NetworkRail

Pioneers Welcome
Innovation is in our nature

Brunel, Stephenson, Tredwell – the rail industry has never been short on pioneers. Brave thinking is in the fabric of who we are; from the first locomotive to a network that spans a nation – we've never been scared to change the status quo. And whilst the challenges we face are different, our pioneering attitude is the same.

What legacy will you leave?

Ready to become a Pioneer? Start by browsing our challenges at www.networkrail.co.uk/challenge-statements

R&D@networkrail.co.uk

Pioneers Welcome
Empowering you to transform our industry

Research and Development
Innovation is in our nature

> **We need much more [innovative work]** and the review will seek to create conditions that enable the sector to innovate, respond to changing conditions and **become pioneers once again**

Keith Williams, Accelerate Rail 2019

Keith Williams on progress of the Rail Review at Accelerate Rail 2019, published 19 March 2019

Contents

Foreword

We have a 200-year history of pioneering to create the railway. Working together – co-operating and competing – to innovate and transform people's lives.

We are in a time of unprecedented opportunity from technology and the emergence and growth of new companies and commitment to invest in R&D.

As pioneers creating the future railway, we need to make it work for better value, better quality services for our passengers and freight customers.

Three major changes are key to bringing this about:

1. Consistency and structure to the R&D process

2. New procurement models to bring clarity and continuity to the route to market; and

3. Active and early engagement from our routes in the decisions and steering required to translate ideas into products and services.

Our R&D portfolio is part of an industrywide effort that signals a new era for investment in technology. It offers opportunities for all and creates a focus to bring together new partnerships, some synonymous with rail, some new to rail and some that may have yet to start up.

Let's share the risks and rewards of innovation, pool our resources to drive the pace of innovation and share learning.

The way we want to apply technology is novel and we want the journey to be inspiring. But the purpose is simple.

To put the needs of passenger and freight customers first.

M. J. Frobisher

Martin Frobisher
Group Engineering Director,
Network Rail

1.0 Research, Development and Innovation

An introduction

☐→○

Research and Development
Innovation is in our nature

1.1 The pioneering attitude, applied

Brunel, Stephenson, Tredwell – our industry has never been short on pioneers. Brave thinking is in the fabric of who we are. From the first locomotive to a network that spans a nation, we've never been scared to change the status quo.

Make the visionary viable with the R&D portfolio

From researching an idea to first deployment, we've put the tools in place to help make your ideas happen.

These tools include de-risking the product, systems, equipment or service and ultimately, helping you build your business case.

This brochure will help you make the best use of R&D and discover how you can help bring the pioneering attitude to life, every day.

What legacy will you leave?

1.2 Our R&D portfolio is leading to a better railway

Delivering innovation and results

Our industry has transformed over the past 15 years thanks to focused programmes made possible by R&D. Investments from the department have helped improve service reliability while reducing asset management costs. The numbers speak for themselves:

40%
reduction in service affecting failures for track

70%
reduction in the number of broken rails since the start of Control Period 3

£1.5 billion
reduction in the cost of renewals over Control Period 4 and Control Period 5

Our priority is to continue to improve the reliability of our combined assets while reducing the cost of overall asset management.

Over the next five years, we plan to put at least half our investment in track, structures and earthworks, making them an integral part of our asset sustainability plan. A further quarter of R&D investment will go towards bringing down the cost of assets that enable trains to move safely around our network – the command, control and signalling assets.

Return on investment

The R&D portfolio is set to drive £2.2 billion in reduced renewals over 20 years. We will achieve this by:

- extending the length of service-aged assets
- targeting intervention through a better understanding of asset degradation
- providing more reliable mitigation of risk while the asset is in service
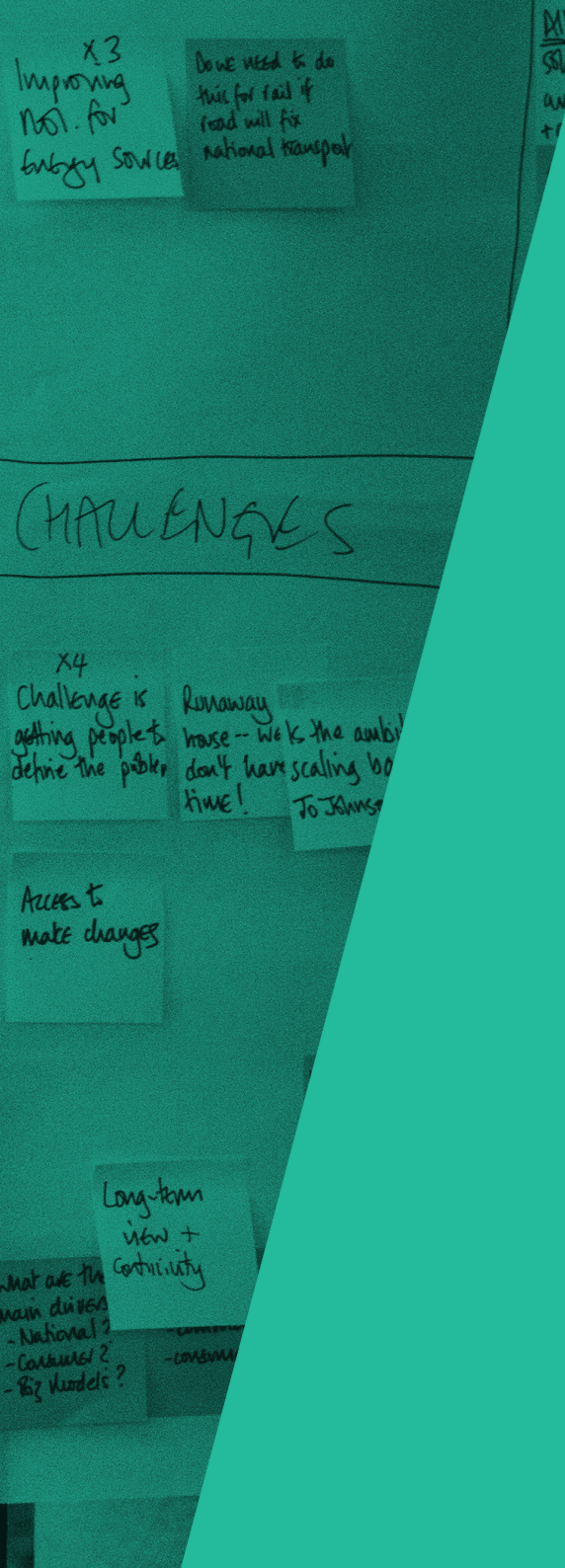
## 1.3 R&D isn't just about a better railway

