The Circular Economy - Application to Road Projects

David Smith,

Technical Director for Business Sustainability, AECOM UK

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The Circular Economy

"A circular economy is one that is restorative by design, and which aims to keep products, components and materials at their highest utility and value, at all times."

Ellen MacArthur Foundation, 2013

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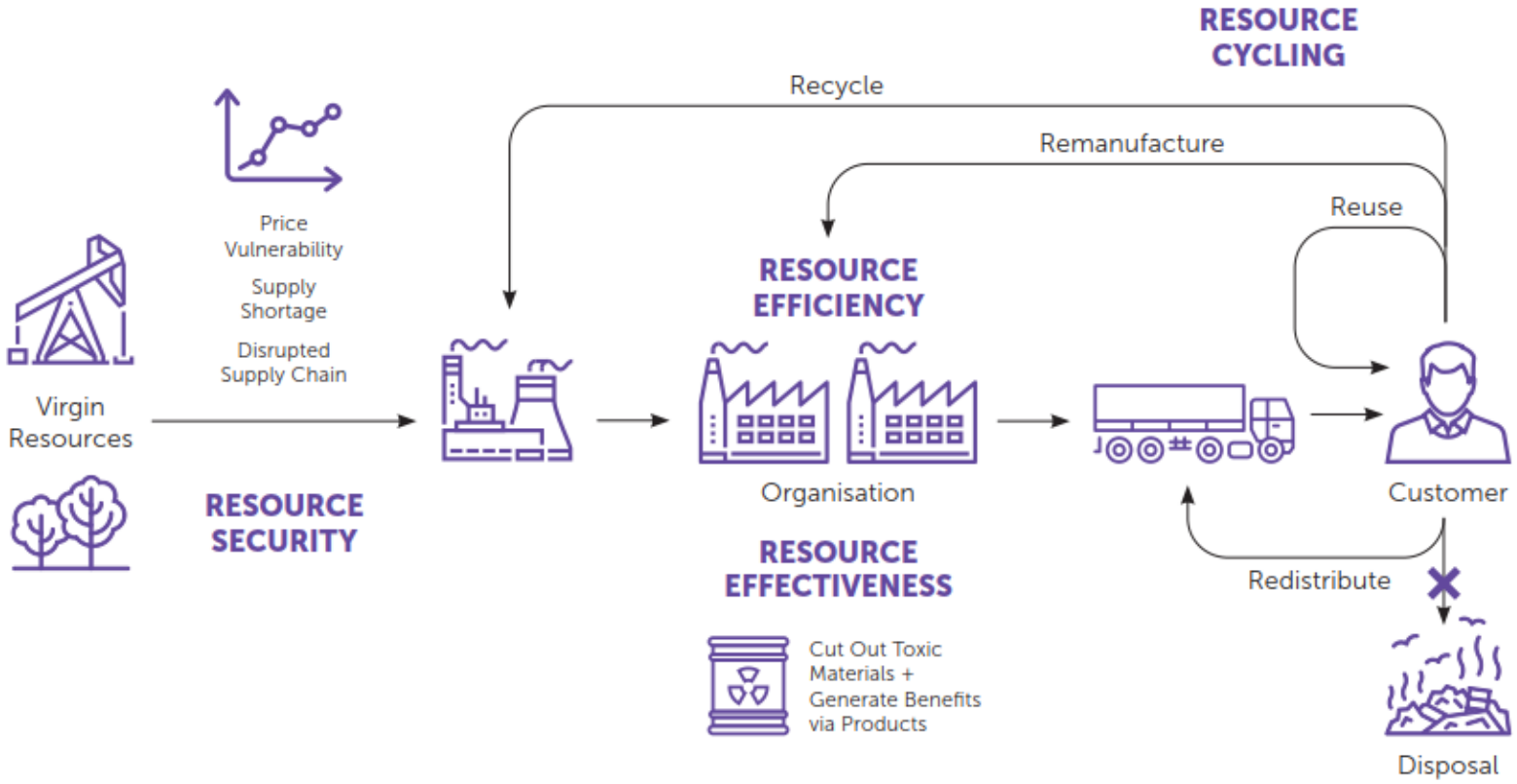
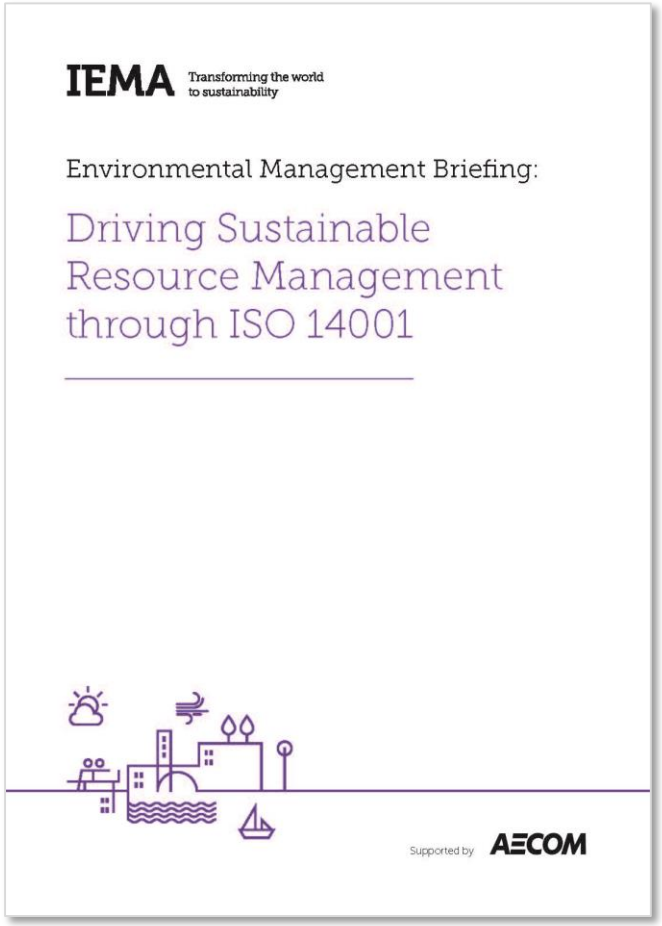
Introducing the Circular Economy





