



National Audit Office



REPORT

Innovation in transport

Department for Transport

SESSION 2026-27
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HC 20

Key facts

£1.1bn

Department for Transport's (DfT's) approximate planned spend on innovation, 2022-23 to 2029-30 (average annual spend of £140 million)

27

number of innovation programmes this £1.1 billion is distributed across

72%

approximate proportion of DfT's planned innovation funding (2022-23 to 2029-30) that aims to decarbonise transport

72%

approximate proportion of DfT's innovation funding that it plans to spend through two delivery partners, Innovate UK and Connected Places Catapult, 2022-23 to 2029-30

**Approximately
£81 million**

combined average annual spend on innovation by Network Rail, National Highways and High Speed 2 Ltd, 2022-23 to 2024-25

£5 million

new dedicated funding from April 2026 to address shared challenges across transport modes

Summary

1 The transport sector has a long history of introducing new and improved ways of helping move people and goods. The government has often supported this activity. There are currently a wide range of opportunities and challenges across the transport sector. Successful innovation will be needed to make the most of emerging technologies and address the challenges of decarbonisation, and in a way that achieves reliable services for people and cost-effective solutions for the taxpayer.

2 The Department for Transport (DfT) has identified innovation as a key enabler to achieving its priority outcomes of growth; greener, safer and healthier transport; and improving transport for people. DfT supports innovation in a range of ways, such as providing funding to businesses and researchers developing and testing ideas, and creating the right regulatory environment for innovative ideas to succeed.

3 We estimate that DfT plans to spend approximately £1.1 billion on activities to support innovation between 2022-23 and 2029-30 (an average annual spend of £140 million) spread across various activities and transport modes. Policy teams initiate and oversee the majority of DfT's innovation programmes. Most of these programmes are then delivered through its two main delivery partners, Innovate UK and Connected Places Catapult. In addition, DfT also provides funding to arm's-length bodies to undertake research and development to help achieve their outcomes. Network Rail, National Highways and High Speed 2 Ltd (HS2 Ltd) have a combined spend of around £81 million a year on research and development.

Scope of this report

4 This report examines whether DfT's support for innovation in transport is delivering value for money. The report looks at whether DfT:

- has set out a clear approach to supporting innovation; and
- is managing its activity to support innovation effectively.

5 Our scope includes innovation spending by DfT's three highest-spending arm's-length bodies: Network Rail, National Highways and HS2 Ltd. For the purposes of this study, we have defined innovation as the creation and application of new scientific or technological knowledge to improve transport. We do not examine DfT's innovation activity relating to improving its internal processes and efficiency. We completed fieldwork between October 2025 and February 2026.

Key findings

DfT's approach to supporting innovation

6 DfT has increased its focus on innovation but could improve how it prioritises its funding to achieve the outcomes it wants. In 2023-24, DfT recognised innovation as one of its key strategic enablers to achieving the department's outcomes and in 2024-25 it revised how it defined that enabler to give innovation greater prominence. We estimate that DfT plans to spend approximately £1.1 billion on activities to support innovation between 2022-23 and 2029-30, across 27 innovation programmes. In its 2025 Science, Innovation and Technology Plan, DfT set out its expectation that its programme of work would reflect the department's three priority outcomes. These outcomes are as follows: growth; greener, safer and healthier transport; and improving transport for people. However, DfT does not have a strong process for prioritising its activity as a whole across different outcomes. As a result, DfT's innovation portfolio has emerged over time. By analysing DfT's management information, we estimate that 72% of DfT's actual and planned spending on innovation between 2022-23 and 2029-30 relates primarily to decarbonising transport. We would not expect DfT's innovation spending to be equally distributed across its three departmental outcomes. However, we have not seen evidence that this distribution results from a deliberate decision by DfT on the balance of funding (paragraphs 1.4 to 1.7 and Figures 1, 2 and 7).

