avoid making any changes to the project.



Progress display while a video is being calculated

The progress display shows the current state. With complex scenes, the bar may move only slowly for a while. This is normal as long as the program continues working and no error message appears.

> **NOTE**
> Do not quit Vasco da Gama or Windows during calculation. For a mobile computer, make sure that the power supply is connected and that no automatic sleep mode begins.

13.6 Check finished video

Open the finished file in a video player and check at least:

- start and end of the video,
- all breakpoints,
- texts and special characters,
- fast camera movements,
- day-night transitions,
- Spotlights, emission maps and shadows,
- Sound, if this was added later in an editing program.



Example frame from a finished travel video

Watch the result in full-screen mode and at normal playback speed whenever possible. Individual still frames may look correct even though a camera turn, a fade or the movement of the head object is still uneven in the running video.

Save the Vasco da Gama project with the finished video. Only the project file allows later changes to the route, camera and effects.

Chapter 14: Tutorial 2 – Designing a Challenging Itinerary

In this tutorial you will build a varied trip yourself step by step. The journey begins in **Hamburg**, leads via **Munich** to **Barcelona** and is then complemented by a freely designed round trip in the Mediterranean region. For the three travel sections, you use different header objects, your own location texts and differently designed route lines. Sights, an automatic tracking shot, an additional night version as well as a fly-in and fly-out complete the project.

Allow approximately 60 to 90 minutes for this tutorial. Work without haste and save a new version of the project after each major section. This means you can return to a functioning interim status at any time.

> **NOTE**
> The images show a fully developed example. The exact location of individual bases and sights may vary slightly in your project. What is crucial is that you understand the process described and can then apply it to your own travels.

14.1 Prepare a new project

1. Launch Vasco da Gama 20 and select **Expert Mode**.
2. Select **Ground mode** as the map display.



Select Expert mode and Globe mode for the tutorial

Set the project settings

1. Open the project settings.
2. For this example, use **1920 × 1080 pixels**, **25 frames per second**, **Progressive** and **Square pixels**.
3. Confirm the settings and save the still empty project, for example as `Tutorial_03_Aufbau.prj`.



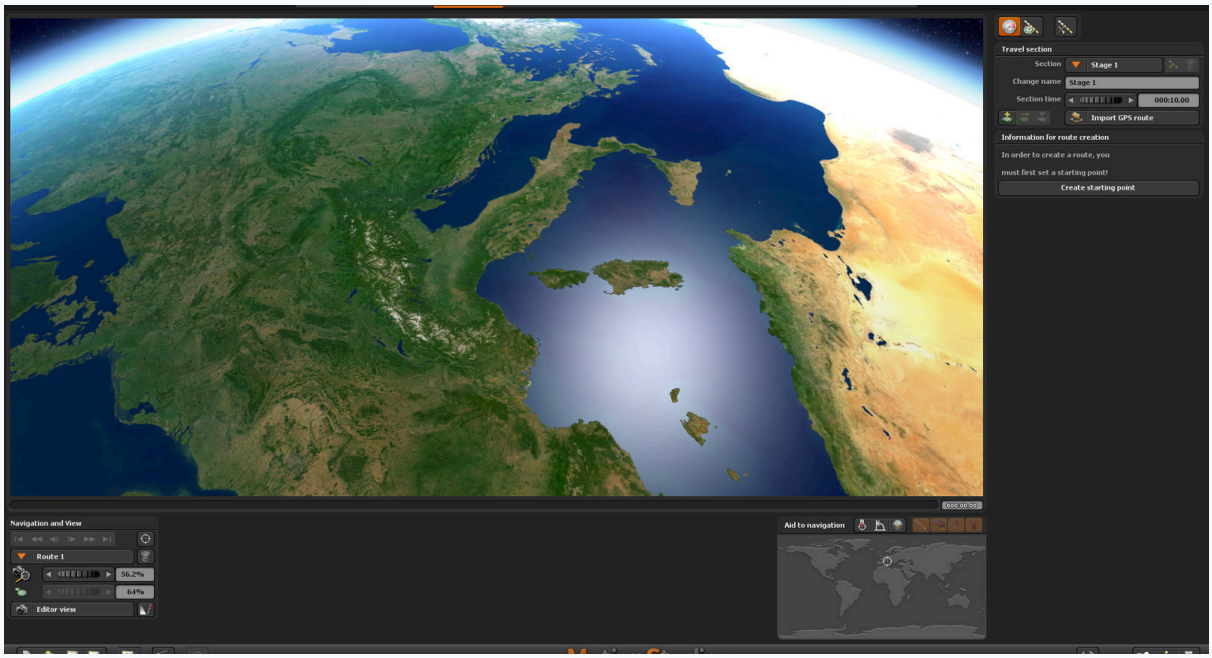
Project settings for the new tutorial project

TIP

Save additional versions such as `Tutorial_03_Route.prj`, `Tutorial_03_Objekte.prj` and `Tutorial_03_Final.prj` later. These intermediate steps make corrections much easier.

14.2 Overview of the empty project

Open the main **Route** tab. Since there is no starting point yet, Vasco da Gama shows the **Create starting point** button. In the map view you can now zoom in or out using the mouse wheel. Hold down the left mouse button to move the map.



Empty project before setting the first stopover point

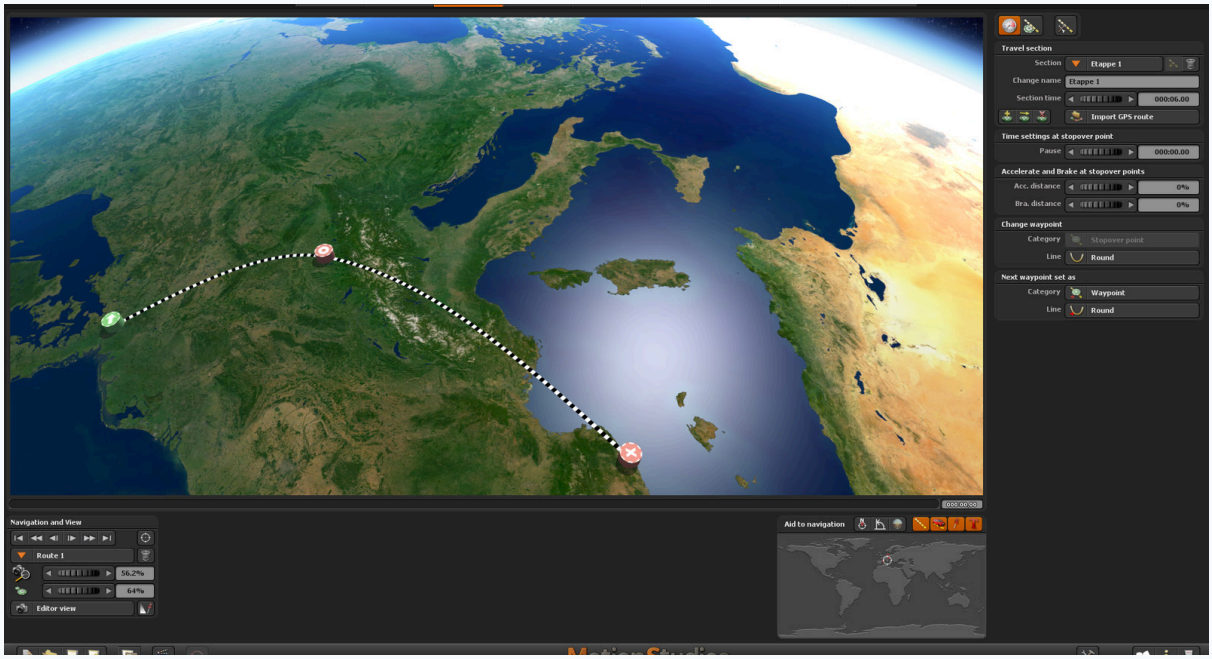
NOTE

A detailed overview of mouse and keyboard operation can be found in the chapter **Mouse operation and keyboard shortcuts**. Zooming, moving and rotating the view are also explained there.

14.3 Adopt Hamburg, Munich and Barcelona from the location database

The first three breakpoints are not freely placed on the map. You use the location database for this. This means that the points are reliably in the correct geographical positions.

1. Open **Location Search** and enter `Hamburg`.
2. Select the appropriate entry in the results list and accept it as the starting point.
3. Add `München` as the next breakpoint in the same way.
4. Then add `Barcelona` as the third breakpoint.
5. Leave the automatic creation of the location text switched on. The texts are designed in more detail in Section 14.7.



The three stopover points added from the location database

> **NOTE**
>
> Use the location search for well-known cities and places. Free base points, on the other hand, make sense if you only want to shape the course of the route.

14.4 Set the first support point by hand

From Barcelona, the route will no longer run directly from city to city, but will continue as a freely designed Mediterranean journey. Create the first manually set point particularly carefully:

1. In the map view, select the stop point **Barcelona**.
2. On the right, under **Set next waypoint as**, set the category **Base point**.
3. Zoom in or move the map until the desired area is clearly visible.
4. Click on the map at the desired location. The new base will be added to the route behind Barcelona.
5. Check whether the connection line is in the intended direction. If the point is in an inconvenient position, move or delete it and set it again.