Resource Management – Working Towards a Circular Economy

From IEMA, Environmental Management Briefing: Driving Sustainable Resource Management through IS0 14001 (2017)

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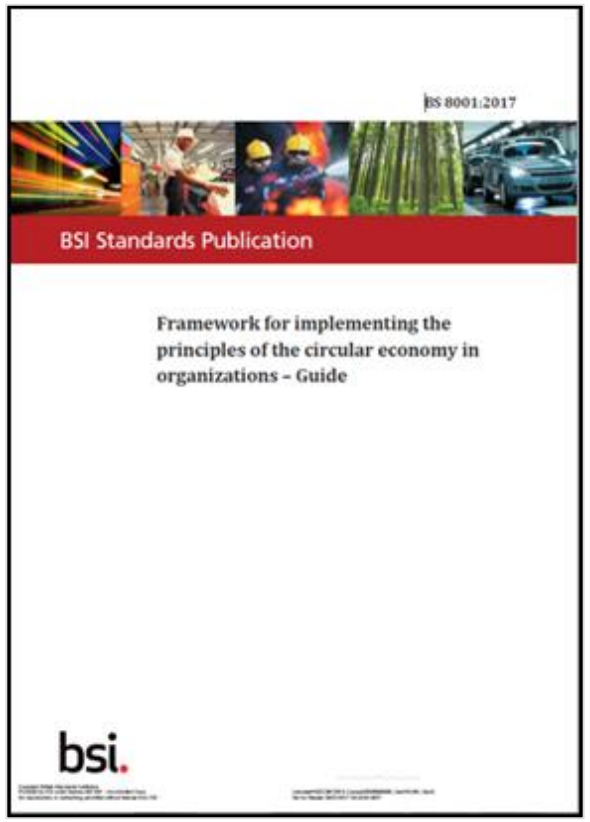
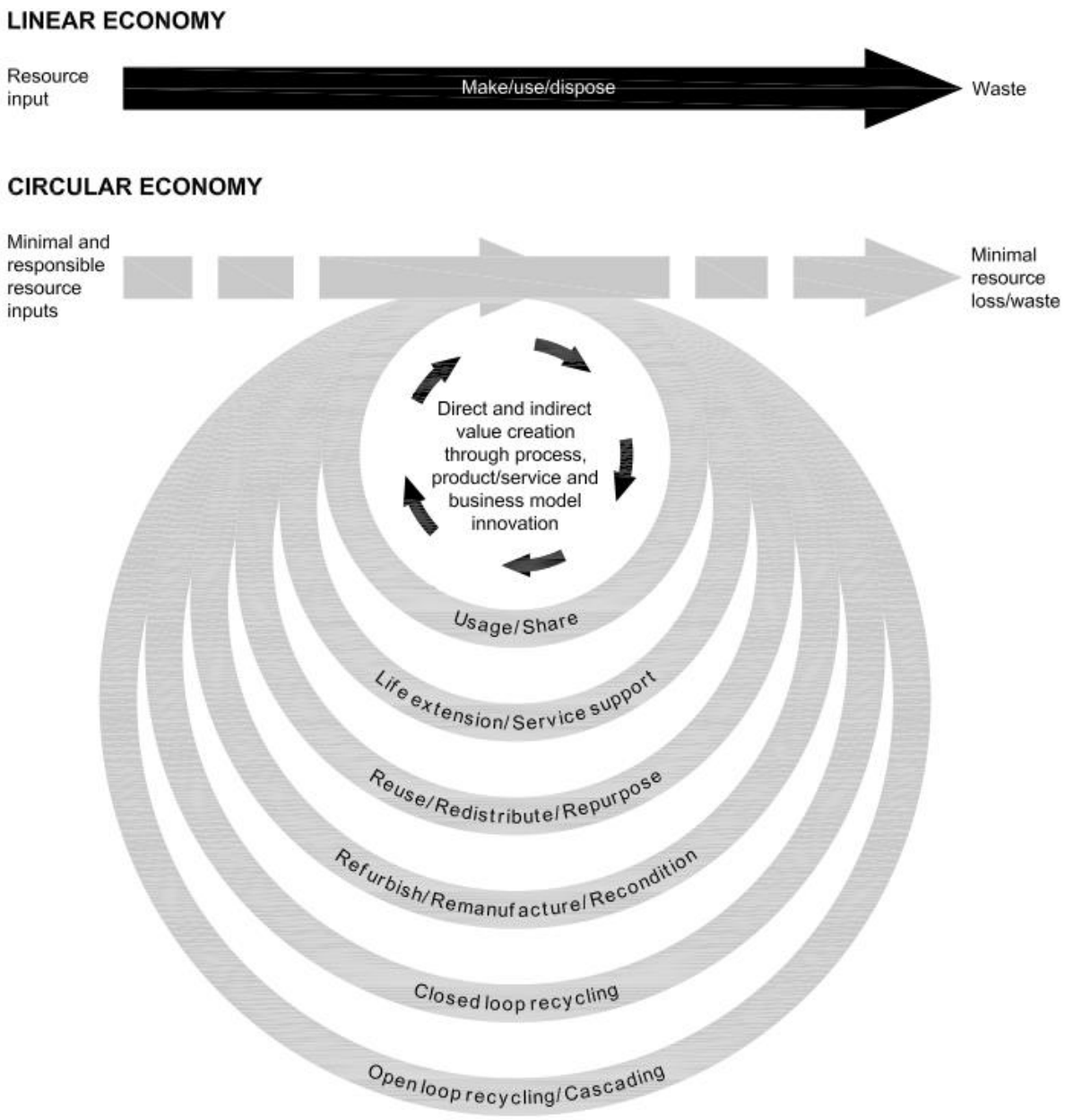
The Circular Economy





