

# SECTOR TRANSFORMATION THROUGH THE HIGHWAYS DOUGHNUT ALLIANCE

## FRAMEWORK & PROCESS

# PART 1

# STRATEGIC TRANSFORMATION FRAMEWORK

## INTRODUCTION

Many societal sectors, such as food, healthcare, transport, and the built environment, sit at the centre of a critical tension. They provide essential services that people rely on to live well, yet the way these services are currently delivered often causes harm for both people and the planet. From resource extraction and carbon emissions to unfair working conditions and social exclusion, these impacts are deeply embedded in how sectors are structured and governed.

Most sectors were designed in and for a different era. They prioritised speed, efficiency, and short-term value. Holistic outcomes were rarely considered, and negative effects were treated as externalities rather than design flaws. As a result, many sectors today:

- Overshoot planetary boundaries
- Underserve social foundations
- Struggle to adapt to changing expectations and constraints

Meanwhile, the world is shifting. Climate targets are tightening, supply chains are destabilising and citizens are demanding more inclusive and responsive systems. Public institutions and private actors alike face increasing pressure to lead through this complexity.

To meet these challenges, we must do more than improve what exists. We must rethink how sectors function, starting from their purpose and redesigning how they operate in practice. This requires bringing together those who shape the system—governments, businesses, institutions, and communities—to explore an alternative future: one where the value of the service is preserved, but the harmful trade-offs are not.

This document aims to support such a transition by introducing a strategic framework to guide sector-wide transformation efforts. It is built on experience from the Highways Doughnut Alliance\* and can be applied to other sectors at local, regional, or national levels.

The framework offers a replicable methodology that enables:

- Systems-level understanding
- Multi-actor collaboration
- Vision-led, actionable change
- Alignment with Doughnut Economics principles

The framework is intended for leaders across government, business, and civil society to design and lead systemic change efforts that are grounded, inclusive, and outcome-oriented.

It can be used to:

- Launch new sectoral transformation processes
- Structure learning alliances or innovation partnerships
- Align stakeholders around shared goals
- Translate complex challenges into coordinated actions

It ensures that transformation is not left to chance or driven by single actors, but built through collective direction, with clear roles, and concrete steps defined.

### **\*The Highways Doughnut Alliance forms part of Live Labs 2**

Live Labs 2 is a three-year, £30 million, UK-wide programme funded by the Department for Transport running between 2023 and March 2026. Seven projects, grouped by four interconnected themes, are being led by local authorities working alongside commercial and academic partners. One of those projects, Wessex Live Lab, will pioneer the UK's first net zero emission roads in Somerset, Cornwall and Hampshire in nine 'Net Zero Corridors', which will act as a proxy for maintenance on all highways. These corridors will be a test bed for innovation, circular solutions and be underpinned by new ways of thinking such as Doughnut Economics.

# FRAMEWORK

This framework outlines five essential and interconnected steps that support sector transformation across any sector. They begin by establishing a shared understanding of the current system, then move through envisioning a better future, identifying what is holding the system back, and designing systemic actions designed to transform the sector.

Steps 1 to 4 shown below follow a logical sequence, while Step 5 (“Who is involved?”) is transversal. It is not a separate phase but a cross-cutting theme that must be addressed throughout the entire transformation process. As the work unfolds, it is critical to continuously revisit questions of influence, participation, and mandates.

## 1. WHERE ARE WE NOW?

*Mapping the system*

- **Why is change needed** now?
- **What critical tensions** and trade-offs define the current system?
- **What internal and external forces** are shaping the sector’s dynamics?
- **What are the sector’s core activities** and material flows?
- **How do these activities and flows generate impact** when assessed through the social and ecological Doughnut themes?

## 2. WHERE DO WE WANT TO GO?

*Creating a vision for the future*

- **What could a thriving, resilient future** for the sector look like?
- **How can the Doughnut Economy model guide this vision** by balancing social needs within ecological limits?
- **What would success look like**, beyond conventional measures?

