

Monitoring Report
October 2025

LMT monitoring report: progress and insights from the Transport Decarbonisation Demonstrator programme



UK Research and Innovation
Our ref: 245-747-02

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List of acronyms and abbreviations

Acronym	Meaning
3PL	Third Party Logistics
BVLOS	Beyond Visual Line of Sight
CO ₂	Carbon Dioxide
CAA	Civil Aviation Authority
CAD	Computer Aided Design
CCAM	Commercialising Connected and Autonomous Mobility
DfT	Department for Transport
eRCV	Electric Refuse Collection Vehicle
EV	Electric Vehicle
ECC	Essex County Council
EASA	European Union Aviation Safety Agency
FOAK	First of a Kind
FTE	Full Time Equivalent
HGV	Heavy Good Vehicle
IMS	Impact Management System
IUK	Innovate UK
LMT	Land and Maritime Transport
LA	Local Authority
LTP	Local Transport Plan
MOU	Memorandum of Understanding
MSP	Monitoring Service Provider
NZP	Net Zero Propulsion
OEM	Original Equipment Manufacturer
QMS	Quarterly Monitoring Scores
SME	Small and Medium Sized Enterprises
SORA	Specific Operations Risk Assessment
STEP	School Travel Evaluation Plan
TDD	Transport Decarbonisation Demonstrator
TRL	Technology Readiness Level
TRA	Temporary Restricted Areas
TVH	Tees Valley Hydrogen
UKRI	UK Research & Innovation
UAV	Unmanned Aerial Vehicle
VLOS	Visual Line of Sight
WCC	Wiltshire County Council
ZEBRA	Zero Emission Bus Regional Areas
ZEHD	Zero Emission Heavy Goods Vehicle and Infrastructure Demonstrator

ZEV	Zero Emission Vehicle
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Executive Summary

The Transport Decarbonisation Demonstrators (TDD) programme was delivered by Innovate UK (IUK) in partnership with the Department for Transport (DfT) to fund place-based demonstrations of low-carbon transport solutions. The programme aimed to accelerate the adoption of innovative technologies, strengthen collaboration between local authorities (LAs) and businesses, and generate practical learning to inform wider decarbonisation. The TDD project consortiums involved one LA and at least one business or university partner.

Overview of delivery

- Seven projects, which ran between 2024 and 2025, were funded through a single competition round in 2023-24, involving 19 partners across 18 grants.
- Projects spanned a diverse set of activities, including digital decision-support tools, infrastructure pilots, logistics and fleet trials, and electric vehicle (EV) charging initiatives.
- The average project duration was around 10 months, with individual grants ranging from £3.1k to £201.2k. LAs predominantly received the smaller grants, while businesses tended to receive the larger grants.

Key findings

Technology development and commercialisation

- Most projects achieved progression up one to three Technology Readiness Levels (TRL), especially where real-world demonstrations could be delivered.
- Survey evidence indicates that four beneficiaries had seen products launched or new services brought to market as a result of the project, with a further five beneficiaries expecting to do so in the future.
- Projects generated practical outputs including operational protocols, design packs, and safety guidance that regulators and LAs can use to inform approvals and procurement.
- Commercialisation remains at an early stage, but case studies demonstrate viable pathways to live deployment, replication, and export opportunities.

Partnerships and organisational development

- The programme significantly strengthened LA–business collaboration, with most beneficiaries reporting new or improved partnerships.
- 13 (out of 14) survey respondents rated the quality of partner relationships as “good” or “very good”.
- Participating organisations reported they had developed stronger technical, delivery, and commercial skills. In particular, Small and Medium Sized Enterprises (SMEs) gained a clearer understanding of LA governance and procurement, while LAs increased their confidence in modular, phased approaches. This interaction helped bridge the knowledge gap between SMEs and LAs, a large barrier to the procurement and adoption of innovative technologies by LAs.
- Employment impacts were modest; few new jobs were created; however, six (out of eight) surveyed beneficiaries reported that existing roles had been safeguarded, often bridging the “valley of death” where companies lack financing to continue development between prototype and market.

Barriers and enablers

- The main barriers to progress identified included regulatory approval delays, third-party dependencies, limited data access, procurement discontinuities, and SME cash-flow pressures.
- The key enablers included strong LA partnerships, early community co-design, access to real-world assets, and responsive oversight from IUK Monitoring Service Providers (MSPs). The place-based nature of the programme helped maximise the potential local impact of the technology and enabled real-world learning to be developed.

Early and potential long-term outcomes

- Early outcomes achieved include commercial launches, new contracts, and regulatory permissions.
- Potential long-term benefits reported by beneficiaries and wider stakeholders include verified emissions reductions, improved operational performance, economic growth through SME development and exports, and enhancements to the public realm and wellbeing.

These long-term outcomes will only be fully measurable once projects have been replicated, scaled, and adopted more widely.

Next steps for the programme

The evidence collected during this commission highlights the strengths of the TDD programme and support the rationale for continuing or expanding the TDD model of innovation support.

From the research, areas have been identified that would require additional attention if future rounds of TDD or similar place-based R&D competitions are delivered. These include:

- Allocating further funding for new TDD competitions to expand the pipeline of place-based demonstrations;
- Allowing for longer delivery timelines, giving space for robust trials, evaluation, and regulatory engagement;
- Providing greater funding flexibility, such as milestone-based payments or carry-over allowances, to ease SME cash-flow pressures;
- Supporting replication and scale-up by funding dissemination, replication toolkits, and small, targeted pots of funding that organisations can draw on after a prototype exists to complete the last bits of proof needed for buyers/procurement to bridge the gap between prototype and procurement-ready solutions; and
- Enhancing regulatory engagement, ensuring demonstrator evidence systematically informs standards, approvals and guidance.

Recommendations for future evaluation

Many of the anticipated impacts of the TDD programme will emerge over the longer-term. To capture them fully, the future evaluation should:

- Undertake follow-up tracking of projects at 12–24 months post-completion to assess progress towards commercialisation, replication across LAs, and integration into procurement frameworks.

- Measure environmental outcomes as technologies scale, including verified reductions in carbon emissions, improvements in air quality, and operational efficiencies.
- Strengthen economic impact analysis, extending beyond initial job creation to include safeguarded roles, SME growth, new investment and export contracts.

Overall conclusions

The TDD programme has shown that relatively small and time-limited grants can deliver meaningful progress in technology readiness, organisational maturity, and early commercialisation. By supporting LA–business partnerships and generating practical outputs for regulators and adopters, the programme has laid foundations for wider systemic benefits. Continued investment, targeted support for replication, and long-term evaluation will be essential to maximise the impact of TDD on transport decarbonisation.

1 Introduction & methodology

Introducing the LMT portfolio

- 1.1 The LMT portfolio comprises seven grant-funding programmes spanning a range of technologies, transport modes (including rail, road and maritime), and objectives. The seven programmes which make up the LMT portfolio are: the Zero Emission Heavy Goods Vehicle and Infrastructure Demonstrator (ZEHID); the Maritime Decarbonisation programme; the Commercialising Connected and Autonomous Mobility (CCAM) programme; the Tees Valley Hydrogen (TVH) Transport Hub programme; the Rail First of a Kind (FOAK) programme; the Net Zero Propulsion (NZP) programme; and the Transport Decarbonisation Demonstrator (TDD).
- 1.2 The seven programmes vary in objectives, size, complexity and duration. Constituent projects can range from single applicant six-month feasibility studies costing around £25k to deliver, to four-year multi-partner collaborative research and development (R&D) projects which can cost millions of pounds.

Purpose of this report

- 1.3 Steer-ED and Technopolis were commissioned by IUK, in partnership with DfT to conduct a monitoring commission on behalf of the LMT portfolio and the constituent seven programmes (note: the maritime decarbonisation programme research has been delayed to 2026 due to concurrent research). This report is one of seven LMT programme reports, focussing on the TDD programme presenting final findings, synthesised from across a range of evidence sources, described below. The delivery timelines for the individual programmes and the evaluation/monitoring process are presented in Figure 1-1.

Introducing the TDD Programme

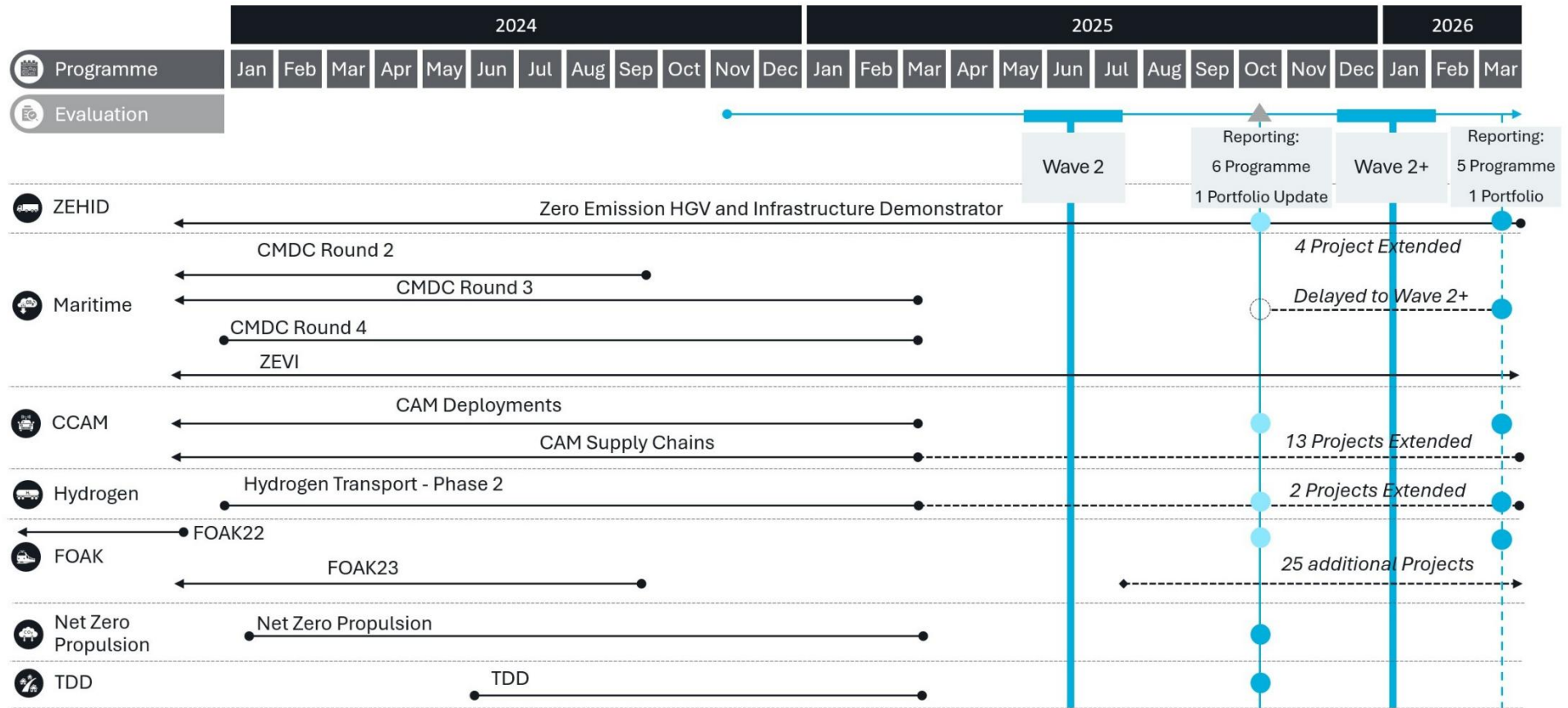
- 1.4 The TDD programme was delivered by IUK in partnership with the DfT to fund place-based demonstrations that reduce local transport emissions and strengthen LA-business collaboration. Up to £2 million in grant funding was available, with up to £1 million reserved for rural transport solutions. Eligible projects were collaborative, led by a UK business with at least one grant-claiming LA, having requested between £100k to £500k for a 6-10 month project, with all projects required to complete by 31 March 2025.

The LMT portfolio monitoring framework and logic model

- 1.5 This programme level report (and the wider LMT monitoring framework) is structured around the portfolio logic model, presented in Figure 1-2. This shows the causal relationships between activities conducted and how those are expected to lead to long-term programme impacts, via outputs and outcomes. The logic model is divided into five

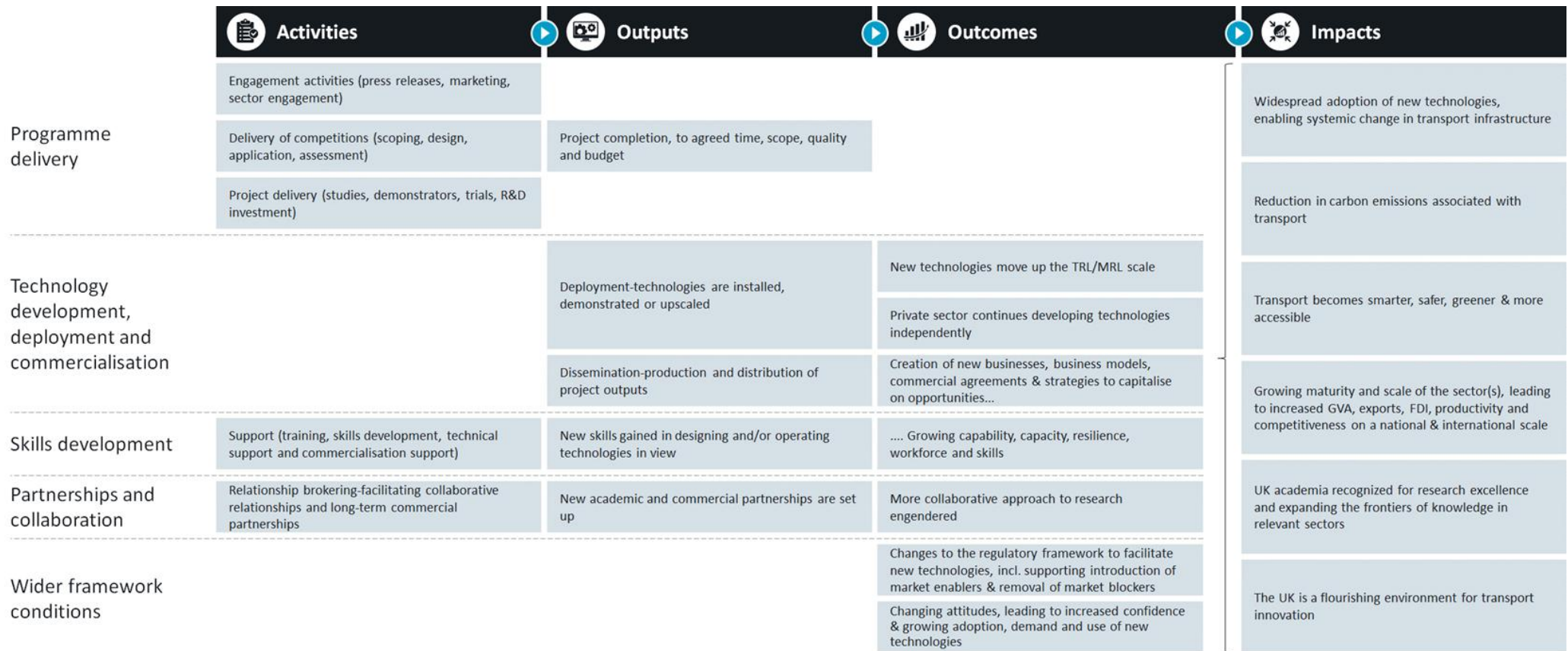
themes, reflecting five key underlying mechanisms: programme delivery; technology development, deployment and commercialisation; skills development; partnerships and collaboration; and wider framework conditions. Each of the subsequent chapters of this report is titled after one of these five themes, providing a structured exploration of the causal mechanisms.

