RSA

Managing risk for the digital railway

Insurance flexibility to meet changing business needs

Take a look ›

The rail industry is evolving

Population growth, urbanisation and climate change are having a fundamental effect on global transport systems and how they are managed. At the same time, digital transformation is changing the way people live and businesses operate.

Adapting to these wider trends, the UK rail industry has to find answers to the specific challenges it faces. The network is under pressure, and there's a real need to increase capacity. An outdated infrastructure is often full at peak times, putting pressures on performance and timetables. This undermines the customer experience and prevents operators from achieving their performance goals. There's little room for error, with a ten-minute morning rush-hour delay at Cheltenham, for example, having a major knock-on-effect over a large part of the network including Scotland, over the next 18 hours.

At the same time, lack of capacity impairs the ability of the rail freight industry to deliver to potential and position itself as a viable, safe and clean alternative to transportation via HGVs that helps to achieve decarbonisation and productivity goals. Potential changes include a Train Operating Company proposing to take freight off the roads, for example by converting old passenger trains into light freight trains to move light goods from the London Container Port to Liverpool Street.

Increasingly, the industry is turning to digital technology to address and overcome the challenges. Digital signalling and train control solutions are among the many ways of delivering significant passenger and freight benefits at a lower cost, helping to create a rail experience that delivers for leisure and business travellers, and for freight distributors.

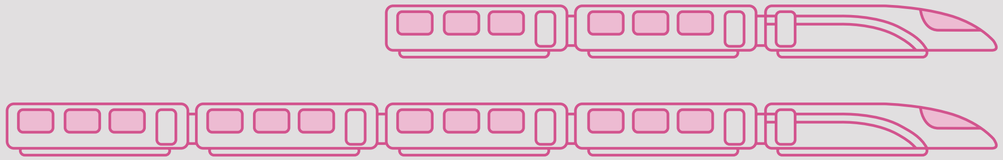
Inevitably, the changes have implications for the ways operators insure their businesses. At RSA, we help customers address new and emerging risks as well as existing challenges. Partners from the start, we intelligently share our expertise and broader insurance data to devise innovative and pragmatic solutions so that whatever happens, our customers are well prepared.

Our short guide looks at some of the changes and issues affecting the industry, and what these mean in terms of managing risk.

Demand for rail services has

more than doubled

over 20 years.



In 2017-18,

88% of trains were 'on time'

a slight improvement on the previous year.

Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/761352/rail-factsheet-2018.pdf

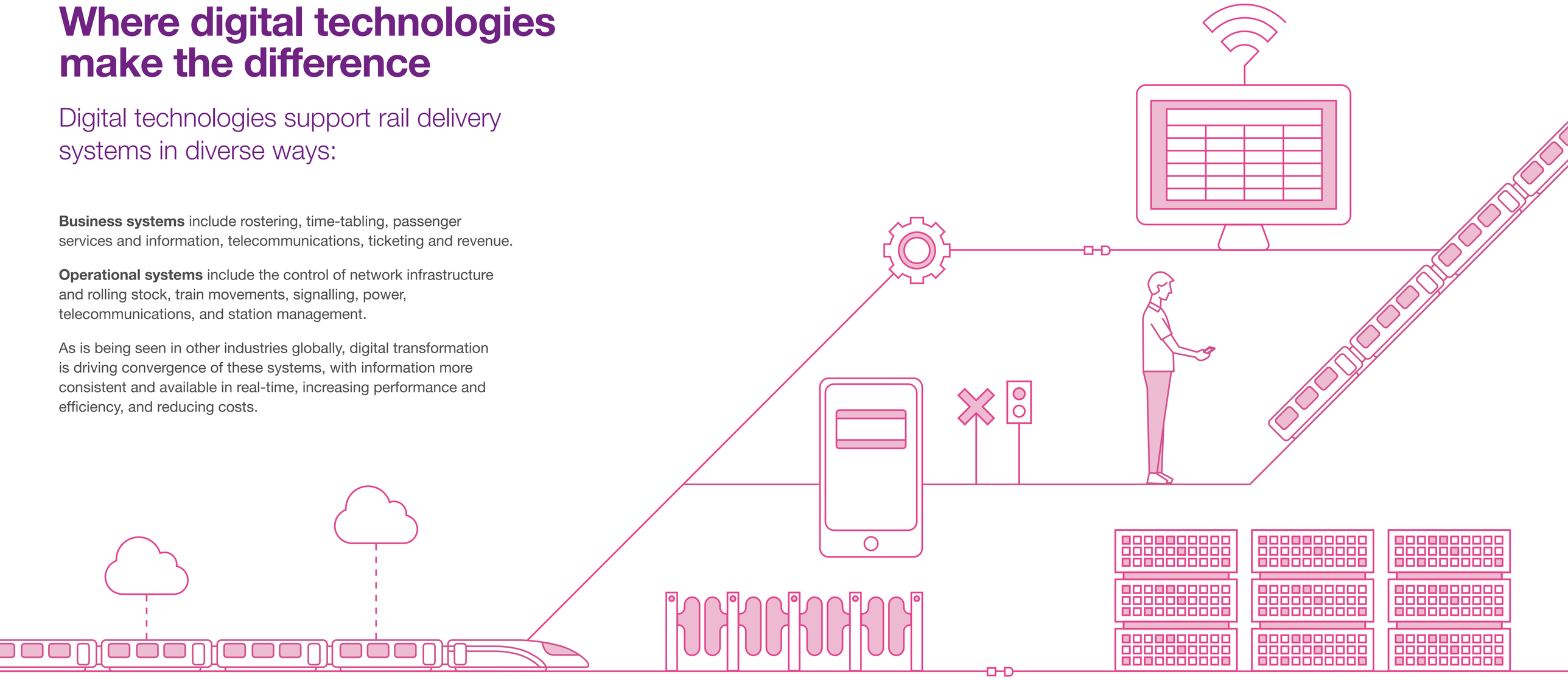
Where digital technologies make the difference

Digital technologies support rail delivery systems in diverse ways:

Business systems include rostering, time-tabling, passenger services and information, telecommunications, ticketing and revenue.

Operational systems include the control of network infrastructure and rolling stock, train movements, signalling, power, telecommunications, and station management.

As is being seen in other industries globally, digital transformation is driving convergence of these systems, with information more consistent and available in real-time, increasing performance and efficiency, and reducing costs.