## 3. WHAT HOLDS US BACK?

*Analysing systemic barriers*

- **What is preventing progress** toward the desired future?
- **What barriers exist** within current market dynamics, regulatory environments, institutional norms, or policy frameworks?
- **Which cultural mindsets or procedural constraints** reinforce the status quo?

## 4. WHAT NEEDS TO HAPPEN?

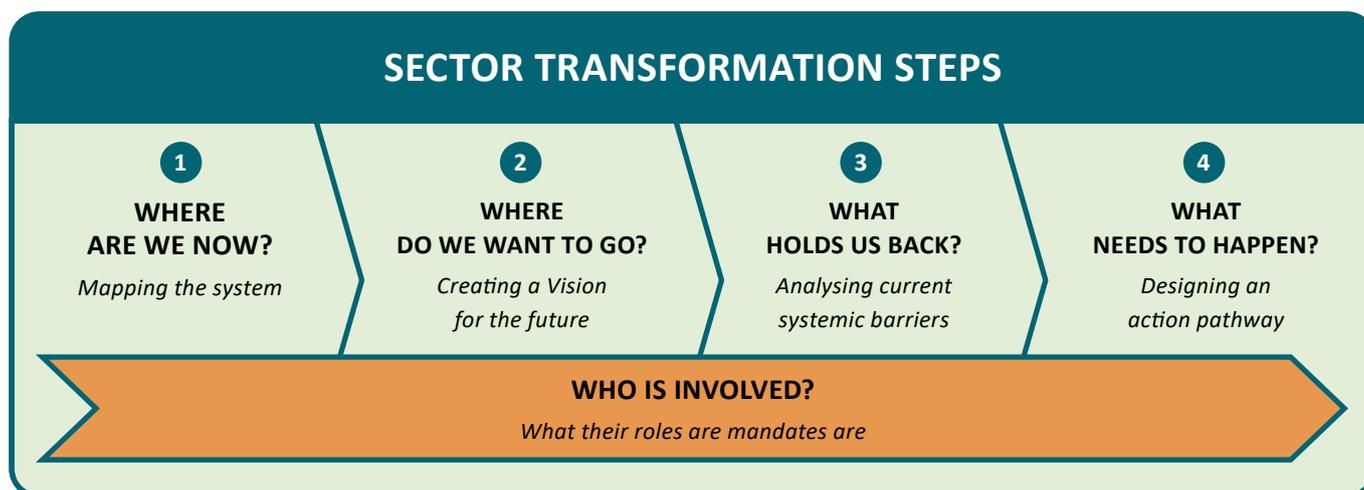
*Designing an action pathway*

- **What concrete interventions** are needed to overcome the identified barriers?
- **What should be changed** at structural, procedural, and cultural levels?
- **Who holds responsibility**, what support is required, and how can accountability be established for long-term transformation?

## 5. WHO IS INVOLVED? (Cross-cutting)

*Understanding actors, roles, and mandates*

- **Who are the key actors** involved in shaping, delivering, regulating, funding, and using the sector?
- **What roles do they currently play**, and how might those need to evolve?
- **What formal mandates and informal influence** do they hold?
- **What capabilities or incentives** are needed to enable action?
- **How do actors interact**, and where are the gaps in inclusion or responsibility?



# PART 2

# METHODOLOGICAL PROCESS

This section outlines how the strategic transformation framework was operationalised through the Highways Doughnut Alliance.

The Alliance process was anchored in the Highways Doughnut framework, an adapted version of the Doughnut Economics model specifically tailored to reflect the realities, responsibilities, and impacts of the UK highway maintenance sector. Developed during Phase 1 of the LiveLabs 2 project\*, the framework defines 18 sector-specific themes, each with a clearly articulated ideal future state.

This framework served as a shared compass throughout the alliance process. It ensured that all activities remained holistic, systems-based, and aligned with a common vision of a thriving sector. The Highways Doughnut not only provided a diagnostic tool for identifying social and ecological stresses, but also defined the desired direction of travel.

