Digital Railway

The Digital Railway - improving track safety

13 September 2017

Tom Lee
Director of Standards, RSSB
Pat McFadden
Head of DR Systems Requirements and Integration

Working together for a better railway:

Department for Transport
Rail Delivery Group
National Rail
Britain Runs on Rail
NetworkRail
RFG Rail Freight Group
Rail Supply Group
Railway Industry Association
RSSB

The technology exists and it continues to develop

Industry Readiness

The successful implementation of digital technologies is reliant on industry readiness to accept, understand and embed their usage and maximise the benefits of the overall systems.

Industry Skills, Capabilities and Transformation

Builds capacity and capability and develops expertise. Enables the workforce and industry to adopt new technologies and ways of working, build digital capabilities and maximise the benefits of the overall systems.

European Train Control System (ETCS)

allows trains to run closer together and to travel at their best speeds whilst maintaining safe braking distances.

Connected Driver Advisory Systems (CDAS) + Automatic Train Operation (ATO)

provides decision support to drivers in the cab so that they have the information they need at the right time to boost performance and safety.

Traffic Management (TM)

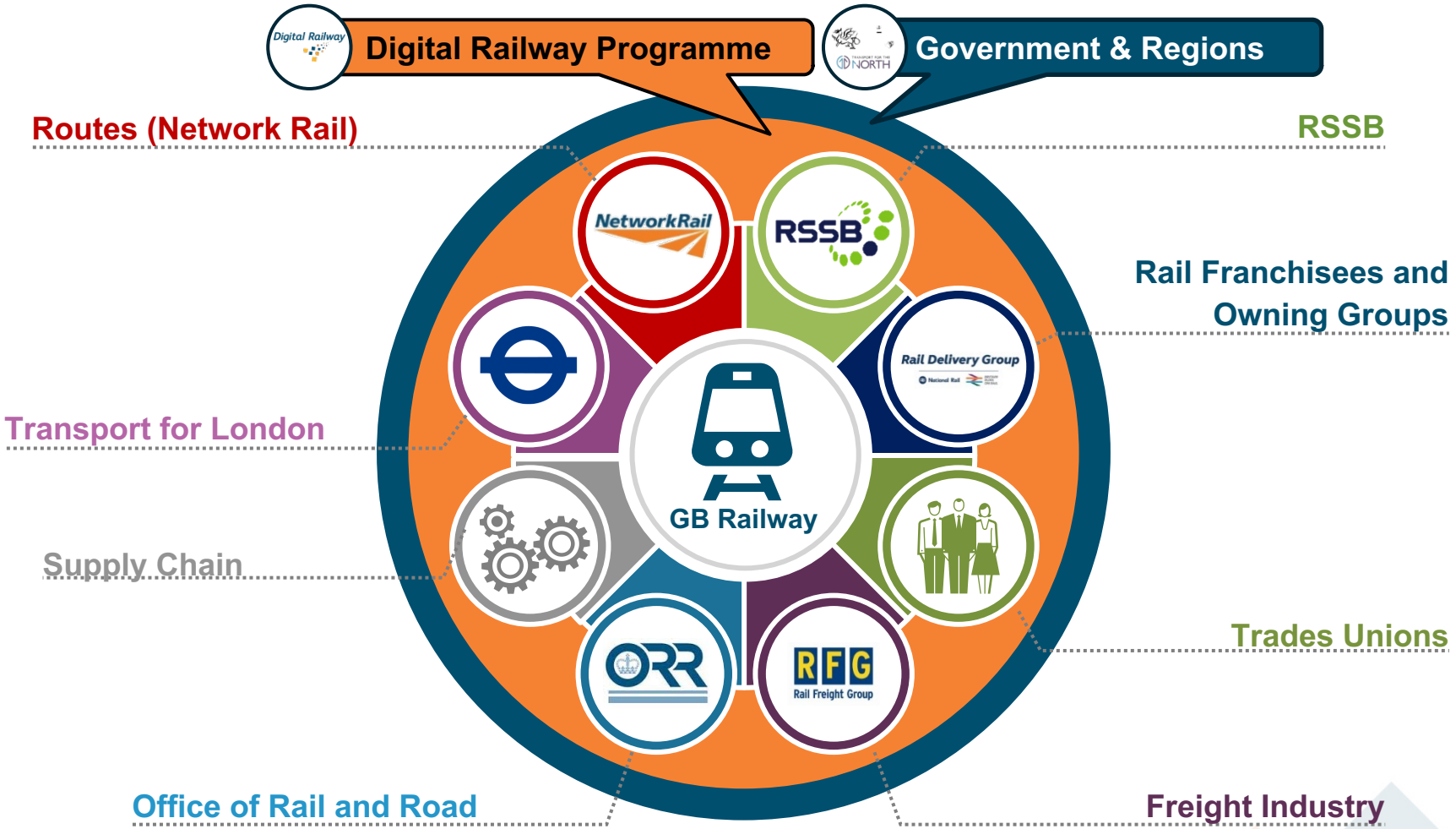
maximises performance as trains flow across the network, maximising the throughput that existing track can support and adapting in real-time as network conditions change to aid rapid recovery.

