

Digital delivery

Enabling outcomes with digital,
data and technology

May 2021



Foreword

I am delighted to present this digital, data and technology strategy for Highways England.

A £27.4 billion investment budget in the strategic road network (SRN) between 2020 and 2025 shows an unprecedented scale of ambition. Our [Strategic business plan \(SBP\)](#) provides high-level direction for every part of Highways England for this period.

“A safe, integrated and connected strategic road network enabled by digital, data and technology.”

This digital, data and technology strategy supports the SBP. It sets out our approach during the next four years and how we’ll work across Highways England to achieve our key objectives; providing safer, smoother and more reliable journeys for our customers.

Our technology foundations already make a critical contribution to customer journeys. However, the role of digital, data and technology in realising the ambition of the SBP is increasingly significant and continues to grow. More than ever, achieving the outcomes set out in the SBP is only possible through the delivery of reliable and secure technology services. The SBP outcomes demand us to be innovative and creative. Some require us to deliver much more quickly than ever before.

We cannot ignore the impact that Covid-19 has had on the way we work and the way our customers use the SRN. The long-term changes to our habits are unknown and now more than ever, we will need to operate with agility to understand the evolving needs of the business.

We will achieve this by:

- **Transforming services** across asset management, operations, customer-focused and corporate functions.
- **Enabling our people** by providing them with the data they need to make better decisions and the technology they need to do their job safely and securely, at the roadside, on the move, in control centres, in offices and at home.
- **Improving delivery** of digital, data and technology services, by adopting more efficient, flexible and streamlined approaches as well as using cutting edge techniques.

We will strive to become thought leaders in the digital, data and technology services we provide. We can only transform, enable and improve through a relentless focus on growing in-house digital, data and technology capabilities. We will need expertise and knowledge in critical technical areas, as well as building strong and mutually beneficial partnerships with an expert supply chain. This plan builds on a strong foundation. Some of this work has already started and armed with this strategy, we are clear about what needs to happen next.

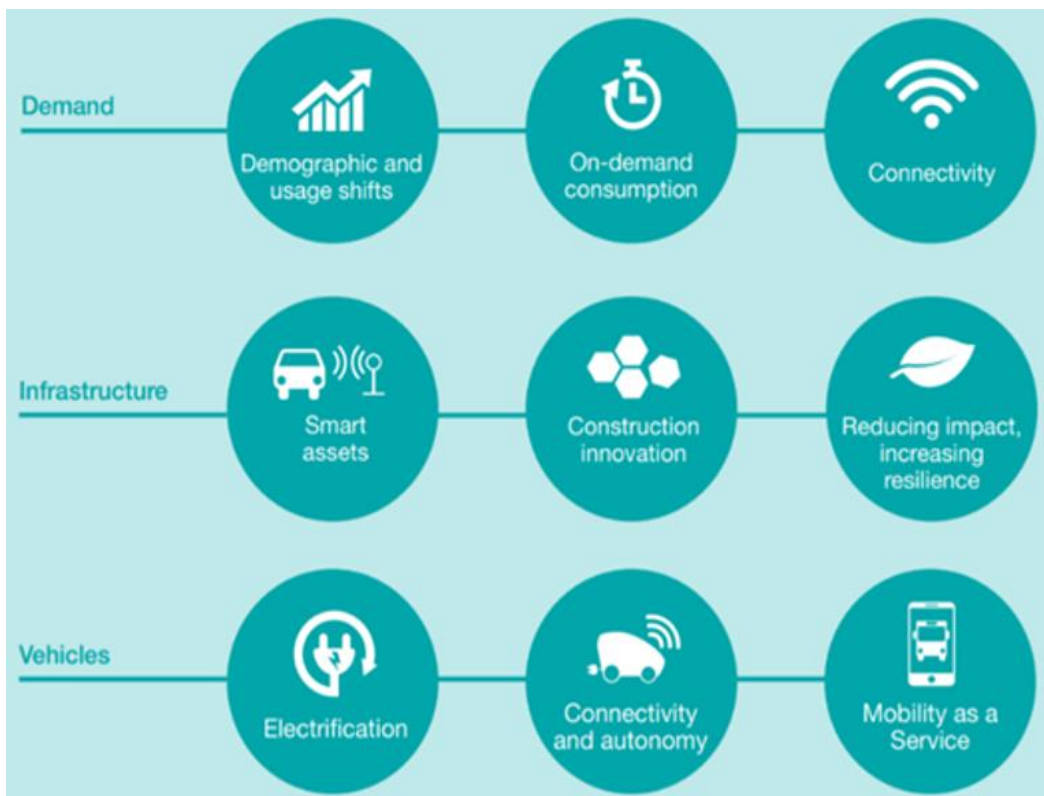
Victoria Higgin

Chief Information Officer and Executive Director of Information and Technology

May 2021

1. Enabling outcomes with digital, data and technology

Connecting the country shows nine future trends across three core areas: demand; infrastructure; and vehicles that will shape the SRN and influence our future operations.



