



MILESTONE
INFRASTRUCTURE

A part of MGroupServices



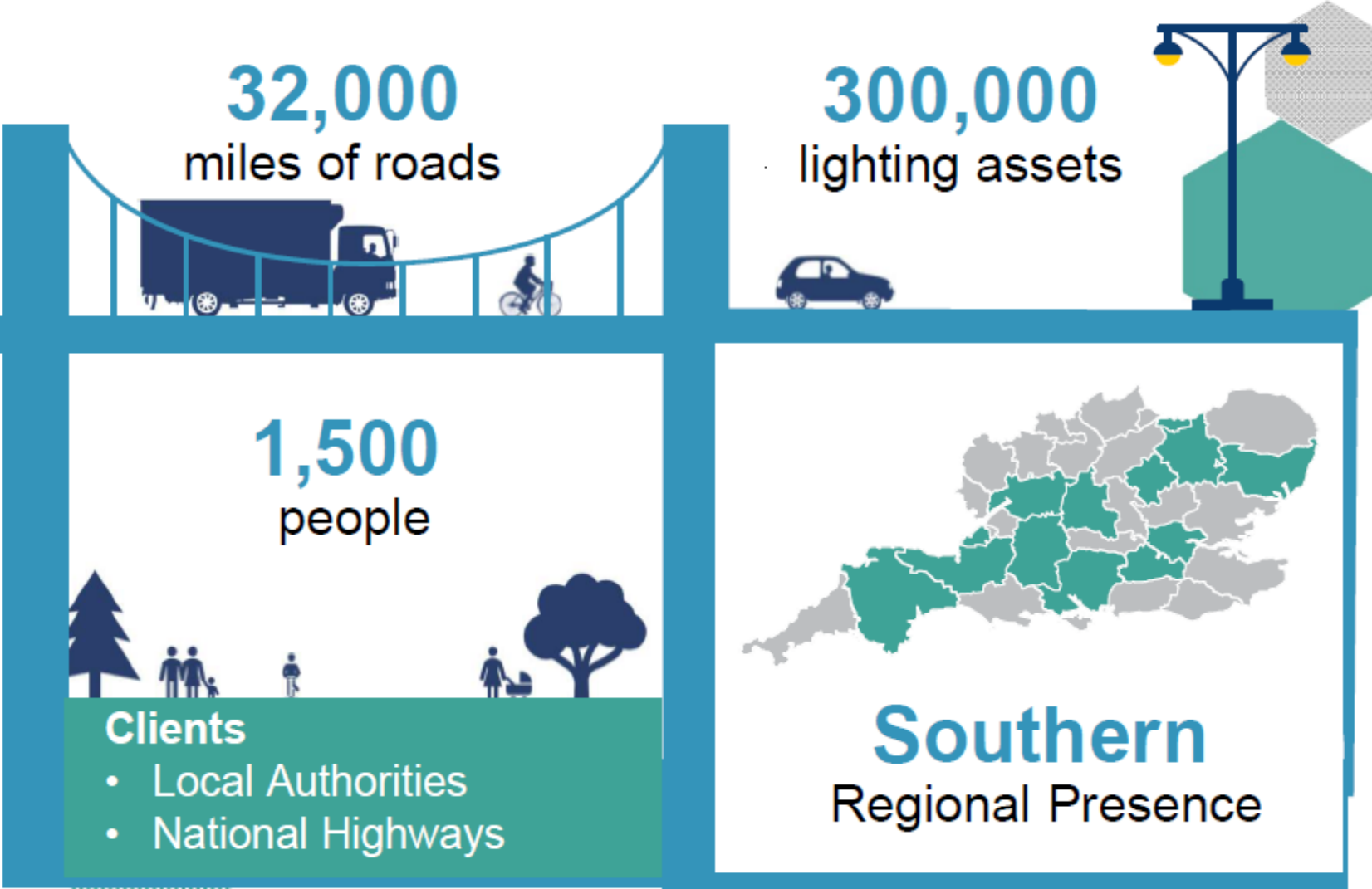
28 June 2023

PAS2080 Carbon
Management in
Buildings &
Infrastructure:

A Tier 1 Highways
Contractor
Perspective



Improve and Maintain Highways



Why PAS 2080?

- External recognition & benchmarked approach to carbon management
- Drives reduction in carbon & costs whilst promoting collaboration
- Environment Strategy 2025 deliverable
- Client requirements & tender / contractual commitments
- USP to support work winning
- Elevates Milestone & MGS ESG credentials



We become world's first roads organisation to achieve global carbon management standard



We will ask our contractors and their sub-contractors to implement their own PAS 2080 accredited carbon management systems by the end of 2025.

Active PAS2080 certifications via BSI (26/06/23):

AI-AGG-Head Office

Align Consortium JV

Anglian Water Services Limited

Balfour Beatty Vinci

Costain Group Plc - Maidenhead

COWI UK Limited

Ferrovial Agroman (UK) Ltd

Hitachi Rail STS S.p.A.

