

The logo for West Yorkshire Combined Authority is positioned in the upper left quadrant. It features the text 'West Yorkshire' in a large, bold, dark teal font, with 'Combined Authority' in a smaller, lighter teal font directly below it. The logo is set against a white circular background that is partially obscured by a large, dark teal circular graphic on the right side of the page.

**West
Yorkshire**
Combined
Authority

Leeds City Region Digital Framework

Transforming Leeds City Region by Digital Tech

Overview of the digital challenge

Digital technologies are changing the fundamental nature of how businesses, government and citizens interact, do business, live and play. We need to ensure that new digital technologies are used as enabling tools, bringing business, the public sector and people along together with a shared vision.

Digital sectors in the UK contributed £118 billion to the economy in 2015: over 7% of the UK's gross value added (GVA), and exports of digital goods and services now amount to over £50 billion. Tech City UK estimates that the digital sectors are creating jobs 2.8 times faster than the rest of the economy.

However the opportunity is not just in the digital sector – those businesses whose core business is in digital technologies. Digital transformation can make every business in every sector more productive, wherever they are located.

And this transformation is changing the skills required to not only operate in highly skilled digital jobs, but also function and participate at a basic level in society.

And none of this would be possible without the fundamental underpinning digital infrastructure architecture which allows all of these connections to be made.

Addressing our 4 key challenges

- The LEP Board have identified 4 key challenges facing Leeds City Region – areas which are holding back the economy and constraining growth.

4 key challenges for Leeds City Region

How can the Digital Technologies help to tackle these?

Widening productivity gap: LCR is ranked 29 out of 38 LEPs on productivity and evidence shows it is underperformance within sectors as oppose to adverse sector mix

By ensuring all businesses have the opportunity to exploit new digital technologies to become more productive.
By upskilling staff and ensuring everyone has the digital skills they need to increase productivity

Low SME investment in R&D and innovation despite the significant assets we have in the City Region

By ensuring all businesses have the opportunity to exploit new digital technologies to drive product and process innovation

Living standards have stalled

By ensuring that everyone can access the same opportunities (employment, lifestyle, learning) through the use of digital technologies

Stubborn deprivation

By ensuring that the current divide between the haves and have nots is not further exacerbated through the increasing use and proliferation of digital technologies.

The Digital Framework

What is the Digital Framework?

- Longstanding ambition to develop a Digital Strategy for the City Region
- The challenge: What is digital? What does it mean?
- Not a strategy, a framework - made up of 5 outcomes - for activity and investment and to provide a collective narrative/ ambition for 'digital' in the City Region
- Key part of the Inclusive Industrial Strategy: 2nd big idea 'Digital Tech Region'.
- Sets the direction of travel and encourages all the other actors in the region to align with both the LEP/WYCA and each other.
- The output is a short concise and flexible and agile and will clearly articulate the overall vision for our digital economy, whilst setting out clear ambition statements and policy interventions to drive forward each of the strands to achieve the overall vision.
- The process to get to this point will be just as valuable as the final output, bringing together the key players across the City Region to help us to: develop a clear collective strategic narrative; determine what our role in the huge issue of the digitisation of business; and how to help the city region economy get 'ahead of the pack.'

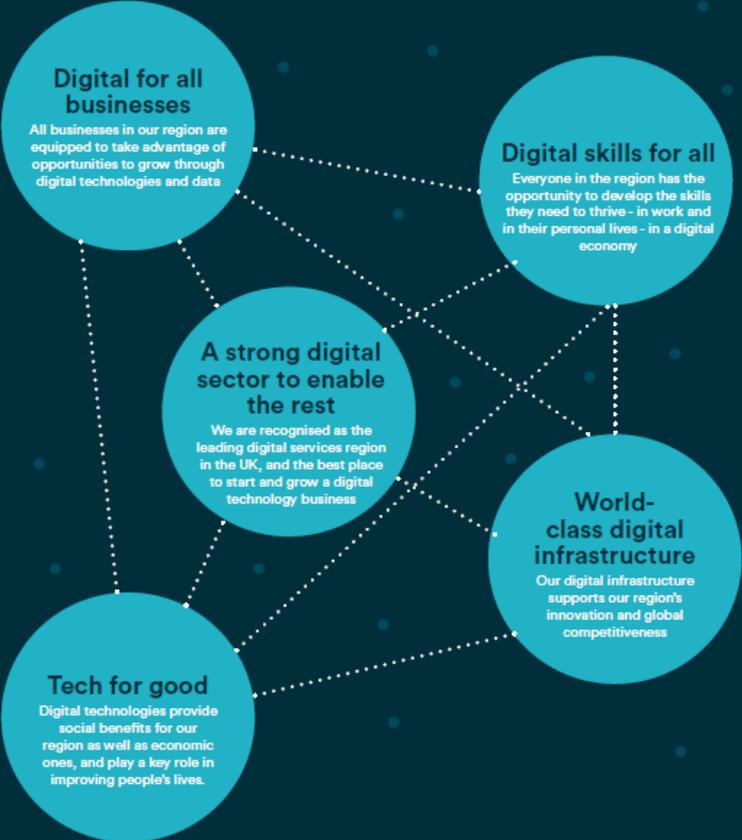
Importantly...

- It positions digital as an enabler – and not the driver – in an attempt to solve some of the City Regions biggest challenges.
- Digital affects everyone – therefore everyone should be involved in shaping what we do.
- Digital will increasingly be used for everything from booking a doctor's appointment to undertaking training/learning to moving around the City Region. New business opportunities will arise from organisations opening up data and local and regional government will have the opportunity to transform the way service are delivered and they engage with citizens. Therefore...
- ...Lives transformed by digital tech.

Growing the LCR Digital economy – 5 outcomes

Lives transformed by digital tech

Digital technologies and data can play a key role in addressing some of our region's biggest challenges. This is our framework for making sure people across our region see maximum economic and social benefit from digital technologies. It focuses on five inter-connected outcomes that will enable our public, private and community partners across the region to achieve one core aim: lives transformed by digital tech.