Taking a strategic approach to digital, data and technology will enable us to successfully harness opportunities from these disruptive trends. For example, whether it's capturing and analysing data to understand on-demand consumption or improving communication with smart assets.

Considering these market trends and the impact they have on decisions we make today will help improve the services we offer to customers and colleagues. It presents an opportunity to create new services and unlock efficiencies across the organisation.

While we must look to and prepare for this exciting future, we must also focus on the objective for this Roads Period (2020 – 2025); enabling a safe, integrated and connected strategic road network.

In the *Strategic business plan (SBP) 2020-2025*, we set out six performance outcomes:



The SBP also sets out our performance goals through to 2025 and the success of this digital, data and technology strategy should be viewed and measured through its contribution to those outcomes.

Successfully improving how we manage our digital, data and technology delivery over the next four years will mean:

- continually improving and providing new asset management, operations, customer-focused and corporate services. They will be planned where possible and focused on meeting user needs.
- giving colleagues the tools and capabilities, they need to do their job, as good as they have at home. They will have a choice of devices and operating

systems, enjoy up to date software, and reliable connectivity in our offices and at the roadside.

- managing an evolving, modern, secure and interoperable technology environment. Technical debt will be reduced, services secure by design, and open standards introduced for increased interoperability.
- attracting the most capable people to help us build and deliver new technology services, through development of strong relationships with further and higher education institutions and being an attractive and exciting place to work for experienced professionals.
- using high-quality data to make decisions and measure whether we've achieved our goals. We'll enable third-parties compliant and legitimate access to our data to innovate and develop more quickly.
- transforming our relationships with suppliers, academia, and all those who contribute who drive our digital, data and technology ecosystem, to help deliver our objectives more efficiently, while keeping our assets and operations secure.

Our ambitious journey has already started. Our Information Technology (IT) delivery capability has been restructured, better aligned to how we operate as an organisation. Technical standards and reference architectures are being updated across our corporate and operational technology landscapes. The Information Vision and Strategy is published and is creating new insights and uses of data across the organisation.

Our new IT and Operational Technology (OT) commercial framework approach has been shared with suppliers and will become the standard for engaging with the supply chain during 2021.

We have considered existing publications across the organisation to support the development of this strategy.

Our Imperatives: safety, customer service, delivery

Highways England Licence

Sets our purpose and what we must achieve in managing the strategic road network

DfT's Road Investment Strategy 2

Provides government's strategic vision and priorities for the strategic roads network

Strategic Business Plan

Provides the company's strategic direction based on the vision and objectives in the RIS2 strategy

Delivery Plan

Sets out how we will deliver the activities in the strategic business plan and the timescales involved

Digital, Data and Technology Strategy

Explains how we will provide safe, more reliable and smoother journeys through the use of digital, data and technology

IT / OT Strategies

Sets the direction of our technology, both corporate (IT) and operational technology (OT), with clear roadmaps and commitments

Information Vision and Strategy

Describes the vision and strategy for a connected future, enabled by information and explain our information journey to 2050

Cyber Security Strategy

Provides the direction for developing our cyber security capability and the process and frameworks to keep us secure

Connecting the Country

Explains our view of what the future could hold and how we plan for the long term beyond RIS2

Asset Management Strategy

Explains what asset management means in practice to our customers, stakeholders and our people

Digital Roads

Provides a clear view of how digital technology will enable us to achieve our 2025 goals

Highways England 2025

Explains how we will, individually and collectively, play our part in contributing to the SBP and connecting the country in RIS2

Asset Management services delivery plans

Roadmaps and delivery plans for transforming and delivering end to end asset management services

Network Operations services delivery plans

Roadmaps and delivery plans for transforming and delivering end to end network operations services

Customer Service Strategy

Provides an overview of the focus areas to improve service to our Customers

IT / OT Commercial Frameworks

Provide a clear way for us to engage with the market, drive consistency and meet requirements