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Highways England – Moving towards the circular economy

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Highways England - Key drivers for the circular economy

– Competition for resources

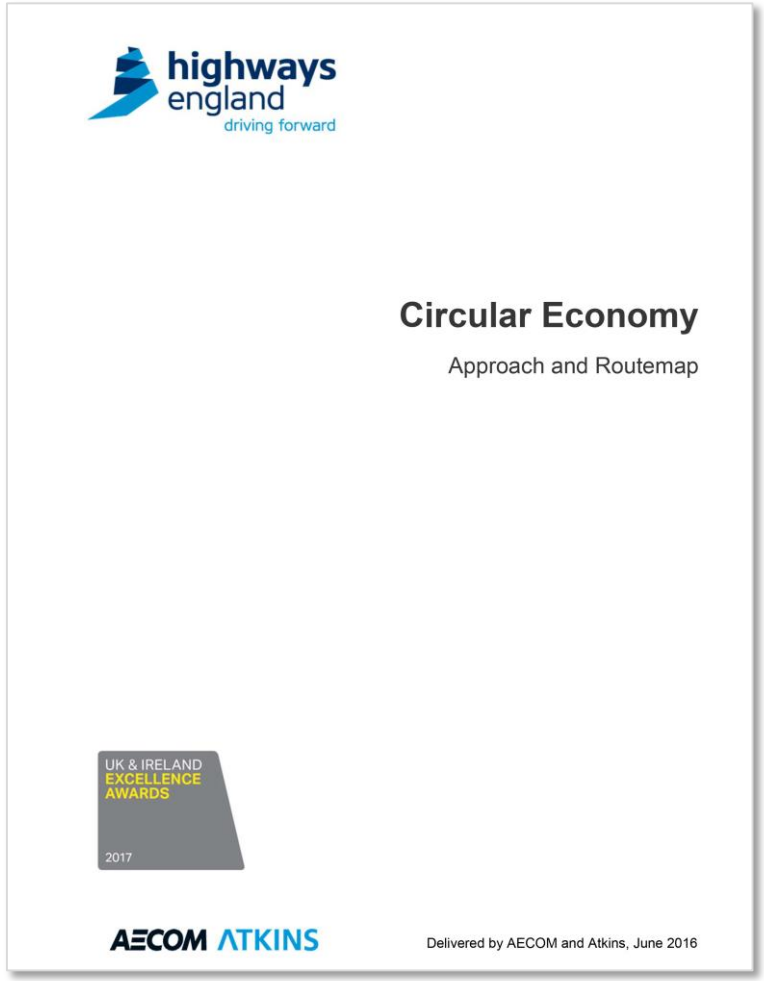
– Material criticality Studies:
  - Heightened supply chain risk;
  - Vulnerability to supply restriction; and
  - Environmental implications

– The need to ensure security of supply

– The need to work within resource constraints

– Potential safety and financial benefits

– Climate change / requirement to development low carbon infrastructure.



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Highways England – Key benefits of the circular economy

- Improved delivery and service to customers:
  - Reduced resource consumption, procurement, purchase, processing and waste management costs;
  - More sustainable performance; with
  - Improved management of business risk.
- Secure supply of materials at a reasonable and stable price
  - Management of environmental, ethical and social impacts that could otherwise damage Highway's England's reputation.
- Creation of opportunities for new business
  - New business models, products and services for its supply chain.

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Highways England - Corporate Commitment

– Highways England's license to operate (2015) includes a requirement to put sustainable development into practice.

– 'Manufactured Capital - circular economy' is one of the five key elements of Highways England's Sustainable Development Strategy (2017).