#TransformedByTech

Digital for all businesses

Ambition:

All our businesses will be equipped to exploit new digital technologies and take advantage of the opportunities for business growth through data.

Principles:

Our prosperity and success depends on ensuring all our businesses have the opportunities to access and exploit the best digital technology and data to drive innovation and productivity. We will work to stimulate, encourage and enable the business leadership, behaviour changes and cultural shift needed to embrace the 4th industrial revolution.

Digital for all businesses

Indicative actions:

- Build upon existing strengths and capabilities (health and medtech and financial services) and sectors where the opportunity is significant (manufacturing and textiles)
- Explore sector deal opportunities around Industrial Digitalisation, focused around med-tech and textiles
- Working closely with the Digital Catapult, Innovate UK, KTN (4 Manufacturing Initiative) and HVM Catapult, explore the recommendations emerging from 'The future of UK Manufacturing report' particularly around 'objective brokerage'
- Working closely with partners on the ground develop relevant and targeted case study and promotional material as part of a comms campaign (from across different sectors) and support and encourage all advisors to offer 'digital support' as standard.
- Pilot the delivery of a package of innovative support to target a cohort of businesses 'cautious innovators' who have not yet embraced the 4th Industrial Revolution, around digitalised supply chains, AI, digital by design principles, new regulatory changes and security issues: data security; process security; and system security.
- Consider what interventions are necessary to support those businesses who have not yet embraced the 3rd Industrial Revolution (laggards), particularly the role of 'trusted suppliers' in the process.
- Link in with the productivity revolution work as part of the Industrial Strategy focusing on business culture and leadership.
- Explore lessons learnt and opportunities to expand and build on the successful Digital Enterprise Programme.
- Consider what specific interventions can be targeted at our extensive micro-business base, particularly using the existing digital sector.
- Explore smarter grant conditions focused on productivity, not jobs.

Digital skills for all

Ambition:

Everyone in the City Region has the opportunity to develop the digital skills they need to flourish in the new digital economy.

Principle: To develop an evolving and joined up pipeline for digital skills to meet the needs of businesses and citizens:

- Inclusion / basic skills: Ensure everyone has basic digital capability to ensure no one is excluded from opportunities because of a lack of skills and can operate in a digital society.
- General skills: Look at opportunities for improving outcomes for those who have basic digital skills, but lack the confidence and knowledge to make the most of the digital economy, whether at work or beyond.
- Advanced skills: Ensure LCR develops, attracts and retains the talent needed for higher skilled roles (E.g. coding).

Digital skills for all

Indicative actions:

- Work with LA and community partners to ensure that the ubiquity of future technologies does not exacerbate the divide between the haves and have nots and instead seeks to reduce inequality.
- Work with partners (e.g. Barclays Digital Eagles) and existing initiatives/community groups to support citizens with digital skills and make it accessible (and as non threatening as possible). Make it 'relevant' to people's lives.
- Maximise opportunities for LCR to shape and participate in in the Fully Funded Digital Entitlement which comes into force in 2020.
- Work closely with schools, FE, HEI (training providers) and employers to ensure we develop talent with the skills businesses need both now and in the future and ensure all programmes/courses all have some element of digital skills training included.
- Promote digital apprenticeships and higher apprenticeships and explore opportunities to use younger employees as ambassadors
- Providing opportunities for existing workers to retrain to enable them to get into digital jobs and developing a business-sponsored campaign to raise awareness of LCR digital careers including supporting those people displaced by digital technologies.
- Explore opportunities to align grant funding with advancements in workforce digital skills.
- Work to attract talent and skills (including large employers) to relocate to LCR to strengthen the skills offer.
- Ensure activity aligns the Leeds City Region Employment and Skills Plan.
- Explore opportunities with the newly established Digital Skills Partnerships (DSP)
- Work with Tech Nation to support their Digital Jobs Strategy
- Work with the digital tech sector to explore opportunities to collaborate around higher level skills interventions together and with HE providers.
- Undertake an audit of all the activity around digital skills taking place in LCR – to identify good practice and opportunities to scale up.

The digital service sector to enable the rest

Ambition:

To become the leading digital services City Region and the best place to start and grow a digital technology business

Principle:

To support our existing business base and grow the ecosystem of digital tech businesses across the City Region, building on existing strengths around Fintech, Data, Artificial Intelligence and Cyber Security.

The digital service sector to enable the rest

Indicative actions:

- Explore opportunities to establish a private sector led Leeds City Region membership Digital body to ensure the sector has a voice within and beyond the City Region
- Develop a detailed understanding of the needs and issues and specific support required for the digital sector including the role of large businesses.
- Expand Leeds Digital Festival across the City Region
- Work closely with LA partners to ensure the conditions exist to allow all digital tech companies (from infrastructure businesses to service businesses all the way through to communications providers) to thrive and flourish across the City Region, strengthening the buzz of the ecosystem and playing to individual areas distinctive strengths. We will focus particularly on:
 - Finance: ensuring the range of finance available to digital tech companies is simple to navigate and accessible,
 - Business support: work with the sector to ensure support is available for digital tech companies to access, sufficiently tailored to specific digital/tech needs, e.g. accelerators, workspace etc.
 - Skills and access to talent
- Develop a soft landing package for scale up tech firms new to the City Region to boost and grow the cluster.
- Develop a marketing campaign that specifically raises the profile and visibility of the digital tech sector for both a UK and international investor audience
- Work closer with Tech UK as part of their new Regional Hubs model
- Ensure as part of work to progress the smart region outcome, local digital sector businesses have the opportunity to contribute and benefit and explore opportunities to support current non digital businesses.

World class digital infrastructure

Ambition:

To build on existing strengths to further develop a globally competitive digital infrastructure delivered through public, private and community activity.