John F Hunt Ltd

John F Hunt Ltd

John F Hunt Ltd

Keltbray Group (Holdings) Ltd

Ove Arup & Partners International Ltd

Porr UK Ltd

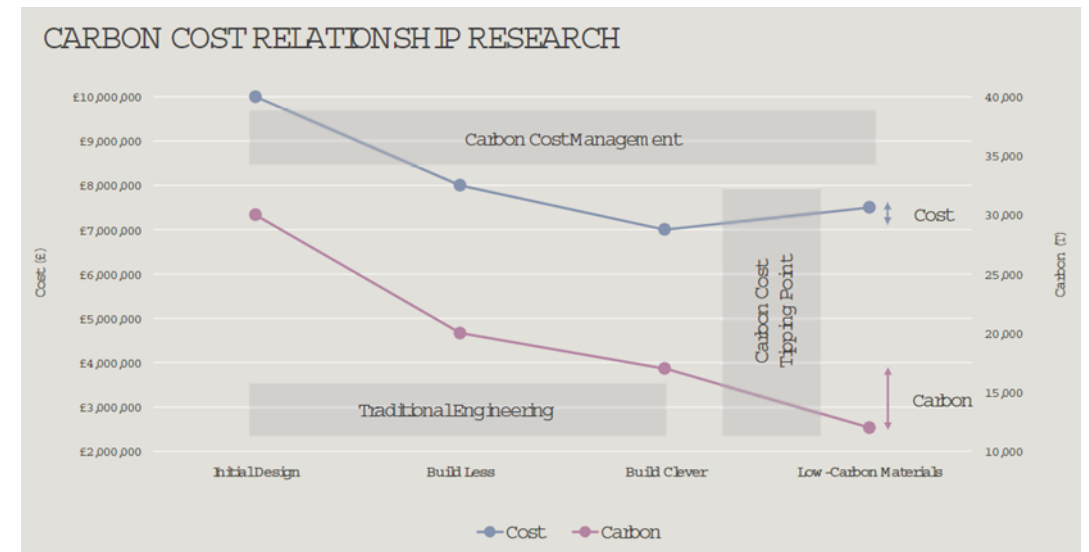
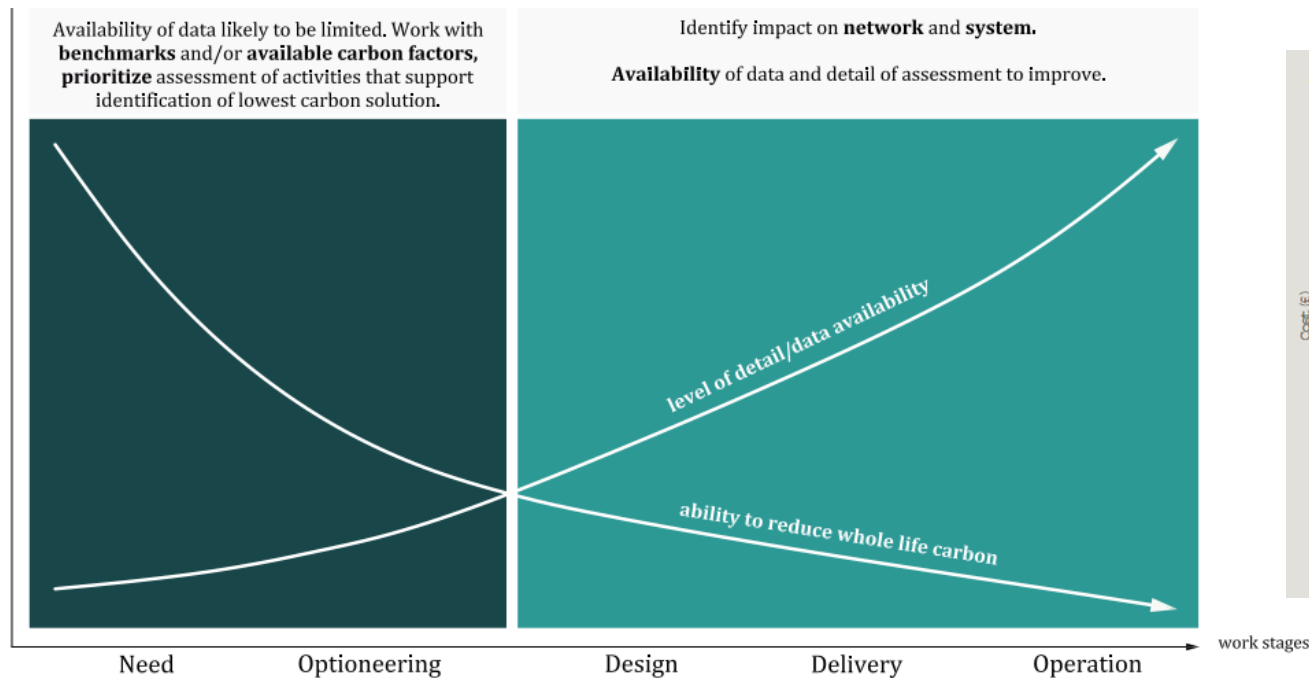
Ramboll UK Limited

Skanska UK Plc

Skanska Costain STRABAG JV

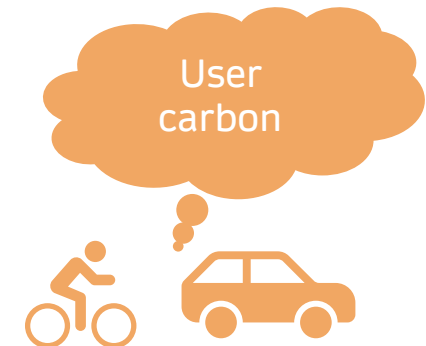
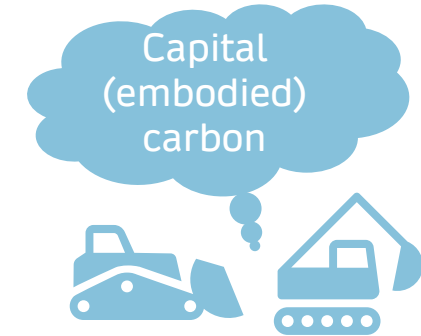
What is PAS 2080?

- Framework for whole life carbon management that can be applied by all parties with the primary objective of reducing carbon emissions in a manner that also reduces costs
- Focused on collaboration between ‘value chain members’ – asset owners/managers, designers, constructors, product/material suppliers – ensuring that carbon is embedded in decision making