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Sustainable development strategy

Our approach

Introduction

"The network of the future will be smoother, smarter and more sustainable."
(Road Investment Strategy: 2015 to 2020)

Highways England's role is to operate, maintain and modernise the strategic road network in the interests of customers. We have an ambitious programme to deliver the Government's Road Investment Strategy. This investment is designed to maximise our road network's support to the UK economy, and to support the quality of life of communities up and down the country. Our Strategic Business Plan, Delivery Plan, as well as the Road Investment Strategy, all include our visions for sustainable development that build on Highways England's licence to operate.

Through this strategy we intend to communicate our approach and priorities for sustainable development to our key stakeholders. We are keen to ensure our action in the future will further reduce the impact of our activities to ensure a long-term and sustainable benefit to the environment and the communities we serve.

This is our first Sustainable Development Strategy as Highways England and with it we intend to adhere to the principles of sustainable development in everything we do.

What is sustainable development and why is it important to Highways England?

Sustainable development is defined in our licence to operate, as "encouraging economic growth while protecting the environment and improving safety and quality of life for current and future generations".

Importantly our licence requires us to put sustainable development into practice in particular with regard to:

- **Financial**
  supporting national and local economic growth and regeneration.
- **Human**
  protecting and improving the safety of road users and road workers.
- **Natural**
  protecting, managing and enhancing the environment.
- **Social**
  seeking to improve the well-being of road users and communities affected by the network.
- **Manufactured**
  ensuring efficiency and value for money.
  (Highways England: Licence, April 2015)

These factors align with the established five capitals of sustainability.

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Development of a Circular Economy Route Map

Governance	• Establish a CE Policy • Integrate CE into Business as Usual

Procurement	• Contractual requirements for CE
	• Supply chain liaison
	  • Exploration of capacity and motivations within the sector
	  • Identify areas with material constraints and create opportunities register for future schemes
	  • Prioritise major schemes

Monitoring and Reporting	• Tool development • Effective monitoring of materials and resource efficiency • KPIs and reporting
Tools and Guidance	• Incorporate route map, BSI standard, asset design support, etc. • Consider design life and future proofing • Dynamic platform of regional CE responsibilities • Material and design guidance to capture CE • Amendments to standards / evolving legislation