It's the future of our business, our industry, our economy and our environment.

We're working closely with the government, industry and academia to support wider government objectives under the Industrial Strategy Rail Sector Deal and the Scottish government's policy to increase inclusive economic growth.

To support this growth, the Government has provided investment to establish stronger connection between universities and the wider rail industry, specifically through the UK Rail Research and Innovation Network. This supports the growth of companies throughout the rail supply chain, positively impacting export opportunities and enabling the rail sector to compete both at home and globally.

This is crucial for the future, working together to transition to a world where railway plays a part in connected and integrated transport with mobility offered as a service.
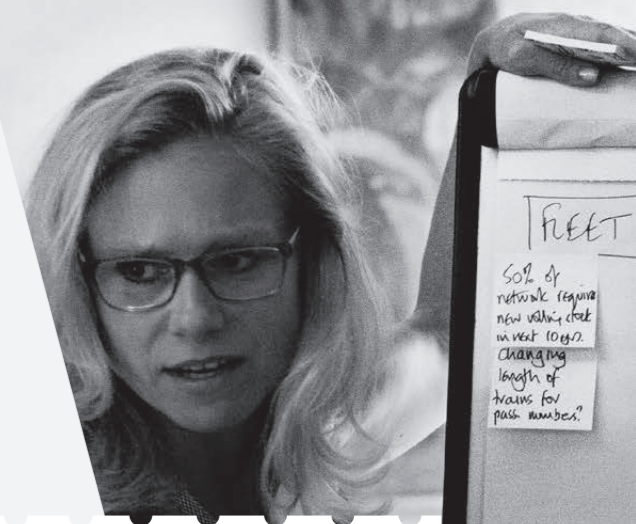
"[The Rail] Sector Deal looks to build on the strong working partnership between the rail sector and the government to **exploit the opportunities of new technologies, improve the efficient use of our rail network capacity and enhance the experience of the passengers** who use our railways by improving the service they receive."

Industrial Strategy Rail Sector Deal

2.0 How we work

2.1 Open for business

Over the next five years, a third of the funding for R&D will come from third parties. Some will come from other government sources, but we expect to source most from other asset managers and supply chain partners. Our aim is to make opportunities attractive to investors by sharing costs to achieve greater benefits.

We've been working hard to become easier to work with and a more dependable partner. Since July 2017, as part of the Open for Business programme, we've put in place a number of initiatives to make it easier for other organisations to invest and build on the railway. There's been a big focus on reducing red tape and bureaucracy and removing the biggest barriers to entry for new innovations into the railway. We've opened up our standards to challenge, put jobs out to market traditionally only Network Rail would do, and put in place a team of business development directors all keen to hear new ideas, new ways of working and new solutions that will deliver passenger benefits.

Research and Development Innovation is in our nature

We are working with Hack Partners to set challenges and manage outputs for their rail industry hackathon 'Hacktrain VI', in November 2019, creating opportunities for data innovators to help our regions and routes make improvements for customers.

This improved collaboration with internal and external partners is being helped by new, faster and more effective ways of working, increasingly applying agile methods and driving usable innovation at pace.

These include:
- introducing processes to increase consistency and structure – showing there's more to R&D than just developing technology
- developing new, clearer procurement models, replacing step-by-step procurement
- engaging with routes and regions to ensure change programmes are connected to regional strategic planning

We work with:

CATAPULT Connected Places

Railway Industry Association
The voice of the UK rail supply community

TRANSPORT SCOTLAND CÒMHDHAIL ALBA

UNIVERSITY OF BIRMINGHAM | BCRRE

INDUSTRIAL STRATEGY

ORR OFFICE OF RAIL AND ROAD

Shift2Rail

Department for Business, Energy & Industrial Strategy

Department for Transport

HM Treasury

Innovate UK Knowledge Transfer Network

mtc Manufacturing Technology Centre

highways england

National Infrastructure Commission

Department for Digital, Culture, Media & Sport

UKRRIN UK RAIL RESEARCH AND INNOVATION NETWORK

RSSB

railalliance

Rail Delivery Group National Rail

i3P

Rail Forum MIDLANDS

2.2 There's more to R&D than technology

Successful R&D is not just about the technology. Technology drives the opportunity, but R&D starts with a value proposition and ends with a business case.