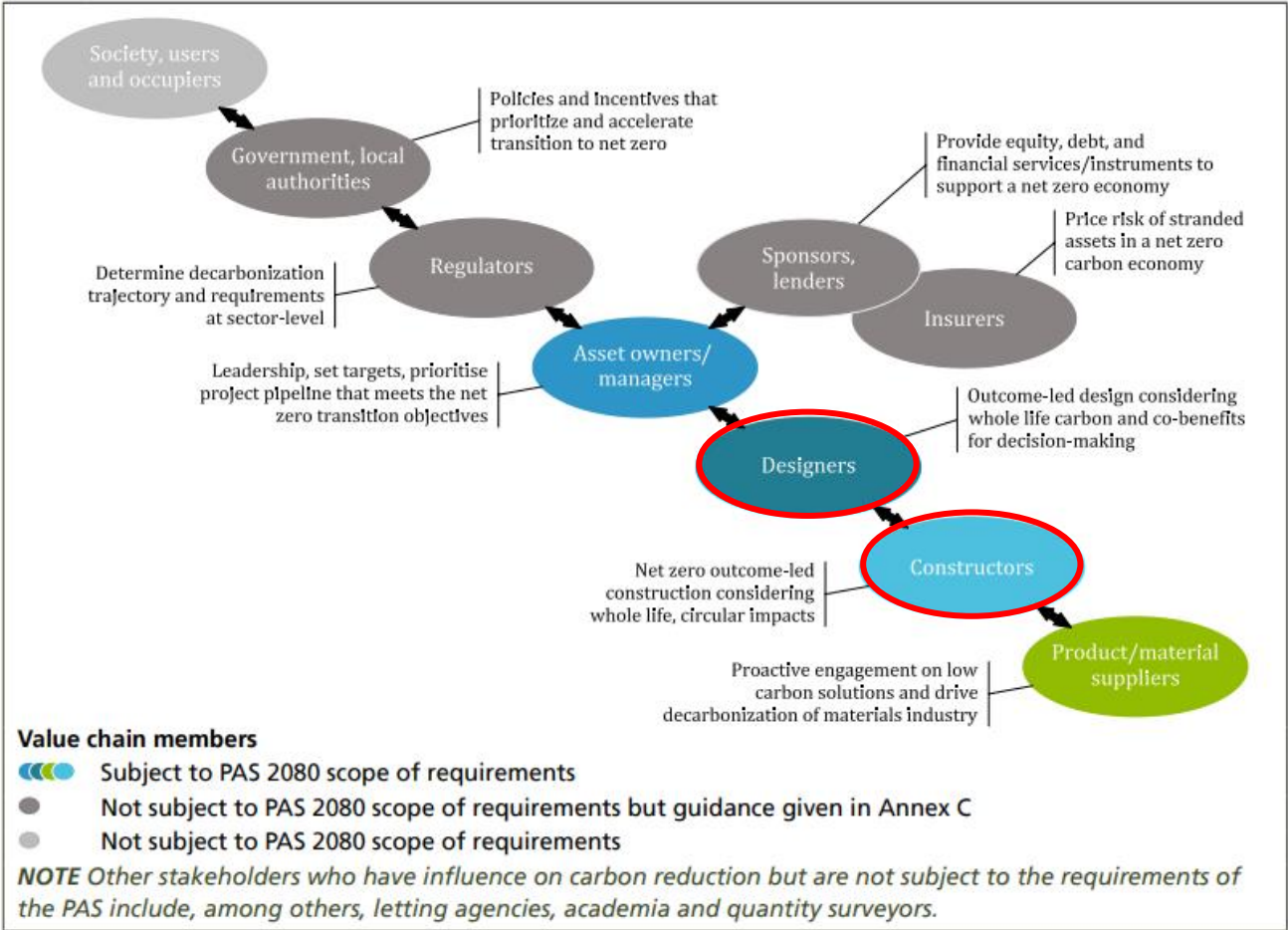
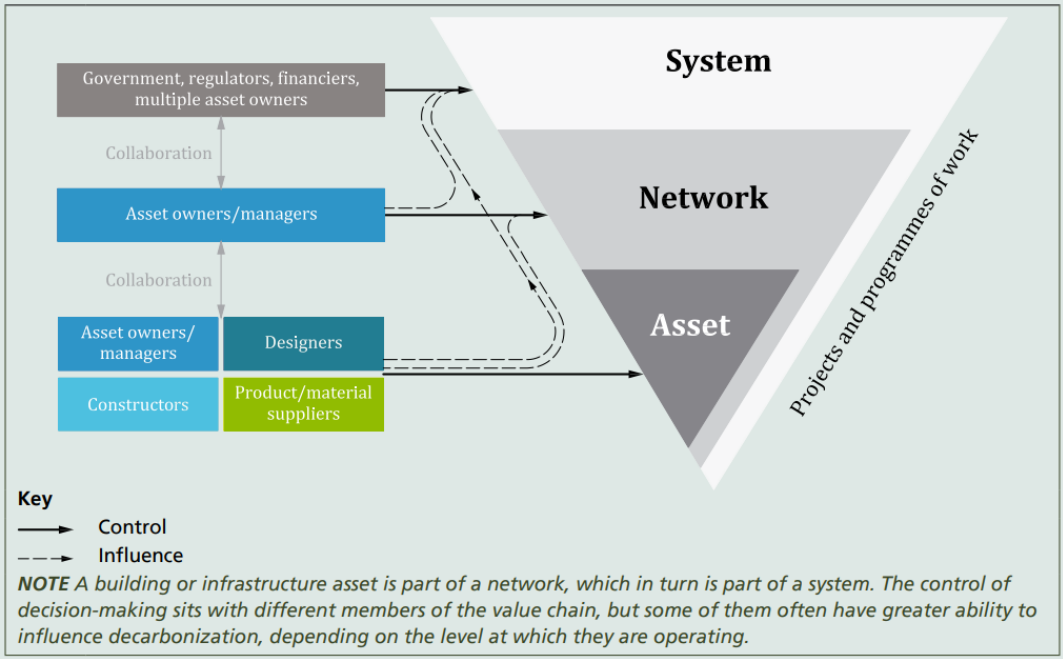
PAS 2080 Core Principles

1. Decarbonisation requirements at the **asset, network and system levels**
2. Alignment to the **net-zero transition**
3. Emphasis on **decisions and actions** that reduce whole-life carbon considering **'control' & 'influence'**, rather than looking at **capital (or embodied), operational or user carbon** in isolation
4. Interrelationships of **nature-based solutions, climate resilience interventions** and carbon emissions
5. **Procurement mechanisms** to accelerate decarbonisation
6. Strengthening value-chain relationships and ways of working to promote **collaboration**, challenge and innovation



PAS 2080 Scope

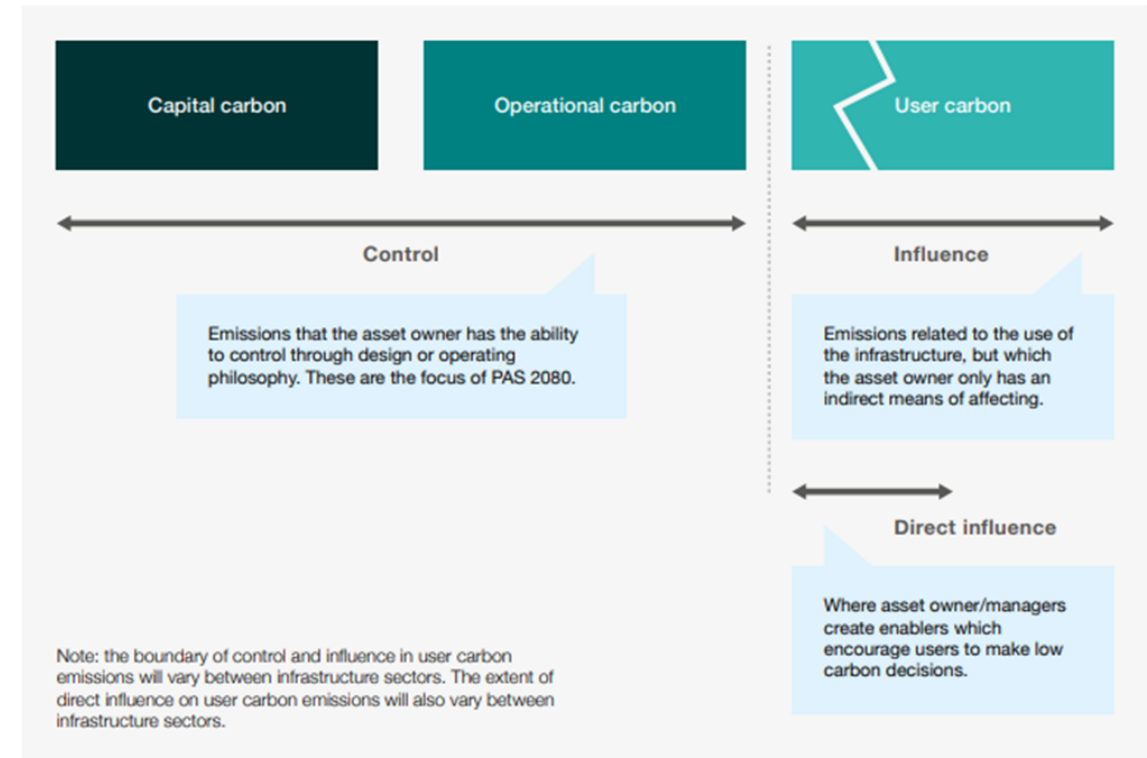
- Business-level assessment of how PAS 2080 standard requirements are embedded within existing management systems, business processes, and forward strategic plans.



