Department for Transport

ADEPT LIVELABS2 Decarbonising Local Roads

A382 and Jetty Marsh Link Road

ADEPT Regional Workshop
September 2026



M GROUP Highways

Devon County Council

University of Exeter

Overview

- Project overview
- What did we change?
- How did we make those changes happen?
- Why does this matter for future highway projects?
- Q&A

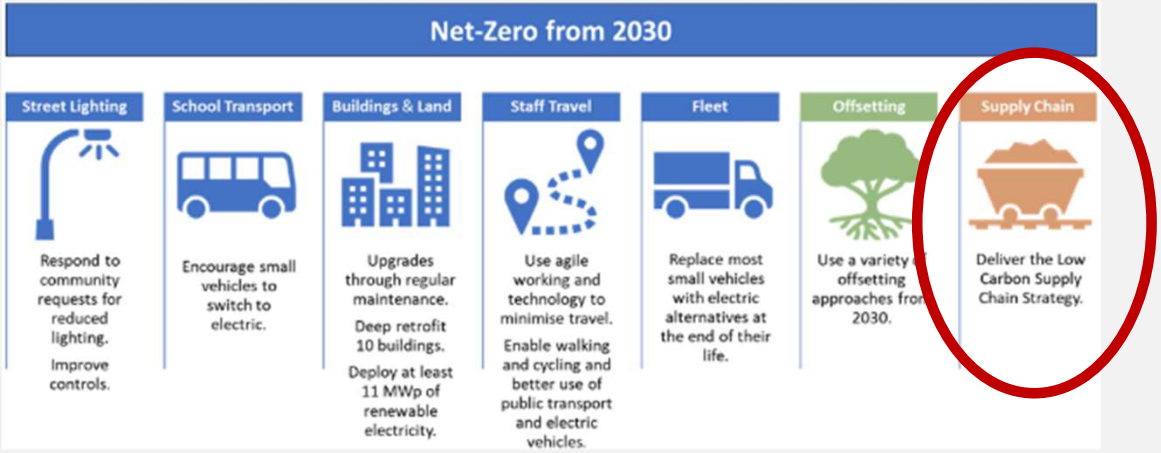






Background in Devon

- In February 2019 DCC declared a climate emergency
- DCC formed the Devon Climate Emergency partnership
- Declaration required parties to review plans to reduce organisational carbon emissions



Strategic approach

Background in Devon

- Across the Climate Change, Environment and Transport directorate, different areas working together to determine how to measure carbon

- Work with **Exeter University** started in 2020 to populate baselines. Lead to formulating standardised way for baselines (per unit/per activity) so that it can be multiplied up

- *This covered highway maintenance works with repeatable activities, also used for capital and larger schemes*

Project overview

Background in Devon

- DCC created a **Carbon Reduction Group** with governance so that policy was acted upon. This involved the right people sitting down to react to what was being shown in the data