Telecoms + Data

will underpin and connect all these systems through Fixed Telephone Network (FTN) and Global System for Mobile – Railway (GSM-R).

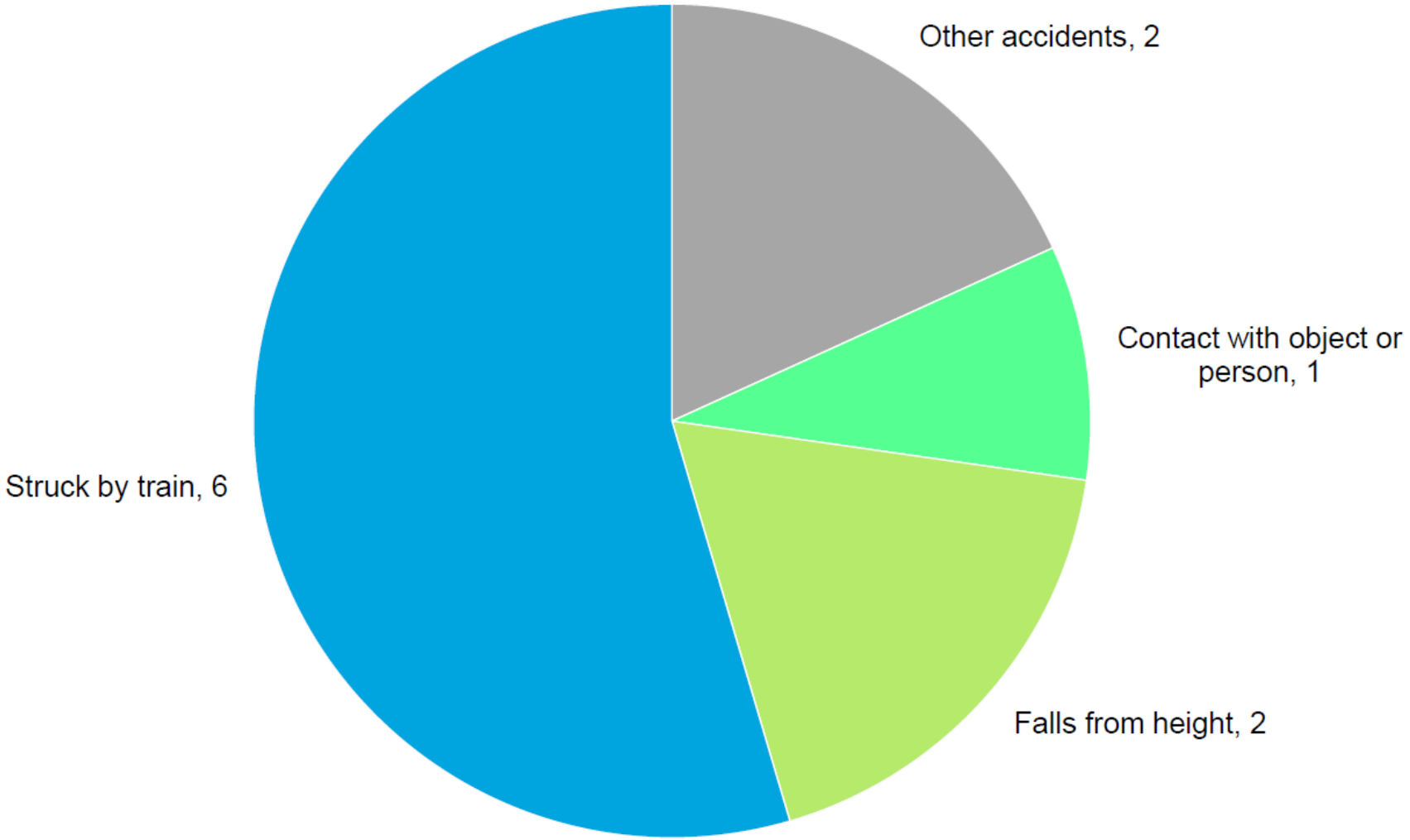
The benefits of Digital Railway will impact both business and society