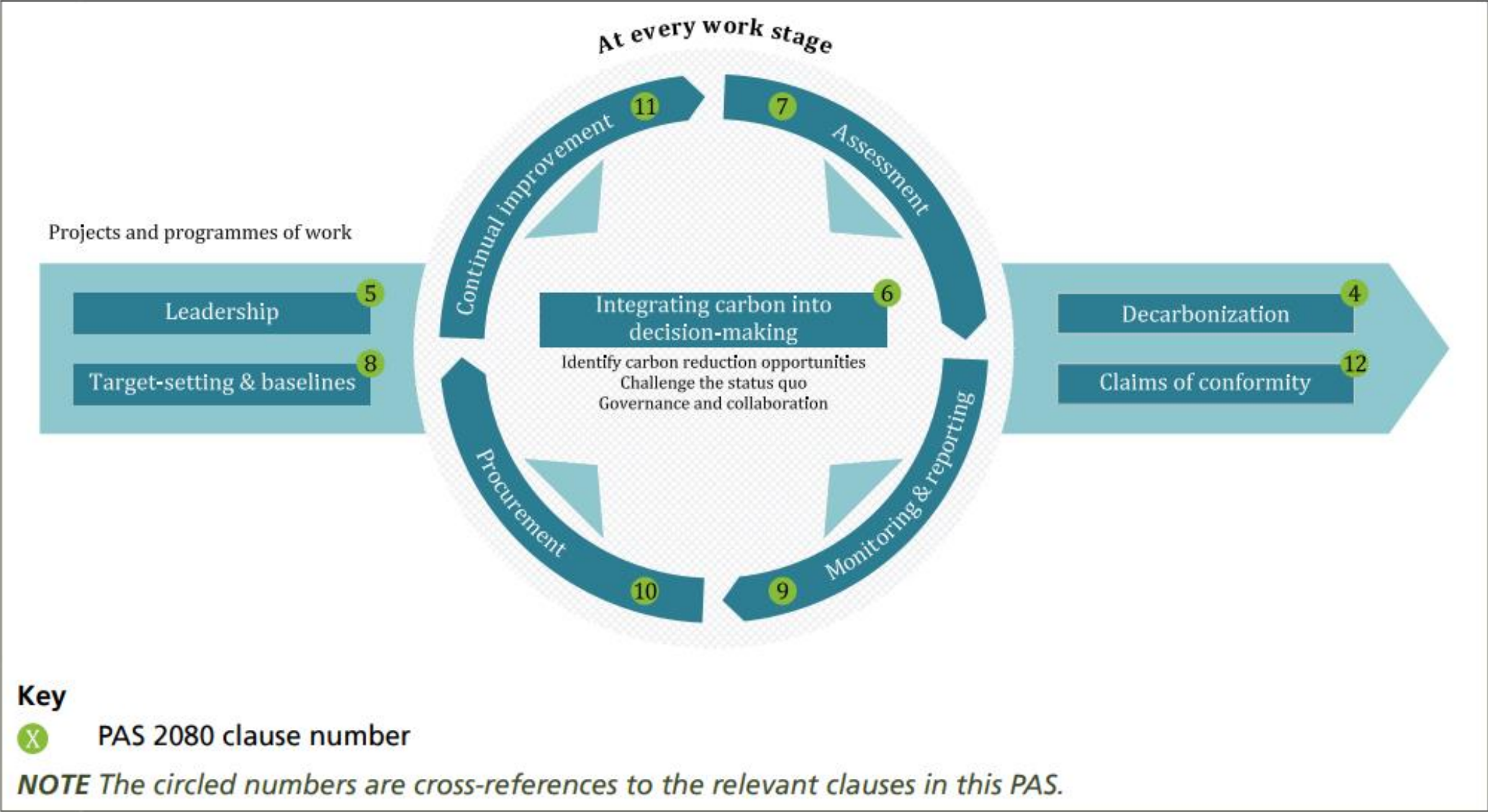
PAS 2080 Scope

- Focus on ‘capital’ and ‘operational’ carbon which is under control
- ‘User’ carbon must still be considered and influenced where possible
- Asset owner/manager generally retains most control – others have to demonstrate influence

	Asset Owner	Designer	Constructor
Capital Carbon	Specifying use of warm mix asphalt (control)	Providing technical input to retain existing assets (influence)	Using solar powered generators (control)
Operational Carbon	Specifying LED street lighting (control)	Optimising pavement design to reduce maintenance (influence)	Use of HVO fuel in fleet/plant (control)
User Carbon	Promoting active travel schemes (direct influence)	Designing scheme to reduce traffic congestion (influence)	Installing lighting studs to encourage active travel (influence)



Carbon Management Process



PAS 2080 Standard Document

5 Leadership

COMMENTARY ON CLAUSE 5

Leadership is recognized as a key enabler of carbon management. It provides the vision to drive carbon reductions across all levels of an organization and allows the right capabilities to exist across the value chain to plan for and drive decarbonization. Leadership is expected from all levels of the value chain in implementing the requirements in this clause.

