

Interreg



Co-funded by
the European Union

Estonia – Latvia

Placement of Webcams on Hiking Trails



<https://baltictrails.eu/lv>

Project: “ **Forest and Coastal Hiking Trail’s accessibility improvement for different social groups**” (EE-LV0013), 01.07.2023. – 30.06.2026.

Project partners:



Latvian Rural Tourism Association “Lauku ceļotājs”



Kurzeme Planning Region



Vidzeme Planning Region



Movement Spontaneous, Latvia



Riga Planning Region



MTÜ Maaturism, Estonian Rural Tourism Association



Pärnu Bay Rotari Club

The Municipality of Häädemeeeste, Estonia

Setomaa Municipality, Estonia

NGO “Peipsimaa tourism”, Estonia

Table of contents

EXAMPLE FROM LATVIA.....	3
1. Objective	3
2. What Are the Prerequisites for This Purpose?	3
3. What Is Needed for the Camera to Operate and Ensure Data Transmission?	4
4. Which Cameras Did We Choose?.....	4
5. How and Where to Install the Camera?.....	5
6. What Are the Problems and Risks?	6
7. How to Integrate Camera Data into a Website?	6

8. How Does It Look to the User?	6
9. Recommendations.....	7
10. Involved Partners.....	8
11. Related Videos	8
12. Sources.....	8
13. Appendix.....	9
EXAMPLE FROM ESTONIA.....	11
1. Objective	11
2. Camera selection	11
3. Location selection	11
4. Partners involved.....	11

EXAMPLE FROM LATVIA

Specific target audience: seniors, parents with young children, school-age children, youth.

Non-specific target audience (transferable experience):

- Municipalities and regional planning authorities
- Managers of specially protected natural areas through which hiking routes pass
- Businesses located along or near hiking routes (e.g. accommodation providers, food service establishments, equipment rental points, local guides, and others)
- Associations, such as regional hiking route organisers, hiking clubs, and similar groups
- Any potential hikers interested in current weather conditions in a specific region

Experts consulted during development of the solution: IT company “AIT”

Solution implementer: Latvian Rural Tourism Association "Lauku ceļotājs".

1. Objective

Nowadays, there are many different sources of information available (online, on the radio, TV) that provide both forecasts and updates on current meteorological conditions. However, just as important is the real-time visual representation of a specific location, which can provide additional insight into local natural conditions—precipitation, wind intensity, trail surface condition (dry, muddy, snowy, etc.).

Visual information allows potential hikers to gain a better understanding of the environment and helps them prepare more effectively for their hike by choosing appropriate gear—clothing, footwear, and more.

For this purpose, a suitable tool is webcams (hereinafter referred to as "cameras") placed in nature, near hiking trails. In the case of the Baltic Coastal Hiking Trail and the Forest Trail, the goal was to find appropriate solutions for installing cameras in natural settings near the trails where no access to electricity or Wi-Fi is available.

2. What Are the Prerequisites for This Purpose?

When selecting a camera to be installed outdoors, near a hiking trail, the following prerequisites are important:

- The camera is designed for outdoor use and can operate reliably in various weather conditions, temperatures, and seasons over long periods;
- The camera includes (or can be connected to) a solar panel, and preferably – a battery that stores the energy generated by the panel;
- The camera automatically sends data to the user at a defined (chosen) time interval, even without motion detected nearby;
- In winter, it is possible to connect an additional battery to the camera;
- The camera can send data at user-defined intervals to a server that processes the data and displays it on the corresponding website;
- If the camera is planned to be installed in a location with access to the electrical grid, then solutions related to solar panels, energy saving (e.g., fewer image transmissions), and camera power safety are not required—allowing more frequent photo or video

transmissions;

- If the installation site has no Wi-Fi coverage, the camera must be able to connect to and transmit data via a mobile network.

