

## How does UK government demarcate risks and opportunities for the Net Zero transition? A mixed-method risk opportunity study of Net Zero evidence gathering and policy making

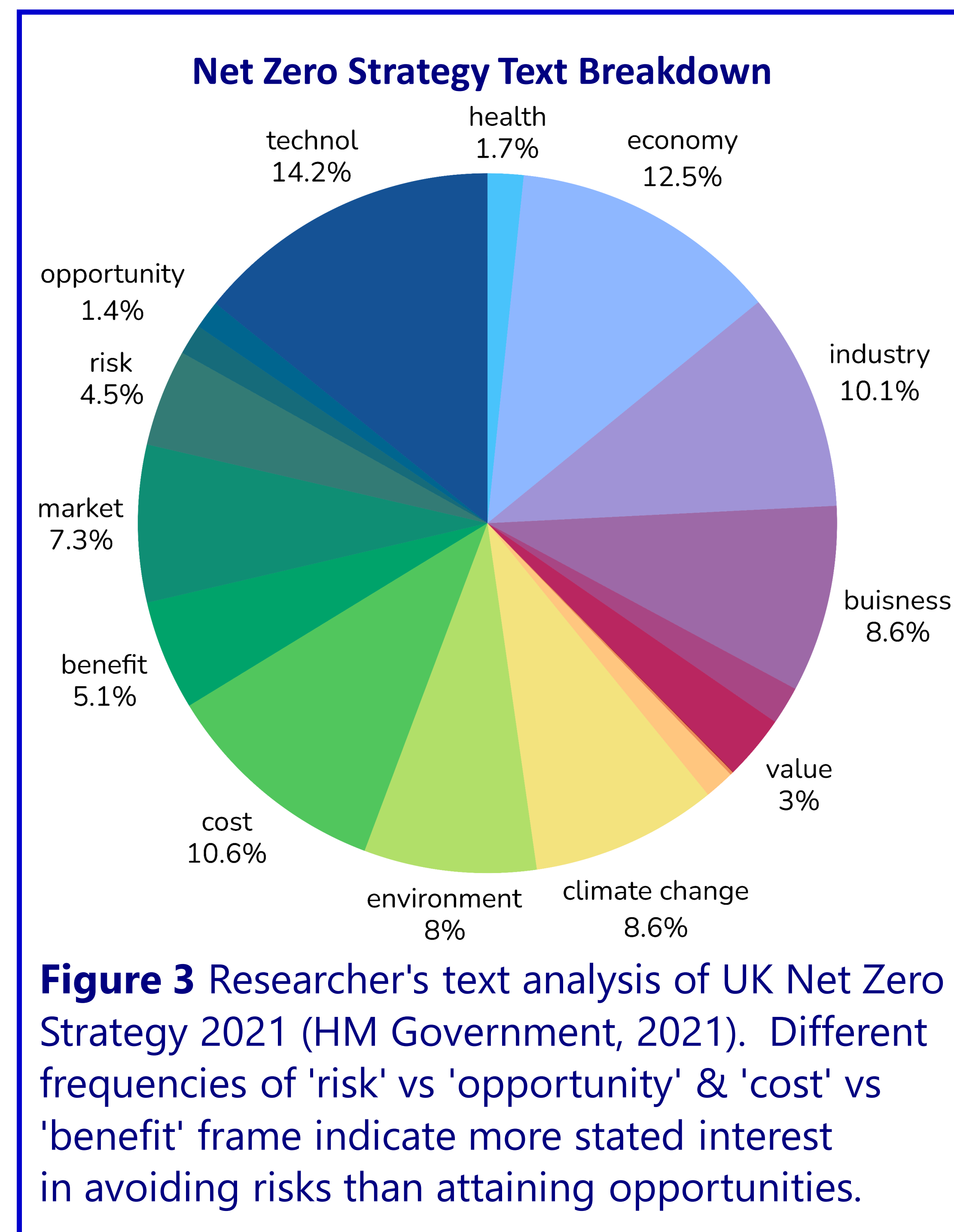
Edward Sudall  
Clive Potter  
Audrey de Nazelle  
Centre for Environmental Policy, Imperial College London