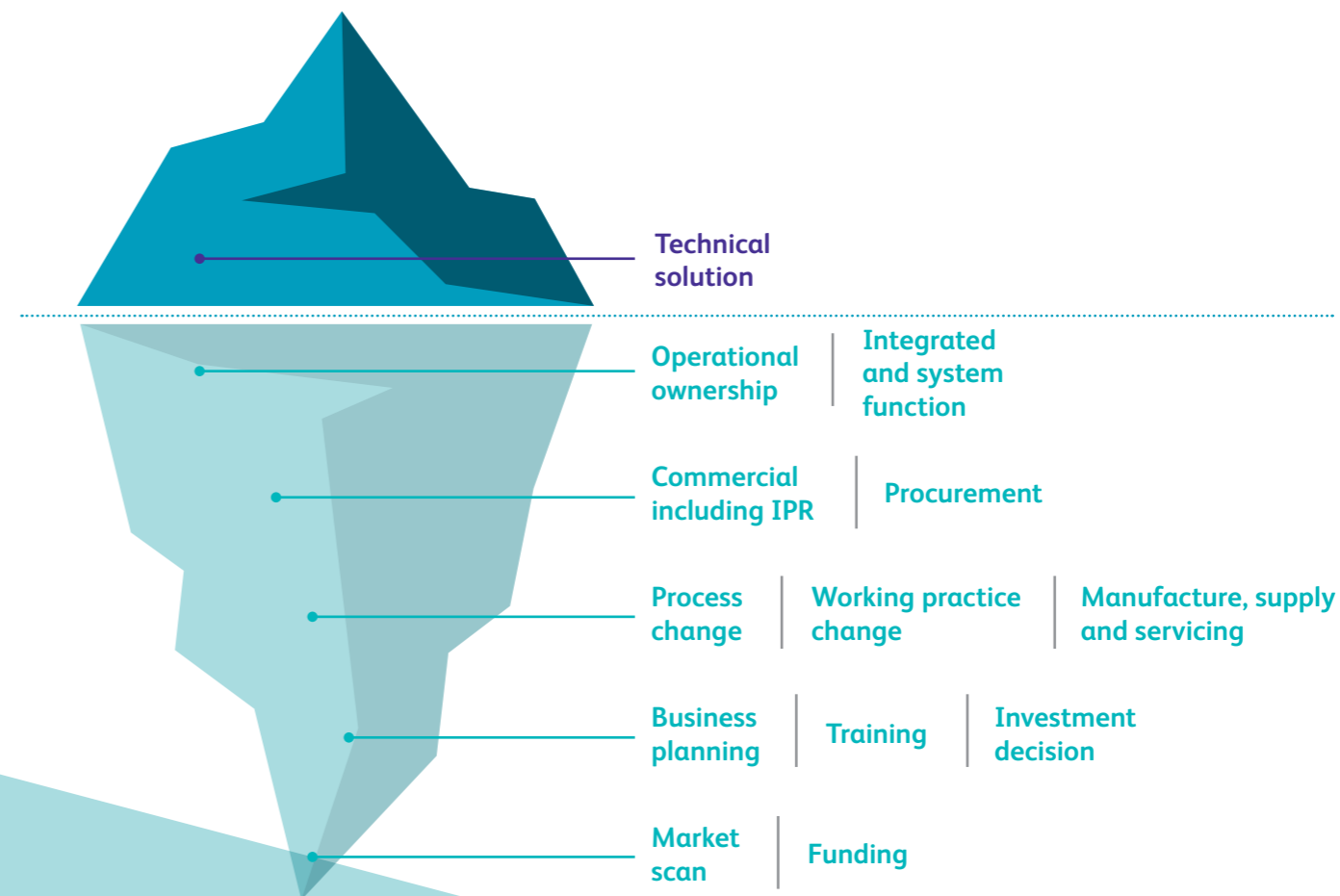We need to build confidence in the new solutions we develop by making sure they:

• are practical

• meet a genuine demand

• can be manufactured, supplied and supported

• meet requirements for reliability, availability, maintainability and safety

This helps us deliver better outcomes for passengers and freight customers. When we innovate it's crucial everyone speaks the same language about the readiness of a solution. This helps us understand how far along the path of development we've travelled and what's left to achieve.

That's why we've introduced the Rail Industry Readiness Levels framework

A framework built on the concept of Technology Readiness Levels developed by NASA for pioneering the final frontier; refined by the RSSB with input from the wider rail industry for use in the railway.

It considers all elements needed to deliver and operate new technology. The framework aims to make sure that everyone involved in the development is clear about its capability and readiness for deployment as part of the railway system.

