A review of the delivery and impact of National Highways' digital, data and technology (DDaT) Strategy and progress against its Digital Roads Roadmap

FINAL

Office of Rail and Road

26th March 2024

Quality information

Prepared by	Checked by	Verified by	Approved by
21st February 2024	21st February 2024	22nd February 2024	22nd February 2024
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Revision History

Revision	Revision date	Details
1.0	8th February 2024	Original version shared with ORR
2.0	22nd February 2024	Revised version taking account of ORR feedback
3.0	26th March 2024	Final version taking account of NH feedback

Distribution List

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1.1.1 Digital, data, and technology plays an integral role within National Highways and the successful delivery of its targets and commitments to enabling safer and reliable journeys for its road users. In the context of meeting Road Investment Strategy 2 (RIS2) performance objectives, digital, data and technology enable more precise monitoring and management of the network, supporting effective investment decisions. In addition, it can enable improvements to journey reliability, can reduce congestion, and aligns with broader environmental goals.

1.1.2 To support the role of the Office of Rail and Road (ORR) as the independent Monitor with regulatory powers to hold National Highways to account for its performance, delivery and efficiency, AECOM has been commissioned to:

- Facilitate a better understanding of National Highways' delivery of its Digital, Data and Technology (DDaT) Strategy, determining how the DDaT Strategy aligns with wider strategies, and impacts RIS2 performance objectives;
- Provide an assessment on National Highways' Digital Roads, focusing on the Digital Roads Roadmap, and the deliverables detailed within it, and;
- Outline how National Highways is learning lessons that it can apply for future road periods.

1.1.3 AECOM's approach involved a review of material and documents delving into existing frameworks, delivery outputs, and strategies, to glean insights into National Highways' digital, data and technology landscape. Concurrently, we engaged with key stakeholders, and undertook three workshops to test the practicalities and approach taken by National Highways to deliver against its commitments.

1.1.4 We found that there is a strong alignment between the DDaT Strategy, the Strategic Business Plan, and the Delivery Plan, particularly in terms of performance goals and outcomes. The DDaT Strategy is effective in integrating with National Highways' overarching business objectives, particularly in enhancing operational efficiency and customer experience. This is supported through initiatives set out in the Quarterly Business Planning and Review (QBPR) cycle. However, the omission of initiatives aligning with the Environment and Sustainability Strategic Priority within the QBPR cycle is a significant gap, and an area for improvement. This is particularly of importance given one of the Strategic Business Plan performance outcomes is '*Delivering better environment outcomes'.*

1.1.5 Despite the strong strategic alignment, there are complexities of directly measuring the specific impact of DDaT initiatives against key performance outcomes. This is due to the initiatives typically acting as organisation enablers, providing capability enhancements rather than having a direct and easily quantifiable impact on the RIS2 performance objectives. Disentangling the specific impact of a single initiative from the broader ecosystem can be challenging, given complex interactions with other systems, processes, and factors, and with other concurrent changes taking place. Despite this, the expected impact of each initiative, in terms of expected benefit should be considered and captured as part of the QBPR process.

1.1.6 We found that the DDaT Strategy and Digital Roads are well-aligned, focusing on business enablers and a shared vision. With regards to Digital Roads, it was noted that whilst the decentralised operating model employed does provide flexibility and agility, it also presents a challenge in assessing the progress and deliverability of the Digital Roads' ambitions and the activities set out in the Digital Roads Roadmap. It is important to ensure that progress of each activity is understood, to understand the overall status of each ambition, and to support their realisation. Despite National Highways' stated view that Digital Roads is a set of ambitions rather than a programme, there are a clear set of activities underpinning the ambitions set out in the Roadmap, with limited evidence to demonstrate progress against these.

1.1.7 It was found that National Highways has applied a structured approach with respect to embedding lessons into the development of the draft Strategic Business Plan for Road Period 3. Within Digital Services, from a strategic level, the learning and embedding of lessons is evident with the DDaT Strategy refresh itself. From an operational and project level perspective, a structured approach is less clear, with evidence to suggest a more tactical approach to continuous learning is utilised.

2. Introduction

2.1 Overview

2.1.1 AECOM has been commissioned by the Office of Rail and Road (ORR) to undertake an independent review and facilitate a better understanding of National Highways' delivery of its Digital, Data and Technology (DDaT) Strategy. In addition to how it interacts with the company's delivery of its RIS2 objectives, and how it is learning lessons that it can apply for future road periods.

2.1.2 This report outlines the key findings in relation to the requirements of the commission:

- Analysis of National Highways' 2021 DDaT strategy, considering its 2023 refresh, how this strategy is aligned with the RIS2 delivery plan, how it interacts with the wider performance framework, and the linkages with other areas, including Digital Roads and its Operational Technology strategy.
- An assessment of the benefits that National Highways has realised or is in the process of realising through delivery of its DDaT Strategy, and the impact on RIS2 key performance indicators (KPIs) and performance indicators (PIs).
- A progress update against each of the deliverables detailed within National Highways' Digital Roads Roadmap, forecasting deliverability during this road period (RP2) and a confidence of delivery assessment.
- Analysis of how National Highways is embedding outputs and learnings from the delivery of both Digital Roads and the DDaT Strategy to inform and contribute to its Strategic Business Plan for the next road period (RP3).

2.1.3 This commission commenced on the 11th December 2023.

2.2 Background

2.2.1 ORR is the independent Monitor with regulatory powers to hold National Highways to account for its performance against its targets and its statutory licence, ensuring that it meets the required standards of safety and efficiency.

2.2.2 ORR's oversight of National Highways ensures its activities provide efficiency, effectiveness, and value for money in the management of the strategic road network (SRN) and ultimately, customers enjoy predictable and reliable journeys. ORR holding National Highways to account includes a set of performance metrics that cover a wide range of factors, including safety, asset management, efficiency, and environmental performance.

2.2.3 ORR publishes annual assessments of National Highways' performance, which are available on its website.

2.2.4 National Highways is the government-owned company responsible for operating, maintaining, and improving the SRN – the motorways and major A-roads in England.

2.2.5 National Highways is publicly funded through the Department for Transport (DfT). The purpose and remit of National Highways is to carry out the functions of a strategic highways company in accordance with its appointment under section 1 of the Infrastructure Act 2015 including the delivery of the requirements of the Road Investment Strategy (RIS).

2.2.6 National Highways must operate management information and accounting systems that enable it to review in a timely and effective manner, its financial and non-financial performance against the budget, objectives, and targets, as well as to monitor and report on risks to successful delivery of those objectives. These objectives are set out in the Road Investment Strategy, the Strategic Business Plan and the Delivery Plan.

3. DDaT Strategy Review

3.1 Introduction

3.1.1 This section provides background information of National Highways' Digital, Data and Technology (DDaT) Strategy including the wider strategic landscape, where the DDaT Strategy sits in the landscape, owners, and its relationship with other strategies. The purpose of which is to provide a better understanding of how the DDaT Strategy has developed through its refresh, how it aligns with National Highways' RIS2 delivery plans, and the wider performance framework.

3.2 Strategy landscape

3.2.1 The schematic diagram below shows our understanding of the current strategic landscape, which consists of multiple tiers.

Figure 1 Strategic Landscape

3.2.2 **Government Policies** which refer to the Government documents that outline the statutory role, directions and guidance issued to National Highways, policies informing the development of the SRN in England, and the funding that will be made available for delivering the long-term strategic vision. These documents include:

- Highway England Licence (granted by The Secretary of State)
- Road Investment Strategy (RIS) 2 (published by Department for Transport)
- National Policy Statement for National Networks (published by Department for Transport)

3.2.3 **Corporate Strategies** which, align with the Government's RIS, setting out the long-term vision for the SRN, providing National Highways' high-level direction, outcomes to deliver, and strategic priorities for improving efficiency, safety, and environmental sustainability. These documents recognise the importance of digital, data, and technology, and identify DDaT as a key enabler of innovation and improvement in the road sector. These documents include:

- Connecting the Country 2050 (sits at the top of Corporate Strategies as the overarching vision and plan to 2050)
- Strategic Business Plan and Delivery Plan (including Performance Framework)

3.2.4 **Business Strategies** which outline National Highways' strategic direction and plans in response to the Corporate Strategies. These strategies and plans, under the umbrella of the Corporate Strategies, further elaborate overarching strategies in the above layer into themes, objectives, and performance indicators. As of the date of reporting, there are 47 National Highways' strategies (including the DDaT Strategy) sitting in this tier. These include, for example:

- Operational Technology Strategy
- Information Vision and Strategy
- Digital Workplace Strategy
- Digital Roads Strategy
- Cyber Security and Information Rights Strategy
- Asset Class Strategy Roadside Technology

3.2.5 **Functional Strategies** which align goals and objectives of a specific functional area with the broader strategic direction and plans of National Highways.

3.2.6 **Operational Strategies** which are the lowest tier of the strategic hierarchy, focusing on short term objectives and execution plans, ensuring that plans are translated into tangible actions and results, and ultimately keep National Highways aligning with its strategic direction.

It is worth noting that National Highways' senior management is leading an initiative to streamline the multitude of strategies, aiming to reduce complexity, bring cohesion within the executive, and enhance strategic clarity. Some existing strategies like the Operational Technology Strategy may be repositioned as a result of this initiative.

3.2.7 Given the focus of this review, which aims to facilitate a better understanding of National Highways' delivery of its DDaT Strategy, and the interaction and impact on the company's Strategic Business Plan and Delivery Plan objectives, this report will not cover Functional Strategies and Operational Strategies. Figure 2 below outlines the relationships between the Government Policies, Corporate Strategies, and Business Strategies.

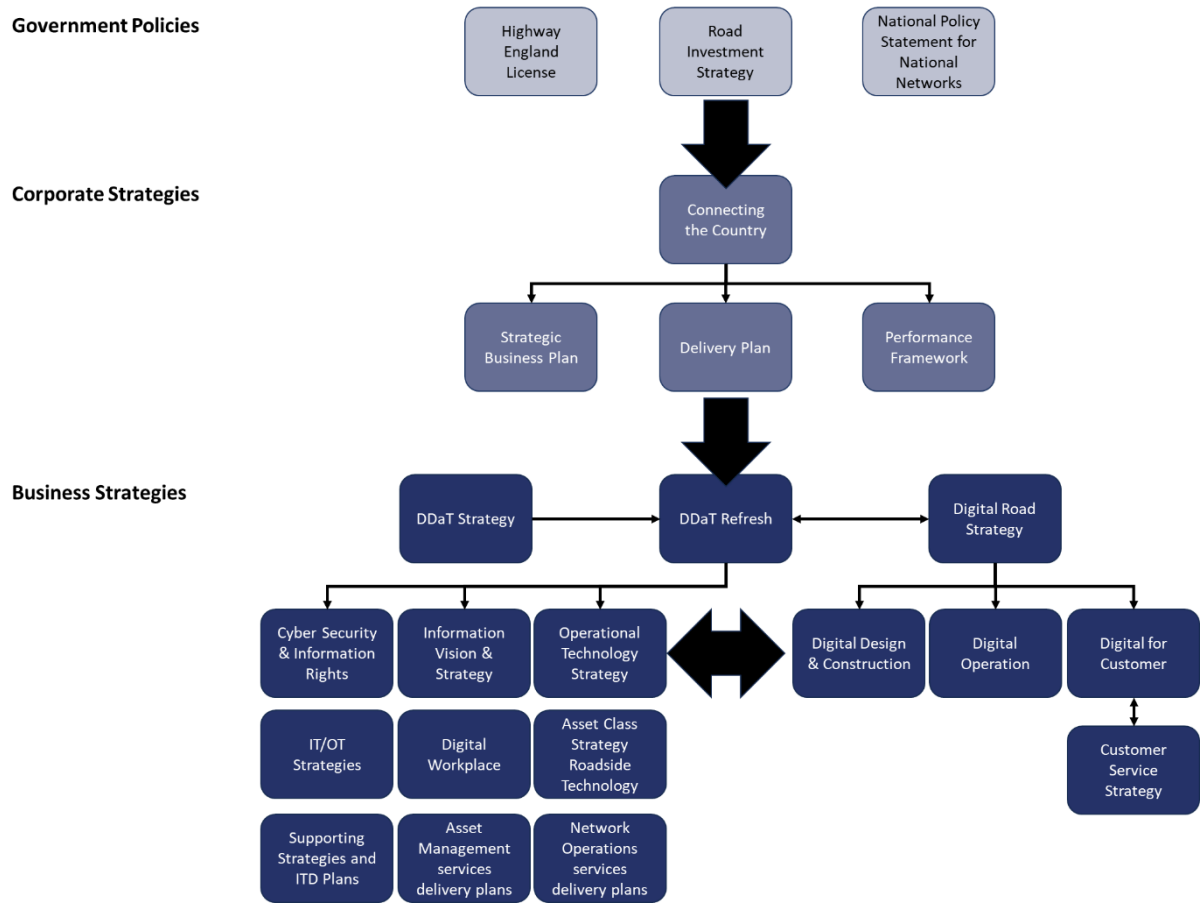


Figure 2 Strategy Relationships

3.3 Digital Services

3.3.1 National Highways has set out a vision for its operating approach (in National Highways' annual report and accounts 2023). It is reaching the third stage of its transformation journey, where it describes itself having moved from a road builder, to a road operator, and further transitioning itself to a service provider in RIS3.

3.3.2 The Digital Services Business Plan 2024 to 2025 indicates how Digital Services will play an increasingly important role in the operational and information technology landscape to enable and lead the business through this self-described transition towards being a service provider.

3.3.3 Digital Services provides the data, technology, and digital infrastructure to make safe, reliable, and efficient journeys on the SRN. Underpinning the infrastructure are services that support the operation and function of the organisation, which span the operational and information technology landscape. Digital Services is structured into 12 divisions (as below). Each division has its specific purpose and a set of capabilities, contributing to information technology and operation technology across the business in a joined-up approach.

- Architecture Design and Technology Service
- Business Partnering
- Chief Data Office
- Corporate Technology
- Cyber Security and Information Rights
- Digital Change
- Enterprise Resource Planning

- Office of the CDIO
- Service Operations
- Service Operations Operational Technology
- Strategy and Portfolio
- Technology Programmes

3.3.4 Digital Services owns and works to the DDaT Strategy which sets out the focus for the remainder of the RIS2 period which is to 'enable journeys with digital, data and technology'.

3.3.5 This is aligned with National Highways' Strategic Business Plan 2020 to 2025 and Connecting the Country, the long-term strategic plan. The DDaT Strategy which was updated in November 2023 focuses on what National Highways will achieve over this current road period and establishes a baseline of ambitions for the next road period.

3.3.6 The following section takes a top-down approach to highlight how National Highways' vision and objectives propagate from Government Policies and Corporate Strategies to the DDaT Strategy and other interfacing strategies.

3.4 Road Investment Strategy

3.4.1 The Road Investment Strategy (RIS) outlined how DfT could realise the opportunity, combined with the reform of the Highways Agency, to transform both roads and the experience of driving on them, whilst also addressing strategic imperatives such as economic growth and climate change. It set out a vision for smooth, safe and reliable motoring, more sustainable roads, and how cutting-edge technologies should be fostered. The first Road Investment Strategy (RIS1) was published in 2014.

3.4.2 In March 2020, the Government published its second Road Investment Strategy (RIS2), which covers investment in and management of the SRN from April 2020 to March 2025. It set out the Government's vision for a safer, more reliable and greener SRN which uses new technology, supports the country's economy and is an integrated part of the national transport network. A total of £27.4 billion was initially allocated to support this vision, which has been revised to £24 billion in the Delivery Plan 2023 to 2024 (Figure 5).

3.4.3 RIS3, currently under development, will set out investment in the SRN during the third road period (2025 to 2030). It will build on the work taken forward in RIS2, investing in the network and improving the way it is operated and maintained. It will set out the performance specification that National Highways will be expected to adhere to during that period.

3.5 Strategic Business Plan and Delivery Plans

3.5.1 Over the first road period, ORR monitored National Highways' performance using the performance specification in the Government's RIS1. DfT has updated this specification for the second period, and National Highways has also prepared its own performance framework (6 performance outcomes agreed with DfT).

3.5.2 To respond to and align with RIS2, National Highways created its Strategic Business Plan and Delivery Plan.

3.5.3 The Strategic Business Plan (SBP) provides the high-level direction for every part of National Highways for the second road period, underpinned by three imperatives: safety, customer service and delivery. It is structured around six performance outcomes from the performance framework, as agreed with DfT, outlined in Figure 3 below.

Figure 3 Strategic Business Plan (2020 to 2025) performance outcomes

3.5.4 The Delivery Plan supports the Strategic Business Plan, covering core activities in operations, maintenance, and renewals, as well as delivery across the enhancement schemes. It also outlines National Highways' preparations for the third road period and shows how the organisation, including people, processes and technology will be developed.

3.5.5 The Delivery Plan provides performance metrics that measures performance of these core activities against target, in alignment with the performance outcomes set out in the Strategic Business Plan.

3.5.6 National Highways is shifting its focus towards a self-described service provider approach, and to facilitate this, Digital Services is reviewing its operating model to accommodate and enable its transition (Figure 4, a conceptual model which is still under discussion within National Highways). To manage the proposed organisational change and the fast-changing industry, National Highways also commits to continuously improving the Strategic Business Plan outcomes and the way these outcomes are reported, so a better alignment between strategies can be achieved. National Highways is also looking for opportunities to improve the transparency in the Strategic Business Plan by reporting not only on financial aspects but also on strategic outcomes.