Principle:

The development of the essential underlying enabling infrastructure across the City Region stimulated by activities to upskill business, employees and citizens to exploit and maximise impact, creating an environment which encourages further investment in infrastructure, from businesses and inward investors.

World class digital infrastructure

Indicative actions:

- Invest in world class connectivity through fibre, mobile, wireless and new technologies, to homes, businesses, social housing, public spaces and public transport where market failure prevails (BDUK, LFFN etc.) and working in collaboration with Network rail, Police and NHS.
- Develop a stronger collective voice as a City Region around digital infrastructure issue, leveraging assets and agreeing shared priorities.
- Develop a policy statement for LA to take advantage of opportunities to re-use existing public sector assets to deliver improved connectivity, including the use of street furniture and existing ducting.
- Work with LAs to identify opportunities to remove the barriers around planning, wayleaves for fibre and mobile connectivity ways to improve internal coordination.
- Position LCR as open for innovation and investment – with a helpful and supportive approach to development.
- Ensure the City Region digital infrastructure ambitions and activities align with – and support- the other 4 outcomes
- Work with private providers to encourage the roll out of full fibre, particularly around new housing developments and business parks
- Look to undertake an infrastructure audit of LCR – coverage, street furniture, fibre coverage, 4G coverage etc and OSI layer mapping to understand the levels of ‘digital maturity’ and subsequent opportunities across the different districts
- Support the development of world class ‘connectivity’ assets e.g. data centres, internet exchanges IoT networks etc.
- Ensure the conditions are in place to encourage the deployment of smart IoT technologies, e.g. through working through local authority planning, highways depts. Etc.
- Further exploit opportunities to capitalise on LoRaWAN across the City Region.
- Develop a regional response to the opportunities that 5G will bring, particularly around demonstrable health use cases.
- Ensure that all spatial priority areas will include consideration of digital infrastructure requirements and develop better intelligence about the networks
- Position LCR as the world's most trusted data centre, offering leading data resilience and network security services, exploring LA data centre expansion opportunities and shared rack space.
- Actively engage with the opportunity to enable local communities to participate economically in the development and ownership of new digital infrastructure assets
- Take advantage of opportunities to expand connectivity through rail initiatives HS2/HS3 etc

Tech for good

Ambition:

Leeds City Region, open for innovation, globally relevant and proactively embracing and exploiting technology and data to improve peoples lives.

Principles:

We will adopt a people first approach to ' smart city thinking', continuing to develop our approach as a City Region which proactively embraces and exploits technology and data effectively and intelligently to improve outcomes for all citizens across LCR.

To create the culture in which we actively embrace new technologies and use data to solve our biggest problems and create new economic opportunities.

Tech for good

Indicative actions:

- Integrating this ambition into all district strategies and throughout the LCR Local Inclusive Industrial Strategy – adopting a 'Region first' approach.
- Focus on leadership across the City Region as the key first step to making this happen,
- Make this relevant to people across the City Region.
- Collaborating with districts to develop skills and capacity within local government to deliver at scale smart city projects and supporting each authority to have a 'smart region' champion
- Securing buy in and a cultural shift from public sector partners to embrace smart region approaches by focusing on the outcomes this approach can achieve.
- Work with key partners on the mechanisms to develop citizen trust around open data through openness, transparency and clear ethics around the use of data as public authorities.
- Leading by example as a public authority particularly through smarter transport interventions and procurement practices, working where relevant with TfN, Universities and others.
- Seeking funding and resources to develop bottom up, scalable smart city solutions which will help achieve our ambition, eg around energy and transport objectives, working with LA's and existing community groups to identify problems.
- Work with key players in this space to encourage a smarter city region, including ODI North and Data Mill North.
- Supporting partners around Open Data principles, standards etc.
- Be proactively and genuinely open for innovation - working with partners to offer opportunities as a testbed city or demonstrator town or district and allowing SME's to innovatively test (pilot) market opportunity and advance smart city thinking, eg NESTAs drone pilot in Bradford
- WYCA to lead by example in sharing its data as standard and exploring SBRI type initiatives.
- Engage with the breadth of digital stakeholders across the five outcomes to understand issues and opportunities faced by different demographics around technology adoption and diffusion.

The Consultation

Process

- Development of draft framework Sept 2017 – March 2018
- **Pre consultation workshops held** **March 2018**
- Refinement and further engagement March – June 2018
- **BIG Panel, ESP, LEP Board and CEXs** **March – June 2018**
- Engagement prep May – July 2018
- **Online engagement** **2nd July – 14th September 2018**
- Refinement September – October 2018
- Launch End 2018/beginning 2019
- Working groups established End 2018

Pre-engagement workshops

- Held in March 2018 with the purpose of testing out some of the thinking to date – checking whether ambitions were ambitious enough / whether the interventions proposed would address the challenges
- Five workshops were held covering the 5 outcome area – invitees were mostly businesses and Universities where an relationship/contact already existed.
- A separate local authority workshop was held for districts across the City Region.

Comms and marketing activity

- Public consultation hosted on YourVoice – new engagement hub for the CA – between 2nd July and 13th September.
- The site hosted blog posts from digital champions including Kersten England, Nic Greenan, and Amir Hussain.
- Social media campaign included polls and questions of the week.
- Press coverage including a Yorkshire Post article by Adam Beaumont <https://www.yorkshireeveningpost.co.uk/news/have-your-say-on-digital-growth-strategy-for-leeds-city-region-1-9279792>
- Promotion through LEP newsletter and local authority channels

Comms and marketing activity

JOIN THE CONVERSATION

Help shape our plans to make sure our region gets maximum economic and social benefit from digital technologies

yourvoice.westyorks-ca.gov.uk/digital



FROM BINGLEY TO BEIJING VIA ROBOT*

How digital is your business?
Tell us at
yourvoice.westyorks-ca.gov.uk/digital

*Manufacturer, Racks Industries, in Bingley expects to double the amount it exports in two years by investing in robotic welding technology



ARE YOU AN EVERYDAY DIGITAL HERO?