5.1 Requirements for all value chain members

All value chain members shall:

- a) set an organizational policy and strategy for carbon management, with clear roles and responsibilities, and align commercial/business goals with this strategy/structure;

5.2 Asset owner/manager requirements

In addition to 5.1, asset owners/managers' leadership shall:

- a) clearly document and communicate the desired carbon management outcomes, roles, responsibilities and requirements (as per Clause 6 to Clause 11) to their value chain when delivering projects and/or programmes of work at the asset, network or system level;

5.3 Designer requirements

In addition to 5.1, designers' leadership shall:

- a) support asset owners/managers in identifying and implementing whole life carbon reduction opportunities in the control and influence (see Clause 4) of the asset owner/manager, including brokering collaborations with relevant stakeholders, where appropriate;

5.4 Constructor requirements

In addition to 5.1, constructors' leadership shall:

- a) promote early involvement in the delivery of projects and programmes, and put mechanisms in place to enable collaboration with asset owners/managers, designers and material/product suppliers;

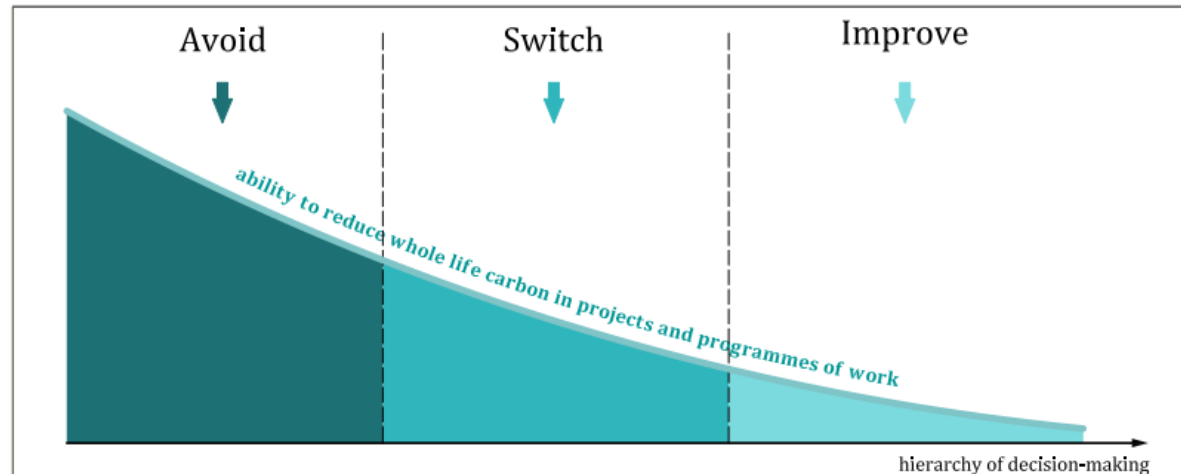
5.5 Product/material suppliers

In addition to 5.1, product/material suppliers' leadership shall:

- a) communicate and promote low-carbon solutions to all value chain members during early work stages;

All Value Chain Members

- Set an organizational policy and strategy for carbon management
- Have training programmes in place to fill gaps in knowledge and skills, communicate consistently on the importance of carbon management, & ensure adequate resource available
- Follow the carbon reduction hierarchy and share current good practice (internally and externally)
- Identify all activities that result in carbon emissions or removals under control or influence, including links to the wider network and system (i.e. other infrastructure assets)
- Prioritize nature-based solutions for reduced whole life carbon emissions and associated co-benefits



Asset Owner / Manager

- Clearly document and communicate the desired carbon management processes, outcomes, roles, responsibilities and requirements – ensure reviewed annually and improved as necessary
- Make decarbonization and alignment with net zero targets central to the scope and requirements of the project(s) and/or programme(s) of works
- Align in-house asset standards and guidance with the decarbonization principles
- Set out the objective and frequency of GHG emissions assessments and reporting during the delivery of projects and programmes, so that assessments sufficiently inform decision-making
- Review and incentivise performance against carbon reduction targets on par with performance against cost and programme
- Support appropriate risk allocation mechanisms that promote the inclusion of low whole life carbon solutions which might be novel and not proven previously

PAS 2080:2023

Carbon management in buildings and infrastructure



Designer

- Support asset owners/managers to set baselines, where requested by the asset owner/manager, by providing relevant activity data
- Comply with targets defined by the asset owner/manager for the project or programme of work and challenge targets where there is potential for improvement
- Identify carbon hotspots in the design of the project or programme of work, and report these to the asset owner/manager and other value chain members at regular intervals
- Support asset owners/managers in identifying and implementing whole life carbon reduction opportunities within their control and influence
- Demonstrate how they will meet the requirements of the asset owner's/manager's carbon management process



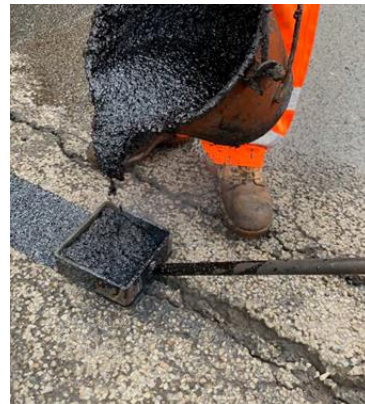
Constructor

- Promote early involvement and challenge their clients, designers and suppliers to provide low-carbon solutions
- Support supply chain partners that can demonstrate their own carbon reduction commitment
- Minimize use of resources (e.g. materials, water, energy), transport to site and construction waste, and maximize opportunities for reuse/recycling/recovery;
- Capture data and share knowledge on innovative construction techniques, materials and products
- Monitor and report carbon emissions in construction and, where appropriate, commissioning and decommissioning activities, during the relevant delivery stages
- Establish appropriate incentives and/or requirements for value chain members to deliver whole life carbon reduction



Product / Material Supplier

- Develop and deploy low-carbon solutions, technologies, materials, products and/or methods
- Put systems in place in their own organization to monitor and share carbon emissions of their own product/material carbon data so that such data is made available to other users
- Engage with other value chain members to share the latest low-carbon innovations
- Provide training to ensure appropriate skills and capability within their organizations in relation to GHG assessment, baselines, targets, low-carbon solutions and low-carbon procurement
- Support asset owners/managers to set baselines, where requested by the asset owner/manager, by providing relevant environmental impact information of the product or material



PAS 2080 – Milestone Progress

2021

- ✓ Carbon baseline (set in 2019) confirmed
- ✓ Milestone C-Est Carbon Tool developed
- ✓ Milestone Whole Life Cycle Cost-Carbon Calc Tool
- ✓ Net Zero Targets
- ✓ 2021-25 Env Strategy
- ✓ Carbon Reduction Plan (PPN 06/21)