Since the Highways Doughnut already defines a clear ideal future for the sector, we embedded Step 2 (“Where do we want to go?”) directly into Step 1 (“Where are we now?”) of the Alliance process. This allowed us to move forward from a pre-established vision, focusing early efforts on mapping the current system and identifying the gaps between where we are and where we aim to be.

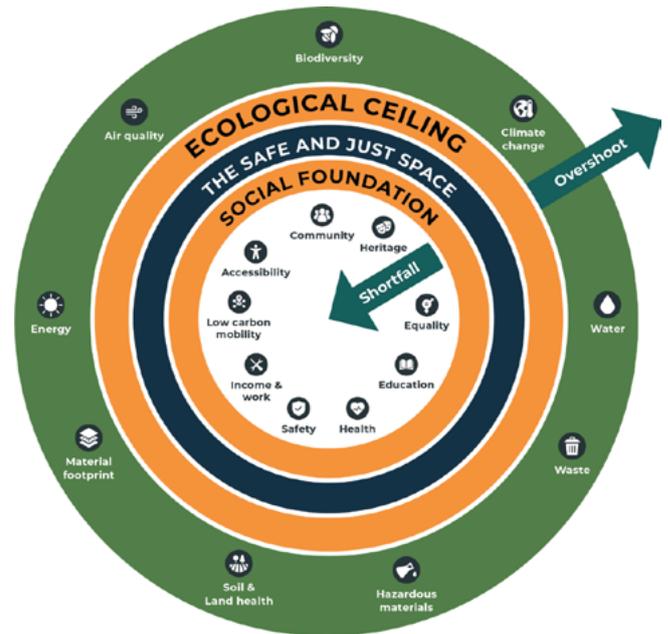


Figure one: Highways Doughnut Framework

Each of the four steps presented below consists of two tasks:

1. Research and preparation of materials
2. Workshop to validate findings and provide additional insights.



# STEP 1. WHERE ARE WE NOW?

Build a shared, evidence-based understanding of how the highway maintenance sector currently functions by defining what it delivers, how it operates, who is involved, and what impacts it creates. The current state analysis is validated and refined through a workshop with representatives from all defined actor clusters.

## RESEARCH

### A. Current state mapping:

- **Map core sector activities:** Define the full range of services and functions that make up the highway maintenance sector, from strategic planning and procurement to construction, routine maintenance, asset upgrades, and end-of-life treatment.
- **Quantify material flows:** Analyse which materials are used (e.g. asphalt, aggregates, concrete), their volumes, origins (domestic vs imported), and how they move through the sector. Include emissions, energy use, and end-of-life treatment such as reuse, recycling, or disposal.
- **Assess impacts through the Doughnut lens:** Apply Doughnut Economics to assess how current sector operations impact both planetary boundaries and social foundations.
  - Ecological: e.g. emissions, land use, resource extraction, pollution
  - Social: e.g. access and equity, job quality, health and safety.

### B. Stakeholder mapping:

- **Map the full ecosystem of actors:** Based on the core sector activities mapping, identify all those involved in shaping, funding, regulating, delivering, using, and being impacted by the highway maintenance sector. Include public, private, and civil society actors.
- **Clarify roles, mandates, and influence:** Document each stakeholder group's role in the system. Analyse their formal mandates (legal or contractual) and informal influence (e.g. thought leadership, advocacy).
- **Group actors into functional clusters and select representatives:** Organise stakeholders into clusters, e.g. national government, local highway authorities, contractors, suppliers, advocacy organisations, civil society groups, academia. From the broader stakeholder map, form a diverse and representative group to co-lead the transformation process. Include both system "upholders" and "influencers".

## WORKSHOP

- **Introduction and scene setting**
  - Introduce the group and show how members represent key actor clusters within the highway sector.
  - Present the Highways Doughnut as the Alliance's guiding compass, highlighting the key parts of the research summarising social and ecological dimensions currently under pressure.
- **Workshop in groups: Identify shared challenges on the Doughnut**
  - Use Post-Its to answer:
    - » Which social and ecological challenges are most pressing?
    - » What patterns/processes are holding the sector back from reaching the safe and just space?
    - » What underlying systemic issues link them together?
- **Discussion in big group**
  - Come together as a big group to discuss main takeaways from each breakout group
  - Discuss overlaps and commonalities across the challenges.