Figure 1-1: Delivery timelines for the programmes and evaluation



Source: Steer-ED, 2025

Figure 1-2: LMT portfolio high-level logic model

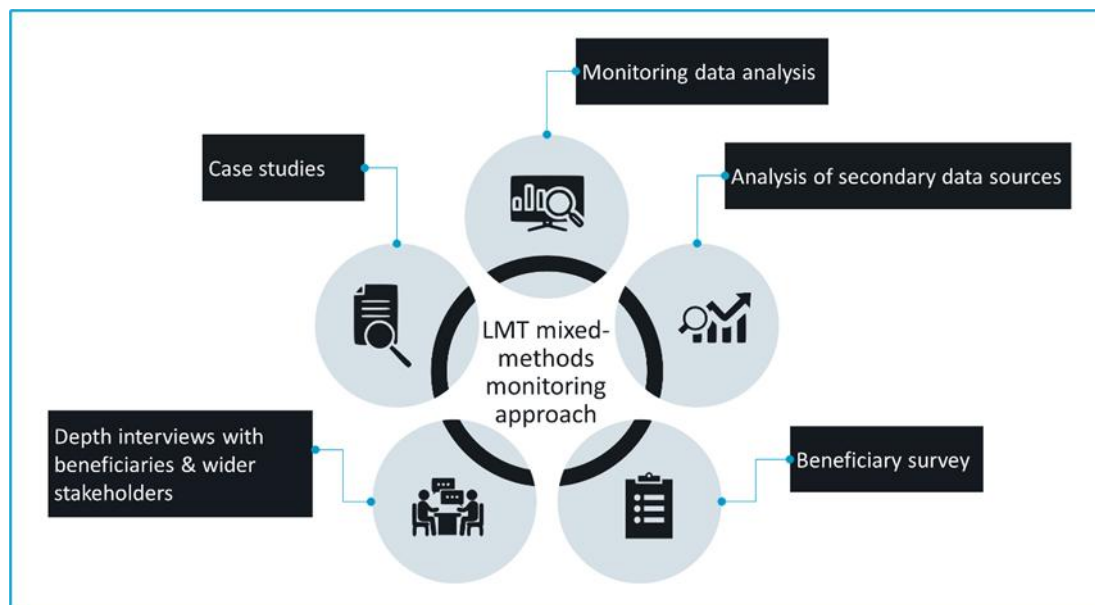


Source: Steer-ED and Technopolis, 2024

Sources of evidence utilised

- 1.2 Figure 1-3 below sets out the five types of evidence collection utilised for this monitoring commission. These evidence strands were selected in order to provide a broad and deep understanding of the portfolio, triangulating across a range of qualitative and quantitative research methods, and gathering inputs from a range of different perspectives.

Figure 1-3: Sources of evidence utilised within the monitoring approach



Source; Steer-ED, 2024

- 1.3 A detailed description of the scope and coverage of methods deployed across the portfolio is presented in Appendix A and is briefly summarised below for the TDD programme:
- **Monitoring data analysis** – spanning three data sources: applicant information data, QMS Monitoring reports¹ and the Impact Management System (IMS).
 - **Analysis of secondary data** – including: Crunchbase to further explore whether businesses participating in LMT programmes are attracting external investment; Meltwater, a media monitoring platform to assess the public dissemination of LMT projects in the period from 12 August 2024 to 12 August 2025; and Dimensions, a database that provides patent and publication data².
 - **Beneficiary survey** – An online survey of beneficiaries was developed and distributed to all project beneficiaries within scope of this wave, amounting to 220 recipients across the portfolio. The survey had a range of multiple choice and free text questions. Both project leads and partners were invited to complete the survey, meaning that multiple responses could be captured from each project. Unique

¹ QMS scores are provided by Monitoring Service Providers as part of Quarterly Review Meetings (QRM) with each project

² This data was based on metadata [as of 01/09/2025 for Wave 2] from Digital Science's Dimensions platform, available at <https://ukri.dimensions.ai/>. Access was granted under licence agreement with UKRI.

surveys were created for each programme and whether a beneficiary had responded in the previous wave. The survey was open for a period of approximately six weeks during July and September 2025. For the TDD programme, 14 responses were received from a total of 19 beneficiaries, representing a 74% response rate (compared to 66% response for the portfolio as a whole)³. Survey respondents covered all seven TDD projects. Of the survey respondents, 10 had responded during the wave 1 survey, while four were answering the survey for the first time. It is important to highlight that the survey respondents in this wave differed from those in Wave 1. As such, while the findings offer valuable insights, they represent a cross-section comparison rather than a longitudinal comparison across waves.

- **Depth interviews** – comprised one-hour depth interviews conducted with programme beneficiaries and a selection of wider stakeholders (knowledgeable industry stakeholders from both commercial and academic institutions) during August and September 2025. The number of interviews undertaken varied by programme, in accordance with the number of stakeholders involved in the programme. For the TDD programme a total of five beneficiaries and four wider stakeholders were interviewed.
- **Case studies** – Three case studies have been undertaken for this programme (a total of 16 across the portfolio). For the TDD programme, the case studies selected were: The IONA Drone Delivery Initiative; Private Infrastructure Network Solutions (PINS); and HomeRun School Travel Evaluation Plan (STEP). Findings from these case studies are integrated across this report and are presented as vignettes with separate full write-ups presented within the annex. All case studies have been reviewed by the programme's independent panel of subject-matter experts, selected for their expertise in relation to the programme or technology in question.

Methodological limitations

1.4 The key methodological limitations are as follows, which should be considered against the findings within this report:

- **Many technologies are still at the early stages of development**, meaning long-term impacts have not yet occurred. Many impacts are unlikely to emerge until several years after projects have completed. This is particularly the case for innovation funding, where numerous steps occur between initial project funding and measurable market outcomes. The findings gathered at this early stage (even if projects have closed) should therefore be considered indicative of a longer-term trajectory rather than conclusive.
- **Dependency on self-reporting**: although multiple sources of evidence have been examined, including consultation with wider stakeholders and industry experts, there is nonetheless an emphasis on understanding impacts via discussion with – or reporting by – project beneficiaries. Beneficiaries may sometimes emphasise positive outcomes or focus less on challenges, thus resulting in findings which could overstate the true impact of the portfolio. Wherever possible, the views of wider stakeholders and industry experts have been considered alongside beneficiary viewpoints to mitigate this risk.

³ Survey response totals vary across questions because some beneficiaries did not complete every item. Throughout the report, the base number of responses is shown for each question to aid interpretation.

- **Heterogeneity of the portfolio:** The programmes within the portfolio vary significantly in terms of scale, technology, and commercial readiness. Applying a consistent methodology across the seven programmes is therefore challenging. To address this, Steer-ED and Technopolis sought to achieve a balance between providing consistent research tools across the portfolio, while also allowing for some tailoring to reflect the differences between programmes.
- **Survey fatigue among respondents:** Repeated surveys of beneficiaries can lead to fatigue, causing lower response rates or incomplete responses and reduced data quality. This risk has been managed via briefing sessions with beneficiaries and proactive management of communications to ensure stakeholders understand the purpose of the research and benefits of participating. Across the portfolio, the beneficiary survey achieved a project response rate of 66%, which is still considered good representation.

Structure of this report

1.5 The remainder of this report is structured as follows:

- **Section 2: Overview of TDD programme delivery** outlines the current status of the TDD programme and presents the progress made.
- **Section 3: Building and strengthening partnerships through programme delivery** focuses on how the TDD programme has fostered partnerships across industry, academia, and government.
- **Section 4: Development, commercialisation and deployment of new technologies** explores the progress made by the TDD programme in developing new technologies and progressing on the pathway to commercialisation.
- **Section 5: Growing skills and organisational maturity through programme delivery** assesses the impact of the TDD programme on enhancing skills and growing businesses and organisational capacity and capability.
- **Section 6: Impacts on wider framework conditions and long-term outcomes** discusses the potential long-term impacts of the TDD programme on broader industry and regulation.
- **Section 7: Conclusions & next steps** concludes the report.

2 Overview of TDD delivery

Key Messages

- Across the TDD competition, seven projects were awarded 18 grants, bringing together 19 unique partners.
- As of September 2025, all seven projects had completed delivery with the majority having delivered all target objectives. Only one project has failed to deliver some of its key objectives.
- Individual grants ranged from around £3k to £200k and planned project duration averaged approximately 10 months.
- Portfolio activities spanned digital tools, infrastructure pilots, logistics trials, and charging access.
- Strong LA–business collaboration and early data access were critical enablers.
- Barriers included short delivery windows, third-party approvals, and cash-flow challenges for SMEs.

Introduction

- 2.1 This chapter provides a detailed overview of the TDD portfolio, outlining the objectives, timelines and key features of the programme, drawing on an analysis of monitoring data plus insights from the beneficiary survey. It goes on to characterise the delivery progress across the projects and offer insights from project delivery drawn from beneficiary interviews.

Introducing the programme

- 2.2 The TDD programme aimed to turn promising decarbonisation ideas into on-the-ground, place-based trials by pairing UK businesses with LAs to co-design and demonstrate R&D solutions on existing local transport networks. It focused on projects that can show measurable emissions reductions, align with local strategies, and generate evidence that others can replicate. Funding explicitly promoted LA-business collaboration and reserved up to half the pot for rural contexts, recognising the distinct challenges that these areas face.
- 2.3 TDD is designed to de-risk adoption, build practical know-how, and improve the choice and availability of low-carbon transport options for communities. Case study projects (Appendices B, C and D) illustrate the diversity of this scope:
- IONA (Appendix B) tested drone logistics in rural Argyll and Bute.
 - Paua (Appendix C) developed a digital marketplace for shared EV depot charging.

- HomeRun (Appendix D) created a county-wide school travel evaluation platform in Essex.

2.4 TDD ran as a single competition round in 2023-24. It opened on 27 November 2023, closed 8 January 2024, and winners were announced 26 July 2024. Projects ran for 6-10 months, with all projects required to start on 1 June 2024 and complete by 31 March 2025.

2.5 Across the TDD competition, seven projects were awarded 18 grants, bringing together 19 unique partners⁴. Consortia typically comprised a UK business lead and at least one grant-claiming LA, with an average consortium size of 2.9 partners per project. Individual grants ranged from £3.1k to £201.2k, with a programme-wide average grant value of £83.7k. The smaller grants were predominantly provided to LAs while businesses tended to receive the larger grants. As of September 2025, all seven projects had completed delivery.

Insights from project delivery

Project activities

2.6 Across the seven TDD projects, activities can be grouped into four broad categories:

- **Digital decision-support and optimisation:** county- or district-scale analytics to target school-run emissions; EV-enabled route planning for refuse collection; and configurable tools to plan/size multi-modal journey hubs.
- **Infrastructure and place-based design:** upgrading conventional bus shelters into modular mobility hubs and piloting solar-powered e-mobility hubs at rail stations to support first/last-mile trips.
- **Fleet and logistics trials:** low-carbon last-mile demonstrations (e.g. time-critical deliveries in rural contexts) and mechanisms to share private depot EV charging across organisations to accelerate electrification.
- **Charging access and inclusion:** planning around households without off-street parking and iterating user-centred charging hardware concepts to broaden access.

2.7 In terms of delivery timelines, five projects commenced on 1 June 2024 (planned duration: ~10 months) and two commenced on 1 July 2024 (planned duration: 9 months), resulting in a portfolio average planned duration of approximately 10 months.

2.8 Case study projects illustrate the delivery of tangible outputs, for example:

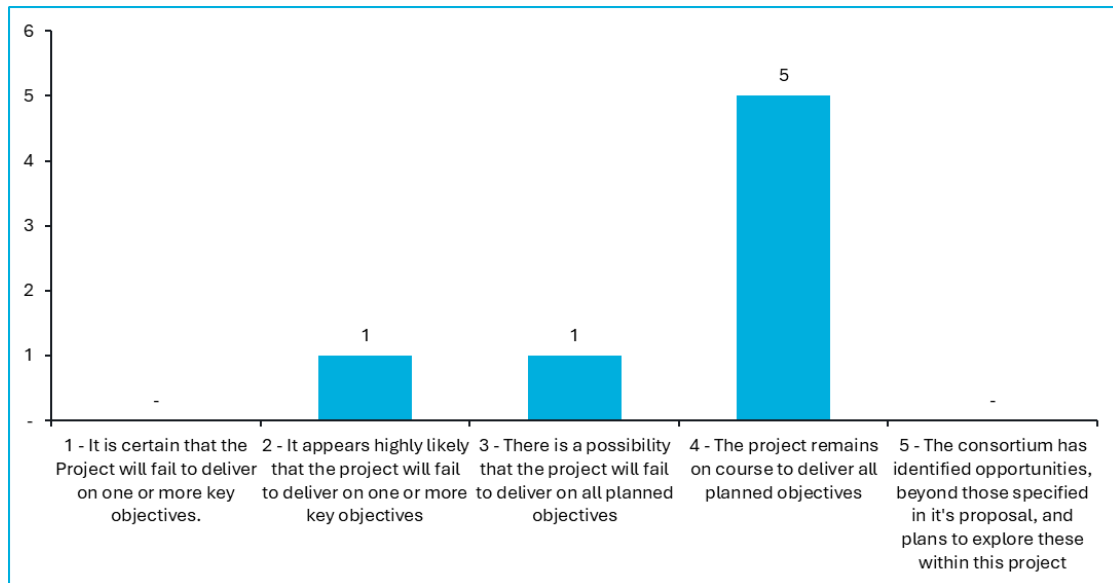
- IONA (Appendix B) validated its tilt-rotor fixed-wing drone design for rural parcel delivery and developed detailed operational checklists.
- Paua (Appendix C) launched a commercial depot-sharing product that reduced certain fleet charging costs by over 50%.
- HomeRun (Appendix D) delivered a fully operational STEP platform, helping secure initial commercial contracts with Wiltshire County Council (WCC) post-project.

2.9 The majority of projects have delivered as planned. As shown in Figure 2-1, five projects have delivered all planned objectives, one project has failed to deliver some non-core

⁴ Two project partners did not receive grants as part of their projects

functions (score of 3/5) and one project has failed to deliver one or more key objectives (score of 2/5).

Figure 2-1: Most recent QMS score for the scope of TDD projects (n=7)



Source: QMS data (IUK), Steer-ED analysis (August 2025) Question: How well has the project delivered against its objectives? (Answer: Cost Scoring Matrix, Scores 1-5)

- 2.10 In terms of progress made in reducing emissions, beneficiary survey evidence indicates that two of the 13 respondents reported their projects had already contributed to reducing the carbon impact of transport, while a further two noted reductions in other environmental impacts. In addition, eight of the 14 survey respondents anticipated that their projects would deliver carbon and/or other environmental benefits following commercialisation.

Beneficiaries' delivery experience

- 2.11 Beneficiaries reported a mixed experience; time-boxed demonstrations concentrated minds but also constrained evidence gathering. Strong LA partnerships and early data access helped, however third-party dependencies and approvals slowed progress. Case study insights reinforce these patterns, as summarised below:
- IONA (Appendix B) faced long delays in securing Temporary Restricted Areas and adoption of Specific Operations Risk Assessment (SORA regulations), limiting trial scale.
 - Paua (Appendix C) struggled with cultural and liability barriers among large depots, though host organisations with dedicated decarbonisation teams engaged more readily.
 - HomeRun (Appendix D) encountered early delays from legal agreements and the compressed application window, but once underway, its LA partnership unlocked county-wide data access.
- 2.12 The application process was generally described as clear and fast-moving, with a short turnaround from call to award supporting momentum. University and larger partners highlighted that the competition brief and templates were straightforward. However, the December–January window compressed bid development for some teams and in some

instances it was incredibly challenging to find an LA partner and write a bid over the December-January window.