Our Imperatives: safety, customer service, delivery

2. Our delivery objectives

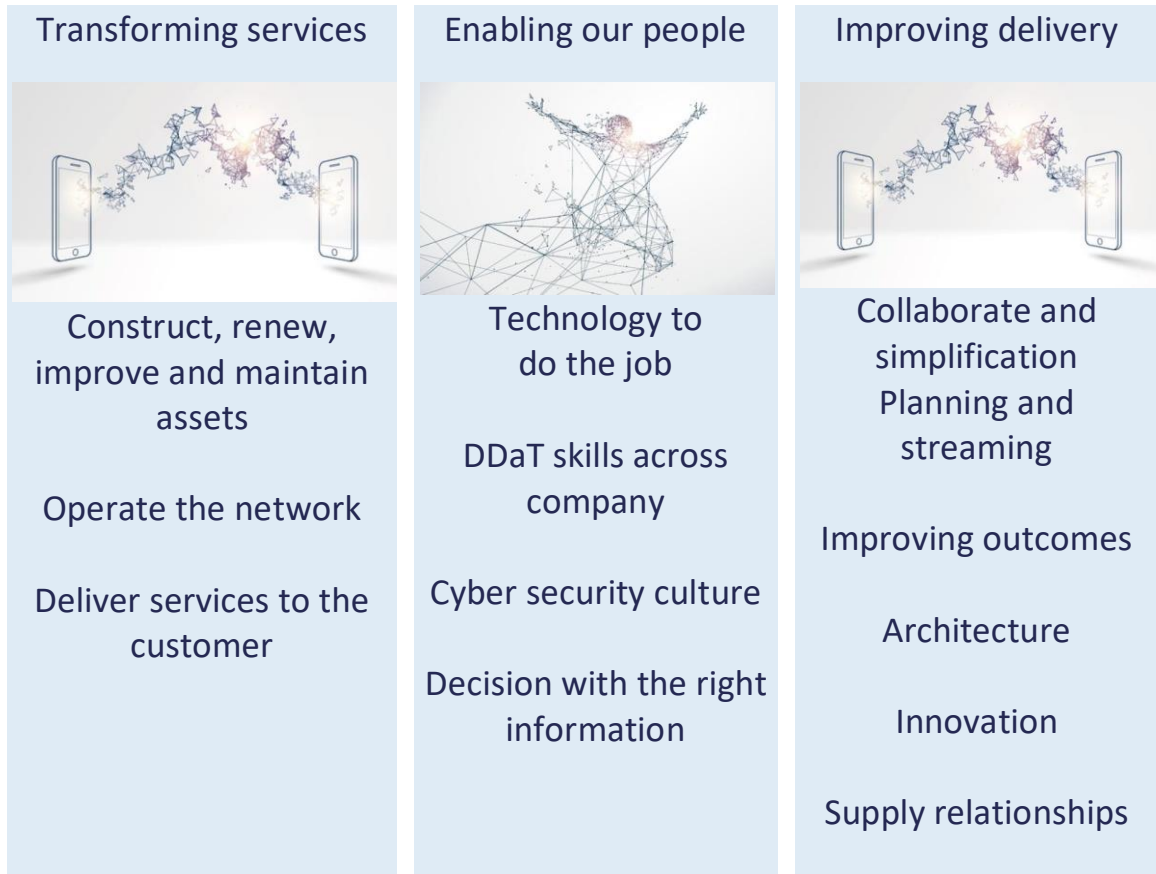
We have defined three digital, data and technology delivery objectives. It is through these we will contribute to the six performance outcomes set out in the *Strategic business plan* and be ready for the future as described in *Connecting the country*.

Our delivery objectives are:

- **Transforming services** across asset management, operations, customer-focused and corporate services, through an end-to-end view
- **Enabling our people** by providing them with the data they need to make better decisions and the technology they need to securely do their job, at the roadside, on the move, in control centres, in offices and at home
- **Improving delivery** of digital, data and technology services, by adopting more efficient, flexible, secure and streamlined approaches

These are underpinned by an attention on growing colleagues' digital capabilities across Highways England, providing the right information and expertise in critical technical areas, and building strong and mutually beneficial partnerships with an expert supply chain.

Each objective sets out contributing activities, which will change over time in anticipation and response to prioritisation across Highways England.



2.1 Transforming services

We will transform the services provided across the company using digital, data and technology to deliver frictionless services for our colleagues and customers. To enable greater business alignment, we have introduced a business partnering approach across the organisation to ensure digital, data and technology services deliver the desired outcomes, and for continuous improvement.

We will implement new ways of working and unlock efficiencies through digital transformation. It will be based on an end-to-end view that considers the interaction between technology, process and people.

Data provides opportunities to facilitate digital transformation. As highlighted in our Information Vision and Strategy, published in March 2019, we will seek to realise value from information, treat information as an asset, securely share trusted information, and use information to help shape our future. We have already

invested in a Data-as-a-Service (DaaS) platform to accelerate adoption of new services based on data science.

Technology plays a critical role, both today and in the future, to provide the powerhouse for operating across the SRN and will create benefits as we modernise operational technology and IT platforms alike. Based on customer behaviours, the modes of transport available and government direction, the technological horizon should be considered up to 2035 for operational technology.

“Asset management is how we use our assets – bridges, roads, drainage, technology, data and even our staff skills and capabilities and those of our suppliers – to deliver a service to our customers”

Mike Wilson, Chief Highways Engineer, asset management strategy

2.1.1 Construct, renew, improve and maintain assets

Increasing digital design and construction will result in safer production, reduced network disruption, increased productivity and smoother journeys for customers. Increasing digitisation of the construction process will support a step-change in intelligent design. Advances in on-site technology will help our sites to become increasingly paperless while automated construction and modularised fabrication will help maximise safety and efficiency.