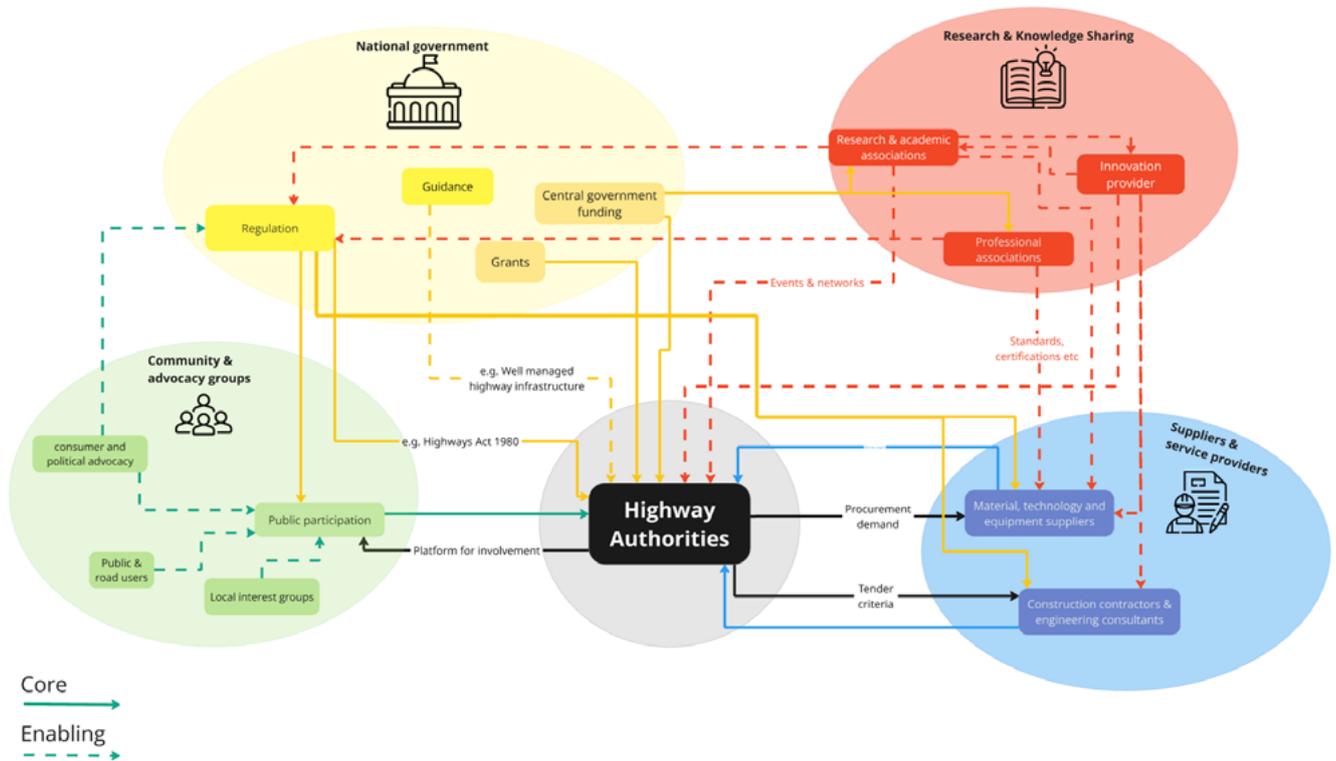


Figure two: Highway Sector Mapping exercise exploring key actor clusters and their core or enabling influence.

## STEP 2. WHAT'S HOLDING US BACK?

Organise the long list of challenges from Step 1 into clearly articulated barriers and explores each in depth. Validate and analyse the barriers in a workshop, assessing their impacts, enabling norms that uphold them, and the power dynamics and influences that sustain them.