- 2.13 Day-to-day interactions with IUK were described as supportive and responsive. Several beneficiaries remarked that projects were straight-forward to get up and running. However, where projects encountered supply-chain or approvals delays, beneficiaries perceived there was limited flexibility on extensions or budget rollover due to DfT funding requirements, which made it difficult to adapt their activities and timelines to overcome these challenges and demonstrate real-world impact.
- 2.14 Monitoring requirements were viewed as reasonable and increasingly evidence-based (e.g., photos, artefacts, data) rather than lengthy narrative reports. First-time project managers (PMs) and those who had not been involved in similar grant funded projects noted some uncertainty about exactly what to submit, suggesting clearer signposting of examples/templates would be beneficial. Design-centric teams reported that too much emphasis was placed on text in comparison to visual outputs, which in their view would have provided more useful evidence.
- 2.15 Several beneficiaries reported that quarterly payment profiles strained cash-flow for smaller firms. These beneficiaries suggested monthly/milestone-based profiles would better fit SME reality. Grant recipients can request monthly claims instead of quarterly and so this indicates that some beneficiaries were not aware of this as an option. Separately, no-carry-over rules and short delivery windows often resulted in projects underspending when they faced delays limiting their ability to deliver against project objectives and demonstrate the impact of their technology.
- 2.16 Barriers to timely delivery reported by beneficiaries included:
- **Third-party dependencies** (e.g., vehicle/asset availability, contractor willingness to operate non-standard routes), causing missed or curtailed trials.
 - **Data-sharing and approvals bottlenecks** within LAs or delivery partners, delaying analysis and on-street activity.
- 2.17 Enablers to successful delivery reported by beneficiaries included:
- **Strong LA collaboration** (e.g., access to fleets, sites, and real-world data).
 - **Community co-design** that helped to buy-in for place-based infrastructure concepts.
 - **Dedicated project staffing** (e.g., a research fellow) that accelerated modelling and analysis.
- 2.18 Common lessons included:
- the need to involve key delivery partners earlier (e.g. fabricators/contractors) to reduce downstream friction;
 - to secure data access up-front; and to budget time for evaluation, not just build/demonstrate; and
 - beneficiaries also reflected on different operating cultures; public-sector processes were slower and more risk-averse than private partners, requiring more lead-in and contingency.

Conclusion

- 2.19 The TDD programme was designed to accelerate decarbonisation by supporting local collaborative demonstrations. The TDD programme funded a diverse set of projects that tackled emissions reduction through digital, infrastructure, logistics and charging solutions.
- 2.20 Survey and case study evidence shows early signs of environmental and operational benefits, with additional impacts expected as projects move towards commercialisation. The programme has also generated tangible outputs, including validated designs, operational checklists and live digital platforms.
- 2.21 Delivery experiences highlight both strengths and constraints. The short timeframe drove focus and momentum but limited flexibility for iteration. Beneficiaries valued IUK's support and proportionate monitoring, but pointed to challenges around approvals, procurement, and SME cash flow.
- 2.22 Overall, TDD has proven effective at stimulating practical, place-based innovation within a compressed window. Future programmes may benefit from longer delivery timelines, more flexible funding arrangements, and earlier engagement of critical partners to reduce delivery risks.

3 Building and strengthening partnerships through programme delivery

Key Messages

- There is strong evidence of the positive impact that the programme has had on strengthening existing and building new partnerships. Nine of 14 survey respondents reported strengthened partnerships, and 10 of 14 reported successfully establishing new relationships.
- The strength and quality of partnerships fostered through the programme appears high with 13 of 14 survey respondents categorised partner relationships as “good” or “very good”.
- Enablers included timely access to data, sites, and fleets, plus clear routes to procurement. Barriers included paperwork burdens and SME cash-flow pressures.
- There are numerous examples of successful partnerships enduring beyond the lifecycle of the programme as projects continue trials and progress towards commercialisation.

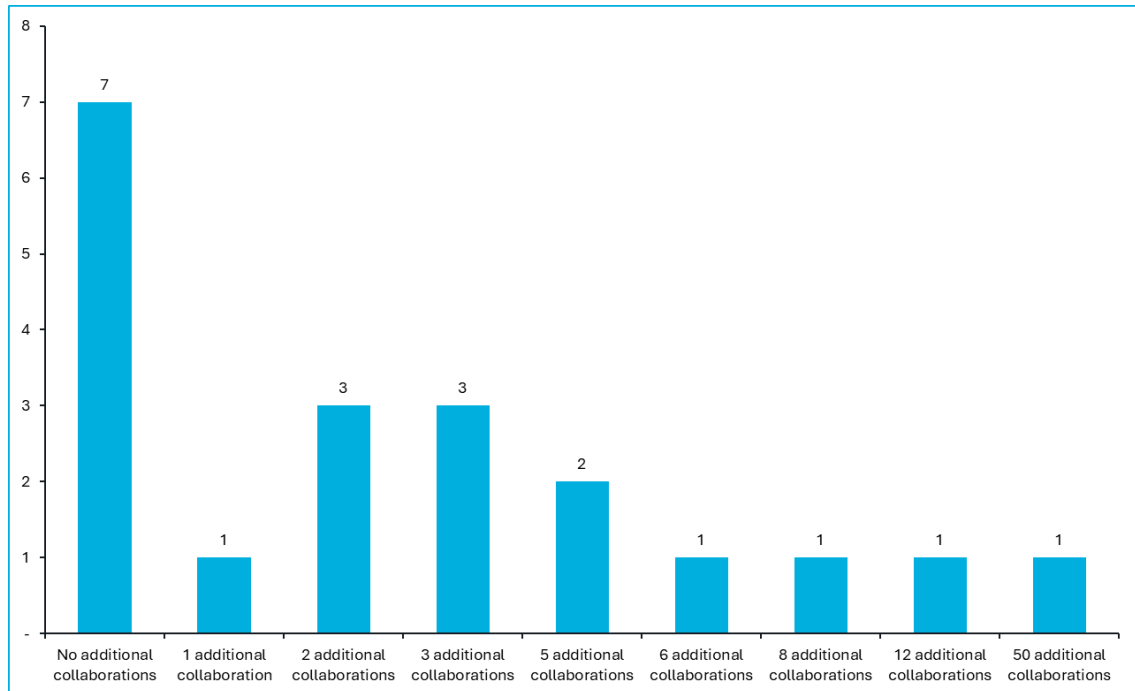
Introduction

- 3.1 A key objective of the LMT portfolio is to encourage a more collaborative approach to research through fostering new academic and commercial partnerships. As a result, TDD programme applicants were required to deliver their project in partnership with at least one other organisation. Participating organisations could include businesses, charities, academic institutions, public sector organisations and research and technology organisations.
- 3.2 This chapter sets out the role that project delivery has played in building and strengthening partnerships between industry, academia and regulators. It explores the mechanisms through which new partnerships were formed, and the TDD programme’s contribution to strengthening these relationships. It goes on to describe beneficiaries’ accounts of the types of partnerships formed and their anticipated (or realised) benefits.

Exploring the role of programmes in partnership development

- 3.3 Partnerships across the TDD programme mostly grew from pre-existing networks. Several consortia were established through prior collaborations (e.g. one design firm already worked with Cenex prior to the TDD project and numerous other business or university beneficiaries already had LA contacts), Original Equipment Manufacturer (OEM) relationships (bringing in a vehicle partner), and relationships created through previous networking activities (e.g. conferences, targeted outreach, LinkedIn).
- 3.4 IUK's brokerage offers were noted but unevenly used. Where time windows were short, beneficiaries tended to engage with individuals/organisations they already knew, reporting that it would not have been possible to pull together a consortia in time, without those pre-existing links.
- 3.5 As part of their engagement with IUK, beneficiaries could use the IUK Business Connect service or utilise the Catapult centres to support with their projects and technology. The IMS data indicates that five beneficiaries out of 20 reported using the IUK Business Connect while two out of 20 reported working with a Catapult.
- 3.6 Figure 3-1 shows that of the 20 beneficiaries in the IMS database⁵, most beneficiaries reported forming new collaborations in the past year. This suggests that TDD has not only sustained existing networks but also stimulated new connections, broadening the reach of innovation activity. This analysis is corroborated by the beneficiary survey, where 10 of the 14 respondents reported that the TDD projects had resulted in new partnerships.

⁵ One organisation was involved in two projects and therefore supplies 2 responses to the IMS data (1 response per project)

Figure 3-1: Number of new collaborations of beneficiaries in the past 12 months as a result of the TDD project (n=20)

Source: IMS data (IUK), Steer-ED analysis (August 2025), Question: As a result of this IUK support, how many new collaborations have you made with external organisations in the last 12 months?

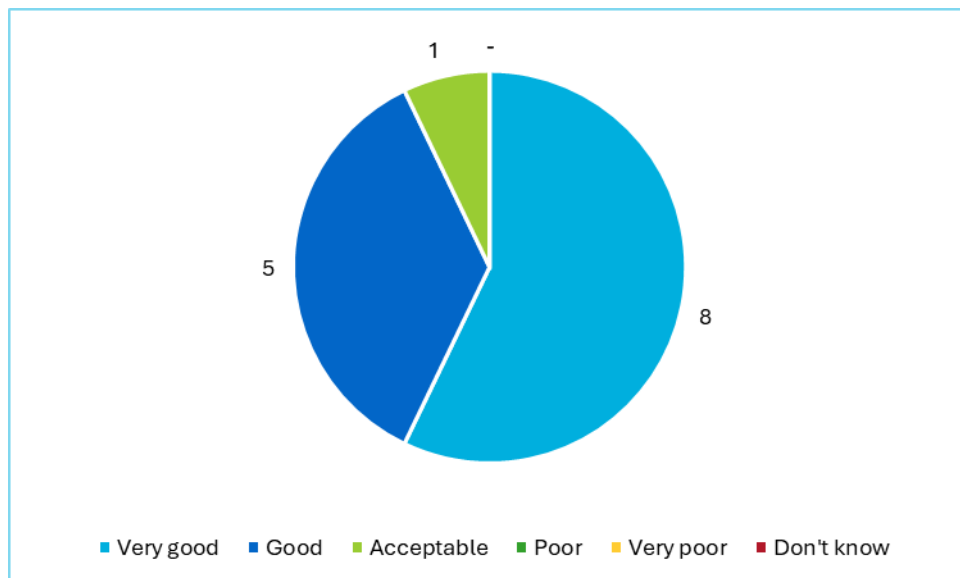
- 3.7 Once formed, partnerships developed through practical, problem-led work. Early scoping sessions, for example, to align with the LA's Local Transport Plan, quick data-sharing arrangements, and site walk-throughs helped to transform mutual interest into collaborative delivery plans. Co-design with communities (for place-based infrastructure) helped secure local legitimacy. Where third-party operators or fabricators/manufacturers were critical, involving these partners early was important and in instances where they were only involved at a later stage (e.g. a contractor reluctant to run non-standard routes, or a manufacturer not yet committed to a catalogue), progress stalled.
- 3.8 Partnerships were maintained by short, regular check-ins. IUK MSPs were seen as supportive convenors who kept momentum without micromanaging. In practice, continuity depended on two enablers:
- Timely access to assets/data (vehicles, sites, operations); and
 - A credible post-demo route to procurement (frameworks, catalogues, standard specs).
- 3.9 Where those were missing and/or where timelines could not flex to accommodate delays in approvals (i.e. including those caused by local elections or obstacles across supply-chains) then relationships defaulted to "friendly but paused".
- 3.10 Looking ahead, beneficiary reflections pointed to some areas of good practice to be embedded in delivery processes to support effective partnership working:
- pre-award letters of intent from operators/fabricators;
 - template data-sharing and minor-variation agreements;
 - standard technical specs that map cleanly to procurement routes; and

- regular milestone-based payments that ease SME cash-flow and keep all partners engaged.

Types of partnerships formed, and how they have been used

- 3.11 The programme saw different partnership models emerge, including businesses working with LAs and technical advisers, OEMs and contractors. The case studies below illustrate some of these models in practice.
- IONA (Appendix B) demonstrated how logistics partners, regulators, and councils together enabled drone testing in rural Scotland, even where regulatory delays stalled beyond visual line of sight (BVLOS) progress.
 - Paua (Appendix C) showed the value of engaging depot hosts and fleet operators directly in product testing, addressing liability and insurance concerns that might otherwise block uptake.
 - HomeRun (Appendix D) highlighted how a single strong LA partnership can unlock credibility with other buyers.
- 3.12 In general, beneficiaries perceived the quality of partnerships to be strong. Perceived quality of partnerships was strongest where relationships pre-existed and roles were clear (who supplies data, who controls assets, who decides). As shown in Figure 3-2, 13 of 14 respondents to the beneficiary survey reported the quality of relationships between project partners to be “very good” or “good”, while no respondents reported relationships between partners to be “poor” or “very poor”.

Figure 3-2: Reported quality of relationships between project partners (n=14)



Source: Beneficiary Survey, Steer-ED analysis (September 2025), Question: How would you rate the quality of relationships between project partners? (Answer options: Very good, Good, Acceptable, Poor, Very poor, Don't know, N/A)

- 3.13 Survey and interview evidence indicates that SMEs rated collaboration positively but flagged cash-flow and paperwork burden as friction that can hinder momentum. Where third-party incentives misaligned (e.g. contractors reluctant to run non-standard routes;

OEM delays, or competition between partners), partnership performance dipped despite good intent.

- 3.14 As highlighted above, formation of partnerships typically relied on existing networks. During delivery, partnerships deepened through problem-led work: data-sharing agreements, site walk-throughs, co-design workshops, and regular short check-ins anchored on tangible artefacts (design packs, model outputs, demo photos). The deepening of partnerships was corroborated by the beneficiary survey, where 9 of 14 respondents reported that their project had contributed to strengthening existing relationships.
- 3.15 Post-project, some relationships continued into self-funded demos/memorandums of understanding (MOUs) and manufacturer conversations; others were paused, pending procurement routes or follow-on funding. Where a clear route-to-market existed, partnerships were more likely to persist and broaden to new sites; where not, they remained ad-hoc and opportunistic.
- 3.16 Wider stakeholder interviews indicated that regional bodies, such as Sub-national Transport Bodies and Mayoral Combined Authorities, can act as light-touch brokers by matching buyers and suppliers and signposting opportunities for replication and adoption of innovative technologies which had been trialled in other locations. This was raised as a general role rather than linked to specific TDD projects.