Our asset management strategy sets out how we will make whole-life decisions across our asset portfolio including bridges, roads and drainage. Digital, data and technology are critical to achieving asset management outcomes.

We need modern, appropriately secured asset information and tools, which capture the right data to assess asset inventory and their conditions.

Combined with, the right intelligent technologies and better information systems, this will help us generate insights from data, considering the entire lifecycle of

major projects, and assessing those schemes which are the best value for our customers.

We will do this by:

- enhancing the lifecycle management for all our operational technology assets
- providing fit-for-purpose asset databases which are accessible on strategic platforms, to facilitate efficient and timely interventions.
- digitising and automating design, and integrating connected construction activities such as estimation, sequencing and costing.
- reducing plant/site operative conflicts through increased use of connected and semi-automated plant for construction and making greater use of data science for elements such as predictive maintenance
- providing strategy and planning colleagues the tools they need to develop route strategies for the next RIS period and beyond.
- replacing our legacy pavements management system, and others such as drainage, aligned to our *Asset management systems strategy* and emerging roadmap.
- increasing the use of 'digital twins' to improve the design and test the strength of the SRN for our road users and operators.
- integrating tunnels and their associated assets into a network-wide asset management landscape and lifecycle, enabling holistic decision-making
- evolving to a national management system, for heritage and planned tunnels which enable the safe operation of Tunnels, as well as maintain availability and enhance Customer experience.

Creating opportunities for better planning



“As a plant operative, my safety will increase thanks to the digital rehearsals and automated assembly of our modular components. Through digital design, we will be able to better plan any scenarios and ensure we operate with the highest safety standards.”

2.1.2 Operate the network

Technology is increasingly critical to smoother, safer and more reliable journeys. Operational technology services enable monitoring and traffic management from our control rooms, through to using digital signs and signals. We must ensure that the technology used is available and secure, while flexible enough to meet growing demand from new challenges, such as seamless connectivity for detection of stopped vehicles or next generation road signage.

We will do this by:

- utilising our current on-road operational technology, improving its application to better the SRN's performance
- deploying sensor technology and data science to predict demand, weather, environmental, traffic and asset conditions
- scenario-modelling the impact of planned roadworks to enable us to provide better mitigations, including dynamically managed speed limits
- proactive monitoring and control of our network, including integration with service management systems to provide status and maintenance information
- using the advanced traffic management system will support future innovations in traffic technology and our control rooms

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- rapidly deploying radar-based detection systems to improve the detection of stopped vehicles on our network.
 - completing delivery of our National Roads Telecommunications Services (NRTS2) transformation programme to improve and future-proof our telecommunications services. This will help us ensure capacity for future needs, as well as deliver our ambition for digital roads. We aim to have very high availability of the services this system provides to our control centres, our national traffic operations centre and our 30,000 roadside assets
 - making available our new NRTS2 wireless service for schemes where there is no existing fibre cabling. As wireless services require significantly less physical roadside infrastructure, we expect that we will be able to work quickly and cost effectively
 - delivering a new NRTS2 digital CCTV service which will enable Highways England Operations to move away from the current bespoke CCTV solution and get future CCTV cameras from the open market, exploiting technology innovation and open market pricing

We will achieve this while ensuring the integrity and availability of our operational technology and data is appropriately secured.

Supporting roadside safety



We are always looking for opportunities to increase the safety of our colleagues at the road side – we are trialing SAFETYcam: an innovative camera system that’s aims to change driver behavior by capturing dangerous driving and providing a visual deterrent so that they are stepped before they cause any risk for our operatives.

2.1.3 Delivering services to customers

Our customers will be better informed and have trust in the journey information they access from us, ensuring that they feel safe and in control of their journeys.

We must consider how our customer will evolve. While today most of our customers are humans informed by data and technology, the increasing amount of connected and autonomous vehicle (CAV) technology used in private and commercial vehicles could mean a future of providing data to self-driving systems. We must understand this direction and be prepared.

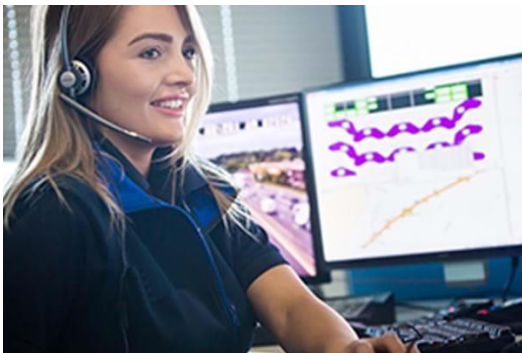
We will increasingly support our local communities, ensuring we satisfy statutory requirements on specific consultations. For the wider environment we will support the investment from designated funds in digital, data and technology that positively affects the wider ecosystem.

