

Centre for Smart Infrastructure and Construction

Aims to develop and commercialise emerging technologies to improve efficiencies, economies and adaptability in the construction and management of infrastructure

- £17m funding (£10m Government; £7m Industry)
- Research on Whole-life Management of Infrastructure Assets (£700k)



THE WOODHOUSE PARTNERSHIP



Cementation

SKANSKA



UNIVERSITY OF CAMBRIDGE

Technology Strategy Board
Driving Innovation

EPSRC

Engineering and Physical Sciences Research Council



Whole-life Management of Infrastructure: What?

Improve the effectiveness of infrastructure asset management

O1: To determine the appropriate level and timing of investment for optimising whole-life value delivery from infrastructure assets

O2: To determine the appropriate level of information availability to support whole-life infrastructure asset management

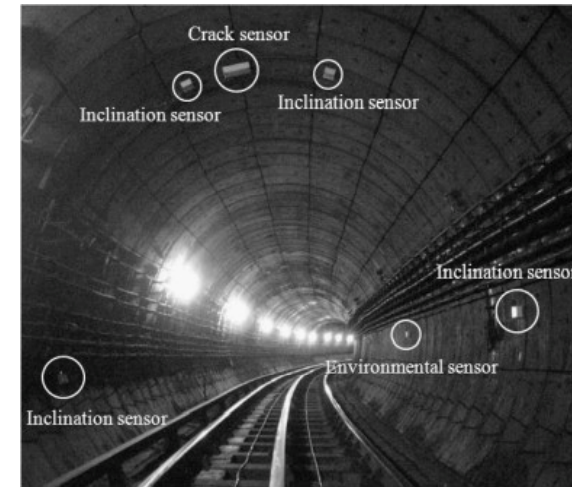
O3: To provide a series of possible strategies for futureproofing infrastructure information

O4: To review challenges in preparing key infrastructure for future needs

Validation and demonstration of project outputs in real industrial scenarios

Whole-life Management of Infrastructure: Why?

- Profusion of condition sensing technologies
- Lack of clarity on what data is valuable
- Technologies are merely supporting elements – value is obtained only when data is turned into good decisions
- How can we keep up with the pace of “change”?



(a) 1860s, Shallow foundations



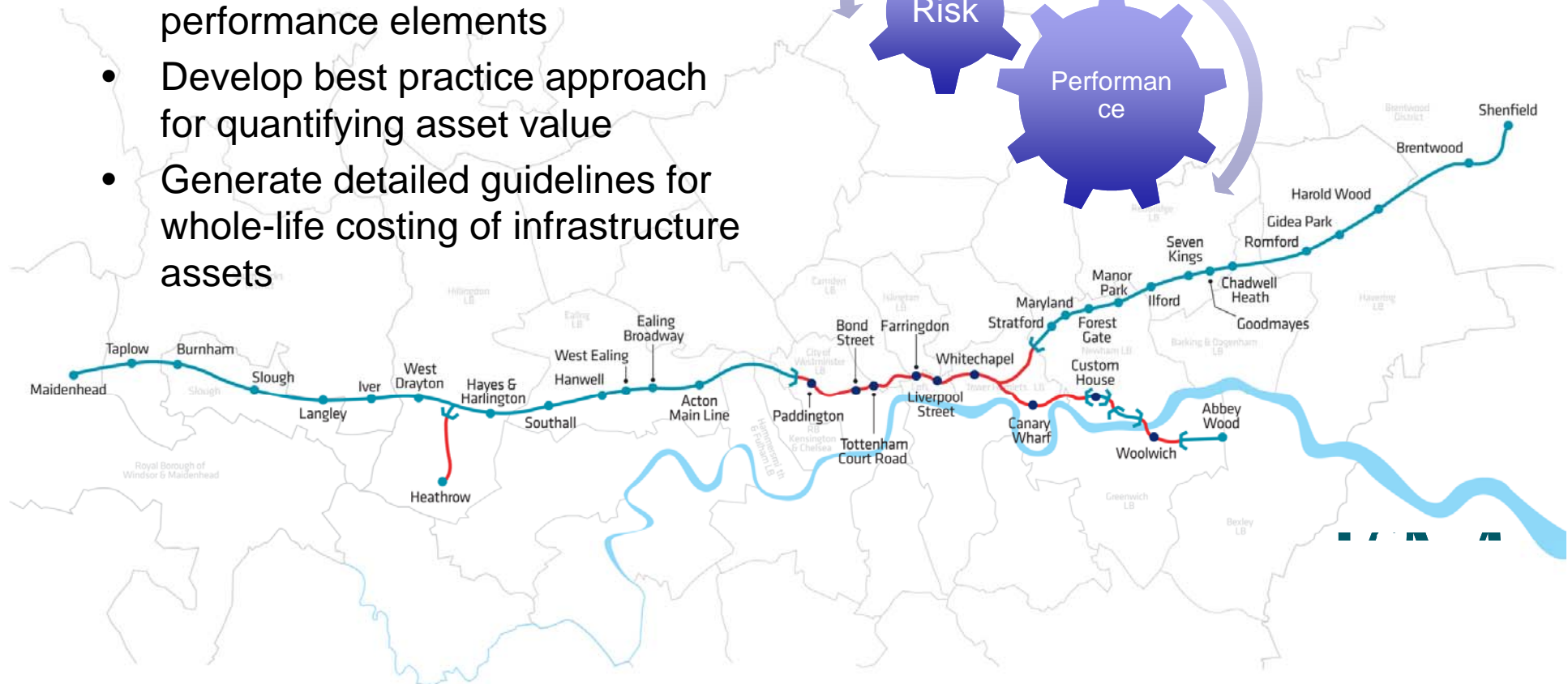
(b) 1950s, Deep foundations



(c) 2002, Reused foundations (refurbishment)

