Making the Digital Railway a Reality
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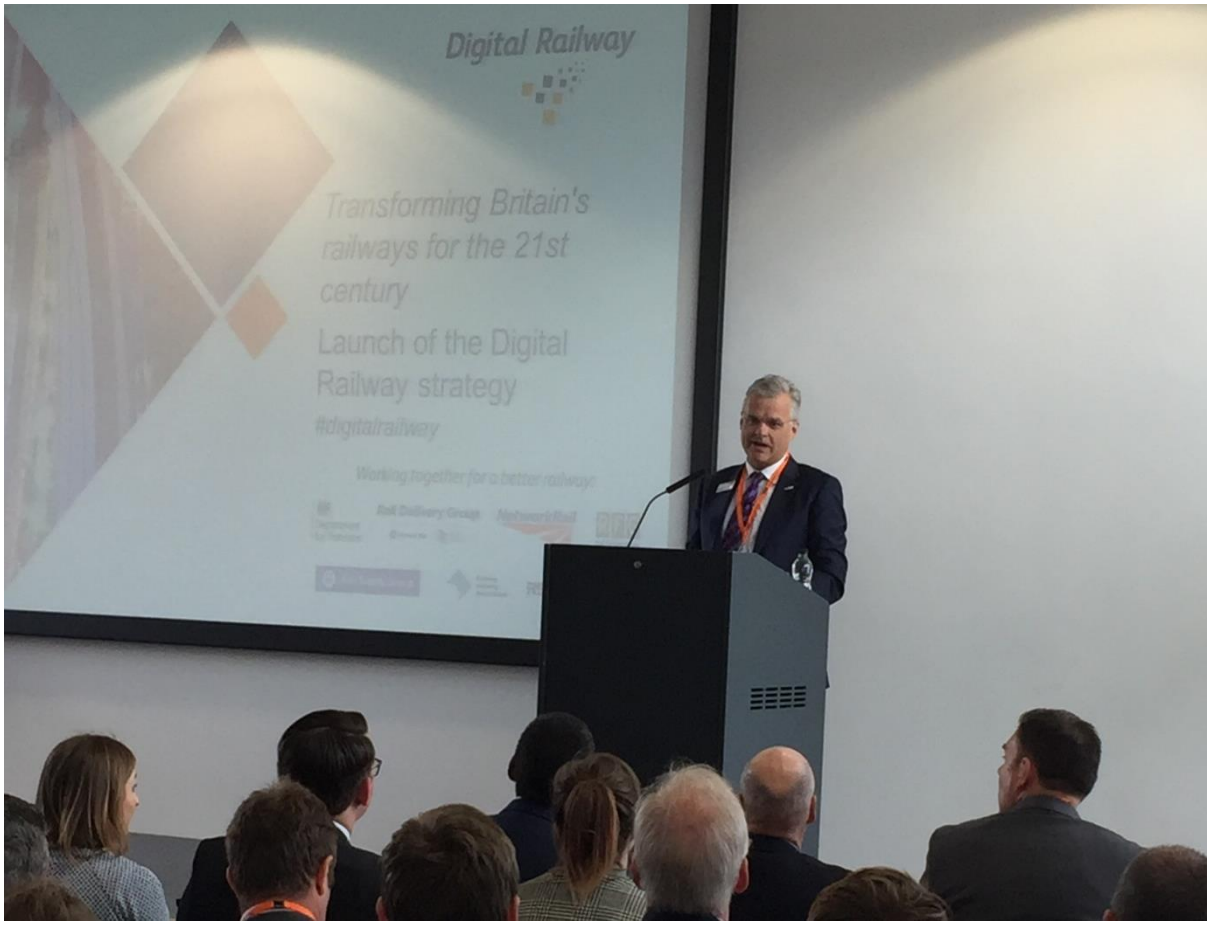
National Digital Railway Strategy Launch
York
10 May 2018



1. Introduction

I would like to start by thanking the Secretary of State for setting out a compelling vision of the role of the railway in a modern, connected Britain. And for making commitments that will mean that a Digital Railway will be a reality in the near future. Our industry is fortunate that we have an unprecedented level of political support for the changes we must drive.