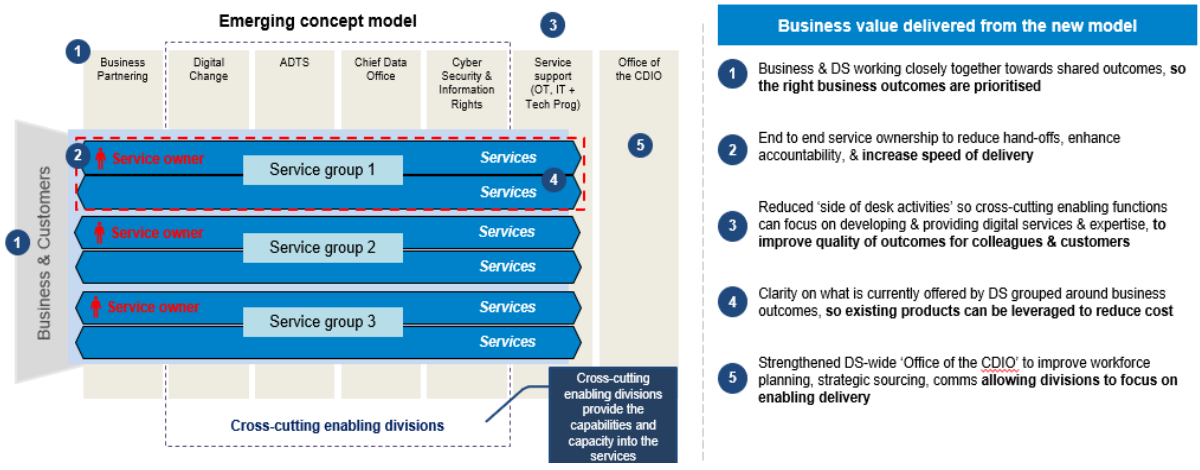


Figure 4 Digital Services' Conceptual Operating Model

3.5.7 To steer the shift, a new Operational Services Committee has been established at the executive level to deliver the message that efforts in the DDaT space are integral to underpin other services of National Highways.

3.5.8 The Delivery Plan 2023 to 2024 provides an annual update of National Highways' funding profile over the second road period highlighting the available funding for each core function. This is referenced in Figure 5 for context.

£m	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Operations and maintenance (Opex)	1,034	1,014	1,029	1,033	1,079	5,189
Operations and maintenance (Capex)	238	350	322	259	202	1,371
Renewals	734	858	902	859	914	4,267
Enhancements	2,027	1,773	1,983	2,228	2,474	10,485
Designated funds	162	150	165	232	247	956
RP3 preparation and development	20	70	130	180	143	543
How we run our network (Opex)	167	146	162	171	174	820
How we run our network (Capex)	76	85	66	66	85	378
Total	4,458	4,446	4,759	5,028	5,318	24,009

Figure 5 RP2 Funding Table 2023 to 2024 (Source: Delivery Plan 2023 to 2024)

Recommendation 1 - Our assessment and findings suggest the executive level of National Highways has a common understanding of (1) DDaT primarily being an enabler of National Highways' services as well as outcomes and priorities in DDaT development; and (2) DDaT underpins the efficiency challenge for National Highways as an organisation. To enhance clarity and cohesion between ORR and National Highways, ORR should make use of direct engagement in the quarterly update meeting (established in 2023) between ORR and Digital Services. This is to better understand National Highways' priorities and outcomes in DDaT aspects, and how the DDaT initiatives contribute to overarching organisational goals and performance metrics. It is proposed that quarterly performance and delivery material is agreed and used at each quarterly meeting as a consistent discussion item.

3.6 Development of DDaT Strategy

3.6.1 The initial DDaT Strategy was developed a year after the commencement of RIS2 (2020 to 2025) and published in May 2021. At that time, National Highways as an organisation was relatively young following the transition from Highways England, and much of its technology initiatives were amalgamated from various regional functions. This version aimed to engender greater strategic alignment between functions that were previously positioned within different parts of the organisation and offer a simplified overview of objectives for the RIS2 period and beyond.

3.6.2 It defined three delivery objectives that contribute to the six performance outcomes set out in the Strategic Business Plan.

Figure 6 DDaT Strategy 2021 Objectives (Source: DDaT Strategy)

3.6.3 **Objective 1 – Transforming services**: Using digital, data and technology (DDT) to provide more personalised and convenient services to road users, such as real-time traffic information and dynamic route planning. National Highways defined three approaches measuring against this progress (extracted from DDaT Strategy):

- Measuring performance as set out in the SBP investing National Highway's IT business partners' time and effort to build open, trusted relationships with colleagues so there is a constant feedback flow.
- Measuring benefits captured within business cases, and looking to continually improve what and how National Highways deliver.
- Working with customer facing colleagues to obtain real customer feedback.

3.6.4 **Objective 2 – Enabling people**: Empowering National Highways' workforce with the tools, data, and training they need to deliver the company's objectives. National Highways defined five approaches measuring against this progress (extracted from DDaT Strategy):

- Feedback from 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.
- Measure the fitness for purpose of National Highways' key data sets, as well as the data.
- Maturity of both National Highways and its supply chain partners who manage its data.

3.6.5 **Objective 3 – Improving delivery**: Streamlining processes and operations using DDT to enhance efficiency and reduce costs. National Highways defined three approaches measuring against this progress (extracted from DDaT Strategy):

- Review progress against specific roadmaps for the key projects, programmes and technology being delivered.
- Track trends on return on investment, considering; quality, cost and efficiency delivered for the services provided.
- Track 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.

3.6.6 The DDaT Strategy published in 2021 was reviewed and refreshed in 2023. The refreshed DDaT Strategy provides a greater degree of focus on what National Highways will achieve between 2023 and 2025, and to align with the key objective of its transformation programme in delivering tangible improvements in National Highways' performance.

3.6.7 The three core themes defined in the DDaT Strategy 2021 remain valid and have evolved and incorporated into five new strategic priorities. The refreshed DDaT Strategy now serves as the overarching vision for National Highways' digital direction, tying into all objectives, key results and performance metrics.

Figure 7 DDaT Strategy 2023 Five Strategic Priorities

- **Strategic Priority 1** – We aim to better inform our customers and provide them with trusted travel information, for example on road closures, ensuring that they feel safe and in control of their journeys. This goes beyond private road users. We must increase our offer to businesses, freight and hauliers who depend on our network to deliver for the UK.
- **Strategic Priority 2 –** We will continue to improve the security, reliability and resilience of our digital, data and technology services that enable us to continuously operate the strategic road network (SRN) in accordance with the legal and regulatory frameworks that we operate within.
- **Strategic Priority 3** – We will provide colleagues across National Highways and within our supply chain with the right tools and services to enable them to be effective in their roles, for example operating the SRN or enabling the organisation to deliver.
- **Strategic Priority 4** – We will invest in our digital, data and technology people, processes and technical capabilities ensuring we are set up to deliver for National Highways and the country.
- **Strategic Priority 5** – Digital, data and technology will help us to deliver our net zero, sustainability and social value agendas, by mapping our biodiversity corridors and calculating carbon data.

3.6.8 The mechanism for measuring the strategy's success is through National Highways' Quarterly Business Planning and Review (QBPR) cycle which aligns to its performance goals set out in the SBP. More details and assessments about the QBPR cycle can be found in Section 4.

Recommendation 2 - National Highways describes itself as transitioning to a service provider (from a road operator) and faces an increasing rate of technological change and advancement. ORR is recommended to conduct an annual evaluation of the DDaT Strategy and its alignment with other strategies to ensure that the company has the right initiatives and priorities in place. This is to provide assurance that National Highways is focusing on the elements that sustain an effective and efficient organisation. This has been demonstrated with the 2023 refresh and should form part of the annual business planning process.

Recommendation 3 - Given the described move towards being a service provider, the importance of digital to National Highways' future capability and the success of its operational delivery and strategic achievement is ensuring that there are clear expectations of National Highways in its Licence. ORR should work with National Highways to draft a relevant licence condition to discuss with DfT for the review of National Highways' licence for RP3.

3.7 Digital Roads

3.7.1 Digital Roads is a strategic initiative launched in 2021 to harness data, technology, and connectivity to transform the way the network is designed, built, operated, and used. Its ambition is to enable a safer strategic road network, faster delivery, and an enhanced customer experience for all.

3.7.2 The vision and plans for Digital Roads 2025 is set within three core themes, which are further expanded into three sub-themes.

- **Theme 1 – Digital Design and Construction** focuses on exploiting digital, data and technology during the design and construction phases, to improve safety, efficiency, and the environment.
  - Digitally enabled design.
  - Modular and standardised approaches.
  - Automated construction.
- **Theme 2 – Digital Operations** leverages data to drive increasingly pre-emptive interventions, resulting in improved asset resilience, increased asset life and a safer, smoother running network.
  - Intelligent asset management.
  - Enhanced operational capability.
  - Digitally enabled workers.
- **Theme 3 – Digital for Customer** brings together the Digital Roads and Customer Service strategies. Working with the wider industry, such as journey planning providers, data and technology services are more readily available so that these companies can deliver improved services to road users.
  - Information provision.
  - Customer engagement.
  - Partnerships and alliances.

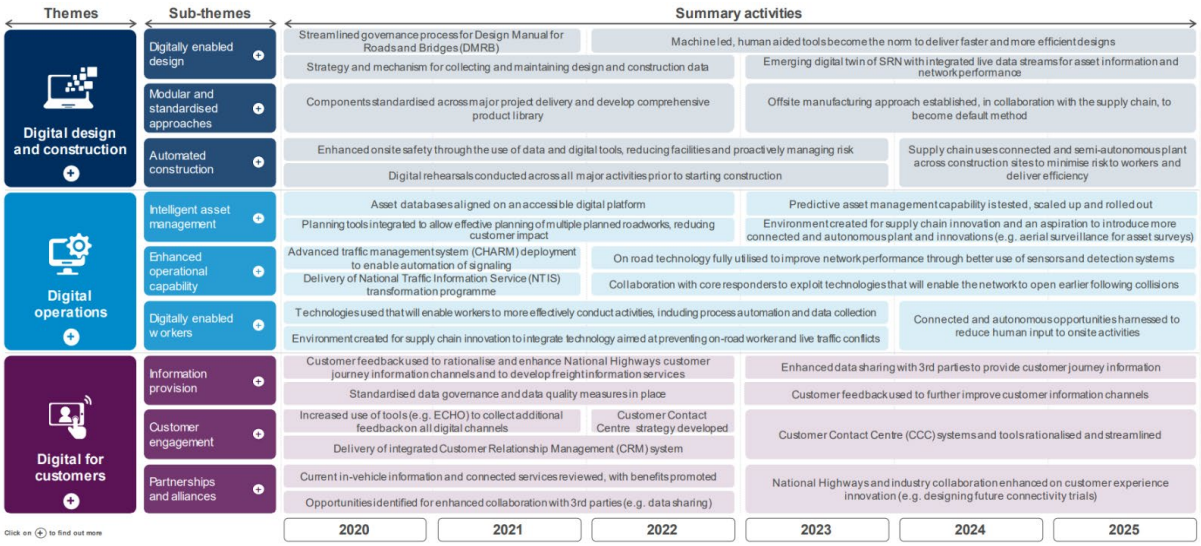


Figure 8 Digital Roads 2025 Roadmap (Source: Digital Roads Interactive Roadmap)

3.8 Operational Technology Strategy (2025 to 2035)

3.8.1 The Operational Technology Strategy is National Highways' strategy in response to the market trend and expectation for data-rich, near real-time information to monitor and influence use of the SRN, as well as a progressive shift towards connected vehicle technology and services.

3.8.2 The Operational Technology Strategy provides both the supply chain and National Highways guidance on how to deliver the Operational Technology objectives outlined in the wider strategies, i.e., Connecting the Country 2050, Strategic Business Plan, Digital Roads and DDaT Strategy.

3.8.3 Prior to the current Operational Technology Strategy, there existed a version developed in 2015, which was the first attempt to outline Operational Technology in a strategic context. However, the strategy at that time was more tactical in nature and did not emphasise a long-term strategic direction.

3.8.4 For the most recent version published in 2022, National Highways went through a one-year iterative process communicating internally and gathering feedback from stakeholders within the business and industry, and enhanced the strategy into its current form which better aligns with National Highways' goals and objectives.

3.8.5 The current Operational Technology Strategy is based around seven themes.

- Strategic theme 1: Safety
- Strategic theme 2: Net zero
- Strategic theme 3: Connecting customers
- Strategic theme 4: Collaboration
- Strategic theme 5: Efficiencies
- Strategic theme 6: Legislation and Regulation
- Strategic theme 7: Technology

3.8.6 In view of the recent DDaT Strategy refresh and developments in Digital for Customer, National Highways' Operational Technology team plans to refresh the Operational Technology Strategy in the next financial year to ensure ongoing alignment with the wider goals and objectives and provide practical responses to the revised strategies.

3.9 Alignment Assessment - DDaT Strategy, Strategic Business Plan and Delivery Plan

3.9.1 The DDaT Strategy demonstrates a strong alignment with the overarching Strategic Business Plan, especially on performance goals and outcomes. The DDaT Strategy aligns with most improvement area

items in the operations and maintenance section of the Delivery Plan as illustrated in the high-level mapping below (Table 1).

3.9.2 The DDaT Strategy outlines digital initiatives addressing improvement areas stipulated in the Delivery Plan, such as:

- Implementation of digital asset management technology across the road network to address automation and efficient ways of working in *"rolling out operational excellence" and "delivering data-driven maintenance"*.
- Improvement of Digital Assist (i.e. IT self-service support platform providing customer support) to address helping customers through self-serve channels in *"improving the information we provide to customers"*.
- Migration towards cloud-based infrastructure to address "modernising our information technology systems" and "replacing our control centre technology".

Delivery Plan Section	Improvement Area	Contain Technology Element?	Addressed in DDaT Strategy?
Operations	Keeping our network moving through the work of our frontline services	Y	Y
	Supporting better end-to-end journeys	Y	Y
	Improving the information we provide to customers	Y	Y
	Upgrading our fleet	N	N/A
	Helping customers travel safely in winter	N	N/A
	Improving environmental performance and helping make journeys more sustainable	Y	Y
	Modernising our information technology systems	Y	Y
	Replacing our control centre technology	Y	Y
	Rolling out Operational Excellence	Y	Y
Maintenance	Delivering data-driven maintenance	Y	Y
	Improving environmental performance	N	N/A
	Managing our soft estate	N	N/A

Table 1 Alignment Analysis between Delivery Plan and DDaT Strategy

3.9.3 The DDaT Strategy 2023 refresh states explicitly that outcomes will be measured through the QBPR cycle which aligns to the goals set out in the Strategic Business Plan. DDaT also aligns with PIs such as PI 3.3 Technology Availability to form part of the performance framework.

3.9.4 Despite the strong strategic alignment, it is not straightforward to directly measure the specific impact that each DDaT Strategy initiative has on the Delivery Plan objectives and performance framework. This is because the activities and initiatives underpinning the DDaT Strategy often play an enabling, contributing and interconnecting role across the organisation. For example, the delivery of technology innovation and business change enables National Highways to work innovatively both internally and with customers through a series of deliverables like data services providing SRN information, supporting services and decision support tools for staff.

3.9.5 The Delivery Plan focuses mostly on tangible metrics and targets rather than efficiency-boosting and effectiveness-enhancing elements. However, these intangible aspects are crucial for understanding National Highways' operations across different teams, and how they contribute to the overall enhancement on effectiveness and efficiency, as well as overarching organisational goals, PIs, and KPIs.

3.9.6 It is also worth noting that, from our assessment, alignment with environmental performance (net zero, sustainability) could be identified at a higher level i.e., between performance outcomes and strategic priorities. The alignment is relatively high-level and weaker compared to others (i.e. Initiative "deploying

sensor technology and data science to predict demand, weather, environmental, traffic and asset conditions" is the only one stipulated in DDaT Strategy).

Recommendation 4 - The DDaT Strategy as an enabling element and foundation for National Highways' operational capabilities, provides enhancements to National Highways' service effectiveness and efficiency. ORR should discuss with National Highways how it plans to directly measure contributions of DDaT initiatives to the overarching organisational goals, PIs and KPIs, providing more visibility and with considerations beyond the availability of systems. This would help National Highways demonstrate how digital helps it to satisfy the conditions of its licence and delivery of the RIS.

3.10 Alignment Assessment - DDaT Strategy and Digital Road Strategy

3.10.1 According to our assessment, the DDaT Strategy, together with Digital Roads, are positioned in the middle level of National Highways' strategic landscape, namely as Business Strategies. As such, both strategies inherit visions and objectives from National Highways' Corporate Strategies, that are positioned in the strategic tier above, and provide a coordinated approach in delivering against the strategic objectives.

3.10.2 Both strategies are also designed and presented in the form of a service lifecycle (as shown below), cutting across directorates and divisions. The DDaT Strategy refresh also recognises the delivery progress in Digital Roads (mainly Digital Design and Construction, and Digital for Customer), since its inception. One of the notable initiatives is Connected and Autonomous Plant (CAP) which involved collaborative efforts across teams, including the Innovation and Procurement teams, and supply chain.

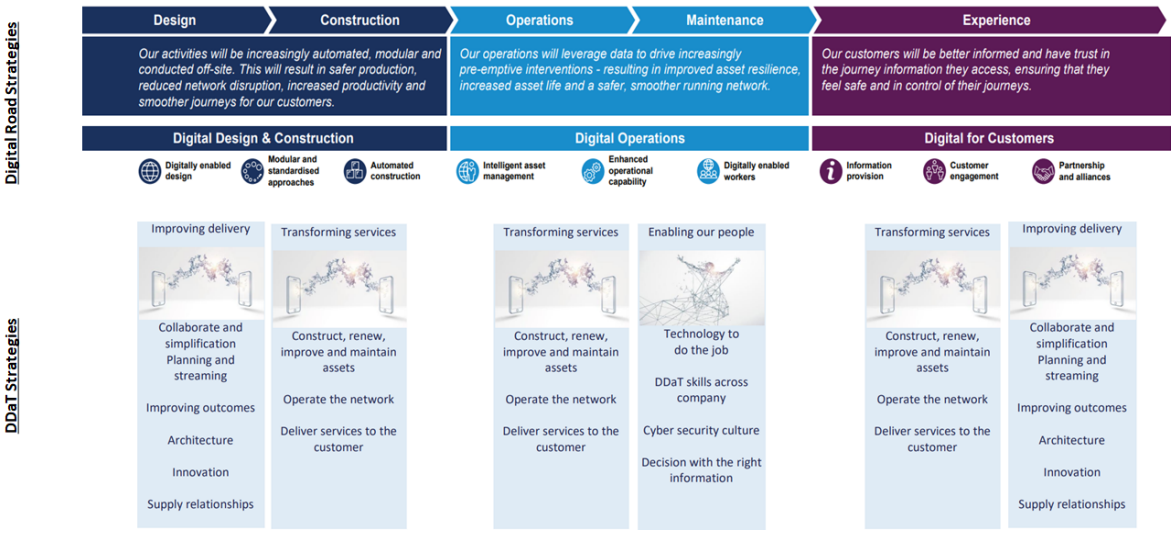


Figure 9 Alignment Analysis between Digital Roads and DDaT

3.10.3 Despite the similarities between Digital Roads and the DDaT Strategy, they focus on different prospective audiences. Digital Roads targets National Highways' supply chain and stakeholders, providing an overview that bridges between the Digital Roads' ambitions, achievements and its internal digital direction. On the other hand, the DDaT Strategy details the strategic direction of National Highways and outlines overall changes, tying together objectives, key results and performance factors as set out in the Strategic Business Plan.