The first manually placed waypoint after Barcelona

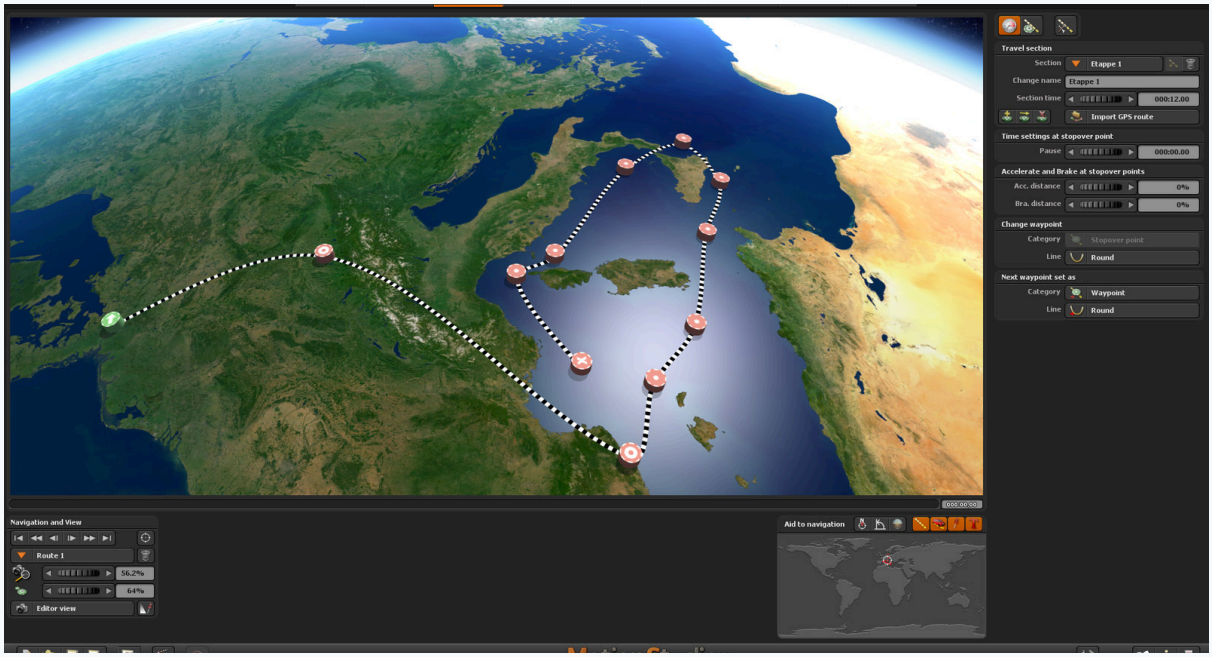
TIP

Initially only set a few, well-placed support points. Additional points can be added later. Too many points that are close together make editing difficult and can cause unnecessary, unsteady movements.

14.5 Complete the Mediterranean route

Now place the remaining support points one after the other. Always use the same process as with the first manually set point: select the desired predecessor, set **base point** as a category and then click on the map.

Take the route from Barcelona via the Western and Central Mediterranean. The example uses a total of twelve waypoints and stopping points. Your points don't have to be in the same places pixel-perfectly.



The complete Mediterranean route built with waypoints

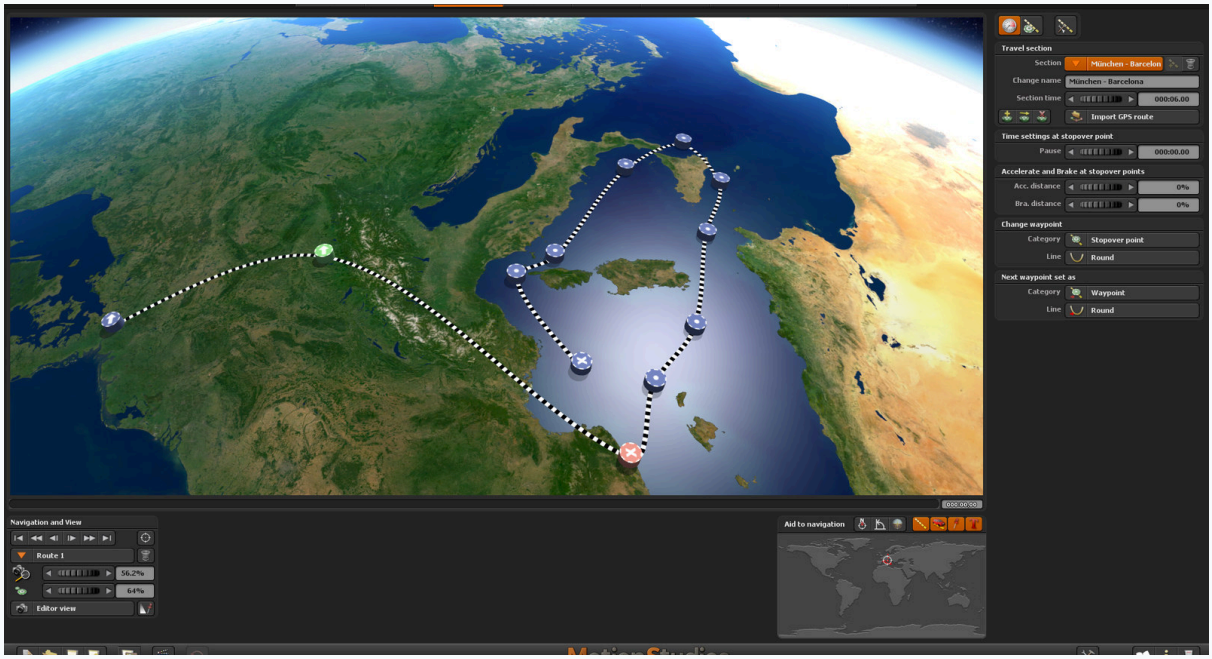
NOTE

The dashed representation at this stage is for orientation purposes only. The final colors and line types will not be set until section 14.9.

14.6 Create three travel sections

Now divide the trip into three sections. This allows each part to have its own duration, header object and route line.

1. The first section leads from **Hamburg to Munich**. Set a duration of **6 seconds** and enter the name `Hamburg - München`.
2. The second section leads from **Munich to Barcelona**. Also use **6 seconds** and the name `München - Barcelona`.
3. The third section covers the cleared Mediterranean route. Use **10 seconds** and the name `Mittelmeer-Rundreise`.
4. Select the sections one after the other in the **Section** selection field and check the beginning, end, name and duration of each.



The route divided into three named travel sections

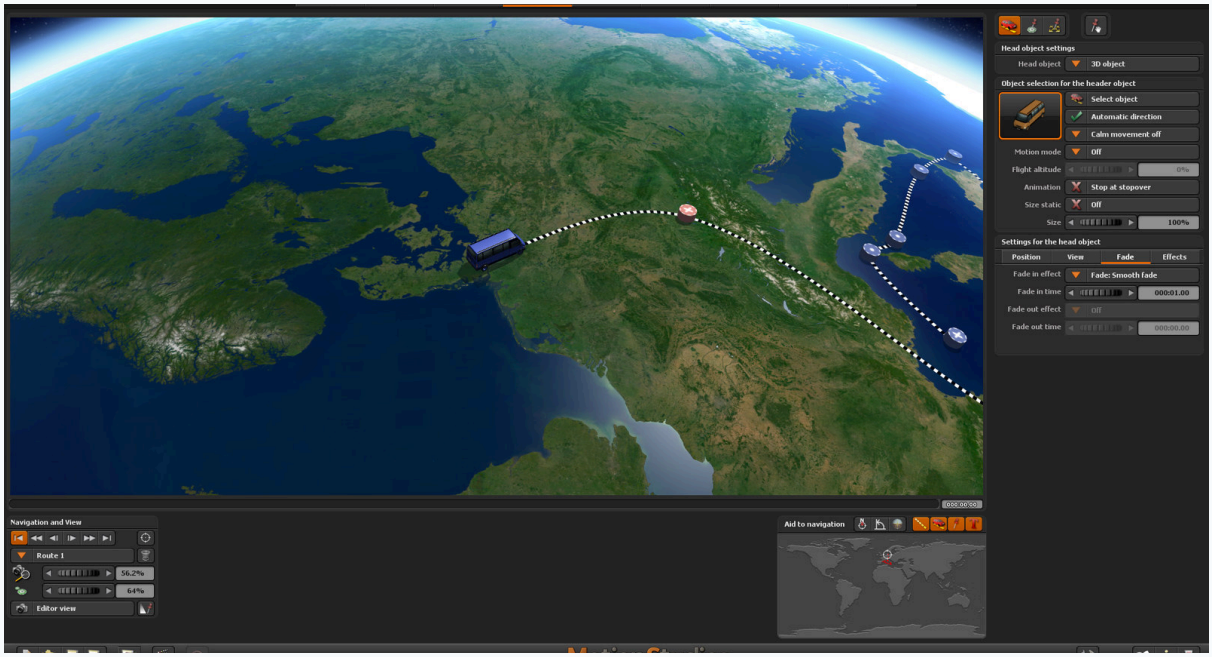
NOTE

A meaningful section name is particularly helpful for longer projects. It only appears during editing and makes orientation easier; it will not automatically appear in the finished video.