With these commitments in place, we are here today as an industry to launch our National Digital Railway Strategy and set out our fifteen year roadmap for the technological transformation of Britain's railway.

Across the industry we have spent three years working together so that we can stand here today and say that all the key elements to launch a Digital Railway transformation are now in place.

It seems so simple – and obvious. Replacing the stop - start traffic light and semaphore signalling system that has served us so well for over 150 years, with on board digital train control. This allows trains to run faster, closer together in greater safety and with more reliability.

The benefits, if extended across the network as a whole, are enormous. For passengers, for railway workers and for our economy.

For passengers, a Digital Railway represents the only way to achieve a step-change in the number of services without expensive and disruptive heavy engineering work.
In urban areas this means passengers will be able to turn up and go on a metro-style service more similar to the tube than to the railway we see today, with real-time information customised for every passenger.

It means faster, more reliable journeys because of our ability to better predict and prevent failures on the network. And it means a more flexible railway which, when married with traffic management, can dramatically reduce knock-on delay – now the largest single cause of train disruption.

I am proud that we are already the safest railway in Europe, but Digital Railway will make it safer still by virtually eliminating the risk of signals passed at danger – which today represents 20% of total passenger accident risk.

And it's not just passengers who benefit but also our people.

For them it will mean less work out on track and better protection when they are. With careers in a highly skilled digital economy. A growing industry.

And benefits for our national economy too.

Digital Railway provides additional capacity and increased connectivity across the railway network, supporting and stimulating economic growth, jobs and housing. Not just capacity for more passengers, but for more freight too, which is vital for our growth post Brexit.
And the chance to lead the world in developing and using Digital Railway technology, opening up significant new export opportunities for the rail sector and supporting the Government's vision of a truly Global Britain.

So when you look at all these benefits you start to understand why Digital Railway isn't a resignalling project.

It's an opportunity to run the whole railway in a fundamentally different way.

And that is the challenge. Given the scale of the change we are proposing, you can understand why some people are apprehensive about our collective ability to deliver. The railway is so complicated and this change impacts so much of it.

And we should acknowledge that we've had problems in the past.

Railtrack promised moving block signalling before the technology was ready. As an industry we rushed into ambitious electrification projects in CP5 without thorough planning and scope definition.

I understand more than anyone why we must not repeat those mistakes.

But we must not allow ourselves to be constrained by the mistakes of the past.

Instead we must learn the lessons and build a robust plan of action that we can be confident in.

When we set up the Digital Railway team three years ago, we knew that there were significant barriers to overcome if the Digital Railway was to ever become a reality. But we also knew that if we tackled these in a systematic way, we could reach a point in time, a tipping point if you like, when a Digital Railway became inevitable and not a distant dream plagued with the false starts that have characterised this journey so far.

2. Overcoming the barriers

We have looked at all of the major obstacles to delivering a Digital Railway, answering the following key questions:

- Is the technology ready?
- Can we afford it?
- Do we have the capabilities we need? And,
- Can we confidently deliver this transformation?

Let me take you through each in turn.

3. The barriers

- *So, is the technology ready?*

Yes it is.

Six weeks ago we achieved a world first. On a massive scale.

We successfully ran trains using the European Train Control System (ETCS) coupled with Automatic Train Operation on Thameslink through the centre of London. Vital to increasing capacity from 18 to 24 trains an hour by the end of next year.

Achieving this is a game changer for Digital Railway. Perhaps, this should not be a surprise. After all, digital train technology itself is not new, it has been around for more than twenty years. We have been running ETCS on the Cambrian Line in Mid Wales since 2011.

It is being used on all new European high speed railways including High Speed Two and is deployed in mixed use traffic in Switzerland.

Norway and Denmark are now embarking on a wholesale switchover to ETCS.

And countries as far afield as Saudi Arabia and Australia are also all using ETCS as the foundation of their train control systems.

All around the world, the technology is settling on ETCS.

This technology is the result of collaboration across Europe over the last 25 years to develop an interoperable system that multiple suppliers can provide, thus creating a competitive supply market.

That doesn't mean the technology will not evolve further – it will. It will get even better. But that is no reason to wait.