3.10.4 Timing plays an important role in understanding the connection between the two strategies. The first version of the DDaT Strategy was published in May 2021, and Digital Road was subsequently formally launched in September 2021. As such, one of the DDaT Strategy refresh objectives was to draw an alignment between the two strategies, with the overarching RIS2 remaining the golden thread connecting them.

3.10.5 The DDaT Strategy refresh recognises Digital Roads' delivery progress and provides narrative on how Digital Road's themes are related to its strategic priorities. For example, Digital for Customer prioritises

keeping customers better informed, aligning with the DDaT Strategy's goal of providing enhanced data for customer journeys and wayfinding through apps, including Sat Nav apps.

3.11 Alignment Assessment - DDaT Strategy and Operational Technology Strategy

3.11.1 The Operational Technology Strategy sits under the DDaT Strategy and Digital Roads in view of its focus being Operational Technology. This is supported by demonstrating direct correlations and responses to the challenges and key themes within the DDaT Strategy and Digital Roads.

3.11.2 The Operational Technology Strategy is considered a response to the DDaT Strategy and Digital Roads, and provides direction on how National Highways could achieve the ambitions with the supply chain, academia and consultants collaboratively. It provides a detailed exploration of how the goals can be achieved from an Operational Technology perspective, and sets out a longer-term development plan detailing the likely impact from implementing various technologies.

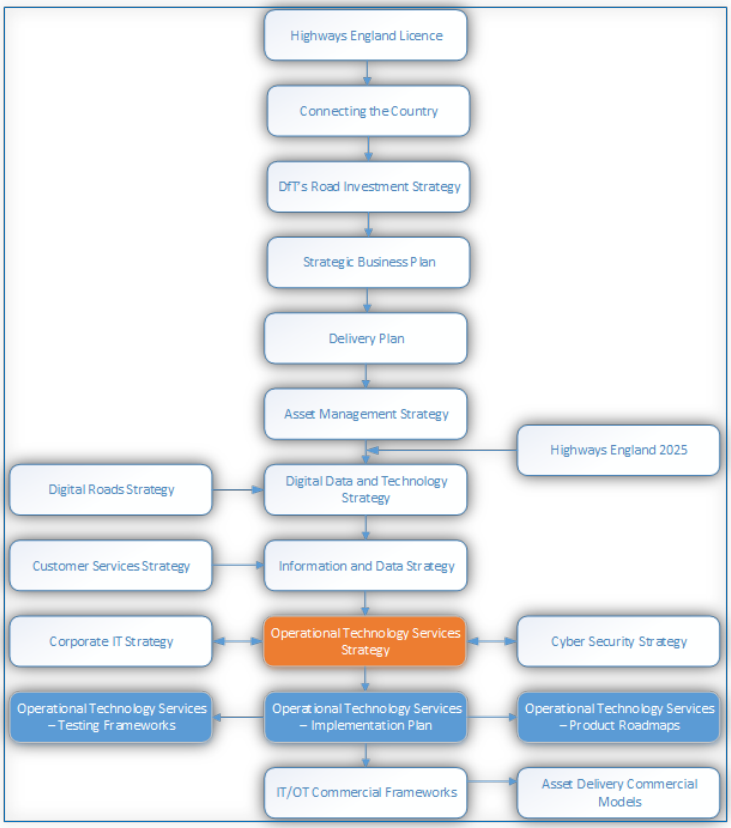


Figure 10 Extract of Operational Technology Strategy Support Document

3.11.3 Operational Technology and the way it's being managed supports at least three priorities set out in DDaT Strategy: improving safety (Strategic Priority 1), providing customers with the best possible experience (Strategic Priority 2) and delivering our work in the most efficient and effective way (Strategic Priority 3).

4. DDaT Impact Assessment

4.1 Analysis and Constraints

4.1.1 For this section, ORR asked us to provide, an assessment of the benefits that National Highways has realised or is in the process of realising through delivery of its DDaT Strategy, and the impact on RIS2 KPIs and PIs.

4.1.2 In order to undertake this assessment, the following information was requested:

- Supporting evidence highlighting progress of the DDaT Strategy initiatives and outcomes, including information relating to benefit assessments of the initiatives.
- Supporting evidence to understand the impacts of the DDaT Strategy initiatives and their relationship to RIS2 KPIs and PIs.

4.1.3 Information was provided by National Highways for each DDaT Strategy initiative through its QBPR process, which described each initiative, their objectives and the underpinning Key Results of each. Information relating to the impact on RIS2 KPIs and PIs was not provided as these were not available.

4.1.4 Given the information at hand, our analysis provided:

- A summary of the initiatives and objectives under each strategic priority, grouping these into aligning themes.
- An assessment of the initiatives, providing a high-level overview of their likely impact on the RIS2 KPI and PI outcomes.
- A snapshot of the general progress, and confidence to complete based on time and cost estimates for the Key Results.

4.2 Overview

4.2.1 Section 3 outlined in detail the evolution of the DDaT Strategy and highlighted the revised five strategic priorities based off of the 2023 refresh.

4.2.2 As per the DDaT Strategy 2023 refresh, over the remainder of this road period National Highways will measure the success against the five strategic priorities, through its QBPR cycle, aligning to the performance goals set out in the Strategic Business Plan 2020 – 2025.

4.2.3 This approach is important as it serves to form the backbone of a robust strategic framework that supports alignment with overarching business goals, aligning to RIS2 KPIs and PIs. Measuring the impact of the five strategic priorities allows National Highways to assess how the strategic priorities and associated initiatives contribute to key business outcomes and objectives. Through assessing the benefits delivered, it supports the validation of its efforts, and enables activities to be directed towards areas of highest impact.

4.2.4 Through the evaluation and assessment of the benefits and impacts delivered by the strategic priority initiatives, National Highways is able to optimise resources accordingly, and support effective investment decisions being made. It also facilitates a greater degree of accountability, driving teams to consistently monitor, evaluate, and refine their approach in response to performance data and evolving business conditions.

4.2.5 As part of the QBPR process which monitors the status of the strategic priority initiatives within the DDaT Strategy, the five strategic priorities have been simplified by National Highways into the below:

- Customer
- Risk
- Enabling NH
- Colleague
- Environment and Sustainability

4.2.6 These areas, along with the activities that underpin them as part of the QBPR process, were formalised in early 2023, where National Highways took a bottom-up and top-down approach to consolidate the various areas of work that were being delivered to meet the strategic business needs and operational requirements of the DDaT Strategy.

4.2.7 Through the QBPR cycle, National Highways has a structured approach to measure, monitor and report on delivery activities underpinning and supporting the realisation of the five strategic priorities outlined in the 2023 DDaT Strategy refresh. There are currently 51 QBPR initiatives, each with a specific outcome and objective, and underpinned by a total of 180 activities (Key Results).

4.2.8 To improve alignment between the expected outcomes of the QBPR initiatives, i.e., its objectives, and the impact on RIS2 performance goals, the QBPR process for each initiative should also include its likely impact on performance goals from their implementation.

Recommendation 5 – ORR should work with National Highway to ensure that as part of the QBPR process, in addition to the identification and reporting of the initiatives, National Highways also includes the likely impact on performance goals from their implementation, aligning to the Strategic Business Plan's performance objectives. This is important as it would better demonstrate the likely impacts to the RIS2 KPIs and PIs, and serve as a basis to monitor performance effectively. This should form part of ORR's holding to account remit and it should consider incorporating this element into the monitoring reporting guidelines for RP3.

4.2.9 Aligning to the five strategic priorities, below highlights a summary of the initiatives outlined in the QBPR and their key objectives, a high-level assessment of the potential impacts of the initiatives on RIS2 performance goals, and an overview of the status (progress of delivery) and a confidence to complete (achieved within designated time and cost metrics) of the activities underpinning the initiatives for this road period.

4.3 Customer

4.3.1 Summary of initiatives

4.3.2 Customer experience and quality of information:

- Developing internal decision support tools and become an active member of the journey planning ecosystem, improving data accessibility and quality to road users via third-party organisations.
- Developing a suite of services to ensure data is timely and accurate, supporting customers to feel safe and in control of their journeys.

4.3.3 Integration of data and performance:

- The National Traffic Information Service (NTIS) modernisation project aims to integrate journey data into the Data as a Service (DaaS) platform, enabling a better understanding of network delays, safety, environmental performance, and the impact of changes across the network.

4.3.4 Customer relationship management:

- Developing a centralised common Customer Relationship Management (CRM) data model and platform to streamline customer data management and enhance processes around customer relationships.

4.3.5 Key Objectives

4.3.6 Data accessibility:

- Making Digital for Customer data products through Application Programming Interfaces (APIs) accessible.
- Creating a suite of services to ensure data is timely, accurate, and fit for purpose for journey safety and control.

4.3.7 Data facilitation and integration:

- Increasing the number of road users accessing National Highway data through third-party organisations.
- Developing internal decision-support tools to enhance the journey planning ecosystem.
- Implementing a modern cloud-based system for near real-time traffic information and data management, supporting KPIs, and RIS3 delivery.
- Consolidating disparate CRM data into a unified system for a more complete understanding of customer interactions, improving customer experience and service delivery.

4.3.8 Potential impact of initiatives on RIS2 KPIs and PIs

4.3.9 The following outlines our assessment of the impacts of the DDaT Strategy initiatives on the RIS2 KPI and PI outcomes:

4.3.10 Improved availability of Digital for Customer data products (**QBPR 26**) would enhance user information and third-party integration, by disseminating real-time information to road users, and enabling third parties to integrate the data into their services, extending the reach and utility of National Highways' data. RIS2 KPIs and PIs impact: *Meeting the needs of all users, Improving safety for all, Providing fast and reliable journeys, Achieving efficient delivery.*

4.3.11 The provision of a suite of services for timely and accurate data to customers (**QBPR 27**) would improve journey planning and safety, and support a customer centric approach, tailoring information to be relevant and easily accessible in one place. RIS2 KPIs and PIs impact: *Meeting the needs of all users, Improving safety for all, Providing fast and reliable journeys.*

4.3.12 Active participation in the journey planning ecosystem (**QBPR 28**) would increase the number of customers accessing quality data, and provide internal decision support tools, improving the efficiency and effectiveness of operational decisions. RIS2 KPIs and PIs impact: *Meeting the needs of all users, Improving safety for all, Achieving efficiency delivery, A well maintained and resilient network.*

4.3.13 The provision of a modern cloud-based system for real-time traffic information (**QBPR 29**) would improve operational efficiency and network management. RIS2 KPIs and PIs impact: *Providing fast and reliable journeys, Meeting the needs of all users.*

4.3.14 Consolidating customer data from siloed systems (**QBPR 30**) would improve customer experience, and efficient service delivery, by providing a unified and holistic view of customer interactions and streamlining its customer service processes. RIS2 KPIs and PIs impact: *Meeting the needs of all users, Providing fast and reliable journeys, Achieving efficient delivery.*

4.3.15 Status and Confidence to Complete

4.3.16 Underpinning each QBPR initiative is a set of activities (Key Results). As part of the QBPR process, the status of each Key Result is measured based on a percentage completion progress rating and assessed through a RAG rating of its confidence to complete in terms of time and cost. For the Customer related Key Results, the table below summarises this information.

Progress	Confidence to Complete			Total
	Green	Amber	Red	
0% Not Started	2			**2**
1 to 84% Started	9	2	2	**13**
85 to 99% Nearing Completion	3	1		**4**
100% Completed	1			**1**
	15	**3**	**2**	**20**

Table 2 Customer Strategic Priority QBPR Key Results Status (January 2024)

4.4 Risk

4.4.1 Summary of initiatives

4.4.2 System and service upgrades:

- Addressing challenges in Regional Operations Centres (ROCs) with outdated technology through the CHARM initiative.
- Implementing the National Enforcement Compliance System (NECS) and National Roads Telecommunications Service (NRTS2).

4.4.3 Cyber security and compliance:

- Strengthening cyber security governance, risk management, compliance, and awareness across all directorates, including initiatives in employee education, phishing susceptibility reduction, cyber incident response, proactive monitoring, and threat intelligence.

- Aligning revised technical specifications with emerging operating models and cyber requirements to ensure compliance with operating licences.

4.4.4 Information and risk management:

- Establishing a central repository for Digital Services policies, standards, and specifications, and determining roles and responsibilities for records management to enhance transparency, privacy, and data accessibility.
- Implementing a robust approach to risk management and reporting within Digital Services.

4.4.5 Key Objectives

4.4.6 Technical specification consistency:

- Revising technical specifications in line with new operating and cybersecurity requirements to achieve a unified model, addressing outdated technical specifications, and focusing on consistency.

4.4.7 Operational efficiency:

- Enhancing risk identification, management, and reporting, along with controlled transitions in Regional Operation Centres (ROCs) for improved operations and customer information delivery.
- Developing new systems to ensure compliance with smart motorway regulations and addressing end-of-life equipment.

4.4.8 Cybersecurity awareness:

- Raising awareness and training employees in cybersecurity, including phishing simulations, tailored awareness sessions, and establishing key performance indicators (KPIs) for incident response.

4.4.9 *Information governance*:

- Complying with the Freedom of Information Act, revising data protection impact assessment processes for GDPR compliance, and establishing clear methods for assessing risk and control in information rights.
- Developing roles and responsibilities for records management, controlling access to a central repository, and addressing non-compliance issues.

4.4.10 Potential impact of initiatives on RIS2 KPIs and PIs

4.4.11 The following outlines our assessment of the impacts of the DDaT Strategy initiatives on the RIS2 KPI and PI outcomes:

4.4.12 Revising technical specifications with new operating model and cyber requirements (**QBPR 19**), can enhance security and compliance, by improving the resilience of systems and mitigating against con-compliance threats. RIS2 KPIs and PIs impact: *Improving safety for all, Providing fast and reliable journeys.*

4.4.13 A consistent approach in managing the tunnel estate (**QBPR 20**) would provide improved long-term asset management outcomes, improving the maintenance and management of infrastructure. RIS2 KPIs and PIs impact: *A well maintained and resilient network, Achieving efficiency delivery.*

4.4.14 Improving risk identification, management and reporting (**QBPR 21**) could positively impact risk mitigation, ensuring effective risk management enabling operational continuity and safety. RIS2 KPIs and PIs impact: *Improving safety for all.*

4.4.15 Upgrading Regional Operations Centre's end-of-life equipment and systems (**QBPR 22**) can enhance operational efficiency, improving timely customer roadside information and reducing legacy costs. RIS2 KPIs and PIs impact: *Providing fast and reliable journeys, Meeting the needs of all users, Achieving Efficient Delivery.*

4.4.16 Developing new systems for smart motorway compliance (**QBPR 23**), can improve regulatory compliance and safety, through supporting road user comfort, and performance standards adherence. RIS2 KPIs and PIs impact: *Improving safety for all, Providing fast and reliable journeys.*

4.4.17 Core Network Migration (**QBPR 24**) ensures continued reliability and efficiency of the digital infrastructure. RIS2 KPIs and PIs impact: *Providing fast and reliable journey times.*

4.4.18 Establishing KPIs for SOC utilisation (**QBPR 38**) and increasing visibility of SOC and supplier collaboration (**QBPR 39**), can support incident management efficiency and enhanced security through optimising response to security incidents, and enhancing overall security. RIS2 KPIs and PIs impact: *Providing fast and reliable journey times, Improving safety for all.*

4.4.19 Other initiatives (**QBPRs 25, 34, 35 to 45**), relate primarily to cyber security, and cover elements such as future proofing cybersecurity, proactive threat management, implementing secure by design principles, vulnerability management, enhanced security testing, and improving user threat detection and training. These initiatives are fundamental factors in enabling National Highways to meet it performance goals, as they facilitate and enable the operating effectiveness of the organisation.

4.4.20 Status and Confidence to Complete

4.4.21 Underpinning each QBPR initiative is a set of activities (Key Results). As part of the QBPR process, the status of each Key Result is measured based on a percentage completion progress rating and assessed through a RAG rating of its confidence to complete in terms of time and cost. For the Risk related Key Results the table below summarises this information.

Progress	Confidence to Complete				Total
	Green	Amber	Red	*NUL	
0% Not Started	5	5	4		**14**
1 to 84% Started	20	17	4		**41**
85 to 99% Nearing Completion	10	1			**11**
100% Completed	6				**6**
*NUL				2	**2**
	41	**23**	**8**	**2**	**74**

Table 3 Risk Strategic Priority QBPR Key Results Status (January 2024)

**NUL denotes no rating given*

4.5 Enabling NH

4.5.1 Summary of initiatives

4.5.2 People capability:

- Developing a resilient and robust People capability identifying skills gaps and moving away from reliance on third party contractors.
- Developing and implementing a Centre of Excellence to provide expertise and a coordinated approach to contract management, to ensure individuals effectively manage contracts to deliver value.

4.5.3 Operating approach:

- Implementing processes to maintain a current, available, and controlled view of technical infrastructure to ensure its safe usage.
- Agreeing upon, refining, and implementing a future operational model for Digital Services.

4.5.4 Governance:

- Integrating effective governance and controls within Digital Services.

- Establishing a robust business plan with regular reporting to align Digital Services activities with wider National Highways strategy.

4.5.5 *Innovation:*

- Using the Lower Thames Crossing (LTC) as a pathfinder for new technologies and digital approaches, with a focus on implementing identified technologies in relevant programmes.

4.5.6 Key Objectives:

4.5.7 *Future capability:*

- Addressing skills gaps and reliance on contractors to build a resilient people capability.

4.5.8 *Improved decision making:*

- Improved understanding and control of the technical landscape to manage risks and make informed investment decisions.
- Developing expertise in contract management and financial reporting, including implementing a Centre of Excellence for business intelligence for improved decision-making.

4.5.9 *Service delivery improvement:*

- Optimising the existing operating model to be more customer-centric and transparent, moving towards an end-to-end business service lead approach.
- Managing IT costs and contract processes more efficiently for better value and service delivery.
- Enhancing governance approaches to reduce compliance issues and improve delivery effectiveness.