The final destination: customer experience

Understanding and responding to customer needs

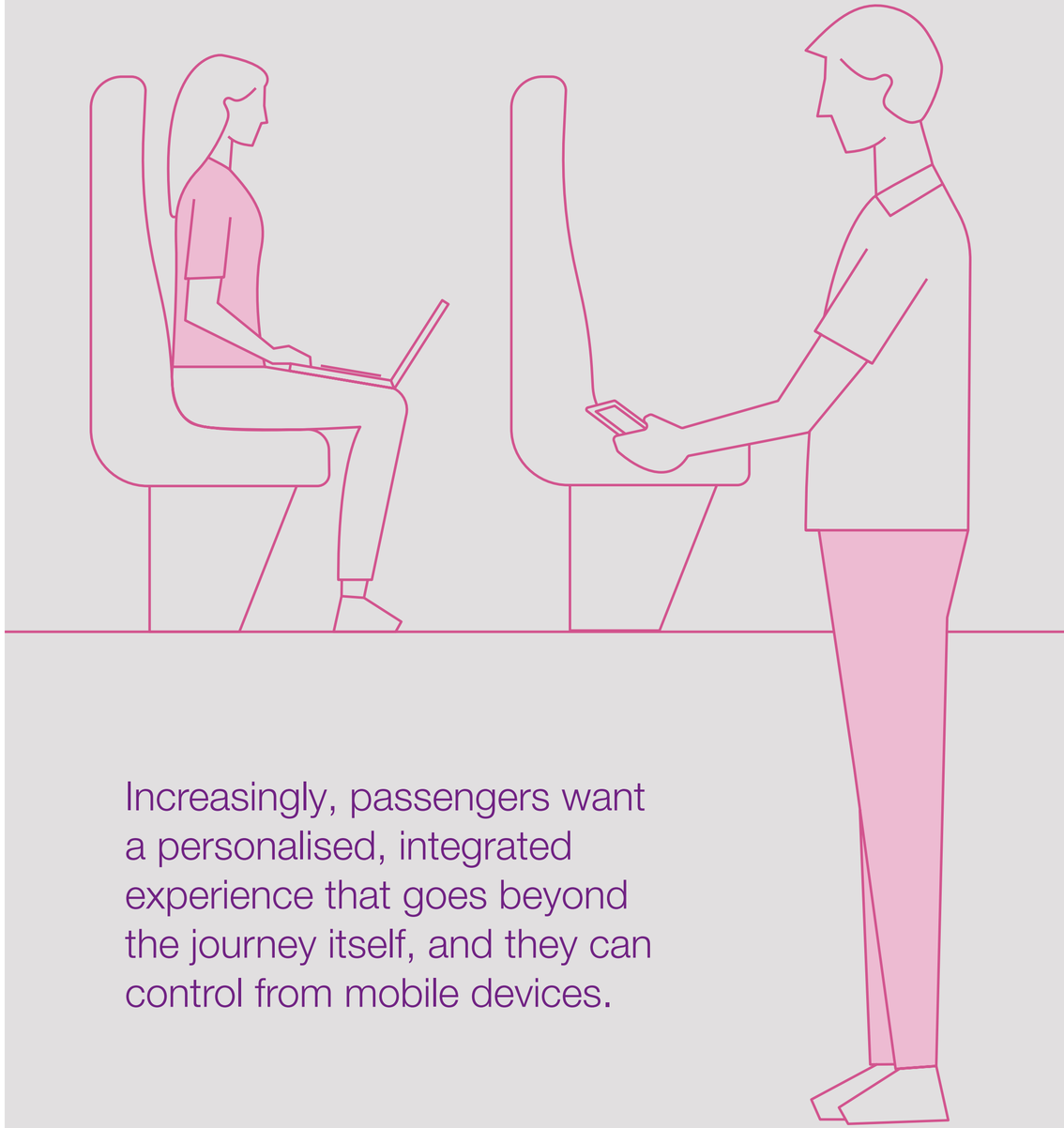
Creating a positive passenger experience is central to a successful rail service. Passengers want convenience, comfort, speed of journey and punctuality. They want to feel safe, and have the reassurance that they'll get to where they need to be, on time and with no delays.

Increasingly, they want a personalised, integrated experience that goes beyond the journey itself, and they can control from mobile devices. Passengers have the right to expect real-time information and seamless connections, so rail systems need to be aligned with other forms of transport to provide an end-to-end hassle-free journey, with one smart card payment system covering the whole trip.

Consumers expect technology to be available during the journey via wi-fi, with sufficient power and connectivity. As commuters become more and more time conscious, train stations are becoming more than just points of departure and arrival. The redevelopment of several major stations has resulted in improved station facilities including supermarkets, high street shops and delivery collection points for commuters.

Adding digital capabilities has huge advantages for operators, and meets user expectations. But it also presents challenges around management and business processes and protection. Connectivity means vulnerability, with infected malware potentially threatening network operations. But it also means that failure of just one element, not necessarily cybersecurity-related, can have a huge knock-on effect on passengers and operators.

Stations, reliant on digital information boards and ticketing systems, face huge disruptions that affect the wider infrastructure when these systems fail for whatever reason. At Gatwick airport in August 2018, passengers were directed to their gates by whiteboard and with shouted instructions, causing chaotic scenes, delays to departures and huge frustration for travellers and staff. There were similar problems in Sweden in 2017, when cyberattacks brought down the IT system that managed train orders and caused significant delays.



Increasingly, passengers want a personalised, integrated experience that goes beyond the journey itself, and they can control from mobile devices.

Re-aligning the physical network for the digital world

How digital advances are changing the face of rail travel

While fully digitalised signalling systems are perceived as new technology, the original system is over 30 years old, so it's reliable and tested. It was developed in the 1970s as part of the France high speed project and implemented in the 1980s. With standardisation being agreed across Europe during the 1990s with the implementation of ERTMS (European Train Management System), it can help to support increases in capacity and speed across the network.

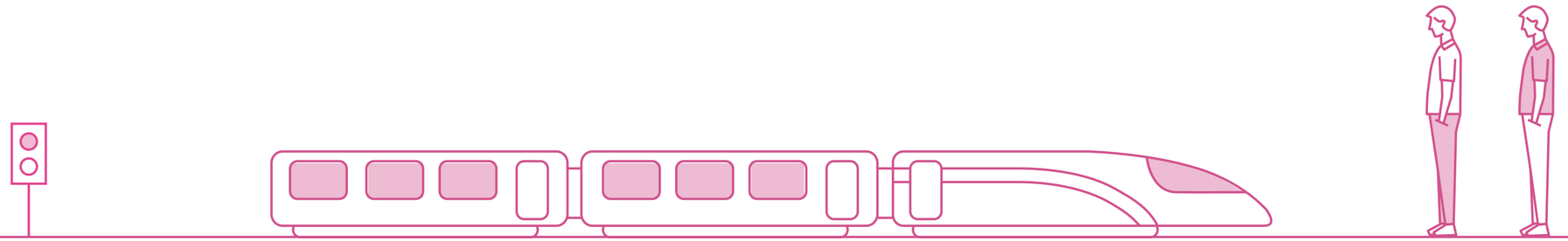
But in a response to changing customer expectations and technology innovation, the industry is benefiting from advanced digital capabilities, with high-profile projects such as Crossrail, HS2 and the Thameslink modernisation programme dependent on innovative new technologies for successful delivery. In 2020, the Glasgow Metro is set to become the first driverless system, and the DLR has effectively been driverless since inception.