Technical solution

Operational ownership | **Integrated and system function**

Commercial including IPR | **Procurement**

Process change | **Working practice change** | **Manufacture, supply and servicing**

Business planning | **Training** | **Investment decision**
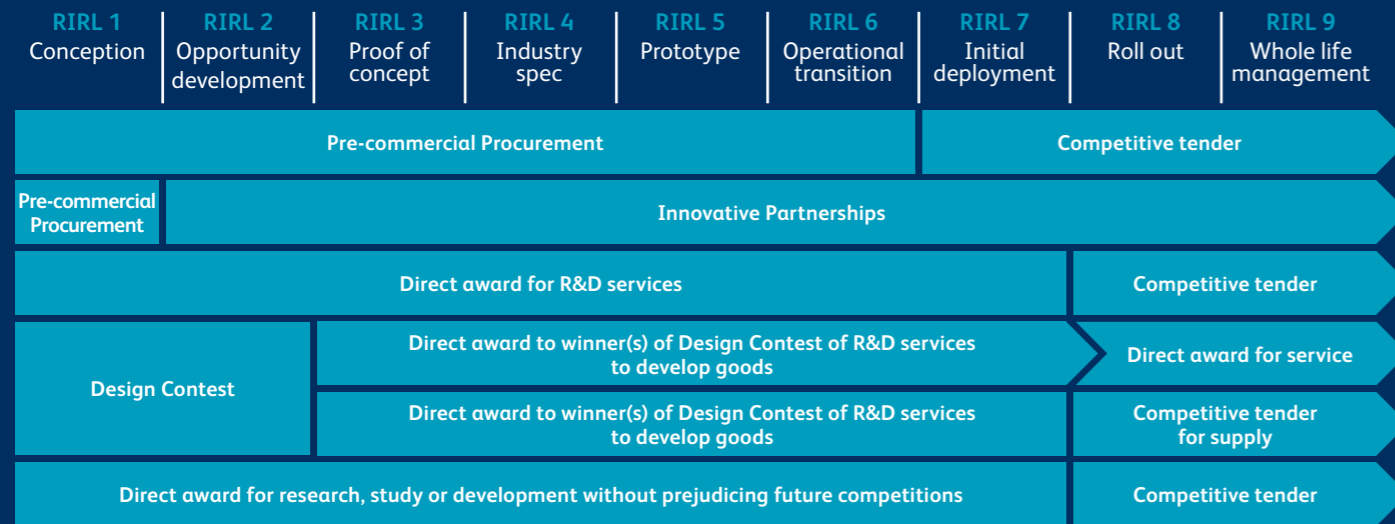
Market scan | **Funding**

The R&D iceberg - the technical solution is just the tip of the iceberg in developing and deploying R&D

2.3 New procurement models improve collaboration

To be pioneering we need to find new approaches to drive ideas and energise innovators. The models we've developed are pragmatic, enable sharing of risk and reward and provide flexibility to facilitate collaboration between industry and the supply chain.

The diagram below is just the start in our journey to continuously improve and develop new procurement models to better encourage investment and improve effectiveness of our R&D activities.

Our Pre-commercial Procurement activity is currently undertaken in collaboration with Innovate UK and Connected Places Catapult whom advertise opportunities on the Gov.uk website. Innovation Partnerships and Design Contests are advertised in the Official Journal of the European Union.

RIRL 1	RIRL 2	RIRL 3	RIRL 4	RIRL 5	RIRL 6	RIRL 7	RIRL 8	RIRL 9
Conception	Opportunity development	Proof of concept	Industry spec	Prototype	Operational transition	Initial deployment	Roll out	Whole life management

Pre-commercial Procurement		Competitive tender	
Pre-commercial Procurement	Innovative Partnerships		
Direct award for R&D services		Competitive tender	
Design Contest	Direct award to winner(s) of Design Contest of R&D services to develop goods	Direct award for service	
	Direct award to winner(s) of Design Contest of R&D services to develop goods	Competitive tender for supply	
Direct award for research, study or development without prejudicing future competitions		Competitive tender	

R&D technology readiness levels (RIRLs) and procurement models

2.4 Active and early engagement from our routes

R&D is only valuable when deployed.

To ensure there is a business need for our innovation and to reduce the time between idea and deployment, the R&D team is working closely with routes and regions to co-create approaches, helping build strong connections between the R&D portfolio and business plans.

These connections drive:
- pull from regions for R&D to meet the most pressing needs for customers
- the development of solutions that are practical to deploy
- a pragmatic assessment of R&D project benefits

Our communication and engagement plays a pivotal role in this activity. We are working with routes and regions to identify changes needed to meet the future state articulated in their business plans and supporting with the practical scope for changes to achieve this. A key development is articulating benefits for R&D projects clearly and consistently.

We are also piloting new methods of innovation as part of our Agile Innovation Programme. Commissioned to provide faster innovation at scale using agile and iterative delivery methods, this programme will allow R&D to target some of the short-term objectives in business plans.
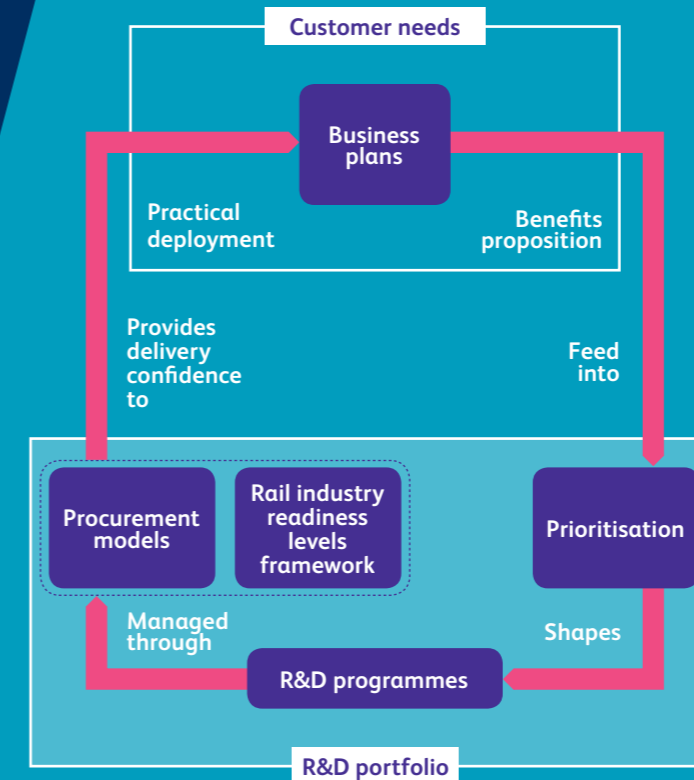
Company business plans and the R&D Portfolio relationship

2.5 Collaboratively defining and managing R&D

The governance structure enables early and continued engagement from across Network Rail through the lifecycle of a project – from the start of an innovative idea to handover and deployment.