3. What Is Needed for the Camera to Operate and Ensure Data Transmission?

To ensure the camera successfully transmits information (images, videos) to the user and enables display on a website, the following technical solutions are required:

1. A SIM card and mobile network coverage in the relevant area, or a stable Wi-Fi connection;
2. An SD card for storing the footage recorded by the camera;
3. A system that allows the camera to transmit data without detecting motion. In cases where motion is required to trigger transmission (e.g., with Reolink cameras), a lightweight ribbon was placed in front of the lens to create constant movement and thus trigger data transfer;
4. A solar panel (preferably with a battery) to ensure a continuous power supply for the camera and data transmission;
5. The ability for the user to receive data and store it on a server. The following alternatives are available (not all cameras support every option simultaneously):

A manufacturer-provided cloud platform that allows storage and use of the information:

- **Pros** – easy to configure;
- **Cons** – often a paid service with limited automation options;
- Data transmission to an FTP (File Transfer Protocol) server:

- **Pros** – once the FTP server is configured, the rest of the data handling process is straightforward;
- **Cons** – requires installation of an FTP server on a private server or use of a service that provides FTP access;

Data transmission via email:

- **Pros** – data can be sent to any email address that supports the necessary data volume (e.g., Gmail or others);
- **Cons** – data processing is more complex, as image/video files must be extracted from email attachments.

When installing cameras along the Baltic Coastal Hiking Trail and Forest Trail, FTP servers were used for data transfer and display in the case of Reolink cameras, while BURREL cameras were set to send data via email.

4. Which Cameras Did We Choose?

Based on the above criteria, two cameras were installed in natural settings (Figure 1-2):

- Near the guesthouse “Caunītes”: Reolink 4G LTE 4K Pan/Tilt Trail Camera (with a remotely rotatable lens) and a solar panel;
- At Cape Kolka – a so-called “forest camera”: BURREL 4G Trail Camera (non-rotatable), equipped with a solar panel and battery.



Figure 1. *Reolink* camera. Picture: Amazon.com



Figure 2. *BURREL* kamera. Picture: 24.lv

5. How and Where to Install the Camera?

Installing a camera in nature—in a specific location—is a creative process that requires careful consideration both beforehand and on-site. Several factors need to be taken into account:

- **Security** – the camera should be installed in a place where it cannot be easily reached without special tools (e.g., a ladder) (Figure 3). If possible, the camera should be positioned in a spot where it is not clearly visible or easily noticed;



Figure 3. In the case of Kolkasrags, a long ladder was needed



Figure 4. Camera at the tourist lodge “Caunītēs”

- **Presence of a site manager** – ideally, the camera should be installed in a location where there is a local manager or property owner who is interested in the project and can access the camera if needed for simple maintenance tasks, such as cleaning the lens;
- **Exposure** – the camera should be aimed at the target area in such a way that direct sunlight does not shine into the lens for most of the day;
- **Solar panel orientation** – the solar panel must face south to receive maximum sunlight, avoiding shading by tree canopies or other objects;
- If the camera is installed during the leafless season, it's important to assess whether vegetation growth during the spring and summer will block the camera or solar panel due to leafing trees or shrubs;
- After installation, the camera must be tested immediately – to ensure it functions correctly, transmits the necessary data at the defined time, and captures the intended view (especially if it's not remotely adjustable).

6. What Are the Problems and Risks?

- The most significant risk is **camera security** (see earlier) – the human factor, which may lead to damage or theft of the camera. Newer cameras are equipped with GPS, but it operates only for a short time and consumes additional energy;
- In the **Baltic States**, which lie in a temperate climate zone with distinct seasons and long periods of short daylight and low winter temperatures, there is a risk that **the solar panel may not provide sufficient power** for the camera and data transmission. Therefore, it is advisable to consider connecting an **additional battery**;
- To **save energy**, it is preferable for the camera to send **photos rather than videos**, at defined intervals that can be adjusted

(every 30 minutes, hourly, etc.);

- If **economical mobile data SIM cards** are used, the monthly data volume is typically limited. Therefore, photo transmission is a better option than video, to reduce data load.

7. How to Integrate Camera Data into a Website?

If the above conditions are met, then:

- An **FTP server** must be installed to receive the image and video files. A script is then embedded in the website that fetches the latest file from the FTP server and displays it on the site. The entire automation process and handling of historical image/video display is developed jointly by the website developer, administrator, and potential users;
- In the **email transmission** case, the process is similar to FTP. However, a custom program must first be written to regularly check the email inbox, extract attachments from the messages sent by the camera, and convert them into photo or video files. All other display options and processes are the same as in the FTP example.

