Delivering trackside connectivity and moving the railway into the ultrafast world

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Network Rail

Putting passengers first

Safety Advice

everyone
home safe
every day

BRITISH
TRANSPORT
POLICE

NetworkRail

- Saturday 13 May 2023, a Network Rail vehicle was forced off the road by three other vehicles as it entered the motorway.
- Three people, wearing balaclavas and carrying crowbars forced the driver from the vehicle before it was driven away from the location.
- The vehicle was pulling a trailer containing a full reel of 24 core fibre
- The vehicle had just left an NR storage unit in Armthorpe, Doncaster, and the theft happened a few minutes later

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Safety Advice

BRITISH TRANSPORT POLICE

NetworkRail

IMMEDIATE ACTION REQUIRED

- Workforce and Security staff should be aware of any vehicles loitering around depot entrances, especially in the hours of darkness. Note the make / model of the vehicle and the number plate if possible.

- When leaving depots, be aware of any vehicles potentially following and if safe, do not pull over if indicated to do so.

- All staff are to be vigilant and check ID / vehicle registrations as there is a risk that stolen equipment may be used to gain access to other NR sites to undertake further theft of metal resources.

- Consideration to be given to using heavy goods vehicles or covered vehicles for the transportation of expensive equipment.

- Project / programme management teams are to engage with Route / region security leads to consider security measures for the protection of resources.

The Impact.......

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The unknown national telecommunications provider

NetworkRail

180 years' experience providing telecommunications services to the railway

The third largest telecoms operator in the UK by assets and reach

A public sector-owned network with government investment

535 people We are all focused on delivering for passengers and freight users

We operate and manage a national fibre network

Security managing our operational data is a 24/7 task

Daily – over 112m events monitored
Monthly – 200 security incidents investigated

£833 million spend (opex and capex) during CP6

252,000 circuits managed

Manage and enhance the national **GSM-R system** on behalf of the rail industry

Exploring ways to improve **mobile connectivity** for passengers

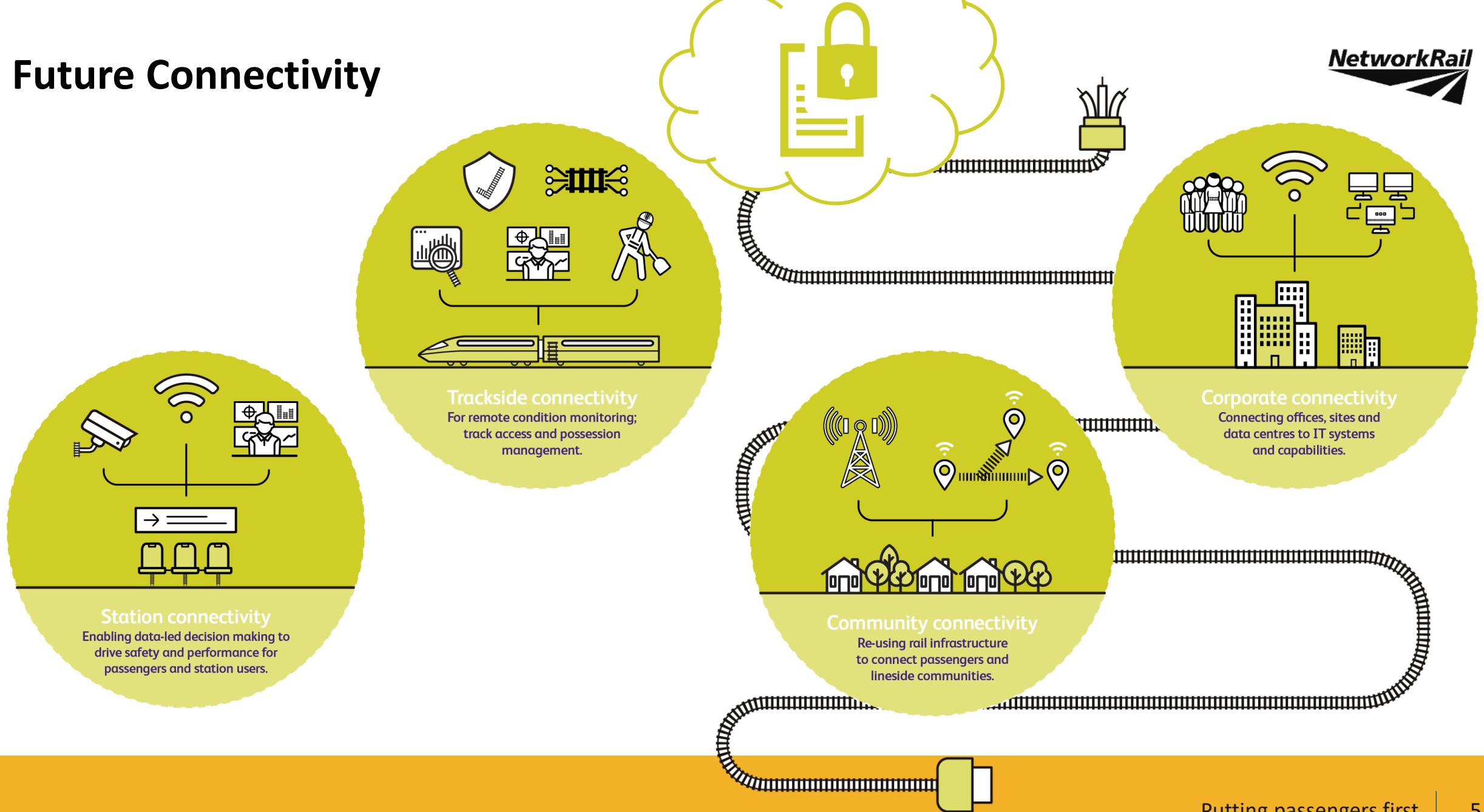Supporting all regions and functions with national telecoms services