2022

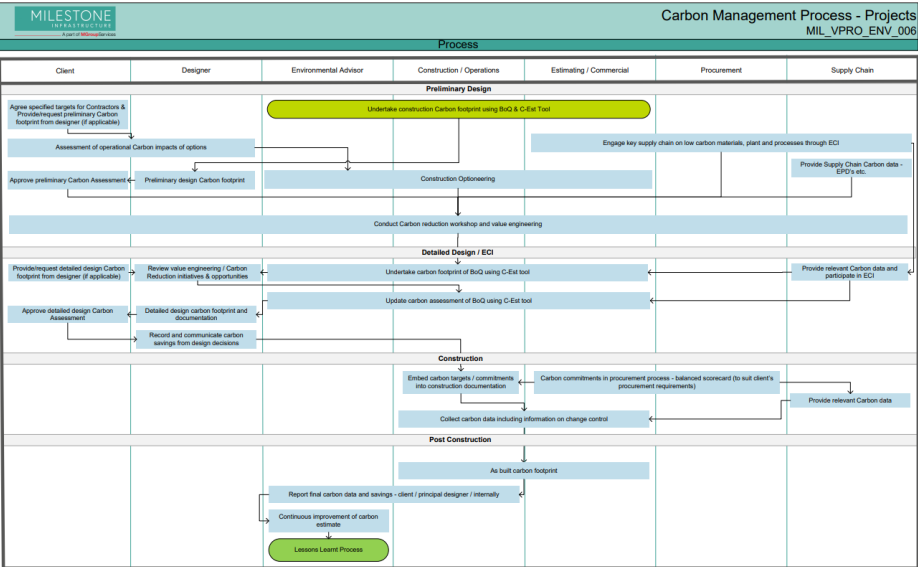
- ✓ Value chain engagement to refine carbon estimates
- ✓ Carbon Management incorporated into transport scheme funding business cases as per DfT guidance
- ✓ Shortlisted for 'Carbon Reduction Champion' and 'Low Carbon Project of the Year' in CN Awards
- ✓ Won Environment & Sustainability and Judges' Special Merit Awards for our collaborative carbon plan with HCC at Highways Awards
- ✓ Safer, Greener Highways Business Plan launched

2023

- ✓ Carbon Management Processes formalised
- ✓ PAS 2080 Workshop & core working group
- ✓ PAS 2080 Continuous Improvement Plan
- ✓ Carbon data accredited to ISO14064
- ✓ PAS 2080 Certification Audits

PAS 2080 in Practice

- Environment Policy, Environment Strategy 2025 & Carbon Reduction Plan (PPN 06/21)
- Carbon Management Processes – maintenance and construction
- Carbon Reduction Innovation Business Cases submitted to asset owners / managers
- Milestone C-Est Carbon Tool (Excel) – aligns with Specification for Highway Works
- Sustainable Procurement Policy and Supplier 360 Feedback incorporating carbon performance



Item	Bill description	Unit	Bill Quantity	Carbon Rate kg/unit	Carbon Total kg
1100/001	SERIES 1100- KERBS, FOOTWAYS AND PAVED AREAS Kerbs, Channels, Edgings, Combined Drainage and Kerb Blocks and Linear Drainage Channel Systems Precast concrete kerb Type BN, laid straight or curved exceeding 12 metres radius not exceeding 20m in length.	m	10	35.61	356.10

PAS 2080 in Practice

- Value Engineering Logs – embedding carbon alongside cost
- Carbon Workshops – involving all value chain members
- Mandatory training incorporating carbon
- Challenging asset manager / owner concrete specifications in standard details
- Supported asset manager / owner in securing >£3m of ADEPT Live Labs 2: ‘Decarbonising Local Roads in the UK’ funding

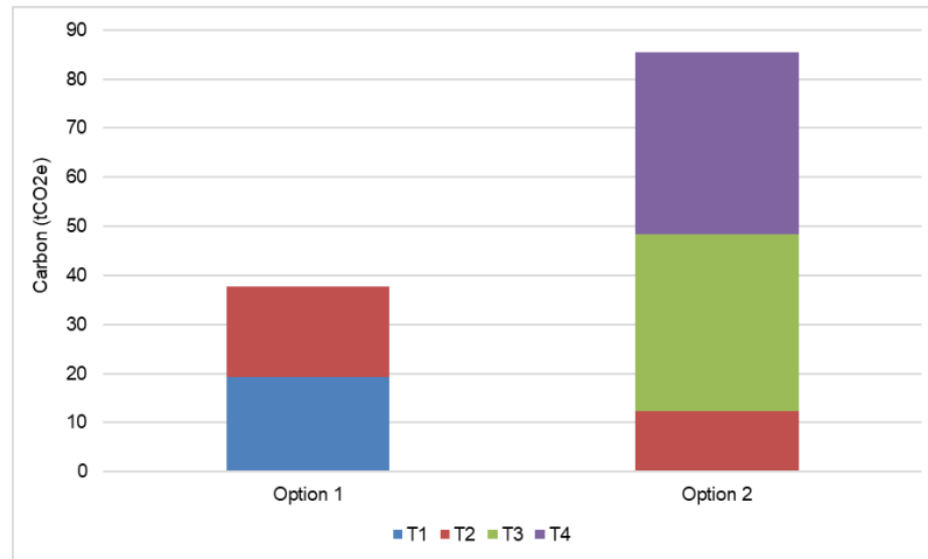


Description	Originator	Approximate Cost Saving	Carbon Saving	Carbon Calculation Notes
Whilst doing the value engineering exercise, the quantities needed remeasurement, and we've updated three items in the bill (700.04/700.09/700.11)	Milestone	£ 151,728.55	42.30	Based on BoQ, assumed this equates to: 850m ² additional warm mix AC 20 PMB Binder Course 200mm thick (170m ³) (+19tCO ₂ e) 1685m ³ reduction in Type 1 subbase (-54.6tCO ₂ e) 1728m ² reduction in cold milling 200mm thick (345.6m ³) (-6.7tCO ₂ e)

PAS 2080 in Practice

- Operational GHG emission calculations by Transport Planning to support optioneering
- Use of Milestone Whole Life Cycle Cost-Carbon Tool to support resurfacing design optioneering
- Biodiversity Net Gain assessments to promote nature-based solutions (e.g. AiDash trial) and shared benefits

Year	15-20 Y Design Life (700mm)			9 Y Design Life Reduced Depth (550mm)		
	Action	Direct Cost (£)	Carbon (tCO ₂ e)	Action	Direct Cost (£)	Carbon (tCO ₂ e)
0	T1		19.36	T3		18.04
1						
2						
3						
4						
5						
6						
7						
8						
9				T4		12.32
10						
11						
12						
13						
14						
15						
16	T2		6.16	T2		6.16
17						
18						
19						
20						
	Residual Life	8 years		Residual Life	0 year	
	20 year life cost	£0.00	25.52	20 year life cost	£0.00	36.52
	Total (£)	£0.00		Total (£)	£0.00	
21				T4		12.32
22						
23						
24						
25						
26						
27	T2		6.16	T2		6.16
28						
29						
30						
31				T4		12.32
32						
33						
34						
35						
36						
37	T2		6.16	T3		18.04
38						
39						
40						
	Residual Life	7 years		Residual Life	1 year	
	40 year life cost	£0.00	37.84	40 year life cost	£0.00	85.36
	Total (£)	£0.00		Total (£)	£0.00	

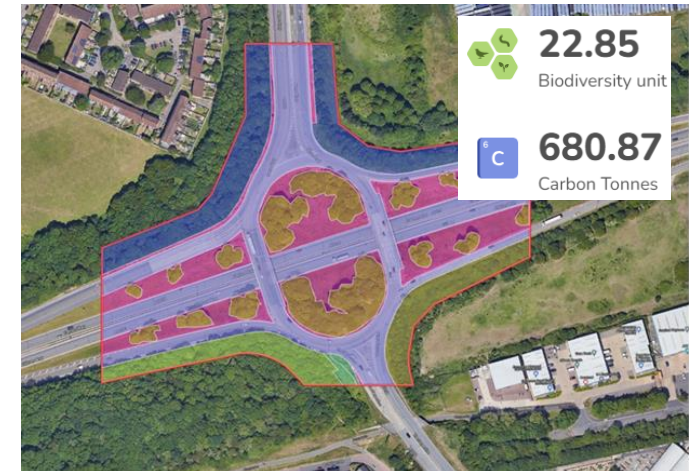


Option 1 (700mm depth reconstruction) – initial installation has a higher carbon output but...