8. How Does It Look to the User?

Information about one or several cameras can be embedded on a website. On the Baltictrails.eu site (Figure 5), information is currently compiled about webcams located along the Baltic Coastal Hiking Trail and Forest Trail routes in the three Baltic countries (Figure 6), as well as the two newly installed cameras near the “Caunītes” guesthouse (Figure 9) and Cape Kolka mentioned earlier (Figure 8, 10, 11).

In the online window, photos taken by the cameras at 30-minute intervals are displayed. An image carousel template was used, showing the last 15 received photos in chronological order. Each photo displays the date and time; in the case of the Kolka camera, temperature and battery status are also shown, providing additional information.

By reviewing the live camera information from northern Estonia down to southern Lithuania, users can get a good overview of the current meteorological situation across a region stretching nearly 500 km from north to south. The information is also available in a mobile phone version (Figure 6).

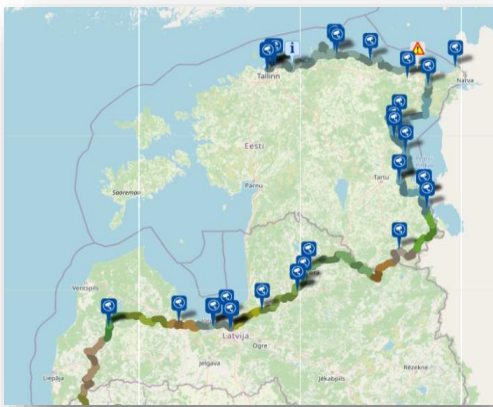


Figure 5. Cameras available in the Forest trail corridor, which are listed on the Baltictrails.eu page

9. Recommendations

1. The **selection of the camera model**, its installation and maintenance, as well as **data integration into a website**, should ideally be entrusted to **experts familiar with the technological specifics** of the entire process;
2. Before deploying a camera in nature, it is highly recommended to **test it in**

advance (ideally during a **winter month**, when temperatures are low and daylight is limited) in a **location close to the tester** that is easily accessible for **at least one month**, in order to make timely adjustments or improvements if necessary;



Figure 6. Baltictrails.eu page on your smartphone



Figure 7. Information that video filming is taking place in the area

3. When installing the camera, **security aspects** must be taken into account – the camera should be **placed in a physically hard-to-reach location**, ideally **near a land manager or property owner** who can monitor and, if needed, maintain the equipment (e.g., clean the lens);
4. A **notice sign** should be placed **near the camera**, indicating that video

surveillance is in operation (see Figure 7), to **inform visitors** of the monitored area;

5. If your maintained camera is located **near the Baltic Coastal Hiking Trail or Forest Trail hiking route**, it can be **included in the Baltictrails.eu website**.
6. After operating both cameras during the winter of 2025/2026, which was meteorologically one of the coldest winters in recent years, it was concluded that the BURREL 4G trail camera is better suited to our weather conditions. Since its installation, it has operated without interruption, including throughout the winter period, when temperatures were low and light levels were insufficient for solar panels.

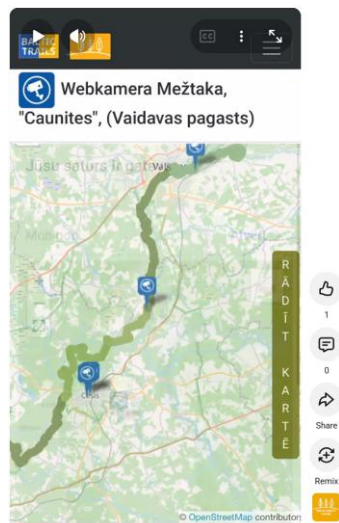
10. Involved Partners

Vidzeme Planning Region, NGO Peipsimaa Tourism, Latvian Country Tourism Association “Lauku ceļotājs”.