6 Data Centres
(owned, occupied and managed)
Tier 3+ Resilience & Independently assured by NCSC

National Cyber Security Centre | **CPNI** Centre for the Protection of National Infrastructure

2 **mobile switches**
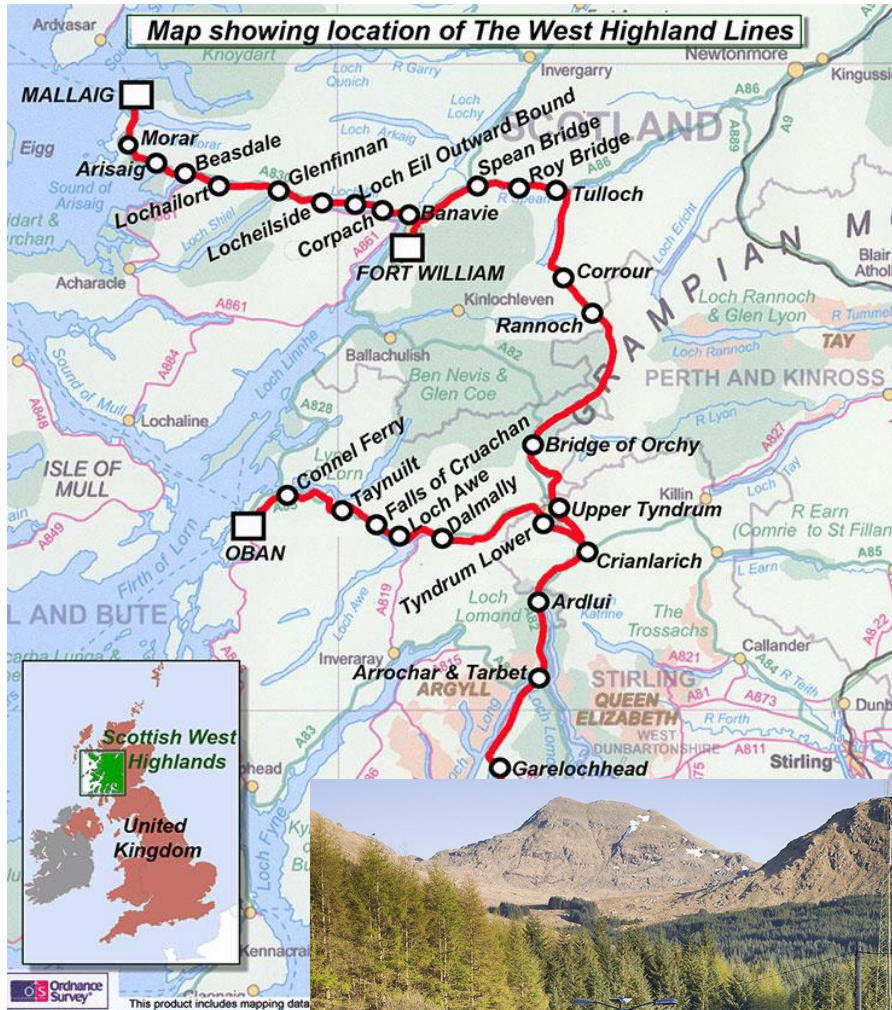National telecoms platforms:
Voice • Data • Radio

Improving colleagues' connectivity with IT Services
2,300 corporate locations across the country

Providing connectivity for over **300,000** operational railway assets

Future Connectivity

Trackside connectivity
For remote condition monitoring; track access and possession management.

