

WMCA Rail Sector Action Plan

Work in Progress

November 2020

Black Country LEP



Overview

This action plan is a sub-set of the West Midlands’ overarching industrial strategy which is currently in development. It aims to outline a regional strategy specific to rail in the context of the overarching regional industrial strategy. This rail action plan aims to recognise the current state of the sector in the West Midlands, and to propose potential solutions to sector challenges and the distinct opportunities presenting themselves to the sector. At the time of writing no additional commitments or funds are attached to this action plan, but through a strategic focus and buy-in from a range of sector stakeholders, we aim to make the case for further investment and intervention in the West Midlands rail sector so that it can fulfil its potential.

This action plan has been produced by Black Country Consortium on behalf of the West Midlands Combined Authority and, crucially, in partnership with key regional rail sector stakeholders. In particular, Professor Clive Roberts and team at the University of Birmingham’s Centre for Railway Research and Education. We intend to engage with further stakeholders to ensure we full represent the regional rail sector, but thus far organisations include:

- HS2 programme team, Birmingham City Council
- Rail Alliance
- Warwick Manufacturing Group
- Midlands Engine
- Private sector rail companies

It’s crucial that the action plan is led by the industry and relates to specific market failures that we can aim to correct, and opportunities we can maximise. An overarching feature of the industrial strategy is that it’s steered by the public sector, but, importantly, delivered by the private sector.

In line with the completion of Control Period 6, this rail action plan initially provides a regional strategy for the sector up until 2024.

Local Industrial Strategy

The Government’s Industrial Strategy sets out intentions for building a prosperous and more inclusive country for the long-term.

As shown in the diagram to the right, the national industrial strategy is driven by 5 “foundations of productivity”: ideas, people, infrastructure, business environment and places. In this action plan we summarise the importance of these foundations in a rail context, particularly in the West Midlands.

Places does not feature as this has cross-cutting relevance within all aspects of our “local industrial strategy”, and similarly, rail’s final output is infrastructural – much of what is captured in this plan links back to infrastructure and it therefore doesn’t require its own section here.



The ‘local’ element is a key part of the Industrial Strategy, with areas across the country in the process of developing local industrial strategies. A trailblazer in developing an industrial strategy, the West Midlands will be among the first to publish our LIS. It will set out the priorities to increase the productivity of the West Midlands and to drive inclusive growth across the region.

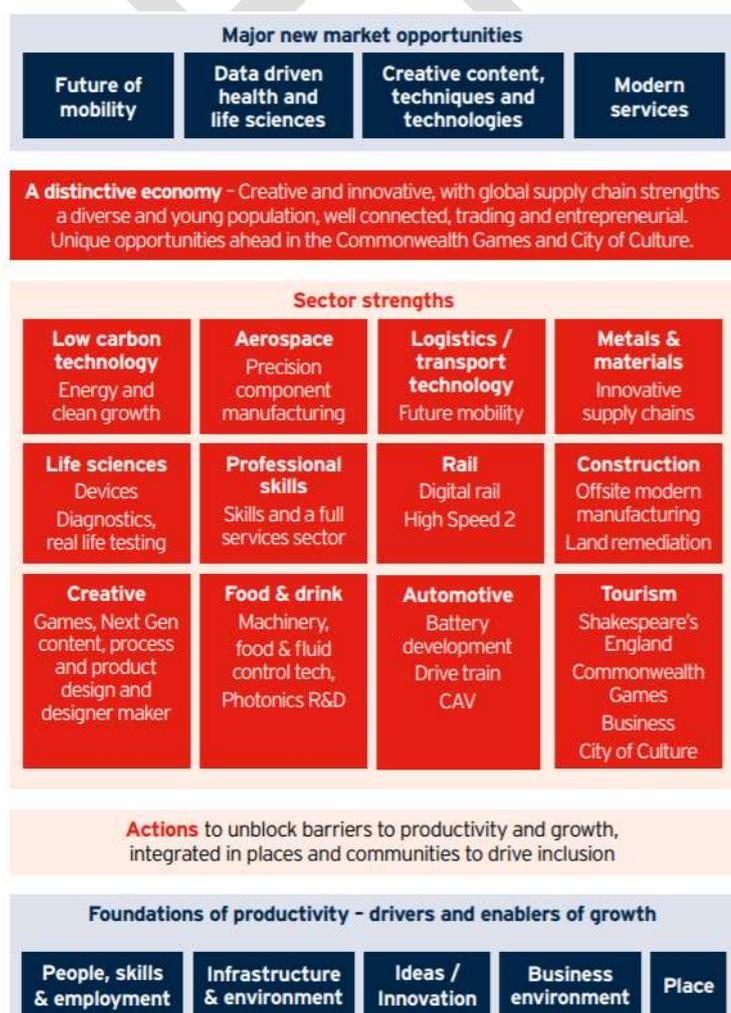
Multiple components come together to create the overarching framework that will help drive a successful delivery of the West Midlands LIS. This framework is displayed in the diagram below, demonstrating the relationship between the foundations of productivity, the key West Midlands sectors and four major market opportunities specific to the region:

- The Future of Mobility
- Data-Driven Healthcare and Life Sciences
- Modern Services
- Creative Content, Techniques and Technologies

Taking advantage of these market-driven opportunities is central to the West Midlands LIS, requiring action across key policy areas, reflected in the inclusion of key foundations of productivity: people, ideas, infrastructure and business environment.

Crucially, the region’s key sectors will ultimately deliver the benefits of the strategic opportunities, including firms of all sizes and from across supply and value chains. Different sectors will have a varying impact on the four opportunities, but it’s vital to recognise sector-led growth in this way rather than the strategic opportunities in isolation. A mix of horizontal policies, through the productivity foundations, and sector-led actions, is the best way to maximise success in achieving the strategic opportunities.

Sector-led actions are being developed within a suite of section action plans such as this one. As depicted in the above framework, the sector action plans sit below the strategic opportunities as their vital delivery vehicles, each within the context of the foundations of productivity and led by the needs and ambitions of industry. The four major market opportunities should be seen as opportunities for all sectors to capitalise on, driven through the sector action plans and eventual implementation of these.



The predominant impact of the **rail sector will be to help deliver the Future Mobility** strategic opportunity. This sector action plan will outline the priorities for maximising the potential of the West Midlands rail sector, ensuring it contributes significantly to the region's future mobility ambition. Throughout this document we intend to make this link clear, and we provide a summary of this alignment below.

The Impact of Rail on the Future of Mobility Opportunity

The West Midlands LIS identifies Future of Mobility as a key opportunity for the region going forward – contributing to the government's mobility 'Grand Challenge'. Our region is the centre of transport innovation in the UK, leading the smart, low carbon movement of people and goods. Adapting to the large-scale change within mobility – electric vehicles, connected/autonomous vehicles, 5G – creates huge economic opportunities for the region, of which multiple sectors will drive forward.

The rail sector will play a vital role in delivering the future of mobility opportunity regionally, particularly given the major technologies disrupting rail, our local expertise and investment into rail infrastructure such as HS2 and the metros. This action plan outlines these features in more detail, and also provides detailed sections on a number of opportunity areas that we feel are crucially important in driving the rail sector's contribution to the Future of Mobility opportunity:

- Digital Rail
- Decarbonisation
- Light and Very Light Rail
- Propulsion

Significant action to harness the potential of the above would support the West Midlands shift to smarter, cleaner and more efficient mobility, specifically within the rail and metro network. All of our proposed interventions (outlined on p.6), however, are relevant to the successful delivery of future mobility. Boosting the capabilities of rail across key policy areas (e.g. innovation, skills, business support) in the right way will ultimately help the West Midlands in its transition to new forms of mobility, and this will involve organisations from across the sector: operators, major companies and smaller supply chain firms.

As well as acknowledging the West Midlands rail industry's inter-connectedness with other sectors such as metals/materials and automotive, it's important to recognise the independent role of the sector in delivering the regional Future of Mobility opportunity. Our rail sector action plan here reflects this and provides the strategic focus for the industry to maximise its potential across key policy areas.

A key ambition of the regional focus on future mobility is to develop a 21st century transport system through a significant programme of transport investment to develop an integrated, clean, multi-modal system linked to HS2. This will improve air quality and directly address productivity challenges by connecting people to new job opportunities and skills provision, improving access to healthcare and green space. The rail sector, including both the railway system and the supply chains, will be a crucial player in delivering this future mobility vision.

Other Strategic Opportunities and Rail

The four strategic opportunities are designed to appeal to all sectors and therefore have broad, wide-ranging definitions. This means that the link between rail and the other three strategic opportunities may be more apparent than first thought. Throughout this document we intend to make the link

between our potential interventions and the strategic opportunities clear, but we also provide a summary of this alignment below.

In the interventions table across, we indicate the alignment using the symbols used below.

Future of Mobility 	Health and Life Sciences 	Modern Services 	Creative Content 
<ul style="list-style-type: none"> • Harnessing the potential of new technologies as identified: digital rail, light rail, propulsion, decarbonisation • Improving skills within the sector so that the smart mobility future can be realised. • Building the required sector ecosystem to maximise rail's contribution to future mobility in the region. • New activity such as West Midlands Rail Council and technology roadmaps. 	<ul style="list-style-type: none"> • Enhancing diversity in the sector to drive equality improvements (e.g. through Women in Rail). • Importance of improving wellbeing in rail to increase social value and reduce health costs, including via digital means (e.g. 5G) • Contributing to the need for cleaner air and a decarbonised environment. 	<ul style="list-style-type: none"> • New service-based and digitally enhanced business models. • Rail's role in boosting the region's connectivity, improving transport infrastructure to attract talent. • Maximising the quality of key supporting services, e.g. skills support, account management, finance and collaboration. 	<ul style="list-style-type: none"> • Implementing new technologies across the regional network – digital rail, light rail etc. • Raising innovation across the sector, including within the supply chain and working across industries (e.g. through CITEC). • Increasing digitisation across rail, partly through a focus on digital & creative skills.

Full List of Proposed Interventions

Before going into the detail of the full document, the table on the next page lists all of this action plan's proposed interventions. These have been developed in partnership with industry and are backed up by robust evidence, including that of distinct market failures that currently hold the industry back. The proposed interventions are grouped under the industrial strategy foundations of productivity and the relevant strategic opportunities that they will help deliver. Some of the proposed interventions are government asks, whilst others are industry suggestions and ideas. Importantly, the proposed interventions are not committed to and all will require further detail and appropriate business cases.