14.7 Select the head objects of the three sections

Set the first head object in detail

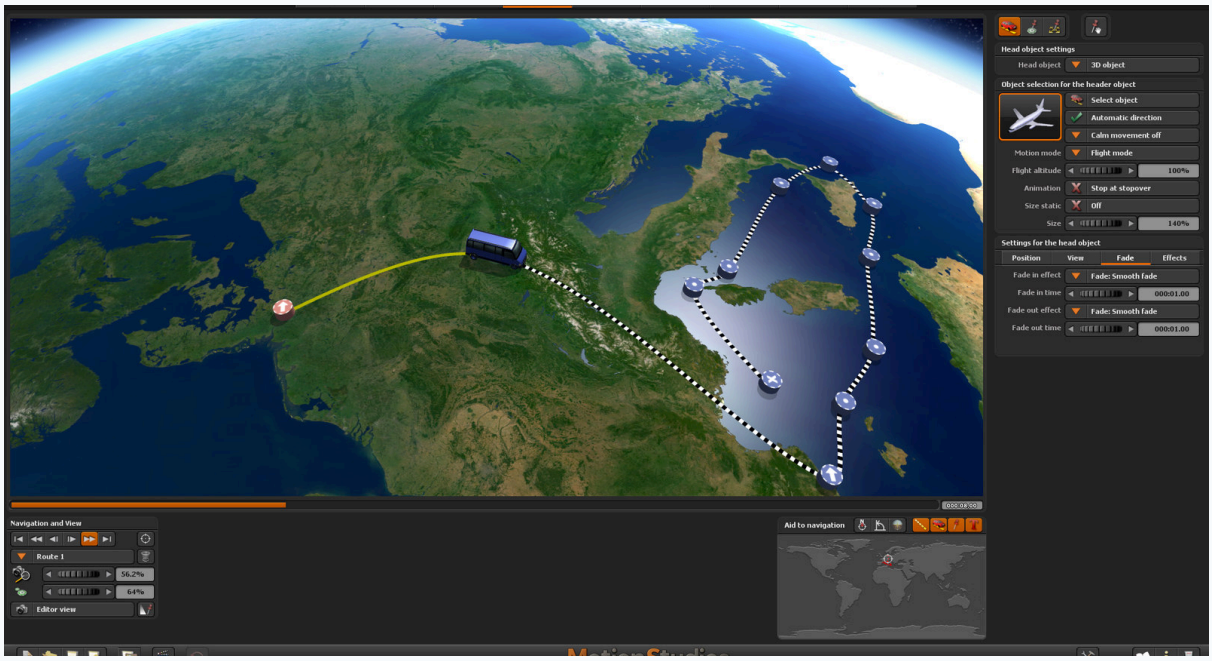
1. In the main **Route** tab, select the **Hamburg – Munich** section.
2. Open the main tab **Objects** and there the settings for the **Head object**.
3. Click **Select Object**.
4. Select a passenger van or comparable road vehicle from the object gallery.
5. Enable **Automatic Direction** to have the vehicle follow the route.
6. Check size, position and fade in time. A fade-in time of one second is used for the example.



Passenger vehicle as the head object of the first section

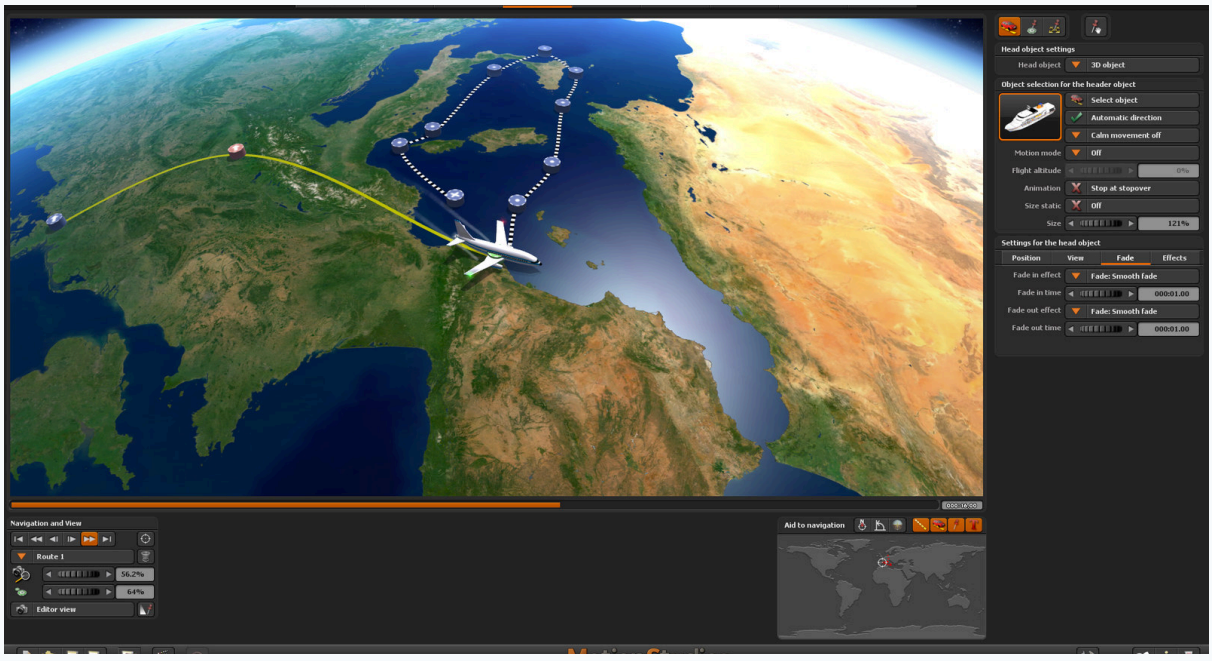
Set the other head objects according to the same procedure

Select the **Munich – Barcelona** section and repeat the process described. This time use an airplane, in the example a **737**.



Aircraft as the head object of the second section

Then select the **Mediterranean round trip** section and use a ship, in the example the **MS Columbus**.



Ship as the head object of the Mediterranean round trip

14.8 Design the local texts

First select the breakpoint **Hamburg** and open the main tab **Texts**. Activate the text at the breakpoint and check the content. Under **Position**, set the height to approximately **35%**. Then select under **View** that the text remains aligned with the camera and easy to read.



Set the text and height for the Hamburg stopover point

The higher height has a practical reason here: the text floats above the head object and therefore does not visually collide with the vehicle, plane or ship. Especially with flat camera angles, the place name and head object remain clearly separated from each other.

Repeat the same process for **Munich** and **Barcelona**. Then check all three labels in a common overview.



The adjusted location texts for Hamburg, Munich and Barcelona

TIP

If text disappears behind a mountain or disappears into the ground when the camera is in an awkward position, select the **Yes, always visible** setting under **View**. This option is described in more detail in Chapter 9.

14.9 Set stopping times at Munich and Barcelona

The journey should take a short rest at the two major intermediate destinations. Select the stopping point **Munich** and set a stopping time of **2 seconds** under **Time details at the stopping point**. Repeat the process for **Barcelona**.



A two-second pause at the selected destination

During a hold time there is time for the place name, the environment and the change to the next head object. Check the transition later in the preview. Two seconds is a good starting point; At particularly important locations the break may be longer.

14.10 Design the route lines of the sections

In the main **Route** tab, open the settings for the route line of the current section. Then select each section of the journey individually and give it an easily distinguishable representation.

In the example, the trip from Hamburg to Munich has a yellow line, the flight to Barcelona has a yellow-red line and the Mediterranean trip has a blue line. You can adjust the width, line type and pattern to suit your taste.