We will do this by:

- decommissioning the Highways England app and improving the Traffic England website. We will focus on the development of one source of fit-for-purpose data and information from Highways England for a range of customers and third parties.
- providing more accurate and up-to-date information on road closures, red 'X', works and diversions. Our network occupancy data will be complete, correct, trusted and delivered on time. We will make consistent information available to our customers and stakeholders, making it easier to plan journeys and travel.
- improving our customer engagement through a customer insight platform. We will ensure greater access to more valuable customer feedback, providing access to more real-time, frequent insights from a larger and more diverse sample of road users, at a reduced cost.

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- developing a data ownership and sharing strategy. We will have a ‘sole source of the truth’ of our asset and network data, which we will use to empower our customers through the provision of correct and reliable information.
 - improving freight information services. We will provide improved capability for freight, haulage and logistics companies to pre-plan their journeys on the network, through more automated and efficient processes.

Improving Customer Engagement



We are developing a new platform for the Dartford Crossing charge which is much more user focused uses modern technology to allow users, businesses, those exempt and residents to manage their payments and accounts more easily.

Traffic camera technology automatically identifies the category of vehicle and assigns the relevant charge (e.g. personal, commercial, local resident), and gives users until midnight of the day of crossing to pay. Users can also pre-pay up to seven-days in advance. Recognition rates for number plates are 98-99% accurate.

2.1.4 Our corporate services

Colleagues across our organisation rely on technology to deliver business outcomes. A modern workplace requires remote working, options on how to collaborate and elements of self-service and automation. While focusing on the outcomes, we must centre services around the user needs – considering how and where they will use the services provided.

Across all the services we provide there are opportunities to utilise digital, data and technology to drive efficiencies, better environmental outcomes and make Highways

England an even better place to work. We must achieve this while ensuring that our corporate systems and information is protected.

We will do this by:

- understanding the impact our digital, data and technology choices make towards the net-zero agenda. We can build a sustainable organisation by capitalising on opportunities, such as remote working, and the use of flexible cloud agreements instead of on-premises datacentres, which have higher carbon footprints
- developing communities of best practice to better leverage knowledge across the business, IT and supplier groups
- finding opportunities to take advantage of better technology to deliver core components to our business. Our Commercial and Procurement function plays a critical role in delivering the SBP's £2.2bn efficiency target. We can use digital tools and better data insights to support this ambition
- providing enhanced self-service options to improve the experience for our colleagues
- supporting the internal digital transformation of Highways England in areas such as the employee recognition programme (ERP) and Human Resources (HR) will mean that we will be able to run more efficiently as a business. For example, upgrading learning management and recruitment systems to improve the experience for colleagues and line managers
- using collaboration and document management to help people work effectively, such as replacing our 'Way we Work' platform to enable access to consistent policy and process information
- embedding assurance and risk management across the company through introducing new common, consistent technology and process
- enhancing the accessibility across the organisation to the right information and data to support decision making throughout this and future road investment periods

2.2 Enabling our people

If we are to expect our people to embrace change and adopt digital ways of working, we need to equip them with the correct information and tools to do their jobs. In addition, we need to support everyone in the company to train and develop skills to take advantage of digital ways of working, create value from data, and understand new technology. This will help us to achieve our outcomes quicker, stimulate new ways of thinking, deliver complex technology services, and ensure everyone helps keep the organisation and our assets safe.

We will also need to build deeper digital, data and technology expertise, in areas critical to the delivery of our SBP outcomes.

2.2.1 Technology our colleagues need to do their jobs

Our colleagues need the right technology where they work: at the roadside, on the move, in the office, or at home. Devices should work as expected and allow our colleagues to do their job effectively. The technology should be robust, fast, secure and as intuitive as the technology people use at home.

We have always been able to work a remotely, especially at the roadside across the SRN. However, with more of us working remotely than before, the right tools are required to ensure we continue to collaborate and remain productive.

Our ability to engage remotely with colleagues, stakeholders and suppliers – in real time and with best-in-class services – is as important now as it's ever been.

We will do this by:

- keeping our workplace estate up to date, exploiting modern software and hardware, while reducing technical debt and legacy IT which are difficult to support
- recognising needs may be different for different colleagues, including our roadside colleagues. Giving colleagues more choice about the right technology tools they need to do their job

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- making it easier to resolve issues quickly by streamlining the number of service desks. This will simplify the user experience
 - introducing more automation and self-service options to give users more control over the tools they require and ways they seek support
 - focusing on accessibility, so we can make reasonable adjustments to meet the needs of all colleagues
 - enabling collaboration between colleagues and suppliers for our major road schemes, such as on the A303 and Lower Thames Crossing

2.2.2 Digital, data and technology skills throughout the organisation

Building digital, data and technology skills across the organisation is critical to achieving our SBP outcomes. This will help us to deliver better services for customers, develop more innovative solutions to problems, and keep the organisation safe and secure.

We need to develop a level of digital literacy across the organisation. This will ensure there is a common base understanding of how to take advantage of our tools and operate in an increasingly complex environment.