Transformation requires the involvement of all parts of the railway



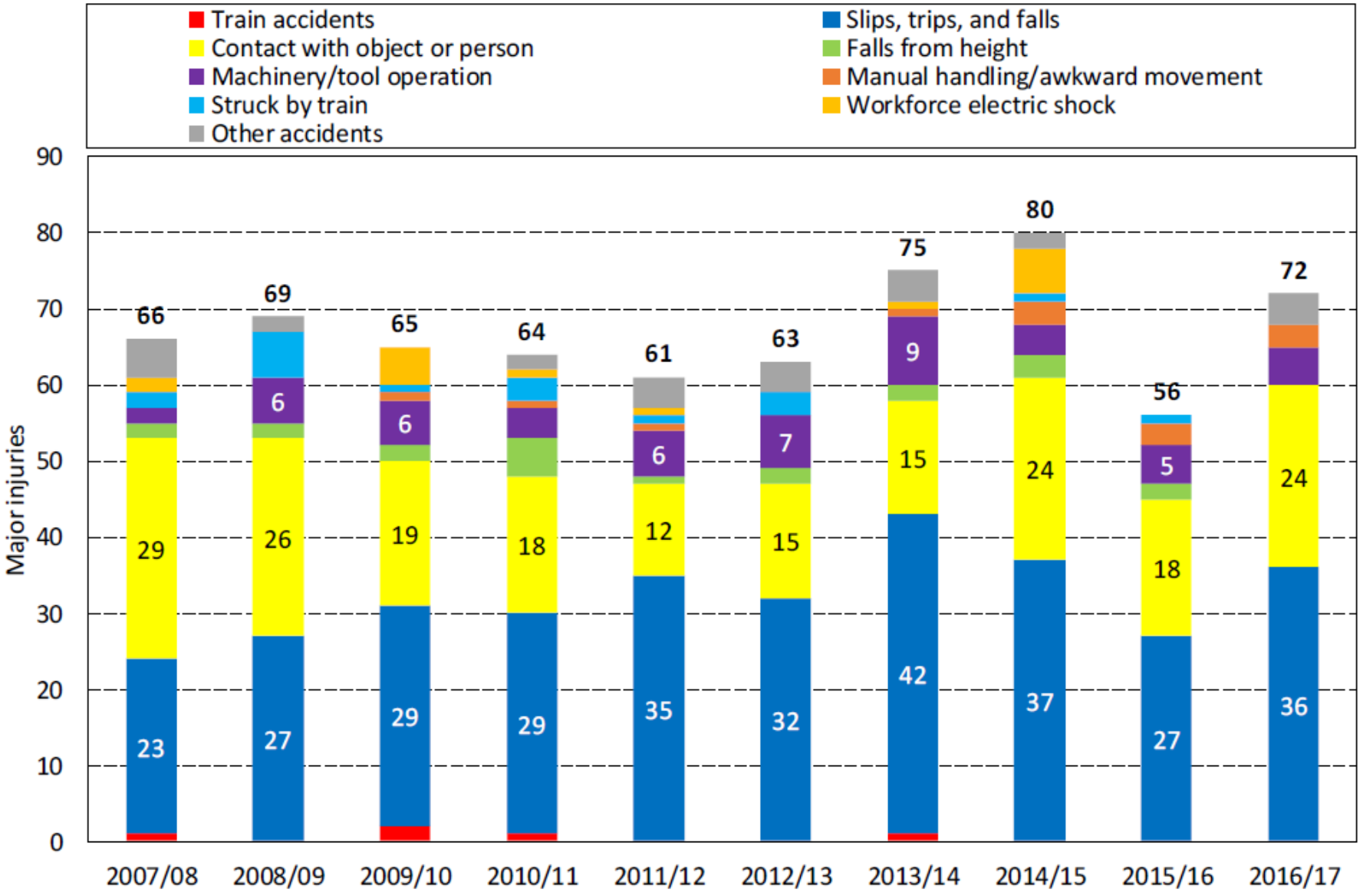
This slide is representative of the parties involved, it is not necessarily comprehensive.