Different route lines for the three travel sections

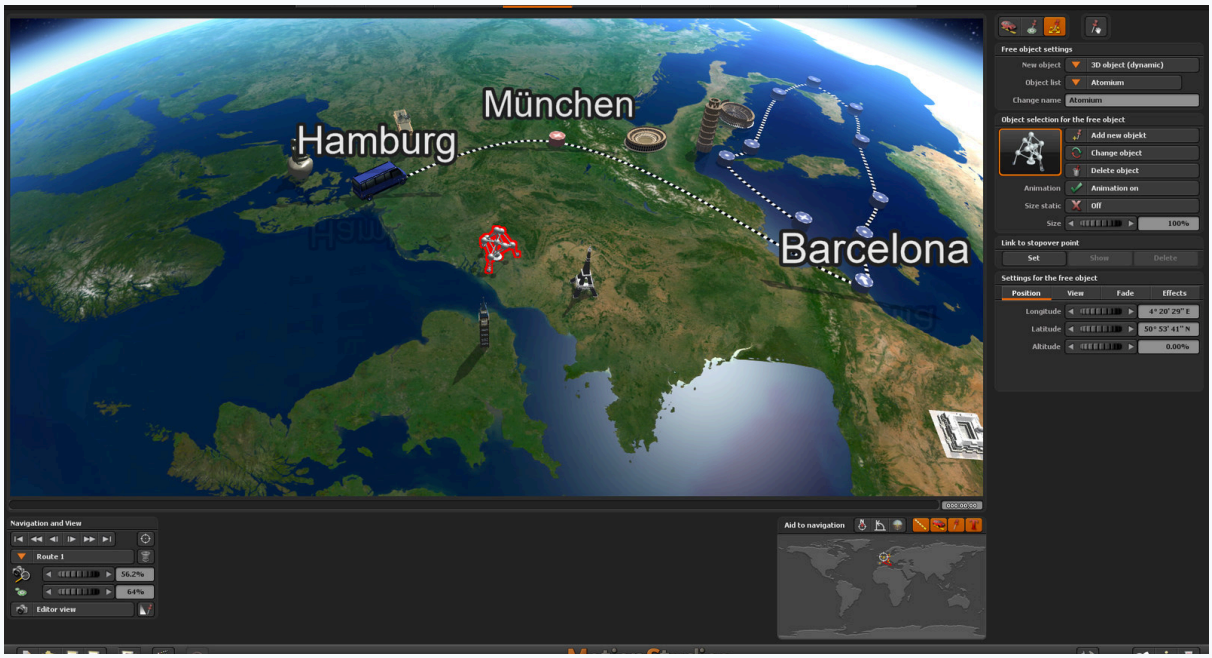
NOTE

Change the line of the selected section here and do not accidentally change the global line setting. The global setting affects the entire route.

14.11 Use the first sight in detail

The **Atomium** is used as the first free object. This process serves as a template for all other sights.

1. Open the main **Objects** tab and select **Free Object**.
2. Click **Add New Object**.
3. Open the object gallery with **Select Object** and select the **Atomium**.
4. Give the free object a unique name. In the example it is also `Atomium`.
5. Set the location on the map. If necessary, move the object until it is clearly visible next to the route.
6. Control size, orientation and height. The object should stand out, but should not obscure the route or a location text.



The Atomium as the first freely placed object

> **NOTE**
> In this processing status, only the first free object is intentionally available. All other sights will then be added following the same process.

14.12 Add more sights

Add the rest of the points of interest following the same process: **Add a new object**, select the object, name it uniquely, position it on the map, and then control the size and orientation.

The example uses next to the Atomium:

- the Brandenburg Gate,
- the Little Mermaid,
- Big Ben,
- the Eiffel Tower,
- the Colosseum,
- the Arena of Verona,
- the Leaning Tower of Pisa,
- the Palacio Real.



All sights in the project overview

TIP

A few clearly visible objects usually work better than many models that are close together. Also check the placement in the camera view, as this is the only place where you will see the later image section.

14.13 Set up the automatic camera movement

Open the main **Camera** tab and select **Automatic camera tracking**. In the first step, let the camera follow the **route line**. The example uses a calm panorama profile and an adjusted zoom correction.



Automatic camera movement along the route line

Play the journey in sections and pay attention to the following points:

- The head object must remain completely in the image.
- Local texts should not be cut off at the edge of the image.
- Large landmarks must not obscure the view of the route and head object.
- The change between vehicle, plane and ship should appear calm and comprehensible.

If a scene looks unfavorable, add an additional camera point at that point or change the profile and zoom correction. Other camera modes and their differences are explained in Chapter 10.

14.14 Create an additional night version with vehicle lights

The new lighting options of Vasco da Gama 20 can be controlled particularly well in its own night version. Therefore, first save the previous project under a new name, for example `Tutorial_03_Nachtlichter.prj`. The normal daily version therefore remains unchanged.

1. Open the main **Camera** tab and select **Advanced camera control**.
2. In the bottom camera track, select the first camera point at **00:00**. Turn on **Sun time at camera point** and set **1. July, 4:00 p.m.**.
3. Select the other camera points one after the other and use **1 at** 00:07**. July, 10:35 p.m.**, at **00:17** the **2. July, 4:00 a.m.** and at **00:31** the **2. July, 6:00 a.m.**.
4. Click **Apply camera settings** after each camera point. Only then will the time, date and year be saved at this point.
5. Switch to camera view, slowly move the timeline forward and control all three journey segments.

Vasco da Gama automatically calculates the intermediate positions of the sun. The date change between the second and third camera points is important: it causes time to move forward past midnight and not jump back from late evening to early morning of the same day. For this additional version, the plane and ship were deliberately replaced by **jet** and **yacht** because these models show the new lighting options particularly clearly.

People transporter with headlights

Move the timeline to the first leg of the journey. As soon as the environment is dark enough, the prepared people transporter creates a directed beam of light. It moves with the vehicle and illuminates the area in front of the head object.



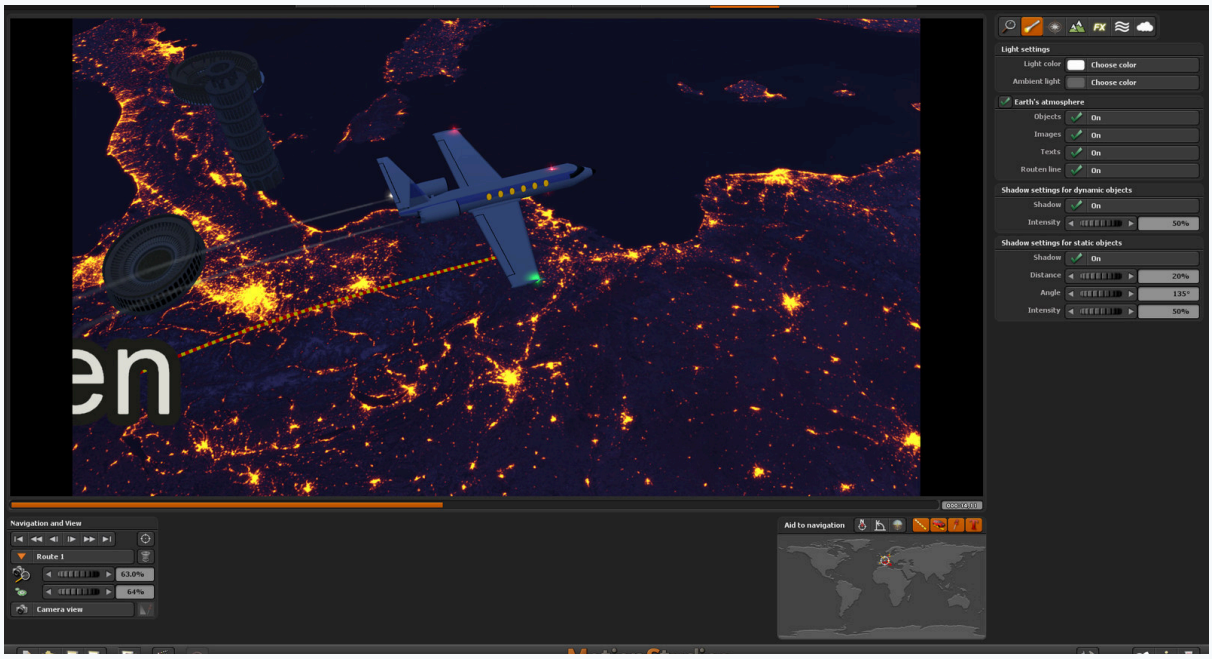
Passenger vehicle with visible headlight beam in the dark

NOTE

The light cone becomes visible automatically. A separate switch on the head object is not required. However, the 3D model used must support the headlight function.

Jet with position lights

Then check the second leg of the journey. The red and green position lights on the jet can be clearly seen even against the dark terrain. This makes it easier to understand the aircraft's orientation during movement.