Beneficiary perspectives on the benefits of partnerships

- 3.17 Beneficiaries pointed to practical gains from partnering with LAs and other partners. Access to real-world assets and data (such as fleets, depots, routes, sites) enabled teams to move into trials and design work. Several firms said the LA relationships accelerated product learning and gave their offer credibility with customers and regulators. In one case, a business working alongside an LA and a technical adviser reflected that they were able to create a shared brief and user insight that tightened the fit between concepts and place needs, resulting in complete modular design packs ready for manufacture discussions. Where demonstrations encountered challenges, projects used their partnerships to diagnose the causes of the challenges. For example, projects identified how contractor incentives or vehicle reliability could derail electric refuse collection vehicle (eRCV) trials, saving time and money on future trials.
- 3.18 Partnerships also opened doors. Beneficiaries reported new MOUs or ‘warmer’ conversations with logistics providers and OEMs, helped by the credibility of having a LA and IUK engaged. LAs highlighted the benefits of having an accountable private partner to co-develop evidence, test assumptions, and translate policy into implementable options. MSPs were valued as a light-touch convenors, helping to ensure alignment across partnerships without slowing delivery.
- 3.19 Looking ahead, beneficiaries perceive effective partnerships as the route to scale. One beneficiary plans to carry forward the same LA-intermediary relationships into prototyping and fabrication, aiming to place products in manufacturer catalogues and increase the ease with which LAs can purchase the product. Another intends to leverage existing partnerships to run larger beyond visual line of sight (BVLOS) demonstrations with health and logistics customers, then replicate this in comparable rural authorities and adjacent

markets. Another beneficiary wants to return to partner LAs with validated trials so that prototypes can be proven locally and procured. Several beneficiaries noted they would keep the relationships warm, with the expectation that follow-on funding, clearer procurement routes, or regulatory milestones will trigger the next phase.

Case study vignette showcasing partnership development and the benefits to the project/organisation

The IONA Drone Delivery Initiative (Appendix B) tested the feasibility of using tilt-rotor drones to provide logistics services in rural Argyll and Bute. The project explored how drones could reduce van miles, cut emissions, and improve delivery reliability in remote areas with challenging geographies. Activities included visual line-of-sight (VLOS) flight trials, development of detailed operational checklists and safety logs, and early engagement with the Civil Aviation Authority (CAA) to prepare for BVLOS operations. This case study highlights the importance of involving LAs and delivery partners from the outset, ensuring technical validation and building credibility for wider adoption.

For IONA, partnership with Argyll and Bute Council was pivotal. The Council provided access to depots, delivery routes, and community networks, giving the drone logistics trials both legitimacy and operational grounding. Logistics firms joined to explore how drones might integrate with rural supply chains, while suppliers and UAV specialists stepped beyond their traditional roles to provide technical consultancy.

These partnerships ensured the demonstrations reflected real-world constraints rather than laboratory conditions. They also helped IONA secure buy-in from regulators, laying the groundwork for later CAA authorisation. For the organisation, the experience highlighted the importance of co-designing with LAs and operators from the outset, turning partnership into a lever for both technical validation and commercial credibility.

Conclusion

- 3.20 The TDD programme has played a clear role in fostering collaboration between businesses, LAs, and wider partners. Evidence shows that most beneficiaries strengthened existing relationships and formed new ones, with partnership quality rated highly.
- 3.21 Effective collaboration was enabled by timely access to assets and data, supportive programme oversight, and clear procurement pathways. However, challenges arose where timeframes were compressed, third-party incentives misaligned, or SME resources were stretched.
- 3.22 Overall, the programme has demonstrated the value of structured support in building strong local innovation ecosystems. Ensuring early partner engagement, procurement alignment, and SME support will be important for sustaining and scaling these partnerships in future rounds.

4 Development, commercialisation and deployment of new technologies

Key Messages

- TDD projects typically achieved 1–3 levels of TRL progression, moving designs and models into field demonstrations of impact.
- There is nascent evidence of beneficiaries already bringing new products or services to market, with further commercialisation from beneficiaries expected in the future.
- Dissemination has been targeted rather than broad, with projects reporting producing technical reports and guidance to enable replication of their technologies' impact.
- Enablers of progress included strong LA collaboration, real-world access, and responsive monitoring.
- Barriers included regulatory delays, procurement gaps, third-party dependencies, and supply chain fragility.

Introduction

- 4.1 This chapter explores the extent to which TDD projects have been successful in developing and deploying technologies, as well as progressing towards commercialisation.

Reported TRL progression across projects, and mechanisms driving this

- 4.2 Across the TDD project beneficiaries interviewed, demonstration was the main driver of TRL progression. Where project teams could access assets, data and sites, they translated desk work into field evidence and reported progression of 1–3 TRL levels since the projects began. Where dependencies (vehicles, contractors, approvals) did not materialise as planned, progress was largely confined to models and designs rather than real-life environment validation. Project examples of TRL progression include:

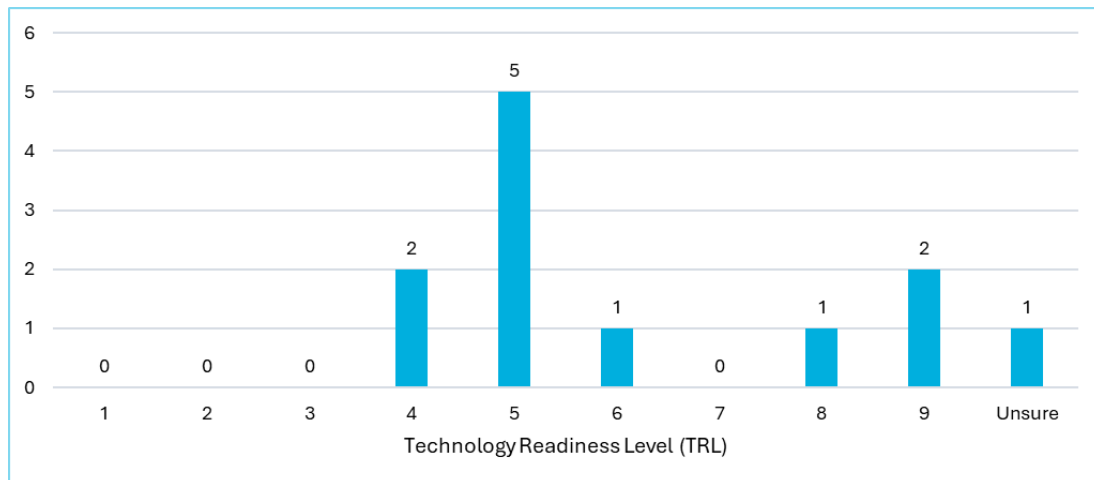
- **Drone delivery demonstration:** One project ran VLOS demonstrations in rural operating environments, capturing flight and emissions data and developing

operating procedures. The project secured CAA operational authorisation post-project, positioning for BVLOS expansion and reporting a TRL move from 4 to 6/7.

- **EV-aware waste-collection routing:** Partners built and integrated new arc-routing solvers with an existing EV modelling stack, reaching a TRL4–5 prototype. However, vehicle breakdowns, contractor reluctance and weak data access prevented the planned eRCV trials, so real-world validation, and further TRL progress, did not occur despite strong technical progress.
- **Modular mobility hubs/street furniture:** Design-led projects completed detailed system designs and digital models for a modular “kit-of-parts” (shelters, benches, signage, planters), advancing from concept to a manufacture-ready design state. Without prototyping and user testing, these remained around TRL3–4, with the next step dependent on securing a fabricator and running on-street pilots.

4.3 Beneficiaries reflected that key enablers of TRL progression included rapid access to real assets/data, responsive MSP support, and co-design with LAs/communities. Limitations included compressed timelines, procurement and approvals cycles, supply-chain fragility (i.e. vehicles/fabricators). As shown in Figure 4-1, a majority of beneficiaries report their technologies as being in a middling TRL (between TRL4 and TRL6), with three responses to the beneficiary survey question reporting either TRL8 or TRL9 for their technology. This indicates an uptick in TRL from the position during wave 1, where beneficiaries mostly reported TRL4 and a few beneficiaries reported their technology was between TRL1 and TRL3. This question was only asked to private business beneficiaries.

Figure 4-1: Self-reported TRL of technology (n=12)

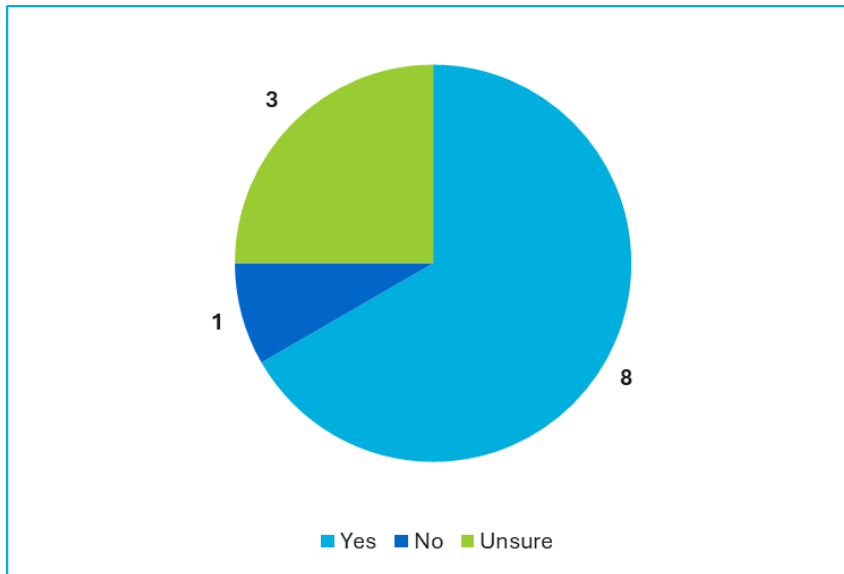


Source: Beneficiary Survey, Steer-ED analysis (September 2025), Question: With reference to the Technological Readiness Level (TRL) scale listed below, what is the TRL of the technology now? (Answer options: Numeric (1-9), Unsure)

4.4 In summary, the TDD programme supported the development of technologies when project teams faced favourable conditions to deliver their projects. Where project teams faced delivery challenges, teams were still able to benefit from increases design/algorithmic maturity for their technologies, however the technologies still require prototype, trial, and procurement routes to reach TRL5–7.

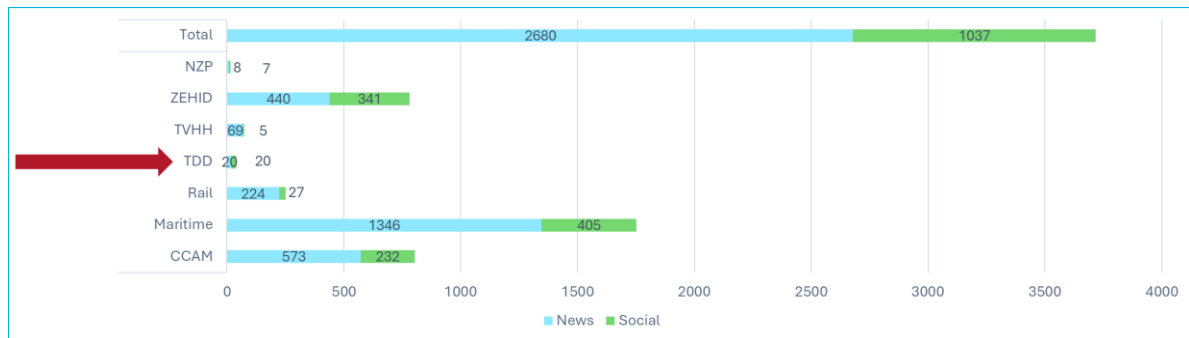
Intellectual property and information dissemination

- 4.5 Beneficiaries reflected that projects generated three main kinds of knowledge:
- **Operational evidence:** for example, drone flight/energy logs and procedures (supporting unit-economics and CAA authorisation inputs); EV-aware routing heuristics and prototype solvers for domestic waste collection; and place-specific datasets for school-run and charging access analysis.
 - **Design and implementation know-how:** manufacture-ready computer aided design (CAD) packs and a modular “kit-of-parts” for shelters/mobility hubs; site selection criteria, bill-of-materials, and install/maintenance playbooks; and practical guidance on approvals (highways, estates) and procurement pathways.
 - **Collaboration & governance learning:** templates for data sharing, change control and co-design, plus hard-won insight into third-party dependencies (vehicle leasing, operator incentives) and how these affect trial viability and evidence quality.
- 4.6 Beneficiaries explained that knowledge was generated mainly through practice and delivery. They highlighted several important methods; short and focused demonstrations carried out on live networks, rapid prototyping combined with parametric design work, and collaborative design processes with both communities and operators. Even when demonstrations did not move forward as intended, the teams were still able to generate useful diagnostic knowledge:
- In the IONA drone project (Appendix B), while regulatory delays limited the scale of BVLOS trials, the team generated detailed operational checklists and safety logs that are now being used to refine future trials.
 - Additionally, Paua (Appendix C) generated evidence on depot-sharing liability and incentives, which has already been published as a white paper with Cenex to set best practice for shared charging.
- 4.7 Outputs such as design packs, model outputs, and slide decks have been shared directly with LAs and partners, while internal concept demonstrators have been used to brief equipment manufacturers and fabricators. Operational artefacts have also informed CAA processes, with one team successfully achieving post-project authorisation. As shown in Figure 4-2, eight of 12 respondents to the beneficiary survey reported technical reports as an output of the project. Two beneficiaries reported that the technical outputs had been published. This highlights the relatively high frequency of dissemination of knowledge arising from projects.

Figure 4-2: Number of respondents reporting technical reports or documents as an output of their project (n=12)

Source: Beneficiary survey, Steer-ED analysis (September 2025) Question: Have any technical reports/document outputs been developed as a result of the project? (Answer options: Yes, No, Unsure, NA)

- 4.8 Beneficiaries described plans for sharing their work more widely once prototyping and validation are complete. They plan to develop replication toolkits, including specifications, CAD models, bills of materials, and siting playbooks (where applicable) so that other LAs can adopt the approaches more easily. They also aim to produce method notes and data dictionaries to help standardise inputs and outputs for routing and analytical tools. Procurement-ready assets, such as standard specifications and catalogue entries, are being prepared to bridge the gap between design and purchase. In addition, beneficiaries saw potential value in “show-and-tell” forums and fabricator open days, which would help share technical learning.
- 4.9 Several beneficiaries also proposed creating a lightly curated central repository to hold non-sensitive artefacts, such as design files, specifications, engagement templates, and trial protocols. Alongside this, they suggested using “validation vouchers” - small, targeted pots of funding that organisations can draw on after a prototype exists to complete the last bits of proof needed for buyers/procurement - to fund the crucial step between an internal prototype and a publishable case study. Taken together, these measures would help turn project-specific learning into portable, evidence-based guidance that other authorities could put into practice immediately.
- 4.10 Dissemination activity has largely been targeted at specific audiences rather than broadcast widely. As shown in Figure 4-3, only 20 instances of TDD projects being referenced in news media (online news and print media such as bbc.com or the London Evening Standard) and 20 instances on social media (activity on platforms, blogs, and forums such as LinkedIn, Reddit or Twitter) were reported. While TDD is a smaller programme than some comparators, the volume of media coverage is markedly lower than most other programmes (with the exception of the NZP programme). This pattern is reflected in the beneficiary survey, where only three of 14 respondents reported news media coverage of their project, and five reported coverage in the trade press.

Figure 4-3: Number of individual media references to projects across different programmes

Source: Meltwater, Technopolis analysis (data collected August 2024 to August 2025)

- 4.11 Patents are not a major expected output of the TDD programme. In response to the beneficiary survey, only two beneficiaries out of 10 reported that new patents were expected to have been held as a result of the programme in three years' time. The limited role of patents in project outputs is also demonstrated through the IMS data, where none of the 19 respondents reported new patents, designs, trademarks or copyrights to be a result of their TDD projects. This is further demonstrated by analysis of the Dimensions database, where no patents or publications are identified as outputs of TDD projects.