Station connectivity
Enabling data-led decision making to drive safety and performance for passengers and station users.

Community connectivity
Re-using rail infrastructure to connect passengers and lineside communities.

Corporate connectivity
Connecting offices, sites and data centres to IT systems and capabilities.

And example of connectivity challenges today

Map showing location of The West Highland Lines

Current Status - Banavie South RETB* 4 wire system to Crianlarich failed

- Service is provided by BT
- The service does have diversity, over a dial-up modem 2 wire system, however, this has also failed.
- Route Telecom technicians have confirmed dial tone at both ends of the 2 wire system and are working with Signalling colleagues to resolve.
- BT have updated that an engineer will be assigned to investigate the fault on the 4 wire system today, but cannot provide an ETA as yet.
- At 08:30 on 15/6/23 already over 800 delay minutes incurred

Control Measures

- To enable the running of trains Pilot Working is currently in place, with 3 x staff (MOMs) this service will cease at 14:00 (14/6/2023)
- This will mean 2 trains per hour will be cancelled, up until 2200 when services close.

Next Action

- BT to provide engineers ETA.

* Radio Electronic Token Block

Challenges with delivering fibre on the railway

- Safety. Safety. Safety

- Asset Protection

- Devolution across the 5 Network Rail regions

- Multiple work silos across Network Rail

- Operational requirements v Putting Passenger First agendas

- Existing infrastructure design focused on sing output requirements
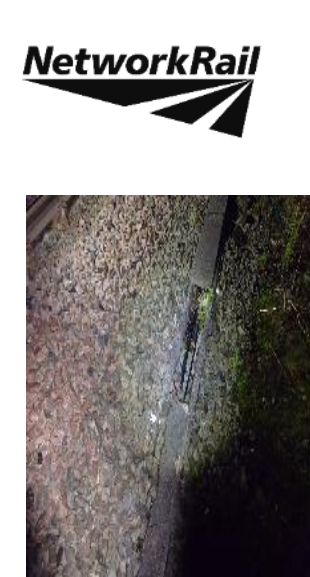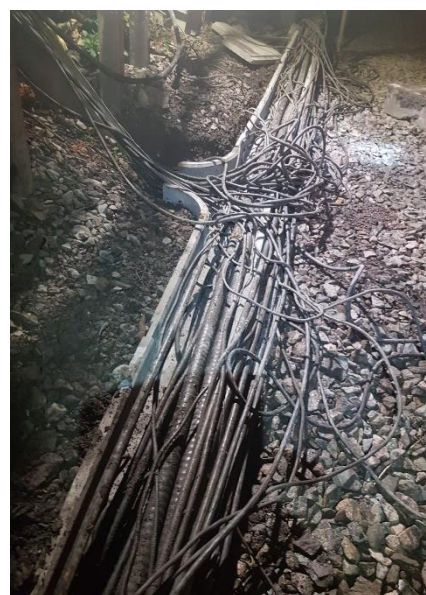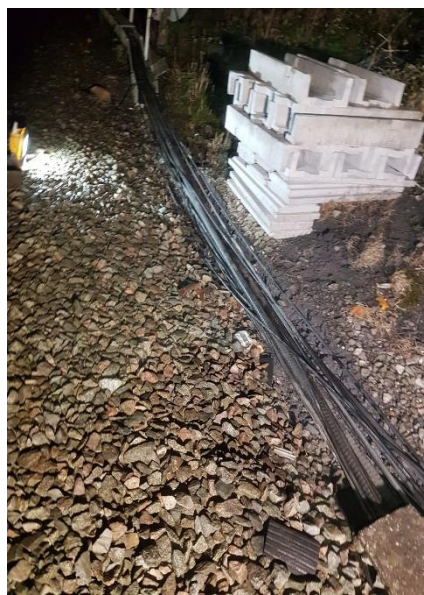
Project Reach

- **Bringing investment into the railway to future proof the operational requirements of GB Rail**

- **Project Reach will enable Network Rail to deliver a better connected, data-driven railway**