### Problem

Net Zero requires whole system transformation. But departments fulfil siloed responsibilities in their problem areas. Intersectional good and bad outcomes therefore remain neglected as illustrated in figure 1. Policymakers want to rectify this whole-system-neglect through 'systems thinking' toolkits to "understand complex systems". (GOV.UK, 2021.; The Civil Service, 10/2020: 9). Status-quo siloed thinking is a problem as intersecting systems are overlooked; mutual opportunities and risks that cut across, for example, 'environment' and 'health' are missed (see figure 2 below).

### Aim

To investigate the varying approaches analysts take in assessing risks and opportunities and the underlying epistemic rationale guiding their decisions. By mapping these differences, this research aims to develop a framework to identify intervention points for improved decision-making.

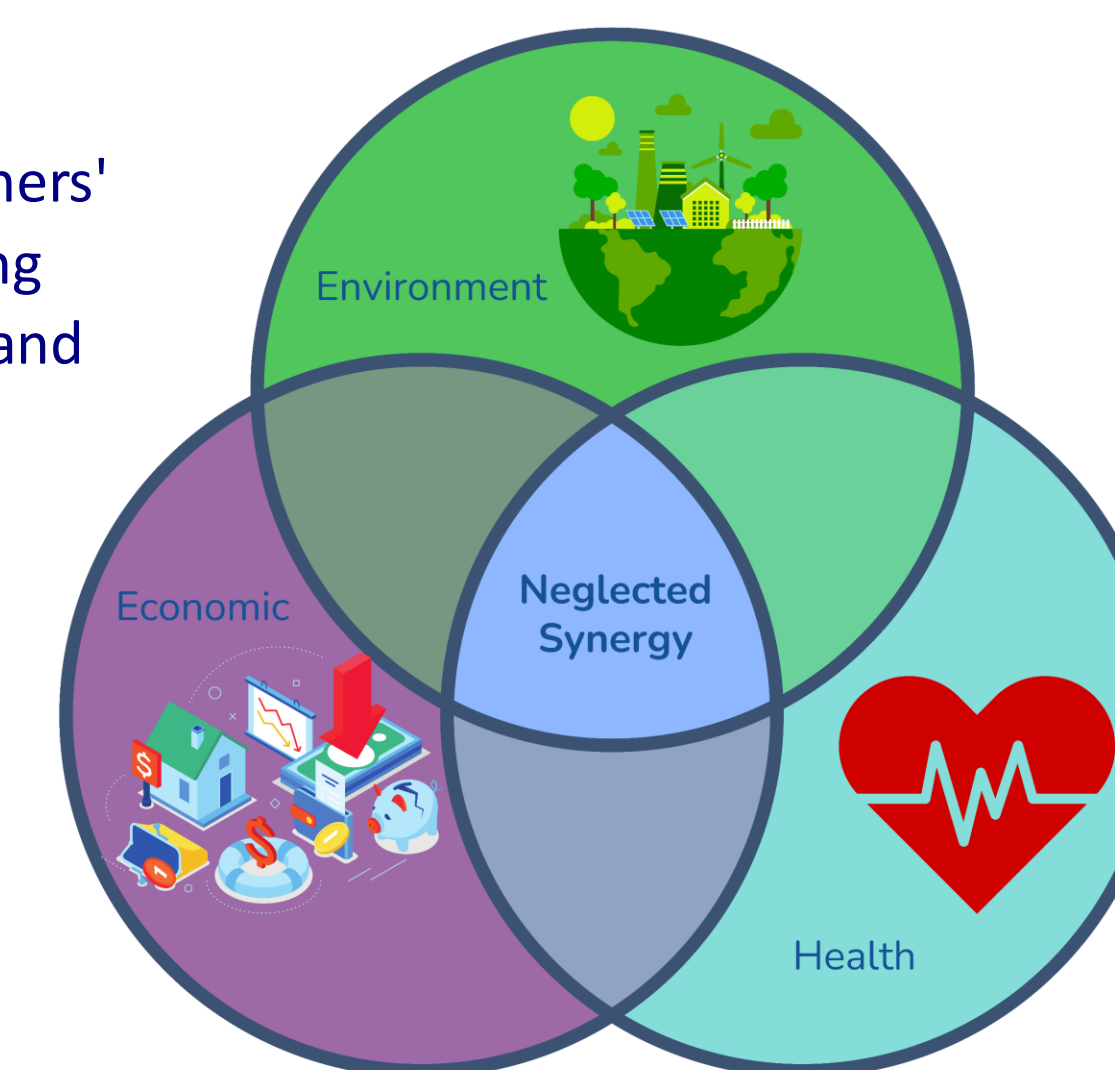


### Research Gap

Public policy, political science, and sociology about science map 'the science policy interface' and prescribe practices in the abstract. (Cairney, 2015; Gustafsson and Lidskog, 2018) An exception is Juhola et al (2024) who describe the policymaking network of Finland government. Questions are open where problems intersect, as illustrated in figure 1 below, within UK policymaking.

Papers which mention Policy, Environment, Health, and Economy together comprise 0.05% & 0.07% of results on Scopus & Web of Science on 12-05-2024, suggesting scholarly neglect.

Figure 1. Researchers' diagram illustrating Problem overlap and neglect



### Research Questions

1. What risks and opportunities are associated with the Net Zero transition?