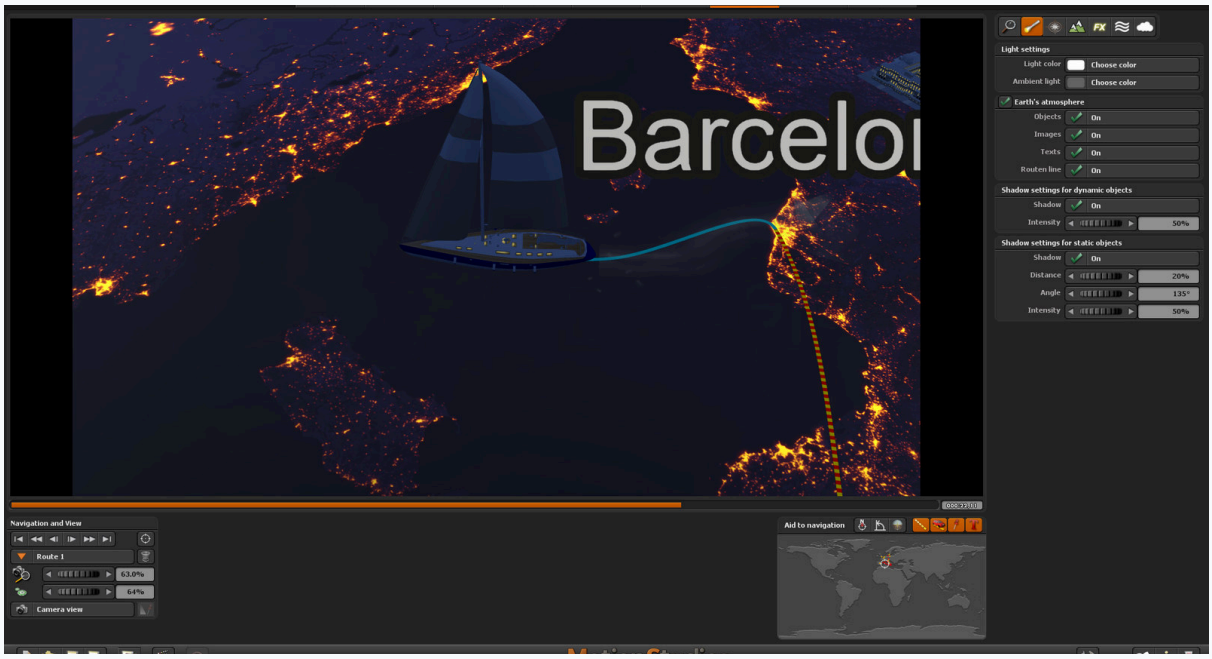


Jet with red and green navigation lights during a night flight

Suitable models already come with their light information. Vasco da Gama takes them into account depending on the brightness of the scene. In daylight, the illuminated surfaces recede; at night they become clearly visible.

Yacht with luminous model areas

In the third leg of the journey you will see the yacht off the Mediterranean coast at night. Illuminated areas on the model remain visible even though the hull, water and surroundings are already dark. Such self-illuminating surfaces are determined using a so-called **emissions map**.



Yacht with illuminated model areas off the coast at night

Not every older 3D model has headlights, position lights or an emissions map. If an object remains completely dark at night, this is not automatically a program error. For a night trip, use an appropriately prepared model and check the result at several points on the timeline.

> **TIP**
>
> When using a night version, also check the legibility of the local texts and route lines. Very dark colors that look good during the day may have too little contrast at night.

14.15 Add fly-in and fly-out as the last step

Fly-in and fly-out are only set when the route, objects, texts and the actual camera movement are correct. To do this, use the **Fly In/Out** tab in the camera settings.

1. For **Fly In**, choose a movement that leads to the journey from a distant overall view.
2. Set a duration of approximately **4 seconds**.
3. For **Fly Out**, select a move back to a wide view.
4. Again, use approximately **4 seconds**.



Fly-in and fly-out at the beginning and end of the journey

In the example, the journey begins and ends with a distant view of Earth. This gives the video a clear beginning and a calm ending.

14.16 Check the finished project

Switch to camera view and examine several points in the timeline. The following illustration shows the Mediterranean journey with ship, colored route line, local texts and sights.



Section of the completed itinerary in camera view

Then check the entire project in the editor view. Select all three travel sections, all stopping points and the most important free objects again.



The fully assembled tutorial project

The tutorial is complete when:

- the journey is divided into three meaningfully named sections,
- Hamburg, Munich and Barcelona are correctly labeled,
- Personnel transport, plane and ship appear in the correct section,
- Munich and Barcelona each have a suitable holding time,
- the three route lines are clearly distinguishable,
- the sights are sensibly placed,
- the automatic camera shows head objects and texts well,
- Headlights and illuminated model areas are clearly visible in the night version,
- Fly-in and fly-out form a quiet beginning and end.

> **TIP**
> Save the final version as `Tutorial_03_Final.prj` . For the video output, then use the process described in Chapter 13. First calculate a short test area and then the full video.

Appendix A: Mouse and Keyboard - Basic Operation

Vasco da Gama 20 can be operated entirely with the mouse. Keyboard shortcuts are voluntary shortcuts. You don't have to memorize them. First, only use the commands that fit your workflow.

Mouse in editor and map view

Input	Effect
Left mouse click on a point	Select waypoint, stoppoint, camera or object point.
Move left mouse button pressed	Move the selected point or rotate the map or earth, depending on the active area.
Right click on a route point	Delete the existing waypoint if editing allows it.
Move right mouse button pressed	Change the viewing angle and tilt angle of the editor view.
Mouse wheel	Zoom in and out in map or editor view; Scroll up and down in many lists.

Confirm or reject changes with the mouse

With pop-up switches and rotary controls, a change that has been started is usually applied with another left mouse click or with **Enter**. As long as it has not been confirmed, you can right-click or press **Esc** to return to the previous value. This is particularly helpful if a value that has been accidentally changed significantly makes orientation difficult.

Free objects

Input	Effect
Left mouse button pressed	Select and move a free object.
Ctrl + left mouse button	Change the size of the free object.
Right mouse button pressed	Rotate free object.
Ctrl or Shift + right mouse button	Rotate object around another axis.

NOTE

Attention: Which mouse action is carried out depends on the active tab and the selected element. Before dragging, check that the correct point or object is selected.

Appendix A: Points, Stages and Clipboard

button	Effect
Image on	Activate previous waypoint or stopping point. The previous camera point is selected in the camera area.
Image from	Activate next waypoint or stop point. The next camera point is selected in the camera area.
Pos1	Select the first point of the active route or the first camera point.
end	Select the last point of the active route or last camera point.
Del	Delete active waypoint or breakpoint if this is possible in the current area.
Arrow left	Reset time position by one frame.
Arrow right	Advance the time position by one frame.
1 to 9, 0	In expert mode, select Route 1 to Route 10.

Copy and Undo

Keyboard shortcut	Effect
Ctrl + C	Copy important data of the active route point. The current camera data is copied in the camera area.
Ctrl + D	Copy camera data in the camera area.
Ctrl + V	Apply previously copied point or camera data to the current target. Depending on the area, a selection of the values to be copied may appear.
Ctrl + Z	Undo the last appropriate edit.
Ctrl + W	Switch height correction between linear and fine-graded calculation. This expert function changes the gradation of height values and should only be used specifically.

TIP

Only copy multiple settings together if you want the starting and destination points to be really similar. Then check the time, height and camera orientation in particular.

NOTE

Older manuals also mention **Ctrl + I**, **Insert** and **Shift + Page Up/Page Down**. In Vasco da Gama 20, these abbreviations are no longer assigned the functions they used to have. Therefore, set new points with the mouse or the visible switches.

Appendix A: Editor view and visibility

Remember camera positions of the editor view

Keyboard shortcut	Effect
Shift + F1 to F4	Save up to four editor camera views.
F1 to F4	Recall a previously saved editor camera position.

These save locations are useful if you frequently switch between a general view and multiple close-up views while editing. They do not change the actual tracking shot of the video.

Show and hide elements in the editor view

button	Effect
Q	Toggle display of the route line in the editor view.
W	Show or hide header objects in the editor view.
E	Show or hide holding objects in the editor view.
R	Show or hide text objects in the editor view.

Cancel

With **Esc** you can cancel a running action or an open selection window. For example, if you move a free object while still holding down the mouse button, **Esc** will restore the original position. In many dialogs, **Esc** corresponds to the **Cancel** switch.

> **NOTE**
> The Q, W, E and R keys affect the work display in the editor. Additionally check the final result in the camera view or preview.

Appendix A: Preview and time range

button	Effect
P	Start or stop preview.
I	Set the beginning of the desired preview area at the current time position.
O	Set the end of the desired preview area at the current time position.
Ctrl + P	Start or stop only the marked area between start and end.
Plus	Fast forward ten frames.
Minus	Rewind ten frames.
Arrow right	One picture forward.
Arrow left	One picture backwards.

The highlighted area is particularly useful if you only want to assess a specific scene. You then don't have to replay the entire project from the beginning every time you make a change.

Why check image by image?

The arrow keys help with transitions, fade-ins and exact camera positions. Go back and forth a few frames if an object appears too early, text fades out too late, or a camera cut appears jittery.

> **TIP**
> For particle effects, start at the beginning of the relevant time period and move forward. Jumping from the end back to the beginning deletes particles that have already been built up and therefore does not show the same development.

Appendix A: Lists and selection windows

Many long lists in Vasco da Gama 20 support additional input. These include, for example, location, map, model and font selections.

Input	Effect
Mouse wheel	Move visible list section up or down.
Arrow up	Select previous entry.
Arrow down	Select next entry.
Pos1	Select the first entry in the list.
end	Select the last entry in the list.
Enter	Accept the selected entry and close the window. Often corresponds to **OK**.
Esc	Close window and discard changes. Often corresponds to **Cancel**.
Letter or number	Skip to the next entry that begins with this character.

Press the same first letter repeatedly to cycle through multiple matching entries one after the other. For example, if you have a long list with many vehicles, pressing **F** repeatedly can cycle through entries starting with F.

> **NOTE**
> Character entry is not a complete search function. It only looks for the beginning of the entry. For city names, use the location search provided.