Tell us how technology has transformed your life.

yourvoice.westyorks-ca.gov.uk/digital



HEALTHCARE VIA AN APP? COMMUTE BY DRIVERLESS CAR? PRINT YOUR DINNER?

How could digital technologies change your life?

Tell us at
yourvoice.westyorks-ca.gov.uk/digital



<https://www.youtube.com/watch?v=FVHYTpOh8Hg>

Responses

- Over 100 responses to the survey were received. 75% of responses were from individuals, 14% from businesses and 11% from organisations.
- Responses were received from every district, although numbers vary significantly across the City Region:

District	% of responses
Leeds	36
Bradford	18
Kirklees	9
Barnsley	9
Wakefield	7
Calderdale	3
York	3
Harrogate	2
Selby	2
Craven	1
Not stated	11

Feedback

- The key question asked was to gauge the level of support for the proposed ambitions and interventions and identify any areas where this needed changing. *‘Do you agree with the proposed ambition and interventions’?* This was followed up with ‘please provide a comment to explain your answer’.
- **Digital opportunities for all businesses**: 85% of respondents either strongly agreed or agreed. No one disagreed or strongly disagreed.
- **Digital skills for all**: 95% of respondents either strongly agreed. One respondent strongly disagreed.
- **Strong digital sector**: 89% of respondents either strongly agreed or agreed. Two respondents disagreed and strongly disagreed.
- **World class digital infrastructure**: 87% of respondents stated that they strongly agreed or agreed. 1 respondent strongly disagreed.
- **Using tech for good**: 86% of respondents either strongly agreed. Two respondents disagreed.

Comments – digital opportunities for all businesses

- 32% of respondents agreed that LCR should provide financial support to businesses to embrace digital technologies followed by the 29% who stated that a single gateway for industrial digitalisation to support the LCR should be considered.

‘There is a real need to support businesses on their digital transformation journeys. Businesses need to have the support mechanisms to enable them to recognise and unlock growth through digital.’

‘It is imperative that all businesses in all verticals recognise how their business can be disrupted or be a disrupter in the digital age. Knowledge and foresight about this - helping business leaders become digitally savvy is essential to the success of those companies and the region.’

Comments – digital skills for all

- 35% of respondents see digital as an opportunity, 64% as both an opportunity and threat and only 1% as a threat.

‘Everyone needs to be digitally included. Not to be means you are severely disadvantaged and excluded. We must invest in delivering against an aspiration of 100% digital inclusion’

‘It is critical that our workforce is upskilled with the digital skills that our business base will require and to enable our residents to maximise the employment opportunities that do and will exist in the future.’

‘No person should be left behind, from the youngest to oldest, people should be enabled to take advantage of technologies available to all’

Comments – strong digital sector

- 46% thought that the one thing LCR could do to support the digital sector is to raise profile and visibility of the sector nationally and internationally followed by 41% who think LCR could support the creation of a specific business support programme/accelerator/ bootcamp.

‘We should make the claim to be the digital centre for the North and set up around that ambition, be bold and brash. Brand this Digital North’

‘Financial support and funding is key. This needs to be opex more than capex based support. The other aspect is access to mentors and experts who will enable digital business to explore known and unknown growth opportunities’.

‘Essential to our growth agenda but important to have a clear USP that makes the region stand out.’

Comments – world class digital infrastructure

- 48% of respondents didn't know the current state of the broadband in the LCR. 34% thought that broadband was good whilst 18% thought it was bad.
- 70% of people believe we should focus our efforts on providing full fibre across the LCR followed by 59% who thought on better public transport and public WiFi.



'Having the best infrastructure is critical in terms of competitive advantage and enabling our businesses to be innovative and maximise growth opportunities.'

Comments – tech for good

- 75% of respondents are excited of autonomous vehicles, artificial intelligence, virtual reality and internet of with a lesser 14% scared.
- Over 60% of the respondents think new technologies can help solve problems such as; air quality, health, inclusiveness and transport.
- 70% of respondents are excited about the opportunities for open data to be opened up and made publicly available.