### RESEARCH

#### Cluster and define systemic barriers:

- **Cluster identified challenges from Step 1 into thematic categories that represent recurring systemic obstacles** such as rigid policy frameworks, data gaps, siloed working, or misaligned incentives.
- **Translate challenge clusters into barrier statements** that clearly summarise core issues.  
Highways Doughnut Alliance barriers:
  - Limited willingness for innovation and lacking adoption of piloted innovations
  - Rigid policies and standards hinder adoption of more sustainable alternatives
  - Lack of standardised metrics and limited data collection
  - Procurement and funding reward fast, low-cost delivery
  - Siloed working processes block collaboration and knowledge sharing
  - Impacted communities and road users are not sufficiently included in decision-making processes

### WORKSHOP

#### Part 1: Gallery Wall barrier validation

- Present posters summarising each barrier with their associated challenges.
- Use dot voting to validate and prioritise which barriers to explore in depth and add additional challenges missing from the posters.

#### Part 2: Group Breakouts on barrier deep dives

- Assign one barrier per group and explore:
  - **Doughnut impact:** Which social or ecological boundaries are affected?
  - **Success vision:** What would the sector look like if the barrier were resolved?
  - **Limiting norms:** What implicit rules or sector assumptions are keeping the barrier in place?
  - **Influencers vs upholders:** Who shapes the conditions, and who has control?
- **Groups rotate to validate** and build on the work of others, adding perspectives from across actor clusters.



## LACK OF METRICS AND DATA TO MEASURE THE SOCIAL AND ECOLOGICAL IMPACTS OF THE HIGHWAY SECTOR

<p>Success is primarily evaluated using financial indicators.</p>	<p>Indirect and long-term impacts are not measured or incentivised.</p>	<p>Social and ecological indicators are inconsistently applied or absent.</p>	<p>Monitoring frameworks emphasise outputs over outcomes.</p>
<p>Indicators are not standardised or uniformly implemented.</p>	<p>Lack of measurements hinder material innovations.</p>	<p>Local authorities do not have a statutory duty to report on climate change.</p>	

Figure four: Example of a barrier poster with the defined barrier at the top and associated challenges in the post-its underneath.