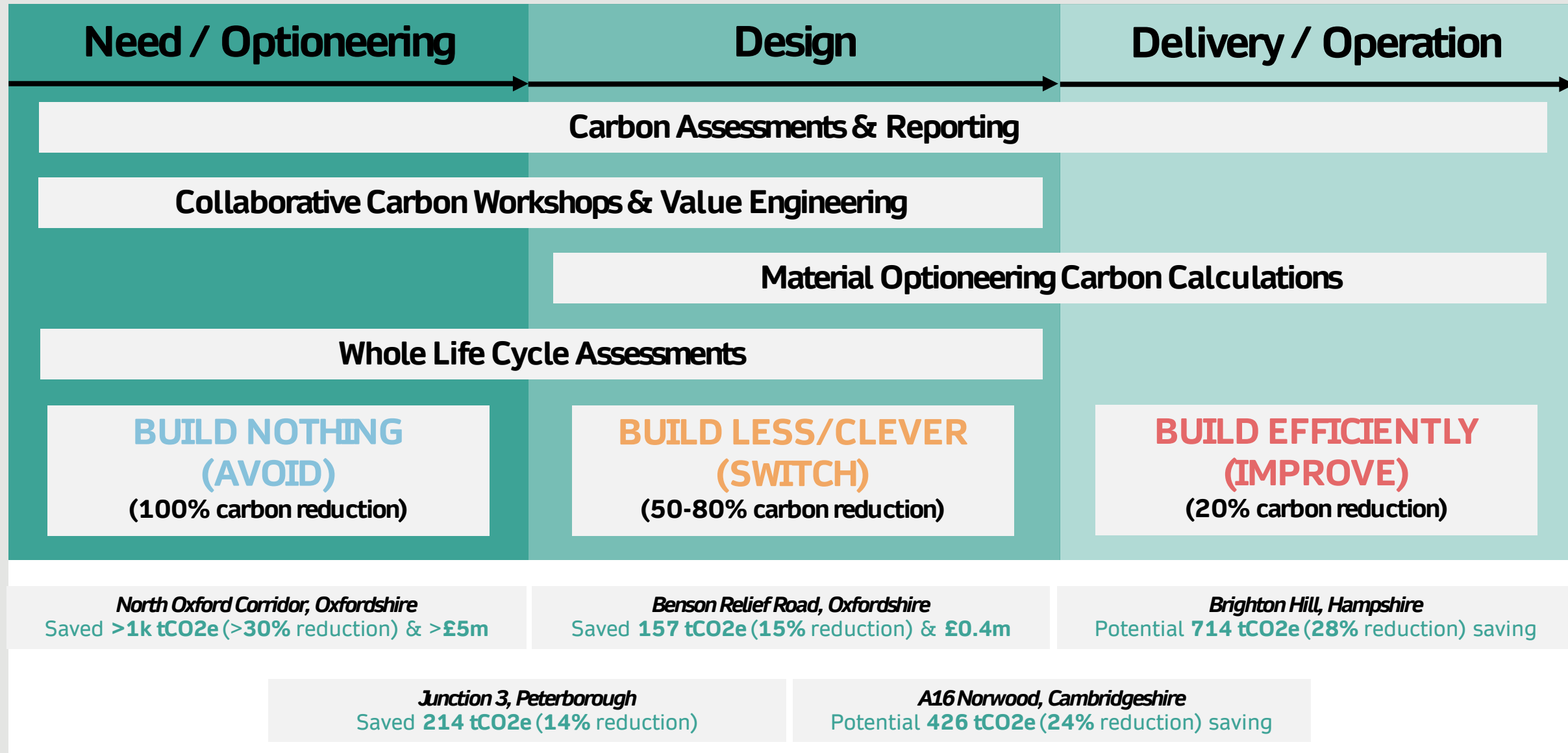
It generates 11tCO₂e / 47 tCO₂e savings over 20- and 40-year periods. 40-year cumulative saving = 19 direct flights from London to Sydney.

Table 3.8: Analysis of Monetised Costs and Benefits (Core – Full Package)

Value (£'000s) 2010 prices, benefits discounted to 2010	
Benefits	
Greenhouse Gases	1,193
Consumer Users (Commuting)	12,184