2. Where, when, and by whom are these Risks and Opportunities demarcated?
3. How and why do teams', papers' and departments' risks and opportunities differ?

### Implications

1. **Contributes** to nascent literature on systems public policy
2. **Answers** environmental policymakers request for applied systems approach to societal issues
3. **Identifies** points for amendment where shared risks and opportunities can be minimised and maximised

### Methodology and Methods

Methods are embedded within the methodology of system Risk Opportunity Analysis (Mercure et al., 2021) as instantiated in figure 2 (bottom left) where cross-system interaction within an environment guide how opportunities and risks for and to 'economic', 'health', 'environment' systems and other boundaries and goals are demarcated (Clark et al., 2021; Ulrich, 2006)

Methods include mapping Defra, SDNZ, Treasury, and DFT team and document networks. Interviewing analysts, policymakers, and operators. Comparative topic modelling policy documents and transcripts. Time series data on government staffing, funding, and stated priorities. Participatory systems mapping workshops at Defra (Barbrook-Johnson and Penn, 2022) to deliberate risks and opportunities with policymakers.

### Expected Outcomes

- Interactive network map showing evidence sharing dynamic between government department policymakers, scientists, and operators
- Evidence based framework to guide decisionmakers to make effective cross-cutting policy under complexity
- Operational join-up intervention points to restructure teams evidence sharing practices to achieve systems-thinking informed goals