Commercial progress made by organisations

- 4.12 Across the interviewed projects, commercial progress has been selective but tangible where demonstrations created credible evidence for buyers or regulators:
- The Paua PINS depot-sharing project (Appendix C) progressed from demonstrator to commercial launch. A live platform was released, 12 depots were onboarded, and early revenues were secured through fleet bookings. Publication of a best-practice white paper with Cenex helped build market credibility. While liability and insurance remain barriers for wider depot participation, the product is now live, with a clear commercial pipeline and paying customers.
 - The IONA drone delivery project (Appendix B) secured CAA operational authorisation post-project and used TDD activity to validate unit economics and set up MOUs with multiple third party logistics (3PLs) firms. Teams planned further demonstrations on a self-funded basis and reported overseas interest (IE/IS/FR, Channel Islands). Contracts were not yet signed for live service, but pipeline readiness improved markedly. One beneficiary from the project summarised:

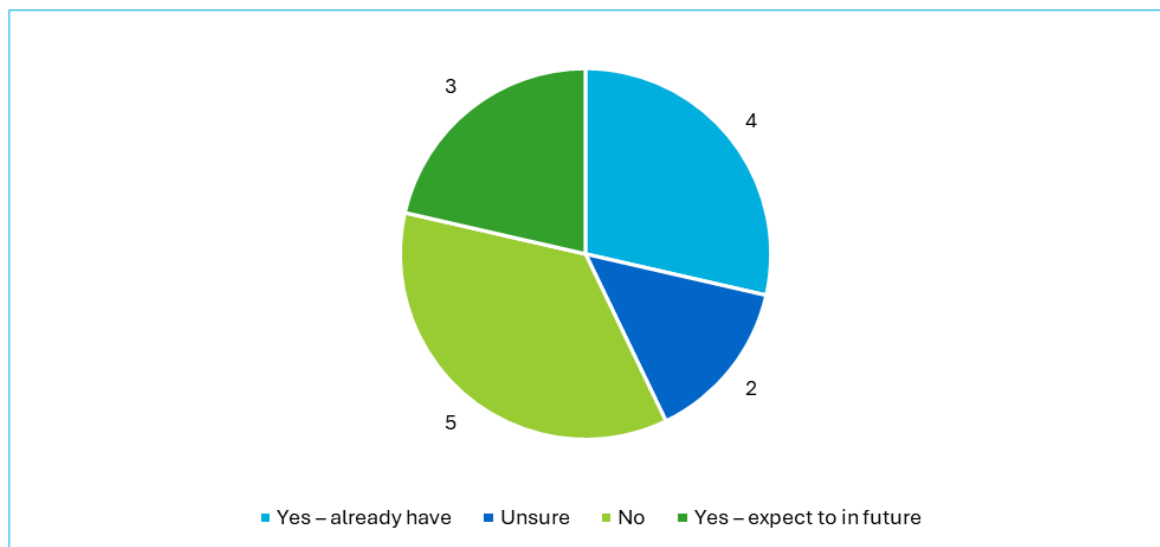
"We achieved everything we needed as a business... got all assets and data." – TDD beneficiary

- The Development of an EV-Enabled Route Planning Tool for Domestic Waste Collection with Supporting Local Authority eRCV Trials project delivered a working prototype (EV-constrained arc-routing) and strengthened OEM relations, but missed vehicle trials meant no saleable, locally validated product for LAs yet. Commercial discussions remain contingent on follow-on validation and clearer procurement routes.
- The Transforming Rural Bus Shelters into Modular Mobility Hubs completed manufacture-ready design packs (shelters, benches, signage, planters) and opened

conversations with fabricators. No catalogue placement or LA purchase orders have been placed yet as progress depends on a prototype and manufacturer agreement to create a buyable line.

- 4.13 As shown in Figure 4-4, survey evidence aligns with these findings. Four respondents (out of 14) reported that their project had already brought a new product or service to the UK market, while five expected to do so in future. Only two reported no commercialisation plans, and three were unsure. This demonstrates that while immediate commercialisation has been achieved in some cases, the majority of projects anticipate further market entry once validation, procurement alignment, or regulatory milestones are secured. However, this still represents a progression from wave 1, where none of the 13 beneficiary survey respondents had reported bringing a new product to the UK market at the time.

Figure 4-4: Whether TDD projects have resulted in new products or services to the UK market (n=14)



Source: Beneficiary Survey, Steer-ED analysis (September 2025), Question: To date, have any new products or services been brought to the UK market as a result of this project? Answer options: Yes – already have, Yes – expect to in future, No, Unsure)

Barriers and enablers to technological and commercial development

- 4.14 Beneficiaries felt that several factors hindered delivery and slowed progress across projects. These included:
- **Regulation and approvals:** Aviation rules and processes were described as underdeveloped for rural drone logistics, which significantly extended the time required to reach meaningful BVLOS trials. Additional delays arose from requirements for highway and estate approvals, as well as election-period restrictions on LA activity. As one team noted, the timeframe was:

“Not a sensible duration [for project activity] for something with so many moving parts.” - beneficiary

- **Third-party dependencies:** Demonstrations often relied on assets beyond the control of grantees. Problems included leased vehicles breaking down, contractors unwilling to run non-standard routes, and fabricators not yet ready to catalogue a design. These issues frequently stalled validation, even when the core technology was fully developed.
- **Data and evidence gaps:** Limited access to council and operations data forced teams to develop workarounds, which weakened their ability to demonstrate clear local benefits. Secondly, without live trials, buyers tend to remain cautious. Simulations were received with interest but did not generate the same confidence as live trials. As one beneficiary reported:

“Councils said, “oh, wow...” to simulations, but wanted results on their own fleet.” – TDD beneficiary

- **Procurement and continuity:** LAs typically procure services rather than prototypes. Direct awards were not possible, and bespoke designs could not be purchased without going through a compliant route. This created a discontinuity between R&D outputs and adoption.

4.15 Several factors were seen as instrumental in helping teams move forward:

- **Real-world access:** Easy access to sites, fleets, depots, and communities enabled rapid progress in technology readiness levels. This included visible progress in areas such as VLOS flights, unit-economics modelling, and securing CAA operational authorisations.
- **Existing relationships and partnership support:** Pre-existing relationships with LAs and intermediaries (such as Cenex), together with MSPs who adopted a hands-off but responsive approach, helped sustain momentum.
- **Focused scope and credible demonstrations of impact:** Concentrated, place-based tasks led to tangible outputs such as prototype solvers and manufacture-ready design packs. These artefacts, in turn, unlocked memoranda of understanding, discussions with fabricators, and interest from overseas consumers.

Case study vignette showcasing a project which has made notable commercial progress, plus commentary on the barriers and enablers experienced

The Paua PINS project (Appendix C) set out to tackle a simple but pressing problem: many fleet depots already have EV charging infrastructure, but it sits idle for much of the day.

The Paua PINS project launched a digital platform enabling fleets to book charging sessions at underused depot chargepoints, onboarding 12 depots during the programme. Early adopters reported charging cost reductions of more than 50% compared with public networks, providing clear commercial validation. Revenues began flowing before the project concluded, and the business has since built a growing sales pipeline.

Progress was not without friction. Cultural and liability concerns meant some large depots were hesitant to participate, while insurance frameworks for cross-operator use remained underdeveloped. These barriers slowed adoption and highlighted the need for regulatory clarity. On the other hand, several factors acted as strong enablers; Cenex's role in convening partners, supportive LAs willing to trial depot sharing, and the production of a best-practice white paper that gave the platform market credibility.

The result is a product now live in market, with paying customers and a clear growth trajectory.

Conclusion

- 4.16 The TDD programme has advanced the development and market readiness of low-carbon transport technologies. Most projects reported progression of one to three TRL levels, with demonstrations enabling translation from models and designs into field evidence. Even where trials were constrained, projects still achieved design maturity, algorithm development, and manufacture-ready outputs.
- 4.17 Commercialisation is beginning to emerge. Survey evidence shows that some projects have already launched new products and services, while others expect to do so following further validation, regulatory clearance, or procurement alignment. Dissemination activity has been selective, with an emphasis on technical outputs and guidance that can support replication by LAs and regulators.
- 4.18 Progress was supported by strong LA collaboration, real-world access, and responsive monitoring, but slowed by regulatory approval delays, procurement discontinuities, and third-party dependencies. Overall, the programme has provided a platform for both TRL progression and early commercial outcomes, laying the groundwork for broader deployment if systemic barriers are addressed.

5 Growing skills and organisational maturity through programme delivery

Key Messages

- SME and LA beneficiaries have seen strengthened organisational skills and maturity because of the programme.
- Beneficiaries highlighted gains in both technical skills (drone operations, routing methods, design-for-manufacture) and delivery/commercial skills (procurement pathways, project scoping around real-world assets).
- SMEs reported stronger understanding of LA governance and processes, while LAs gained confidence in modular, phased solutions to support modal shift.
- The growth in skills and maturity will enable beneficiaries to develop larger-scale demonstrations, validation-ready prototypes, and manufacturer agreements.

Introduction

- 5.1 Delivery of TDD projects is expected to stimulate growth in the capability, capacity, resilience, workforce and skills of beneficiary organisations, ultimately leading to growth in the maturity and scale of the place based transport decarbonisation sector, with corresponding economic benefits. This chapter sets out the mechanisms by which activities have impacted organisational skills and maturity, and the role of the programmes in creating and safeguarding jobs.

How projects have contributed to skills development amongst partner organisations

- 5.2 SMEs and LA partners reported the programme has had positive impact upon skills development and organisational capabilities. Drone teams strengthened their operational procedures and safety cases, while routing teams advanced their optimisation methods and data engineering. Design teams deepened their understanding of design-for-manufacture and regulatory approvals.
- 5.3 Alongside these technical improvements, partners developed stronger delivery and commercial skills. They learned how to scope projects around real-world assets such as fleets, depots, and sites, how to evidence benefits effectively, and how to prepare

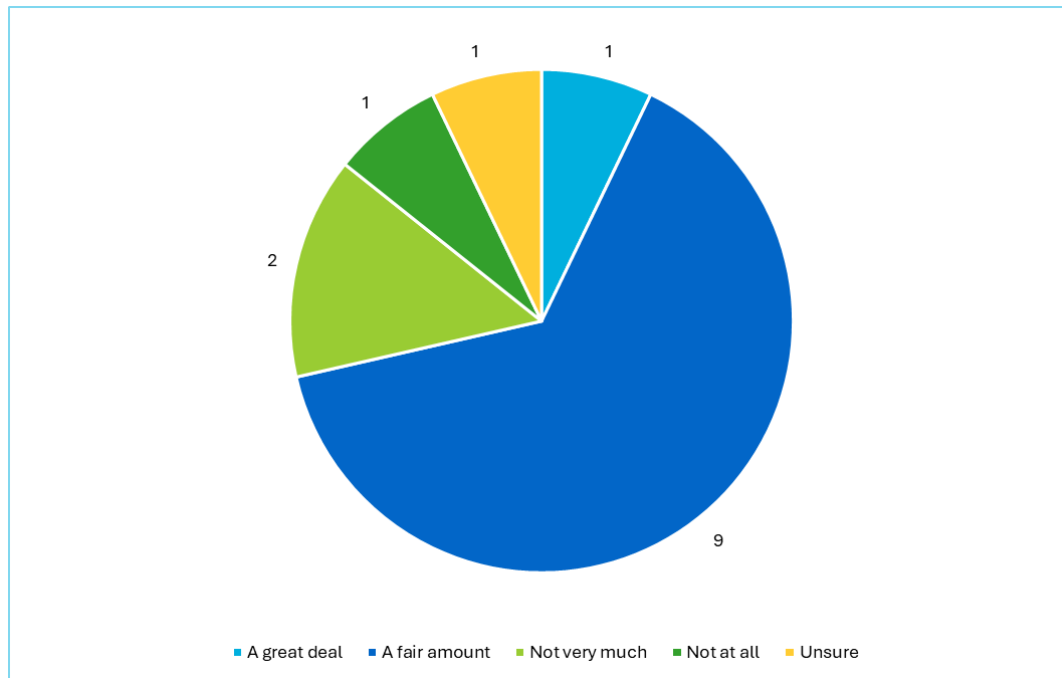
products for procurement through catalogue or framework routes. At the same time, SMEs gained a clearer appreciation of LA governance, procurement, and reporting processes, while LA themselves grew more confident in pursuing modular, phased upgrades as a way of supporting modal shift.

How projects have contributed to growth in organisational maturity amongst partner organisations

- 5.4 The lessons reported across projects were highly practical. Teams emphasised the importance of involving fabricators and operators from the outset, securing data access at the start, and mapping a clear procurement path during the R&D phase. One beneficiary reflected:

“If we were to do the project again, we would involve a fabricator from the outset.” – TDD beneficiary

- 5.5 Partners also highlighted the need to build in contingency for external factors such as election periods, permits, vehicle reliability, and supply chain delays. Finally, they stressed the value of leaving sufficient time for evaluation, rather than focusing solely on build and demonstration.
- 5.6 The skills and capabilities developed through the programme are already shaping beneficiaries’ next steps. Drone teams are planning larger demonstrations designed to be BVLOS-ready and are engaging with logistics and health-sector clients. The routing team is now able to return to LAs with a validation-ready prototype, while the design team is pursuing agreements with manufacturers to move prototypes into catalogue listings that LAs can purchase compliantly.
- 5.7 For LAs, the experience has increased their confidence in specifying modular and place-sensitive solutions, although formal procurement routes continue to dictate the pace of adoption. Across the board, organisations reported greater delivery confidence, stronger ability to navigate partnerships with LAs, OEMs and contractors, and clearer pathways to commercialisation.
- 5.8 As shown in Figure 5-1, most survey respondents reported that their projects had contributed positively to organisational skills and capabilities. Nine respondents (out of 14) indicated that their project had strengthened skills “a fair amount,” while one reported “a great deal.” Only a small number of respondents reported limited or no impact, with two indicating “not very much,” one “not at all,” and one “unsure.” This is a progression from wave 1, where six out of 14 respondents reported that their TDD project had “not very much” positive impact on skill levels in their organisation. Moreover, during the wave 1 survey none of the 14 TDD survey respondents reported their projects having a “great deal” of impact on their organisation’s skill level. This suggests that, overall, participation in TDD projects has had a broadly positive impact on organisational skills.

Figure 5-1: Self-reported impact of the TDD project on organisation skill (n=14)

5.9

Source: Beneficiary Survey, Steer-ED analysis (September 2025), Question: To what extent has the project had a positive impact on skill levels within your organisation? This could include for example commercial, technical, or regulatory knowledge/skills (Answer options: A great deal, A fair amount, Not very much, Not at all, Unsure)

Case study vignette showcasing how a project has resulted in the maturing and skills development of the organisation(s) involved

HomeRun (Appendix D) entered the TDD programme with a proven concept for school travel planning but limited organisational experience in working at county scale.

This shift demanded new technical skills in data engineering, validation, and visualisation. It also required a stronger grasp of LA governance, procurement, and reporting processes to ensure outputs aligned with decision-making cycles. By the end of the project, HomeRun had not only delivered a live platform used across 550 schools, but also built the internal capacity to scale the approach elsewhere. The team described the programme as a turning point, maturing from a pilot-stage start-up into a credible data partner for councils nationwide.

The role of programmes in creating and safeguarding jobs

5.10

Job creation due to the projects was modest. However, some SMEs reported meaningful job creation from the project (project managers, analysts, fabrication/designers) which enabled them to continue developing their technologies. Several beneficiaries indicated funding safeguarded roles by bridging the “valley of death” between prototype and market and enabled temporary specialist posts (e.g., research fellow/data engineer). Findings from the beneficiary survey show that one out of 14 respondents reported job creation

while six out of 14 respondents reported the safeguarding of existing roles. The modest level of job creation is supported by the IMS data, where of the 20 responses, only seven reported anticipating additional FTE as a result of the TDD project in five years' time.