Appendix A: Input fields and dials

Text and number fields

button	Effect
Arrow left / right	Move the cursor by one character.
Pos1 / End	Jump to the beginning or end of the field content.
Del	Delete characters to the right of the cursor.
Ctrl + C	Copy the contents of the active field to the Windows clipboard.
Ctrl + V	Paste text from the Windows clipboard into the active field.
Enter	Confirm entry.
Esc	Discard change and restore previous content.
Tab	Finish input and move to the next designated control element.

Function wheels and rotary controls

In the main settings you can specify how function wheels are operated. With **Standard** you drag the value directly with the mouse. With **click - mouse wheel - click** you activate the controller with a left mouse click. The controller is shown in blue. Then change the value using the mouse wheel or the arrow keys.

Input	Effect when the controller is active
Mouse wheel, right arrow or up arrow	Increase value.
Mouse wheel in opposite direction, arrow left or arrow down	Decrease value.
Enter or left mouse button	Accept new value.
Esc or right mouse button	Discard change and restore old value.

TIP

If a controller is very sensitive, use the arrow keys. This allows the value to be changed in small, controlled steps.

Appendix B: Frequently Asked Questions - Getting Started and Projects

Should I use Easy Assist or Expert Mode?

Easy Assist leads to a complete route with just a few decisions and is good for getting started. Expert mode offers direct access to routes, objects, texts, camera and effects. Use it when you want to design specifically or edit multiple stages.

Do I need to understand each setting before I begin?

No. First create a simple route using Tutorial 1. Then get to know only the areas you need for your next project. The mini help explains unknown controls directly on the switch.

Why should I save multiple project versions?

In the case of extensive projects, intermediate statuses make corrections easier. For example, save versions by route, objects, camera and effects. If you don't like a later change, you don't have to start over.

What is the difference between project file and video?

The project file contains settings and references to data used. It's not a finished video yet. Only the video output calculates all images in the selected resolution, rendering quality and codec setting.

> **TIP**
> If possible, keep the project file and images you use yourself in a common project structure. This makes it easier to back up or transfer to another computer later.

Appendix B: Frequently Asked Questions - Saving and Retrieving Projects

My project opens, but my own images are missing. What can I do?

First, check whether the image files were moved, renamed, or saved to an unconnected drive. Vasco da Gama 20 also looks for missing images in the project file folder and in an existing **Images** folder. The most reliable solution is therefore a common project structure: the project file and your own images used are in a project folder, and the images are preferably in the **Images** subfolder.

Why are cards or objects missing after moving to another computer?

A project file stores settings and references, but does not automatically contain all map, object and additional packages. Install the same packages on the target computer and copy your own media. If an additional package is missing, the project can usually still be opened; however, the associated objects are not displayed.

How do I secure a large project?

1. After important steps, save a new version, for example `Reise_01_Route`, `Reise_02_Kamera` and `Reise_03_Effekte`.
2. Copy the project file and your own media together to a backup drive.
3. Occasionally open a copied version to check.
4. Retain the last working version until the final video has been reviewed.

Can I overwrite an older project directly?

First save a project from an older program version under a new name. This means the original remains unchanged if you want to access it again later with the older version.

> **NOTE**
> **Attention:** A project is not a complete data backup of all installed maps and objects.

Appendix B: Frequently Asked Questions - Route and Camera

Why don't I see a connecting line when I set a point?

Check the global setting **Distance** and the visibility of the route line. If the actual route line is turned off, the guide line can still help with editing. It shows the direction to the next point without being part of the finished video.

I accidentally deleted or moved a point. What now?

If possible, press **Ctrl + Z** immediately. If further changes were made afterwards, it is better to open a previously saved project version. Always save a new version before major modifications.

Why is a point a waypoint and not a breakpoint?

A waypoint mainly shapes the route. A stop point also has a stop time and can show objects or texts at a station. Mark the point and check its point type. Only change the points to stopping points where you want the journey to visibly stop.

Why does a head object move hectically in tight curves?

Many small waypoints with quick changes in direction can seem unsettling. **Calm Movement** interpolates these changes. Use the function especially when there are many hard curves on short distances. If the curves are already wide and soft, it is usually not necessary. Heavy smoothing can move the head object laterally away from the unchanged route line.

Why is the automatic camera not as expected after moving a route?

Camera data is on its own track and is not copied when a route is copied or moved. A manual camera remains. The automatic camera uses Route 1 as a reference. If route 1 is moved to another route, its previous calculation basis is missing in this particular case.

Can I also edit in the camera view?

Yes. Editor and camera view allow editing. In the camera view, you see objects and text as they appear later in the video. Switch between both views regularly.

Appendix B: Frequently asked questions - Check the camera specifically

Why does the camera suddenly show an unsuitable section?

First check the active camera mode and the selected camera point. In automatic modes, route, time position and altitude change the section. With a manual camera, you control the position, target and alignment at the relevant camera point. Jump back and forth a few frames to see if just a single point or an entire section is affected.

Why does a camera transition appear jerky?

Large differences between camera points in direct succession can cause abrupt movements. Increase the time interval, set a suitable intermediate point or gradually adjust the direction, height and inclination. First check the transition in a short marked preview area.

Why does the automatic camera change even though I haven't edited any camera points?

The automatic camera is calculated from route 1 and the current time position. Changes to route, speed or stopping times can therefore also change the calculated camera path. Check the camera again after major changes to Route 1.

How do I reliably compare two camera settings?

Mark a short area with **Mark In** and **Mark Out**. Before making changes, save the project with a new name and play the same section in both versions. Individual still images are not sufficient to assess movement.

> **TIP**
> Always assess a tracking shot a few seconds before and after the changed location.

Appendix B: Frequently Asked Questions - Objects and Texts

Why is a particular vehicle or landmark missing?

The available content depends on the Vasco da Gama package and additionally installed object packages. For examples, choose items from the main category **Vasco da Gama** if possible if you want to be sure that other users also have them.

Why does text disappear behind a mountain or in the ground?

Open the text's settings and change the terrain visibility to **Yes, always visible**. This renders the text in front of the terrain. This helps both behind mountains and at camera angles where the caption appears to sink into the ground.

Why does text float over the head object?

The height above the ground can be deliberately chosen so that the text and header object do not collide with each other. Check the setting in the camera view at several points in time because the viewing angle and distance change.

Why doesn't the vehicle follow the route line exactly?

Check **calm movement** first. Strong smoothing only affects the movement of the head object; the route line remains unchanged. Reduce smoothing if the vehicle is visibly traveling off route.

When should I use calming movement?

The function is useful when many small waypoints cause hard changes of direction over a short distance. The head object then does not follow every small change abruptly. For long, already smooth curves, additional smoothing is usually not necessary and can unnecessarily remove the object from the line.

Why is a vehicle pointing in the wrong direction?

Check the object orientation and the selected camera orientation. Some models have a different basic direction due to their design. First correct the orientation of the object and then check several parts of the route, especially before and after tight turns.

Why don't all vehicles light up at night?

Automatic headlights, position lights and emission maps require appropriately prepared models. If the model is not supported, the display remains unchanged.

Appendix B: Frequently Asked Questions - Maps and GPS

Why do I see fewer base cards than in the instructions?

The basemap window displays different content depending on the installation. The selection depends on the Vasco da Gama package purchased and additional map packages. A missing card is therefore not automatically an installation error.

Why doesn't my own map show a flat area?

An imported map can be located on a globe depending on the base map chosen. For a flat work surface, the map display and base map must be set accordingly. Check both before importing the map.

How do I remove map data that I added myself?

Open the imported map selection and use the function to remove the self-added data there. Then check whether the desired base map is active again.

Why does an imported GPS track look different than a released route?

A GPS track contains many actual recorded points and therefore follows the real path. A freely set route only connects the points you have specified and can have a different course. Treat both ways of working as alternatives.

Why is a map or image file not found?

Check that the data drive is connected and has the same drive letter. Vasco da Gama 20 also searches for missing project images in the project folder and in suitable image folders.

Why doesn't a GPS track fit exactly on the visible road?

GPS records, maps and road data can vary in accuracy. A weak GPS signal or a simplified map drawing also causes deviations. First check map position and track. Only correct clearly disturbing sections and keep a copy of the imported track beforehand.

Appendix B: Frequently Asked Questions - Lighting and Effects

Why don't I see city lights during the day?

City lights recreate illuminated residential areas from a height and only appear on the night side. In a bright daytime scene they are not visible. Switch it off if you also want to display the night side without city lighting.

Why don't I see any sun reflection on the water?

The reflection depends on the position of the sun relative to the camera and the water surface. Change the time of day or camera angle and check the scene again. A switched-on effect alone does not guarantee a visible reflection.

Why are there no particles visible?

Particles build up over time. Start at the beginning of the section and slowly move the timeline forward or play the preview. If you jump to the end first and go backwards, no new particles will be built.

What are atmospheric solar rays?

They are visible bundles of light that are structured by clouds or obscuring objects. The English technical term is Godrays. The effect is strongest when there is backlight and a suitable atmosphere.

Why is depth of field barely noticeable?

The difference becomes visible when there are close and far away subjects in the image and the focus range is set appropriately. When viewed from a distance, almost all areas of the image can appear sharp.

Why does an effect look different in the still image than in the preview?