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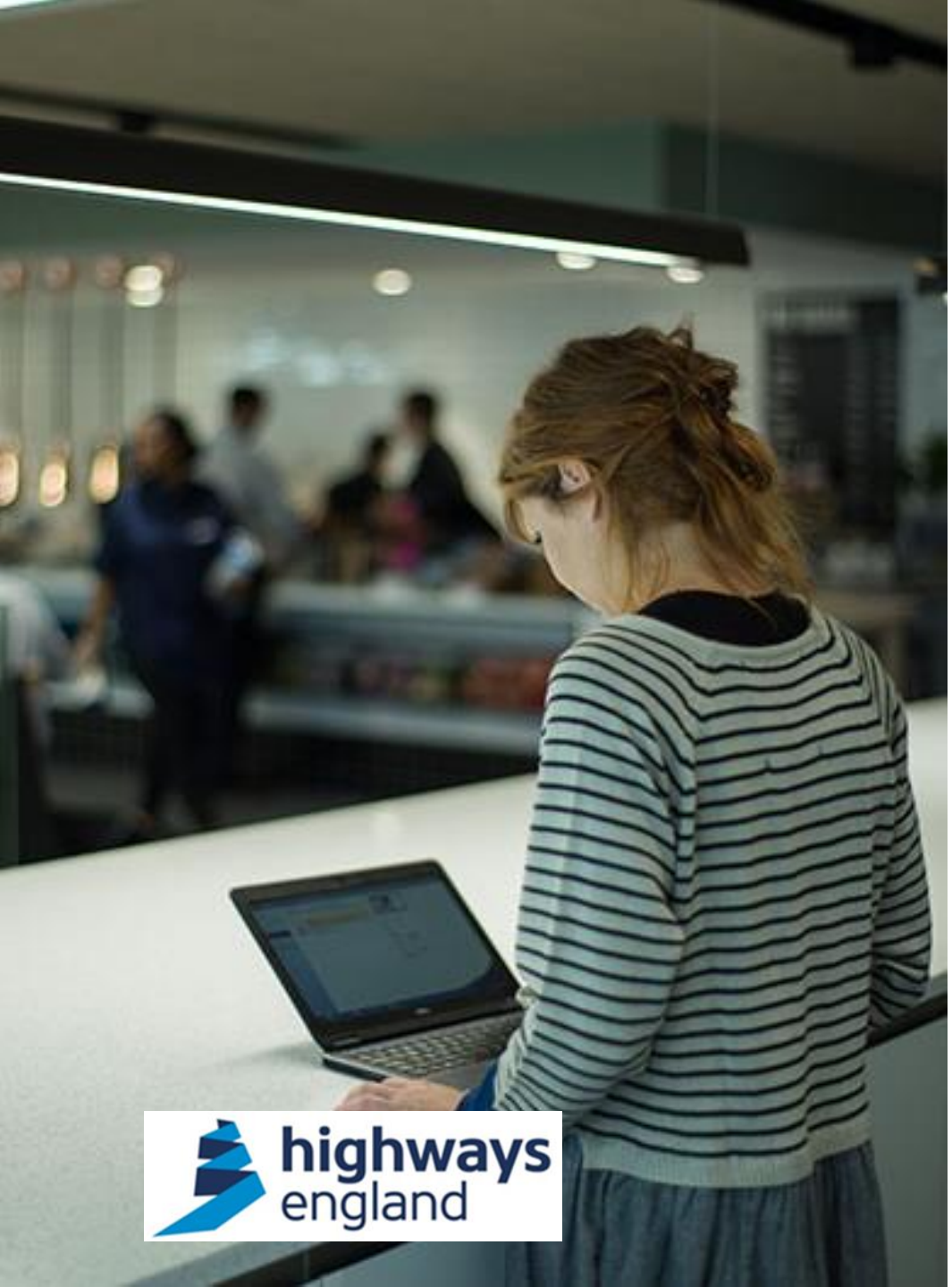

Highways England's approach to the circular economy

1. Minimising demand for primary resources and maximising the reuse of resources already in use on the network. Reutilising resources in as high a value applications as is possible.

2. Being innovative; working with suppliers to find new ways to deliver a more resilient and adaptable network – seeking efficiency and value for money.

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Highways England's approach to the circular economy

3. Working to achieve security of supply; working with others to improve the stability and predictability of demand for high performance products and services. Enabling suppliers to invest in innovative approaches and secure long-term partnerships with wider supply networks, their staff and wider communities;
4. Supporting the objectives of Biodiversity 2020, seeking to reverse biodiversity loss and, in the longer term, delivering biodiversity gains; and
5. Adoption of a natural capital approach to capture the value of the off road land holding.

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Pathfinder Projects

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The A14 Circular Economy Pathfinder Project

- **Re-generate**
  - Opportunities to generate and use renewable energy and materials
  - Opportunities to restore the heath of ecosystems
- **Share**
  - Prolonging the life of assets through consideration of durable design, opportunities for maintenance upgrades &retention of high material value through end of life reuse
  - Opportunities to work with other major infrastructure schemes to facilitate sharing of plant and reuse of resources such as excavated and secondary materials (e.g. MI-ROG)
  - Working with local skills agencies to help develop local capability & capacity.
- **Optimise**
  - Designing out waste and recording materials data via BIM to support future asset management
  - Improving resource management such as reducing waste through off-site manufacture and development of programme level resource management planning tools.
- **Loop**
  - Seek to achieve longer term resource reuse with maintenance of material value?
  - Improving resource management such as reducing waste through off-site manufacture and development of programme level resource management planning tools.
- **Virtualise**
  - Looking for opportunities to ‘dematerialise’ services, for example, removing the need for overhead gantries by transmitting information to in-car ‘set-top boxes’
- **Exchange**
  - Adoption of BIM will provide accurate, GIS linked knowledge of infrastructure composition and location, with the potential to reduce the demand for investigative excavations. BIM will improve resource management and maintenance across the road network.