We believe that changes in these areas can provide the West Midlands rail industry with the right environment to succeed in the future.

IS Foundation	Proposed Intervention	Strategic Opportunity
Ideas	1 The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector. Dudley VLR and Innovation Park.	 
	2 Utilise the West Midlands Innovation Programme (WMIP) for rail priorities, including the CITEC programme, supporting future railways, and bidding into existing national schemes.	 
	3 Through focused actions, raise the innovation potential of rail supply chains and its SMEs in the West Midlands.	 
	4 Analyse how COVID-19 might change the vision of the future rail sector and how those changes can be realised and implemented in West Midlands.	 
People	5 Provide better matching of skills supply and industry demand, e.g. through extending the Skills Factory and & delivering relevant T-level/apprenticeship standards required by firms.	
	6 WMCA & industry to work with HE institutions like BCRRE to accelerate higher-level skills within the rail space.	
	7 Increase levels of CPD offers and take up in the sector.	 
	8 Local partners to better define digital skills requirements and communicate these, including for supply chain firms.	 
	9 Build on good practice to take action on encouraging diversity and inclusion in the sector, e.g. through the work of Women in Rail.	 
Business Environment	11 Re-position and strengthen the Rail Alliance, providing them with the capacity to broaden their role as a support organisation and enhance their supply chain support	 
	12 Create a West Midlands Rail Council, to provide strategic oversight and to monitor the successful implementation of this action plan.	 
	13 Promote and scale-up existing business support programmes – e.g Rail Forum Midlands Pilots and Digi-Rail – developing new programmes where required.	 
	14 Provide surgeries for companies struggling in the aftermath of COVID-19 and link them to funding/loans available via Government or banks.	 
	15 West Midlands Rail sector to collaborate to determine social-distancing best practices to deploy across the network incl. monitoring of effectiveness.	 

	16 Provide banks and access to finance providers with rail industry understanding to ensure a boost to investment flows		
	17 Develop rail context for regional 'Productivity Factory' programme (& its delivery models) to support supply chain companies raise productivity.		
Infrastructure	18 The WMCA will continue to work across partners to maximise the impact HS2 by delivering its growth strategy, and accelerate pan-Midlands strategy and delivery through the Midlands Engine's Midlands Connect partnership.		
	19 The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector.		

National Rail Sector Deal

Some areas of this document refer to the national rail sector deal document announced 5 December 2018. Our WM document here broadly reflects the sentiments asserted within this. The mutual commitments between the rail industry and the government set out in this document will allow more trains to run per hour by running trains closer together; deliver more frequent services and more seats, and cut delays by getting trains moving more quickly after disruption. The Sector Deal will enable companies to drive innovation, invest in research and development, upskill the workforce and look beyond the UK to export markets worldwide. Given our position at the “heart of the rail industry,” the Midlands will play host to pilots on a new rail data platform, a scheme supporting high-potential SMEs, and a skills programme to stimulate apprenticeships. We want to ensure these can benefit the rail industry in our region as well as having a wider positive impact on our economy and society.

Reflecting that the West Midlands as a region shares the national-level ambitions in rail, this sector action plan will deliver transformative improvements in three main areas:

- The passenger experience – driving greater capacity on regional railways and increasing data sharing to serve the interests of customers.
- The economy – a well-functioning railway is a driver of economic growth.
- The rail industry supply chain – supply chains in the West Midlands will become even more focused, efficient, productive and confident.

Given the significant infrastructure investment coming into the region, and emerging technologies that will define future railways, a sector strategy in the West Midlands is extremely timely. Providing this framework to help the regional rail sector capitalise on this opportunity is particularly useful in the context of national and local industrial strategy. This action plan will drive the rail sector's contribution to a successful industrial strategy.

An important action that underpins this document is raising the profile and capacity of the locally-based Rail Alliance, providing the West Midlands rail industry with an enhanced and focused support offer. We are delighted to announce that the Birmingham Centre for Railway Research & Education (BCRRE) has signed a Memorandum of Understanding with Rail Alliance Limited. This partnership is an excellent opportunity for our regional expertise to provide industry with the support structure they require to succeed now and in the future.

The Impact of COVID-19 on Rail

There is no one market trend in the rail industry as a result of COVID-19. This is due to the diversity of businesses comprising the sector. Overall, the rail has emerged dented but not severely damaged. Of course, passenger rail and its supply chain have suffered the most serious blow. However, they do not summarise the rail sector's total fortunes. Indeed, some sub-sectors including freight continue to thrive and long-term infrastructural developments remaining steady. So a regional rail response must deal with mixed fortunes, stemming fall-out as well as garnering the opportunities brought about by the pandemic shake-up. It is only in looking at both the positives and negatives that we can determine where the sector as a whole heads from these times forwards.

As with other industries, the parts of the rail sector recovering from the most serious COVID-19 damage require emergency financial intervention in the form of grants and loans. Industry leaders in the region have also articulated a long-term view, stressing greater collaboration between the rail sector and financial institutions with the aim of reforming financial products, services and mechanisms that best optimise investment flows into the industry. With this said, these leaders have demonstrated a robust whole system approach towards their industry and what they understand comprises its marketplace. Emphasis has been placed not on additional financial injections but consolidating existing resources, identifying what the region does well- manufacturing, technology and business-wise- and taking a very honest look at areas for development and improvement. On the last, they have been mindful of the Williams Review and are keen to understand the challenges and opportunities that its findings will reveal.

The Williams Review of franchising and business modelling within the rail industry was in motion prior to the pandemic. For the sector and especially for passenger rail it is posing serious questions to around productivity, quality and transparency. This scrutiny has been watched carefully by the rest of the industry and COVID-19 has intensified the spotlight on these very areas. The effect has been as powerful as it has been mixed, forcing a rethink amongst those reluctant to change but spurring enthusiasm amongst other quarters of the industry to design innovative technological and business solutions for the sector. Either way, it has re-established approaches to services (emphasising *service* to the customer) and technological innovation, redefined rail as much more integrated with other modes of transport than in previous years, and opened up discussions of possibilities in the public and private realms of places and place-making. In the West Midlands, industry thinking has moved in the same direction, concentrating on headline themes such as purchasing and procurement, digitisation, sustainability, skills and workplace diversity, consumer-centred engagement and place-making.

Purchasing and procurement are powerful levers and are necessary change-makers for the entire rail sector. For passenger rail, recovery from COVID-19 has been far from automatic. The lifting of lockdown has not been accompanied by a resurgence of passenger numbers back to pre-COVID levels and public confidence in safety and service quality remains low. Rising fares, delays and cancellations and a poor customer experience are symptoms of what the Williams review is trying to change together with the siloed 'closed shop' of contracting, aka 'rail run by rail for rail'. The review seeks innovation, transparency, customer-focused quality and value for money. The external push for change must come from purchasing and procurement systems compelling the passenger industry to improve, as internal drivers have not proliferated. For other parts of the sector the rapid contraction of the economy brought about by COVID-19 has instigated a search for new product and service entry points to mitigate any actual or possible reduction in business. For those seeking opportunities, purchasing and procurement criteria are major linchpins mentioned by West Midlands sector

representatives to welcome both diversification in the sector as well as market entry for those new to the supply chain, especially SMEs.

The evolution of purchasing and procurement mechanisms, criteria and practices must naturally be accompanied by good business support and signposting, easy access to R and D assets and funds to exploit these assets. These three elements must be mentioned here as priorities for the region's rail industry. However, they are covered in much more detail elsewhere in this document and throughout the West Midlands Rail LIS/LIRS Action Plans.

For passengers and industry consumers, alike, anxious to seek assurance of safety, hygiene and the timely and efficient delivery of their transport and goods, digitisation has been especially key in 2020. Sector stakeholders have been keen to point out that technology push and technology pull have been growing for a number of years and growing not just within rail, but throughout all related sectors. COVID-19 has therefore increased and accelerated questions and demands as to what digitisation can do for the sector (particularly in terms of output and outcome based productivity, precision and quality) and its customers (especially focussed on customer satisfaction) in the new normal.

The West Midlands region is especially fortunate- in both its rail and digital assets and due to its chosen smart technology strategic priorities-to be a burgeoning UK epicentre for digital innovation. The Birmingham Centre for Railway Research and Education (BRCC), Quinton Rail Technology Centre (QRTC) and the on-stream Very Light Rail National Innovation Centre (VLRNIC) are prime examples of local assets. Their development highlights both regional and national commitment from not just government but, very significantly, industry to invest in the sector. Equally, the region's committed pursuit of the Future of Mobility and 5G innovation and testing, and integration of a large and active Digital sector in all of this, demonstrates the appetite for engaging with all transport sectors and linking them to people and infrastructure. Importantly, the region's rail sector sees the digitisation agenda as permanent commitment, for example making explicit and emphatic mention of it in terms of skills and training within the RAIL WMLIS/LIRS. It is keen to see what can be transposed from rail to other sectors and vice-versa. It also sees great advantages in cross-sector collaboration partnering rather than simply competing against other forms of transport.

Decarbonisation has been a priority theme for the UK government in its transport strategies. Even throughout the COVID-19 peak this has remained prominent. DfT's push for railway electrification and wider public health concerns relating to heavy fuel-based pollutants have been two of the many factors that have catalysed a wave of exploration around alternatives to fossil fuels and polluting journey patterns. Keenness to develop, explore and exploit technological opportunities by rail sector leaders in the region is strongly tied to their understanding of the Place Foundation of Productivity. Their identified actions in developing a West Midlands Rail Council and ensuring that it builds Technology Roadmaps as a priority reflect their commitment on this front, with themes including electrification, hydrogen technology, network optimisation, clean travel as part of mobility as a service (MaaS) mentioned in conversations to build the narrative in this report. Like digitisation, decarbonisation is being seen increasingly as a pathway towards market differentiation and major investment decisions (especially over the rolling stock and track infrastructure we will purchase in the UK as a whole over the next few decades), but it is perhaps driven equally by policy and regulation. Without it, whole sections of the industry will either become non-compliant and thus obsolete or burdened with heavy fines and taxation.