Conclusion

- 5.11 The TDD programme has strengthened organisational skills and maturity among both SMEs and LAs. Beneficiaries reported significant improvements in technical capabilities, delivery practices, and commercial readiness. These gains are already shaping follow-on activity, with organisations preparing for larger-scale demonstrations, validation-ready prototypes, and manufacturer agreements.
- 5.12 Survey evidence confirms widespread skills development, while case studies highlight how organisations were able to evolve into credible delivery partners for LAs. Employment effects were modest, reflecting the short delivery window, but the programme played a role in safeguarding roles and bridging the gap between prototype development and market entry.
- 5.13 Overall, TDD has enhanced organisational confidence and capability, equipping beneficiaries with the skills, processes, and partnerships needed to pursue commercialisation and replication.

6 Impacts on wider framework conditions and long-term outcomes

Key Messages

- Adoption was strongest where technologies were demonstrated in real-world settings; simulations alone did not build confidence.
- Where projects have generated practical artefacts (e.g. design standards, operational protocols) they have been able to influence the regulatory environment.
- Early outcomes have included commercial launches, contracts, and regulatory permissions, with long-term potential for benefits in decarbonisation, operational efficiency, exports, and public realm improvements.
- Barriers to impact included immature regulation, reliance on third parties, data access issues, limited LA capacity and capability and procurement challenges.
- Enablers of impact included strong LA collaboration, community co-design, modular approaches, and supportive programme oversight.

Introduction

- 6.1 This chapter discusses the role that projects have played in affecting trust in, and adoption of, new technologies, plus contributions to the regulatory environment. It then goes on to discuss evidence about potential longer-term outcomes that may be delivered by the portfolio.

The role of projects in driving adoption of new technologies

- 6.2 Beneficiaries and wider stakeholders tended to report that willingness to use and accept new technologies rose where partners and LA residents could see a clear application of the technology and of its benefits. For example, on-street designs, flight demos, or decision supported outputs using local data. Beneficiaries and wider stakeholders emphasised the importance of identifying place-based solutions to local problems (as the TDD programme did) as a key factor in enabling solutions to gain more traction and be adopted.

- 6.3 Where trials stalled, acceptance plateaued. For example, councils reacted positively to simulated EV refuse vehicle routing results but still wanted proof on their own fleets before buying. For drones, interest was high but tempered by BVLOS permissions and occasional local opposition.

The role of projects in shaping the regulatory environment

- 6.4 Projects generated a range of practical artefacts that regulators and approving authorities could draw on in the future. These included operational procedures and flight logs that demonstrate safe practice for uncrewed flights; design standards and siting criteria to guide the development of bus shelters and mobility hubs; safety practices for shared charging infrastructure; and data schemas and heuristics to support electric vehicle-ready waste routing. Together, these artefacts provide regulators with concrete, real-world examples that can help shape future approvals and standards.

Case study vignette showcasing how a project has helped to contribute to changes in the regulatory environment

The Paua PINS (Appendix C) has potential to contribute to important regulatory insights. By trialling the sharing of private EV depot infrastructure across multiple operators, the project highlighted gaps in permissions and approvals for cross-organisational charging access. These findings could help shape future regulatory frameworks on how privately owned charge points are accredited, accessed, and integrated into wider procurement-ready specifications for LAs and fleets.

Long-term outcomes

- 6.5 Interviews and survey responses indicate that the demonstrator projects have already delivered some early results, while also pointing to wider benefits that could materialise if adoption continues.
- 6.6 Realised or emerging outcomes to date include:
- **Design and regulatory progress:** several projects completed design packs that LAs and partners can use directly; some also secured flight permissions, including CAA operational authorisation, creating a foundation for future trials.
 - **Diagnostic learning:** even when trials stalled due to external dependencies, teams generated useful diagnostic knowledge, clarifying data requirements, approval processes, and operational risks. This reduces uncertainty for subsequent attempts.
 - **Market signals:** early memoranda of understanding with logistics firms and initial discussions with fabricators demonstrate commercial interest beginning to take shape.
- 6.7 Case study evidence strengthens these findings. IONA (Appendix B) validated its drone design and achieved post-project CAA authorisation, providing a foundation for BVLOS. Paua (Appendix C) launched a live commercial depot-sharing product with 12 depots onboarded, proving revenue potential. HomeRun (Appendix D) achieved county-wide rollout in Essex (~550 schools) and secured early contracts in Wiltshire, showing immediate replication value.

6.8

6.9 Potential long-term outcomes if commercialisation proceeds include:

- **Decarbonisation and air quality:** further route optimisation and modal shift toward public transport; reductions in van miles through drone logistics; and quieter, cleaner waste collections from EV-suitable rounds. A total of 12 out of 14 beneficiary survey respondents reported that they anticipated their project to contribute to reducing the carbon impact of transport or contribute to reducing other environmental impacts of transport once their technology is fully commercialised. Additionally, seven beneficiary survey respondents reported that their project has already or will contribute to cleaner air.
 - Case study evidence highlights: IONA's (Appendix B) potential CO₂e savings (<2g per kg/km compared to vans), Paua's role in accelerating fleet electrification through shared charging (Appendix C), and HomeRun's (Appendix D) ability to target active travel measures for emissions reduction.
- **Operational performance:** improved route design for LAs; modular hubs that allow phased investment in line with demand; and wider shared learning on approvals and asset utilisation.
 - IONA's operational checklists, Paua's (Appendix C) depot usage protocols, and HomeRun's (Appendix D) data-led analytics all produced artefacts directly transferable to other adopters.
- **Economic effects:** deeper partnerships with OEMs and fabricators, conversion of export enquiries (from Ireland, Iceland, France, and the Channel Islands) into contracts, and stronger commercial pathways.
- **Public realm and wellbeing:** the creation of high-quality waiting environments that enhance accessibility and support local regeneration. A total of five beneficiary survey respondents (out of 14) reported improved public realm or places as a realised or anticipated outcome of their project.
 - HomeRun (Appendix D) also highlighted safety and wellbeing benefits around the school run, including reduced congestion and safer active travel options.

Case study vignette showcasing the long-term impacts of one of the technologies being developed

The Paua PINS (Appendix C) team onboarded 12 depot sites and launched a live booking service, proving that cross-operator charging was both technically viable and commercially attractive. Some fleets reported cost savings of more than 50% by accessing depot chargers rather than relying on more expensive public networks.

The long-term implications are significant. If scaled nationally, depot-sharing could reduce the need for duplicated charging investment, lower barriers for SMEs switching to EVs, and ease pressure on the public charging network. The project also generated regulatory insights around liability and insurance, which can inform future frameworks. By combining commercial traction with policy relevance, Paua PINS illustrates how demonstrators can create impacts that extend far beyond funded activities.

Barriers and Enablers

- 6.10 Projects faced a number of barriers that limited progress or created additional strain. Regulatory barriers were highlighted as a barrier to the wider adoption of technologies. For example, aviation rules and processes were widely viewed as not always appropriate for rural drone logistics, leading to delays in securing approvals.
- 6.11 Many demonstrations also depended on third parties, such as vehicle providers, contractors, and fabricators. Breakdowns in leased vehicles, limited contractor willingness to run non-standard routes, or a lack of commitment from fabricators often stalled activity even when the core technology was ready. Access to council and operational data was another recurring challenge, weakening the ability to demonstrate local benefits.
- 6.12 In addition, procurement continuity proved difficult. While research and development produced prototypes, LAs could not easily transition to compliant purchase. Procurement was particularly difficult where LAs lacked the capacity and capability to procure new technologies and had a tendency to favour tried and tested solutions. These issues were compounded by tight timelines and the cash-flow pressures of quarterly claims, which placed particular strain on SMEs. While IUK can permit monthly claims at the request of consortia (as was the case in the Coventry project), awareness of this option was low among beneficiaries. Better communication of the availability of alternative claim profiles could help SMEs to manage cash flow more effectively in future rounds.
- 6.13 At the same time, several factors enabled progress and helped projects move forward. Strong collaboration with LAs, coupled with early community co-design, ensured that solutions were grounded in place-based needs. Monitoring officers provided hands-off but responsive oversight, giving teams flexibility while keeping momentum.
- 6.14 Design approaches that emphasised modular solutions proved especially well-suited to rural contexts, allowing adaptation to local constraints and staged investment. Finally, the production of practical artefacts, such as design packs and operational protocols, helped translate demonstrator activity directly into approvals processes and procurement pathways, providing a clear route from trial to adoption.

Conclusion

- 6.15 The TDD programme has begun to shape adoption and regulation of emerging transport technologies. Confidence in new solutions was strongest where live demonstrations provided visible evidence of value, while reliance on simulations alone limited willingness to adopt.
- 6.16 Projects produced practical artefacts such as operational protocols, design packs, and safety procedures that regulators and LAs can draw on to inform approvals and procurement. These outputs reduce uncertainty and provide a foundation for future uptake.
- 6.17 Evidence also shows early outcomes, including commercial launches, contracts, and permissions, alongside clear long-term potential in decarbonisation, operational performance, and economic growth. However, barriers such as regulatory delays, third-party dependencies, data gaps, and procurement hurdles constrained progress. Enablers

such as strong LA collaboration, community co-design, and modular approaches helped to maintain momentum.

- 6.18 Overall, TDD has demonstrated that small, place-based demonstrations can deliver practical outputs with regulatory and commercial relevance, laying the groundwork for broader systemic benefits if scaled nationally.

7 Conclusion & Next Steps

Key Messages

- The programme has successfully achieved TRL progression (progression of 1-3 TRL for most but not all projects), practical outputs to inform regulatory approvals and procurement, and some early commercial launches.
- The programme strengthened partnerships and organisational capabilities, though progress was constrained by approvals, procurement gaps, third-party dependencies, and SME cash-flow pressures.
- Many long-term benefits will only be measurable after some time, so evaluation should continue 12–24 months post-completion to capture environmental and economic impacts.

Summary of monitoring findings

- 7.1 This report is structured around the LMT portfolio logic model, which is divided into five themes: programme delivery; partnerships and collaboration; technology development, deployment and commercialisation; skills development; and wider framework conditions. The key findings from the monitoring commission in each of these areas are set out below.
- 7.2 The TDD programme has demonstrated that short, place-based demonstrations can deliver tangible outputs and early outcomes. Seven projects were funded, involving 19 partners across 18 grants, with activities spanning digital tools, infrastructure pilots, logistics trials, and charging access. Evidence shows that projects typically progressed by one to three TRL levels, generated practical artefacts to inform regulatory frameworks and procurement, and in some cases launched commercial products and secured contracts. Beneficiaries reported that once commercialised their projects and technologies will enable LAs to procure decarbonised solution to transport challenges across both rural and urban settings, supporting improved air quality and reduced carbon emissions.
- 7.3 The programme strengthened partnerships between businesses and LAs, with most beneficiaries reporting new or improved collaborations and high-quality relationships. These strong partnerships allowed the technologies to be tailored to the specific needs of the local area, helping maximise the potential local impact of the technology and developing real world learning which can be applied to both the local area and other areas. It also built organisational maturity, with participants developing stronger technical, delivery, and commercial skills, bridging the knowledge gap between LAs and SMEs. While job creation was modest, the programme supported the safeguarding of roles, particularly within SMEs.

- 7.4 At the same time, several barriers constrained progress. These included regulatory delays, third-party dependencies, procurement discontinuities, and SME cash-flow pressures. Enablers included strong LA collaboration, community co-design, and responsive monitoring oversight. Overall, TDD has provided early evidence of environmental, operational, and commercial benefits, while highlighting lessons that can improve future programme design.

Next steps for the programme

- 7.5 Looking ahead, the evidence suggests there is a strong case for continuing or expanding the TDD model. The first competition has shown that relatively small, time-limited projects can deliver TRL progression, generate regulatory artefacts, and in some cases achieve early commercialisation. To build on this momentum:
- **Consider allocating funding for future TDD and similar place-based R&D competitions**, to expand the pipeline of place-based demonstrations and allow promising technologies to progress from prototype to adoption.
 - **Provide flexibility for longer delivery timelines in future rounds**, to enable more robust trials, evaluation, and engagement with regulators and communities.
 - **Increase funding flexibility** (e.g. milestone-based payments, carry-over allowances) to ease SME cash-flow pressures and improve resilience to external delays.
 - **Support replication and scale-up** by funding dissemination, replication toolkits, and potentially small, targeted pots of funding that organisations can draw on after a prototype exists to complete the last bits of proof needed for buyers/procurement to bridge the gap between prototype and procurement-ready solutions.
 - **Enhance regulatory engagement** by ensuring demonstrator evidence is systematically channelled into standards, approvals, and guidance for emerging technologies.

Recommendations for future evaluation

- 7.6 Many of the most significant potential impacts of the TDD programme will only become clear over time, once technologies move from demonstration to wider adoption. It is therefore essential that evaluation continues beyond the immediate delivery window to capture these long-term benefits. This is especially important for assessing potential carbon emission reductions, where time and wider data is required to assess the complete effect of the technology on carbon emissions more widely
- 7.7 A priority is follow-up tracking of projects at 12–24 months post-completion. This would provide evidence on whether demonstrators progress to commercialisation, replication across other LAs, or integration into procurement frameworks. Without continued monitoring, there is a risk that important successes, or barriers, will remain invisible given programme funding has ended.
- 7.8 Future evaluation should also focus on environmental outcomes as projects scale. While early demonstrations have shown technical feasibility, the full value lies in verified reductions in carbon emissions, improvements in air quality, and operational efficiencies in live deployments. These benefits will only be measurable after some time and should be tracked.

- 7.9 Finally, there is a need for stronger economic impact analysis. Initial job creation during the programme was modest, but over the medium term, benefits may include safeguarded roles, SME growth, new investment, and export contracts. Capturing these indicators will be critical for assessing the programme's contribution to green growth and wider industrial strategy.

Appendices

A Sources of evidence utilised

Monitoring data analysis

- A.1 Three forms of programme monitoring data are captured by IUK and were provided to Steer-ED for analysis, as follows:
- **Applicant information data** is basic ‘demographic’ data covering organisations awarded funding. The data includes the beneficiary’s name, project name, project description, competition programme, the total amount of funding, which was initially bid for, the grant funding amount provided, project start and end date.
 - **QMS monitoring reports** are quarterly assessments undertaken by external MSPs ; typically, industry professionals who are knowledgeable about the technology in question and are contracted to provide an independent assessment of project progress on a quarterly basis. Their assessment covers the project’s scope, time, cost, exploitation, risk, and project management. Officers score each of these project aspects as well as providing commentary as to the reasoning behind their scores.
 - Data captured via IUK’s **impact management system (IMS)**. IMS is a data collection system which is, at the time of writing, being rolled out across all IUK programmes. It captures data upon project commencement, during project delivery, and following project completion, and is provided in the form of short-answer multiple choice, quantitative, or character-limited free-text responses. It covers subjects such as patents, technology progression and partnerships (amongst others). For this wave, IMS data was provided for only four programmes: FOAK (FOAK 2023 competition), CCAM Deployments and Supply Chain, NZP and TDD. It should also be noted that the data available varied across these four programmes, with fewer questions being asked of FOAK beneficiaries compared to CCAM beneficiaries. It is anticipated additional data from IMS will be available for subsequent monitoring activities.