We now have a stable enough platform from which to start the roll out, confident that future upgrades will be predominantly software and not hardware related.

So have we overcome the technological barrier? Yes we have.

So the second question:

- *Can we afford it?*

Yes, we can.

But before considering the costs, let us recognise that there isn't a 'do nothing' option. Well over half of Britain's signalling system will be life expired in the next 15 years. Renewal of these assets is essential to run a safe and reliable railway and would cost around £20bn at today's prices. So when we think of affordability the question is first, shall we spend £20bn renewing signals with fundamentally the same limitations we've been living with for decades? £20bn to create no extra capacity?

Or shall we invest in the technological transformation of our network?

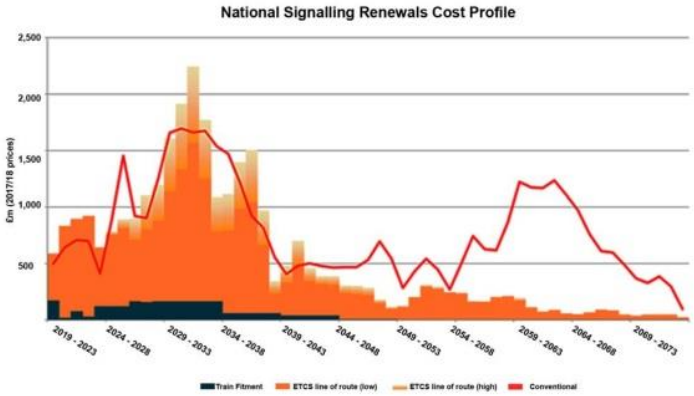
And the exciting thing is that we now believe this technological transformation, with all its wider benefits, will be achieved at a lower cost than persisting with conventional renewals.

That is why, as you have heard the Secretary of State say, we are making a commitment that all signal renewals and upgrades will be digital, or digital-ready.

The supply chain has confidence that if we engage with them early and enter into longer, outcome-based relationships, the new systems can be delivered at 30% less than the current cost. And the supply chain is basing this on their experience of deployments in the rest of Europe where costs are significantly lower than they are in the UK.

This means that the transformation to Digital Railway will actually be cheaper than conventional resignalling when the whole industry cost is considered over a twenty year timeframe (Figure 1).

Figure 1



And I think savings could be even greater.

Just look at London Underground who have long deployed digital train technology. The costs on the second line they upgraded, the Northern line, were approximately half of those on the first, the Jubilee line. This is as a result of long term funding commitment and progressive learnings.

But Digital Railway is not just about infrastructure. As you have heard the Secretary of State say, it is about much closer collaboration between track and train which means we also need to get the trains fitted with ETCS.

It is most efficient to do this in the factory when trains are procured so I very much welcome the Secretary of State's clear commitment that all new rolling stock ordered should be digital or, at the very least, digital ready. This was previously a barrier that, working with the Department for Transport, we have overcome.

And, even when working with older 'go anywhere' freight trains, we now have competitive contracts for retro-fitting. Awarding this freight contract, and the associated commercial agreements with the freight operating companies has been a huge success and another of the barriers that we have now overcome.

We have carried out strategic outline business cases for five railways; different types of railways. And in all cases it is clear that a Digital Railway is economically attractive.
So can we afford it? Perhaps the question we should be asking is, can we afford not do it?

So the third question:

- *Do we have the capabilities we need?*

We should be under no illusion, the Digital Railway will change everyone's role in the railway. From those in the signal box, the drivers and guards on the train and the maintenance teams out on the track.

Train Operating Companies will have to upskill thousands of train drivers and recruit new ones as additional capacity comes online. But the transition is progressive and would involve around 1,500 drivers per year, which is less than half of the current annual driver training numbers.

Rail operators like GTR and Crossrail are already leading the way. Showing that recruitment and training of new drivers and retraining of existing drivers for ETCS can be done. We <u>can</u> overcome this barrier.

All of our people will have great opportunities to learn and develop as the industry grows. Giving them the chance to gain valuable transferable skills within a modern digital industry. And there is no doubt that we will need a new cadre of engineers to help deliver the Digital Railway. So harnessing our existing training centres and established academic partnerships, we will create a Digital Railway Academy.