The wake up call around the above themes, amplified by COVID-19 highlighting the vulnerabilities of the sector, has reinforced the need for future-proofing. The modernisation of rail sector skills and recruitment priorities was recognised regionally as a dual need long before the pandemic. However,

amidst the need to revive the order book pipeline and seek efficiencies and savings for survival, regional rail leaders have been strikingly resolute in keeping particularly high-level skills, gender equality in recruitment and career development as top priorities. They are not 'nice to haves' but rather necessities to attract the most able workforce with not only the right skill sets but the right attitudes and aptitudes to seek change, take (calculated) risks and innovate societally as well as financially and technologically. An underlying feature of this thinking is to ensure resilience and competitiveness for the future of the industry. This demonstrates the region's forward thinking approach and perhaps also the lessons learned that a lack of agility exemplified by what the Williams review seeks to unknot will hold the region and UK PLC back.

Alluded to above is the growing realisation that rail needs to become much more of a service than it has been. This relates to both the passenger market as well as industrial markets where businesses must maximise attentiveness and responsiveness to the demand side to survive in the immediate term and prosper in the longer-term. Although much of the rail industry focus has been on the economy, technology and the environment, our research has pointed to a growing need for engagement and two-way communication between professional supply and demand communities and customers as citizens. This marks a paradigm shift in the demand side playing a growing role in shaping service accessibility and quality and also influencing the location and function of rail infrastructure. Recalling the content of previous paragraphs in this section, many focal points will be enablers, especially reformed procurement criteria that stress accountability and redress, digitisation and the availability of information and greater choice and even the shaping of careers and skill sets which will have to balance consideration of people and not just tasks.

1) Sector Summary

The rail sector plays a critical role in supporting the health, wealth and wellbeing of the UK, and the economic enabling impact in communities following rail investment is well documented and brings forward investment in housing, jobs and new communities.

With 240,000 people employed either directly or in supply chains, our industry creates £10.4 billion of wealth (Gross Value Added) annually to the UK economy. The numbers are significant and importance to the UK goes far beyond that.

Rail connects people, places, goods and markets – critical to keeping the population moving and supporting a range of wider benefits: improving connectivity for workers which is key to productivity; providing access to skills, health and leisure opportunities; providing an effective alternative to the road network, helping to mitigate congestion issues; and with increasing numbers of electric trains provides a cleaner, lower emissions means of travelling for large numbers of people every day.

1a) Defining Rail

Capturing rail industry activity is not easy due to the variety and broadness of the sector; this ensures that the SIC code system often doesn't reflect the true size of rail in a particular geography. A recent Oxford Economics study¹, however, breaks the sector down into four industry groups:

- The railway system
- The railway supply sector
- Retailers and caterers at UK railway stations
- 'Induced' UK economic activity supported by the wage-funded spending of workers employed in these industries.

The report, which provides a detailed analysis of the economic impact of rail in the UK, uses the diagram across to explain the different components of the sector. This may somewhat simplify a complex web of activity, but it's a useful diagram for better understanding how everything in rail fits together and what we should be measuring and considering when we refer to 'rail'.



Using Oxford Economics' definition of rail, they conclude an industry Gross Value Added (GVA) figure of **£36.4bn and 600,000**

¹ 'THE ECONOMIC IMPACT OF UK RAIL 2018': <https://www.oxfordeconomics.com/recent-releases/06ec32db-6550-44ed-ac64-6502b9530867>

jobs in the UK. The core railway system and railway supply sector take up almost three-quarters of this (31% and 41% of sector GVA respectively).

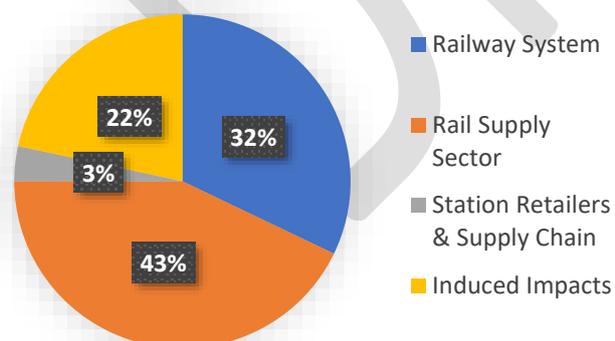
1b) Sector Strength Regionally

Rail in the West Midlands is well summarised by the West Midlands Rail Executive’s recent consultation document for their 30-year Rail Investment Strategy:

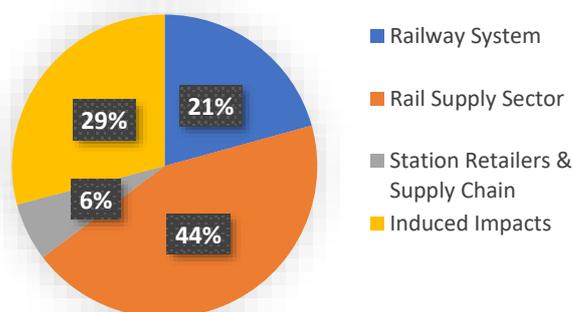
“Rail is a major player in moving people around the West Midlands. For the first time in 2017 rail became the largest mode for peak travel into central Birmingham, with over 38% of people using the train in the morning peak. It is key to logistics and distribution across the UK, with intermodal rail-freight growing by 9% in 2016-17. However, the scale of committed and potential growth in housing and employment volume and distribution, as well as freight growth, will directly challenge the capability of the region’s rail infrastructure given its regional role and location at the heart of the UK rail network. By 2033 the two phases of High Speed 2 (HS2) will have delivered major new rail capacity, and released capacity on the existing West Midlands network. HS2 will further cement the region’s role at the heart of both the UK economy and its transport network. The West Midlands will be a yet greater place to live and work. The capacity opportunity that HS2 offers is one the West Midlands must take. But as this Rail Investment Strategy illustrates, growth will quickly use thus up.”

According to the aforementioned Oxford Economics report, rail contributes **£2bn GVA impact and almost 40,000 jobs in the WMCA 3-LEP area**. Rail supply is the largest sub-activity of this, making up 43% of railway-related GVA (£850m), followed by the railway system with 32% of GVA (£650m). The rest of rail GVA and jobs comes through station retailers and wider induced impacts. Similarly to GVA, almost half of rail industry impact jobs are within the rail supply sub-activity, reflecting the strength of manufacturing supply chains in the WMCA. A significantly less percentage of jobs (compared to GVA) are within the railway system (21%). Induced impacts make up a higher proportion of jobs than they do for GVA (29% compared to 22%) and station retailers have double the proportion of jobs than their proportion of sector GVA.

Rail Industry GVA Distribution in the WMCA



Rail Industry Jobs Distribution in the WMCA



With **£850m**, the WMCA has the **most railway supply GVA of comparative areas**, including other CA's. It also has the second highest amount of GVA within the railway system behind the South East LEP area. Nearby Derby & Nottingham has a significant rail supply sector for its size, providing £650m GVA within this sub-sector. This is useful for **cross-regional rail supply chains** within the Midlands.

Rail sub-sectors GVA across selected comparator areas (£bn)



At the regional level, **1.72% of WM region jobs are railway-related** (49,200 jobs). This is the joint second highest concentration of all UK regions outside of London (see below map).

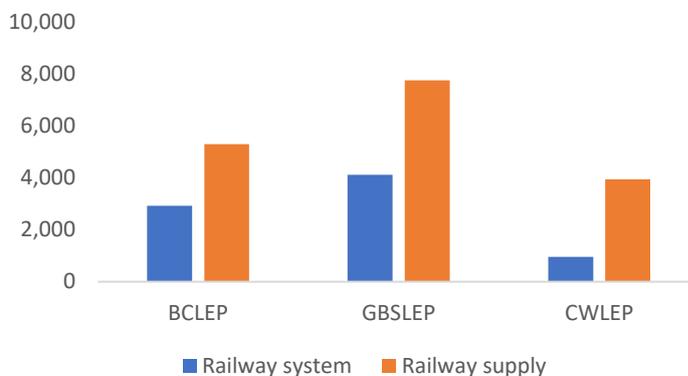
Railway-related impact jobs as a share of regional jobs



At the LEP level, the Black Country has the highest % of railway related jobs (2.32%) as a share of total local jobs of all LEPs; the case is the same for GVA. GBSLEP is also above the UK average when it comes to the share of rail jobs. The Black Country also tops the LEP rankings when it comes to rail supply sector jobs as a share of all local jobs. Mainly due to its comparative size, GBSLEP has the largest

number of jobs and GVA across rail sub-sectors of the 3 LEP area, but there's a significant cluster of activity within the Black Country for both the railway system and the supply chain. The railway system contributes a significant amount of GVA/jobs in BCLEP and GBSLEP, but next to nothing in CWLEP.

WMCA LEP jobs in rail sub-sectors



Aside from the headline data, the West Midlands rail sector is underpinned by both academic excellence and private sector leadership. On the former, **The Birmingham Centre for Railway Research and Education (BCRRE)** at The University of Birmingham is the leading institution for railway science and education, with over 130 academics, researchers and professional support staff. BCRRE, as the lead university, recently announced a £92million industry-partnered investment in research on digital train technology through the **UK Rail Research and Innovation Network (UKRRIN)**. Birmingham is a key university internationally in the rail space, and the same can be said about the **University of Warwick**; these high quality, sector focused science & research facilities provide an integral foundation for the region to embrace new technologies within rail. Additionally, the **Quinton Rail Technology Centre** is the UK's leading facility for rail testing, trialling and product development. Boasting the only endurance track (i.e. looped), it is ideal for a wide range of uses including offering the UK's only crash test facility; and a proposed **very light rail innovation centre (VLR) at Dudley**, in association with WMG at the University of Warwick will showcase light rail technologies. Much of this activity is particularly relevant given the focus given by government on 'clean growth' 'future mobility', and 'AI & data' as industrial strategy 'grand challenges'.

Furthermore, the future £80m **UK Battery Industrialisation Centre (UKBIC)** in Coventry is a major development for battery manufacturing across sectors along with the Advanced Propulsion Centre based at WMG. Both of these will be key facilities in the development of battery technology for vehicles, including those within rail, not just for the West Midlands but the UK overall as an international leader in this space. In addition, a wide variety of world-class innovation assets exist in the West Midlands, notably the **Manufacturing Technology Centre (MTC)**, **Warwick Manufacturing Group (WMG)** and the **Institute for Advanced Manufacturing and Engineering**.