The digital railway is central to increasing the capacity of a congested railway system, helping to increase the number of trains that can be run without having to build additional lines. On the London Underground, for example, various lines have seen ECTMS installed in recent years, increasing capacity and speed, with trains on the Victoria Line capable of running at 90 second intervals.

In order to optimise costs and efficiency, and improve the passenger experience, significant advances are being made in fields such as smart ticketing and remote asset condition monitoring. Meanwhile, network capacity is set to be increased by European Train Control System (ETCS) in-cab signalling under Network Rail's Digital Railway programme.

A digitally-powered system helps to address many of the challenges the industry faces, helping more trains to run, more quickly, safely and cost-effectively. Services become more reliable, with fewer issues. Where, currently, a problem in one area can impact the entire network, a digital infrastructure helps to mitigate the risks and maintain service efficiency and reliability.

The Victoria Line on the London Underground has always used Automatic Train Operation, with the driver in-cab providing reassurance.



Signalling advances

Digital technologies move conventional signalling forward, transforming the way trains are operated and controlled around the existing network. Just as importantly, they enable trains to run closer together and faster, helping to address the capacity issue.

As trains travel faster, it becomes harder for drivers to recognise coloured signals trackside. Digital signalling, then, moves the technology into train cabs, giving drivers and operators location, speed and fault information relating to every train on the network in real time. In the event of disruption, the digital railway can advise the control centre of the best options to get the service running again, minimising delays.

Automatic train operation

Digital signalling is a positive towards the use of fully automated trains, which will incorporate advanced sensor technology to determine track status and to make the appropriate decisions.

Enhanced customer experience

Big data and the Internet of Things are enabling truly integrated and inter-modal transport solutions, where smart technology provides travellers with the information and services they demand, offering the potential for interoperable tickets valid for trains, buses, car-sharing schemes and bicycles to provide a seamless travel experience.

Digital rail solutions help infrastructure providers, train operators and other key stakeholders to work together, creating a more flexible, reliable network, reducing costs, streamlining efficiency and delivering a service passengers and freight users can use with confidence.

> *The use of digital technology is a huge opportunity for rail. These technologies will help the railway of the future make better use of the existing infrastructure and capacity...and find much more sustainable solutions which are lower cost for rail users and taxpayers.*
>
> **DfT, November 2017**

How the digital railway looks...