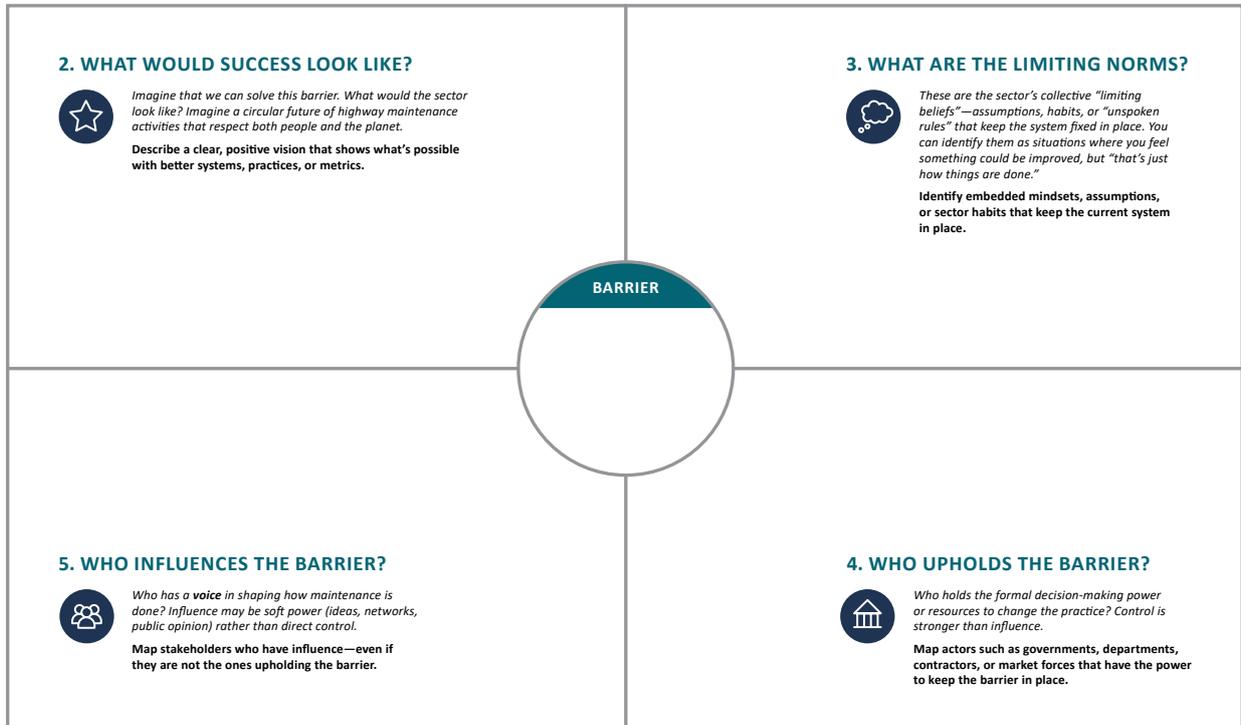


Figure five: Workshop canvas for step 2-5 of the Barrier Deepdive exercise.

# STEP 3. WHAT NEEDS TO HAPPEN?

Develop a shared and actionable roadmap for overcoming barriers and transitioning toward a thriving Highway Sector. This step translates system insights into strategic interventions across cultural, procedural, and structural levels and assigns clear roles to actors responsible for implementation.

## RESEARCH

### Develop long list of actions:

- Starting from the **success visions** developed in Step 2, define a longlist of practical actions that can help shift the sector toward the desired future across three transformation levels:
  - **Structural** – Changes to policy, regulation, funding frameworks, or governance.
  - **Procedural** – Adjustments to workflows, operational processes, and collaboration practices.
  - **Cultural** – Shifts in narratives, mindsets, skills, and norms.
- **Ensure actions tackle root causes** by:
  - Addressing **limiting norms** that keep the system fixed in place.
  - Covering **ecological and social impact areas** based on Doughnut analysis.
  - Aligning with **actor roles and influence**, using the maps from Step 2 to inform responsibility, support, and feasibility.

## WORKSHOP

### Action validation and role mapping:

- Introduction and barrier recap
  - Reintroduce each barrier with key takeaways from Step 2 in a quadrant summary:
    - » Why it matters?
    - » Impact on the Doughnut?
    - » What success looks like
    - » What's holding us back
- **Group work:** Validate, refine & assign actions
  - Break into groups (1 per barrier) and review proposed actions:
    - » Validate and improve wording
    - » Merge, remove, or add actions as needed
- Assign actor roles for each action from the key actor clusters (central government, local authorities, contractors, suppliers, academia, and civil society):
  - **Lead actor:** Responsible for initiating and coordinating the action.
  - **Supporting actors:** Enable or influence implementation.
- Plenary share-out and alignment:
  - Groups present their refined actions and assigned roles.
  - Facilitated discussion highlights:
    - » Cross-cutting actions or repeated actors
    - » Opportunities for bundling and synergies
    - » Gaps in ownership or areas of resistance

## Barrier 2: Rigid Policies and Standards hinder adoption of more sustainable alternatives

### Why it matters?

Without adaptable, dynamic standards, promising innovations proven in local contexts (e.g. Live Labs) remain sidelined. Standards that lag behind practice delay climate mitigation, accessibility, and wellbeing improvements in road infrastructure.

### Impact on the Doughnut

Outdated, inflexible standards block the uptake of low-carbon materials and inclusive design practices, locking the sector into business-as-usual solutions that undermine both ecological resilience and social equality.

### What success looks like

Regularly update, dynamic standards. Legal clarity enables shared risk in innovation. Compliance redefined to include ecological and social performance.

### What's holding us back

- 'We've always done it this way.'
- Risk-aversion tied to legal responsibility.
- Standards lag behind available evidence and field trials.

Figure six: Barrier deepdive summary

# STEP 4. NEXT STEPS & LONG-TERM UPTAKE

## (NOT YET REACHED BY THE HIGHWAYS DOUGHNUT ALLIANCE)

Ensure long-term uptake by embedding actions into organisations, agreeing on roles, and establishing governance for continued momentum of the Highway Doughnut Alliance.

