NetworkRail

The what, why and how of the GSM-R System

Delivering better communications

The GSM-R System (Global System for Mobile Communications – Railway):

- Improves safety, performance and passenger experience
- Delivers secure and reliable driver-signaller communications
- Encompasses technology, processes and people across the industry
- Provides the foundation for a modern, sustainable, digitally-enabled railway network with increased capacity and lower running costs

The benefits at-a-glance

- Increased safety
- Improved performance
- Enhanced passenger experience
- Digital future

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Working for you.

Signs help drivers where signal numbers cannot be seen easily from the train cab

Why was it introduced?

Compliance

There were two key drivers for the introduction of the GSM-R System: the requirement to comply with the European common standard for digital data and voice communications in railway applications, and to follow recommendations from major incident enquiries.

Improving safety

The GSM-R System ensures direct radio driver-signaller communications at all times. This includes areas such as tunnels and deep cuttings, where radio communications have not previously been possible, therefore:

- Improving safety for drivers, maintenance teams and passengers
- Ensuring faster and more effective responses to potential hazards with applications such as Railway Emergency Call
- Eliminating the need for drivers to exit the train in the event of a problem

Reducing operating costs

By replacing the patchwork of increasingly inefficient and expensive legacy systems, the GSM-R System:

- Reduces ongoing maintenance costs
- Improves reliability
- Delivers the foundation for a digitally-enabled railway network

Moving away from analogue

Previous radio driver-signaller communications relied on analogue radio networks. These had limited functionality and had become increasingly expensive to maintain.

Alongside this, new digital technology is necessary to keep pace with industry developments such as ERTMS (European Rail Traffic Management System) and ETCS (European Train Control System).

How it works

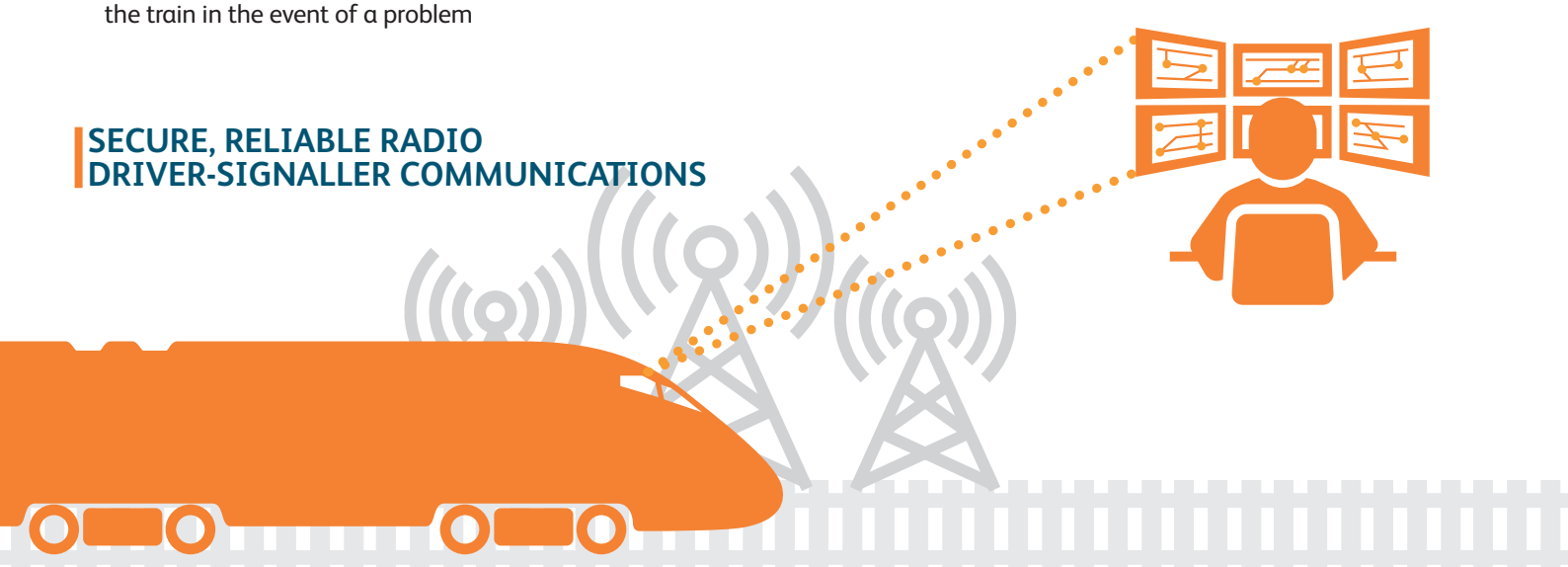
The GSM-R System integrates technology, processes and people.