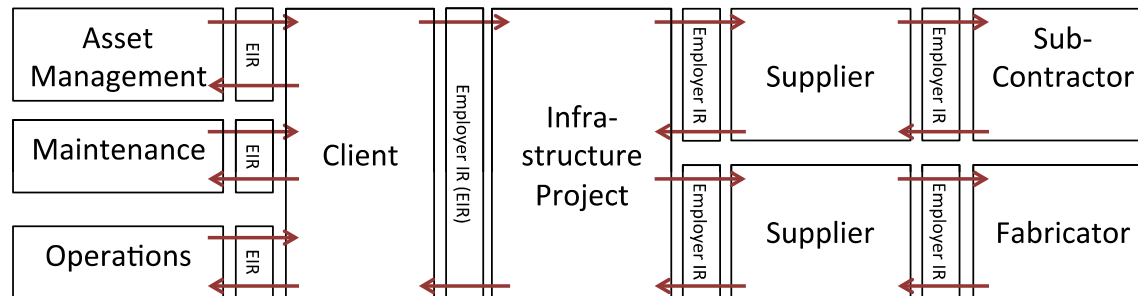
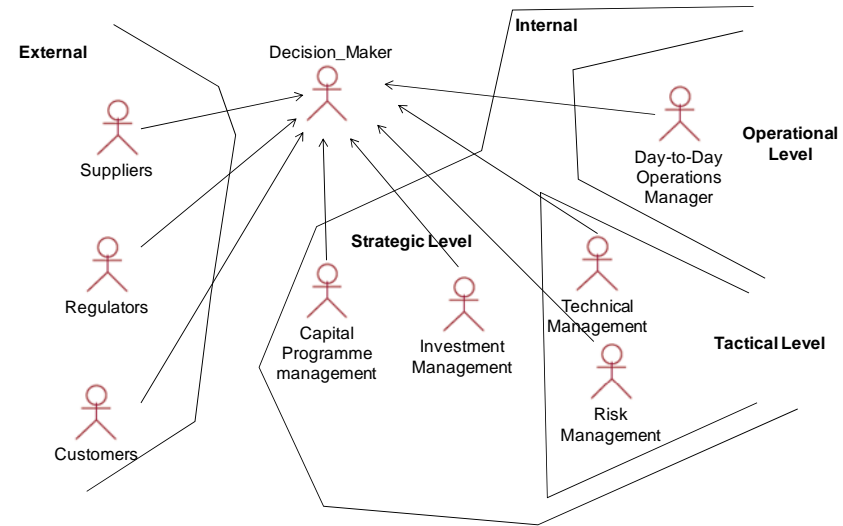
Whole Life Costing: How?

- Case studies to understand current state of practice and shortcomings
- Identify key cost, risk and performance elements
- Develop best practice approach for quantifying asset value
- Generate detailed guidelines for whole-life costing of infrastructure assets



Information requirements mapping: How?

- Identify key decision-makers and decisions made across the lifecycle
- Identify information required to support the decisions
- Identify other users and needs of information
- Generate information flow maps



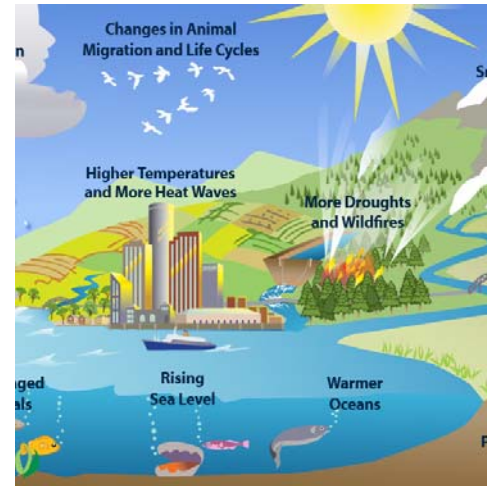
Futureproofing information: How?

- Case studies with industrial partners to identify key information that needs to be futureproofed
- Identify the challenges faced in long-term storage of data
- Identify technologies that can overcome those challenges
- Develop tool to map futureproofing needs to technologies



Futureproofing infrastructure: How?

- Identify long-term uncontrollable changes and disruptions, e.g., Climate change, population growth, terrorism
- Identify controllable (or planned) changes faced, e.g., capacity increases
- Identify key strategies used for futureproofing infrastructure assets to meet these challenges (workshops)



Train Incident Management System: What?

- **Objective:** To develop a self-learning fault diagnosis tool for trains
- Funded by Hitachi Rail



Train Incident Management System: Why?

- Fault-finding is very time consuming and costly
- Lack of expertise in maintenance
- Poor quality data
- “No fault found”



Train Incident Management System: How?