The delivery of some outcomes requires us to have deep expertise across specific digital, data and technology domains, such as control systems and cyber security. Our approach is to identify these areas, mature and build our in-house expertise. We'll need to successfully attract, nurture, and develop the absolute best digital, data and technology professionals we can. As we scale and adapt the organisation to face the challenging ambitions we have set, we will need a people strategy to facilitate this.

We will do this by:

- investing in supporting and training our people across the business with essentials of digital literacy, including cyber security
- making effective decisions to build-in house solutions or use the supplier community; aligned to workforce planning. Through this we will look to

understand where having skills in-house will deliver best value, and where it can help us keep critical skills or realise opportunities quickly

- developing clear technology, digital and data career paths and opportunities for our people. We will facilitate cross-fertilisation of skills between technology and business by creating roles such as product owners and service designers, managers, or owners
- developing an early careers strategy, to cover apprentices and graduates. Creating partnerships with leading universities and further education organisations. This allows us to attract apprentices and access top talent

2.2.3 Growing our culture of cyber security and data protection

As we introduce more technology at the roadside and digital collaboration with our supply chain, our systems can become even more vulnerable to cyber threats. Information and information systems are a critical business asset, fundamental to the delivery and operation of public services. For Highways England, this includes the operational technology (OT) that underpins the SRN.

Our approach is one of trust. It is essential that we can maintain trust in the systems we operate, ensuring critical national infrastructure, our customer data and corporate information is secure. We will embed security and privacy by design as a default within the organisation.

We will take a deeper strategic approach to cyber security by providing threat intelligence, strategic procurement support and scenario testing to find threats and incidents before they happen. People are our most important asset, and we will improve our in-house cyber security capability, in line with the government cyber security strategy, while educating and helping our wider Highways England colleagues.

We will support our digital, data and technology colleagues in building systems, applications and operational technology that are designed with the intention of constantly evolving, staying secure and up to-date.

We are expected to release information as part of the Freedom of Information acts and will manage this in a transparent, secure, and consistent manner.

We will do this by:

- ensuring that digital services across Highways England are designed and run securely, reliable, and compliant with relevant legislation and policies. This covers both our corporate IT systems and our operational technology, plus, where appropriate, those of our delivery partners and suppliers.
- working closely with the strategic business partners and their teams, plus the wider directorates and functions to ensure the provision of timely cyber security advice and expertise. We will develop and own Highways England's cyber security and information rights standards, policies and frameworks and actively manage compliance and risk within agreed risk tolerances. We also build our security operational and investigative capability, for example, cyber security threat intelligence and analysis; our security operations capability (SOC) and responding to and advising on freedom of information requests and GDPR compliance.
- not just designing and operating digital technology. We have a cross cutting role across Highways England, and our partners, in advising and helping everyone across the business to contribute to ensuring that our services and information are secure and reliable, keeping the whole of Highways England secure from cyber threats.
- growing the dedicated information rights team increasing our ability to provide expert advice and assurance and supporting the organisation in meeting our GDPR and transparency obligations.
rolling out training and communications to create and embed a culture of awareness around security and transparency
- working with the organisation to publish more data, showing our commitment to openness and transparency and increasing public trust.

2.2.4 Making decisions with the right information

Decisions made with information create better outcomes for our customers, stakeholders, and ourselves. We will enable our people and customers to make better decisions underpinned by fit-for-purpose and easily accessible data.

Our data benefits us and creates an estimated £60 billion of value to UK Plc. To protect and grow that value we will measure, manage, and value our data as an asset in its own right. Information is a valuable resource that we will keep safe and secure from accidents and attacks. Information can affect people's lives and we will use it transparently and ethically.

We will do this by:

- ensuring we earn the right to look after our customers' data
- sharing fit-for -purpose data through a suite of secure channels that are open to any one for access, use and sharing again
- growing and then partnering our data science teams with academia and supply chain partners, to apply cutting techniques to data that generate new ways of working. This, in turn, will unlock new value and new opportunity.
- creating a data-driven culture that promotes the idea that everyone in Highways England has a responsibility to look after our information

2.3 Improving delivery

The effective provision of digital, data and technology services will enable our colleagues to deliver efficiently and contribute to our strategic outcomes. We will focus on delivering at the right pace, to the expected quality and to facilitate innovation. We will also align our delivery in value streams, by creating service-focused, cross functional teams and decreasing time to value with modern architecture, design, and delivery methodologies.

2.3.1 Organising for collaboration and simplification

Across Highways England, we will provide services which deliver the right quality outcome for the business and recognise the scale of delivery required over the current road period and further into the future. We will organise and align the IT directorate with the other directorates, so that requirements are better understood, in-house expertise is kept, and we jointly find further opportunities for efficiency or innovation. We will take an end-to-end view of the service lifecycle, from conception through to implementation and maintenance. We will build services that support our outcomes, once, and scale them to new areas where necessary, supporting us to also be more user centric.