4.5.10 *Strategic review:*

- Ensuring the DDaT strategy remains relevant and exploiting opportunities for innovation in key areas.

4.5.11 Potential impact of initiatives on RIS2 KPIs and **PIs**

4.5.12 The following outlines our assessment of the impacts of the DDaT Strategy initiatives on the RIS2 KPI and PI outcomes:

4.5.13 Improving people capability (**QBPR 1, 2**) can improve resilience, leading to more consistent and reliable service offering. RIS2 KPIs and PIs impact: *Achieving efficiency delivery, Providing fast and reliable journeys.*

4.5.14 Improving processes in the technical landscape (**QBPR 3**) would enable better informed investment decisions, and risk management, by better understanding the technical landscape and potential risks, and making more strategic investments in technology. RIS2 KPIs and PIs impact*: Improving safety for all, A well-maintained and resilient network, Achieving efficient delivery.*

4.5.15 A better understanding of the architecture and technical landscape (**QBPR 4**) can support risk mitigation by addressing gaps related to operational risks, and a more efficient management of resources. RIS2 KPIs and PIs impact: *A well maintained and resilient network.*

4.5.16 A refreshed approach to governance and digital service demands (**QBPR 5**) would improve compliance and effective governance, leading to fewer compliance issues and more efficient project execution. RIS2 KPIs and PIs impact: *Achieving efficient delivery, Improving safety for all, A well maintained and resilient network.*

4.5.17 Establishing a Centre of Excellence for Contract Management (**QBPR 7**) would improve contract efficiency, leading to a more effective contract management approach, potentially resulting in better value for money and improved service delivery. RIS2 KPIs and PIs impact: *Achieving efficient delivery.*

4.5.18 Optimising the operating model towards a customer centric approach (**QBPR 8**), would result in better alignment between the organisation and customers, improving and being more responsive to customer needs. RIS2 KPIs and PIs impact: *Meeting the needs of all users.*

4.5.19 Establishing a Centre of Excellence for business intelligence (**QBPR 11**), would provide better visibility and insights from data, driving improved decision making. RIS2 KPIs and PIs impact: *Achieving efficient delivery.*

4.5.20 Individuals effectively using commercial frameworks and managing contracts to deliver value (**QBPR 31, 32, 33**), would enable the effective management of suppliers, delivering costs savings, and greater innovation from the supply chain. RIS2 KPIs and PIs impact: *Achieving efficient delivery.*

4.5.21 Other initiatives (**QBPR 9, 10, 12, 13, 14**), such as upskilling people in financial management, keeping the DDaT Strategy relevant, and improving visibility on costs does improve capabilities within Digital Services, however, would have limited direct correlation and impact on RIS2 KPIs and PIs.

4.5.22 Status and Confidence to Complete

4.5.23 Underpinning each QBPR initiative is a set of activities (Key Results). As part of the QBPR process, the status of each Key Result is measured based on a percentage completion progress rating and assessed through a RAG rating of its confidence to complete in terms of time and cost. For the Enabling NH related Key Results the table below summarises this information.

Progress	Confidence to Complete				Total
	Green	Amber	Red	*NUL	
0% Not Started	1	12	3		**16**
1 to 84% Started	8	13			**21**
85 to 99% Nearing Completion	9	1			**10**
100% Completed	9				**9**
*NUL				12	**12**
	27	**26**	**3**	**12**	**68**

Table 4 Enabling NH Strategic Priority QBPR Key Results Status (January 2024)

**NUL denotes no rating given*

4.6 Colleague

4.6.1 Summary of initiatives:

4.6.2 User-centric approach:

- Achieving a comprehensive understanding within Digital Services of the needs and preferences of colleagues, enhancing user experience and satisfaction.

4.6.3 Improved workplace services:

- Overcoming barriers that hinder the improvement of workplace services, including addressing both technical and contractual factors, for enabling the adoption of more efficient, up-to-date workplace technologies and processes.

4.6.4 Key Objectives:

4.6.5 *Enhanced user experience*:

- Understanding the needs and preferences of individuals regarding how they want to access and utilise digital services.
- Streamlining the use of digital services, making it more user-friendly and intuitive for individuals.

4.6.6 Quality improvement:

- Providing high-quality, reliable corporate IT services, focusing on improving the overall quality and reliability of these services.

4.6.7 Potential impact of initiatives on RIS2 KPIs and PIs

4.6.8 The following outlines our assessment of the impacts of the DDaT Strategy initiatives on the RIS2 KPI and PI outcomes:

4.6.9 By understanding people needs and service use (**QBPR 15**) can enhance decision making, supporting network management and project delivery through a more informed and data-driven service offering. RIS2 KPIs and PIs impact: *Achieving efficient delivery, A well-maintained and resilient network, Providing fast and reliable journeys.*

4.6.10 Removing barriers to modernising workplace services (**QBPR 16**) can improve efficiency and agility in responding to challenges, leading to more streamlined operations, and responsiveness to changing needs. RIS2 KPIs and PIs impact: *Achieving efficient delivery, A well-maintained and resilient network, Providing fast and reliable journeys, Improving safety for all.*

4.6.11 By making it easier for people to consume digital services (**QBPR 17**) this can increase productivity, as individuals spend less time navigating cumbersome systems and more time on their core responsibilities. RIS2 KPIs and PIs impact: *All*

4.6.12 Providing high quality and reliable corporate IT services (**QBPR 18**), enhances reliability and continuity through the reduction in downtime and impact on internal process and operations. RIS2 KPIs and PIs impact: *Improving safety for all, Providing fast and reliable journeys.*

4.6.13 Status and Confidence to Complete

4.6.14 Underpinning each QBPR initiative is a set of activities (Key Results). As part of the QBPR process, the status of each Key Result is measured based on a percentage completion progress rating and assessed through a RAG rating of its confidence to complete in terms of time and cost. For the Colleague related Key Results the table below summarises this information.

Progress	Confidence to Complete			Total
	Green	Amber	Red	
0% Not Started	1	2		**3**
1 to 84% Started	3	5		**8**
85 to 99% Nearing Completion	5	1		**6**
100% Completed	1			**1**
	10	**8**		**18**

Table 5 Colleague Strategic Priority QBPR Key Results Status (January 2024)

4.7 Environment and Sustainability

4.7.1 Based on the QBPR information received from National Highways, there were no direct initiatives or activities aligning to Environment and Sustainability. This is a clear gap, meaning that for Strategic Priority 5 (*Environment and sustainability which is to use digital, data and technology to help National Highways to deliver its net zero, sustainability and social value agendas, by mapping the biodiversity corridors and calculating carbon data)*, no evidence was provided to suggest that National Highways are undertaking any initiatives in relation to this strategic priority.

4.7.2 This would suggest that as things stand, the DDaT Strategy initiatives are not supporting the Strategic Business Plan (2020 to 2025) performance outcome; delivering better environmental outcomes. It is understood however that initiatives and the progress of activities for Strategic Priority 5 will be embedded into the QBPR process in Q1 2024 to 2025.

Recommendation 6 – ORR should directly engage with National Highways to understand the reasons why there is a significant gap with respect to the omission of the DDaT Strategy's strategic priority 5 (Environment and Sustainability) initiatives as per the QBPR process. Given this is a strategic priority, and a significant element of National Highways' performance outcomes as set out in its Strategic Business Plan, it would be essential for National Highways to identify and determine the initiatives underpinning this priority, and ensure they are monitored, progressed, and reported on. It is

recommended that this should form a key area for discussion at the next quarterly meeting between ORR and National Highways scheduled for Spring 2024.

4.8 Assessing Benefits

4.8.1 Determining the direct benefits of digital, data, and technology initiatives, particularly in large and complex environments like National Highways, and assessing the direct impact on RIS2 KPIs and PIs can be challenging for several reasons:

4.8.1.1 Many DDaT initiatives are strategic in nature, with benefits that accrue over a long period. The long-term impacts can be hard to measure and attribute directly to specific initiatives, especially when other concurrent changes are taking place.

4.8.1.2 While some benefits, such as cost savings, are easily quantifiable, others, such as improved user satisfaction or employee morale, are harder to attribute.

4.8.1.3 DDaT initiatives often have complex interactions with other systems, processes, and factors. Disentangling the specific impact of a single initiative from the broader ecosystem can be challenging.

4.8.1.4 Effective measurement requires high-quality, relevant data. In some cases, the necessary data may not be available, or existing data may be of poor quality, making it difficult to accurately assess outcomes.

4.8.1.5 The success of DDaT initiatives often hinges on user adoption and effective change management. If these aspects are not managed well, it can skew the perceived effectiveness of the initiative or technology itself.

4.8.1.6 Benefits realised may be the result of a combination of various factors and initiatives, making it difficult to attribute them directly to specific DDaT strategies.

Recommendation 7 – Despite the difficulties in identifying the specific and attributable benefits delivered through the DDaT initiatives, ORR should encourage National Highways to apply a greater degree of focus on identifying the expected benefits and impact of the DDaT Strategy initiatives, as suggested in the 2023 refresh. This would be achieved through an effective benefit management process, to identify, measure, monitor and assess the expected impacts and realised benefits.

5. Digital Roads Assessment

5.1 Analysis and Constraints

5.1.1 For this section, ORR asked us to provide, a progress update against each of the deliverables detailed within National Highways' Digital Roads Roadmap, forecasting deliverability during this road period (RP2) and a confidence of delivery report.

5.1.2 In order to undertake this assessment, the following information was requested, however was not made available:

- Project and programme level documentation for each Digital Roads theme, highlighting each activity and project set out in the Digital Roads Roadmap, including, status and progress reports, project tracking details, risk and mitigation information.
- Benefits framework and benefits realisation plans for the ambitions set out in the Digital Roads Roadmap.

5.1.3 Key information provided by National Highways included:

- High-level monthly reports for Digital Design and Construction, and Digital for Customer.
- A delivery expectation assessment for Digital Design and Construction.
- Digital Roads high-level architecture and capability assessment.

- An assessment on Digital Roads' ambitions, delivery model, and alignment of each ambition against the original strategic intention.

5.1.4 Given the information at hand, our analysis provided:

- An overview of Digital Roads, its structure, how it is positioned within National Highways, and its delivery status.
- An overview of the alignment of each ambition against the original strategic intentions set out in the Strategic Business Plan 2020 to 2025.
- Considerations around business capabilities, and the capabilities being delivered through Digital Roads.
- Success stories and key outcomes being delivered through Digital Roads.

5.2 Overview

5.2.1 Digital Roads is a group of ambitions set out to harness data, technology, and connectivity to improve the way the SRN is designed, built, operated, and used. The purpose of which is to enable safer journeys, faster delivery, and an enhanced customer experience, aligning to RIS2 performance objectives.

5.2.2 The genesis of Digital Roads can be traced back to National Highways Strategic Business Plan 2020 – 2025, with its inception motivated by the anticipation of significant technological changes and the need to be more responsive and adaptable to increased technological demands. Digital Roads was officially launched in September 2021, setting out the ambitions for the RIS2 period.

5.2.3 Rather than being a standalone function, Digital Roads is a set of ambitions that guides the organisation towards modernisation, with an emphasis on efficient and strategic investment in technology and supporting functions. It represents an effort to enhance collaborative working across National Highways, aiming to reduce operational silos by adopting a matrix structure with a federated delivery approach.

5.2.4 Currently, National Highways is in the process of implementing and realising the ambitions outlined in Digital Roads, practically applying and integrating the planned initiatives into its operations, focusing on technological integration and innovation.

5.3 Organisation and structure of Digital Roads

5.3.1 As National Highways view Digital Roads as a set of ambitions rather than specific deliverables outlined in a structured programme, this is reflected in its approach to governance, reporting and delivery.

5.3.2 Digital Roads prioritises the reporting of achievements across various activities, emphasising the broader ambitions rather than focusing solely on traditional project delivery metrics. Whilst this allows for a more flexible structure, it doesn't facilitate a clear assessment of progress.

5.3.3 The strategic approach to Digital Roads is centred around enablers, supporting overall performance and operational improvements. As part of this enabler centric approach, the outcomes are closely integrated with National Highways' day-to-day operations, influencing various organisational activities. This strategic integration highlights its role in shaping operational and investment priorities, without being a standalone or structured programme.

5.3.4 Initially Digital Roads was overseen by a group called the Design Authority, which included representation from directors across the organisation. The oversight of Digital Roads has transitioned to the Central Transformation team, which is responsible for coordinating updates and progress across the three core themes; Digital for Customer, Digital Design and Construction, and Digital Operations.

5.4 Ambition Alignment

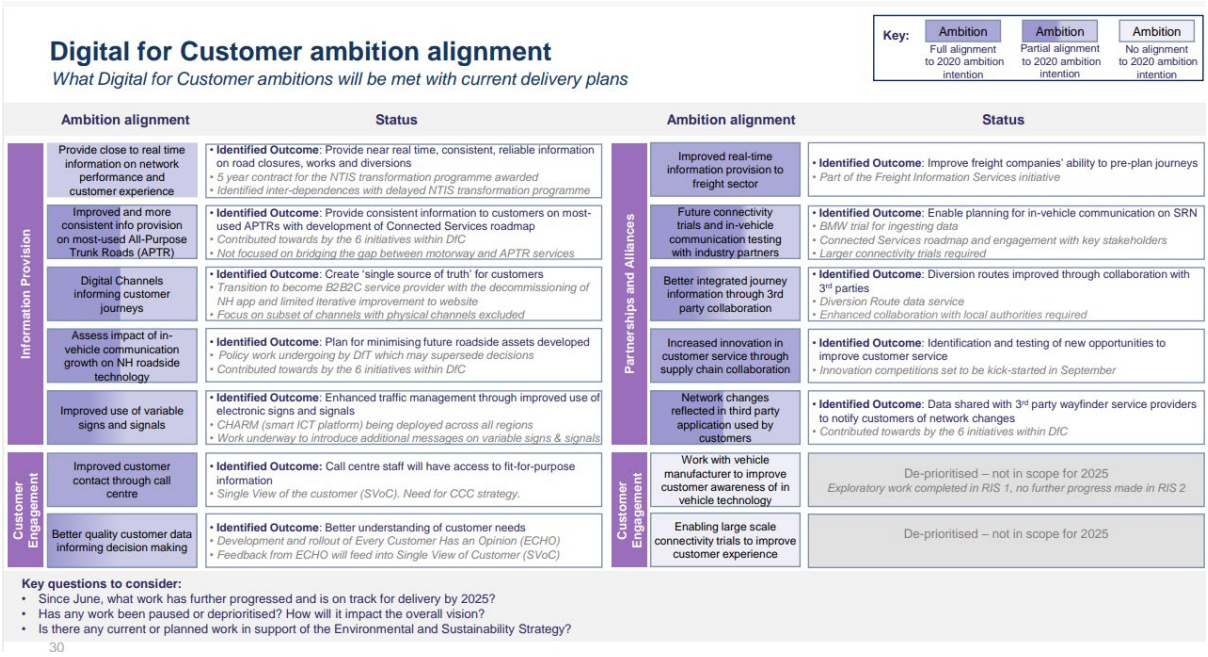
5.4.1 In early 2023 National Highways concluded a review of the Digital Roads ambitions determining the alignment to the initial ambition intentions set out in the Strategic Business Plan 2020 to 2025. This assessment of the ambitions reflects the evolving nature of Digital Roads' organisational goals, within an ever-evolving technological environment.

5.4.2 National Highways has been on a significant transformation journey, evolving from its original role as road builders during the Highways Agency era, to road operators, and now aiming to become a service provider. This evolution reflects a broader vision of the organisation to enhance its service delivery and customer focus, aligning with the ambitions of becoming more digitally integrated and customer centric. Aligning to this organisational transformation is the responsiveness of its strategies and the need for them evolve to meet the changing needs of its customers. The alignment review of the Digital Roads ambitions is a positive activity and demonstrates National Highways organisational introspection.

5.4.3 As an example of this review, a key improvement area under the Digital for Customer theme, was a shift towards a more value-led delivery model, pointing towards the need for better connectivity across Operations and a more cohesive approach to digital initiatives. National Highways is applying these learnings to refine its approach to the delivery of Digital for Customer ambitions.

5.4.4 Another example is the original ambition to increase the adoption of aerial inspections, using drones to support operational and maintenance activities. However, this proved to be impractical and was not implemented by Operations. This does not necessarily equate to failure in setting out the original ambitions, but rather reflects a pragmatic plan-do-review approach to testing the activities underpinning the ambitions and demonstrates a willingness to avoid the sunk cost fallacy trap.