Some effects respond to time, movement, position of the sun or camera. Therefore, don't just check a single image. Play for a few seconds and always use a forward timeline motion for particles.

Appendix B: Frequently Asked Questions - Preview and Output

Why is the preview jerky?

A preview is calculated in real time. Clouds, shadows, reflections, particles and high resolutions increase the effort. Set the preview quality to **Balance** in the main settings. This setting does not automatically change the quality of the final output file.

Why is there no Max Quality selection in the preview?

This calculation stage is for output only. Current graphics cards cannot always display particularly complex scenes with clouds in real time with maximum quality.

What does quality mean in the codec window?

The codec quality controls the compression of the video, for example via bit rate or quality level. It is not the same as the quality of the rendering engine. The render quality determines how accurately Vasco da Gama calculates the scene; the codec determines how these calculated images are stored.

Do I always have to test the entire video?

No. Set the start and end of a preview or output area. First, examine a short, meaningful scene. This allows you to identify errors more quickly and save calculation time.

Does a jerky preview also have to jerk in the finished video?

No. The preview attempts to display the scene in real time and can skip images if there are complex effects. The output fully calculates each image. Check the result with a quick test output before changing any settings just because of a slow preview.

Why is the output file very large?

File size depends on resolution, frame rate, duration, codec and codec quality. High quality and low compression require more memory. Before the full output, create a short test and check it in the intended editing program.

Appendix B: Frequently Asked Questions - Video Output and Codec

Why can't the video be opened in the editing program?

Not every editing program supports every codec. First, create a quick test at the same resolution and frame rate as your editing project. If you have problems, choose another available codec or image sequence and check which formats your editing program explicitly supports.

Why does the output stop or no file is created?

Check free space, write permissions and output path. As a test, use a short file name in a local folder. A network drive, an unconnected drive, or a format not supported by the codec may prevent output. Write down an error message completely.

Why aren't the aspect ratio or frame rate correct in the editing program?

Project, Vasco da Gama output and editing project should use the same resolution, aspect ratio and frame rate. For example, if a 16:9 video is inserted into a different editing project, black edges or distortions may occur.

Which quality setting do I need to compare?

The **Output Quality** determines the calculation of the scene. The **Codec quality** determines the compression and bit rate of the already calculated images. If display errors are visible, first change the output quality; If there are blocks or unnecessarily large files, change the codec setting.

> **TIP**
> Before doing a long calculation, test ten to twenty seconds from a demanding scene and then open the file in the intended editing program.

Appendix B: Frequently Asked Questions - Installation and Performance

Where should I install the program?

The program path requires comparatively little space and can normally remain on the Windows C: drive. For the second path with the extensive data, choose a drive with enough free space. An external drive is also possible.

What do I have to consider with an external data drive?

Connect the drive before starting the program and, if possible, use the same drive letter permanently. Changing the letter may result in maps, elevation or object data not being found.

What can I do if Vasco da Gama doesn't start?

- Restart Windows.
- Check whether installation and activation have been completely completed.
- Check the data drive and free space.
- Update the graphics card driver directly from the manufacturer.
- Make a complete note of an error message that appears.

Why are no maps or objects found despite installation?

Vasco da Gama uses a program path and a separate data path. Check whether the data folder selected during installation still exists and is accessible. For an external drive, the drive letter must match the original installation.

What do I do if I receive an activation or serial number message?

Transfer the serial number exactly and pay attention to easily confused characters. Use the number only for the associated product version and package purchased. Never post the serial number in forums or screenshots. If the message persists, send the exact wording to support via the designated support channel.

Appendix B: Frequently Asked Questions - Performance and System Reserves

How do I improve work speed?

Use **Balance** for the preview, close unnecessary programs and only test complex effects in a short area. A fast SSD for data and projects shortens many loading times. The final output may then use a higher quality.

How much free space is needed?

In addition to program and map data, projects, intermediate data and especially videos require additional storage. Before a long output, check both the destination drive and the Windows drive. Leave a significant reserve free instead of filling the disk to the last free unit.

Which graphics card driver is the right one?

If possible, use the latest driver directly from the graphics card manufacturer. Windows can install a driver that basically works, but it does not always provide all the performance and OpenGL functions optimally. Before updating, note the existing driver version.

Does lower preview quality also help video output?

Above all, it speeds up work and testing. The final output has its own quality setting. That's why you can work with **Balance** and then save the finished video in **Highest Quality** or **Max. Calculate quality**.

> **NOTE**
> Current system requirements and information on supported program packages can be found at www.motionstudios.de.

Appendix B: Quick help according to error pattern

observation	Check first	Then read
Map, image or object missing	Data drive, file path, installed package	Chapters 5, 8 and 9
Vehicle drives next to the line	Calm movement, object orientation	Chapter 8
Text disappears in terrain	**Yes, always visible**, height above ground	Chapter 9
Camera shows wrong area	Camera mode, route 1, active camera point	Chapter 10
Effect is not visible	Time position, camera, position of the sun, preview forward	Chapter 11
Preview stutters	Preview quality **Balance**, highlight short area	Chapter 12
Video is very large	Codec, bitrate, resolution and duration	Chapter 13
Video won't open	Codec compatibility and short test output	Chapter 13
Program does not start	Data path, free memory, graphics card driver	Chapter 1

Check only one cause at a time

Do not change multiple settings at once. Eliminate a possible cause, check the same time position again and record the result. This way you can reliably see which setting is responsible and can undo the change if necessary.

When does a new test project make sense?

If you cannot determine whether the cause lies in the project or the program, create a small new project and only use the affected function there. If it works in the test project, the cause is most likely in a setting or file in the original project.

Appendix B: Systematic Troubleshooting

If a result looks unexpected, don't immediately change many values at once. Do this in this order:

1. Save the project with a new name.
2. Move to a time position where the problem is clearly visible.
3. Check which main tab and which element are active.
4. Read the mini help for the switch in question.
5. Turn the suspicious effect off and on again once.
6. Check the scene in editor and camera view.
7. Temporarily reduce preview quality or additional effects.
8. Restart Vasco da Gama and open the saved test version.
9. Create a quick preview or test output.

Appendix B: Prepare a support request

Prepare for a support request

Write down:

- the exact version and the Vasco da Gama package used,
- the Windows version,
- manufacturer and model of the graphics card,
- the exact wording of an error message,
- the last steps before the problem,
- whether the error also occurs in a new test project.

If possible, include a small project file that can be used to understand the problem. Beforehand, remove personal content that is not needed for the exam.

Also add:

- a screenshot with the complete program framework and the settings window open,
- in case of output problems resolution, frame rate, output quality and codec,
- in case of display problems, the relevant time position in seconds and images,
- if files are missing, original and current storage location,
- an indication of whether the problem still occurs after a restart and in a small test project.

NOTE

Caution: Do not post your full serial number in forums, screenshots or publicly accessible files. Submit registration information only through the support channel designated by MotionStudios.

Appendix C: Support and Contact

Further help, current information and program updates can be found on the MotionStudios website:

- Internet: www.motionstudios.de
- Frequently asked questions: www.motionstudios.de/FAQ
- Support email: support@motionstudios.de
- General Inquiries: info@motionstudios.de

Information for quick processing

If possible, mention in a technical query:

1. exact program version and program package,
2. Windows version,
3. Graphics card model and driver version,
4. complete error message,
5. short sequence of steps to recreate,
6. Information as to whether the problem also occurs in a new project.

Describe not just that something “didn’t work,” but what outcome you expected and what happens instead. A screenshot can be helpful if the switch, error message and visible result are visible.

> **NOTE**
> Before requesting, check whether a current program update or a new graphics card driver is available. Back up your project before beginning an installation or upgrade.

Appendix C: Updates, examples, and learning guides

On the MotionStudios website you will find product information as well as example projects, information about updates and other learning opportunities. The online FAQ supplements this manual with questions that concern several products or current offers.

Useful order when learning

1. Read Chapter 2 and learn about the main tab, editor view, and camera view.
2. Complete Tutorial 1.
3. Use the thematic chapters for your own projects.
4. Complete Tutorial 2 if you want to combine multiple stages and design elements.
5. Do not use mouse and keyboard shortcuts until you are familiar with the basic process.

When updating

- Exit Vasco da Gama before installing.
- Back up important project files and self-created content.
- Leave data drives connected.
- After the update, first check a copied test project.

TIP

Keep this PDF along with some working example projects. This gives you orientation even if you haven't worked with the program for a long time.

Appendix D: Glossary - A to C

Alpha Channel Additional image information for transparency. PNG and TIF can contain an alpha channel; JPG usually not.

Animation Changes in position, camera, light, text or other properties calculated over time.

Atmosphere Representation of sky, light scattering, haze and color effect between day and night.

Atmospheric Sun Rays Visible beams of light in backlit situations, often called Godrays.

Resolution Number of pixels in a video, for example 1920 x 1080.

Basic map Map base on which route and objects are displayed. The available selection depends on the program package.

Frame Rate Number of frames per second. It is also known as fps.

Bitrate Amount of data per time period of a video or audio file. A higher bitrate can mean better quality and larger files.