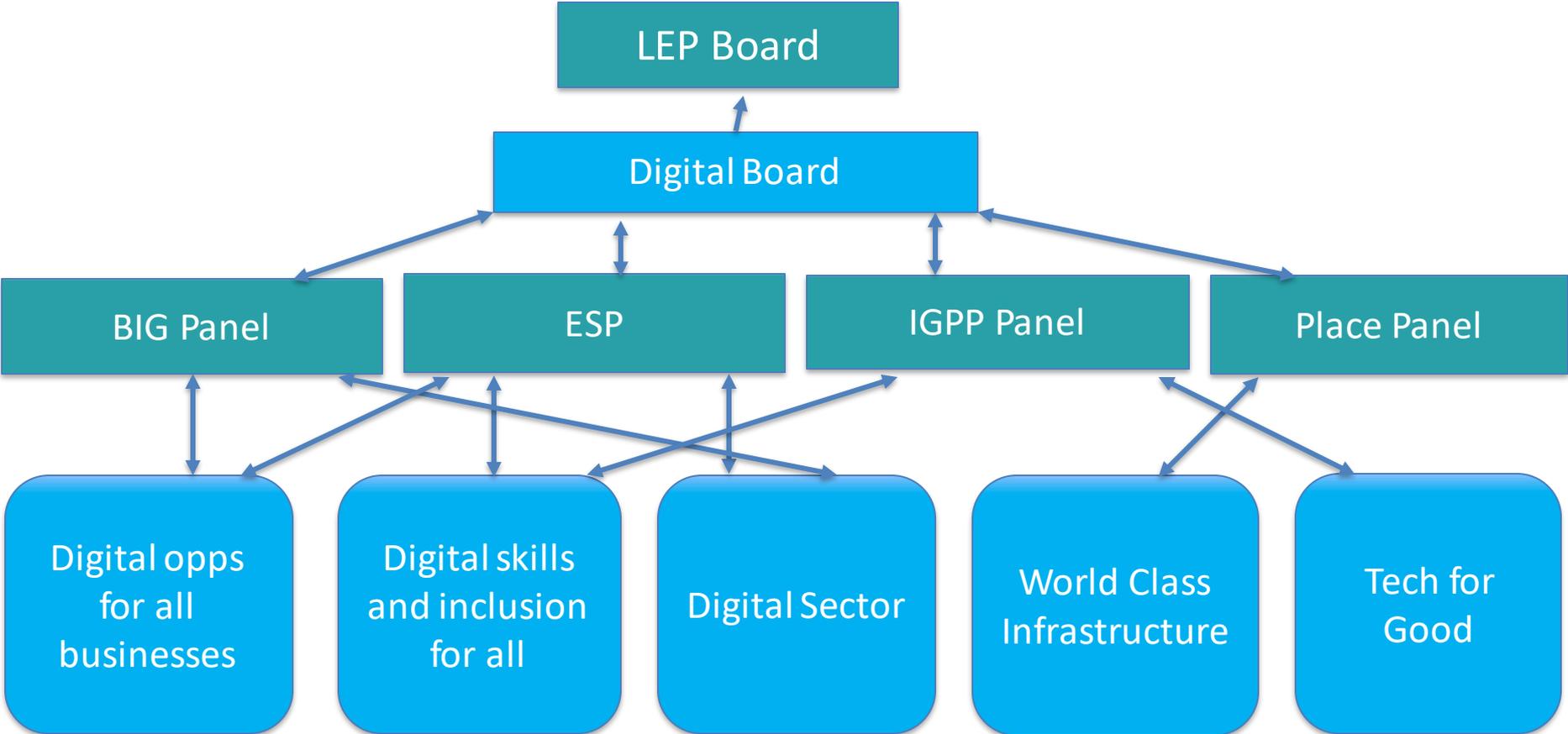
‘Openness, inclusivity, working from the outside in. These must be the key pillars on which strategy is built. The biggest challenges the city region faces are around social and economic inequalities. This is an opportunity to face those head-on and address them.’

Next steps

Governance

- Working groups will be established to develop and own action plans to ensure the aspirations in the framework are realised, building on existing activity taking place across the City Region.
- Each of the five outcomes of the framework will be owned by various existing Panels and Boards. Working groups will report directly to Panels.
- An overarching working group comprising LEP Board digital champions others along with Kersten England and lead officers will be established.

Digital Board and Working Groups



Working Groups / Action planning

Outcome	Suggested high level priority focus areas (as identified by the consultation)
Digital opportunities for all businesses	<ul style="list-style-type: none">• Industry 4.0 roll out – support to SMEs• Messaging/reach to businesses
Digital skills and inclusion for all	<ul style="list-style-type: none">• 100% Digital Leeds City Region• Digital Skills Partnership
Digital Sector	<ul style="list-style-type: none">• Raising the profile of the LCR Digital Sector
World class infrastructure	<ul style="list-style-type: none">• Full fibre roll out• Free WiFi across LCR
Tech for good	<ul style="list-style-type: none">• Facilitate engagement between LAs and the private sector to explore opportunities

Appendix

Opportunities and challenges – digital for all businesses

Digital transformation can make every business in every sector more productive, wherever they are located. A recent survey of 1,000 UK-based businesses found digital capabilities helped boost revenues by 4.4% and reduce costs by 4.3%. For example, small and medium sized enterprises (SMEs) with a strong web presence on average grow more than twice as quickly as those with minimal or no presence, export twice as much, and create twice as many jobs.

While UK companies have similar levels of internet access and web presence as those in other European countries, they are less likely to digitise their back-office functions than their peers in other countries. Fewer than 20% of UK enterprises use software to share information across the organisation, compared to 40% in France and more than 55% in Germany and only 22% of SMEs in the UK use any form of e-commerce.

The Productivity Leadership Group, a business-led initiative addressing the UK's productivity challenge, has recently published a report identifying some of the barriers that may be stopping businesses adopting digital technologies. These include:

- Knowledge by managers of what technologies are available and how they could be deployed within businesses
- The low priority afforded to digital transformation
- The cost of bringing in outside expertise
- The cost of buying new software and equipment
- Lack of skills among the workforce
- Connectivity

From marginal changes like a restaurant adopting online bookings, to wholesale business transformation - If successful, this could play a crucial role in closing the our productivity gap.

In a 2017 report, the World Economic Forum identified a \$100 trillion opportunity for both industry and society through the adoption of new digital technologies. Each day, around five million devices link up with each other, with the internet, or with both. There are around 6.4 billion data-communicating objects in the world today. And by 2020, this number is forecast to explode to around 20 billion.

The manufacturing sector is on the cusp of the 4th industrial revolution (4IR), bringing with it new technologies and techniques that will change the products, processes and supply chains involved in every aspect of industry. This technology ushers in even greater connectivity that will allow manufacturers to maintain their competitive edge in a rapidly changing world, and respond flexibly and quickly to customers' requirements.

The 4th industrial revolution is happening globally and concurrently. In Europe, Germany (Industrie 4.0), France (Industrie du Futur), Sweden (Produktion 2030) and Italy (Fabbrica Intelligente) are all actively taking an interest. The US and Chinese manufacturing sectors are also readying themselves for this change.