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The A14 Circular Economy Pathfinder Project

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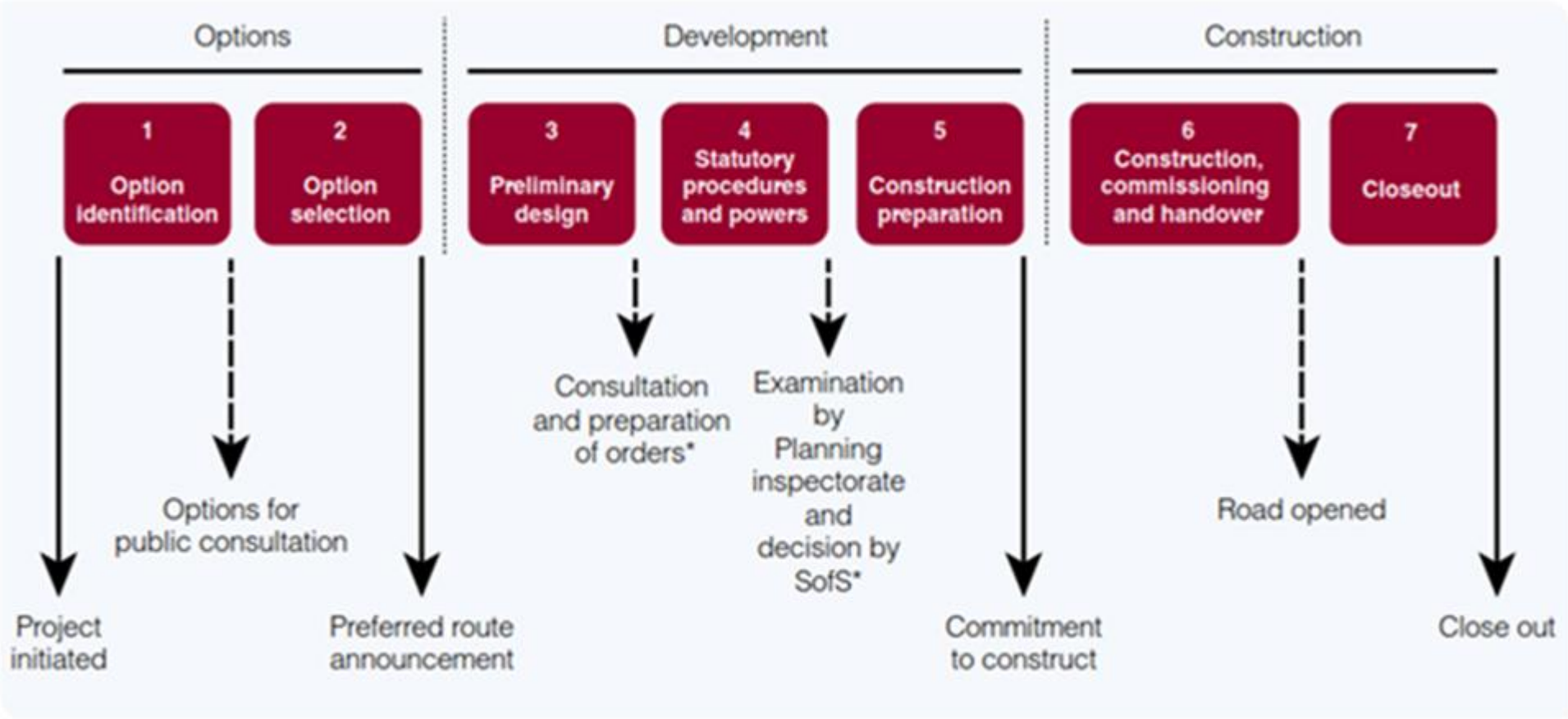
Circular Economy Pathfinder Projects