- **Project Reach is designed to futureproof Network Rail's telecoms infrastructure as well as improve public connectivity across the country**

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Fibre and the Railway

NetworkRail

Network Rail Regions

- Eastern Region
- London North Western (LNW) Region
- Scotland Region
- Southern Region
- Wales and Western Region

Service elements included in costs

New fibre (432 cores) providing additional telecoms capacity for multiple rail use cases

*Mast infill, multi use antenna, 3rd party cabinet breakout and multi operator core capability**

In-tunnel mobile coverage

*Excludes Spectrum subject to UK Gov
**Excludes on-board Equipment and fitment costs

Delivery Model

National passenger connectivity services can only be delivered through multiple agencies working together, alongside a multi-channel funding model including any external long-term infrastructure investment opportunities which will be explored as part of Project REACH.

Delivery leadership Options

1. **Network Rail**
   Delivers synergies

2. **Service Provider**
   Includes spectrum

Cross industry working group

UK GOV | NRT | TOC's | MNO | Tech' Partners
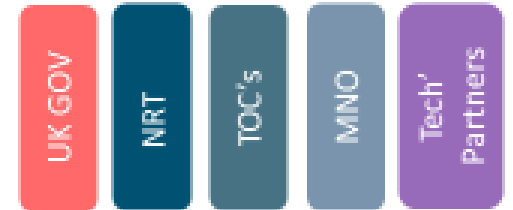
Indicative costs Regions Vs National (£m)

Region Programmes	Track Miles	Solution CAPEX	OPEX (Annual)	Journeys %
Eastern	6042	933,271,488	19,224,545	13.08%
NW&C	4500	695,088,000	14,318,182	14.59%
Scotland	1718	265,369,152	5,466,364	6.33%
Southern	3300	509,731,200	10,500,000	41.44%
Wales and Western	3352	517,703,328	10,665,455	24.55%
National Programme	18,912	1,973,391,767	11,840,351	100.00%

NB: National Programme delivers greater economies
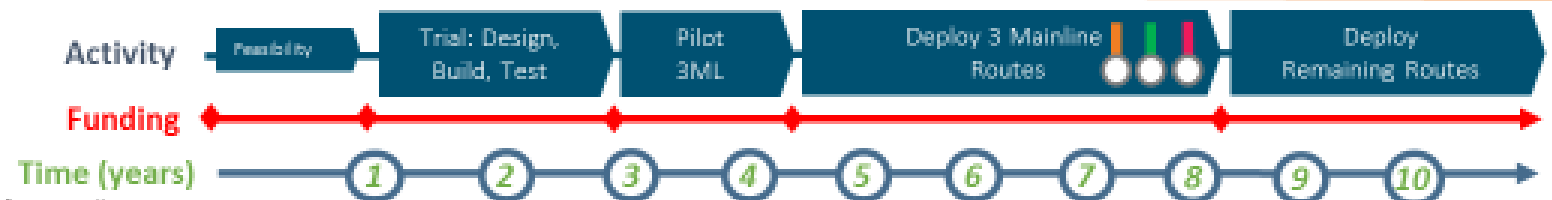
NRT Synergies

Fibre Cable: Funding contribution from NRT CP6 settlement estimated at c45m plus utilisation of existing fibre cable capacity

GSM-R mast re-use; reduces investment required mast infill and provides new points of presence alongside multi-use antennas (4G etc.) to meet multiple use cases

Timeframe to deploy

Activity — Feasibility | Trial: Design, Build, Test | Pilot 3ML | Deploy 3 Mainline Routes | Deploy Remaining Routes

Funding

Time (years) — 1 2 3 4 5 6 7 8 9 10

Note: All figures costs indicative subject to further analysis assurance exc risk, prelims and allowance for assumptions eg access

Project Reach

Future proof current network

- Deliver a new, cost effective telecoms network to meet current and future needs
- Develop data driven and smart infrastructure to enable best in class railway services
- Address operational requirements to enhance safety and reliability
- Potential to enter into service collaboration with Network Rail

Outcome in support of HMG objectives

- Contribute to wider connectivity objectives across the UK, especially alongside towns and rural areas
- Accommodate increasing digital demand for higher bandwidth
- Develop a new public communications network alongside the rail corridor

Alignment with a trusted partner

- Shared ambition to maximise deployment of geographical telecoms network infrastructure
- Long term partnership supported by dynamic ways of working focussed on best outcome for all parties
- Leverage private sector expertise and innovation
- Network to be used by both Network Rail and selected partner