

# Increasing railway line capacity starts with increased automation

An important aspect of the European Rail Traffic Management System (ERTMS) is its ability to meet increasing demand for better on-time performance, line capacity, and energy optimised driving.

While the answer is automation, the question remains: 'how much'?



The 'how much' is indicated by the Grade of Automation (GoA), with GoA1 being a train with no automation and GoA4 indicating a train that is automatically controlled without any onboard staff.



## AUTOMATION DEFINED

**Automatic Train Operation (ATO)** is a method of operating trains automatically where the driver is either not required at all or serves a supervisory function at most.

**ATO over European Train Control System (ETCS)** is a system that allows trains to drive automatically while adhering to timetables and European signalling.



## POTENTIAL BENEFITS OF ATO OVER ETCS

- Has the potential to help railway operators increase capacity and optimise existing networks.
- Will allow trains to run at closer intervals, which can improve passenger service.
- Can reduce energy use, lower operating costs, improve punctuality, and provide smoother, more comfortable journeys for passengers.

## THE CHALLENGE

Leveraging the full potential of ATO over ETCS will require a higher grade of automation. But this first requires the development and validation of appropriate ATO over ETCS standards applicable to all types of rail lines.

### Enter Europe's Rail.

EU-Rail delivered a solid basis for future **standard specifications** for ATO over ETCS (up to GoA3/4) and **demonstrated** that the specifications were practicable and interoperable.

## SPECIFIED



### Key Finding

A set of specifications known as ATO GoA2 allows railway undertakings and infrastructure managers to start deploying ATO.



### Fast Fact

The TD developed a detailed specification at higher grades of automation that includes a perception component and an automatic processing module.



### Did You Know?

These two components help automate several functions that are currently performed by a driver.

## DEMONSTRATED



### Key Finding

An ATO over ETCS up to GoA3/4 technical demonstrator (TD) was prepared for a real railway line.



### Fast Fact

8 different configurations were successfully integrated, with each configuration using devices that are interoperable, interchangeable, and able to provide basic functionality.



### Did You Know?

Two remote driving configurations were successfully tested in such operational situations as passing an unprotected level crossing and reacting to an obstacle.

## CONCLUSION

Achieving higher grades of automation with ATO up to GoA3/4 will reduce headways and increase line capacity, improve the performance of railway traffic, and lower operational costs.



### Who Benefits

Infrastructure managers, railway operators, suppliers, and final users.



Infrastructure managers



Railway operators



Suppliers



Final users

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