We will do this by:

- working with business partners and their teams to lead and be accountable for creating technology roadmaps that support all business processes, functions and services
- improve business sponsorship and ownership to ensure alignment of projects and programmes from the start through to benefits realisation
- professionalising our digital, data and technology capabilities, and seeking to organise centres of excellence, in one organisational location within Highways England, to deliver in the most efficient way and to avoid duplication
- building services which meet the needs of users, via a human-centred design approach, while considering the needs of our future users
- doing things once, where it is possible to do so and makes sense.
- Increasing collaboration between digital, data and technology professionals across the organisation
- Being better informed and equipped to understand make versus buy decisions, by increasing the skill and ownership within our in-house IT teams

2.3.2 Planning and streamlining decision making

Improving how we plan, having clear roadmaps and streamlining decision making will help us to deliver business outcomes when they are required. This requires a balance of just enough governance to balance priorities, speed and compliance.

Delivery managed by the IT Directorate will be aligned to the SBP outcomes using portfolios. From business partners to service delivery managers, this alignment will ensure we have clear accountability and line of sight across the full lifecycle for each service.

We will do this by:

- developing delivery roadmaps for the remaining four-year period of the Delivery plan for asset management, operations, customer and corporate
- our business partners will provide us with greater insight about the needs of the business to enable us to prioritise our investments, which will be underpinned by an integrated delivery plan
- undertaking integrated delivery planning across all our teams and services, to ensure digital, data and technology considerations are made up-front
- streamlining investment processes and decision-making bodies, so we make timely decisions based on enough information but not too much
- introducing a portfolio approach across the IT Directorate
- introducing a new strategic governance forum for all digital, data and technology initiatives across Highways England

2.3.3 Improving outcomes from projects and programmes

Ensuring we deliver the projects and programmes that rely on digital, data and technology to meet the intended outcomes is a key focus over the next four years. We will invest in building delivery capability and processes that can realise project benefits at the cost, speed and specification required. We will make sure the correct delivery

frameworks and methodologies are applied to match the scale and complexity of our work.

The world is changing at pace. To keep on top of that change, we will invest in a digital lab that focuses on working with the brightest minds to create fast paced innovative solutions using innovative tools and techniques.

To enable this, we will:

- align delivery frameworks across the business to ensure we are all working in the same way and to foster collaboration
- assign and coach owners on every project and programme to ensure effective business sponsorship, change management and adoption of new services
- introduce project, programme and portfolio management tooling to support delivery activities to improve consistency and transparency
- coach our colleagues and invest in programme and project delivery skills development and certifications across the organisation
- build professional, service-oriented portfolio and project management offices to provide long-term capability and expertise to plan and manage delivery
- build an agile centre of excellence to upskill our team in modern, agile ways of working and apply them where relevant
- align technology delivery with asset delivery, so we can more effectively collaborate across functions and support our major projects and operations
- establish a mechanism to regularly review the value being driven through projects and programmes, based on defined KPIs, and undertake business case evaluation at multiple stages through the delivery lifecycle
- Build a digital lab to take products and services from idea to production in a rapid way unlocking new areas of value quickly

Our future digital roads



The proposed Lower Thames Crossing is part of the biggest investment in the country's road network for a generation and an essential component in the UK's future transport infrastructure. We will use improved technology, data and information to aid construction and road users, as well as enhancing our operations on this critical part of the strategic road network.'

2.3.4 Increasing flexibility with architecture

Our target technology architecture will be modern and flexible to allow us to quickly create new services or improve the existing ones through re-use of existing services. We will also focus on reducing complexity and increasing standardisation across our infrastructure and platforms which will enable greater automation, orchestration and flexibility across our technology stacks leading to quicker provision of infrastructure services.

We will do this by:

- strengthening our in-house architecture function, to provide expert support and build the long-term view of our IT and Operational Technology estates
- introducing strong architectural governance across the delivery lifecycle and align it with the new delivery framework
- providing guidance through principles and policy to increase standardisation and reduce complexity. We will also provide governance across our supplier base, to encourage re-use where possible
- supporting service design and integration and introducing holistic service architecture design done up-front and in line with strategic platforms and Government Digital Services (GDS) guidelines

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- implementing a strategic platform approach with fewer, and more reliable platforms, to encourage re-use, reduce costs, enhance security and make use of the services that deliver most value
 - developing and implementing our hosting strategy – increase the use of cloud platforms to enable the provision of modern, automated, secure and flexible services (e.g. digital twins)
 - focusing on reducing technical debt to ensure we can upkeep the operational technology estate in an efficient way, reduce our security vulnerabilities and manage it correctly
 - exploiting projects such as on the A303 and Lower Thames Crossing, to develop, test and rollout technology which enhances potential future capability and enables the continuous improvement of customer experience over the entire lifespan of the assets

Identifying vehicles stopped on our network



We are deploying the use of radar-based detection systems to improve the detection of vehicles stopped on our network. This allows for the adoption of new and innovative technology.