Portfolio Board

To manage R&D as a portfolio, we've brought together Network Rail region and central business areas under a R&D portfolio board.
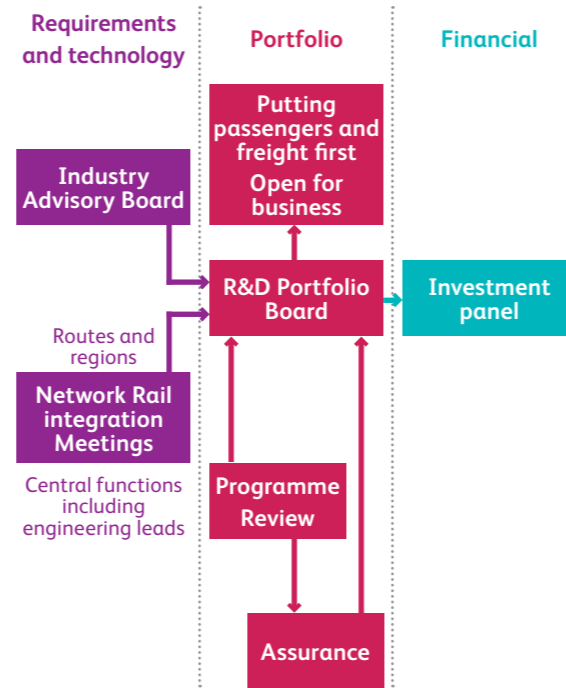
This board, chaired by the R&D portfolio's Senior Responsible Owner and our Chief Technology Officer, is the decision-making engine for the R&D portfolio. It authorises projects and programmes, making sure the portfolio is balanced for short, medium and long term opportunities and directed at the right priorities.

Industry Advisory Board input

Advice and guidance are received from an Industry Advisory Board, consisting of members from our funders and external bodies for transport and industry as well as Train Operating Companies (TOCs), Freight Operating Companies (FOCs) and non-rail technology leaders. This board endorses the R&D Portfolio plan based on funder priorities and advises on approaches and technology from wider industries.

Programme Review

The health and progress of R&D projects and programmes are monitored through regular programme reviews, with input from region and central business stakeholders.

Requirements and technology **Portfolio** **Financial**

Industry Advisory Board

Putting passengers and freight first

Open for business

R&D Portfolio Board

Investment panel

Routes and regions

Network Rail integration Meetings

Central functions including engineering leads

Programme Review

Assurance

R&D portfolio governance structure

2.6 Understanding and acting on challenges

The R&D portfolio is guided by business challenges.

Currently, we have 50 challenge statements published on our external website that raise awareness of our priorities and signal opportunities to innovate.

Each challenge statement highlights a specific business opportunity, providing detail on:

• challenge definition

• root cause analysis

• priority areas of focus

• guidance for research and development

These challenge statements connect to our technology roadmaps, showing us the direction we're heading in. Our strategic business plans lay out the objectives for regions and other business areas and will increasingly draw on outputs from the R&D Portfolio.