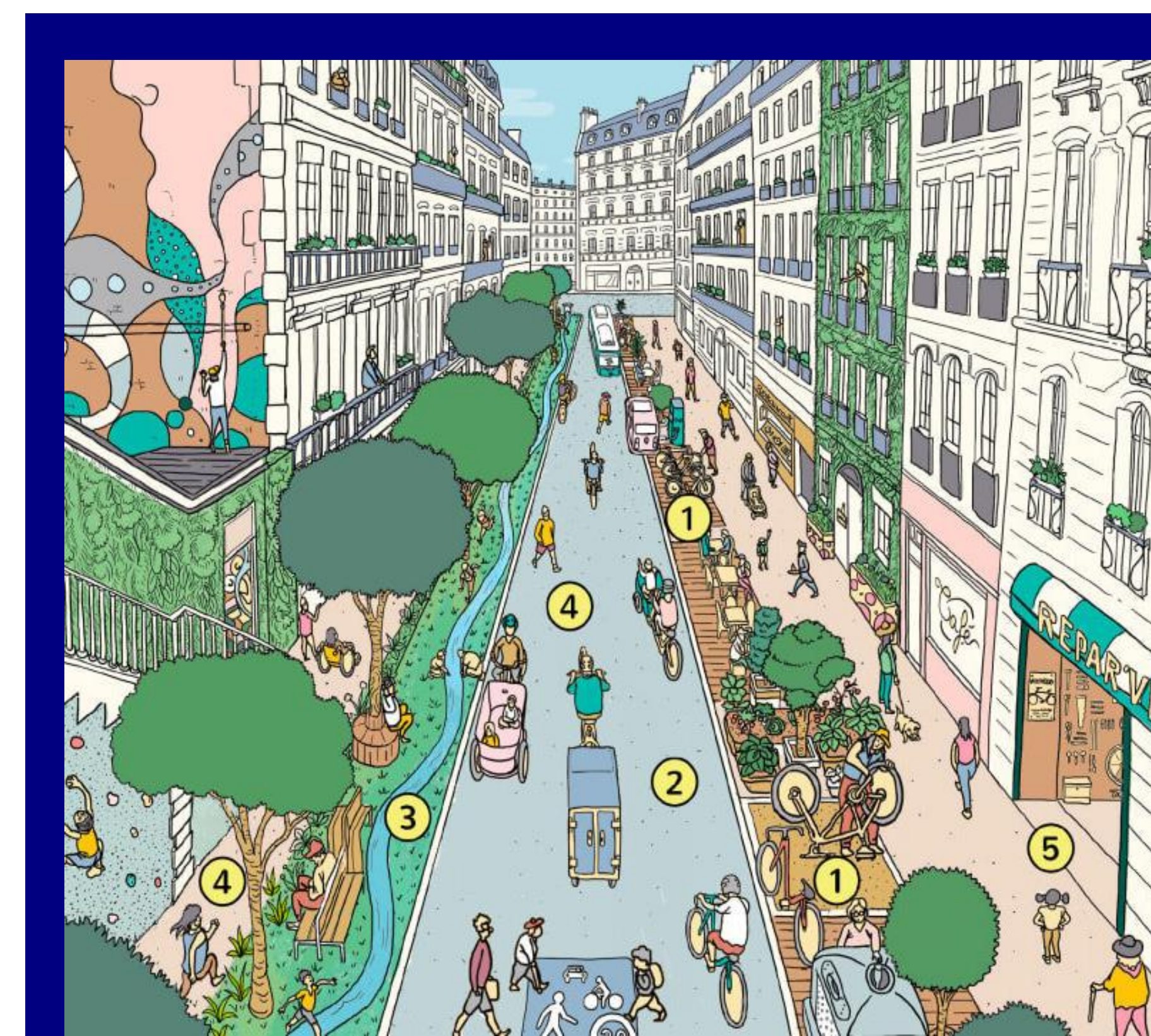


Figure 2 Nick Boscon's 15 Minute City visual for Paris en Commun

### Risk Opportunity Analysis Application

ROA seeks to "identify the scientific basis to manage information flow in a policy appraisal framework theoretically compliant with structurally transformative situations." (Mercure et al., 2021: 2)

ROA countervails against expected utility benefit costing. For example, figure 1 illustrates an environment with negative outcomes and positive outcomes which complexly transgress system borders and defy marginal benefit costing (Helm, 2023: 42-46). Greenery has economic, environment, and health opportunities; active travel spaces save healthcare costs and enable more active citizens and workers (de Nazelle et al., 2021; Nieuwenhuijsen et al., 2024). These features raise resilience and lower emissions. 'Risk' and 'opportunity' therefore depend reflexively on system scope and evidence sets relied on (Ulrich, 2006)

### QR\_reference\_repo



- [1] GOV.UK, 2020.; The Civil Service, 10/2020
- [2] HM Government, 2021
- [3] Helm, 2023: 42-46
- [4] Mercure et al., 2021: 2
- [5] de Nazelle et al., 2021
- [6] Nieuwenhuijsen et al., 2024
- [7] Ulrich, 2006
- [8] Gustafsson and Lidskog, 2018
- [9] Cairney, 2015
- [10] Juhola et al., 2024
- [11] Barbrook-Johnson and Penn, 2022
- [12] Clark et al., 2021