Workforce fatalities by type, 2007/8 – 2016/7



Source: Annual Safety Performance Report 2016/7, RSSB July 2017

Major injuries by accident type



Source: Annual Safety Performance Report 2016/7, RSSB July 2017

Existing controls

- Reduce the need for trackside work, for example…
  - Reduce equipment on the lineside
  - Condition monitoring
  - Automated inspection
- Plan to be safe
  - Procedures such as NR/L2/OHS/019 *Safety of people on or near the line*
  - Hierarchy of controls, starting from the top
- Be safe
  - Operational requirements
  - Rule Book
  - Handbooks
  - Company instructions
  - Safe working processes

Track Worker Safety

1907

UK Rail Companies reject the UK Board of Trade recommend-ation to issue whistles to track workers to warn of approaching trains.

1914

A UK Government debate on the need for action to reduce deaths was defeated despite 420 railway men killed in the previous year. 102 were track workers

1985

11 track workers fatalities

2009 - 2014

3 track workers fatalities

2014

Network Rail Target

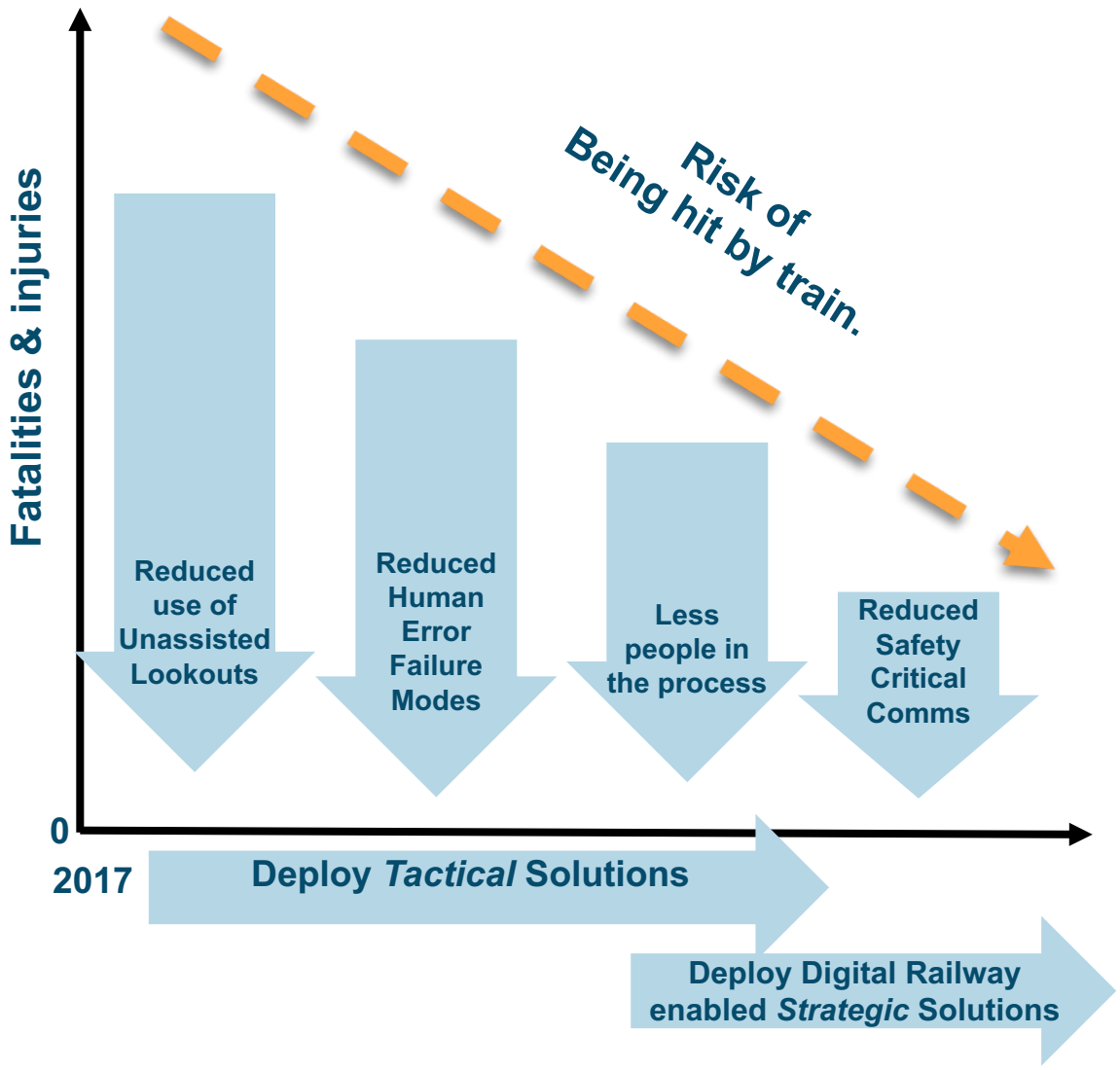
Zero Fatalities & Zero Major Injuries

2015 - 2016

0 Track worker fatalities
1 major injury

First financial year on record without a workforce fatality

Trackworker Safe Access Strategy
Corporate Risk Reduction