Take a look at the statements at **www.networkrail.co.uk/challenge-statements**
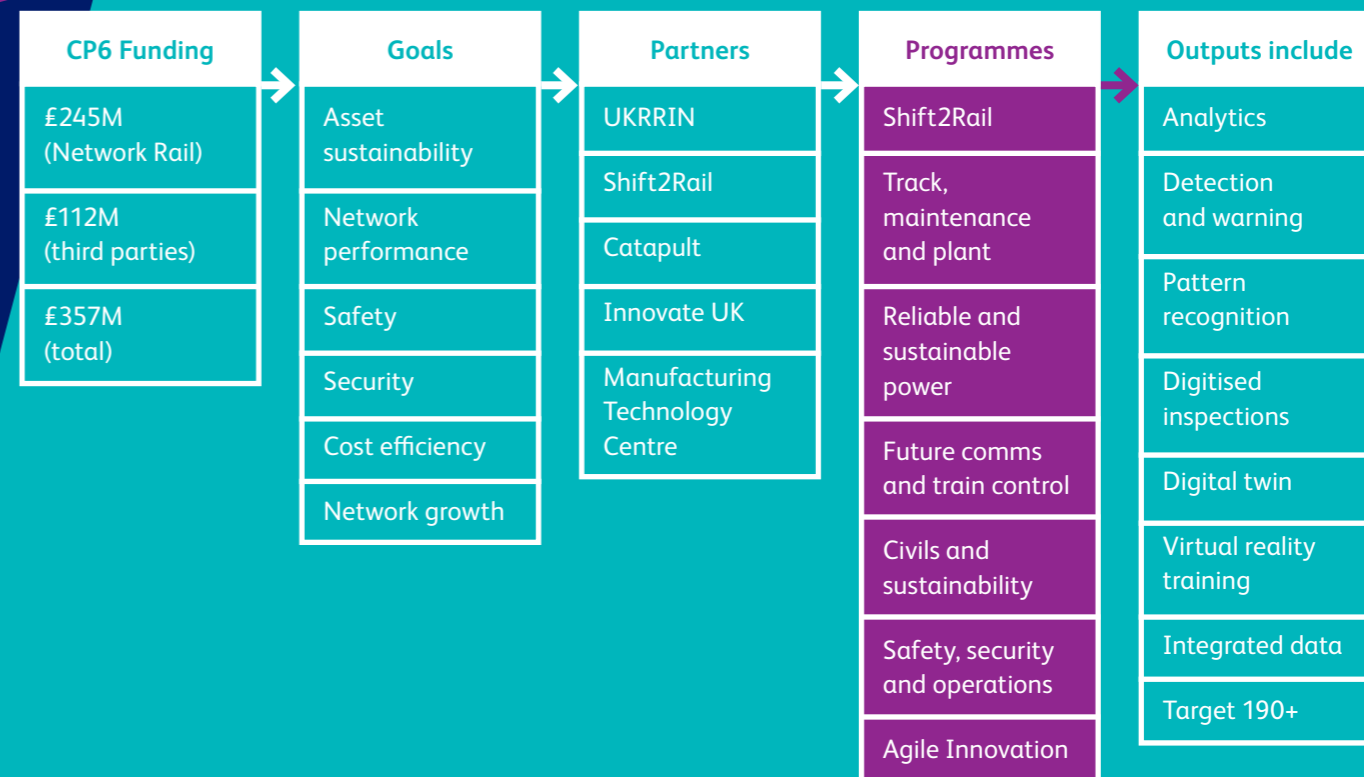
2.7 Our key programmes

The R&D portfolio was designed to generate a pipeline of improvements across all our assets.

Programmes were formed through several stages, involving consultation with:

- Network Rail Chiefs of Engineering, Security, Safety and Environment;
- Network Rail Telecoms;
- Network Rail Directors of Route Asset Management;
- Investment Projects;
- Related Network Rail national programmes including Digital Railway and Intelligent Infrastructure;
- Supply chain and the wider industry.

This was followed by validation and definition by route and Technical Authority teams, identifying the business challenges, scope and priorities.

Our programmes encompass:

CP6 Funding	Goals	Partners	Programmes	Outputs include
£245M (Network Rail)	Asset sustainability	UKRRIN	Shift2Rail	Analytics
£112M (third parties)	Network performance	Shift2Rail	Track, maintenance and plant	Detection and warning
£357M (total)	Safety	Catapult	Reliable and sustainable power	Pattern recognition
	Security	Innovate UK	Future comms and train control	Digitised inspections
	Cost efficiency	Manufacturing Technology Centre	Civils and sustainability	Digital twin
	Network growth		Safety, security and operations	Virtual reality training
			Agile Innovation	Integrated data
				Target 190+

What we are doing

Research and Development Innovation is in our nature

R&D in motion

We've already been at the heart of pioneering projects that are changing the railway.

Our main focus has been on improving our collection and use of data to keep passengers and freight customers moving.

Going forward, we're looking to exploit five key technology areas:

- **Robotics** – Machines including drones that perform inspection, monitoring and maintenance tasks, complemented with virtual and augmented reality technology, removing people from unsafe environments and reducing the impact on train services from possessions.

- **Materials** – Assets with reduced embedded carbon that can be life-extended and recycled, or designed to exploit off-site manufacturing and 3D printing.

- **Autonomy** – Artificial intelligence including machine learning providing real-time monitoring and supporting decisions, optimisation and design for maintenance, renewals, security, and enhancements.

- **Data** – Platforms for virtual design, testing and dynamically responsive operations. Open data and blockchain enable new business models to encourage innovation and responsiveness, reducing the need for physical intervention whilst improving safety, performance and information to customers.

- **Energy systems** – Safe, readily maintained, flexible and cost-effective power options that combine to deliver reliability and draw on green energy.

Meet NEMO the rail robot

A rail robot, NEMO, combines cameras and sensors to find faults, position repairs and uses innovative technologies to generate repairs.

Impact

Successfully developing the means to undertake repairs to the railhead has the potential to realise net benefits approaching £100m over five years, while making repairs more efficient. It requires less time for the track to be taken out of service and reduces the time spent by colleagues in a hazardous environment.

Where we are now

Having started in 2016, the equipment is being developed by Network Rail, Connected Places Catapult and Cranfield University under both Network Rail R&D funding and the European Union-funded Shift2Rail infrastructure innovation programme project 'In2SMART'.

It uses a modular design approach for an autonomous command and control system with open-source robotic control interfaces. It will communicate with the maintenance scheduling and asset management systems and is independently powered.

Where next?

To create a deployable system, we plan to combine the new technology 'platform' created by this project with specific rail repair processes developed through other projects.

"Increases in passenger and freight services mean that wear and tear on our assets increases, while opportunities to inspect and maintain them decreases."

"Rail robots will provide frontline staff with a safer means to carry out the work necessary to address this."

Amanda Hall, Engineering Expert (Systems)
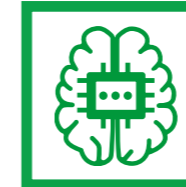
Tracks, camera, action

Plain Line Pattern Recognition (PLPR) is a train-borne high-speed video system that provides safe, consistent track monitoring.