11. Related Videos

Pilot test with children and parents near Sietiņezis on the Forest Trail, 12.06.2025

<https://www.youtube.com/shorts/OFwEqaWQeJY>



Pilot test for school-age youth, Forest trail near Kauči, 12.06.2025

<https://www.youtube.com/shorts/rC0Gaj6WpXc>



Training video (06:54 min):

<https://www.youtube.com/watch?v=qEe3Ts kOaI8>



12. Sources

1. www.baltictrails.eu;
2. Reolink camera (Kolka cape): <https://baltictrails.eu/lv/coastal/poi/4549?7>
3. BURREL camera near “Caunītes”: <https://baltictrails.eu/lv/forest/poi/4489?2>
4. Technical instructions and specifications for the cameras mentioned in the document (available on the web).

13. Appendix

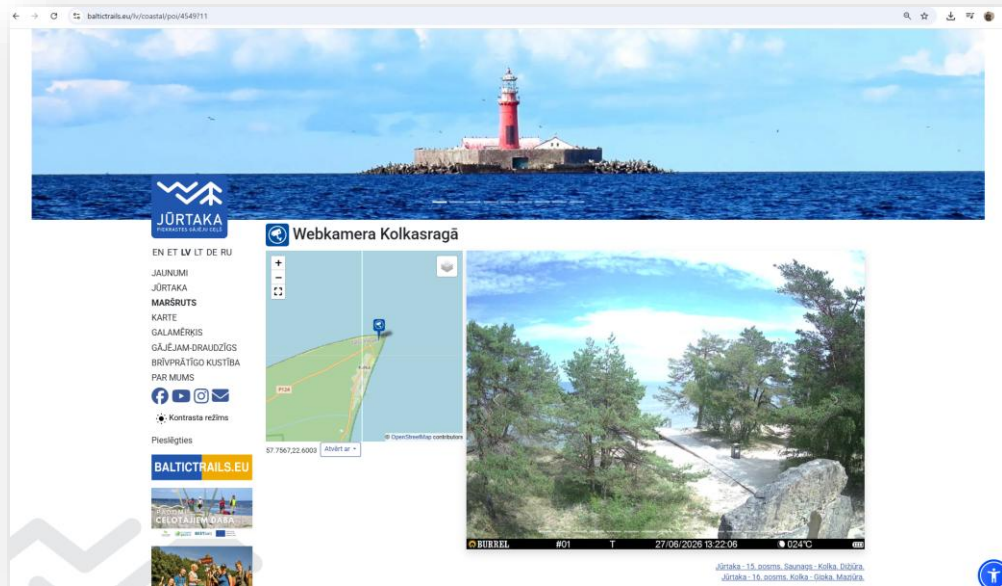


Figure 8. Kolkasrags camera broadcast view on Baltictrails.eu page

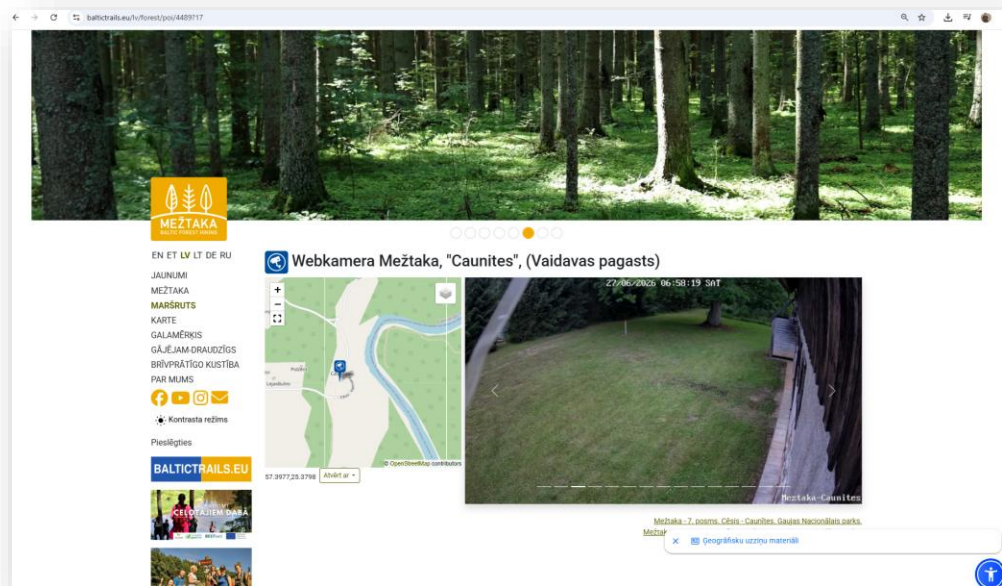


Figure 9. The broadcast view from the “Caunītes” camera on the Baltictrails.eu page