It uses a specially-designed FTN (Fixed Telecoms Network) and mobile technology that includes trackside radio base stations, cab and fixed terminal equipment, and central switching equipment.

Processes range from journey registration and operational messaging to prioritising driver-signaller communications, ensuring priority is given to the most important messages and calls.

The people involved include train drivers and managers, signallers and signalling managers, route and electrical controllers plus maintenance, telecoms and train preparation staff, amongst others.

SECURE, RELIABLE RADIO DRIVER-SIGNALLER COMMUNICATIONS



GSM-R sign fitted to Ground Position Light (GPL)

The benefits in more detail

The GSM-R System raises safety, performance and customer experience standards across Britain's whole rail network. It also delivers the foundation for our digitally-enabled future.

Increased safety

- Improved safety for Britain's rail network for operators, maintainers and passengers
- Ensured faster responses to potential hazards
- Eliminated the need for drivers to exit the train in the event of a problem
- Reduced trackside maintenance

Improved performance

- Complete coverage across Britain's GSM-R radio network ensures better reporting of issues and reduces their impact on performance
- Improved reliability and punctuality including a reduction in delays due to poor track conditions
- Enhanced diagnostics enable remedial action designed to avoid incident repetition

Enhanced passenger experience

The ability to communicate instantly with signallers enables drivers to keep passengers better informed in the event of delays. This reduces both passenger frustration and the risk of passengers attempting to disembark should a delay become protracted

Digital future

The telecoms infrastructure underpinning the GSM-R System provides the foundation for building a modern, digitally-enabled railway network. It will reduce operating costs, deliver increased value for stakeholders and help to meet regulatory obligations

THE GSM-R SYSTEM IS A £1.86 BILLION INVESTMENT IN DIGITAL TECHNOLOGY – INTRODUCING A FIRST-CLASS RAILWAY COMMUNICATIONS SYSTEM PLUS NEW, MORE EFFICIENT SIGNALLING SYSTEMS IN THE FUTURE

The GSM-R System in numbers

15,000km+
of railway lines covered

2,500
GSM-R telecoms masts

4,056
connected trains

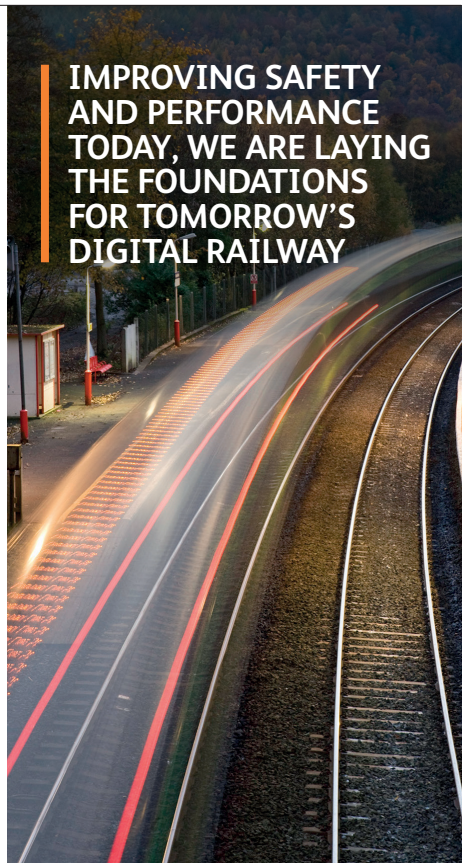
100%
coverage across the GSM-R radio network

£1,860,000,000
£1.86 billion investment

21,200
drivers and signallers trained

900
signaller terminals

2
switching centres



Looking to the future

The GSM-R System was phased into service across Britain's rail network between 2007 and 2014. It required the renewal of the entire lineside telecoms network that supports the railway network's daily telecom needs.

It is already a major achievement however, the ongoing success of the GSM-R System depends on the continual commitment and collaboration of all users.

Future enhancements to the system include a software upgrade supporting the roll-out of ERTMS (European Rail Traffic Management System).

For more information about Network Rail's telecoms assets and services, please contact: NRTenquiries@networkrail.co.uk

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