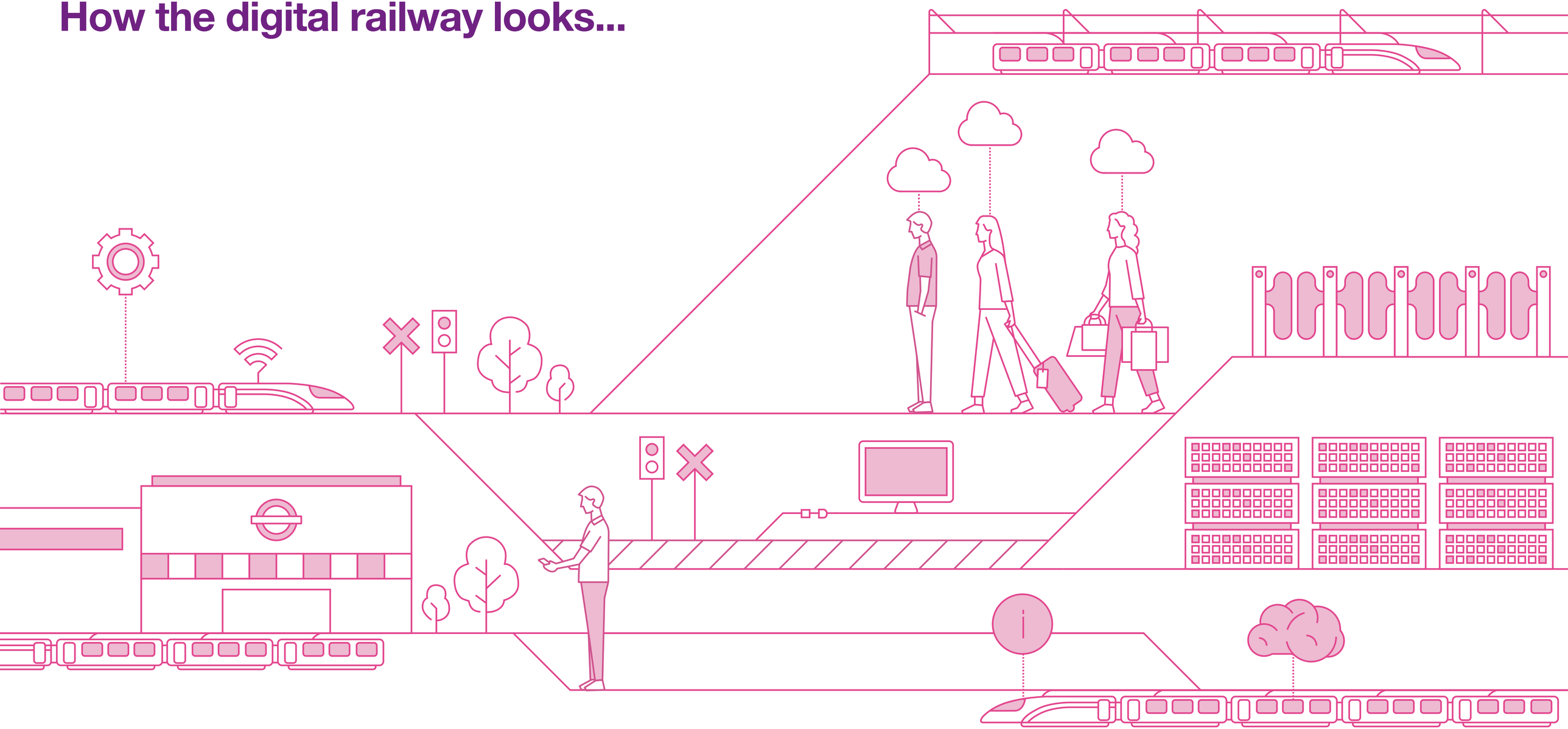


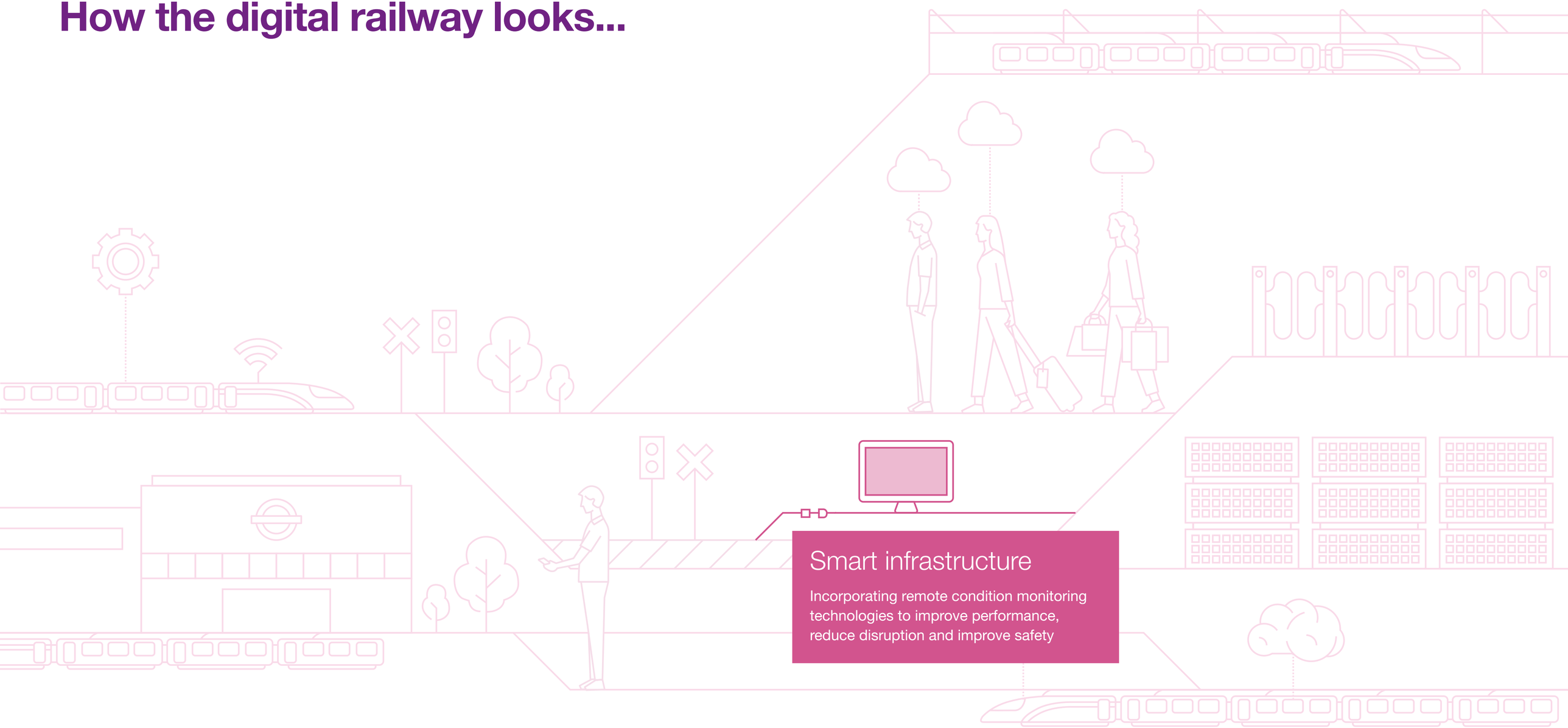
Illustration based on: https://new.siemens.com/uk/en/company/topic-areas/intelligent-infrastructure/digital-railway.html

How the digital railway looks...

European Train Control System (ETCS)

ETCS systems form the basis of operational and technical interoperability between on-board and lineside equipment

How the digital railway looks...



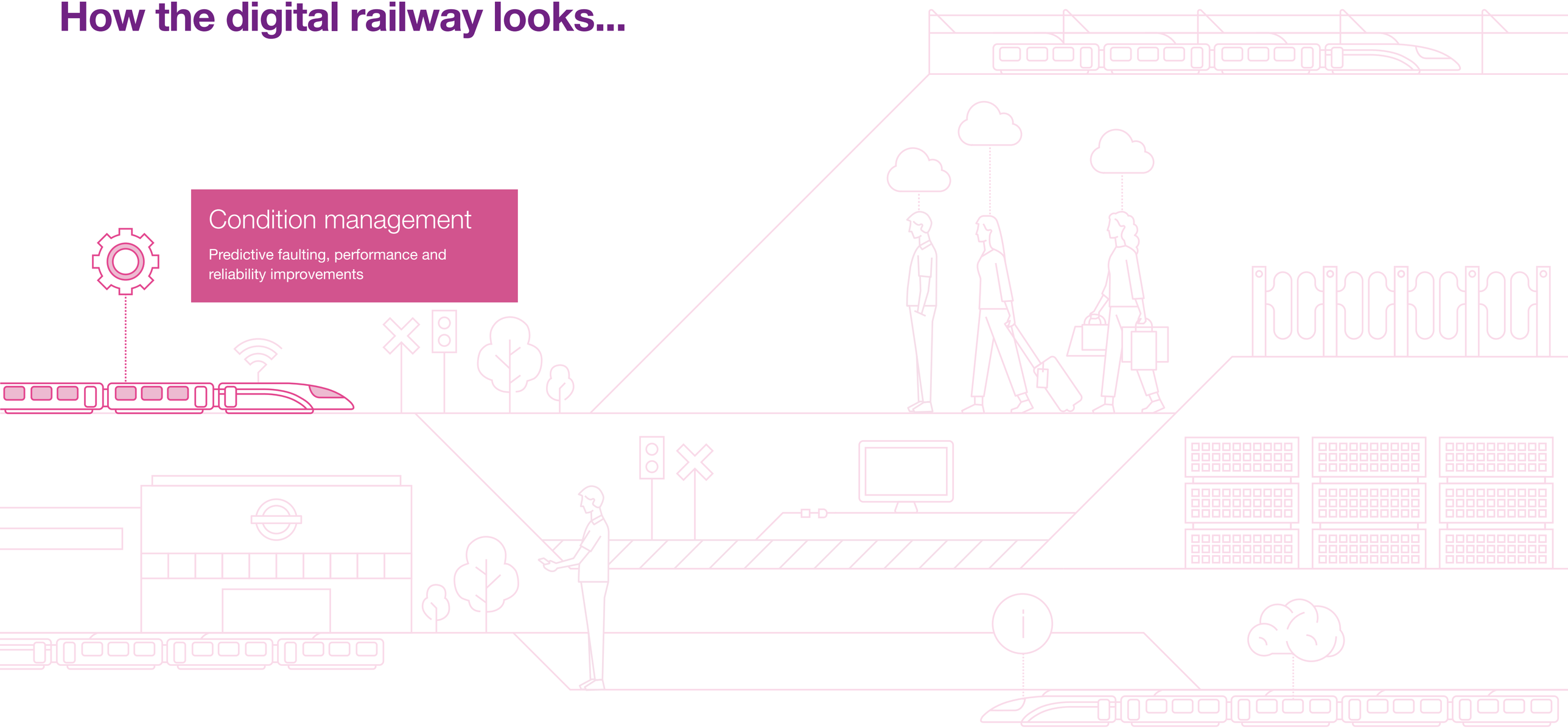
Smart infrastructure

Incorporating remote condition monitoring technologies to improve performance, reduce disruption and improve safety

How the digital railway looks...

Condition management

Predictive faulting, performance and reliability improvements



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How the digital railway looks...