Despite not hosting a rail OEM, the West Midlands has a vast range of companies in the sector, supplying both products and services across the supply chain. Regional rail supply chain includes expertise in **rolling stock design, development and manufacture; infrastructure and consultancy services; systems and signalling; and light and very light rail technologies**. There is a cluster of rail construction specialists & consultancies (AECOM, TDI etc) & a presence of international transport advisors (Arup, WSP, Atkins etc) – these are particularly **high skilled and highly paid jobs**. Similarly, large rail engineering and technology firms such as **Alstom** (Wolverhampton) and **Wabtec**

(Birmingham) have operations in the region. Beyond this, there are many smaller manufacturing firms that supply products into rail as well as other manufacturing sectors. The heavy **cross-over relationships** with significant local automotive/aerospace/other manufacturing activity has an agglomeration affect for the rail sector. The **Rail Alliance's** Stratford-upon-Avon location provides effective representation and networking for the rail supply chain. Major planned infrastructure in the region (**HS2, Metro** etc) and nationally ensures distinct opportunities for West Midlands rail companies in the future (see next section). New infrastructure investment including HS2, metro and new lines, along with Control Period 6 (CP6) – from 1 April 2019 to 31 March 2024 investment – are key features of this. In addition, there is considerable rail cross over into other sectors including construction, skills and training, retail, hospitality, tourism, logistics and distribution.

At the overall Midlands level, the **Midlands Connect** programme has developed a regional transport strategy that identifies the major infrastructure projects needed to improve the connectivity of the Midlands. Midlands Connect is a pan-Midlands partnership of 23 Local Authorities, nine Local Enterprise Partnerships, the Chambers of Commerce, Highways England, HS2 Ltd, Network Rail, and our Sponsor the Department for Transport, reflecting the appetite for collaborative working in the Midlands on the use of transport infrastructure to drive economic growth, trade and productivity. Midlands Connect has recently announced its ambition to create a **Midlands Rail Hub**. The Hub, centred on Birmingham, is expected to increase the number of services and cut journey times between major parts of the region. In the 2017 Autumn Statement, the government committed to a £5million development package for the Midlands Rail Hub.

Any rail sector strategy like this one must consider interventions that not only suit rail but suit a thriving **metals and materials** sector that underpins it. The West Midlands has an historic presence within metals manufacture and treatment, but also contains the largest concentration of materials related jobs in the UK. The success of these foundation sectors is crucial to the success of rail as many products used in the industry are created by metals and materials companies, particularly at the beginning of the product life cycle. Without a successful, innovative and sustainable supply of metals and other materials (such as rubber, plastics etc), the regional rail sector will not maximise the potential outlined in this document.

Furthermore, the cross-cutting nature of digital and low carbon applications is proving disruptive for many sectors, not least in rail. Achieving a digitally connected, low-carbon railway is a key part of the rail strategy both nationally and in the West Midlands, as is central within this document. Digital and low carbon capabilities regionally will be a crucial enabler to deliver transformative change in the West Midlands railway system and throughout supply chains. It's therefore crucial that, alongside sounding out the needs for the rail industry, there is a wider regional approach on building on existing digital and low carbon strengths that will drive the digitisation and decarbonisation – these has the potential to unlock capacity, connect communities and enhance the customer experience. This region in particular has the institutions in place to deliver this, and through a series of technology roadmaps (more detail included later), the West Midlands can provide a unified focus and direction to adopt these new technologies.

Wider regional and national strategy is in line with our intentions for the rail sector. Centred on HS2, connectivity is a key priority within the WMCA Strategic Economic Plan (SEP) and there's a distinct focus on the 'Future Mobility' Grand Challenge within the broader West Midlands Local Industrial Strategy. In addition, there's a drive to reduce emissions and to increase the quality and quantity of public transport both locally and nationally. In line with national targets around clean air and clean and connected transport, the WMCA is currently consulting on a Clean Air Zone in Birmingham which may increase use of trains, buses and trams. It's clearly the case that a boost in demand for the region's

railway is likely in the coming years, a scenario that ensures we prepare our infrastructure and supply chains to maximise the potential of this.

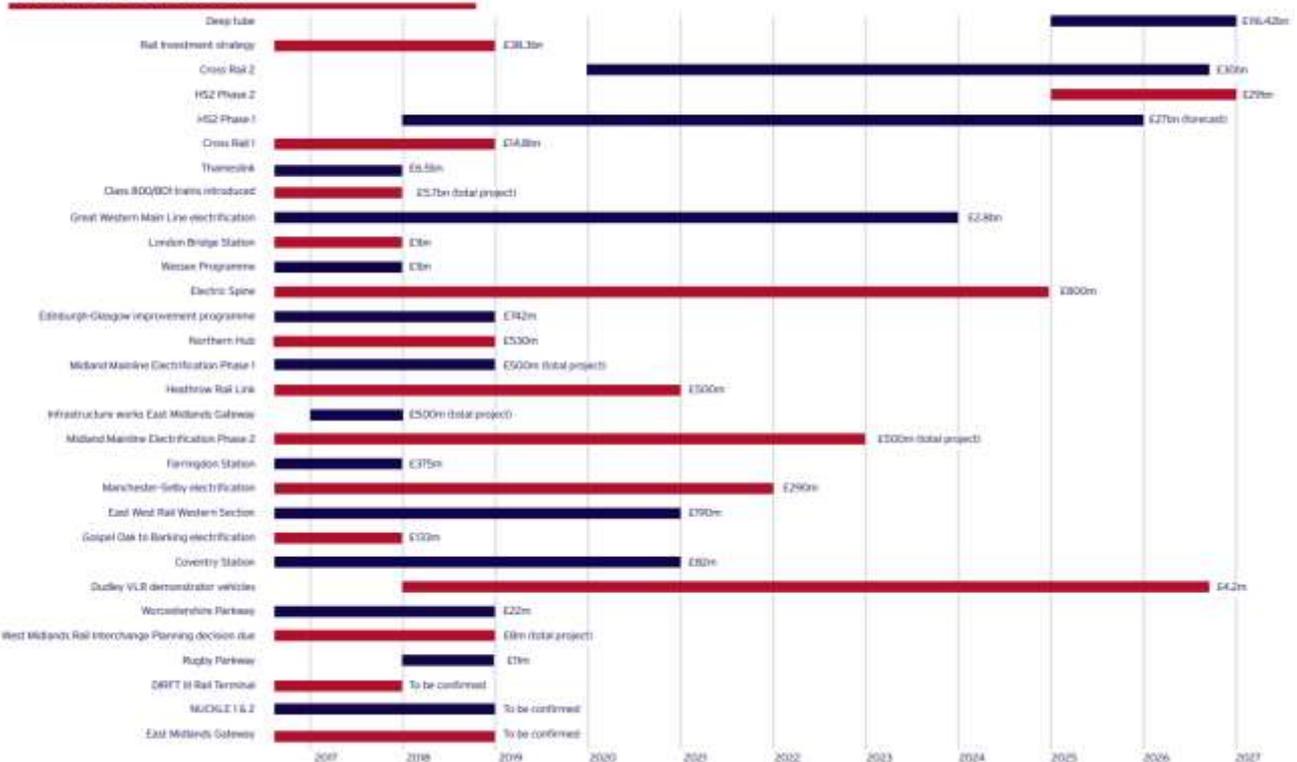
This action plan should also complement and reflect the West Midlands Rail Executive’s (WMRE) 30-year rail investment strategy when the final document is published, and respond to key challenges and opportunities identified by Network Rail.

1c) West Midlands Rail: Opportunity 2024

Capitalising on Future Infrastructure investment

The years ahead will see very significant investment in transport infrastructure, much of this within the railways and connected modes of transport. High Speed 2 (HS2), at £55bn, is one of the world’s largest live global investment programmes in high speed rail and the largest construction programme in Europe. HS2’s HQ and National College are both in Birmingham and the line is expected to add £3bn GVA to the regional economy. The UK is also investing heavily in conventional and light rail renewal and expansion, as well as improved stations and infrastructure – the value of the UK’s rail and infrastructure pipeline exceeds £100bn (see below image).

UK Rail and Infrastructure Opportunities - pipeline of over £100bn



Transport infrastructure is experiencing historic levels of investment, the greatest wave for a generation. New infrastructure is being commissioned, new trains are being procured and digital technology is being embraced.

Alongside the major HS2 investment, the West Midlands is seeing large investment in existing and new rail projects, such as Midland Metro, and within light rail, very light rail and freight. WMRE’s Rail Investment Strategy indicates that by 2032 transformed West Midlands rail services will themselves add £325m each year to the economy, rising to £540m by 2047. Early and major economic benefits - for example through WCML Cross-Birmingham Services, a new Walsall-Wolverhampton Service and

New Services on the Camp Hill Corridor - of £59m GVA per annum by 2025 are identified by the strategy.

The timescales, investment level and requirements for rail investments, including the above, are visible and planned long in advanced. We're therefore aware of upcoming projects and investments, providing a distinct opportunity for the rail sector given this wide-ranging investment. Part of this action plan will be about ensuring the West Midlands rail sector maximises the potential benefits from these major projects, and communication of the opportunity to companies of all sizes will be part of the solution. The visibility of opportunity in the West Midlands is reflective of the rail sector overall; investment is allocated in a structured manner by government/Network Rail through 'control periods' – 5-year timespans of investment work. These are used to decide priorities for investment, with control period 6 beginning in 2019. West Midlands rail investments, and our leading supply chain and central location makes this an excellent base to access rail projects elsewhere in the UK, such as those that will be committed to in control period 6.

Control Period 6 (CP6) – from 1 April 2019 to 31 March 2024 - has an investment value of £48bn focused on performance and reliability improvements. Key ambitions of CP6 are:

- Delivering a 15% reduction in the number of delayed trains
- A more efficient railway, including a significant uplift (25%) earmarked for day-to-day improvements
- Investment in further projects to increase much needed capacity on the rail network
- A reduction in the risk of a train accident by a further 10%.
- Environmental targets such as reducing energy consumption by 18% and reducing carbon emissions by 25%

For rail to achieve its full potential, sustained levels of infrastructure is vital, and the government's settlement for CP6 is a good indication of this.