Analysis of secondary data sources

- A.2 Three sources of secondary data were explored for inclusion within this document:

Crunchbase

- A.3 To further explore whether businesses participating in LMT programmes are attracting external investment, and whether LMT participation aligns with investment-raising events, Technopolis have made use of Crunchbase – a platform that provides information on businesses and funding events.
- A.4 Of the ~430 unique organisations participating in LMT projects, Technopolis were able to identify 215 (50%) in Crunchbase (the remainder were mainly public orgs and universities). Of these, 88 have one or more instances of securing external funding (251 deals in total, 2010-2025). Crunchbase provides details on the type of funding, the date and the financial amount.

- A.5 Findings evidenced that investment/ funding activity was relatively low pre project participation, and increased gradually, peaking during IUK LMT project period — with the highest number of investment/funding rounds in 2023 (63). This suggests a clear increase in funding and investment round announcements following the start of IUK LMT project participation.
- A.6 Table A-1 shows the different types of funding / investment round that are captured.

Table A-1: Funding/ investment round

Investment Type	Number	Investment Type	Number
Grant	131*	Non-equity assistance	4
Seed	28	Post-IPO debt	5
Pre-seed	7	Private equity	3
Series-A	16	Series-B	6
Equity crowdfunding	5	Corporate Round	2
Convertible Note	2	Series-C	2
Debt Financing	7	Undisclosed / Unknown	28
		Grand Total	251*

Source: Technopolis Crunchbase data, 2025. *Note: 13 LMT grants are included, which have then been removed from the subsequent analysis.

- A.7 For the 88 companies with funding data, Technopolis have tracked deals (both volume and value) over time at the company level. Technopolis have analysed the total number and value of deals for each company since the start of their LMT project, and then also compared this with the number and value of deals achieved in an equivalent period prior to the project start date (i.e. if the LMT project started 2 years ago, Technopolis have compared the 2 years, pre- and post- this start date).
- A.8 At the overall portfolio level, this reveals:
- LMT participants have achieved 110 deals since their project started. This is 43% higher than the 77 deals they achieved in the same length of time before project start.
 - LMT participants have achieved deals worth \$4.7bn since their project started. This is more than five times higher than the \$0.8bn achieved in the same length of time before project start.
 - On average (per company, amongst these 88), organisations have secured 1.3 deals worth \$52.9m since project start, and 1.0 deals worth \$9.7m in the same period before.

Meltwater analysis

- A.9 To assess the public dissemination of LMT projects, a structured search of media output was conducted using Meltwater, a media monitoring and analytics platform. The data collection for each project covered the past year (period from 12 August 2024 to 12 August 2025), capturing online news and print, as well as social media activity on platforms, blogs, and forums. For accuracy, search queries were tailored for each project by combining project titles or acronyms with lead organisation names, and articles were manually screened to remove irrelevant results. The search process also involved an

iterative refinement of keywords to ensure that retrieved content was directly attributable to the projects.

- A.10 Meltwater's metrics enabled assessment of both the quantity and quality of media coverage. Estimated views gauged the average exposure of articles, reach measured the potential audience size, and engagement captured interactions across platforms such as Facebook and Twitter. These data points were collected for each project and aggregated at the programme level, providing a comprehensive overview of LMT projects' media performance.

Dimensions

- A.11 Dimensions is a comprehensive research database that provides patent and publication data. The LMT projects were identified within the Dimensions dataset. However, only Maritime FOAK of the seven programmes were associated with patents and only Maritime, FOAK and CCAM were associated with publications within the dataset⁶. As not all the programmes were associated with patents and publications from the dataset, there is some discrepancy to self-reported information from project beneficiaries which will be further explored with the Dimensions team. Dimension data has therefore only been included for programmes where patents and publications have been linked.

Beneficiary survey

- A.12 An online survey of beneficiaries was developed and distributed to all project beneficiaries within scope of this report, amounting to 220 recipients. Both project leads and partners were invited to complete the survey, meaning that multiple responses could be captured from each project. The survey included a range of multiple choice and free text questions and allowed for the gathering of valuable additional data beyond the core data collected by IUK via IMS, QMS monitoring reports and applicant information data.
- A.13 Unique surveys were created for each programme and whether a beneficiary had responded in the previous wave. The number of questions therefore varied slightly between programmes and whether a beneficiary had responded in the previous wave. However, the core survey questions remained consistent between programmes and whether a beneficiary had responded in the previous wave. The survey was completed by 36 beneficiaries which had not returned a survey in the previous wave and 109 beneficiaries which had returned a survey in the previous wave.
- A.14 The survey was open for a period of approximately six weeks, from 23 July 2025 to 1 September 2025. The survey received a total of 145 responses, with some projects receiving multiple responses. In total the survey achieved a portfolio response rate of 66%. This is a good response rate for a survey of this type and means that responses to the survey can be considered broadly representative of beneficiary views.
- A.15 Table A-2 shows the beneficiary survey response rates and number of responses from unique organisations within each of the seven programmes.

⁶ This data was based on metadata [as of 01/09/2025 for Wave 2] from Digital Science's Dimensions platform, available at <https://ukri.dimensions.ai/>. Access was granted under licence agreement with UKRI.

Table A-2: Beneficiary survey response rates and overall number of responses

Programme	Number of Responses	Number of beneficiaries sent the survey	Response Rate
ZEHID	30	42	71%
CCAM	51	70	73%
Hydrogen	11	11	100%
FOAK	26	39	67%
Net Zero propulsion	13	39	33%
TDD	14	19	74%
Total	145	220	66%

Source: Steer-ED survey response analysis, 2025

Depth interviews with beneficiaries and wider stakeholders

Interview methodology

- A.16 The qualitative research component comprised one-hour depth interviews conducted with programme beneficiaries and a selection of wider stakeholders. The interviews were held using MS Teams and were guided by a topic guide.

Beneficiary interviews

- A.17 As Table A-3 shows, a total of 61 interviews were undertaken with project beneficiaries (project leads, and in some cases project partners) during the period 4 August 2025 to 25 September 2025. The number of interviews undertaken varied by programme, in accordance with the number of stakeholders involved in the programme. The ZEHID and CCAM programmes were a key focus for beneficiary interviews due to the substantial number of beneficiaries participating in these initiatives.

Wider stakeholder interviews

- A.18 Interviews with wider stakeholders took the same format and were conducted with a selection of knowledgeable industry stakeholders (from both commercial and academic institutions), based on recommendation by IUK and programme sponsors. These interviews were conducted over the period from 1 August 2025 to 24 September 2025. As Table A-3 shows, a total of 50 interviews with wider stakeholders were completed. Priority was given to programmes with the largest funding allocation, and therefore ZEHID and CCAM were a key focus for wider stakeholder interviews.

Table A-3: Beneficiary and Wider Stakeholder Interviews

Programme	Number of Beneficiary Interviews	Number of Wider Stakeholder Interviews
ZEHID	14	15
CCAM	21	10
Hydrogen	5	9
FOAK	8	8
Net Zero propulsion	8	4
TDD	5	4
Total	61	50

Source: Steer-ED interview analysis, 2025

Interview notes and analysis

- A.19 All interviews were recorded and transcribed using the automatic transcription facility on Microsoft Teams. A note-taker also attended each interview and took detailed notes of the conversation between the interviewer and the interviewee. Following the interview, the notes taken by the note-taker and any notes taken by the interviewer were either manually coded or analysed using qualitative analysis software, Atlas.ti. Both forms of analysis were guided by a coding frame aligned with the study's research questions and topic guide to ensure consistency. Coding was conducted by the programme leads and project team support to ensure consistency and reduce bias, with openness to emerging themes. Learnings from these interviews, supported by quotations, are provided throughout this report.

Case studies

- A.20 A total of 16 case studies have been developed for the monitoring commission (two or three case studies for each programme). Three of these have been developed for this report and are presented as vignettes within the report and as separate full write-ups within the annex. The case studies were developed through interviews with project leads and supporting desk research. All case studies have been reviewed by the programme's independent panel of subject-matter experts, selected for their expertise in relation to the programme or technology in question. This provides a valuable external perspective on the importance and potential long-term impact of the technology in question.

B Case Study: The IONA Drone Delivery Initiative

Introduction	
Grant Value	£248,460 (grant value)
Project Duration	10 months
Start date	01/06/2024
End date	21/03/2025
Context & Objectives	
Project summary	The IONA Drone Delivery Initiative project is being funded through the TDD competition. The project involves the trialling of an unmanned, fixed wing, tilt motor, electric propulsion aircraft drone in the rural setting of Argyll and Bute in west Scotland. In technological and mechanical terms, the drone had already been demonstrated but this project seeks to gain operational learnings in how a drone would work in a commercial logistics business model. This involves integrating the drone into a logistics environment with delivery network systems. The project aims to test trial run flights with partners to show how a rural drop off and pick up would work and will allow for follow-on analysis and optimisation.
Context	The IONA Drone Delivery Initiative seeks to address three key logistics challenges:
Business/org. type	
What challenges was the project trying to address?	• High last-mile delivery costs: In rural settings, logistics costs are high. This is primarily due to fuel costs and the cost of the labour-intensive operations (i.e. certain conditions require a drive of multiple hours for one delivery which can be done in minutes using a drone: and delivery services in Scotland are subsidised by the Scottish government) • Disparity in quality of service: Inefficiencies in last-mile logistics do create disparities in service quality depending on where you live. This especially impacts rural residents and their access to essential goods and healthcare services. This could to a lesser effect also impact drones which may also not be permitted to fly over certain rural areas. • Environmental impact: The logistics sector faces mounting pressure to reduce its carbon footprint and adopt sustainable
Any relevant contextual information about the industry and technology	

	practices, particularly in rural areas where reliance on fossil fuel vehicles is still currently prevalent. Conclusion: The last-mile logistics sector in rural environments is underserved, with limited innovation tailored to non-urban settings. Autonomous drone solutions combine innovations: electric, unmanned, and flight to address issues in an environmentally sustainable and more cost-effective manner. The project's proprietary drone technology, featuring a unique tilt-rotor model with a fixed-wing design, provides for vertical take-off and landing, and long-distance capability. This makes it a more flexible solution for logistical needs than other innovations. Additionally, IONA seeks to specialise in generic parcel delivery where many competitors target specialisations such as the movement of medical supplies.
Objectives What were the key aims of the project?	Key Aims: • Reduce operational costs: Deliver a flight demonstration that proves the cost effectiveness, in terms of cost-per-delivery, of using a drone to deliver parcels in certain rural settings over fossil-fuel powered van deliveries. • Decarbonisation: Cut emissions through utilising electric and autonomous technology, contributing to environmental goals and sustainable rural development. • Prototype validation and commercialisation: Achieve technical validation (TRL 5 to 6) and establish a pathway to commercialisation for autonomous rural logistics solutions.
Project Activities	
<i>Outline of process activities</i> <i>Key challenges</i> <i>Key successes</i> <i>Experience of the LMT programme</i>	There are several ongoing activities being delivered as part of the project. These include conducting: • Developing and testing payload management design for operational requirements. This includes conducting infrastructure assessments through tests and developing an interface for the drone to work with. • Test flights to validate the drone's economic feasibility and update the airframe for new regulations. This may result in refining the tilt-rotor drone model. • Regulatory compliance procedures. The project has initiated an airspace application under the Open A3 category to allow for a controlled, limited test of operations in rural airspace. • Interface tests with logistics providers to examine interactions between drones and couriers. A major challenge has been regulatory delays. While the EU has implemented the SORA framework under European Union Aviation Safety Agency (EASA), the UK's adoption has been delayed—originally scheduled for Q3 2024, now postponed to April 2025 (Q2 2025). This

	delay prevents operations at high TRL levels and impedes data gathering needed for certification (SAIL III and beyond). Additionally, Temporary Restricted Areas (TRAs)—part of the UK's Airspace Change Programme to enable unmanned aerial vehicle (UAV) operations—have not yet been approved. Some companies have had applications pending for over 18 months. Without TRAs, operations are limited to ~1.5km line-of-sight or require observers every 3km, undermining cost-efficiency. TRAs are also time-limited and cannot be renewed in the same area for the same purpose, making them unsuitable for long-term logistics services. Whilst still in delivery phase the project still hopes to achieve the outlined objectives in testing drone flights in rural logistics settings. Additionally, the project has already garnered considerable interest and engagement from stakeholders, including other local councils, some logistics providers, and community businesses. This stakeholder support is reflective of a collective interest in addressing the pressing need for improved rural logistics infrastructure. One of the reasons IONA applied for this grant was to increase their market visibility and reputation by receiving a UK government grant, which has already been partially achieved. Feedback on the grant process was that it was reflective of most grant funding programmes. The project's UKRI representative, has provided invaluable guidance. The programme manager has been highly effective in assisting the project throughout. Some constructive criticism was that the funding and submission portal could benefit from some refinement to streamline the process further. This could include some feedback or interactive features, although there have been noticeable improvements to this system throughout the project delivery period.
Outcomes & Impacts	
Outcomes <i>What outcomes were achieved?</i>	The project aims to validate IONA's tilt-rotor fixed-wing design by demonstrating its efficiency in time, cost, and emissions. The results will feed into demonstrating a viable business model for logistics partners, with proven capability to carry 10kg cargo over a 70km round trip. The work has also enhanced IONA's R&D capacity, enabling further refinement of its logistics model and technology infrastructure. Broader third-party benefits are being realised which were not explicitly planned at project start. Several of IONA's suppliers are providing technical guidance, leveraging their expertise to support as consultants rather than purely as direct manufacturers. This collaborative approach has yielded significant benefits and created a network that includes UAV technology organisations, ground station personnel, and an organisation with an integrated transport management system. which

	has generated insights and practical learnings that have proven critical for the project's development. Internal processes have been refined by creating detailed checklists, addressing previously unknown operational issues, and running iterative "internal loops" to continually improve processes. These process optimisations, are reflective of the procedural advancements already achieved.
Impacts <i>What impacts have been achieved or are anticipated?</i>	The impacts of the project are multifaceted. A key objective is to further evidence the decarbonisation impacts of using drones over traditional methods. Therefore, the corresponding environmental impacts are clear. The drone technology is estimated to emit less than 2 grams of CO₂ equivalent per kilogram of cargo per kilometre, a substantial reduction compared to traditional fossil-fuel powered delivery vans. Carbon savings are also delivered at the vehicle manufacture step on a drone versus van basis; although noting differences in overall vehicle lifespans and the lifetime payloads delivered per vehicle. Drone parts production and assembly is estimated to use significantly lower carbon emissions than van manufacture and assembly process. To assess the overall environmental impact of the technology, comprehensive lifecycle analysis would have to be conducted but the technology is likely to provide decarbonisation benefits. Economically, autonomous delivery services in rural areas could improve access to wider supply chains for local businesses, lower logistics costs, and support the growth of smaller businesses, such as hotels, bakeries, and pharmacies, that rely on timely deliveries. It also opens the possibility for examining direct supplier-to-user delivery rather than requiring parcels to be transferred to a central logistics hub first. In terms of social equity, enhancing service reliability in rural communities would address longstanding service disparities, improving quality of life and potentially contributing to better health outcomes for residents.
Additionality <i>To what extent did the project play a role in the outcomes and impacts that have been achieved?</i>	The funding received through this project has been important for advancing the drone technology and maintaining development momentum. The support of IUK provides some credibility to the project, particularly when seeking regulatory approvals for testing innovations, and as a potential investment opportunity. The LMT funding has been important to bolster investor confidence, which is key for research and development projects.
Successes and lessons learnt	
Key lessons <i>What has been learnt?</i>	Through this project, several important lessons have been learned. Regulatory alignment has proven critical, with delays in UK regulatory frameworks representing a major barrier to progress. The experience

<i>Are there any key factors for why the case study was successful/unsuccessful?</i> <i>What are the barriers and enablers to delivery and impact?</i> <i>Are there any suggested improvements for future?</i>	has underscored the need for streamlined regulatory pathways or additional government support in order to expedite the development and deployment of autonomous drone solutions. Furthermore, the supplier network and stakeholder collaboration has been invaluable. Working closely with end-users and logistics partners has been essential for refining the service model and for addressing technical and operational challenges in adverse Scottish weather conditions. These have led to the realisation of unexpected benefits, such as the use and refinement of checklists and “internal loops” which will continue to be used by IONA in the future. The project’s primary barriers remain regulatory delays combined with high development costs, which present ongoing obstacles to scaling the technology. However, these are offset by some enabling factors, including the partnerships with logistics businesses and drone suppliers that recognise the potential for improved logistics and service quality in rural areas.
Next Steps <i>What are the next steps for the project</i>	IONA plans to test operations in jurisdictions with more advanced regulatory environments to continue validation and demonstrate scalability. The goal is to establish a commercially viable rural delivery service, complementing existing infrastructure with sustainable drone logistics.