Automatic Train Operation

Computer-driven trains boost performance and safety, and support optimum capacity on the network

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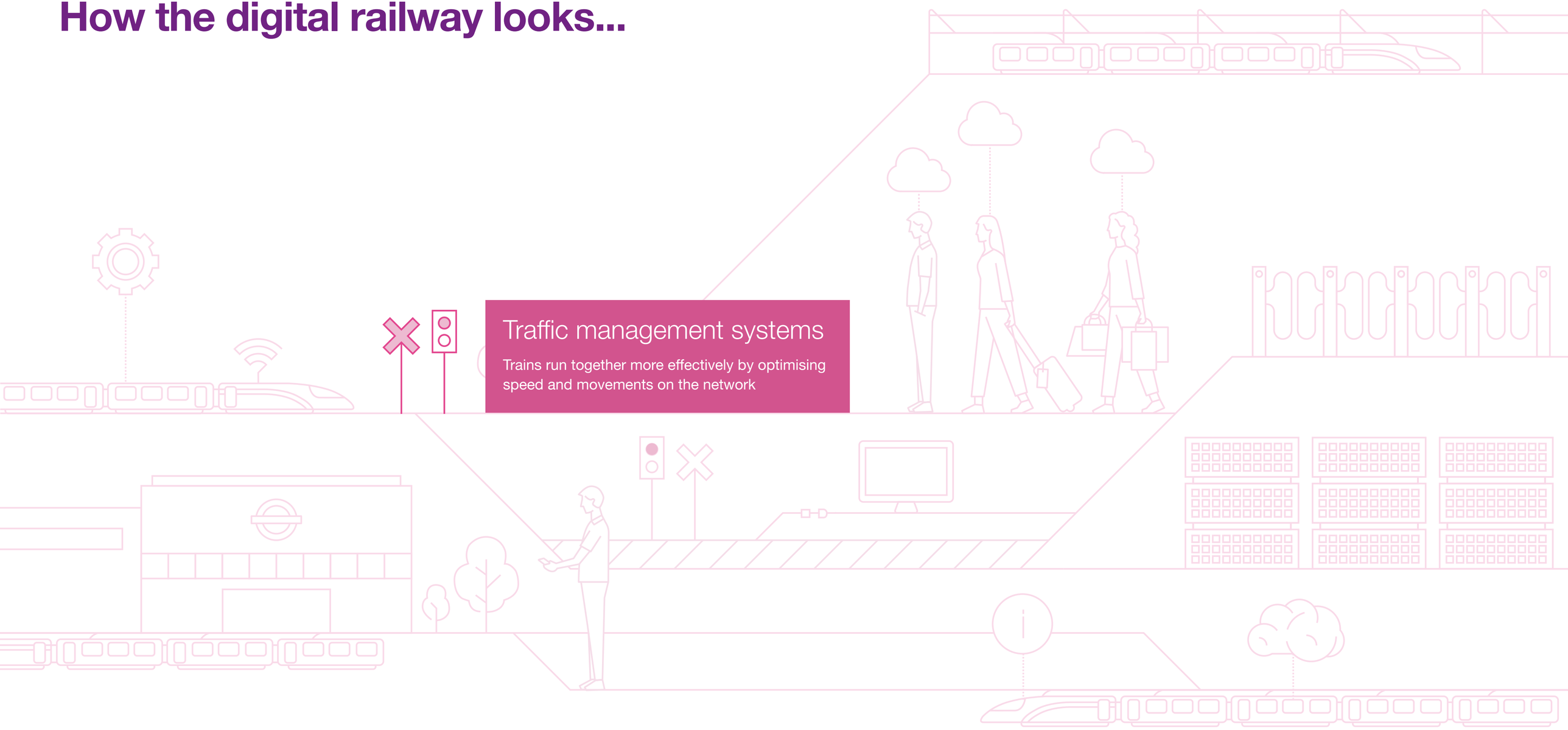

Traffic management systems

Trains run together more effectively by optimising speed and movements on the network

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How the digital railway looks...

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How the digital railway looks...

Intelligent trains

Lightweight, high-performance energy-efficient trains are more reliable and comfortable

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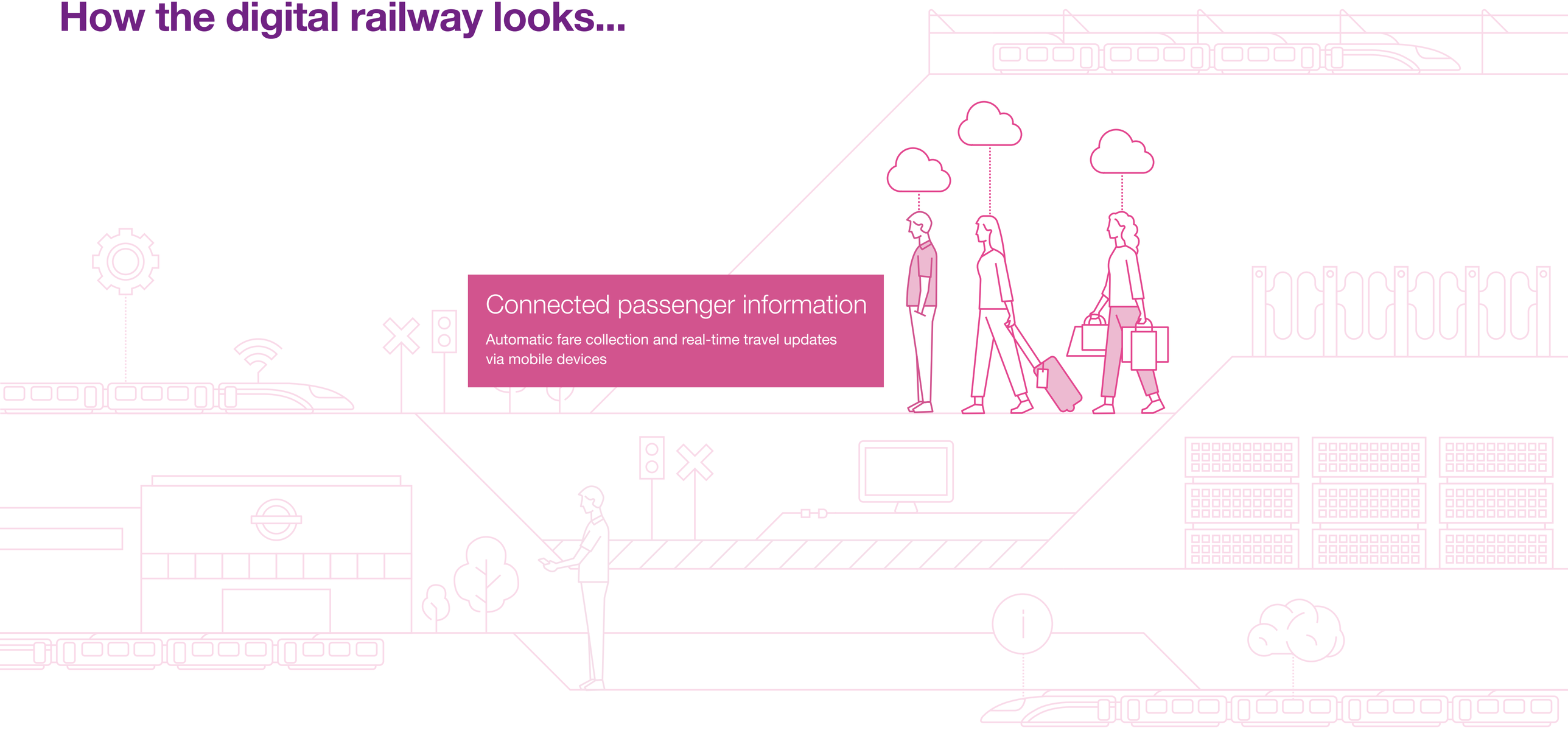
How the digital railway looks...