The benefits of 4IR technology adoption for manufacturing will be widespread, with smarter supply chains, smarter production and smarter products. It is a global shift, which offers opportunities for UK manufacturers as global supply chains are joined up more effectively. But this global shift also presents a risk if UK manufacturers fail to keep pace. [EEF]

Recent research by Digital Catapult Centre Yorkshire has found that the digitalisation agenda is a high priority for roughly 40% of firms (adopters and cautious innovators) in the Leeds City region. Studies elsewhere, including one in the Netherlands, would suggest that the ratio of companies fitting into the three categories are, 5 to 10% 1st Adopters; 40% Cautious Innovators and 50% Sceptics and Laggards

Whilst it is important not to generalise, from the limited sample of this study it would suggest that the “Sceptic/ Laggard” Group of companies are quite commonplace in the Yorkshire Region. One could almost suggest they represent the heartland of traditional manufacturing in the UK. Typically these firms are SME’s, often some way down the supply chain (i.e. further from the end customer).

Investment in digital transformation for this group is often seen as a costly distraction from the immediate and pressing activity of running a manufacturing company and business. Leaders often don’t feel they have the luxury of time or “headroom” to contemplate major innovation of this nature.

There is also a sense of a lack of understanding about digital manufacturing / Industry 4.0 and its implications for their business. Added to that, is a good dose of “Yorkshire” scepticism from companies about, what one firm described as, “Industry 4.0 hype”. For some businesses, talk of artificial intelligence, robotics and autonomous production is farfetched and has been over-exaggerated by the vendors of large hardware solutions.

The 2017 business survey shows that undertaking innovation activities is most prevalent within Transport/Storage/Communications (81%), Advanced Manufacturing (83%) and Creative and Digital (80%) sectors and propensity to do any of these things increases with establishment size.

Opportunities and challenges – digital skills for all

At a **basic skills level**, there is a strong correlation between digital exclusion and other forms of exclusion (poverty, age, gender, disability, work status, education, proximity to services). If left unchecked it is likely to exacerbate other forms of exclusion. Lack of basic digital skills and the ability to use the internet safely and securely is a key barrier to digital inclusion. 11.5 million people (over the age of 15) lack one or more of the five basic digital skills (Lloyds/Ipsos Mori 2017).

On **advanced digital skills** side it is estimated that 1.2 million new technical and digitally skilled people will be needed by 2022 to satisfy future skills needs. A more data-driven and action-focused local approach to tackling digital skills shortages will help drive the growth of local digital economies. It could provide more local employment opportunities by better matching demand and supply.

58% of digital tech companies in the North say finding ‘talent’ is a key business challenge. According to the 2017 LCR Business Survey 5% of firms struggled to recruit digital skills, but the number increases to 24% among creative and digital tech firms.

The 2017 business survey found that Digital and advanced IT skills were identified as in need of improvement by one in five establishments (20%), increasing for three in ten establishments with 50 or more employees (30%).

We are living in a world where it is increasingly important to develop and maintain the **general digital skills** needed at work and to get the most out of a digital economy. The majority of the population sit in this big middle. And helping our small businesses and charities thrive in the digital world is also crucial to their success.

Centre for Cities 'Cities Outlook 2018' notes that by 2030, technological advancements - combined with globalisation and changes to the make-up of the country's population - will have brought significant changes into the labour market, with big implications for policymakers. However, a point that is often missed is that this change is not new, but an ongoing process. Indeed change has been a good thing, bringing with it innovations and improvements in standards of living.

The job market will look very different in 2030. As Nesta identifies in The future of skills: employment in 2030, a number of factors, such as technological changes, globalisation and demographic changes will affect employment, **reducing demand for some occupations and increasing it for others**. Generally, those jobs that are made up of routine tasks are at a greater risk of decline, whereas those occupations requiring interpersonal and cognitive skills are well placed to grow. Nesta's study looks at the likely impact for the UK as a whole and finds that there are likely to be more jobs nationally in 2030 than today. But this is likely to play out differently across the country.

<http://www.centreforcities.org/wp-content/uploads/2018/01/18-01-12-Final-Full-Cities-Outlook-2018.pdf>

IPPR state that automation will produce **significant productivity gains** that will reshape specific sectors and occupations. In aggregate, however, these gains are likely to be recirculated, with jobs reallocated rather than eliminated, economic output increased, and new sources of wealth created.

In the absence of policy intervention however, the most likely outcome of automation is an increase in inequalities of wealth, income and power, and particularly risks increasing gender and race inequality.

Based on LCR analysis, employment in the City Region has a significant susceptibility to automation, in line with the level estimated for the UK.

However, susceptibility is much higher in some sectors and occupations than in others – for example a majority of jobs in the agricultural sector and in sales occupations are at high risk of automation.

With some exceptions, higher skilled jobs are expected to be the most resistant to automation, along with caring occupations.

Routine clerical and manual roles will continue to be the most susceptible to automation, together with sales roles (such as checkout operators).

Forecast pattern of automation has implications for inclusive growth – further decline of middle skilled clerical and manual roles narrows progression routes for those without a degree while negative impact on some service intensive roles with high levels of employment could further reduce opportunities for low skilled.

UK Consumer Digital Index 2018 (Y&H)

	Yorkshire and Humber	UK average
Proportion of people with full basic digital skills	81%	79%
Proportion of people who feel their digital skills have improved in the past year	68%	60%
Proportion of people with zero basic digital skills	6%	8%
Proportion of people who say they use the internet to manage and improve their health	48%	47%
Proportion of working population without full basic digital skills	13%	10%
Proportion of people who say using the internet helps them to save money	68%	29%
Proportion of benefit claimants with low or no digital capability	19%	18%
Proportion of people who say internet/mobile banking helps them to avoid overdraft fees	62%	66%
Proportion of those aged 60+ who are online	72%	72%

In an increasingly global marketplace, efforts to drive efficiencies through new technology and the adoption of new business models have together focused on ways of minimising routine activity. Technology is being substituted for clerical roles as computerisation allows information to be accessed and manipulated more easily. At the same time the shift in the UK's industrial production towards high skilled and high value specialisms creates a reduced requirement for workers who can undertake routine tasks.