Codec Methods for saving and compressing video. Codec quality is not the same as rendering quality.

Appendix D: Glossary - D to G

Depthbuffer / depth buffer Determines which parts of the image are spatially in front of or behind others. Text and images can always be kept visible without the terrain being obscured.

Drone Camera Camera mode for free-looking, spatial movements with greater control over flight direction and viewing angle.

Editor view Working view with overview of route, points and placed elements.

Emission Map Additional image of a 3D model that identifies self-illuminating areas, such as windows or position lights.

Stage Part of a journey. Multiple stages can use different head objects, lines and times.

Fade in / Fade out Softly fade in or out an object, text or image.

Fly-in / Fly-out Introductory or final camera movement, often from a wide view of the route and back again.

fps Frames per second, i.e. images per second. See frame rate.

GeoTIFF TIF image file with additional geographic positioning information.

GPX Common file format for GPS tracks, waypoints and routes.

GPS track Sequence of recorded geographical points that describe a path actually traveled.

Appendix D: Glossary - H to K

Holding object 3D object or image that appears at a stopping point and identifies a location or event.

Breakpoint Route point with its own length of stay. Text, objects and special camera settings can be used on it.

Height Map Additional image with height information for the surface effect of a 3D model.

Highest quality Recommended high level of calculation for final output. It takes more time than a work preview.

JPEG XL / JXL Modern image format with high compression. It is used, among other things, for large quantities of map tiles.

Camera view View of the scene from the perspective that can be seen later in the video. Edits are also possible here.

Camera point Timed camera position or camera setting between which the program calculates movements.

Tab Area of the program interface with which you can switch between topics such as routes, objects, texts, camera or effects.

Head Object Vehicle, plane, ship or other 3D model moving along the route.

Appendix D: Glossary - L to O

lens flare Artificially generated light reflections from a bright light source in the camera image. Vasco da Gama 20 offers multiple styles.

Mark In / Mark Out Start and end of a selected time range for preview or output.

Max. Quality Particularly complex rendering stage for the output. It is not available for real-time preview.

Mini Help Short help text that appears directly on a control element when the mouse pointer stops there.

Object package Additionally installable collection of 3D models. Not every object in the illustrations belongs to every program package.

Orientation line Guide when editing a route. It can be visible even if the actual route line is turned off.

Location database Searchable collection of geographic locations that can be used to set breakpoints at known locations.

Appendix D: Glossary - P to P

Particle System Time-dependent generation of many small elements for smoke, dust, steam or similar effects.

Pixel Aspect Ratio Shape of the individual pixels. For modern videos, **Square Pixels** is commonly used.

Progressive Image composition in which each video frame is saved in its entirety. In contrast to the older interlaced method.

Project file File with settings and references of a Vasco da Gama project. It does not automatically contain all image or map files used.

Rendering Calculating the finished frames of a video.

Render Quality Accuracy with which scene, shadows, clouds, reflections and other effects are calculated. Do not confuse with codec quality.

Route Temporally animated route consisting of waypoints and stopping points.

Route line Visible line of travel in the finished image. Design and visibility can be adjusted per route.

Base Point for shaping the route without having to stay for a long time.

Appendix D: Glossary - T to Z

depth of field Camera effect in which only a certain range of distances appears in focus.

Timeline / Timeline Timeline overview of the project. On it you select the current time, camera points and preview areas.

TIF High quality image format with possible alpha channel. As a GeoTIFF, it can also contain geodata.

Preview quality Calculation level for smooth work. The **Balance** setting is a good starting point.

Waypoint Point that forms the course of the route. In contrast to the stopping point, it usually does not have a longer stay.

Cloud Quality Detail and calculation level of cloud representation. Higher quality requires more computing power.

Time index Time specification made up of seconds and individual images, for example 05:07 with five seconds and seven images.

Zoom Enlarge or reduce the visible map section or change the camera distance.

> **NOTE**
> Technical terms in the manual are explained in everyday language if possible. The English name is only added if it is common in the program, in a file format or in other video applications.

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NOTE

The numbers refer to chapters. Terms from appendices are indicated with the name of the appendix. You can go directly to the desired area via the table of contents or the PDF bookmarks.

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TIP
If you are not sure what a visible element is called, start with Chapter 2. The main window overview maps the most important areas of the program interface.

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate

All three editions use the same basic workflow. Their main differences are the amount of included data, maps and object packages. The following table helps you identify which components belong to your edition.

NOTE

Separately purchased map or object packages can extend your installation. Therefore, not every item shown in this manual must be available on every computer.

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Quickt & Easy Assist 3	YES	YES	YES
Depth of field effect	YES	YES	YES
Easy flight mode (flight movements with just one click)	YES	YES	YES
Switchable clouds	YES	YES	YES
3D mountain landscapes	YES	YES	YES
Simulation of ocean waves with solar reflections	YES	YES	YES
Reflections of objects, texts and mountain landscapes on the sea	YES	YES	YES
64Bit processor support	YES	YES	YES
Multi-core processor support	YES	YES	YES
Optimized display quality (latest technologies)	YES	YES	YES

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate - Camera, objects and route

Camera, objects and route

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Creation of stereoscopic 3D videos	YES	YES	YES
Drones camera work	YES	YES	YES
Automatic camera control with camera profiles	YES	YES	YES
Fixed camera mode for motionless cards	YES	YES	YES
Manual camera work with keyframes	YES	YES	YES
Placing objects and texts at checkpoints	YES	YES	YES
Text at stopover points	YES	YES	YES
Adjustable route color, style and width	YES	YES	YES
Using your own 2D objects (images) as head objects, key objects or free objects.	YES	YES	YES
Adding national borders	YES	YES	YES

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate - Text, media and animation

Text, media and animation

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Save videos as Raw DV, AVI DV type 1/2, VfW, AVI (DirectShow), Windows Media Video (wmv), QuickTime (mov) and as image sequences (JPG, BMP, TGA and PPM)	YES	YES	YES
Hide/show texts and objects at checkpoint	YES	YES	YES
Adjustable route color, style and width	YES	YES	YES
Acceleration and deceleration at checkpoints	YES	YES	YES
Free positioning of text and objects	YES	YES	YES
Different fonts can be used simultaneously	YES	YES	YES
Integration of own photos	YES	YES	YES
Particle animation, e.g. real smoke from steam locomotives	YES	YES	YES
Simulation of animated turns, arrivals and departures of objects	YES	YES	YES
Free camera movement (camera zoom, position, tilt and angle)	YES	YES	YES

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate - Maps, preview and GPS

Maps, preview and GPS

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Light and shadow effects adapt to the position of the sun (the month and time can be freely selected), e.g. the sunrise or sunset	YES	YES	YES
Alternative control dial mode	YES	YES	YES
Quick save button for projects	YES	YES	YES
Simple map mode	YES	YES	YES
Enhanced map mode	YES	YES	YES
Simple camera mode	YES	YES	YES
Uniform timeline	YES	YES	YES
Undo function	YES	YES	YES
Import of GPS tracking routes (formats such as CRS, G7T, GPX, KML, TCX, OVL and others)	YES	YES	YES
Analysis of GPS data from images, allowing for images to be placed automatically in the location where they were taken.	YES	YES	YES

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate - Included data and detail levels

Included data and detail levels

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Support of High Definition Video HDV, HDTV, 4K and Ultra HD	YES	YES	YES
Start of the route with exact time data	YES	YES	YES
Simulate up to 10 independent routes at the same time (rallies)	YES	YES	YES
Different speeds can be set for the selected objects	YES	YES	YES
Improved preview, i.a. the setting of mark in/out points	YES	YES	YES
3 basic world maps (Blue Marble, Classic Sat and Classic Earth	YES	YES	YES
Library with 3D objects	approx. 350	approx. 350	over 7.800
Number of GPS database entries of cities, capitals and villages	365.269	4.526.205	4.526.205
Degree of detail (map size in pixels) for land mask, night lights, city names and country borders	65.536 (0.26 GB)	262.144 (1.81 GB)	262.144 (1.81 GB)
Degree of detail (map size in pixels) for mountain landscape	65.536 (0.22 GB)	524.288 (9.75 GB)	524.288 (9.75 GB)
Object Package "Sights"	NO	NO	YES

Appendix F: Edition comparison - HDPro, HDPro XXL and HD Ultimate - Additional object and map packages

Additional object and map packages

Vasco da Gama 20	HDPro	HDPro XXL	HD Ultimate
Object Package "Aircraft and Airlines 7"	NO	NO	YES
Object Package "Ships and Boats 6"	NO	NO	YES
Object Package "Vehicles 2"	NO	NO	YES
Object Package "Wildtiere"	NO	NO	YES
Object Package "Cartoons 2"	NO	NO	YES
Object Package "Airports Germany"	NO	NO	YES
Earth Maps Adventure	NO	NO	YES
Earth Maps Aesthetic	NO	NO	YES
Earth Maps Classic	NO	NO	YES
Bonus Map "Mond"	NO	NO	YES
Bonus Map "Mars"	NO	NO	YES