Connected passenger information

Automatic fare collection and real-time travel updates via mobile devices

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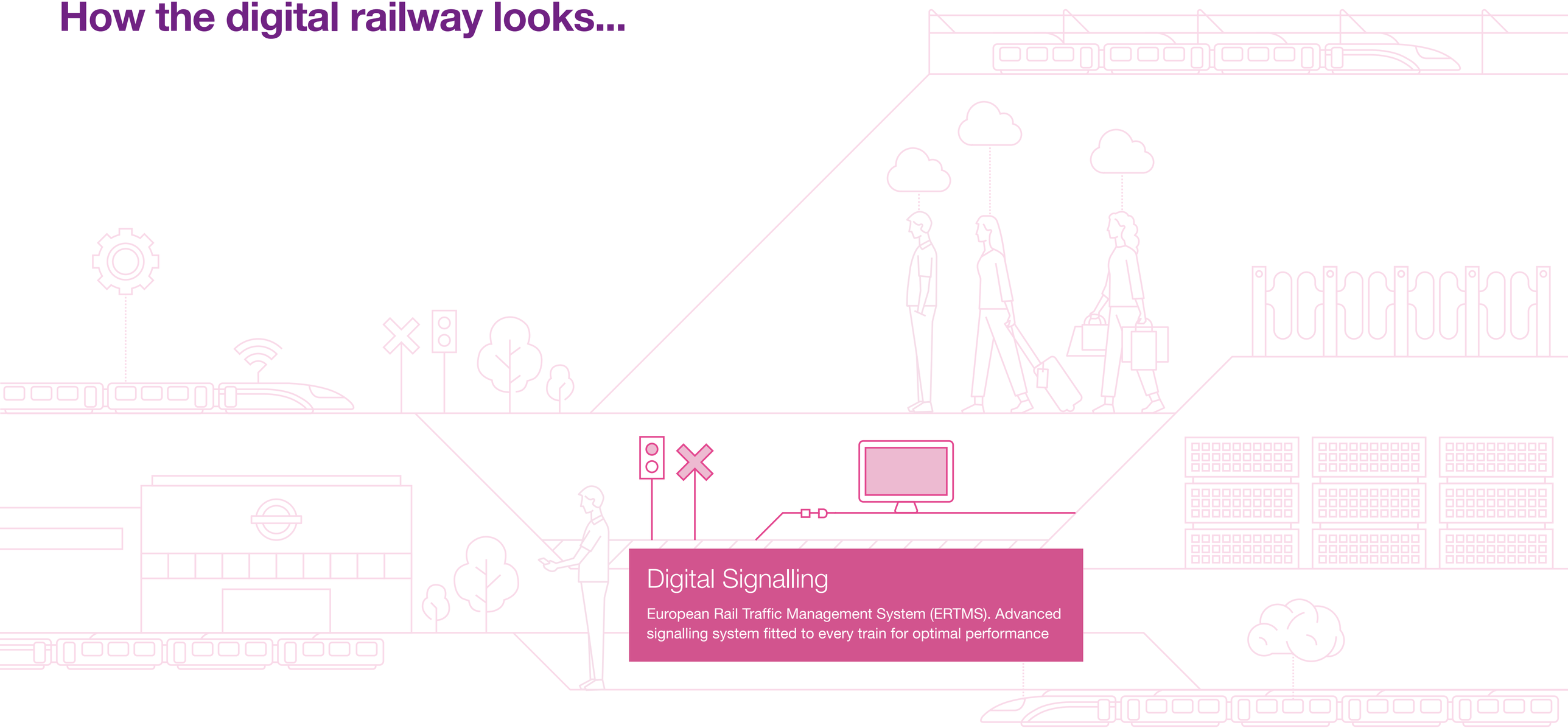

Digital Signalling

European Rail Traffic Management System (ERTMS). Advanced signalling system fitted to every train for optimal performance

Illustration based on: https://new.siemens.com/uk/en/company/topic-areas/intelligent-infrastructure/digital-railway.html

How the digital railway looks...

Connected – Driver Advisory System (DAS)

Driver information to improve timetable adherence and overall performance

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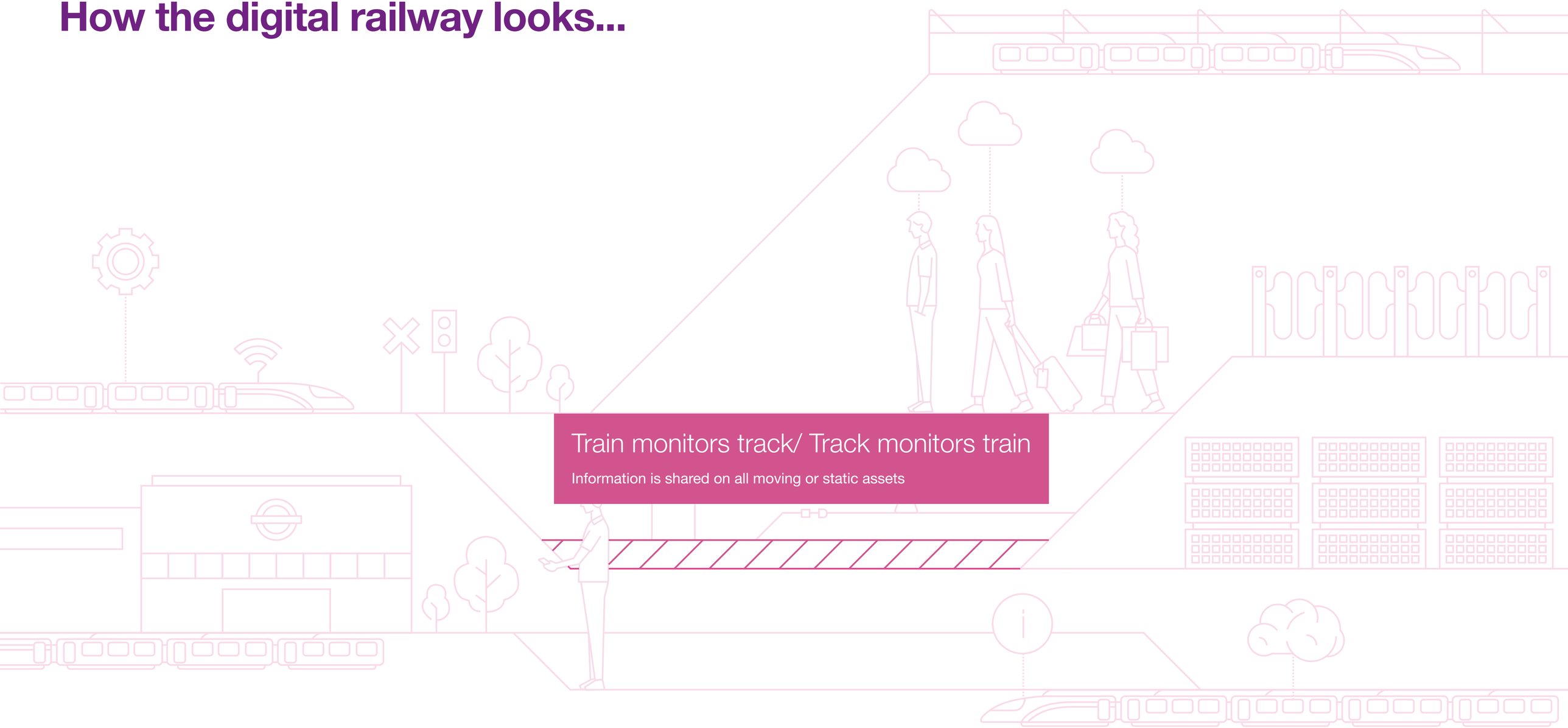