Using laser technology, it captures images of the track every 0.8mm at up to 125mph and uses algorithms to automate the examination of images to flag potential faults.

Impact

Any potential faults are more consistently identified, freeing engineers to focus on examining areas of concern while working in a safe environment.

The quality of the track condition data is enhanced, which underpins more effective asset management decisions.

Where we are now

PLPR has been rolled out on 14,000 miles of track across our network.

Where next?

We aim to refine the algorithms to reduce the number of false positives and teach the system to learn from the examination inspectors to increase the level of automation.

'We were successful on several innovative UK funding calls… to develop new and innovative products…we have enabled Network Rail to automate basic visual inspection."

Stuart Kimkeran, Head of Technology and Development Solutions, Omnicom Balfour Beatty

On the move again

Degraded Mode Working System (DMWS or COMPASS) is a proof of concept system that helps trains to start moving again after signalling system failure. It's activated remotely and can be implemented in minutes.

Impact

Failures in signalling systems lead to substantial delays for passengers – with an annual cost of £130 million attributed to signalling system failures. DMWS reduces compensation and negative reputational impacts for the railway industry by helping train operators restore services after signalling system failures through reducing the loss of train paths.

Where we are now

DMWS has been developed as a working concept and has the potential to provide resilience across the network.

But it's not just the newly developed system that moves us forward. The procurement approach was innovative, enabling a challenge to be set and companies to compete led by new solutions.

Where next?

DMWS is being taken forward and we expect it to be deployed on parts of our network within the next five years.

The novel and award-winning procurement approach used for DMWS could be improved to achieve an uninterrupted route to market for future R&D projects by applying the innovation partnerships model.

> **"We're proud to have applied our global cross-sectoral digital and engineering expertise to solve a major issue for the UK railway, enabled by innovative and collaborative procurement."**
>
> **Altran (Supplier), winner of the Engineering and Safety Railway Industry Innovation Award 2018**
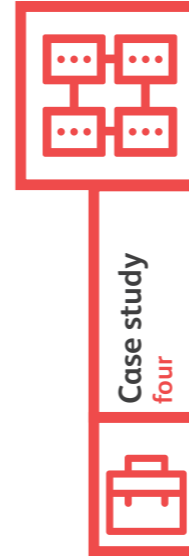
Data to support decisions

Decision Support Tools (DSTs) provide aligned and consolidated data on the condition, performance and degradation of assets.

They're used to support maintenance and renewal decisions across the network and have been developed for track, signalling, electrical power, operational property, level crossings, switches and crossings.

Impact

Engineers and planners can access the information they need, when they need it. DSTs allow engineers to understand degradation rates better and provide evidence to carry out timely and cost-effective interventions to keep the network operating.

Where we are now

DSTs have been deployed nationally as part of the ORBIS programme, Network Rail's programme to collect, join and exploit accurate rail infrastructure data

Where next?

Integration with the Intelligent Infrastructure programme to manage our assets, predicting and preventing failure rather than finding and fixing faults.

> **"The benefits are huge: I'd estimate we were treating just 50-75 percent of the correct track areas – now I'm confident it's closer to 100 percent… This is, without doubt, the greatest development I've seen for displaying asset data."**
>
> **Steven Kingston, TME, Wales**

Forewarned is forearmed

Enhanced Points Condition Monitoring (ePCM) is software designed as part of Network Rail's 'predict and prevent' strategy, increasing our ability to detect, diagnose and predict potential failures earlier.

Impact

Earlier detection of anomalies means that assets can be monitored in a more proactive manner, which leads to less reactive interventions. There's also the potential to save around 75,000 delay minutes annually.

Where we are now

The ePCM software has piloted in three locations.

Where next?

Following pilot schemes, we plan on national implementation in Control Period 6. This work aims to broaden the benefits felt by all stakeholders such as automated scheduling of works.

> **"The ePCM software trial provided Leeds DU with a platform with the capability to predict failures and failure modes rather than the conventional alarming which our current platform Intelligent Infrastructure provides. We've seen a benefit from using this software – in the space of a few days three potential faults were predicted."**
>
> **Rhiannon Jones, Assistant S&T Maintenance Engineer, Holbeck Depot, Leeds**

Rail sensor technology trials at RIDC Melton

Insight from multiple rail sensor data feeds brings focus to problems before they delay passengers and freight

Impact

Repurposing technology from other industries is a faster and cheaper route to realise a greater breadth and depth of infrastructure data, putting us in a better place to detect a variety of problems.

Where we are now

Technology specialists, from small to large enterprises, have used RIDC Melton to trial a range of communications-based sensing technologies with support from Network Rail.

Where next?

More extensive trial deployments of wireless internet of things (IoT) and optical fibre acoustic sensing will deliver a rich flow of live data. This will enable further innovation, potentially leading to new ways of working for the railway, underpinning improved performance.

> **"It has been a pleasure working with the highly knowledgeable people at Network Rail as we trialled our IoT sensing technology solutions on the railway. Network Rail installed our LoRaWAN gateways and sensors and we've worked together to explore sensor reliability, maximising battery life and how data can be used for insight in a variety of use cases impacting rail infrastructure operations."**
>
> **Mike van Bunnens, Managing Director, Comms365**

4.0

Get involved

4.1 Introducing the R&D team

The R&D team supports our Chief Technology Officer to govern the portfolio, working across NR and industry to ensure it's effectively defined and delivered.