It's vital to ensure our rail industry is not left behind when competing for major contracts. To fulfil our ambition of being at the heart of the current and future rail industry, we need to maximise existing assets, both regional and national. This will include maximising the National Rail Digital Facility, and the use of the CompeteFor and BidSmarter procurement platforms. These initiatives can be used extensively to raise awareness of opportunities, help local suppliers prepare for, access and win rail business - a key WMCA priority. They must be linked directly to industry through a variety of networks, particularly the Rail Alliance, so that our companies can stay ahead of their national and international competition.

Linking opportunities to West Midlands' rail companies of all sizes is even more important when considering the region's wider momentum. For example, the Commonwealth Games will drive greater demand on transport systems, providing us with the challenge to supply the required demand. At least £170m worth of local transport improvements for the Games has already been earmarked, reflecting another key opportunity for the regional rail sector. Improving engagement with SMEs and the rail supply chain now will help us to successfully construct the infrastructure of the future.

A more efficient, skilful and innovative rail sector in the West Midlands will enable the significant transport infrastructure investments both locally and nationally to prosper; this will have a long-term positive effect on connectivity, productivity and society's wellbeing. In order to maximise the opportunity of HS2, control period 6 and other rail investments, we need to embrace changes within the sector and ensure local supply chains are ready to win contracts.

Technologies

Meeting the growing societal and environmental demands will require a transformational shift in the rail sector, towards the use of new technologies and processes. New ways of designing, building and operating trains can ensure the railways are cleaner, quicker and more efficient – to the benefit of the industry and society as a whole. A number of technologies are currently disrupting the rail sector and will undoubtedly be the future of our railways. Within this strategy we will focus on four key technology areas that are of distinct importance to this sector in the West Midlands:

- **Digital Railway** – using digital technologies to reduce costs and unlock capacity, performance and safety benefits for passengers and freight users. Digital signalling and traffic management systems are core components for reducing current capacity problems on the existing network.
- **Light & Very Light Rail** – reducing the weight and cost of trains by half in order to facilitate low cost connectivity of suburban and rural areas.
- **Decarbonisation** – taking wide-ranging action to decarbonise the railway amid urgent environmental priorities.
- **Propulsion** – taking advantage of new, more powerful and more efficient modes of propulsion technologies. Successfully developing innovative powertrain and energy storage solutions for rolling stock, and lowering the cost of electrification, are key objectives for the industry.

Later in the document there's a section on each of these technologies, outlining the opportunity that the West Midlands has to capitalise on them to drive success in the sector.

2) Foundations of Productivity in the Context of Rail

2a) Ideas

Network Rail suggest that there will be an extra one billion journeys by the mid-2030s. New capacity on the railways is urgently required to meet this continued rise in demand. Whilst conventional ways of providing this capacity through new railway infrastructure will continue to be an important and effective approach, more efficient and innovative methods are increasingly desirable.

The railway needs to exploit research, development and technology innovation to make train travel more accessible, more comfortable, more reliable and more affordable. Implementing innovative ideas, such as the greater commercialisation of the four technologies above, in the West Midlands, can enable the region's railways of the future. The adoption of innovation and the uptake of ideas is key to the success of West Midlands industry, including the railways. This includes fully embracing the potential of megatrends such as Industry 4.0 and Mobility as a Service (MaaS).

An extension of the four technologies noted above, the Rail Technical Strategy Capability Delivery Plan (CDP) identifies twelve "key capabilities" that the railway needs to develop in order to meet the industry's objectives of increasing capacity and improving customer service in a sustainable and affordable manner. The twelve capabilities are as follows:

1. Running trains closer together
2. Minimal disruption to train services
3. Efficient passenger flows through stations and trains
4. More value from data
5. Optimum energy use
6. More space on trains
7. Services timed to the second
8. Intelligent trains
9. Personalised customer experience
10. Flexible freight
11. Low-cost railway solutions
12. Accelerated research, development and technology development

These twelve capabilities can provide a key focus for ensuring the right innovation is integrated into the West Midlands rail sector, resulting in wide-ranging benefits that ultimately sum up to increased productivity and growth in the region.

Smaller firms are naturally more averse to innovation and R&D, with evidence that some are unable to engage with larger firms and Catapult centres. It's felt that innovation support is patchy and poorly co-ordinated, with a disproportionate focus on large businesses. The utilisation of innovation in rail must not be carried out in isolation - it should bring SMEs and the supply chain with it. This reflects the need for industry-wide involvement on innovation, allowing smaller companies to engage and be a part of the growth. De-risking investment into innovative product development and practices will be a crucial part of this.

Potential Actions

Transformation Through Innovation

At the regional level it should be the ambition to utilise new technologies in order to enhance the quality of our railways and the rail sector.

This should include region-wide working to accelerate the delivery of the Network Rail's UK Digital Railway programme. This will be the catalyst for a lasting transformation of railway operations in the West Midlands and the wider UK. With digital train control and traffic management at its heart, and the use of activities like digital twin technology, it will add significant capacity, revolutionise performance and dramatically improve the customer experience for rail passengers and freight users.

Delivering the Digital Railway is a very significant opportunity for the West Midlands rail system to deliver vast improvements including:

- Better asset sustainability
- Increased capacity
- Improved reliability
- Enhanced safety
- Accelerated economic growth
- Improved environmental outcomes

The West Midlands needs to leverage its existing strength in this space, e.g. through the Birmingham Centre for Railway Research & Education's lead within the UK Rail Research and Innovation Network (UKRRIN), to ensure it remains a leading region in the UK for transport innovation.

Furthermore, exploiting our emerging specialism within light and very light rail technologies and more effective propulsion systems will contribute to decarbonising the railway system. Innovative rolling stock solutions have the potential to drive down costs by providing a new breed of vehicles that are lightweight and low cost. Through the Very Light Rail Innovation Centre and Test Track development in Dudley (a collaboration with Warwick Manufacturing Group), this is another innovation area by which the West Midlands is a leading player. Harnessing this expertise in the right way can ensure the West Midlands has a nationally and internationally impact on rail travel in the years ahead.

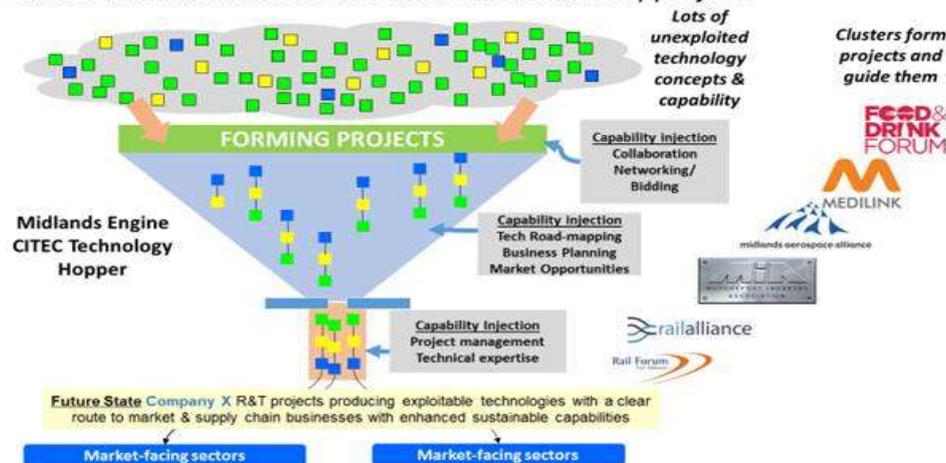
Stimulating further innovation is a key strand of the overarching WM LIS focus on future mobility, and the technologies currently disrupting rail will clearly have a part to play in this. There's a regional ambition to enable a new approach to real-time data and user management across the whole transport system, and both the railway system and supply chain will be integral in making this a success. Stimulating innovation in connected mobility will underpin a new approach to distributed, connected factories and supply chains, significant gains for the wider UK economy and local supply chains across the region and wider Midlands Engine area.

CITEC: Demand-driven innovation in the supply chain

The ambition of CITEC is to facilitate R&D projects that transfer technology between industry supply chains (i.e. "horizontally") for commercial exploitation. It will focus on Midlands Engine priority markets and three enabling competencies identified in the ME Science and Innovation Audit. It will mobilise key Midlands business cluster networks which will work collaboratively to identify and mentor projects, harnessing guidance from leading major firms to accelerate the unrealised potential of many supply chain firms to innovate.

This concept will deliver 300 cross-cluster technology transfer projects to create new industrial value chains and seed emerging industries at the heart of the Midlands Engine economy, creating 4,000 jobs directly, contributing to enhanced productivity and reorienting Midlands supply chains towards future global markets. CITEC has a particular focus on raising productivity through creating or injecting IP and kick-starting its exploitation in so-called "long-tail" of supply chain companies.

CITEC funnel: from idea to market via cross-industry projects



CITEC adopts a small-firm bottom-up innovation model developed and proven in the Midlands, by the aerospace supply chain since 2006 (involving Rolls-Royce, UTC Aerospace Systems and other Midlands Tier 1s), and since 2012 used by four English regional aerospace clusters in the £40m NATEP programme. NATEP has identified many cross-industry opportunities it cannot properly exploit – the kinds of opportunities that CITEC could exploit. CITEC also injects lessons from a horizontal innovation programme involving the Motorsport Industry Association and the Institute for Engineering and Technology.

The project will mobilise key market-facing Midlands industry cluster networks, including the Rail Alliance (as well as Midlands Aerospace Alliance Medilink Midlands etc) to identify, develop and guide projects into diverse future markets using strong customer support and expert mentoring. Many processes within the rail industry are fundamentally cross-sectoral and would benefit from this type of collaborative working programme.

At a value of £120m over 2017-2021 (50% of which is industry matched funds), CITEC could be delivered at different geographies, either the Midlands as a whole or specifically in the WMCA area. The programme recently received £40,000 from Midlands Engine funds to develop the concept; we are clear in our ask for further commitment and funding to this demand-driven and cross-sectoral innovation project.