C Case Study: Private Infrastructure Network Solution

Introduction	
Grant Value	£318,171
Project Duration	10 months
Start date	01/06/2024
End date	31/03/2025
Context & Objectives	
Project summary	Paua PINS aimed to tackle the challenges surrounding EV (electric vehicle) fleet charging by enabling the sharing of private depot infrastructure. By developing a secure, scalable digital matchmaking platform and running live demonstrations, Paua tested and proved that shared private charging infrastructure can be viable and impactful for accelerating fleet electrification. Paua Share allows fleets to find and agree sharing terms for depot charging access. The platform includes health and safety vetting, in-app navigation, billing through Paua's existing tools, and revenue options for host depots. Bus depots are often empty during the day but fill up overnight, council depots show similar patterns, while HGV depots vary but typically operate more intensively at night. By aligning these usage profiles with fleet demand, Paua Share helps unlock underused capacity and lower charging costs.
Context <i>Business/org. type</i> <i>What challenges was the project trying to address?</i> <i>Any relevant contextual information about the industry and technology</i>	Paua is a business formed in 2020. The organisation has been involved in several grant-funded initiatives focused on EV infrastructure. Paua PINS is strategically significant as a foundation for its commercial growth into shared depot charging. EV fleet infrastructure is growing, but commercial vehicles—particularly heavy good vehicles (HGVs) and vans—face infrastructure barriers and while there is growing interest in sharing depot-based chargers, no scalable or digital solution has existed.

	<i>“It is really, really compelling... a way of getting more electric vehicles, particularly larger ones, on the road.” – project beneficiary</i>
	The project seeks to provide solutions for: • Limited public charging for heavy and commercial vehicles; • Underutilised private charging infrastructure; • Security and safety concerns for certain fleets (e.g. emergency services); • Inefficiencies in depot access and charging for fleet operators; • Lack of scalable models for infrastructure sharing; and • Complexity of liability, insurance, and operational risks in depot sharing
Objectives What were the key aims of the project?	The objectives of the project were to: • Develop and launch a product that enables private charging depot sharing; • Build a smart matchmaking engine to optimise sharing opportunities; • Publish a white paper to establish industry best practice; • Demonstrate viability through active depot hosts and live charging activity; and • Support wider EV adoption through lower-cost charging solutions.
Project Activities	
<i>Outline of process activities</i> <i>Key challenges</i> <i>Key successes</i> <i>Experience of the LMT programme</i>	Key project activities included: • Development of a new software module for depot sharing, integrated into Paua’s core platform; • Establishment of ~12 depot locations and 80 connectors in the private network; • Demonstrations with fleet operators; • Publication of a white paper in collaboration with Cenex; and • Partnership building and an advisory panel with stakeholders including LAs and fleet managers. Key challenges included: • Slow onboarding of large depots due to concerns about insurance, liability, and operational complexity. When host organisations had dedicated decarbonisation teams, this has often less of a challenge.
	<i>“Getting people comfortable with sharing... bigger organisations have been more difficult... anxieties more about commercial or operational - e.g. what if a vehicle sets on fire at my depot.” – project beneficiary</i>

- “Cold start” challenge of launching a two-sided marketplace (getting both users and hosts onboard);
- Industrial disputes or local disruptions could reduce availability of depots to third parties. However, if the shared asset market becomes sufficiently large, pooling could actually enhance resilience by giving fleets more alternatives; and
- Nervousness among some potential hosts about competitive sensitivities. Sharing depots with other fleets could lead to unintended knowledge transfer about the host’s operations or business model.

Key successes included:

- Commercial product launched and now live;
- Multiple depot hosts onboarded including a mix of public- and private-sector operators;
- Created thought leadership via best practice guide;
- Paua recognised as a market leader in shared charging infrastructure; and
- Realised significant interest from OEMs and HGV dealerships.

Experience of the LMT Programme

Assessor feedback was consistently recognised as highly valuable throughout the application process, regardless of whether the outcome was successful. During the programme, Paua Pins participated in a cross-programme meeting where they met other TDD grant awardees. While Paua found this engagement useful, the breadth of the programme meant that discussions were not specific to the EV sector, limiting the relevance of lessons learned from other actors in the industry.

During the programme, Paua also interacted with the DfT HGV-electrification strategy team. Given the change of UK Government during the project, there was uncertainty regarding the team’s direction, which limited the support they could offer. This engagement was largely coincidental and not directly linked to the programme. Paua further engaged with various parts of the ZEHID team, recognising potential shared benefits, though these opportunities have yet to be fully leveraged to support other projects in the sector.

Unlike other projects Paua has been involved in, there was no showcasing event available to attend. Such an event could have been a beneficial addition, as it has proven successful in previous initiatives. At the conclusion of the project, Paua engaged with the Department for Transport (DfT) to share details of their work during the project; however, it remained unclear how this information was utilised by DfT.

	Overall, Paua reported that most DfT and IUK activities appeared somewhat ad hoc and did not seem to be well integrated into the programme. Throughout the project. However, Paua worked closely with their MSP, who provided clear and consistent support for the administrative aspects of project delivery.
Outcomes & Impacts	
Outcomes <i>What outcomes were achieved?</i>	• Successful launch of a new commercial product (depot sharing module); • Live use by fleets and operators, including van fleets, regional haulage operators, and public service vehicles such as emergency or council service depots; • Increased engagement from commercial vehicle market stakeholders; and • Collaboration with LAs and Cenex on best practice.
Impacts <i>What impacts have been achieved or are anticipated?</i>	The project delivered significant benefits across cost, efficiency, safety, and decarbonisation. One of the most notable impacts was the reduction in EV charging costs for certain fleets by more than 50%. This was achieved through a shared charging model, where visiting operators accessed depot chargers at lower rates, while hosts generated additional revenue from underutilised assets. The savings were therefore mutual: external users reduced operating costs, and depot owners monetised infrastructure that would otherwise remain idle. Beyond cost savings, the project improved infrastructure efficiency and utilisation, ensuring that existing charging assets were used to their full potential. It also enhanced safety by relocating heavy vehicle charging away from public areas, reducing risks associated with mixed-use environments. Crucially, the initiative encouraged the electrification of heavier vehicles by making depot charging more accessible and flexible. Sharing arrangements gave operators confidence that charging would be available when needed, alleviating range anxiety and the risk of stranded assets. For depot hosts, the ability to schedule and monetise underused chargers strengthened the business case for investing in higher-capacity infrastructure, further accelerating the transition of heavy vehicles to electric power. The project also delivered broader public value by maximising the use of Department for Transport's Zero Emission Bus Regional Areas (ZEBRA)-funded charging infrastructure, ensuring taxpayer-funded assets were fully leveraged. Finally, it helped de-risk depot electrification for users by removing infrastructure friction, creating a more seamless and reliable charging experience.

Additionality <i>To what extent did the project play a role in the outcomes and impacts that have been achieved?</i>	The funding played a critical part of the development of the technology. The support enabled faster development, better quality output, and the demonstration phase that underpinned industry buy-in and commercialisation.
Successes and lessons learnt	
Key lessons <i>What has been learnt?</i> <i>Are there any key factors for why the case study was successful/unsuccessful?</i> <i>What are the barriers and enablers to delivery and impact?</i> <i>Are there any suggested improvements for future?</i>	Key lessons included: • There is significant demand for sharing infrastructure for large vehicles; • Cultural and operational readiness in organisations is key to infrastructure sharing; • Dedicated decarbonisation teams within host organisations are major enablers; • Commercial and liability concerns need early engagement to prevent delays; and • A product can succeed technically but requires active engagement to overcome behavioural and organisational barriers. Suggested improvements included: • More targeted support for large depot operators around insurance and legal frameworks. Paua argued that this that this would come from a combination of market leaders and also "learning by doing" rather than any specific intervention. The development of "good practice" guides for sharing depot infrastructure that is funded from the public purse could help provide this guidance; and • Policy-level support to incentivise depot sharing; Paua stated that the recently announced depot grants do not mandate sharing but should possibly consider how maximum taxpayer value is created from this funding i.e. what about best practice being the sharing of depot infrastructure.
Next Steps <i>What are the next steps for the project</i>	The next steps for the project will concentrate on scaling the two-sided network by onboarding additional hosts and fleet users, ensuring broader adoption and impact. In parallel, the matchmaking engine will be refined to deliver more efficient and seamless connections between charging providers and operators. The team will also explore strategic partnerships with OEMs, LAs, and HGV dealerships to strengthen market integration and accelerate uptake. Finally, development will continue on HGV-specific public charging solutions, building on the principles established through PINS to create infrastructure tailored to heavy vehicle needs.

D Case Study: HomeRun School Travel Evaluation Platform

Introduction	
Grant Value	£150,007
Project Duration	10 months
Start date	01/06/2024
End date	31/03/2025
Context & Objectives	
Project summary	This project was delivered by HomeRun and analysed school run journey data across Essex (72% rural) to develop the HomeRun School Travel Evaluation Platform (STEP). The platform predicts and aggregates pupil journeys to generate actionable insights, identify congestion tipping points, and estimate the region's school run carbon footprint. The analysis informed evidence-based recommendations enabling Essex County Council (ECC) to target resources for maximum impact on reducing emissions and congestion, supporting transport strategy and funding decisions.
Context <i>Business/org. type</i> <i>What challenges was the project trying to address?</i> <i>Any relevant contextual information about the industry and technology</i>	Addressing school-run-caused traffic is key to the UK's Transport Decarbonisation Plan, spanning traffic reduction, improved air quality and net-zero by 2050, alongside Local Transport Plans (LTPs). School travel is particularly challenging in rural settings, where longer distances and lack of active travel and public transport infrastructure make private car use dominant. Currently, Zero Emission Vehicle (ZEV) ownership rates tend to be lower in rural regions. School travel in rural areas is particularly carbon-intensive; trips in these settings can generate up to five times more CO ₂ emissions than urban school journeys, largely due to longer distances and limited active travel or public transport options.
Objectives What were the key aims of the project?	The objectives of the project are to: • Create a scalable data platform; • Provide LAs with visual and analytic intelligence to inform travel policy and better support schools; and

	• Enable scenario forecasting and impact quantification for intervention. Ultimately encouraging modal shift to more active travel modes.
Project Activities	
<i>Outline of process activities</i> <i>Key challenges</i> <i>Key successes</i> <i>Experience of the LMT programme</i>	Project activities included: • Platform development and data modelling; • Collaborated with Essex County Council, Solace Digital (UX/design), Talink (AI modelling); and • Initial plans to collect bespoke survey data were set aside when this proved impractical at scale. Instead, the team drew on existing datasets provided by the LA. This approach improved accuracy, scalability, and timeliness, since the datasets were already detailed, regularly updated, and capable of supporting ongoing monitoring. • Key challenges to delivery included: • Limited internal resource managing multiple tools; • Legal agreements caused early delays. This was because the project involved sensitive data on children's travel patterns, robust safeguards were essential. Data governance had to be carefully framed to meet ethical and legal standards, with multiple stakeholders involved in reviewing and approving arrangements; • Tight six-week application window spanning the Christmas break, with a 5 January 2024 deadline, made it very difficult to finalise the LA partnership in time; and • Lack of opportunity to present the project directly to DfT at the end of the programme - an in-person demo would have been far more engaging and effective than a mid-project virtual meeting when the product was not yet ready. Key successes of the project included: • Met all project goals and extended coverage from dozens to hundreds of schools; • Secured positive visibility at a regional conference (York), endorsed by ECC; and • Raised profile significantly through early commercial traction and national exposure. Experience of the LMT programme: The application process presented some challenges, particularly due to the tight deadline and the need to secure LA commitment during the Christmas period. These timing constraints added complexity and required significant coordination to meet submission requirements.

	Once the project commenced, early legal and administrative processes could have been more streamlined to avoid delays. Additionally, the absence of a final showcase for funders, such as DfT and potential consumers, was seen as a missed opportunity to highlight achievements and demonstrate impact.
Outcomes & Impacts	
Outcomes <i>What outcomes were achieved?</i>	The project successfully delivered a fully operational STEP platform, which is now being used by ECC across approximately 550 schools. This marks a significant milestone in terms of adoption and demonstrates the platform's scalability and impact within the education sector. In addition, early commercial traction has been achieved, with a contract currently in progress with WCC. The project also strengthened in-house technical capability. Finally, the company's profile has been raised significantly, positioning it more prominently within the market and providing the potential to work with a wider range of LAs.
Impacts <i>What impacts have been achieved or are anticipated?</i>	The project enabled data-driven identification of schools with the greatest potential for emission reductions, ensuring that efforts were targeted where they could deliver the most significant benefits. This insight also informed the strategic allocation of active travel spending, helping to maximise the impact of available resources. The project is expected to deliver significant benefits, including reduced congestion and carbon emissions, alongside improved safety and increased uptake of active travel. Fewer cars on the road will contribute to cleaner air and safer environments, while a modal shift towards more active forms of travel is anticipated to generate substantial health benefits.
Additionality <i>To what extent did the project play a role in the outcomes and impacts that have been achieved?</i>	The grant played a critical role in enabling these outcomes. It accelerated product development, allowing for rapid delivery, and boosted confidence among potential collaborators and customers in both the provider and the solution. Additionally, the funding facilitated meaningful engagement with LAs, strengthening partnerships essential for long-term success.
Successes and lessons learnt	
Key lessons <i>What has been learnt?</i>	Key lessons: A critical lesson from the project was the importance of close coordination with LA teams to ensure the solution remained relevant and achieved strong adoption. Another major factor in the project's success was that STEP was not treated as a side initiative but formed part of a strategic pivot for the company. This

<i>Are there any key factors for why the case study was successful/unsuccessful?</i>	meant additional time and resources were invested beyond what was covered by the grant, ensuring delivery quality and long-term impact.
<i>What are the barriers and enablers to delivery and impact?</i>	Barriers and enablers: The project faced some early challenges, particularly around bureaucratic processes and the time required to finalise legal agreements, which slowed initial progress. These delays were compounded by limited resources, which stretched the team's capacity during critical phases.
<i>Are there any suggested improvements for future?</i>	Conversely, early endorsement from ECC proved to be a key enabler. This support provided credibility and helped drive adoption, reinforcing confidence in the project and its outcomes.
Next Steps <i>What are the next steps for the project</i>	The next phase will focus on expanding the rollout of STEP to additional LAs, including WCC. Alongside this, the team will explore opportunities to integrate complementary tools, such as a journey-sharing app, to enhance functionality and user experience. Finally, efforts will be directed towards positioning STEP as a strategic planning tool for developers, transport planners, and active travel projects, ensuring its value extends beyond immediate use cases.

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