I am confident that an industry with a digital vision will excite the next generation of engineers and project managers and will help us, as an industry, to attract and retain the best apprentices and graduates.

So this isn't a barrier – it's a fantastic opportunity to continue to grow our industry!

The fourth and final question is:

- *Can we confidently deliver this transformation?*

We have looked at the signalling renewal workbank across the country in detail and we believe that the next three control periods spanning the next 15 years represent three different phases of Digital Railway rollout.

Figure 2

In CP6, we will focus on a line of route deployment. We have funding for the early development phases of converting the East Coast Main Line and the Secretary of State has already announced that the TransPennine route upgrade (Figure 2) will be the first digital intercity railway.

We will also launch five further procurements around the country, all delivering tangible benefits for passengers.

For example, the big renewal planned for Crewe will be ETCS enabled and will smooth the path for HS2 operating on the classic network.

And the significant ETCS enabled renewal at Feltham will lay the cornerstone for a Digital Railway on our Wessex route.

And, on other routes, we will implement traffic management technology.

Figure 3

CP7 will build on this experience and capability and be focused on regional deployment of ETCS (Figure 3). Major resignalling opportunities will start to create ETCS railways. For example, the whole track 40 miles from Waterloo will be ETCS within 10 years, providing the potential for a metro style service into Britain's biggest commuter station. That is transformative.

We will also put forward strong business cases to Government to accelerate renewals to create joined-up digital regional routes.

Figure 4

In CP8 we will link the regional routes and build out a national network (Figure 4).

Within 15 years, we could expect 70% of journeys to be ETCS and Traffic Management enabled. In time for the arrival of HS2 in Manchester in 2032.

It is an exciting prospect that when this country first has a high speed backbone, it could also have a Digital Railway skeleton.

So yes, we <u>can</u> deliver this transformation.

4. One Integrated Plan

The plan I have set out is achievable.

But let us all be in no doubt that a new level of collaboration and cooperation is required within the industry to deliver it.

We must work together as one railway, delivering real integration between track and train. But to do this we will need a coordinated cross industry plan. One plan. The current Digital Railway Group in Network Rail will be accountable for working with the System Operator, the franchising authority, the train operating companies, the rolling stock procurement teams and, of course, the supply chain to produce an optimised plan for the rollout of a Digital Railway.

This plan should be developed in detail by 2021 to cover the funding periods CP7 and CP8, to 2034. The implementation of the plan will be carried out by many parties – but there must be one plan based on fully integrated system thinking. I firmly believe that time spent up front, working together across industry, will enable us to build a programme that we can successfully deliver.

I'm optimistic that we'll come together and achieve this.

But before I conclude, I want to strike a different tone. A warning tone. Let me now be very clear about the frailties of our existing railway and the risks of inaction; the risks of persisting with the current ways of working.

Today, 45% of Europe's congested railways are in Britain. Our railways are increasingly full, up and down the country. And train reliability has been declining for six years as our railways have filled up.

But our system is only full because of the limitations imposed by the old way we run it. There are too many complex interdependencies in the system that make driving up performance and capacity really hard. These interdependencies result in variability, which is the key thing modern industries strive to avoid. By introducing digital train control, we can run trains much faster and more precisely, freeing up the latent capacity that exists and driving up performance and reliability. This is exactly what our customers want.

We must act.

5. Conclusion

So in conclusion, the case for a Digital Railway is compelling. It is a chance to deliver huge benefits for our passengers and for the freight that this country depends on. It is the most cost efficient way to deliver the future railway Britain needs.

It amounts to the biggest transformation since steam to diesel. But in some other respects, it's even more profound as it demands fundamental changes in all parts of our railway. We have taken time to think through all the barriers that we will have to overcome to enable this transformation. We know it can be done.

We have political support as shown by the Secretary of State's presence alongside me here today. His support to procure digital enabled trains and to convert freight trains is a critical milestone, matched by our commitment to install only digital ready signalling.

These three changes coming together are what makes today special. Now we, the industry, have to come together to embrace change and modernisation.

To turn Digital Railway from an aspiration to a reality. The tipping point that I spoke about earlier is now, it is today.

Thank you.