Raise the Innovation Potential of Rail SMEs

In order to reverse the long-tail of low productivity manufacturing firms in the region, we need to tackle SME risk aversion to innovation. There're multiple ways that may achieve this, but, importantly, a link between academia and the private sector is required to provide seamless levels of strong communication. Linked in with our Productivity Factory programme (see full details later in this document), it's suggested that the role of the Rail Alliance be extended so that they can offer a better resourced and higher quality service to the industry regionally. From an innovation perspective this might involve a range of activities that would assist rail SMEs in engaging with innovation activities and projects, such as:

- Assisting in scaling up of new products
- Maximising Industry 4.0/Digital Railway adoption across the industry
- Opening up the opportunities of intellectual property within local tier 2 and 3 rail firms

- Ensure accessibility of regional R&D facilities to lower tier suppliers and facilitate opportunities for companies to collaborate.
- Support the development of new technology supply chains

As explained in more detail within the Business Environment section of this document, the Rail Alliance has recently partnered with the University of Birmingham’s Centre for Railway Research & Education – this provides an exciting opportunity to uplift the quality and capacity of rail industry support in the West Midlands.

The table below summarise our proposed intervention areas for the ideas foundation. As utilised across all of the foundation sections, here we group actions into four areas: super-charge, build, maintain and consolidate.

Ideas – Summary Table of Proposed Interventions

Super-charge	Build	Maintain	Consolidate
The West Midlands rail sector should collectively utilise new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector	Through multiple actions, raise the innovation potential of Rail SMEs in the West Midlands		
Government should support and match-fund the emerging CITEC programme which facilitates demand-led R&D projects that transfer technology between industry supply chains	Analyse how COVID-19 might change the vision of the future rail sector and how those changes can be realised and implemented in West Midlands.		

2b) People

The regional rail sector has a long-term commitment to, and involvement in, education and training which will have created a modern, specialised workforce. Becoming a desirable employer able to attract the highest calibre recruits is the sector’s ambition. An important part of upskilling will be providing the skills required to reach rail’s ambitious future, but skills shortages exist today that are affecting businesses on a daily basis.

A skills shortage exists across the sector, due to a number of factors, including an ageing workforce, competition for skilled staff and a lack of STEM trained graduates and school leavers entering the industry. This shortage could potentially be exasperated by Brexit. Current skills provision is focused heavily on apprenticeships and, whilst of value, they’re not currently available for all the technical needs of the rail sector and therefore not always suitable for upskilling the sector’s workforce. Investment is required in productivity-related skills and training and training solutions that can be delivered at or near SME locations.

The sector is not seen as an attractive career choice for young people and there has been an erosion of vocational education and training in the last few decades. There has been little or no focus on practical skills in schools, with a huge decline in young people taking practical subjects, together with

the downgrading of diplomas, many of which are relevant to the rail sector. Combining this with the sector's ageing workforce – 40% of workers involved with rail vehicles are over 50 (Rail Supply Group) – and the major rail investments regionally, presents a real problem for the sector.

The industry struggles to recruit sufficient numbers into critical roles, specifically systems engineers, signal designers, project managers, commercial managers and trainers (RSG). Furthermore, rail fails to attract women, particularly in engineering roles (they make up 4% of all railway engineers). For the future, it's vital that the sector develops a strategy around obtaining digital skills in order to deliver the vision for a fully functioning digital railway. Much upskilling of the existing workforce will be required to optimise and maintain new digitally driven assets, whilst more specialist digital skills will also be required, such as data analysis.

Additionally, training for school leavers is fragmented, often uncoordinated and does not meet companies' needs – this is especially true for smaller companies. Provision relevant to the rail sector has suffered as a result of some training providers not being responsive to industry demands. Some of the skills the sector requires are generic, leaving the rail sector competing with not only other industrial sectors but those outside of the industrial sector.

Rail sector resources for meeting these challenges are generally insufficient, and characterised by poor connectivity, poor coordination, a shortage of trainers, and a lack of quality employer-led training which is accessible to the supply chain.

Skills shortages will constrain the delivery of regional and national infrastructure investments if they are not addressed immediately. The Rail Supply Group suggest that even a modest degree of delay or cancellation to major projects caused by skills shortages would result in around £1.1bn worth of GVA being lost to the UK economy. Reversing skills shortages and preparing skills for the sector's future are therefore integral for success going forward.

Potential Actions

Delivering the Rail Sector Skills Delivery Plan Locally

As outlined in the national rail sector deal, the delivery of the 2017 Rail Sector Skills Delivery Plan (RSSDP) is key to ensuring the industry is supplied with the right skills at the right time and in the right place. A collaboration of partners will need to work together regionally to ensure the objectives of the RSSDP can be delivered in the West Midlands rail sector.

Specifically, action that will drive a successful regional contribution to the national industry ambition will include:

- **Provide better matching of skills supply and industry demand , e.g. through extending the Skills Factory and & delivering relevant T-level/apprenticeship standards required by firms.**

The new normal, burgeoning environmental regulatory reforms, evolving consumer and quality standards, and a rise in digitisation all require rapid adaptation of skills supply. The imminent retirement of large portions of the older workforce will leave a huge skills deficit. Whilst the need is not immediate preparations must begin immediately to allow adequate lead-in times.

Industry partners and the WMCA recognise the similar skills challenges occurring within manufacturing sub-sectors, such as automotive, aerospace and rail. Therefore, the potential solutions to reverse these issues will vary only slightly across different manufacturing/engineering sub-sectors. The key skills ask within the WM Local Industrial Strategy for these sub-sectors is an extension of the successful Black Country Skills Factory:

The Black Country Skills Factory has expertise in the delivery of flexible, bite-sized training courses. It has proved to have a very successful model in ensuring that courses like this are delivered by providers and are driven by the specific skills needs of employers. The Skills Factory has so far focused on the Advanced Manufacturing and Engineering sector and has therefore already experienced working with the rail sector locally. There's opportunity for an extension of this work, to make available easy access courses delivering real value on skills across the whole of the region's rail sector. Widening the scope of the Skills Factory to include the whole WMCA area will provide additional capacity and impact.

The overall Skills Factory project aims to continue to expand and grow the bite-sized and apprenticeship provision to upskill the West Midlands workforce, including within rail as a key sector locally. In particular the future Skills Factory should be closely integrated with the new Productivity Factory and the upskilling offered by the Skills Factory should especially be tailored to help SME's become more productive.

- **Increasing the Number of New Entrants to the Sector**

Firstly, this will include attracting the best through an uplift in careers support. Perception of manufacturing remains an issue. The sector needs to work with government to refocus parts of the school curriculum to place a greater emphasis on this – and to provide improved, relevant and timely (early) careers advice. Providing clarity regarding the potential for careers within the sector and the different routes that might apply is crucial in convincing young people that a good career can be achieved in rail. The rail sector should be seen by educators and potential recruits as a high-tech and dynamic industry open to applicants from all ages, genders and races. West Midlands partners must be fully involved in the development of 'iRail', the Midlands rail industry's school engagement programme, using HS2 as a catalyst for a change in perception and identification of career opportunities.

There's also a need to ensure training and accreditations have credibility and formal recognition across both government and industry, accompanied by increased in the number of students locally in full time rail related courses. This can partly be carried out through a region-wide extension of the successful Black Country Skills Factory, which provides a link between the industry-demand for skills and supply from providers.

- **Increase levels of CPD offers and take up in the sector**

New demand will require additional training for the existing workforce. We will work with all skills and education providers to encourage additional and easy to access skills provision. Key partners within this will be universities, HS2 college, and other major colleges. Similar to the work on new entrants, increasing rail apprenticeships will also help to develop a better skilled workforce, as will support development of new /relevant frameworks

- **Work within existing frameworks and create new ones to ensure a more holistic and co-ordinated approach to careers advice and rail engagement with schools.**

Today's school-aged students are leaving STEM pathways early, resulting in a lack of suitably trained school leavers and graduates entering the industry. If the trend continues, we will neither be able to replace the outgoing workforce nor meet the demands on the sector resulting from demand-side productivity expectations, legislation (especially environmental) and rapid digitisation of production and service delivery.

- **Improving Diversity – e.g. through Women in Rail.**

Women in Rail was created to improve diversity in the UK rail industry through providing networking opportunities and support for all women within the sector, encourage undertakings and stakeholders to adopt diversity as a business strategy and devising initiatives aimed at positioning rail as an attractive career choice for young people. The WR Mentoring Programme aims to continue the work of WR and to provide a support platform for men and women in UK rail, champion diverse thinking, cross-fertilisation of ideas and networks and promote diversity in rail, starting with gender diversity as the core focus, but embracing broader diversity over time.

- **Digital Skills**

In order to deliver on long-term digital skills, partners in the West Midlands and the industry need to understand and formalise precisely what digital skills are required for the future, including for supply chains. This intelligence will need to be fed back into the skills agenda and strategy development within the WMCA to ensure that the rail sector is a priority. Due to the importance of major regional transport investments, it's crucial that the region delivers a digitally skilled rail workforce for years to come.

- **Work with HE institutions to accelerate higher-level skills within rail**

At the higher education level, the WMCA must also provide support and initiatives to support institutions like BCRE in attracting more funding and more students across the qualification levels. Having such a reputable and leading organisation within this field in the region is an opportunity that should not be missed or understated. Fully capitalising on key HE institutions like BCRRE and Warwick will be an important step going forward, particularly to provide the highly skills workers that will be required to setup, produce and maintain a digital railway.

People – Proposed Interventions Summary Table

Super-charge	Build	Maintain	Consolidate
Increase the number of new entrants to the Sector	WMCA & industry to work with HE institutions like BCRRE to accelerate higher-level skills within the rail space.	Increase levels of CPD in the sector	Local partners to better understand and formalise precisely what digital skills are required for the future, including for supply chains
Provide better matching of skills supply and industry demand, e.g. through extending the Skills Factory and & delivering relevant T-level/apprenticeship standards required by firms.			Work within existing frameworks and create new ones to ensure a more holistic and co-ordinated approach to careers advice and rail engagement with schools.
Improve diversity in the sector, e.g. through the work of Women in Rail			

2c) Business Environment

The major infrastructure investments in the region, including HS2, Midland Metro and motorway improvements, provide the West Midlands rail sector with a profound opportunity. Products supplied by our rail industry will be crucial to the success of these investments and other across the country. These major projects have many features and programmes within them that offer a unique opportunity for the region. For example, one of the key rail assets that will be created by HS2 is the maintenance and rolling stock depot at Washwood Heath. This will provide over 500 jobs to the local area, but also jobs and businesses in the rolling stock and maintenance supply chain.