Figure 10. Screenshots from the camera at Cape Kolkas in July 2025 (8 different days)

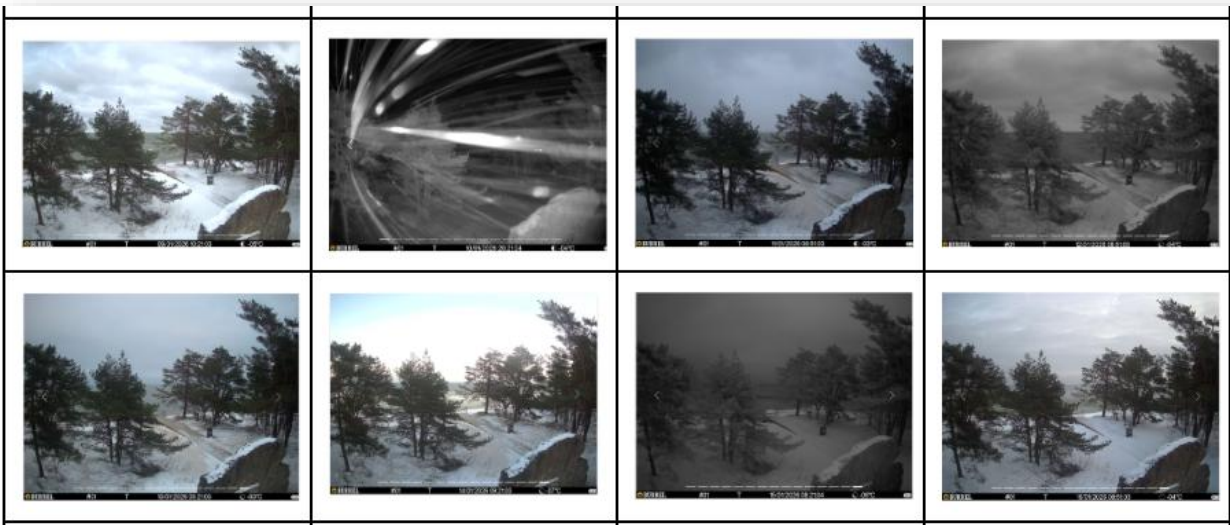


Figure 11. Screenshots from the camera at Cape Kolkas in January 2026 (8 different days)

EXAMPLE FROM ESTONIA

Specific target audience: seniors, parents with small children, school-age children, young people.

Non-specific target audience (can adopt experience): municipalities, entrepreneurs, associations.

Solution implementer: Peipus region non-governmental tourism organization.

1. Objective

One of the goals of the project was to install cameras near the shores of Lake Peipsi in eastern Estonia, where the Forest Trail runs, so that potential hikers could see the current meteorological conditions in the lake area.

2. Camera selection

In the case of Estonia, various camera models were selected that can be connected to a constant power source, thus ensuring a continuous video data flow.

3. Location selection

Two criteria were taken into account when selecting locations (Figure 12):

- Availability of electricity at the potential location of the camera;
- So that the information displayed on the camera would be useful to potential users.