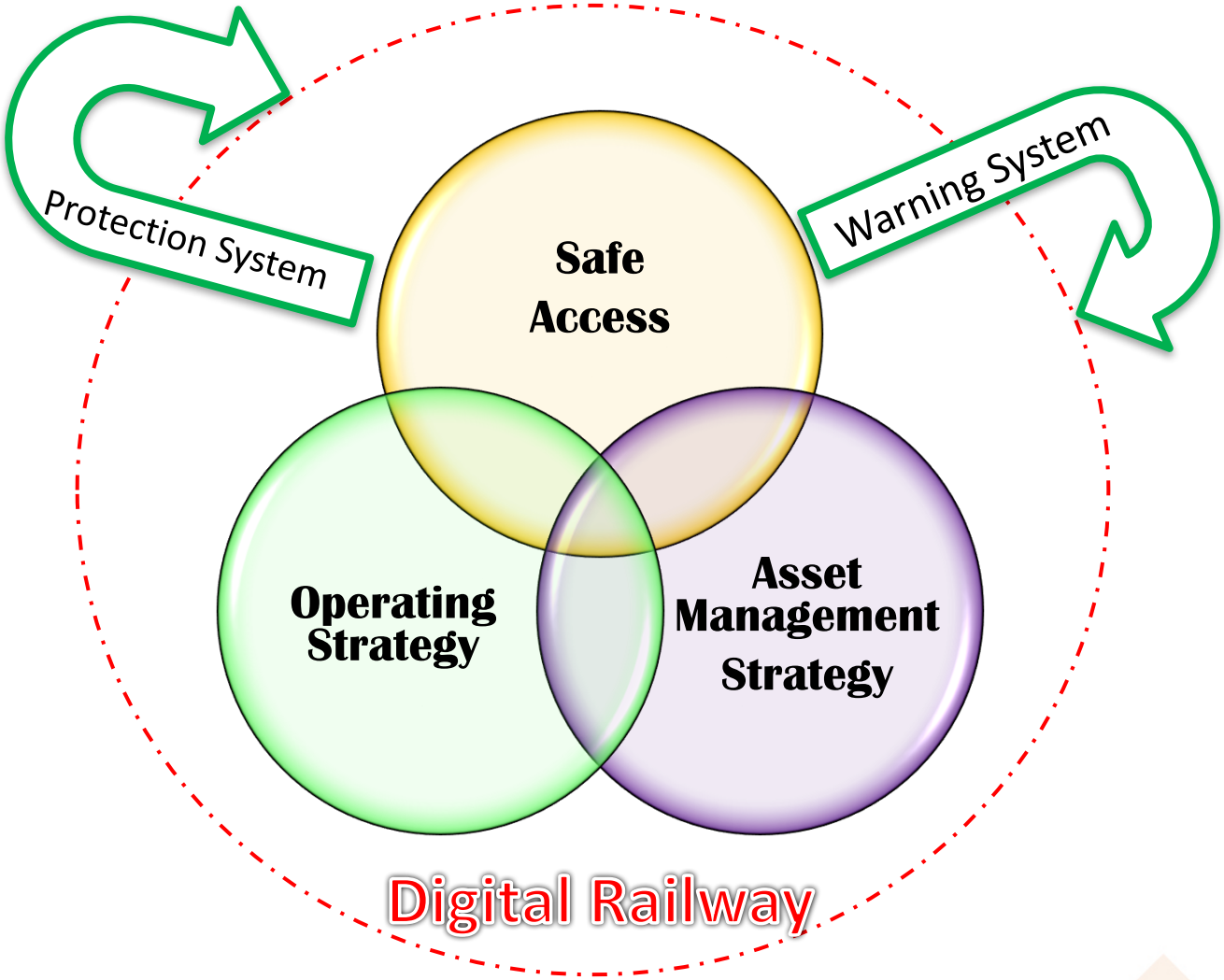


To support a sustainable strategy of risk reduction the Railway needs:-

High Integrity Train Blocking Systems and Technically Activated Warning Systems

- **Low** human error failure modes
- **Low** installation failure modes
- **Low** complexity of use
- **Low** hardware costs
- **Low** installation costs
- **Low** system maintenance costs
- **Very High/wide** ranging number of installations to impact risk profile

Integrated safety model



Traffic Management: Protection Solutions

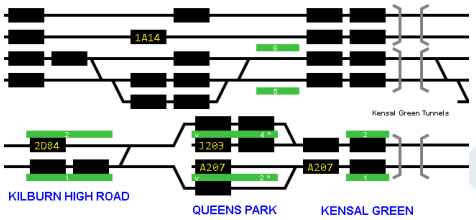
- Traffic Management is the new Signalling Control System of the future.