5.4.5 For each of the three core themes, the outcomes of the ambition alignment review are outlined in the figures below:



Digital for Customer ambition alignment

What Digital for Customer ambitions will be met with current delivery plans

Key: Ambition — Full alignment to 2020 ambition intention; Ambition — Partial alignment to 2020 ambition intention; Ambition — No alignment to 2020 ambition intention

	Ambition alignment	Status
Information Provision	Provide close to real time information on network performance and customer experience	• **Identified Outcome**: Provide near real time, consistent, reliable information on road closures, works and diversions • *5 year contract for the NTIS transformation programme awarded* • *Identified inter-dependences with delayed NTIS transformation programme*
	Improved and more consistent info provision on most-used All-Purpose Trunk Roads (APTR)	• **Identified Outcome**: Provide consistent information to customers on most-used APTRs with development of Connected Services roadmap • *Contributed towards by the 6 initiatives within DfC* • *Not focused on bridging the gap between motorway and APTR services*
	Digital Channels informing customer journeys	• **Identified Outcome**: Create 'single source of truth' for customers • *Transition to become B2B2C service provider with the decommissioning of NH app and limited iterative improvement to website* • *Focus on subset of channels with physical channels excluded*
	Assess impact of in-vehicle communication growth on NH roadside technology	• **Identified Outcome**: Plan for minimising future roadside assets developed • *Policy work undergoing by DfT which may supersede decisions* • *Contributed towards by the 6 initiatives within DfC*
	Improved use of variable signs and signals	• **Identified Outcome**: Enhanced traffic management through improved use of electronic signs and signals • *CHARM (smart ICT platform) being deployed across all regions* • *Work underway to introduce additional messages on variable signs & signals*
Customer Engagement	Improved customer contact through call centre	• **Identified Outcome:** Call centre staff will have access to fit-for-purpose information • *Single View of the customer (SVoC). Need for CCC strategy.*
	Better quality customer data informing decision making	• **Identified Outcome**: Better understanding of customer needs • *Development and rollout of Every Customer Has an Opinion (ECHO)* • *Feedback from ECHO will feed into Single View of Customer (SVoC)*

	Ambition alignment	Status
Partnerships and Alliances	Improved real-time information provision to freight sector	• **Identified Outcome**: Improve freight companies' ability to pre-plan journeys • *Part of the Freight Information Services initiative*
	Future connectivity trials and in-vehicle communication testing with industry partners	• **Identified Outcome**: Enable planning for in-vehicle communication on SRN • *BMW trial for ingesting data* • *Connected Services roadmap and engagement with key stakeholders* • *Larger connectivity trials required*
	Better integrated journey information through 3rd party collaboration	• **Identified Outcome**: Diversion routes improved through collaboration with 3rd parties • *Diversion Route data service* • *Enhanced collaboration with local authorities required*
	Increased innovation in customer service through supply chain collaboration	• **Identified Outcome**: Identification and testing of new opportunities to improve customer service • *Innovation competitions set to be kick-started in September*
	Network changes reflected in third party application used by customers	• **Identified Outcome**: Data shared with 3rd party wayfinder service providers to notify customers of network changes • *Contributed towards by the 6 initiatives within DfC*
Customer Engagement	Work with vehicle manufacturer to improve customer awareness of in vehicle technology	De-prioritised – not in scope for 2025 *Exploratory work completed in RIS 1, no further progress made in RIS 2*
	Enabling large scale connectivity trials to improve customer experience	De-prioritised – not in scope for 2025

Key questions to consider:
- Since June, what work has further progressed and is on track for delivery by 2025?
- Has any work been paused or deprioritised? How will it impact the overall vision?
- Is there any current or planned work in support of the Environmental and Sustainability Strategy?

30

Figure 11 Digital for Customer ambition alignment

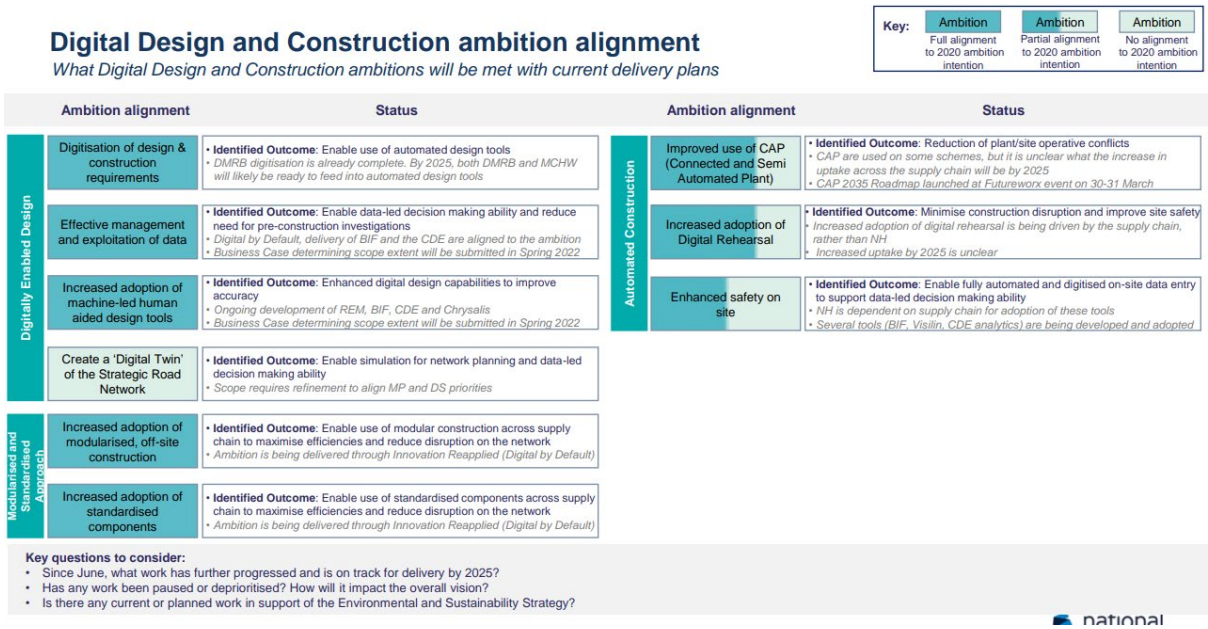


Figure 12 Digital Design and Construction ambition alignment

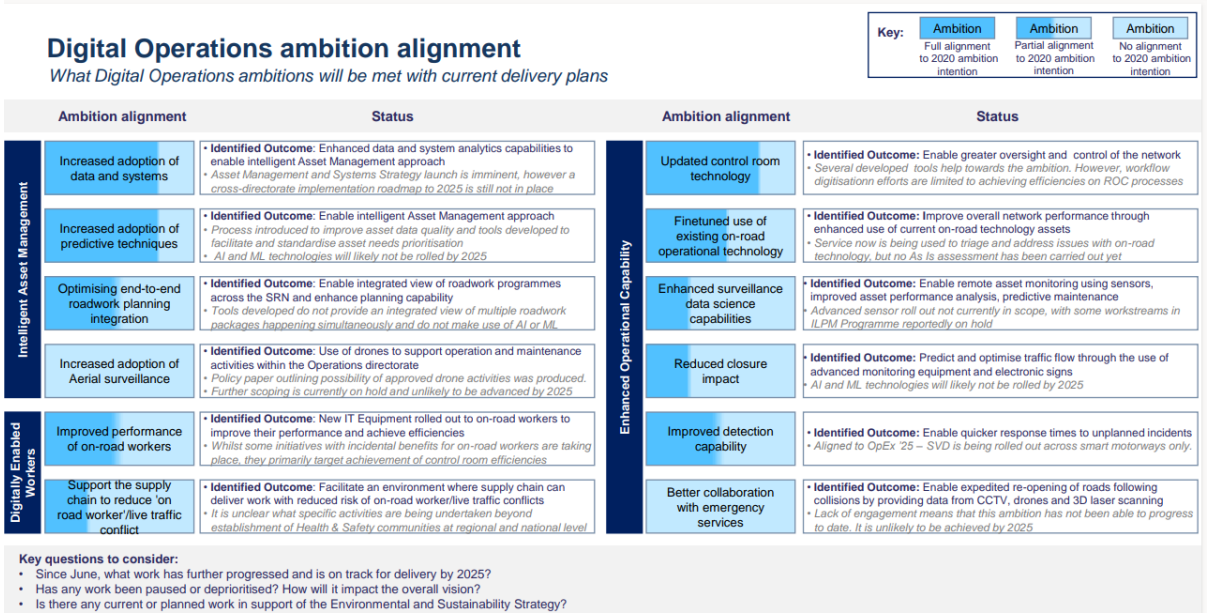


Figure 13 Digital Operations ambition alignment

5.5 Business Capabilities

5.5.1 In addition to undertaking an alignment review of the initial ambitions, National Highways has also assessed its high-level business architecture, and business capabilities with respect to Digital Roads. The assessment supported the development of a business capability model, with an aim to provide a common framework for a shared understanding across National Highways. The capability model enables National Highways to assess the current, and plan for future road periods through maturity assessments, facilitating the prioritisation and re-baselining of digital ambitions.

5.5.2 For the capability analysis, National Highways didn't solely concentrate on internal personnel capabilities; it extended the analysis to encompass mapping of systems and services delivering the ambitions.

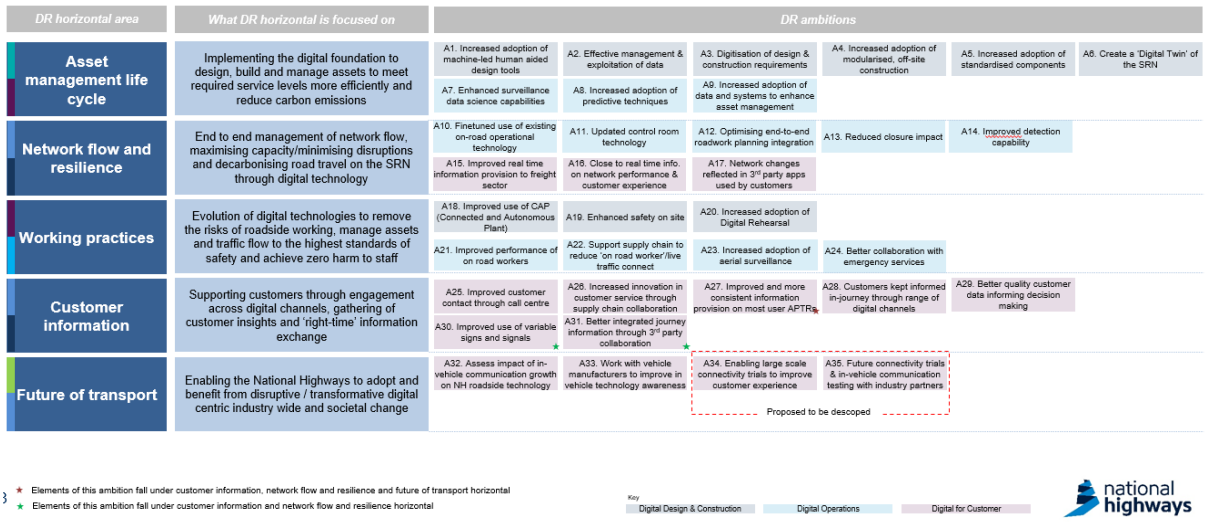


Figure 14 Digital Roads ambitions mapped

5.6 Capabilities delivered Digital Roads

5.6.1 The Digital Roads ambitions demonstrate a blend of systematic and tactical approaches aimed at enhancing capabilities and improved digital outcomes. The combination of these approaches indicates that Digital Roads is not either a purely systematic or tactical framework, but rather a strategic view incorporating long-term digital capability development, with the practical, project-based application of digital technologies. This approach should enable National Highways to improve its overall business capabilities, while addressing specific operational needs and opportunities through digital innovation.

5.6.1.1 As an example, Digital Design and Construction undertook activities such as the digitisation of the Design Manual for Roads and Bridges, and have enhanced the effective management and exploitation of environmental and spatial data. These types of activities demonstrate a broader vision to enhance business efficiency and operational effectiveness through the use of digital technologies.

5.6.1.2 Some digital initiatives are already embedded in National Highways business as usual, indicating a strategic integration of digital tools and processes into the organisation's core operations. The translation of strategic ambitions into specific projects, such as the collaboration with Operations on data gathering, highlights a focus on implementing digital tools and technologies to address specific operational challenges or opportunities.

5.6.1.3 The exploration and implementation of new technologies, such as open-data, and machine-led tools for automating construction processes, represent tactical moves to leverage digital advancements for immediate operational improvements and efficiencies.

5.6.1.4 Digital Roads explores the opportunity to marry up specialised needs and specialised functions, for example recognising the need for engineers to grasp data requirements, and for data specialists to understand engineering concepts. Bringing these skills together enables National Highways to create solutions that leverage data and technology to achieve clear business outcomes.

5.6.1.5 There have also been activities to improve safety on construction sites, where technology aids in tasks like receiving permits on handheld devices or wearing vests with embedded tech for enhanced safety protocols. Whilst seemingly small, these tactical advancements contribute to a safer workforce, efficient operations, cost-effectiveness, and an overall improved customer experience.

5.7 Delivery Assessment and Status

5.7.1 The timelines for achieving the ambitions vary, as outlined in the Digital Roads Roadmap. The Roadmap sets out the three core themes, the sub-themes beneath them, and the activities underpinning the realisation of the ambitions. The Roadmap outlines the ambition statements for each of the three core themes and sub-themes, with further detail in Appendix A1.

5.7.2 Through the Digital Roads workshop held with key stakeholders on 8th January 2024, it was highlighted that the majority, if not all, of the ambitions are targeted for completion within RP2, which shows a commitment to advancing National Highways' digital capabilities in the near term.

5.7.3 However, through this review, a break-down of the status of each activity set out in the Digital Roads Roadmap, and associated evidence to assess the status of Digital Roads progress against its Roadmap was requested, but this information wasn't provided. The initial intention was to undertake a deliverability forecast, and confidence of deliverability assessment against the Digital Roads activities as set out in the Roadmap for the remainder of this road period, however this hasn't been possible.

5.7.4 The reasoning for this information being unavailable was explained that Digital Roads is not a formalised programme, but rather a series of ambitions, as outlined previously. The ambitions are delivered through a delegated operating model across the business, where federated teams manage and report on deliverables to the Central Transformation team. National Highways' view is that this decentralised approach facilitates a more flexible and agile approach to delivery.

5.7.5 This approach, the nature of the ambitions and the key ambition statements are intentionally designed to offer flexibility and provide a degree of openness. This approach allows National Highways to adapt to changing circumstances and emerging opportunities without being rigidly tied to overly specific or restrictive plans, which is of importance in a rapidly evolving digital environment.

5.7.6 However, in order to realise the Digital Roads' ambitions, a set of activities, however evolving they may be, should be clearly outlined, the status of which understood, and reassessed as part of business planning.

Recommendation 8 – National Highways told us that the term 'ambition' is used to describe both the ambitions themselves, and the activities underpinning each ambition as set out in the Digital Roads Roadmap. ORR should engage with National Highways to affirm that the Roadmaps set out a clear actionable plan of delivery to achieve each ambition. Rather than perceiving the activities as further ambitions, National Highways should see them as activities to realise each ambition. Whilst these activities may evolve over time, and diverge from those outlined in the Roadmap, ORR should encourage National Highways to reassess them as part of the annual business planning process, to ensure strategic alignment continuity, and ensure continued progress towards realising the ambitions.

5.7.7 In 2022, National Highways undertook an internal assessment of the Digital Roads delivery expectations for the 2025 vision. The purpose of which was to take stock of ambitions two years into RIS2, assess progress, which could then support realistic ambition setting for 2030.

5.7.8 The delivery expectations assessment was a baselining exercise, recognising that for some ambition statements there would be differences in the uptake and maturity of its ambitions. The assessment of the delivery expectation of ambitions towards 2025 was based on: progress to date, current trajectories, and likely risk factors; information that was asked for as part of this review but wasn't provided.

5.7.9 Information relating to the 2022 delivery expectation assessment was only provided for Digital Design and Construction, with the corresponding information for Digital for Customer, or Digital Operations not provided. The delivery expectation assessment was undertaken against the core theme's ambition statements, rather than for the specific activities outlined in the Digital Roads Roadmap.

5.7.10 The table below outlines the outputs from the delivery expectation assessment for Digital Design and Construction. It should be noted that the RAG status is based off a previous assessment undertaken by National Highways. The description of each RAG status is outlined in Figure 15.

Ambition Statement	2025 Status	Narrative of where the ambition statement will be in 2025
Digitised requirements - Our design and construction requirements will be digitised, enabling automated design and seamless integration of connected construction activities (estimation, sequencing and costing).	**RAG Status: Dark Green**	In 2025 it is likely that National Highways and its supplier network will have access to a digitalised Design Manual for Roads and Bridges (DMRB) and Manual of Contract Documents for Highway Works (MCHW), complete with supporting governance processes. This enables National Highways to be agile when updating and writing standards as a result of external factors e.g. meeting net zero targets. DMRB and MCHW will likely be coded by an API to add value to other parties by providing standards in a machine readable format e.g. for use by automated design tools. *Evidence: DMRB and MCHW likely to be standardised and ready to feed into automated design tools.*
Effective management and exploitation of data - We will create and make greater use of available data (e.g. topographical and environmental information) to reduce the need for pre-construction site visits and investigations.	**RAG Status: Light Green**	Data repositories have been established to draw together multiple data sources into a single platform. This enables easier access to data with one point of entry, supporting faster and more agile exploitation of data to drive insights informing improved design. Improved access to existing asset and operational data will significantly reduce in-person site surveys. Remotely operated surveying methods (e,g., drones) are likely to be utilised on some projects. *Evidence*: *the business information framework (BIF) and data as a service (DaaS) are set up to drive insights for efficient design and construction.*
Machine-led, human aided tools – These will be used to create automated designs and improve accuracy.	**RAG Status: Light Green**	In pockets of National Highways' supply chain, designers have developed and will continue to develop discrete design tools that automate parts of scheme designs. These will help deliver more accurate designs quicker by automating common, repeatable design steps – allowing designers to focus efforts on solving complex problems. *Evidence: self-delivery of gantries and CCTV on smart motorway schemes will automate much of the design work for these asset systems.*
Digital Twin - The foundation of Digital Twin will be utilised on projects through the collation and federation of existing data to support network planning and decision making.	**RAG Status: Amber**	While digital twin will likely be utilised in some capacity on some projects, by 2025 this will likely take the form digital twins for major projects and will not be immediately capable of supporting network planning or decision making. Digital twin capability and maturity levels will vary across the SRN based on the project's needs. Further work will likely be required to upskill parts of the organisation for operations, maintenance and planning.
Modularised and off-site fabrication - These will become the default where practical, minimising disruption on the network and delivering a more sustainable approach.	**RAG Status: Light Green**	By 2025 the transition to modularised and off-site fabrication will be well underway, although it is unlikely to be the default delivery method as programme commercial models do not always support modular and off-site. Pockets of best practice, i.e. Smart Motorways Programme (SMP) Alliance are likely to exist and help form a pathway for wider integration across other delivery programmes. *Example: SMP alliance move to offsite manufacturing for some products utilising modular components*
Standardised components - We will increase the use of standardised components in our designs (based on our digitised construction requirements) in order to maximise efficiency.	**RAG Status: Light Green**	The number of standardised components is likely to have increased significantly by 2025 with standardised components being utilised across the smart motorway programme. The integration of standardised components with machine led, human aided design tools will start to bring additional value to the quality and efficiency of the design and construction process. Further work will be required to bring forward construction requirements in order to inform standardisation of both components and delivery methods. *Evidence: standardised product library available and used within Major Projects*