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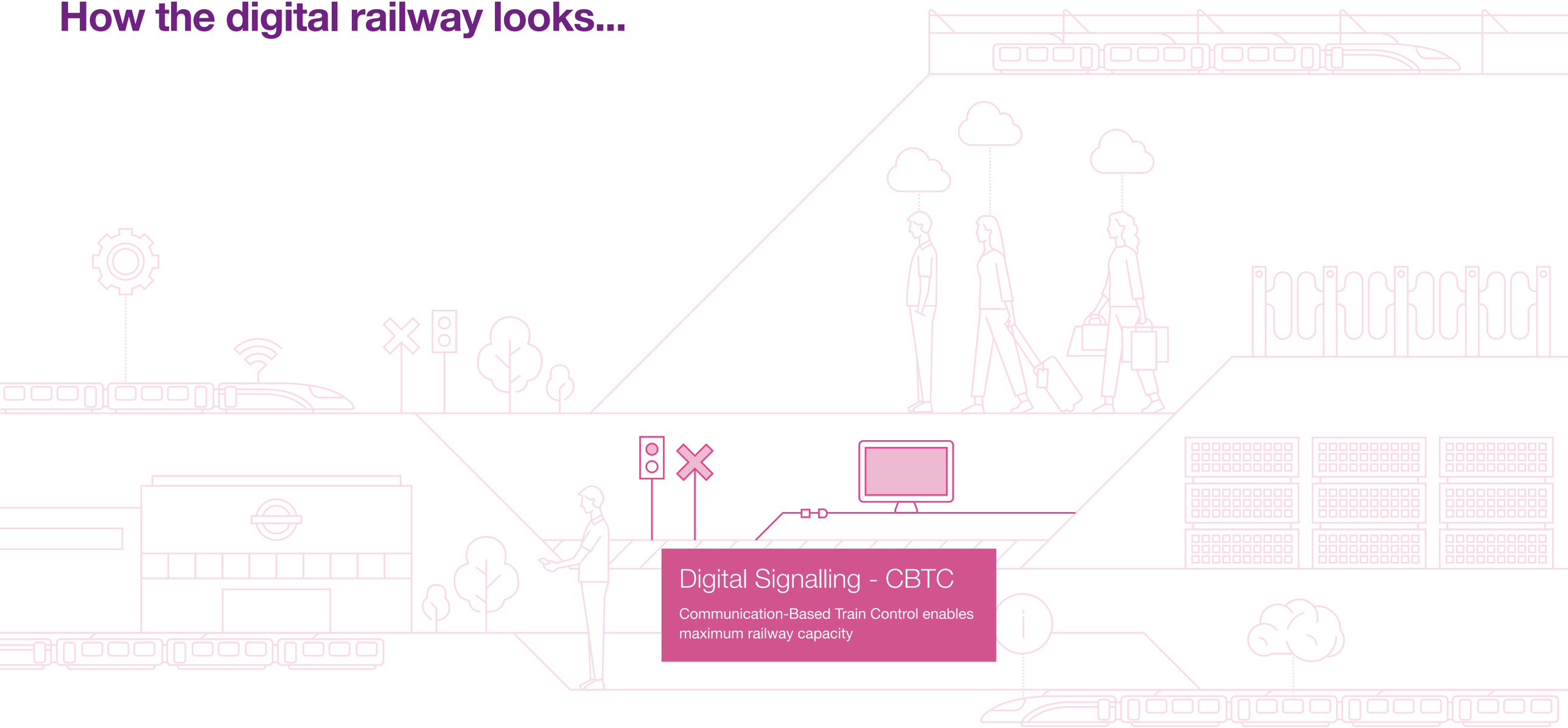