As a result, the number of jobs in middle skilled occupations is projected to fall by more than 30,000 (7%) in the City Region over the next decade. Even though it is expected that there will be fewer jobs in these occupations, there will still be demand for workers, as a result of replacement demand. It is projected that there will be close to 180,000 job openings in the City Region for administrative and skilled trades roles over the coming decade. Labour market report 2017/18

Action is needed on both the demand and supply side to maximise the huge opportunity presented by high level skills for individuals and the wider economy of the City Region. We need to increase the supply of individuals with economically valuable higher level skills to address shortages and promote investment but there is also scope to increase demand for these skills by helping firms to move up the value chain and by attracting high value firms into the City Region.

Many employers in the City Region under-invest in workforce development relative to the needs of their business and there is evidence that participation in job-related training is in decline. This is a concern since raising the skills levels of people already in the workforce is critical to improving the City Region's overall skills position

Opportunities and challenges – the digital sector

Digital sectors contributed £118 billion to the economy in 2015: over 7% of the UK's gross value added (GVA),¹ and exports of digital goods and services now amount to over £50 billion. Tech City UK estimates that the digital sectors are creating jobs 2.8 times faster than the rest of the economy.

The UK is home to growing digital clusters across the country. As well as the 'core' digital sectors, technology is transforming other sectors across the economy to create emerging fields.

UK competitors like Manchester, Liverpool and Sheffield are also setting out their digital propositions focused around their digital tech sectors. Manchester boasts heavyweight players and substantial investment in media and digital, presenting itself as a leading EU digital city. Liverpool is good at selling its diverse digital sub-sectors and describing how its digital sector builds on its heritage.

The proportion of businesses in the 2017 business survey reporting an increase in the number of people employed in the last 12 months is higher than average within Creative and Digital sectors (26%). Among priority sectors, establishments within Creative and Digital sub-sectors (47%) and Financial, Professional and Business Services (45%) are most likely to report an increase in turnover in the last 12 months

Leeds City Region has existing significant specialisms on which to build:

IT Software and Hardware including cloud applications and services area, data analytics, especially for the digital healthcare and consumer media, sports, retail and advanced manufacturing sectors. It has specialisms that support a wider UK capability in data science and algorithm development, AI, data visualisation and open data.

Creative Industries TV, Film and Media with leading games companies and vibrant ecosystems offering creative industries support in addition to membership organisations and a very buoyant and fast growing film and screen sector.

Cyber Securities and Data Protection Technologies with a number of companies with a significant and successful presence in international markets and particular focus on 'applied intelligence' capabilities.

Smart Technology, Smart Cities, Internet of Things (IoT) and New Technologies. The region's distinctive manufacturing heritage provides opportunities to grow further around the forth industrial revolution and industrial IoT. These specialisms are increasingly applied into global growth sectors such as automotive (around the 'connected car' for instance), aerospace, rail and the wider transport sectors, as well as advanced medical, healthcare and consumer sectors. There are emerging examples of artificial intelligence based enterprise and new machine learning and robotics based business growth as well as new Smart Cities' technologies.

Depending on the definitions (narrow or wide) used (we think) Leeds City Region has between 8,500 and 15,000 'Digital tech businesses'.

As part of the ecosystem, the City Region has a thriving corporate tech scene (Sky Betting & Gaming, BAE Systems) across the City Region (Leeds, Harrogate, Bradford, Selby). There is a diversity of corporates with a significant HQ and regional functions and presence across growth sectors including media and entertainment, communications, financial services, cyber, digital health. It includes corporates with digital and design functions and extensive human and knowledge capital which KADA research found to be a distinctive feature of the LCR digital offer.

The City Region is a corporate technology powerhouse with a vibrant start up scene and has synergy with recognised UK sub sectoral strengths including data analytics, IoT, cyber, AI/robotics, games/creative, and cloud/software.

“Yorkshire Tech Connected” denotes a strong, well connected, emerging community of technology, digital and creative media specialists with MeetUps, Founders Friday, and high profile digital leaders.

The City Region has a track record of fast growing UK and foreign owned technology companies and investors and a strong regional and globally connected platform with some of the fastest growing northern tech companies including ControlF1, Big Change Apps, TPP, and Sky Betting & Gaming.

The city region boasts a series of high quality digital assets. These include innovation and technology spaces, business parks and tech business locations, and studio spaces. In addition it has global digital research and development facilities and institutes and major digital hubs of activity:

Innovation and tech spaces such as Barnsley's Digital Media centre, the 3M Buckley Innovation Centre, the Round Foundry Media Centre (Leeds), and the Elsie Whiteley Innovation Centre (Halifax), Huddersfield Digital Media Centre and Future Labs (Leeds).

Business parks and tech business locations with a strong digital/creative presence including York Science Park, Lanthwaite Business Park (Wakefield), Dean Clough Mills (Halifax), Broughton Hall Business Park (Skipton), and Cardale Technology Park (Harrogate).

Studio Space including Duke Studios (Leeds), the Production Park (Lanthwaite, Wakefield) and Yorkshire Studios (Church Fenton).

Digital Research and Development Facilities including DC Labs (York), the Advanced Digital Institute (Bradford), the Digital Catapult Yorkshire (Bradford), and the Digital Health Enterprise Zone (Bradford).

Institutes and digital hubs of activity including the Open Data Institute (Leeds), NHS Digital (Leeds), Leeds Digital Hub, Leeds Hack Space, and the Leeds Institute for Data Analytics.

Opportunities and challenges – world class digital infrastructure

By 2020, the volume of global internet traffic is expected to be 95 times that of 2005, and connected devices will outnumber the global population by nearly seven to one. In the UK, fixed internet traffic is set to double every two years, while mobile data traffic is set to increase further at a rate of 25% to 42% per year.