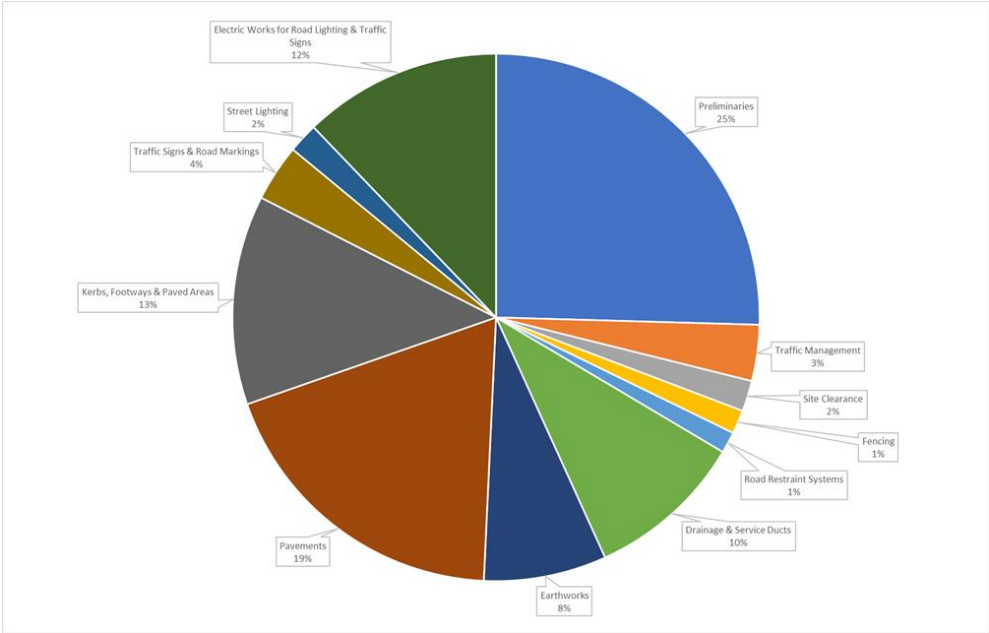
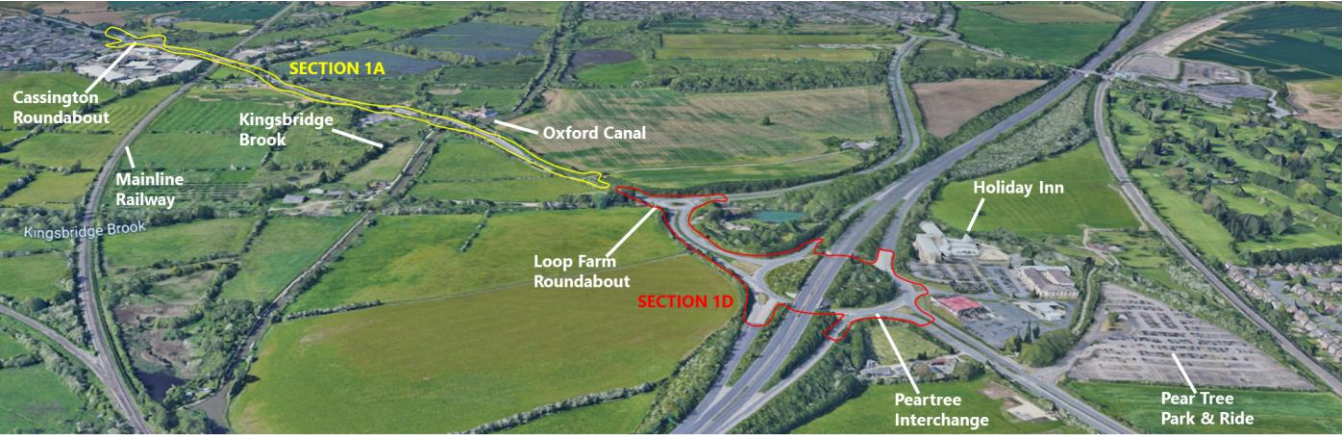


PAS 2080 in Practice



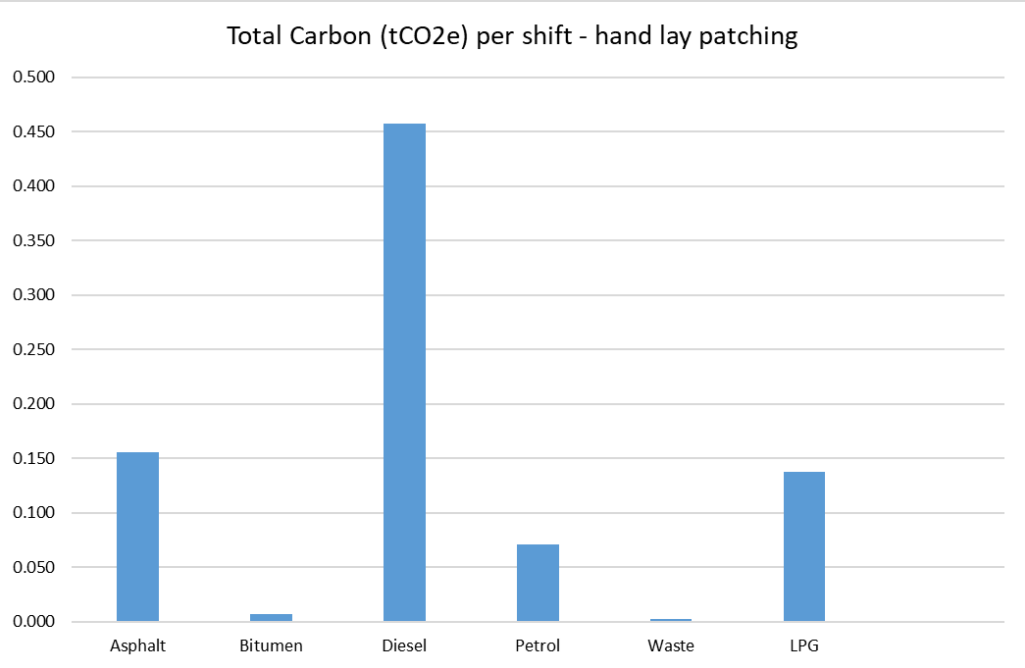
PAS 2080 in Practice

Leadership	Integrating Carbon into Decision-Making	Whole-Life Carbon Assessment	Target Setting & Baselines	Monitoring & Reporting	Procurement	Continual Improvement
Carbon Workshop – contract manager led, and all value chains represented	Carbon Reduction Commitments Log & carbon incorporated into progress meetings agenda	Carbon assessment completed using Milestone C-Est Tool & BoQ	Carbon targets shared with Asset owner / manager as part of workshop engagement	Value Engineering Log capturing carbon reductions alongside cost savings	Requirements for supply chain to confirm agreement on use of HVO fuel	Case study produced as part of award submissions



PAS 2080 in Practice

Leadership	Integrating Carbon into Decision-Making	Whole-Life Carbon Assessment	Target Setting & Baselines	Monitoring & Reporting	Procurement	Continual Improvement
Devon Highways Carbon Board participation and representation	Environment Performance Improvement Team (PIT) established	Data provisions to support calculation of specific baseline carbon factors for highways maintenance operations	Signed up to Devon Climate Declaration to align with asset owner / manager carbon reduction targets	Use of Client Carbon Reporting Tool to support GHG emission quantification and recording	Contract changes negotiated to incentivise and facilitate innovation relating to carbon reduction	Environment Performance Improvement Team (PIT) established with asset owner / manager attendance



Devon County Council | Carbon Reporting Submission Form

[Tasklist](#) > Work details

Work details

Please tell us how your works are defined. If you have multiple activity work types on your scheme, you can use the 'add' button to include them all.

Work Category	Work Type	Extent of work	Unit
Surface Treatments	Patching	20	Meter Sq

[+ Add](#)

Q & A

CHALLENGES

Carbon gets lost in amongst wider 'sustainability'

Carbon being accounted, not managed

Deemed strictly an 'environmental' issue

What does 'net zero' mean?

Regulation currently points to consideration of operational carbon only

Carbon not addressed until late in the process

SUCCESSSES

Meaningful support from leadership & clients

Carbon 'elevated' and assessed alongside cost

Carbon embedded in design meetings

Design request carbon feedback on decisions

Carbon as a differentiating factor in procurement

Spreading awareness & encouraging industry innovation