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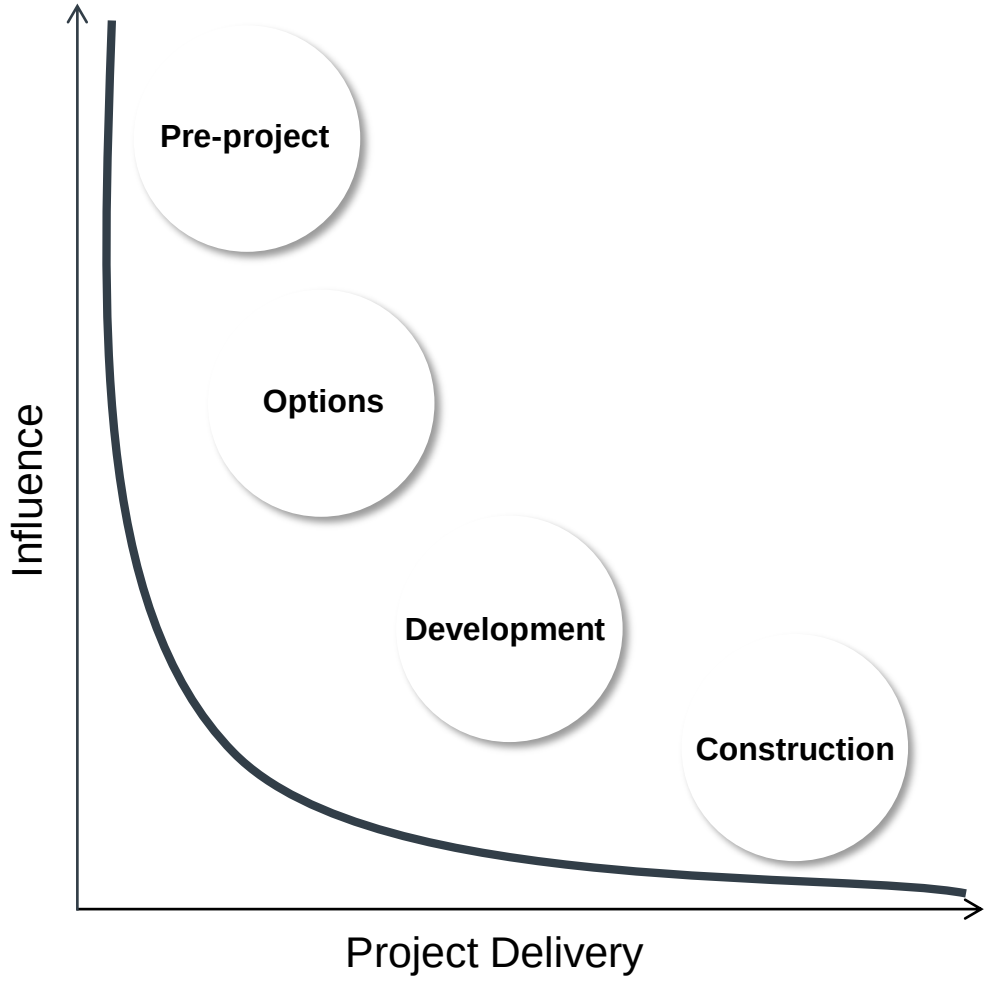
Identification of opportunities



Design plays a critical role in the shift to a circular economy by influencing the way we make, consume and dispose of products.

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Stonehenge – Amesbury to Berwick Down scheme

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Stonehenge – Amesbury to Berwick Down scheme

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Stonehenge – Amesbury to Berwick Down scheme

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Imagine it.
Delivered.