Maintaining and advancing a distinct rail cluster of businesses in the West Midlands is therefore a real possibility and key opportunity; this should include extending our cluster through inward investment strategies to promote our excellence. The region's expertise with rail research/innovation/R&D also provides industry with collaboration opportunities and the ability to maximise rail's digital vision.

Through the significant mobilisation of the existing resource base, partners (industry bodies and the public sector) can better support small rail companies with manufacturing productivity and awareness of opportunity. An increase in this facilitative activity would raise awareness, opportunities and performance within smaller firms. Developing a stronger, more innovative and responsive rail supply chain will considerably reinforce the sector as a whole in the West Midlands. This will allow the region to capitalise on the industry's distinct opportunities outlined previously.

This will require effective support provision and communication locally. Much of the existing support infrastructure does not capture many SMEs, and this may mean they're missing out on useful initiatives and intelligence.

This is also relevant for firms of all sizes winning contracts. Visibility of what local companies need to do to win certain contracts is vital for the success of our supply chains. Currently, contracts for major projects, such as HS2, remain hard to reach for many rail SMEs. This may be due to a number of factors, but in general greater support and intelligence could be provided to make supply chains ready for these distinct opportunities. Companies should be getting ready now to supply future projects, including the industry's digital railway ambition. Industry leaders and wider partners locally must ensure the rail sector is aware of the above and is implementing actions to be ready to supply. We must ensure that this activity is business-led to ensure the correct barriers are communicated to partners.

While there are extremely valuable organisations for the rail regional sector (e.g. Rail Industry Association, the Rail Alliance), they have a lack of capacity to deliver the significant impact that is required. Not enough companies, particularly small, supply-chain firms, are obtaining the knowledge, advice and guidance that organisations like these can offer. This is currently an important market failure that is maintaining the industry's long-tail of low productivity businesses.

Potential Solutions

Re-position and strengthen the Rail Alliance, providing them with the capacity to broaden their role as a support organisation and enhance their supply chain support

Unleashing the potential of the rail sector in the West Midlands and across the UK will require greater capacity for industry, particularly through trade bodies like the Rail Alliance. A commitment to funding and support of these organisations from central government would provide a crucial expert 'middle man' between the public sector and industry. Currently under-utilised and under-resourced, commitment from government to the Rail Alliance will create an effective working interface of support

across a wide range of themes to enhance the productivity and performance of rail companies. This executive capacity would produce a combined unit of expertise for businesses of all sizes to tap into, whether that be awareness of new sector opportunities or funding advice. Similar programmes of practical support have been successful in the past, though it's important to ensure that the support remains principally demand-led.

The West Midlands has a particular opportunity with the locally-based Rail Alliance, and their newly formed partnership with the University of Birmingham. Re-positioning the role and capabilities of the Rail Alliance could provide the conduit required between opportunities and West Midlands rail SMEs. With more resource and capacity, the Rail Alliance could provide specialist communication of opportunities, technologies and smaller companies' role in building the railway of the future. Strengthening the scope and capabilities of the Rail Alliance has the potential to boost rail sector productivity through the utilisation of key business activities such as innovation, skills and exports. On the latter, rail export performance can be improved by better cooperation between the public and private sectors, in this case utilising the strengths of the public sector – DIT – and industry bodies – a re-formed Rail Alliance. Delivering this in the West Midlands will help us to contribute effectively to the sector's commitment to double exports by 2025.

Rebuilding the UK upstream supply chain is a UK Plc issue requiring a consistency of purpose from government and the regions, industry and the various interested trade bodies and institutions working together for the long-term. Success will require a national framework that is well networked into a strong regional and local delivery environment. In the West Midlands, a newly positioned and better resourced Rail Alliance can provide this delivery.

Deliver our regional Productivity Factory' programme

Enhancing this sector specific business development should be in line with our emerging regional 'Productivity Factory' programme. This is a new type of productivity resource to support supply chain companies in the region raise productivity – it has similar objectives and scope to the National Manufacturing Competitiveness Level (NMCL) programme. £3million worth of investment is proposed over a three-year period for a 12-month programme of activity to support small businesses with a potential to grow through: initial benchmarking & diagnostic, masterclasses, one-to-one coaching from industry experts, peer-to-peer mentoring and support, and a final evaluation. Initial benchmarking with an expert will identify the most effective ways of achieving growth. The expertise of the rail trade bodies like Rail Alliance should be integral to any rail involvement within the Productivity Factory.

Create a West Midlands Rail Council

In order to provide strategic oversight and to monitor the successful implementation of this action plan, a regionally focused Rail Council should be setup. This would bring major West Midlands industry players together to oversee progress on an ongoing basis (e.g. meeting twice a year). Taking lessons from the automotive council would be a useful exercise, as this is an established and effective industry forum. Sharing of knowledge and engaging with different stakeholders will be important to create a more integrated, collaborative and open rail sector for the future.

Provide banks and access to finance providers with rail industry understanding

The rail and financial industries and government must collaborate to ensure financial policy and legislation reform packages optimise stabilisation of rail businesses and the sector as a whole, in the

medium and long term. There must be ongoing conversations and exchanges of intelligence so that financial products and services remain relevant and accessible in the long term.

One barrier to rail firms successfully receiving finance from banks and other generic providers is a lack of knowledge of the rail sector from providers. Providing access to finance agents with an understanding of the rail sector will allow them to better assess loan and grant applications, leading to more investment into the sector and the potential for more innovation, productivity-enhancing activity.

Promote and scale-up existing business support programmes – e.g Rail Forum Midlands Pilots and Digi-Rail – developing new programmes where required.

This will involve the use of Growth Hubs and sector bodies to promote programmes like Digi-Rail and the emerging Midlands pilots through the rail sector deal, and to work in partnership to develop industry-required provision where needed. This will lead to an increase in awareness of current business support products and more joined-up support in the region.

Provide surgeries for companies struggling in the aftermath of COVID-19 and link them to funding/loans available via Government or banks.

Providing surgery activities to link with business support and financial activities will be crucial in the response to the pandemic. It will enable the start of activities that will feed into resilience initiatives relating to strengthening the supply chain and linking SMEs with gaining investment and funding.

West Midlands Rail sector to collaborate to determine social-distancing best practices to deploy across the network incl. monitoring of effectiveness.

This links emerging national requirements to regional and local contexts to enable safe and efficient working practices at the same time as enabling maximum productivity within challenging circumstances. The outcome of this action will be to boost learning and continuous improvements in adapting to the new normal that can be shared by sector support organisations with their members.

Business Environment – Proposed Interventions Summary Table

Super-charge	Build	Maintain	Consolidate
Re-position the Rail Alliance, providing them with the capacity to broaden their role as support organisation within their new partnership with BCRRE	Deliver our regional Productivity Factory' programme	Provide surgeries for companies struggling in the aftermath of COVID-19 and link them to funding/loans available via Government or banks.	
Create a West Midlands Rail Council	Provide banks and access to finance providers with rail industry understanding to ensure a boost to investment flows.	West Midlands Rail sector to collaborate to determine social-distancing best practices to deploy across the network incl.	

Super-charge	Build	Maintain	Consolidate
		monitoring effectiveness.	of
	Promote and scale-up existing business support programmes – e.g Rail Forum Midlands Pilots and Digi-Rail – developing new programmes where required.		

2d) Infrastructure

Opportunity:

As mentioned previously in this document, there are major infrastructure investments in the region, including HS2, Midland Metro and motorway improvements, which provide the West Midlands rail sector with a profound opportunity.

Planned Activity:

- **The WMCA will continue to work across partners to maximise the impact HS2 by delivering its growth strategy, and accelerate pan-Midlands strategy and delivery through the Midlands Engine’s Midlands Connect partnership.**

This will maintain in-flight momentum of HS2 delivery to keep productivity and employment levels high through an economic downturn, as well as maximising the integration of Midlands Connect/ Midlands Engine synergies with the wider developing transport ecosystem of the region. This is vital to keeping the flagship programme on track and within cost boundaries whilst ensuring that other related benefits keep cascading into the region, especially in terms of mobility/ travel and skills development.

- **The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector.**

New technologies are fundamental to keeping up international competitiveness in the sector as well as unlocking potential in other sectors. This is especially important when it comes to the faster and more efficient transportation of people and goods, and maximising their safety.

Digital rail, light rail and very light rail are likely to have positive impacts on costs to consumers and will help with widening public transport accessibility and mobility. This means that more affordable and accessible rail transport will be opened up to much greater numbers of passengers than is the case presently.

Infrastructure – Proposed Interventions Summary Table

Super-charge	Build	Maintain	Consolidate
<p>The WMCA will continue to work across partners to maximise the impact HS2 by delivering its growth strategy, and accelerate pan-Midlands strategy and delivery through the Midlands Engine’s Midlands Connect partnership.</p>	<p>The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector.</p>		

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4) Strategic Opportunity Areas

The suggested actions outlined above should be delivered in the context of major opportunity areas for the rail sector. As previously outlined, four areas will be particularly important: digital rail, light and very light rail, propulsion and decarbonisation. An industry-wide adoption of these technologies will ensure the rail sector's contribution to the West Midlands' future mobility strategic opportunity. This will be in the form of AI for both passenger travel and freight. The interventions outlined in this action plan can support this ambition becoming a reality: the whole rail sector helping to deliver smart rail mobility in the region through key technologies:

4a) Digital Rail

Using our specific regional expertise, in the West Midlands we want to support the delivery of the national rail sector deal's ambition of a digitally transformed railway network which boosts productivity, performance and availability, and provides high standards of service for customers. We have the opportunity to build this through our current specialism and focus on digital technologies (e.g. through the Birmingham University's Centre for Railway Research & Education) and leadership in rail technology and operations.

Digitalisation, including the use of big data and the Internet of Things (IOT), will benefit the West Midlands and the wider UK through increased capacity, reduced congestion, and reduced emissions leading to increased public health. This transformation can connect our communities and improve network performance for the populous. Much work is required to make the UK and West Midlands railway sector and system digitally advanced, such as upskilling the workforce and helping companies across the supply chain prepared for change and access rail opportunities. This is however an excellent opportunity reflected in the digital focus applied by the national sector deal discussion.