Ambition Statement	2025 Status	Narrative of where the ambition statement will be in 2025
Connected and semi-automated plant (CAP) - We will reduce plant and site operative conflicts through increased use of connected and semi-automated plant for construction, which would be remotely-operated (potentially off-site) and support 'just in time delivery'.	**RAG Status: Light Green**	CAP levels have been defined and existing contracts and legislation reviewed. Connected plant technologies such as geofencing, 3D machine control, plant telemetry, and remote and intelligent compaction will be increasing used across projects where capabilities and business cases support their use. These will contribute to more precise construction activities as well as reducing site worker exposure. *Evidence: Autonomous plant such as driverless dump trucks have been trialled on the A14 improvement scheme.*
Enhanced safety on-site - Sites will become less labour intensive using digital safety tool e.g. briefings and digital rehearsals to reduce the risk exposure of on-site workers.	**RAG Status: Light Green**	Sites will benefit from using the digital Highways Passport initiative to enable quicker, targeted and more effective site briefings and inductions. Digital rehearsals will be leveraged to ensure workers are only on site when required. Connected worker technologies will start to be deployed on projects to monitor health, safety and wellbeing of on-site workers. *Evidence: Highways Passport initiative adopted across the smart motorways programme, augmented reality for roadside technology commissioning trialled.*
Digital rehearsal - We will rehearse site activities using digital simulations to minimise disruption to construction and assembly.	**RAG Status: Light Green**	Major projects will rehearse site activities as BAU. A toolbox of digital rehearsals will be available to designers, planners and contractors to drive efficient delivery at a number of different levels. For example at a micro scale, ground level rehearsals can be used to test and support assembly of individual assets while at a macro scale, programme level rehearsals can be used to identify critical path activities and model interaction between programmes. Other types of rehearsals will include: scheme level, site logistics, virtual reality, and connected and autonomous plant rehearsals. *Evidence: Digital rehearsals used across a number of projects and asset delivery activities (e.g. bridge installations)*

Table 6 Digital Design and Construction delivery expectation assessment

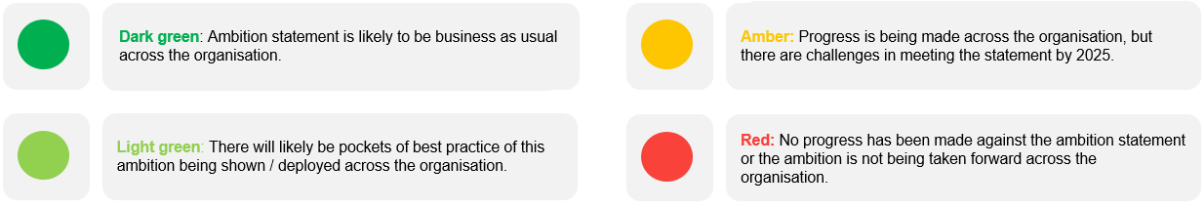


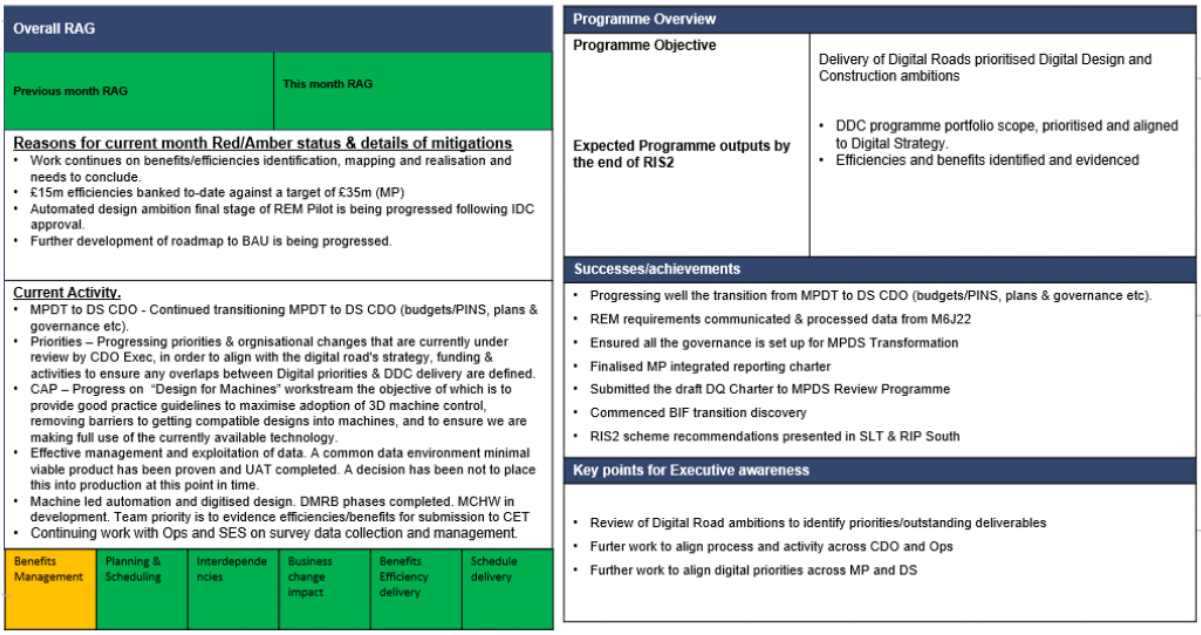
Figure 15 Status key

5.7.11 It has not been possible to undertake a delivery assessment for the activities outlined in the Digital Roads Roadmap. This aligns back to the previous statement (paragraph 5.7.4) that National Highways view the Roadmap activities as ambitions themselves, with Digital Roads not structured as a programme of work, with clear mapped out deliverables.

Recommendation 9 – ORR should encourage National Highways to undertake on an annual basis, a delivery expectation assessment for each of the Digital Roads' core themes and their ambition statements. This would provide a stocktake of delivery expectations and provide a better understanding of progress being made, to support the realisation of each ambition. ORR should monitor these delivery expectation assessments to provide confidence that National Highways is on track to deliver against the ambitions within the road period.

5.8 Reporting

5.8.1 As part of the reporting of progress, Digital Services provide monthly status updates to the Central Transformation team, for Digital for Customer, and Digital Design and Construction themes. It should be noted that the Digital Operations theme is reported on as part of boarder operational reporting. Snapshots of the reports for Digital for Customer, and Digital Design and Construction are highlighted in the figures below:



Overall RAG

Previous month RAG	This month RAG

Reasons for current month Red/Amber status & details of mitigations

- Work continues on benefits/efficiencies identification, mapping and realisation and needs to conclude.
- £15m efficiencies banked to-date against a target of £35m (MP)
- Automated design ambition final stage of REM Pilot is being progressed following IDC approval.
- Further development of roadmap to BAU is being progressed.

Current Activity.

- MPDT to DS CDO - Continued transitioning MPDT to DS CDO (budgets/PINS, plans & governance etc).
- Priorities – Progressing priorities & orgnisational changes that are currently under review by CDO Exec, in order to align with the digital road's strategy, funding & activities to ensure any overlaps between Digital priorities & DDC delivery are defined.
- CAP – Progress on "Design for Machines" workstream the objective of which is to provide good practice guidelines to maximise adoption of 3D machine control, removing barriers to getting compatible designs into machines, and to ensure we are making full use of the currently available technology.
- Effective management and exploitation of data. A common data environment minimal viable product has been proven and UAT completed. A decision has been not to place this into production at this point in time.
- Machine led automation and digitised design. DMRB phases completed. MCHW in development. Team priority is to evidence efficiencies/benefits for submission to CET
- Continuing work with Ops and SES on survey data collection and management.

Benefits Management	Planning & Scheduling	Interdependencies	Business change impact	Benefits Efficiency delivery	Schedule delivery

Programme Overview

Programme Objective	Delivery of Digital Roads prioritised Digital Design and Construction ambitions
Expected Programme outputs by the end of RIS2	• DDC programme portfolio scope, prioritised and aligned to Digital Strategy. • Efficiencies and benefits identified and evidenced

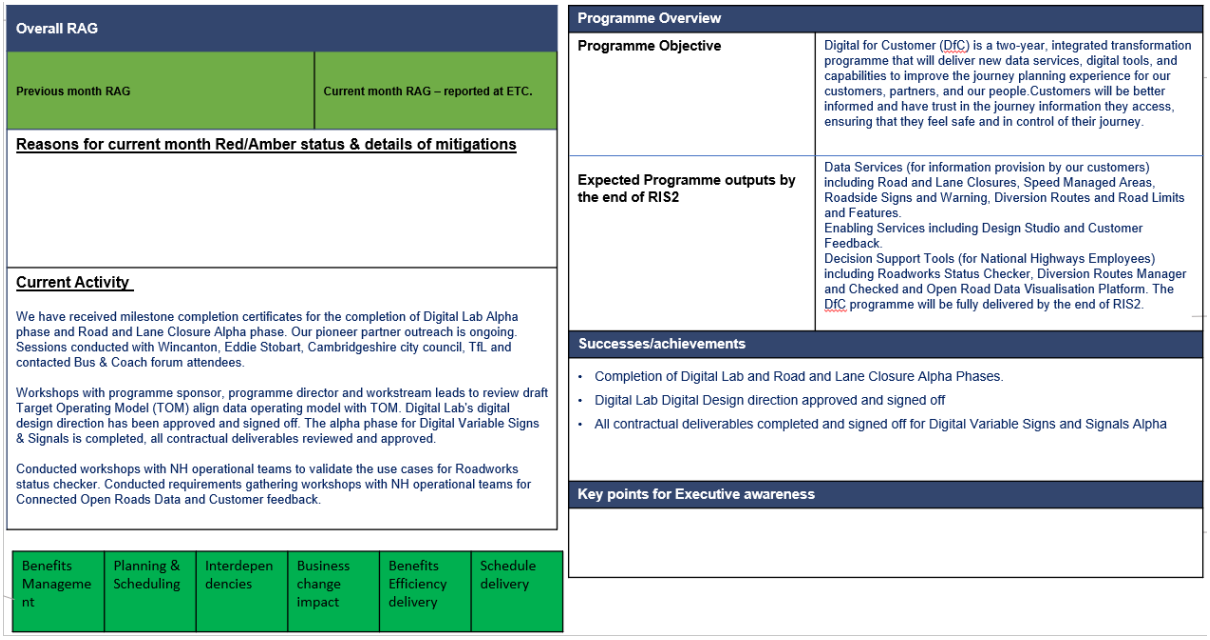
Successes/achievements

- Progressing well the transition from MPDT to DS CDO (budgets/PINS, plans & governance etc).
- REM requirements communicated & processed data from M6J22
- Ensured all the governance is set up for MPDS Transformation
- Finalised MP integrated reporting charter
- Submitted the draft DQ Charter to MPDS Review Programme
- Commenced BIF transition discovery
- RIS2 scheme recommendations presented in SLT & RIP South

Key points for Executive awareness

- Review of Digital Road ambitions to identify priorities/outstanding deliverables
- Furter work to align process and activity across CDO and Ops
- Further work to align digital priorities across MP and DS

Figure 16 Digital Design and Construction monthly report



Overall RAG

Previous month RAG	Current month RAG – reported at ETC.

Reasons for current month Red/Amber status & details of mitigations

Current Activity

We have received milestone completion certificates for the completion of Digital Lab Alpha phase and Road and Lane Closure Alpha phase. Our pioneer partner outreach is ongoing. Sessions conducted with Wincanton, Eddie Stobart, Cambridgeshire city council, TfL and contacted Bus & Coach forum attendees.

Workshops with programme sponsor, programme director and workstream leads to review draft Target Operating Model (TOM) align data operating model with TOM. Digital Lab's digital design direction has been approved and signed off. The alpha phase for Digital Variable Signs & Signals is completed, all contractual deliverables reviewed and approved.

Conducted workshops with NH operational teams to validate the use cases for Roadworks status checker. Conducted requirements gathering workshops with NH operational teams for Connected Open Roads Data and Customer feedback.

Benefits Management	Planning & Scheduling	Interdependencies	Business change impact	Benefits Efficiency delivery	Schedule delivery

Programme Overview

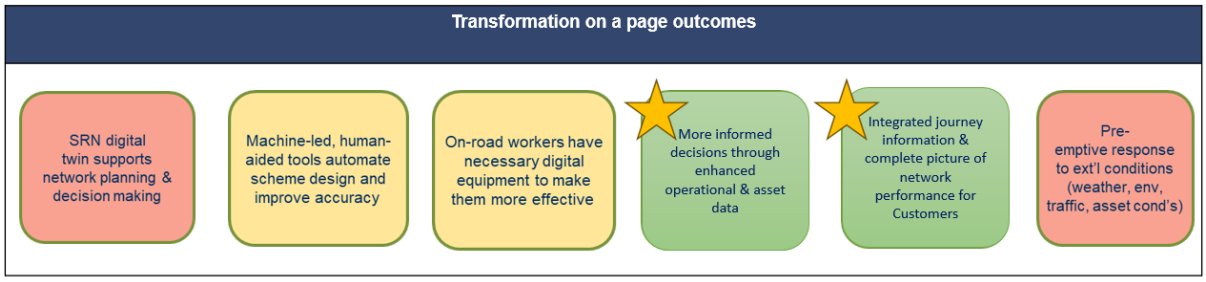
Programme Objective	Digital for Customer (DfC) is a two-year, integrated transformation programme that will deliver new data services, digital tools, and capabilities to improve the journey planning experience for our customers, partners, and our people.Customers will be better informed and have trust in the journey information they access, ensuring that they feel safe and in control of their journey.
Expected Programme outputs by the end of RIS2	Data Services (for information provision by our customers) including Road and Lane Closures, Speed Managed Areas, Roadside Signs and Warning, Diversion Routes and Road Limits and Features. Enabling Services including Design Studio and Customer Feedback. Decision Support Tools (for National Highways Employees) including Roadworks Status Checker, Diversion Routes Manager and Checked and Open Road Data Visualisation Platform. The DfC programme will be fully delivered by the end of RIS2.

Successes/achievements

- Completion of Digital Lab and Road and Lane Closure Alpha Phases.
- Digital Lab Digital Design direction approved and signed off
- All contractual deliverables completed and signed off for Digital Variable Signs and Signals Alpha

Key points for Executive awareness

Figure 17 Digital for Customer monthly report



Workstream Key Risks / Issues

Ref	Cause	Effect	Mitigation Action	Owner
Ref: 50417 Impact: 3 Likelihood: 4 Workstream/Prog:WP009 - Road and Lane Closure Service APLHA	Existing DaaS NOMS interface does not meet the requirements of Road & Lane Closure planned data dependency on supplier to provision new services Outcome: This could lead to a failure to meet data services requirements and/or reduce the value of the service.	There is a dependency on the supplier to enable access and communicate timelines for provisioning of new services. the DfC team need to assess any impact on current plan and scope. the ingestion design patterns, reworking of data models, mappings and dictionary.	15/12 Requirements and Impact Assessment document shared with George Marchant and DS OpSEnv Design And Transition team. Transition team requested to complete Service Form. Awaiting Service Form template from Transition team.	
Ref:61502 Impact: 4 Likelihood: 3 Workstream/Prog: Data Condition and Governance	There is a risk that data conditioning activities will be delayed due to time taken to obtain access to DYNAC ESB data	Data conditioning activities and interface mapping are delayed impacting data pipeline build.	01/12 DYNAC ESB sample log Roadworks data obtained and analysed. Additional request made to obtain Situation event data	

Figure 18 Digital for Customer Transformation on a page outcomes

5.8.2 Reporting of Digital Roads to the Central Transformation team has increased in frequency, moving from a quarterly cycle to a monthly cycle. This is positive as it enables a greater degree of focus on the rate of progress of the Digital Roads ambitions, particularly as National Highways moves into an implementation phase, seeing out the remainder of the road period.

5.8.3 The reporting of Digital Roads in its nature is quite high-level, the monthly reports whilst giving a general status overview to the core themes, don't provide a detailed view on the progress of each ambition, or the activities that underpin the realisation of each. It is worth noting that despite National Highways not viewing Digital Roads as a formal programme, the language used in the reporting may suggest otherwise.

Recommendation 10 – ORR should encourage National Highways to reassess the contents of its monthly reporting on Digital Roads, providing more structure and detail. The internal reporting on Digital Roads should be focused on the deliverability and progress of each of the ambitions, detailing the activities being undertaken to deliver them, outlining aspects such as, their delivery status, confidence to complete, and expected completion date. This is to facilitate an improved understanding within National Highways of the progress being made to achieve each ambition, and provide confidence to ORR that there is a focus on delivering the Digital Roads Roadmap ambitions.

5.9 Success Stories and Key outcomes

5.9.1 Digital Roads demonstrates a commitment to integrating digital technologies to enhance road safety, efficiency, and customer experience. There have been a number of demonstrable successes in realising some of the ambitions and capturing beneficial outcomes.

5.9.2 Digital for Customer has successfully led an initiative to support digital integration with vehicles, achieving the target of 10,000 vehicle connections. This was facilitated through the interface offered by the National Traffic Information Service (NTIS), sharing critical lane signalling and speed information, marking a significant milestone in enhancing road safety and user experience.

5.9.3 Efforts to minimise roadwork durations and improve the accuracy of information shared with customers has led to better customer experiences. Enhancements in data accuracy regarding length and time of major road works and projects has significantly contributed to an improved overall experience for customers. These improvements are rooted in better understanding of deliverables and incorporating efficiency enhancements during on-site activities for major project schemes.

5.9.4 Connected and Autonomous Plant (CAP) has been deployed as part of a trial on the A14 upgrade scheme. The expectation is that CAP will transform National Highways construction sites through delivering safe, automated and efficient construction processes. It is estimated that the uptake of CAP into the construction industry could deliver a 20 to 25% improvement to construction productivity and transform safety. National Highways has developed a Connected and Autonomous Plant 2035 roadmap

which sets the vision and key activities that need to be delivered for CAP to become the business-as-usual approach by 2035.

5.9.5 Under the Digital Design and Construction theme, another successful outcome was through the use of Digital Rehearsals. These are used to rehearse site activities using digital simulation to minimise disruption to construction and assembly. On the M4, the use of a Digital Rehearsal for a bridge demolition saw time savings, increased efficiency, and safety during the actual demolition against what was initially planned.

5.9.6 It was noted from the workshops that National Highways stated it has a comprehensive benefits framework for Digital Roads, aligning with organisational KPIs and broader delivery elements, enabling the capture of real and measurable improvements from the outcomes of the ambitions. Additionally, it was also noted that benefit realisation plans are also developed for the ambitions. A copy of this framework and benefit realisation plans were requested for assessment but was not provided.

