

Transforming rail freight through digitalisation and automation

With the goal of making rail freight a more attractive and sustainable transport option, EU-Rail conducted two technical demonstrators (TD).



FLEET DIGITALISATION AND AUTOMATION DEMONSTRATOR

Developed a **digital automatic coupler** and **condition-based maintenance**, both of which will help enable a digital and automated rail freight system.

Digital automatic coupler (DAC)

The new freight DAC will contribute to the automation of shunting operations and bring additional functionalities to the entire freight system.



Key Finding

Having defined the specifications and conducted a thorough cost-benefit analysis, the TD delivered several coupler solutions.



Fast Fact

The DAC prototype underwent dynamic testing, conducted at different speeds on both straight and curved tracks.



Did You Know?

As the cornerstone technology of fleet digitisation and automation, the DAC has the potential to enhance rail freight's load capacity and operational intelligence.

Condition-based maintenance (CBM)

CBM aims to perform maintenance only when necessary and not on a fixed schedule or after a failure occurs.



Key Finding

CBM involves changing the way maintenance staff work and the company's processes.



Fast Fact

CBM reduces costs, avoids unnecessary maintenance activities, increases the availability of the locomotive, and improves the reliability of a freight asset.



Did You Know?

CBM is a viable option for railway undertakings and those entities in charge of maintenance – one that could result in a **10%** reduction in lifecycle costs.

DIGITAL TRANSPORT MANAGEMENT DEMONSTRATOR

This TD focused on **real-time network management** and the **intelligent video gate**.

Real-time network management

A comprehensive yard and network management platform was designed for the proactive planning of operational activities at a marshalling yard.



Key Finding

By reducing lead times and improving infrastructure use, the yard and network management solution could reduce costs by **10%**.



Fast Fact

Using the solution could improve total yard lead times by **20%**.



Did You Know?

Thanks to its use of automatic train operation and coupling, yard and network management could cut staff costs by as much as **50%**.

Intelligent video gate (IVG)

A gate system located at intermodal terminals and equipped with high-frequency cameras to automatically identify wagons and intermodal loading units.



Key Finding

IVG could significantly reduce wagon check times (up to **-20%**), terminal staff costs (up to **-50%**), and terminal loading times (up to **-50%**).



Fast Fact

Using IVGs improves operational efficiency for terminal operators by enhancing automation for check-ins, inspections, damage claims, and the handling of dangerous goods.



Did You Know?

IVG can reduce the time needed to conduct inspections and the shunting of arriving trains, which in turn means more reliable departures.

CONCLUSION

Both TDs allow the rail freight sector to visualise and concretely test technological advancements and to more adequately quantify the impact of fleet digitalisation/automation and digital transport management technologies.



Who Benefits



Infrastructure managers



Railway operators



Suppliers



Final users

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Solutions developed by Shift2Rail, Europe's Rail's predecessor programme