7 DfT aims to use a range of interventions to support innovation but could make better use of regulation and its commercial influence. DfT has identified the key types of interventions that it expects its staff to consider when developing or delivering activity that can support innovation. These include funding, regulation, partnership working and using public procurement to support uptake of innovation. DfT uses these interventions to influence innovation activity, sometimes in combination. For example, DfT's Sustainable Aviation Fuel programme has involved grant funding and specialist advice to encourage production, alongside new regulation and legislation to support its uptake. DfT recognises that it could use its commercial and regulatory policy interventions more systematically across the department, alongside funding (paragraphs 1.8 and 1.9, and Figures 3, 4 and 5).

8 DfT has identified and is addressing barriers to innovation in its approach. In 2022, DfT consulted internally to identify barriers to it successfully supporting innovation, and what it needed to do to address these. The barriers DfT identified included the following: a risk-averse culture; a lack of clear messaging from leadership; staff lacking knowledge and understanding; and business processes that were not supportive of innovation. DfT has worked to address these barriers, for example through a central team dedicated to supporting innovation across DfT, knowledge-sharing groups, engagement events and tailored support. It has also provided guidance to help its investment boards, whose knowledge and experience of assessing innovation programmes may be limited. DfT still has more to do to embed a culture of innovation across the organisation (paragraphs 1.10 to 1.12).

DfT's management of its activity to support innovation

9 DfT's governance of its innovation activity provides limited strategic oversight.

DfT intends its Research and Development Board to provide direction for DfT's investments in transport innovation. However, in practice, this board has a limited role in decision-making on investments, with its activity focused on monitoring spending and redistributing underspends between research and development programmes. This monitoring activity does not cover all innovation activity across the department, excluding, for example, a £198 million programme to fund innovative aviation fuels. DfT does not coordinate its innovation activities in a way that would allow it to monitor risk appetite, cross-cutting risks, outcomes or value for money beyond individual projects. This leads to potential missed opportunities for coordinating activity across different modes of transport (paragraphs 2.3 to 2.5, 2.7 and 2.10, and Figures 6 and 7).

10 DfT has not clearly set out its risk appetite for innovation to guide its investment decisions.

Innovation requires actively seeking well-managed risk taking, as the path to outcomes is not necessarily clear or known. Some level of failure is inevitable and is an indication that an organisation is taking well-managed risks in pursuit of the outcomes it wants to achieve. Setting out its risk appetite for innovation would help DfT decide what level and type of risks to take in its projects to achieve the intended outcomes, and to monitor and manage higher-risk activity. We have seen that, in the absence of any guidance to decision-makers, there is a tendency towards lower-risk activity, which may limit its impact. DfT was, for example, only able to provide us with one example of a higher-risk investment that it stopped. Currently, DfT does not have an overview of how much risk it is taking across its innovation activity, limiting its ability to balance risk across different areas of activity (paragraphs 2.6 to 2.7 and Figure 8).

11 DfT commissions its main delivery partners, Innovate UK and Connected Places Catapult, to monitor progress and outcomes, but this does not cover all the innovation activity that DfT funds.

We estimate that, between 2022-23 and 2029-30, Innovate UK and Connected Places Catapult will deliver about 72% of DfT's total innovation spend. Both Innovate UK and Connected Places Catapult have appropriate monitoring arrangements and report regularly to DfT about the achieved outputs and outcomes of the innovation activities they deliver. This allows DfT to monitor progress and outcomes across themes, beyond individual programmes. We have seen examples of good monitoring and evaluation of DfT's individual programmes. However, outside the programmes delivered by Innovate UK and Connected Places Catapult, we have not seen DfT adopting a similar thematic approach. To maximise the impact of its innovation work, DfT will not only need to assess the effectiveness of its funding. It will also need to assess how it uses regulation, partnership working and commercial influence in support of transport outcomes (paragraphs 2.8 to 2.10 and Figure 9).