6. Future Learnings

6.1 Analysis and Constraints

6.1.1 For this section, ORR asked us to provide analysis of how National Highways is embedding outputs and learnings from the delivery of both Digital Roads and the DDaT Strategy to inform and contribute to its Strategic Business Plan for the next road period (RP3).

6.1.2 Information was provided for us to undertake this analysis, which was captured through the workshops, and through the provision of documentation relating to the RIS3 draft Strategic Business Plan development process.

6.2 Overview

6.2.1 This section includes the key lessons that National Highways has identified, has learnt, or is in the process of learning and embedding into the organisation. The findings of this section are primarily derived from the three workshops conducted with key National Highways stakeholders with respect to the Operational Technology Strategy (12th January), DDaT Strategy (8th January), and Digital Roads (8th January).

6.2.2 The data collected in the workshops when collated and analysed revealed 5 key themes, which are outlined below:

- Strategy and Business Alignment;
- Internal Capability Building;
- Collaboration and Stakeholder Engagement;
- Operational and Service Excellence, and;
- Effective Communication and Engagement.

6.2.3 Strategy and Business Alignment

6.2.3.1 A key lesson highlighted by the stakeholders was the need for a single, clear point of reference to guide initiatives in the Road Investment Strategy 3 (RIS3). From a strategic perspective this is essential as it encourages a coordinated focus and planning that shifts away from a disparate and siloed strategic landscape. This approach further sets the scene for strategic alignment of various strategies within the organisation, coordinating the efforts of the employees to keep these various strategies relevant and effective.

6.2.3.2 Another lesson was the need for clearly defining the business needs and drivers. This will encourage fit for purpose and competitive supply chain engagement. Further defining the levels of services, especially distinguishing between business services delivered by operations and those supported by technology and digital services, will provide insights to the supply chain for a healthier and more focused engagement with National Highways.

6.2.3.3 The workshops also focused attention on the need to consider practicality while defining the ambitions to make the strategies relevant and impactful. To realise these ambitions, attention must be paid on developing detailed roadmaps and funding plans. The DDaT strategy is an excellent example of this as it was refreshed to align more closely with the practical aspects of the operational environment. This adjustment helped in setting realistic goals that are in sync with the organisation's business priorities and reporting requirements.

6.2.3.4 Similarly, aligning technological and operational realities and a long-term vision, is a key lesson identified by National Highways. This is evident in the current Operational Technology Strategy which is a product of refining the 2015 Operational Technology Strategy to now include detailed exploration of achieving goals and understanding the impact on different technology types. The alignment of strategies with operational realities while maintaining a long-term forward view is quite a complex task. However, National Highways is soon to begin the process of refining its Operational Technology Strategy, procurement practices, and maintenance requirements to align with current technological realities and operational needs.

6.2.4 Internal Capability Building

6.2.4.1 National Highways has identified the need to build internal capabilities to support operational needs, planning, and shaping the future state of its initiatives. This includes building in-house expertise and reduced reliance on external consultants and suppliers. Despite the challenges of attracting top talent in highly specialised fields due to the niche nature of the domain and remuneration limitations due to budget constraints, National Highways sees this strategic shift as essential for the successful execution of its key strategies. Following the strategic development focused on enhancing capabilities and integrating new personnel, National Highways is also starting projects specifically designed to implement various aspects of its change strategy.

6.2.4.2 Another key lesson is the importance of organisational readiness aligned to technology readiness, especially towards the end of the technology lifecycle. This is to ensure successful deployment of technology and its implementation and utilisation within the organisation. This is evident in the establishment of a new function within Digital Services, called Operational Service Design and Transition Function, to ensure organisational readiness and collaboration with the Chief Technology Officer's team for service design.

6.2.4.3 In addition, learning from the positive impact of automation, National Highways recognises the potential for expanding automation across various repeatable processes and functions for a more integrated and comprehensive automated system.

6.2.5 Collaboration and Stakeholder Engagement

6.2.5.1 Building upon strategic and organisational alignment, National Highways recognises the importance of internal collaboration between different departments acknowledging the value that diverse contributions bring to achieving desired outcomes. For example, in recent years there has been a significant shift in this approach, historically, Major Projects was run independently with minimal input from Operations or Digital Services. There has been a shift towards more active involvement from Operations and Digital Services in each stage of a project, conducting design reviews, and serving as signatories to ensure that testing and design meet the required standards.

6.2.5.2 Externally, National Highways has extended this approach of collaborative engagement with the supply chain, industry experts, academia, and the business community. Community forums have been established under the auspices of the Engagement Council. These forums and working groups have facilitated valuable interactions and collaboration with industry representatives, leading to a shared approach to problem-solving, and addressing challenges and issues more effectively through a collective approach.

6.2.6 Operational and Service Excellence

6.2.6.1 National Highways is shifting from an output based to an outcome-based approach. It recognises that merely delivering technology outputs will not achieve meaningful outcomes. As such the outcome-based focus involves a more service-oriented approach, prioritising end-user experience and service delivery.

6.2.6.2 Subsequently, this is reflected in how National Highways is measuring success and its KPIs. Its efforts reflect an ongoing process to refine and evolve how they measure and report on the performance and effectiveness of its services. It includes evaluating performance based on a broader set of requirements and strategic goals, and the evolving nature of the organisation. Similarly, for the measuring of KPIs, the KPI steering group at National Highways is actively working on adjusting current metrics and considering potential new ones for future use. This process involves a layered approach that starts with a broader assessment of asset performance and then focuses in on service delivery and technology capability.

6.2.6.3 In terms of maintaining capability and consistency in delivery, National Highways recognises the challenges associated with delivering roadside technology. Its operating model, which is federated based on regions, presents unique challenges in maintaining consistency across the network. To address these challenges, it is looking at opportunities for a centralised approach. This change is believed to enhance clarity, consistency, and maintenance, improving overall efficiency and effectiveness in technology management.

6.2.6.4 Another key challenge faced by National Highways is unpredictable market conditions with regards to supply vs demand, namely the fluctuating demand in technology procurement, leading to periods of scarcity and abundance. This inconsistency poses challenges for supply chain partners, particularly in terms of investment in research and development. This also poses challenges for National Highways to develop an approach that encourages a competitive and innovative supplier ecosystem. As such, National Highways is working to reshape its procurement practices to provide a more stable and predictable environment for suppliers. This includes addressing inefficiencies in generating demand and managing contracts, especially in logistics and spare parts.

6.2.7 Effective Communication and Engagement

6.2.7.1 National Highways recognise that strategies that prioritise and invest more in communication and engagement tend to be more successful. This is evident in its efforts to reframe the role and importance of Operational Technology, with the development of a communication strategy to highlight the value and impact of Operational Technology in business operations. This has led to a cultural shift where an increased number of individuals within the organisation are now actively engaged with Operational Technology, reflecting a positive change in attitudes and understanding. Building on this success, National Highways realises that the journey towards a fully service-oriented approach is an ongoing endeavour which will require dedicating sufficient resources and time to ensure continuous and effective communication of all strategies.

6.2.7.2 Senior Leadership buy-in and support has proved to be a key enabler in National Highways' success of effective communication and engagement. This involvement has proved to be the key in emphasising strategic objectives, engaging the organisation, adding credibility to National Highways' goals and acting as a catalyst for driving organisational change. This alignment forms the core of National Highways' strategic change, making the adoption of new processes and governance more natural and integrated.

6.3 RIS3 Strategic Business Plan Process and Methodology

6.3.1 Below outlines the development process of the RIS3 draft Strategic Business Plan (dSBP) which considered and took account of learnings captured from the delivery of the DDaT Strategy and Digital Roads.

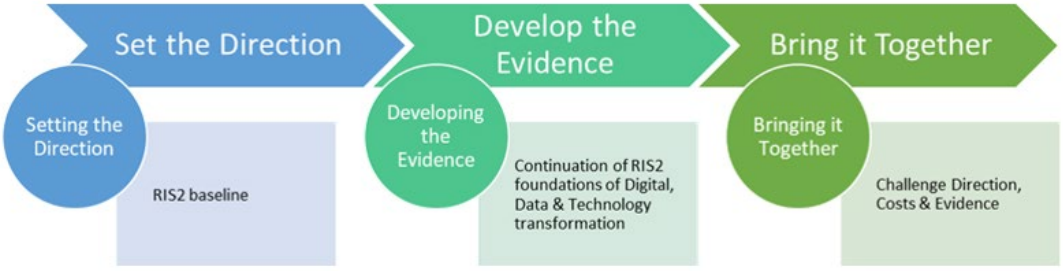


Figure 19 Development process of dSBP

6.3.2 Following DfT's funding categorisation into, 'Corporate Technology' and 'Op Tech Comms and Systems', National Highways further categorised the proposed programme to align with the RIS3 transformation themes. These are:

- Mature Asset Lifecycle Ownership;
- Digitally Capable Organisation;
- Environment and Sustainability Deeply Embedded in What We Do;
- Proactive Control of our Network, and;
- Integrated and Flexible Capital Delivery.

6.3.2.1 *Mature Asset Lifecycle Ownership:* National Highways relies on a complex array of asset management systems to manage and maintain its assets. These systems play a critical role in ensuring the effective operation, safety, and longevity of England's highway infrastructure including those assets that are deemed critical and regulated.

6.3.2.2 *Digitally Capable Organisation:* National Highways' corporate digital services provide the foundation for connecting, collaborating, and communicating within National Highways, with the supply-chain, customers and other stakeholders. They are a critical enabler and include 'shared services' such as Cyber Security and Data Services.

6.3.2.3 *Environment and Sustainability*: This investment aims to create a plan, covering social value as well as environmental sustainability, to ensure that active steps shall be taken to enable reductions in line with National Highways' published targets and contribute to the low-risk appetite for Delivering Better Environmental Outcomes. Delivery of this plan will be for all the teams and will be embedded in their activities.

6.3.2.4 *Proactive Control of our Network*: digital, data and technology is used to manage traffic, enhance safety, optimise resource allocation and deliver an improved user experience. It includes control room technology, traffic management systems, services used to detect and respond to incidents and the underpinning telecommunications network.

6.3.2.5 *Integrated and Flexible Capital Delivery*: National Highways' runs and maintains a limited number of Digital, Design and Construction services consumed by Major Projects. The current service provision is for the management and licensing of cost, risk, and schedule-based applications that support capital delivery schemes.

6.3.3 dSBP Development Methodology

6.3.3.1 A collaborative approach with the Digital Services Senior Leadership Team was taken to build and refine the narrative statement. For a coherent submission, narrative was built in a consistent way, using the same language and reference points. There were 2 types of narrative:

6.3.3.1.1 Narratives that describe the high-level services provided and their impact on the business, factoring in the costs, performance and managing risks for the outputs the spend delivers for the business. It also includes the impact of reducing, stopping, or breaking spend.

6.3.3.1.2 Narrative statements supporting each transformation theme, setting out an overall response to business demands with clarity about what will and will not be delivered under this theme.

6.3.3.2 Combining these narratives enabled National Highways to develop a RIS 3 Programme Investment Plan document which was the foundation of the dSBP. Other areas of the dSBP were developed in collaboration with the Senior Leadership Team and Subject Matter Experts. These included: National Highways' evolution and operating model; RIS2 position, performance and activities; Deliverability; Risks and Assumptions underpinning the narratives and Customer.

6.3.3.2.1 Evolution and operating model – collated to show how National Highways had developed over RIS2 to meet increasing demand for DDaT services.

6.3.3.2.2 RIS2 position, performance and activities – shows how the work done by National Highways is a key enabler for its KPI's and supports the business.

6.3.3.2.3 Deliverability – shows the deliverability of the dSBP in terms of scale, Full Time Equivalent position, level of unknowns', ability to deliver, complexity, governance structures in place and how these will support delivery.

6.3.3.2.4 Risks and Assumptions underpinning narratives – collated with the Senior Leadership Team, informing the known risk areas, and base assumptions made in developing the RIS3 programme of work.

6.3.3.2.5 Customer - The Customer team engaged with stakeholders to understand their requirements and preferences for RIS3. National Highways has outlined information on how its plans respond to the stakeholder engagement findings.

6.3.4 Learning outcomes for RP3

6.3.4.1 As a first step in developing the Performance Framework within the dSBP, National Highways undertook a review of lessons learned, which demonstrates a formal mechanism for embedding lessons captured into the development process.

6.3.4.2 Part of the process of building learning points into developing the RP3 Performance Framework is an acknowledgement that the performance specification needs to be smarter in its design to drive both the performance expected and incentivise the right outcomes.

6.3.4.3 Through this approach, National Highways has identified the main developments between RP2 and RP3, and assessed against similarities and differences. This includes taking a more matured approach to developing the Performance Framework, working closer with customers and stakeholder to identify improvements to the existing measures.

6.3.4.4 Through RP2, National Highways has invested in data handling technology, which includes cloud-based infrastructure. This has allowed for the processing of more data, greater degrees of automation, more sophisticated analytical techniques to be adopted, improved visualisation, and improved quality assurance. National Highways has undertaken work to design its metrics with this new technology, which will see benefits in terms of futureproofing its work, however, it should be noted that this process in currently ongoing.

6.3.5 National Highways has applied a structured approach with respect to embedding lessons into the development of the draft Strategic Business Plan for RP3. Within Digital Services, from an operational and project level perspective, this is less clear, with a more tactical approach to continuous learning being undertaken, through the revaluation of outcomes and retrospectives on specific projects.

Recommendation 11 - ORR should encourage National Highways to not only capture learning outcomes, but to formally embed and monitor them across Digital Services, and wider across the organisation through a formalised lessons learned process. Such processes would encourage collective learning within National Highways and assist in the building of a culture of continuous improvement.

7. Conclusion and Recommendations

7.1 Conclusion

7.1.1 From the review, it was noted that there is a strong alignment between the DDaT Strategy, Strategic Business Plan, and Delivery Plan, particularly in terms of performance goals and outcomes. This alignment is evident in the operations and maintenance sections of the Delivery Plan, where DDaT related improvements directly support the strategic objectives.

7.1.2 The DDaT Strategy is effective in integrating with National Highways' overarching business objectives, particularly in enhancing operational efficiency and customer experience. This is supported by the explicit linkage of the objectives as part of the QBPR process.

7.1.3 Despite the strong strategic alignment, there are complexities of directly measuring the impact of DDaT initiatives against key performance outcomes. This is due to the initiatives typically acting as organisation enablers, and the complex interaction and impact from other systems and processes. The assessment

of benefits is further complicated by challenges in quantifying non-tangible benefits and attributing outcomes directly to specific initiatives. The RIS2 Delivery Plan is primarily focused on tangible aspects such as PIs and KPIs, whilst the DDaT Strategy encompasses both tangible and intangible aspects that improve overall organisation goals such as organisational efficiency and effectiveness across teams. Despite this, the expected impact of each initiative, in terms of expected benefit to National Highways should be considered and captured as part of the QBPR process.

7.1.4 National Highways monitors, measures, and reports on the DDaT initiatives through the QBPR process. With 51 DDaT Strategy QBPR initiatives and 180 Key Results underpinning them, there's a clear commitment to a comprehensive and detailed process for how the strategic priorities will be realised, with the exception of Strategic Priority 5. Given the approach, with clear owners of each initiative and their Key Results, improvements to resource allocation can be made, and clear lines of accountability across teams maintained.

7.1.5 As part of the QBPR process, a significant gap is the omission of initiatives and activities aligning with the Environment and Sustainability Strategic Priority (Strategic Priority 5). This indicates a key area for improvement, where the DDaT Strategy's initiatives should better support National Highways' performance goals for environmental and sustainability outcomes, delivered through digital, data, and technology. This is particularly of importance given one of the Strategic Business Plan 2020 to 2025 performance outcomes is '*Delivering better environment outcomes'*, and one of the RIS3 transformation themes is '*Environment and Sustainability deeply embedded in what we do'.*

7.1.6 The DDaT Strategy and Digital Roads are well-aligned, focusing on business enablers and a shared vision that aligns across National Highways. Digital Roads is governed by a decentralised operating model, emphasising the integration of ambitions rather than rigid project deliverables. Whilst this approach provides flexibility and agility, it presents challenges in assessing the progress and deliverability of the ambitions, and the activities that underpin their realisation.

7.1.7 The Digital Roads Roadmap sets out the activities that underpin and support the realisation of the ambitions, with clear target delivery timescales. We weren't able to assess the delivery status of the activities outlined in the Roadmap due to relevant information not being made available. It was suggested by National Highways that its Central Transformation team captures and consolidates status information of the Roadmap's activities, however, upon request this information was not provided. Through the workshop and other interactions, National Highways has stated that Digital Roads is not a programme but a set of ambitions, and whilst this may be the case, there are a clear set of activities underpinning the ambitions set out in the Roadmap, with limited evidence to demonstrate progress against these.

7.1.8 Through the development of a business capability model, the ambition alignment assessment, and the review of business capabilities in relation to Digital Roads, National Highways demonstrates a considered approach to understanding, assessing, and planning for digital transformation. However, a greater degree of focus should be applied on understanding the progress of the activities set out in the Digital Roads Roadmap and deliver against these.

7.1.9 It was found that National Highways has applied a structured approach with respect to embedding lessons into the development of the draft Strategic Business Plan for Road Period 3. Within Digital Services, from a strategic level, the learning and embedding of lessons is evident with the DDaT Strategy refresh itself. From an operational and project level perspective, a structured approach is less clear, with evidence to suggest a more tactical approach to continuous learning is utilised, with little evidence to suggest that learnings are being applied broadly across Digital Services' portfolio.

7.2 Recommendations

7.2.1 The recommendations from this review are outlined below:

7.2.2 **Recommendation 1 -** Our assessment and findings suggest the executive level of National Highways has a common understanding of (1) DDaT primarily being an enabler of National Highways' services as well as outcomes and priorities in DDaT development; and (2) DDaT underpins the efficiency challenge for National Highways as an organisation. To enhance clarity and cohesion between ORR and National Highways, ORR should make use of direct engagement in the quarterly update meeting (established in 2023) between ORR and Digital Services. This is to better understand National Highways' priorities and

outcomes in DDaT aspects, and how the DDaT initiatives contribute to overarching organisational goals and performance metrics. It is proposed that quarterly performance and delivery material is agreed and used at each quarterly meeting as a consistent discussion item.