Central to the national industrial strategy is the four grand challenges, of which AI & Data and Future Mobility are especially important for digital railway. Combining our digitisation expertise with current transport infrastructure will allow the region to capitalise on future mobility solutions. For example, in future autonomous condition monitoring and new communications control systems will allow conveying of trains, with benefits for rail capacity. Wider use of data in the rail network will ensure the West Midlands optimises more productive travel for the populous, and there are also the manufacturing opportunities presented by the fourth industrial revolution.

The digital opportunity links in with the opportunities of future investment. A digitally-aware, flexible and robust rail sector in the West Midlands can be proactive and successful in delivering the key projects outlined above (HS2, metro etc) for the benefit of the region and its people. The WMCA's role will be to support the sector in preparing itself for this digital revolution, which will be led by our university expertise in collaboration with big players within the industry.

There're also distinct cross-sector opportunities that involve the digital aspects of rail. This will be particularly important in the West Midlands with a large set of high value manufacturing clusters, many of which already intertwine. Digital technologies will bring these sectors closer together, enhancing collaboration and innovative capacity in the region.

A digitally transformed rail network in the region will provide high levels of productivity, performance and availability, providing high standards of service for customers and freight users at the heart of a connected and sustainable network. This will build on the West Midlands' position as a leader in rail technology and operations by creating new jobs, expanding the capabilities of the supply chain, growing exports and supporting greater connectivity, house building and economic growth. The time

is right to transform West Midlands rail into a modern, dynamic, high-tech sector that has significant capacity for growth. As laid out in the national sector deal document, significant investment into the sector will deliver a true revolution of the industry.

The adoption of digital technologies is a cost-effective way of releasing significant additional capacity on the existing network; future growth of the sector depends on its ability to embrace and develop new technologies. HS2 and the West Midlands Metro are key drivers for change and provides the area with a significant opportunity to build on regional innovation assets and advance the digital railway vision – this is set out in the 2016 report: ‘Delivering the Digital Opportunity for HS2 in the West Midlands’.

The national Digital Railway Programme, set out in the rail sector deal document, aims to transform the rail network for customers, business, and freight operators, by deploying modern signalling and train control technology to increase capacity, reduce delays, enhance safety and drive down costs. Put simply, the Digital Railway will move the system that dictates train movement away from expensive to maintain and outdated trackside signalling systems to digital controls in the train cab controlled by dynamic traffic management systems that will be an enabler for a next-generation rail that both customers and freights users expect and deserve.

Almost two thirds of signalling on the UK network needs replacing in the next 15 years which provides a once in a generation opportunity to adopt transformative digital railway technologies.

Benefits to Digital Railway



Source: Network Rail

4b) Light and Very Light Rail

Lightweighting must also be a key ambition, given the environmental, societal and efficiency gains that can be made from lighter trains. Not only does a very light vehicle use less energy, especially when incorporating a kinetic energy recovery system, it also exerts less stress on the infrastructure. This in

turn enables the application of innovative track technologies that can be laid without the need to relocate underground utilities. The proposed VLR centre in Dudley and the existing Quinton Rail Technology centre puts the West Midlands in a prime position to maximise the lightweighting opportunity. Fully succeeding within the shift to a lighter railway will include capturing supply chain benefit; the case must be the same with considerations on future technologies such as hydrogen, battery or solar rail trains/lines.

Warwick Manufacturing Group at the University of Warwick are a leading institution in the development of light and very light rail. Through a joint venture with Dudley MBC, they're setting up the Very Light Rail Innovation Centre at Castle Hill which will be used for prototype trials, allowing for testing (via a test-track) and evaluation of demonstrator vehicles and systems.

The Dudley site development is a key part of Warwick's activity on rail through the Revolution Very Light Rail Project. The main objective of the project is to reduce the weight and cost of a railcar by half in order to facilitate low cost connectivity of suburban and rural areas. The Radical Train will demonstrate unique self-powered bogies (with integral hybrid propulsion and kinetic energy recovery system) combined with a modular, lightweight body-shell utilising advanced materials. WMG will also be transferring expertise in lightweighting technology from the automotive sector into this project.

Light and very light rail is clearly another area by which the West Midlands has a competitive advantage when it comes to technology development. We must utilise this to ensure the region's whole rail sector can contribute to delivering a lighter railway.

4c) Propulsion

Taking advantage of new, more powerful and more efficient modes of propulsion technologies. Successfully developing innovative powertrain and energy storage solutions for rolling stock, and lowering the cost of electrification, are key objectives for the industry. Similarly to light rail, the University of Warwick has specific strengths within this field; the university hosts the UK's Advanced Propulsion Centre. Furthermore, the future £80m UK Battery Industrialisation Centre (UKBIC) in Coventry is a major development for battery manufacturing across major transport sectors

4d) Decarbonisation

New approaches to meet the energy requirements of the railway system regionally and nationally are needed now and for a sustainable future. Taking wide-ranging action to decarbonise the railway amid urgent environmental and efficiency priorities is required and this will involve utilising innovative propulsion and light rail technologies. Integrating and commercialising these new products and services is imperative for us to make real changes to the railways and society as a whole – such as through increased productivity and inclusive growth. In the West Midlands we need to take a more holistic approach which makes better use of new technologies such as those within energy generation and energy storage.

5) Regional Technology Roadmaps

In order to support the West Midlands rail sector's management of these key strategic technology opportunities (and the future mobility opportunity as a whole), we suggest that a series of technology "roadmaps" be produced specifically for and in relation to the regional rail industry. It's suggested that this is something the West Midlands Rail Council could co-ordinate in partnership with key stakeholders such as Network Rail and companies of all sizes.

Technology roadmaps would allow a more coherent and unified assessment of emerging rail technologies and their relevance to the sector regionally. The roadmaps would ideally identify what can be achieved based on existing West Midlands capabilities, and highlight the opportunities and challenges of capitalising on products and services related to technologies like digital rail, propulsion, decarbonisation and light rail.

Bringing together key stakeholders would provide an organised and strategic oversight to the successful development of these technologies in the region. Through the suggested West Midlands Rail Council, compatible emerging technologies could be monitored through the roadmaps on a regular basis, ensuring that the region is responsive to evolvments within rail technology. Importantly, the roadmaps should be industry-led, taking soundings from companies of all sizes within our region so that there's a holistic perspective. Understanding specifically what firms need in order to fully capitalise on rail opportunities is crucial in shaping business support, funding and policy moving forward; this can be driven through a suite of technology roadmaps produced by and for the region.

The development of technology roadmaps will support the West Midlands rail industry in its management of the significant opportunities in the sector, both short and long-term. Rail technology roadmaps have been utilised in the past at the national level, through RSSB (<https://www.rssb.co.uk/research-development-and-innovation/research-project-catalogue/t809>), and internationally, through partners such as CER, the Community of European Railway and Infrastructure Companies (<http://www.cer.be/sites/default/files/publication/A%20Roadmap%20for%20Digital%20Railways.pdf>).

We believe that one of the first actions of a newly brought together West Midlands Rail Council would be to begin work to produce a suite of rail technology roadmaps that provide a long-term, intelligent focus for the whole sector going forward. This would intend to support regional success in capitalising on the large opportunities presenting themselves in the rail sector.

6) Full List of Proposed Interventions

On the following page we have again listed all of this action plan's proposed interventions. As outlined previously, some of the proposed interventions are government asks, whilst others are industry suggestions and ideas. Importantly, the proposed interventions are not committed to and all will require further detail and appropriate business cases.

At the time of writing no additional commitments or funds are attached to this action plan, but through a strategic focus and buy-in from a range of sector stakeholders, we aim to make the case for further investment and intervention in the West Midlands rail sector so that it can fulfil its potential. We believe that the changes suggested below are the areas that will provide the West Midlands rail industry with the right environment to succeed in the future and help deliver the future of mobility regional opportunity.

6) Full List of Proposed Interventions

IS Foundation	Proposed Intervention	Strategic Opportunity
Ideas	1 The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector. Dudley VLR and Innovation Park.	 
	2 Utilise the West Midlands Innovation Programme (WMIP) for rail priorities, including the CITEC programme, supporting future railways, and bidding into existing national schemes.	 
	3 Through focused actions, raise the innovation potential of rail supply chains and its SMEs in the West Midlands.	 
	4 Analyse how COVID-19 might change the vision of the future rail sector and how those changes can be realised and implemented in West Midlands.	 
People	5 Provide better matching of skills supply and industry demand, e.g. through extending the Skills Factory and & delivering relevant T-level/apprenticeship standards required by firms.	
	6 WMCA & industry to work with HE institutions like BCRRE to accelerate higher-level skills within the rail space.	
	7 Increase levels of CPD offers and take up in the sector.	 
	8 Local partners to better define digital skills requirements and communicate these, including for supply chain firms.	 
	9 Build on good practice to take action on encouraging diversity and inclusion in the sector, e.g. through the work of Women in Rail.	 
10 Work within existing frameworks and create new ones to ensure a more holistic and co-ordinated approach to careers advice and rail engagement with schools.		
Business Environment	11 Re-position and strengthen the Rail Alliance, providing them with the capacity to broaden their role as a support organisation and enhance their supply chain support	 
	12 Create a West Midlands Rail Council, to provide strategic oversight and to monitor the successful implementation of this action plan.	 
	13 Promote and scale-up existing business support programmes – e.g Rail Forum Midlands Pilots and Digi-Rail – developing new programmes where required.	 
	14 Provide surgeries for companies struggling in the aftermath of COVID-19 and link them to funding/loans available via Government or banks.	 
	15 West Midlands Rail sector to collaborate to determine social-distancing best practices to deploy across the network incl. monitoring of effectiveness.	 

	<p>16 Provide banks and access to finance providers with rail industry understanding to ensure a boost to investment flows</p>	 
	<p>17 Develop rail context for regional 'Productivity Factory' programme (& its delivery models) to support supply chain companies raise productivity.</p>	 
<p>Infrastructure</p>	<p>18 The WMCA will continue to work across partners to maximise the impact HS2 by delivering its growth strategy, and accelerate pan-Midlands strategy and delivery through the Midlands Engine's Midlands Connect partnership.</p>	 
	<p>19 The West Midlands rail sector should collectively adopt new technologies (including digital rail and very light rail) in order to enhance the quality of our railways and across the rail sector.</p>	 

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