12 DfT's three highest-spending arm's-length bodies are more actively prioritising and managing their innovation portfolios. Arm's-length bodies are often the potential buyer and user of the innovations that they are supporting. They also have specific remits, which DfT funds them to deliver against, sometimes with fixed-year funding cycles. These factors support more active management of their portfolios of innovation activity. However, we found that the arm's-length bodies we reviewed also have clearer processes, compared with DfT's, for assessing potential activity. These include setting prioritisation criteria and the desired mix of risk profiles or stages of technology readiness in their portfolios of innovation projects (paragraphs 2.11 to 2.13 and Figures 10 and 11).

13 DfT has facilitated learning within the transport sector but has identified that it needs to improve the coordination of innovation activity with its arm's-length bodies and key stakeholders. In 2017, DfT established the Transport Research and Innovation Board to bring together representatives from key organisations and government departments with an interest in transport research and innovation in the UK. The three arm's-length bodies we spoke to were positive about this board and how they had learned about shared challenges. However, DfT's coordination of innovation activity with and between its arm's-length bodies has been limited. DfT identified that this results in duplication of activity and failure to prioritise cross-sector interventions. In April 2026, DfT launched a £5 million Delivering Efficiency through Technology Adoption fund to address this. DfT has used this fund to establish seven programmes to support the development and adoption of new technology that can be applied across the transport sector (paragraphs 2.14 to 2.16 and Figure 12).

14 Industry representatives we spoke to identified several areas where DfT can improve how it supports innovation. They highlighted a range of areas for improvement, with the most important themes being as follows: a culture of risk aversion; contractual and procurement processes that work against experimentation; concerns about intellectual property rights; and the need for better support to move trials to commercial end products. They also told us that procurement practices place disproportionate burdens on smaller companies. These areas are not unique to DfT. DfT is considering what it needs to do to better support innovative ideas through to commercial deployment from the outset of innovation programmes. International data show that the UK was in the top 10 global locations for transport patents relating to sustainability and digital technologies between 2000 and 2023. However, between 2018 and 2023, the rate of growth has slowed and is falling faster than all the other top locations except Russia (paragraphs 2.17 to 2.19 and Figures 13 to 15).

Conclusion

15 The successful support and adoption of new ways of doing things is key to addressing the opportunities and challenges facing the transport sector. In recent years, DfT has improved its approach to supporting innovation, taking steps to raise its profile within the department and to widen the type of interventions it makes. To continue this positive trajectory there are several areas where DfT can improve what it does to ensure it achieves good value for money. In particular, DfT could better define how its innovation activity can support the full range of outcomes the department wants to achieve. In doing so, it must be clearer on how much risk it is willing to take, collect the data and information it needs to manage and assess its activity, and help progress activity from early stages through to commercial readiness.

Recommendations

- a** To improve its management of activities to support innovation, DfT should:
- strengthen its process for prioritising its funding across the different outcomes it is seeking from its innovation activity, including being clear how those outcomes will enable it to achieve its departmental objectives, and then monitor alignment against this;
 - define, embed and use its risk appetite for innovation activity, to guide investment decisions and actively manage and balance the risk profile across its innovation activity;
 - decide how it can more actively manage its innovation activities within the department – whether through a managed innovation portfolio or other appropriate governance mechanisms; and
 - ensure that its approach to monitoring and managing its innovation activity is fully supported by appropriate management information.
- b** To assess the effectiveness of its support to the innovation system across its wider policy instruments such as regulation, procurement, commercial influence, and partnership at a transport mode level, DfT should:
- support more thematic monitoring and evaluation frameworks to capture evidence of impact beyond individual projects; and
 - decide how it will assess the impact of its innovation activities towards its departmental objectives of growth and improving transport for users.

- c** To ensure optimal collaboration and avoid duplication, DfT should build on the success of the Transport Research and Innovation Board to put in place effective coordination of innovation activity across DfT and its arm's-length bodies.
- d** To maximise the impact of its innovation activity, DfT, and its arm's-length bodies, should identify ways to address any barriers to the adoption of the innovations they fund, including:

 - better supporting progression from trials through to final products; and
 - ensuring that contractual and procurement processes encourage rather than deter suppliers of innovation, particularly smaller companies.