

Location – Tracking in rail freight transport for the Rail Cargo Group, a subsidiary of ÖBB

Assignment

How can the position and movements of single freight wagons be monitored using a cost effective solution?

Challenge

The Rail Cargo Group, a subsidiary of ÖBB covers over 46 million train-kilometres per year. It controls around 511,000 trains – on average one wagon per minute departs from the railway station. Such a train is able to reach a maximum speed of 90-120 km/h. The Rail Cargo Group owns around 20,000 wagons, travelling through the 5,500 km rail network in Austria as well as delivering goods throughout Europe. In addition, there are many wagons from third parties that are being handled by the Rail Cargo Group.

International journeys require the strong logistical talents of dispatchers. Where is the wagon, when will it get to the distribution hub, is its journey on time? Furthermore customer expectations keep rising: Clients expect affordable prices, a safe journey and deliveries on time. Clients are already used to being able to monitor the status and arrival time of their goods delivered by trucks.

Positioning a freight wagon within the Austrian railway network works relatively well. However, determining the position and arrival times for international destinations remains a challenge. When and where a wagon is to be found on its long journey through other European countries or if it will be able to reach the next locomotive at the following distribution hub in time is assessable only by experienced dispatchers. Unpredictable events may always occur – and real time information about such situations is currently vague.

Expected result

To be able to trace its own as well as wagons from other companies, the Rail Cargo Group searches for wagon-tracing solutions. The solution should be cost effective. It should also be able to be attached to the existing steel wagons without causing any problems. As long as these criteria are fulfilled, the ÖBB soon wants to be able to centrally access the movement data of its 20,000 wagons.

Now it's your turn! Show us how to track freight wagons. Combine positioning elements with sensors and software, which purposefully complete and optimize the tracking effort. Important: keep the use case in mind and consider in your application how you will fulfil the requirements and evaluation criteria.

Keep it short. The jury is expecting a general concept of max. three pages or five PowerPoint slides. This should be informative enough to prove how your product will be able to solve the ÖBB Challenge.

Documents for this challenge should be submitted via provia.at, the tender platform of ÖBB and ASFINAG.

Register now:

<https://www.provia.at/bieterportal/Login?ReturnUrl=%2Fbieterportal%2FbieterRegistrierung%2F10774%2FVeroeffentlichteAusschreibungen%2FAusschreibungsdetailsAnfordern>

What you should also know:

- The choice for the technical setup is up to you (GPS, GSM, Lora, NB-LTE etc.)
- Data may be provided as an API or through your own portal.
- There is no electricity supply for the sensors.
- Highly accurate precision and permanent scans are not necessary within this price segment. It is however important to know that wagon positions should be able to be pinpointed to the corresponding railway-route and not, for example, in a wheat field. The precision of the positioning data is one of several evaluation criteria of the jury. Please make an exact assessment regarding this topic. The ÖBB will check these values in possible test runs further down the line after the challenge.
- Wagons are due for routine maintenance only once every six years – for small repairs the wagons are checked up to once a year. Therefore the chances to switch batteries are scarce.
- The weight and size of your product are primarily not relevant. Ideally, they should not complicate the installation.
- The wagons are exposed to extreme impacts from outside (pressure from trains travelling in the opposite direction, cold weather in winter, heat in summer, vandalism ...) Robustness and anti-theft protection are absolutely necessary.
- During operation, your solution should not hinder existing radio signals and, vice versa, should not be hindered by them. In order to guarantee this, your solution should correspond to the norm EN 50121, August 2015 edition, [description link](#). Other certificates are not necessary in this stage. Should a trial decision be reached, it is possible that an electromagnetic tolerance test will be carried out.
- Data should be provided securely.

What we do not expect:

- Telematics providing information solely to the locomotive.
- Telematics which are only able to pinpoint entire trains and not single wagons.
- Cost intensive telematics with the highest precision, high scan and transmission frequencies as well as infinite battery run time. Which parameter should be less important in order to facilitate a lower price, without lowering the value of the service is your decision.

Submit the relevant information using provia.at! Use this site from www.innovationspartnerschaft.at as your promotion platform. To be visibly connected to the challenge, click on *submit idea* (Idee einbringen), provide a quick description of yourself, your competencies and your contact information. Just copy existing texts or upload a brochure. This will have no impact on the jury's assessment – provia.at is the path towards the jury.

Benefit

Innovation dialogue

At least five companies will be contacted to present their idea to the ÖBB jury (either on-site or via Skype). The ÖBB is interested in learning about how various rail freight systems work, if they provide sufficient data in order to fulfil the final use case. This is why the challenge is mainly concerned with market ready prototypes which provide reliable data.

After the Challenge: Test runs

After completing the challenge and the innovation dialogue, a test run is planned. The goal of this run is to try out different technical solutions on the routes of a test train for real scenarios for an entire month. The gathered data will provide information regarding the system's functionality and performance. A reimbursement of expenses of max. € 5000 per test run is planned. The information gathered from the innovation dialogue will be considered by the ÖBB when it comes to planning the test runs. If need be, the participants will be invited to take part in the test run.

Evaluation criteria

The following criteria will be used to evaluate the submitted solutions:

- Total costs for the first and second year regarding an ordered unit number of 1 piece, 200 pieces as well as 20,000 pieces and their maintenance costs (set up, component switch, battery switch) (35 %)
- Position accuracy and scan frequency (15 %)
- Durability (lifetime of the battery, energy consumption,...) (15 %)
- Frequency of broadcasting (15 %)
- Data quality concerning both raw and prepared data including their availability (including proprietary) (10 %)
- Expandability of the system (10 %)

Category

Electrotechnical Devices and Components

IT & Telecommunication

Mobility

More Information

<https://innovationspartnerschaft.at/challenge/location-tracking-im-schienenguterverkehr-der-rail-cargo-group-der-obb>

Correction:

In a previous translation of the challenge we asked for your solution to correspond to the norm EN 5021. This was a mistake. The solutions should correspond to EN 50121.