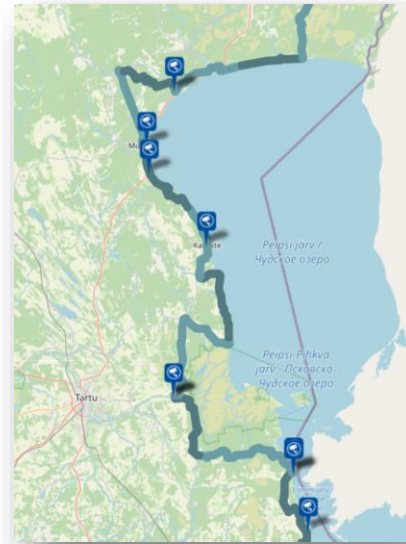


Figure 12. Cameras located in the forest trail corridor – on the western shore of Lake Peipsi

As a result, six locations were selected:

- Lohusuu village near the municipal building;
- Mustve port (visible port area, Peipus, part of the beach), (Figure 13);
- Kasapää village near the museum building (visible stage, Lake Peipus, area), (Figure 14);
- Kalaste village center – situation in the center of the settlement;
- Kavastu ferry on the Great Emajõgi River. Visible village, situation in the river, ferry that transports pedestrians across the river (2026 – under repair);
- Räpina port (visible port area, Lake Peipus).

4. Partners involved

Vidzeme Planning Region, Peipus Region Non-Governmental Tourism Organization, Latvian Rural Tourism Association “Lauku ceļotājs”.

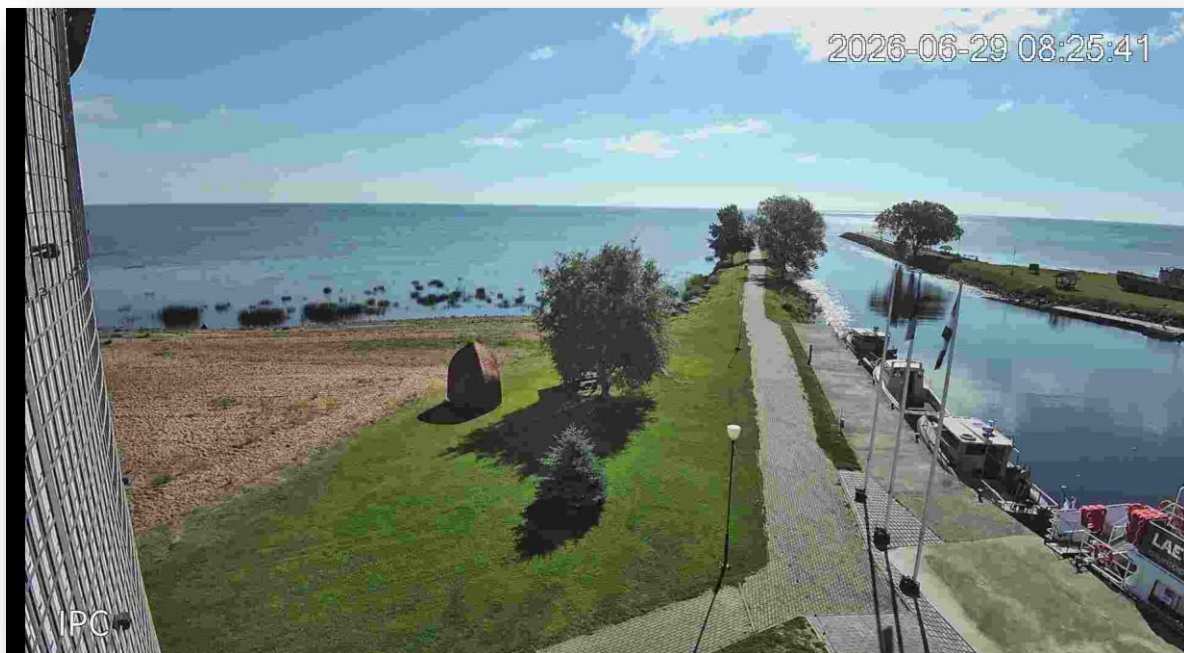


Figure 13. Live camera view of Mustvee port, on the shores of Lake Peipsi



Figure 14. Live camera view of Kasapää village, on the shores of Lake Peipsi



*The publication has been prepared within the framework of the EU Interreg Est-Lat programme 2021.–2027. project “**Forest and Coastal Hiking Trail’s accessibility improvement for different social groups**” (EE-LV00013).*

The publication reflects the views of the author. The managing authority of the programme is not liable for how this information may be used.