2.3.5 Innovation

The Designated Funds Plan 2020-2025 sets out the need to innovate, modernise and realise the benefits of emerging technologies, which have the potential to revolutionise what it means to travel on our roads. To do this, we will need to coordinate the research and provide guidance for proven concepts to enable widespread adoption.

Our investments in roadside technology have seen development of connected corridors, which gather information about the traffic and travel conditions. This data can be sent directly to other vehicles to warn about incidents ahead or poor weather conditions. These technologies have been successfully tested but will need to be adopted at scale in the future to generate their expected safety benefits.

We need the ability to trial new innovations cost effectively and with no disruption to customers and colleagues. We also need to use the experience in our community; using innovators in academia and research, as well as in our supplier network to provide challenge and stimulus.

In doing this, we will need to maintain safe and secure testing environments, where experimentation and innovation can occur to develop our next generation of services.

We will do this by:

- developing a digital, data and technology-driven culture. We will focus on making quality information the basis of our assumptions and share the data we must improve services for our customers and colleagues
- working in collaboration with the supply chain to develop and test (within secure, sand boxed environments) technology which will look to future horizons, such as intelligent asset management
- further investing in the data as a service platform we have built to rapidly offer scalable data solutions
- continue to run competitions which bring together our partners, suppliers and other interested communities to help solve our technical challenges

- establishing a digital labs capability; a route for rapid prototyping, developing, testing and iterative delivery. We will help de-risk investments by proving the need for them through discovery phases, and finding the most effective way of solving the problem such as through an Alpha phase
- providing data-to-intelligence services. We will look to find the critical relationships between our data sets to drive insights which align our activities to focus on our SBP outcomes.
- investing in data-driven capabilities. We will establish current information and decision-support capability when data-to-intelligence services are set up.

Improving safety and reducing congestion



As a traffic officers we always need the latest information on traffic and incidents to make the right decisions to keep free flowing traffic and intervene safely. Thanks to the increased up-time of roadside technology we can make such decision on accurate and near real-time data.

2.3.6 Improved supplier partnerships

To meet the expectations set by the SBP, we must improve the breadth and depth of our supply chain and the way we specify and manage their expected performance and results. We will improve our procurement processes and frameworks to reduce our time to market, create a competitive environment for our suppliers and ensure our organisation receives the intended outcomes originally set.

We will build stronger supplier partnerships, while assuring the quality, risk and security of our entire supply chain. This will enable us to align procurement with our intended outcomes, while delivering cost efficiencies from both commodity and complex technology purchases.

We will:

- introduce new information technology and operational technology commercial framework agreements to serve as the route to market, and ensure we can meet all the digital, data and technology requirements of RIS2 and beyond
- build end-to-end category management roles and capability to drive commercial engagements
- increase engagement in the initial stages of the procurement cycle to ensure clarity of requirements, specifications and option analysis
- establish a Digital Leaders Forum, which will build a chief information officer (CIO) network for the roads construction industry to increase transparency and collaboration
- develop strategic relationships with key platform providers, ensuring we can get the best out of innovation in the supply chain

3. Measuring the success of our strategy

The digital, data and technology initiatives outlined in this strategy will be measured against the performance outcomes in the strategic business plan 2020-2025. Specific digital, data and technology delivery objectives are set out at the beginning of the document:

- transforming services across asset management, operations, customer-focused and corporate functions
- enabling our people by providing them with the data they need to make better decisions and the technology they need to do their job, at the roadside, on the move, in control centres, in offices and at home
- improving delivery of digital, data and technology services, by adopting more efficient, flexible and streamlined approaches

We have showed an approach for each objective to measure success of our delivery:

3.1 Transforming services

We will seek feedback from our colleagues and customers by:

- measuring progress against performance measures as set out in the SBP investing our IT business partners' time and effort to build open, trusted relationships with colleagues so there is a constant feedback flow
- measuring the benefits captured within business cases, and looking to continually improve what and how we deliver
- working with customer facing colleagues to obtain real customer feedback

3.2 Enabling our people

We will repeatedly ask our colleagues whether the data, tools and skills provided enables them to effectively achieve their goals by:

- collecting feedback through our annual colleague surveys and service satisfaction scores
- giving colleagues a range of options to provide feedback regularly when it suits them
- closely monitoring user issues captured by the service desk and continuously improving our service
- measuring the fitness for purpose of our key data sets, as well as the data maturity of both ourselves and our supply chain partners who manage our data

3.3 Improving delivery

We will track and measure the benefits delivered and changes implemented across our digital, data and technology portfolio by:

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- reviewing progress against specific roadmaps for the key projects, programmes and technology being delivered
 - tracking trends on return on investment, considering; quality, cost and efficiency delivered for the services provided
 - tracking the efficiencies delivered through Commercial and Procurement, which will include environmental outcomes as a metric to review our supply chain and support the net zero agenda