Remote Possession Management

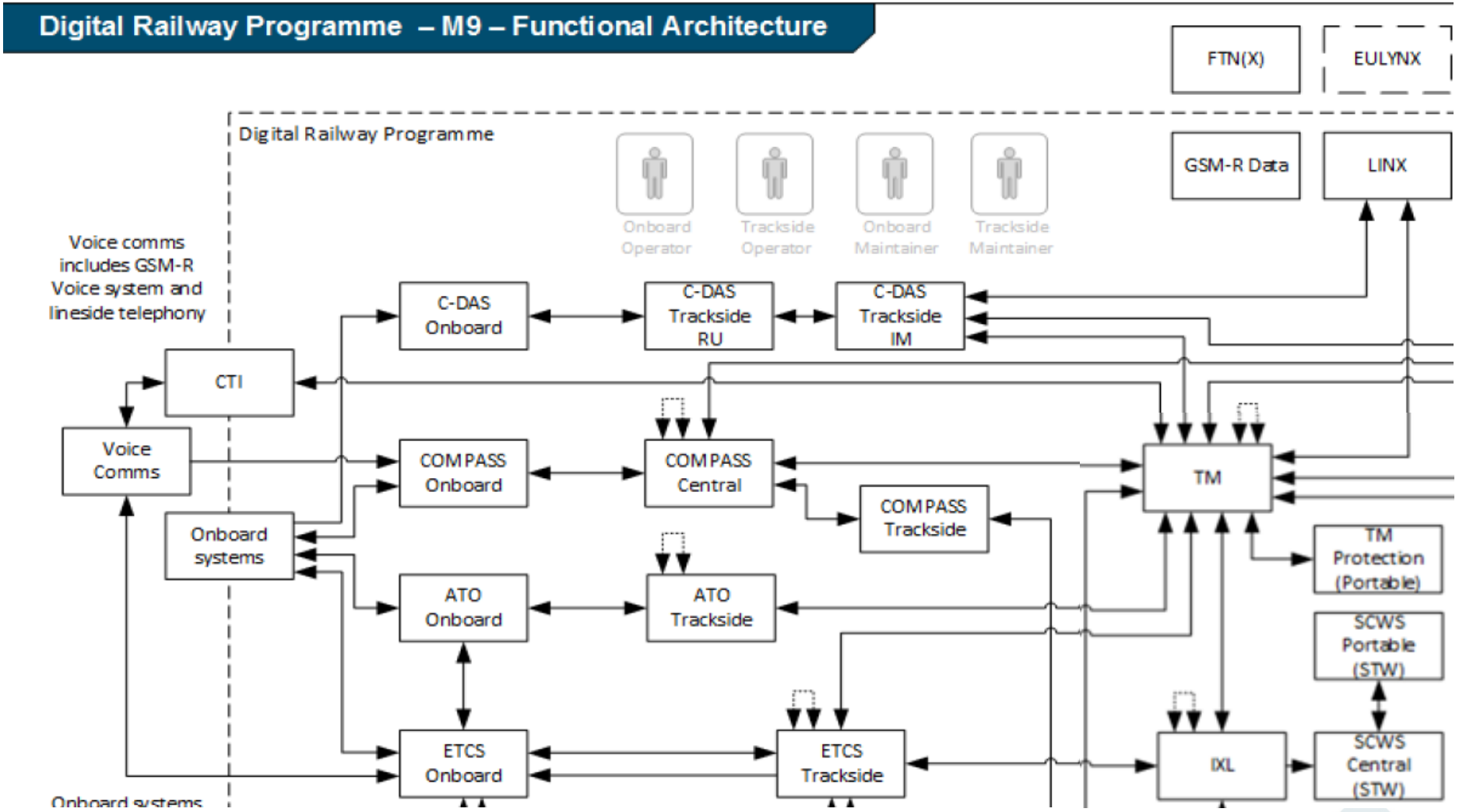
- provides the ability to deploy a protection system from a remote location, blocking Movement Authorities directly from site.

Signal Controlled Warning System

- Connected to the ROC or Control Centre signalling equipment
- Connected to other data sources (e.g. mapping & positions of safety)
- Builds a model of the state of the railway
- Registers field units and locates them within the model
- Calculates the warning criteria to allow workers at the field unit to reach a position of safety
- Determines if a position of safety is available
- Sends a warning to field units to warn of approaching trains when the warning criteria are triggered or if no position of safety is available



Recognised as a Component of Digital Railway



Digital Railway

Working together for a better railway:

Department for Transport

Rail Delivery Group

National Rail

Britain Runs on Rail

NetworkRail

RFG Rail Freight Group

Rail Supply Group

Railway Industry Association

RSSB

digitalrailway.co.uk

@DigitalRailway