### RESEARCH & AGREEMENTS

#### A. Institutionalising the actions:

- **Develop a prioritised action plan**, using criteria such as urgency, expected impact, feasibility or resourcing.
- **Define clear roles, responsibilities and commitment** for each action:
  - Lead actors: those with mandate, capacity, and legitimacy to act
  - Supporting actors: those who enable, influence, or collaborate
  - Clarify what it means to “lead” or “support” a given action
  - Confirm commitments from the Alliance partners in leading or supporting each action
- **Identify gaps in ownership or commitment:**
  - Are any actions lacking a responsible lead?
  - Are any key organisations missing from the implementation map?
- **Support embedding of actions in organisational processes:**
  - Explore how actions can be integrated into strategies, KPIs, funding cycles, or operating procedures
  - Consider capacity-building or policy alignment needs

#### B. Sustaining the Alliance:

- **Clarify the future role of the Alliance:**
  - Define the functions it should serve (e.g. learning hub, coordination body, advocacy voice)
  - Define who should be involved and what mandate they have to commit to change.
  - Expand the representation in the Alliance based on identified gaps in the Action plan
- **Establish a neutral convening function:**
  - Select or design an entity (existing or new) to hold the mandate. Equip it with:
    - » A clear coordination role
    - » Accountability mechanisms (e.g. reporting, monitoring)
    - » Resources (staff, funding, facilitation)
- **Agree on accountability and progress tracking:**
  - Define how progress will be monitored and shared.
  - Select and agree on shared indicators and milestones to track progress.
- **Build commitment for long-term collaboration:**
  - Reaffirm shared ambition and values
  - Define mechanisms for updating the action plan over time
  - Agree on meeting frequency and format

# ACKNOWLEDGMENTS

This report would not have been possible without the participation and engagement of the Highways Doughnut Alliance. We thank all members for their time, expertise and commitment to working collaboratively across the sector to explore challenges and co-develop pathways toward a more socially just and ecologically safe highways system.

The following individuals have contributed to the outcomes of the Alliance.

## AUTHORS

- **Circle Economy** - Kristin Strandberg, Kimmy Lahr, Guus ter Haar
- **Doughnut Economics Action Lab** - Ilektra Kouloumpi

## HIGHWAYS DOUGHNUT ALLIANCE MEMBERS:

- **Local Highway Authorities:**
  - Matt Philips, Highway Asset Manager Cornwall
  - David Shrimpton, Wessex Live Lab Enabler, Cornwall
  - Victoria Walsh, Highway Systems Manager, Devon
  - Mark Fortune, Climate Emergency Manager, Somerset
  - Niel Guild, Wessex Live Lab Enabler, Somerset
  - Lucille Simms, Social Value Lead, Somerset
- **Central Government**
  - Jesse Prendergast, Knowledge Transfer Manager, Innovate UK
  - Tim Rowland-Deverell, Head of Local Highways: Strategy and Environment, DfT
- **Contractors**
  - Oliver Thomas, Innovation Manager, Colas
  - Ricky Beecroft, Innovations Project Manager, Colas
  - Andy James, Business Director, Cormac
  - Dorothee Fitzsimmons, Senior Environmental PM, Kier
  - Peter Ingram, Contract Director Local Authorities, Kier

- **Suppliers**
  - Craig Mutch, Research and Development Coordinator, Glasdon
  - John Cookson, Customer Support Manager, Glasdon
  - Toby Fitzsimmons, Commercial Manager, Miles MacAdam
  - Andy Jones, Head of Commercial and Technical, Stabilised Pavement
- **Academia & Networks**
  - Peter Lefort, Green Future Network, University of Exeter
  - Xiaoyu Yan, Professor in Sustainable Energy Systems University of Exeter
  - Gordon Airey, Head of the Nottingham Transportation Engineering Centre Research Group, Nottingham University
- **Community & advocacy groups**
  - Andy Watt, Senior Engineer, Sustrans
  - Andy Jones, Chair, Road Surface Treatments Association (RSTA)