7.2.3 **Recommendation 2** – National Highways describes itself as transitioning to a service provider (from a road operator), and faces an increasing rate of technological change and advancement. ORR is recommended to conduct an annual evaluation of the DDaT Strategy and its alignment with other strategies to ensure that the company has the right initiatives and priorities in place. This is to provide assurance that National Highways is focusing on the elements that sustain an effective and efficient organisation. This has been demonstrated with the 2023 refresh and should form part of the annual business planning process.

7.2.4 **Recommendation 3** – Given the described move towards being a service provider, the importance of digital to National Highways' future capability and the success of its operational delivery and strategic achievement is ensuring that there are clear expectations of National Highways in its Licence. ORR should work with National Highways to draft a relevant licence condition to discuss with DfT for the review of National Highways' licence for RP3.

7.2.5 **Recommendation 4** - The DDaT Strategy as an enabling element and foundation for National Highways' operational capabilities, provides enhancements to National Highways' service effectiveness and efficiency. ORR should discuss with National Highways how it plans to directly measure contributions of DDaT initiatives to the overarching organisational goals, PIs and KPIs, providing more visibility and with considerations beyond the availability of systems. This would help National Highways demonstrate how digital helps it to satisfy the conditions of its licence and delivery of the RIS.

7.2.6 **Recommendation 5 –** ORR should work with National Highway to ensure that as part of the QBPR process, in addition to the identification and reporting of the initiatives, National Highways also includes the likely impact on performance goals from their implementation, aligning to the Strategic Business Plan's performance objectives. This is important as it would better demonstrate the likely impacts to the RIS2 KPIs and PIs, and serve as a basis to monitor performance effectively. This should form part of ORR's holding to account remit and it should consider incorporating this element into the monitoring reporting guidelines for RP3.

7.2.7 **Recommendation 6** – ORR should directly engage with National Highways to understand the reasons why there is a significant gap with respect to the omission of the DDaT Strategy's Strategic Priority 5 (Environment and Sustainability) initiatives as per the QBPR process. Given this is a strategic priority, and a significant element of National Highways' performance outcomes as set out in its Strategic Business Plan, it would be essential for National Highways to identify and determine the initiatives underpinning this priority, and ensure they are monitored, progressed, and reported on. It is recommended that this should form a key area for discussion at the next quarterly meeting between ORR and National Highways scheduled for Spring 2024.

7.2.8 **Recommendation 7 –** Despite the difficulties in identifying the specific and attributable benefits delivered through the DDaT initiatives, ORR should encourage National Highways to apply a greater degree of focus on identifying the expected benefits and impact of the DDaT Strategy initiatives, as suggested in the 2023 refresh. This would be achieved through an effective benefit management process, to identify, measure, monitor and assess the expected impacts and realised benefits.

7.2.9 **Recommendation 8 –** National Highways told us that the term 'ambition' is used to describe both the ambitions themselves, and the activities underpinning each ambition as set out in the Digital Roads Roadmap. ORR should engage with National Highways to affirm that the Roadmaps set out a clear actionable plan of delivery to achieve each ambition. Rather than perceiving the activities as further ambitions, National Highways should see them as activities to realise each ambition. Whilst these activities may evolve over time, and diverge from those outlined in the Roadmap, ORR should encourage National Highways to reassess them as part of the annual business planning process, to ensure strategic alignment continuity, and ensure continued progress towards realising the ambitions.

7.2.10 **Recommendation 9 –** ORR should encourage National Highways to undertake on an annual basis, a delivery expectation assessment for each of the Digital Roads' core themes and their ambition statements. This would provide a stocktake of delivery expectations and provide a better understanding of progress being made, to support the realisation of each ambition. ORR should monitor these delivery

expectation assessments to provide confidence that National Highways is on track to deliver against the ambitions within the road period.

7.2.11 **Recommendation 10 –** ORR should encourage National Highways to reassess the contents of its monthly reporting on Digital Roads, providing more structure and detail. The internal reporting on Digital Roads should be focused on the deliverability and progress of each of the ambitions, detailing the activities being undertaken to deliver them, outlining aspects such as, their delivery status, confidence to complete, and expected completion date. This is to facilitate an improved understanding within National Highways of the progress being made to achieve each ambition, and provide confidence to ORR that there is a focus on delivering the Digital Roads Roadmap ambitions.

7.2.12 **Recommendation 11 -** ORR should encourage National Highways to not only capture learning outcomes, but to formally embed and monitor them across Digital Services, and wider across the organisation through a formalised lessons learned process. Such processes would encourage collective learning within National Highways and assist in the building of a culture of continuous improvement.

Appendix A

A.1 Digital Roads ambition statements

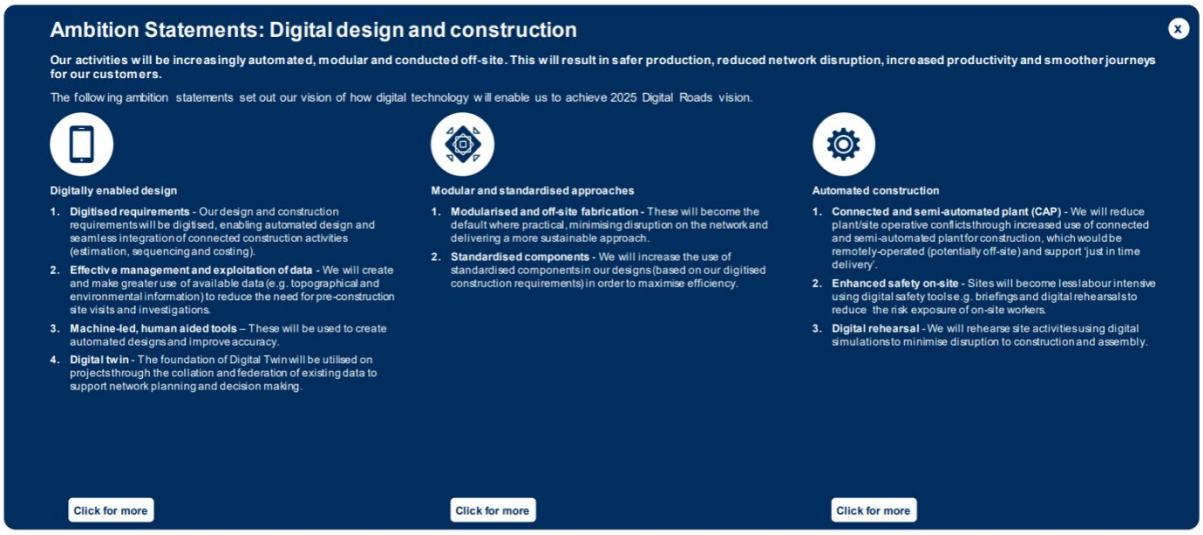


Figure 20 Ambition Statements: Digital Design and Construction (Source: Digital Roads Roadmap 2025)

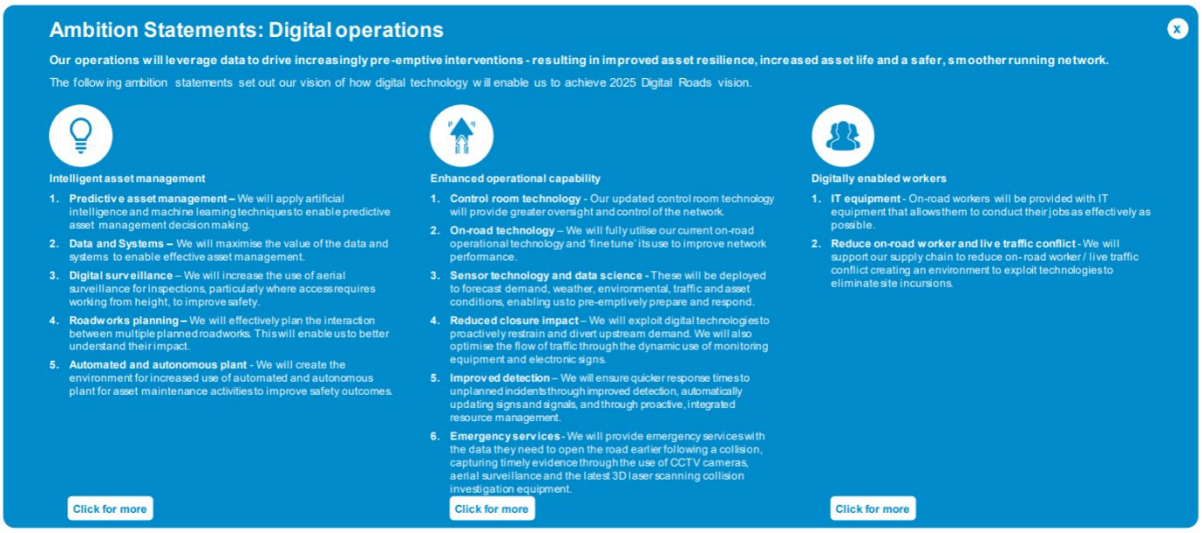


Figure 21 Ambition Statements: Digital Operations (Source: Digital Roads Roadmap 2025)

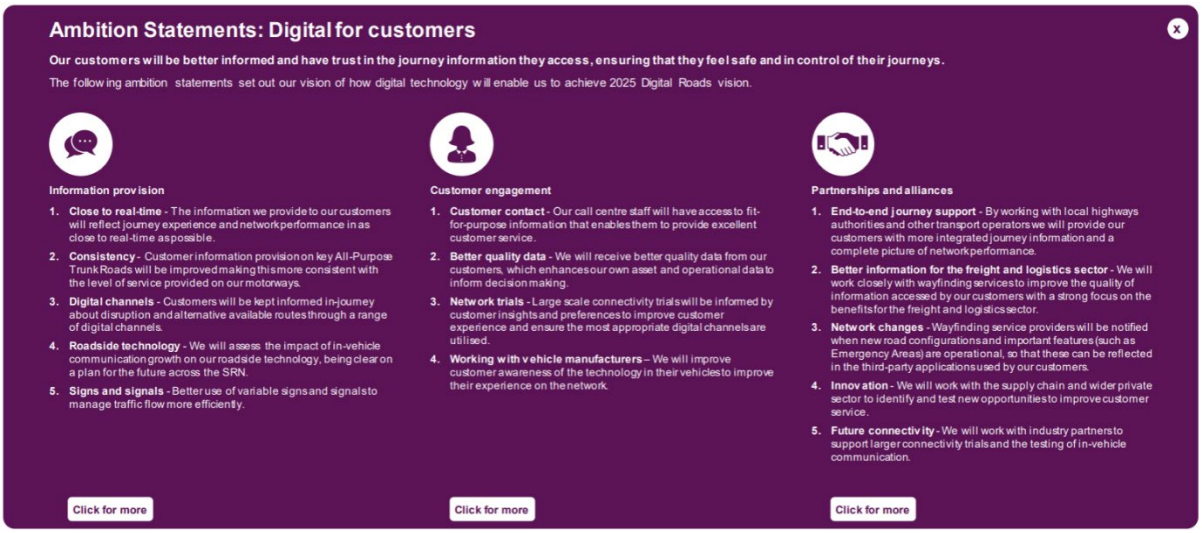


Figure 22 Ambition Statements: Digital for Customer (Source: Digital Roads Roadmap 2025)

A.2 Workshop Overview:

As part of the information gathering process, three Workshops were undertaken in relation to the DDaT Strategy (8th January 2024), Digital Roads (8th January 2024), and Operational Technology Strategy (12th January 2024). Below is an example of the questions asked in the DDaT Strategy Workshop:

General (Vision)

Collaboration and engagement and building effective relationships with the regulator.

- What previous engagement has there been with ORR in monitoring performance and outcomes from the DDaT Strategy?

Case for change and vision's clarity and consistency.

- Could you describe the journey of the DDaT Strategy?
- What was the motivation and driver behind the 2023 refresh, and how were the priorities derived?
- What is the anticipated general direction of travel in the long term given that the refresh priorities are specific and different to the 2021 version?
- Is there a specific programme or governance that oversees the delivery of the DDaT Strategy priorities and initiatives?

People, Capabilities and Culture

Levels of accountability at exec. board level and highly digitally aware.

- How is the change brought about by the DDaT Strategy managed, are there any difficulties in managing and embedding change within the organisation?
- Do you believe that current governance arrangements i.e., customer journey process, impede the ability of delivering digital and technological based improvements?
- Are digital, data and technological capabilities championed on the Exec. Board?

Clarity around specific responsibilities and their ability to change the status quo.

- Are there distinct owners and champions for each DDaT Strategy priority and initiative?
- Is there adequate resourcing to implement the DDaT Strategy, and how are resources balanced to support the impacts on legacy systems?

Organisational Alignment

Alignment on the same roadmap and outcomes.

- How does the DDaT Strategy align with the goals and objectives of the RIS2 delivery plan?
- Can you identify specific areas where the DDaT Strategy has directly influenced RIS2 performance?
- Are there any key milestones that have been established to deliver the priorities in the DDaT Strategy?

Structured collaboration throughout project lifecycle.

- How does the DDaT Strategy interact with and impact the broader performance framework of National Highways?
- How does the DDaT Strategy integrate with Digital Roads and the Operational Technology strategy?

Impacts and Benefits

Performance monitoring and independent assurance reviews.

- Do you believe that the DDaT Strategy is embedded in the organisation?

- How are its outcomes measured, monitored, and reported?
- How is it being further embedded?
- Are there any performance metrics that have been notably affected by the implementation of the DDaT Strategy?
- What tangible benefits has National Highways realised from the DDaT Strategy in terms of impacts on RIS2 KPIs and PIs?
- How are you able to distinguish the specific benefits delivered through the DDaT Strategy priorities?

Create momentum and demonstrate early wins.

- Are there any specific success stories or case studies that highlight the impact of the DDaT Strategy on these metrics?

Barriers and Blockers

Risk impact assessment and mitigation procedures.

- What were the key challenges that led to the 2023 refresh?
- What have been the key blockers to implementing the priorities and initiatives set out within the DDaT Strategy?
- Are there any instances where the expected benefits of the priorities and initiatives have failed to materialise?

Lessons and Future Impact

- Best practices and understanding feedback.
- Have you undertaken any lessons learning activities on the impact of the DDaT Strategy?
- What would you say are the key lessons from the strategy in terms of;
  - Implementing it.
  - The impact of its priorities and initiatives.
  - Embedding it across the organisation.
  - People and capabilities.

Reality check and prioritisation and future planning.

- How do you expect the DDaT Strategy to evolve into RP3?
- How are the learnings and outputs from the DDaT Strategy being used to shape the strategic business plan for RP3, and what is the process for capturing these?
- Can you provide examples of how past experiences are informing future strategic planning?

A.3 Document Capture

The tables below outlines where documents have been requested but not received, and those documents that were received through this commission:

Documentation	Description
DDaT Strategy initiatives documentation	Supporting evidence highlighting progress of the DDaT Strategy initiatives and outcomes. • Project Reports • Benefits Assessments
Digital Roads Roadmap documentation for each deliverable	Project and programme (Digital Design and Construction, Digital Operations, and Digital for Customers) level documentation highlighting each activity and project in the Digital Roads Roadmap. • Status and progress reports • Project tracking detail • Delivery documentation • Performance information • Risk and mitigation data
DDaT Strategy impacts on RIS2 KPIs and PIs	Supporting evidence to understand the impacts of the initiatives underpinning the DDaT Strategy priorities, and their relationship and impact on RIS2 KPIs and PIs
Digital Roads Delivery Expectation Assessment	For Digital Operations, and Digital Design and Construction
Digital Roads quarterly reporting	For Digital Operations
Digital Roads Benefits Framework	Benefits framework for Digital Roads, to determine the lens through which benefits are assessed
Digital Roads Benefits Realisation Plans	Benefits realisation plans for the ambitions set out in the Digital Roads roadmap

Table 7 Key documents requested but not received

Document Name	Description
DDaT Strategy Slides_v04	DDaT Strategy 2021 overview, including high level view of objectives, functions, deaired outcomes, and the means of measuring success
20.12.23 Final QBPR Data	Quarterly Business Planning and Review cycle initiatives for the DDaT Strategy, outlining specific activities, and objectives
ORR QBPR Jan 2024	Quarterly Business Planning and Review cycle initiatives for the DDaT Strategy, outlining status and confidence to complete for each activity
FY202425 1 year Business Plan template_Digital Services submitted	Digital Services annual business plan for financial year 2024 to 2025
RIS3 Corp Tech and Op Tech Comms and Systems Overview and Methodology v1.0	RIS3 draft Strategic Business Plan development overview for corporate technology and Operational Technology comms and systems
Digital Design and Construction – January 2024 reporting	January 2024 report on a page for Digital Design and Construction
Digital Roads CT Reports Version 2	September 2023 to January 2024, report on a page, and transformation on a page for Digital for Customer
Digital Roads Deep Dive II_Executive Transformation Committee_Final_v2	Digital Roads deep dive on ambitions, delivery model, and ambition alignment assessment
Network flow and resilience workshop outputs – Mapping the original 8 ambitions to 5 new consolidated initiatives	Network flow and resilience workshop outputs highlighting the consolidation of 8 original ambitions into 5 new initiatives
Work Package 5 – DR High Level Architecture	Digital Roads high level architecture and capability assessment
DDaT Final April 22.1	DDaT Connexus update from 2022
Digital design and construction v0.5	Digital Design and Construction delivery expectation assessment
AD History	Overview and history of Asset Delivery
CTM-IDR overview_ORR-JAN2023	Case studies for Collaborative Traffic Management and Intelligent Diversion Routes Programmes
Historic rolling performance for Technology availability	Monthly performance of Technology Availability since December 2021
OTS Support Document – Final	Operational Technology Strategy supporting document
ToR Road User Working Group – 22.01.24	Terms of reference for the Road User Working Group
27.09 S&P DSLT Session_v0.1	DDaT Strategy refresh update highlighting release plan, engagement plan and summary
Digital, Data and Technology Strategy – Comms Handling Plan – V0.1	Communication handling plan for the DDaT Strategy 2021
Digital, Data and Technology Strategy – publication and comms plan v0.1	Publication and communication plan for the DDaT Strategy 2021
BRISC_Corp_Risks	Risk register export with 2 corporate risks
Tech, Digital and Data Storyboard and Key Messages V1	DDaT Strategy 2021 storyboard
Technology & Digital Strategy Plan	Roll out and engagement plan for the DDaT Strategy 2021
Technology and Digital Strat – Introduction to document	High level overview and strategic positioning of DDaT Strategy 2021

Table 8 Documents received