The team is a focal point for R&D and innovation in Network Rail: managing programmes; connecting ideas with funding; owning tools and processes that help pioneers innovate; and coordinating with other R&D within and beyond the rail sector.

R&D Assets

R&D has dedicated Rail Innovation and Development Centres, that provide safe environments to test equipment and form part of the rail industry's UK Rail Research and Innovation Network. Funding from the Department for Digital, Culture, Media & Sport has facilitated the creation of the first rail 5G testbed in Europe at the RIDC Melton, to support the next generation of digital infrastructure and enhance opportunities for operational and passenger connectivity.

Product Acceptance

A key part of developing new technology for the railway is achieving acceptance for use on the live network. Our product acceptance team manage this process for Network Rail.

Andy Doherty
Chief Technical Officer

Alison Smith
Senior Programme Manager

David Rowe
Head of Strategy

Janine Fountain
Programme Manager
(Civils & sustainability)

Karl Butler-Garnham
Programme Manager
(Future comms and train control)

Huw Evans
Programme Manager
(Safety, security & operations; Reliable & sustainable power)

Rob Forde
Programme Manager
(Track, maintenance & plant; Agile Innovation)

Felicity Osborn
Programme Manager
(Shift2Rail)

4.2 What does this mean for you?

Our industry depends on our collective ability to inspire and create change through research, development and innovation.

This change goes beyond physical assets – it's about using technology to build a reliable service our passengers, staff and nation can be proud of.

It's up to **all of us** to make this happen.

4.3 I work for Network Rail, what if I've got an innovation idea?

If you've got an idea, R&D can support you to establish who might be interested and how to get it moving. New ideas for projects are typically shared through Network Rail integration meetings, the general governance structure we have in place to keep the organisation connected, and put through an R&D programme review. This review considers the contribution to route plans, challenge statements and technology roadmaps.

Where suitable, the R&D team supports translating these ideas into feasible project proposals. This could include opportunities for financial support and capital investment, signposting funding opportunities and competitions and in some cases giving a steer or endorsement of bids.

By using a small amount of initial funding, such as 'seedcorn' funding available from the R&D fund, the R&D team can help you to translate an idea into a fully formed project proposal or agreement. This serves to progress potentially to a funded project within our R&D portfolio.

We can also support by connecting you with other innovators and with research and development that is already happening. We can highlight the processes in place to gather challenges and find ways to solve some of them quickly.

If you are in a Region, we can link you into the structured process for gathering challenges that reflect the most pressing passenger needs. These will feed into our Agile Innovation programme.

4.4 I am an external supplier, what innovation ideas should I bring to Network Rail?

If you're an existing or future partner or supplier, the R&D team can help you navigate your way to contributing to and exploiting our R&D portfolio.

If your idea or proposal sparks interest, we'll consider how we can help you which could include:

- data to help develop your product;
- helping aid products through development stages;
- honest and open commercial conversations;
- supporting overall readiness for real-world usage;
- guidance navigating product acceptance processes;
- introductions to our test centres or support in identifying appropriate test locations; and
- guidance using the Rail Industry Readiness Levels (RIRLs), to support preparation for implementation

We are also encouraging contractors, suppliers and stakeholders to propose changes to our standards as part of our Open for Business Programme. For more details visit **www.networkrail.co.uk/challengeourstandards**

4.5 Want to shape the future of the industry?

Performance innovation opportunity

Alongside the R&D fund sits the Performance Innovation Fund, which offers £40m over the five years of CP6.

This fund is aimed at delivering innovation that will have a positive impact on both passengers and freight customers in the short-term.

The scheme is all about developing proposals that focus on recognised problems or opportunities, that offer whole industry benefits, are likely to drive real performance improvement through delivery before the end of CP6 and ideally offer matched funding.

To find out more and get advice from the team, send an email to:
PerformanceInnovationFund@networkrail.co.uk

Rail Technology Strategy input

Our R&D portfolio contributes directly to the Rail Technology Strategy, which is currently being updated. This refresh considers what R&D has achieved and what contribution it can continue to make. It considers the advancement in technology and the establishment of the government's industrial strategy.

To be part of the industry's future technology journey and contribute your R&D views, contact the industry body at:
RTS@RSSB.co.uk

Suppliers looking for support

The UK's major representative organisations in the rail supply sector have joined forces in collaboration to form the 'Rail Innovation Family' that helps provide greater and clearer support for suppliers seeking to bring innovation into the rail industry.

Together, the organisations within this Rail Innovation Family offer a powerful and extensive innovation offering, which can help suppliers to navigate the rail sector. Organisations in the Rail Innovation Family include:

Birmingham Centre for Railway
Research and Education (BCRRE)/
Rail Alliance (RA)
www.birmingham.ac.uk/railway/
www.railalliance.co.uk
j.s.illingsworth@bham.ac.uk
+44(0) 121 414 4165

Rail Forum Midlands (RFM)
www.midlandsrail.co.uk
elaineclark@midlandsrail.co.uk
+44(0) 1332 593550

Railway Industry Association (RIA)
www.riagb.org.uk
ria@riagb.org.uk
+44(0) 207 201 0777

4.6 Ready to become a pioneer?

Have you got a solution or idea?
Why not see if it fits with our challenges at
www.networkrail.co.uk/challenge-statements

You can also send your idea to us
and talk to a member of the team.

Get in touch. **R&D@networkrail.co.uk**