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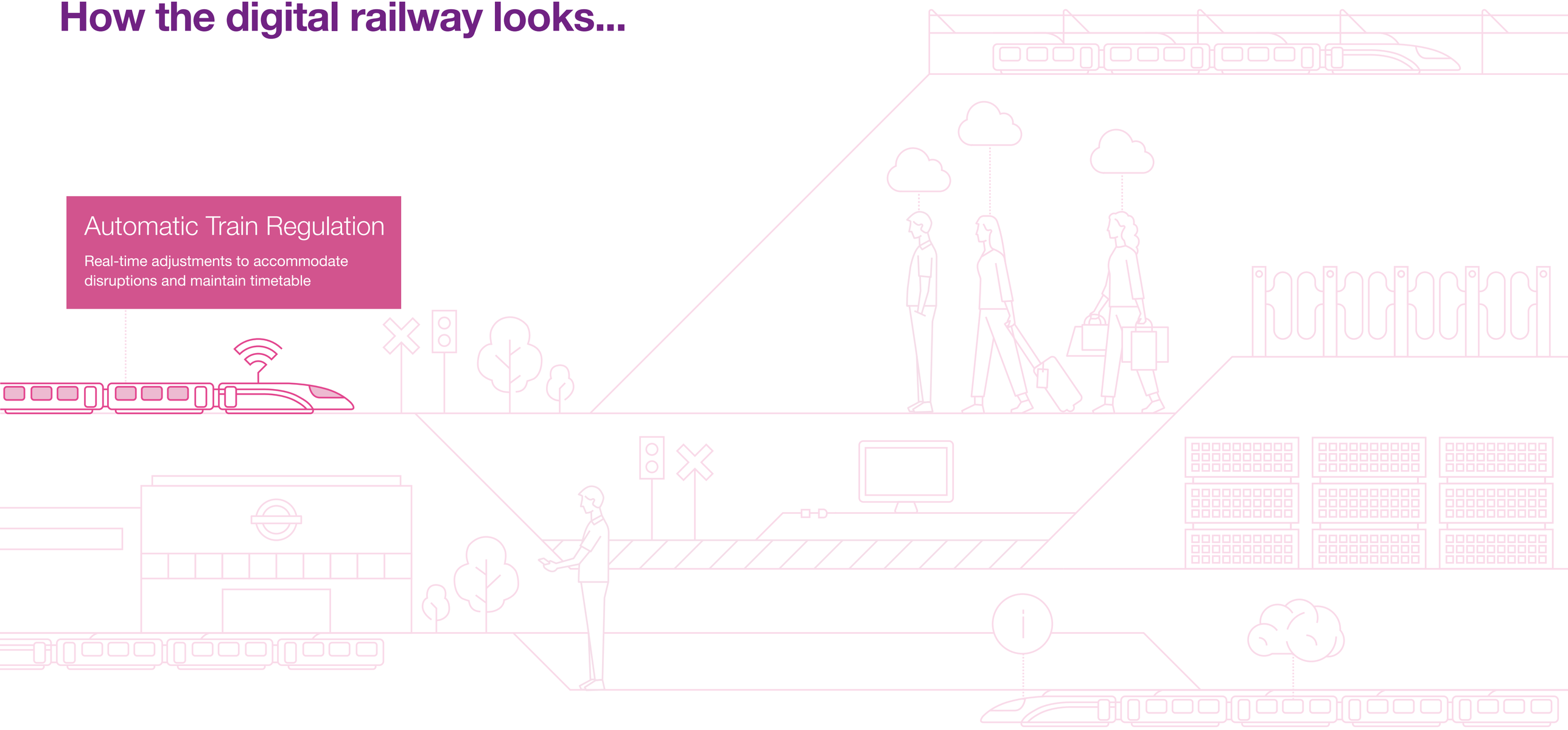
How the digital railway looks...

Automatic Train Regulation

Real-time adjustments to accommodate disruptions and maintain timetable



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Adapting rail industry insurance to meet changing needs

The digital railway is an inevitable and positive progression, offering significant benefits to travellers in terms of convenience and reliability of services, to workforce safety and efficiency and to the freight sector in terms of providing a viable alternative to road transportation.

> *With years of experience as a leading rail insurer, we have supported leading rail companies worldwide, becoming a trusted partner who understands their priorities. This has enabled us to build significant industry expertise. In short, we speak our customers' language, getting to know them and their business inside out.*
>
> **Steve Medhurst, RSA Global Rail Practice Leader**

Understanding and managing new risks

But as well as new opportunities, digitisation introduces new risks to stakeholders. Software and communication systems become central to the efficient running of the network, but by definition they are also vulnerable to cyber-attacks. These include the digital systems that are at the heart of business and operational systems, along with the sensitive data these networks transfer. There are also the systems that deliver operational functions like signalling, power, rolling stock and customer communications.

Actively managing and controlling the risks has a direct and significant impact on the insurance premiums paid by rail operators. But achieving this demands an in-depth understanding of these risks and how they're evolving alongside the industry itself. From an insurance perspective, this means looking at the technology, products and services that will help to prevent these risks from materialising, taking a proactive approach in order to help customers mitigate the risks.

Insuring the world's leading railway companies

RSA has had involvement with three of the top five railway companies in the world. Whether our customers are building and maintaining trains, operating or financing passenger and freight services or keeping the network running, we take the time to understand their challenges and their priorities. This is fundamental to providing the right cover and capacity with the capability to create bespoke and flexible solutions, identifying any gaps in cover that could leave a business exposed. As well as identifying and evaluating the risks themselves, rail operators need to be able to respond quickly and within budget to minimise, monitor, and control the impact of loss events.

Lateral thinking and customised solutions

Developing the right solutions require expertise and flexibility. For one of our key European national railway partners, for example, we took an alternative approach to risk management which best suited their day to-day operations. We decided to shift our focus from their largest value stations to those deemed to be of critical strategic importance.

These sites included depots, key signal boxes, key pinch points on the network, and other locations including data centres and ticket halls. We recognised that damage or loss of power at these sites could critically impact the business. In this case, our innovative thinking meant our partner successfully implemented safety measures and contingency plans to ensure continued operations, even in the event of an incident.

Insurance plays a significant role in any solution as it can provide immediate and relevant responses in the event of an incident, and give access to wider services including IT forensics, legal services, incident management and communication specialists. At the same time, insurance teams have the experience and specialist expertise to work with clients to provide preventative risk management services. Without adequate protection, the cost of repairing compromised systems and replacing damaged equipment can be considerable, and the reputational effects lasting.

A risk management approach informs exposures, and improves disaster recovery and communications plans, which are critical for the protection of a client's reputation and business operations in the event of a cybersecurity breach or failure in any part of the digital ecosystem.

> *Since the start of the NS/RSA relationship six years ago, we have been amazed by the depth of rail industry knowledge that RSA has at its disposal. It is important that we work with experts so that we can share and debate views, issues and ideas. RSA is outstanding in this respect."*
>
> **Ellen Rekker, Insurance Director, Nederlandse Spoorwegen**

Case Study

Eurotunnel

Eurotunnel had suffered two major fires resulting in £200m of losses each time. The experience and specialist knowledge of our rail team has helped Eurotunnel reduce and manage their risk following these incidents.

After extensive testing, we consulted on the implementation of SafeStation, a system that deploys water mist at key points along a 900m stretch of tunnel. We also provided expert advise for Project Salamander – a first-line fire defence involving ‘water curtains’ to minimise fire spread.

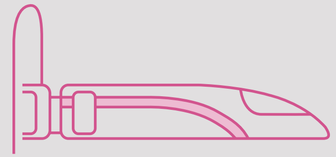
RSA’s core capabilities in rail

At RSA we have substantial rail industry experience and expertise, providing cover for over 65 clients across 20 countries and supporting many of the world’s leading rail companies. We have a broad appetite for risk, from depot risks to rolling stock, and an innovative approach that enables us to provide the right cover at the right cost.

- Tailored solutions that align with the unique needs of each business from all sectors of the rail industry
- Complementing existing risk engineering strategy, risk management and claims defensibility
- A fresh perspective on existing controls to help embed business resilience and minimise the risk of a major loss
- Ensuring an effective response to new and emerging risks, sharing our broader insurance experience and data from diverse industries to develop innovative, pragmatic solutions
- Full visibility and control of a risk management programme through access to our suite of user-friendly risk management tools
- Supporting major risk engineering programmes and infrastructure projects
- Providing an informed insurance perspective on emerging trends and topical issues affecting the rail industry

Providing cover for more than
65 clients across
20 countries

Supporting many of the
world’s leading
rail companies



We have a
broad risk apetite