The UK's digital infrastructure must be able to support this rapid increase in traffic, providing coverage with sufficient capacity to ensure data can flow at the volume, speed and reliability required to meet the demands of modern life. Broadband and mobile must be treated as the fourth utility, with everyone benefiting from improved connectivity. This will play a crucial role in ensuring that everyone, wherever they live and however they connect, can make full use of digital services and benefit from participation in the digital economy. Improved connectivity also increases innovation and productivity across the economy

£1.7 billion of public funding is already being invested in delivering broadband across the country. Over 90% of UK premises can now access superfast broadband, and suppliers are on track to reach 95% of UK premises by December 2017.

There is general agreement that the only way to future proof the UK's digital economy is with a full fibre network (fibre directly to the premise from source) – good quality, high speed Wi-Fi, 5G and fixed connections all require a fibre backbone to operate.

Whilst 95% of UK homes are expected to have 24Mbps by 2017, this is significantly behind what's available across in other countries: more than half of Japanese and South Korean homes are connected to a fibre service faster than 1Gbps (gigabits per second) – and countries as diverse as Estonia, Turkey and Denmark are investing in fibre services faster than 10Gbps. Transformative changes to people's lives through new digital services in personalised medicine, education and communication are most likely to be pioneered in those societies with the widest roll-out of high-speed broadband – already more than 1,000 times higher than UK recommendations.

Opportunities for non digital businesses, the digital sector and smart projects (autonomous vehicles as an example) all rely on the widespread availability of a fast, reliable and secure digital infrastructure.

Opportunities and challenges – tech for good

The use of technology is changing everyday life for people, and how towns and cities are evolving to meet their needs.

As digital technology spread across the globe, the concept of a ‘smart city’ was popularised as a concept in the early 2010s to describe the use of these new advances in technology and data to make better decisions about governing cities and delivering services. Since then, interest in the concept has exploded, attracting influence, investment, and criticism across the world.

Governments and policymakers have struggled to match the promise of smart cities with the ‘messy’ reality of their cities. That messy reality has not deterred Silicon Valley tech companies, as they spread around the world, leaving policymakers and regulators scrambling to understand and react to the digital disruption they bring. The rise of companies such as Uber, Airbnb, and Deliveroo is rapidly changing urban life.

Local governments are now realising that they have a role to play in both protecting and furthering the interests of their citizens and businesses amidst this disruptive landscape.

The continuing proliferation of data represents a huge opportunity. Those ‘cities’ harnessing and exchanging data safely and securely have the potential to make enormous advancements in the fields of healthcare, energy, mobility, education and sustainability.

Recent research from KPMG suggests a base case scenario of 25% of UK new vehicle sales being Connected and Autonomous Vehicles by 2030. This does however hide a wide variety of assumptions, particularly around behaviours.

<http://futurecities.catapult.org.uk/wp-content/uploads/2017/11/GRSCS-Final-Report.pdf>
[file:///H:/Downloads/Smart%20Cities%20Full%20Report%202017%20\(4\).pdf](file:///H:/Downloads/Smart%20Cities%20Full%20Report%202017%20(4).pdf)

Cities around the world are creating and deploying 'smart city strategies' but a further challenge is around 'what does that mean?' Smart cities is a term which has become increasingly used over recent years - there are many different definitions depending on who you ask with no one agreed statement being 'right'.

The Centre for Cities set out 2 main approaches to Smart Cities:

Top down or technology centric approaches. Cities adopting this approach by become smart by integrating data gathered from different kinds of sensors into a single virtual platform in order to manage city operations more efficiently. These large scale top down initiatives are not relevant or applicable for many old and established UK cities as they depend on a blank canvas and in most case stretch far beyond UK cities financial and technical capabilities.

The bottom up approach. Emphasises the use of new technologies (eg social media, websites, mobile apps or censoring technologies) and new data (becoming available through open data platforms or sensors) as a means to enable citizens to devise solutions, acquire new skills through online learning and improve their interaction with public authorities

A report by Philips naming Singapore, London and Barcelona as top global cities states that Smart City Programmes are being held by a lack of funding and visionary leadership. The report says that one in ten local authority representatives (out of 150 key influencers) from around the world stated that they did not have the capacity to look at developing a smart city programme. The most common inhibiting factors were budget limitations (23%) and the need for more supporting infrastructure (19%). But the report also revealed that 56% of respondents cited visionary leadership as the factor that would make the biggest difference to the success of smart city programmes.

According to the Centre for Cities, those cities that have made most progress have tended to use three general principles to guide their smart city agendas:

- Integration with economic development and public service delivery plans. Instead of drawing up a smart cities strategy from scratch, cities have integrated smart initiatives within their existing economic development and public service delivery plans and have identified how new technologies can help them achieve their existing goals.
- Pragmatic focus with the bulk of investment targeted in projects that are practical, achievable and financially viable while also leaving some space for innovative experiments and pilots
- Participation of community representatives, local businesses and residents to ensure projects are relevant to the city's opportunities and challenges

The momentum behind smart cities is reflected in a growing understanding of what is required to accelerate the adoption of digital technologies. HUAWEI research identifies five key opportunities:

- Bridging the gap between smart city programmes and strategic city priorities: Cities are building the links that will embed digital innovation in frontline services.
- Supporting the emergence of city platforms: More cohesive strategies are being developed for the deployment of new technologies, including big data analytics and citywide Internet of Things (IoT) solutions.
- Strengthening regional perspectives: As the extended scope of smart cities is recognised, smart city programmes are developing collaboration networks across combined authorities, county authorities, and regional agencies.
- Expanding the partner ecosystems needed to deliver a smart city vision: The increasingly important role that local universities are playing in shaping and developing urban innovation programs is one notable development.
- Developing more integrated approaches to city issues: A growing number of projects recognise the interconnection between transport, health, energy, and housing, for example, and the need to assess the impact of innovations across these traditional siloes

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Thank you