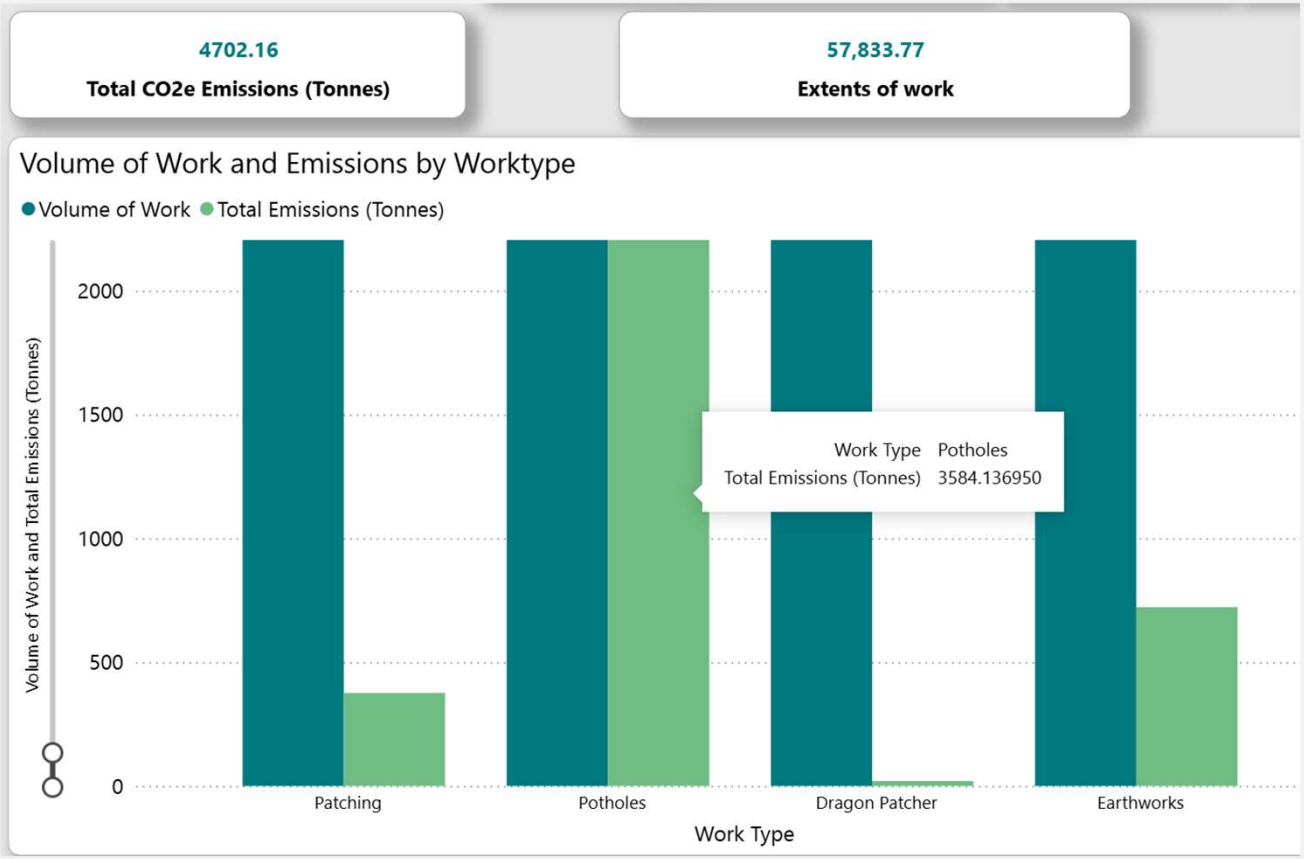
- Development of a **reporting system**. Focus on real time reporting system (no lag in data), with high volumes of data received so we could be reactive and change

- Created a highways specific **decarbonisation plan** which is data led from live data



Project overview

Background in Devon



Project overview

What is the A382 improvement scheme?



What did we change?

What did we change?

Challenging what we needed to build

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QUESTION	QUESTION	QUESTION	QUESTION	QUESTION	QUESTION
Do we need a 10-metre-wide carriageway?	Do we need kerbs along every section?	Do we need a pedestrian bridge?	Do we need a concrete bat culvert?	Do we need the same extent of earthworks and vehicle restraints?	Can existing infrastructure or materials be reused?
Carriageway width reduced to 8.3 metres	Unnecessary kerbing removed	Proposed pedestrian bridge replaced by an at-level crossing	Concrete bat culvert replaced by a bat hop-over	Vertical alignment altered	Former road alignment reused for the shared-use path
CHANGED	CHANGED	CHANGED	CHANGED	CHANGED	CHANGED

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What did we change?

Replacing concrete wing walls with soil-filled bagwork

- Conventional concrete and steel wingwall construction was replaced with Flex MSE bagwork.
- Over 200 tonnes reinforced concrete removed from design.
- The solution mitigates the potential for differential settlement between the culverts and wingwalls.
- The permeable system allows water and plant roots to pass through.



What did we change?

Avoid disposal by finding a productive use

Excavated material

- Retained through the golf-course bund instead of being taken away for disposal.

Existing pavement

- Incorporated into the new pavement construction, reducing disposal and demand for new materials.

Site-won timber

- Processed and returned as useful construction products.





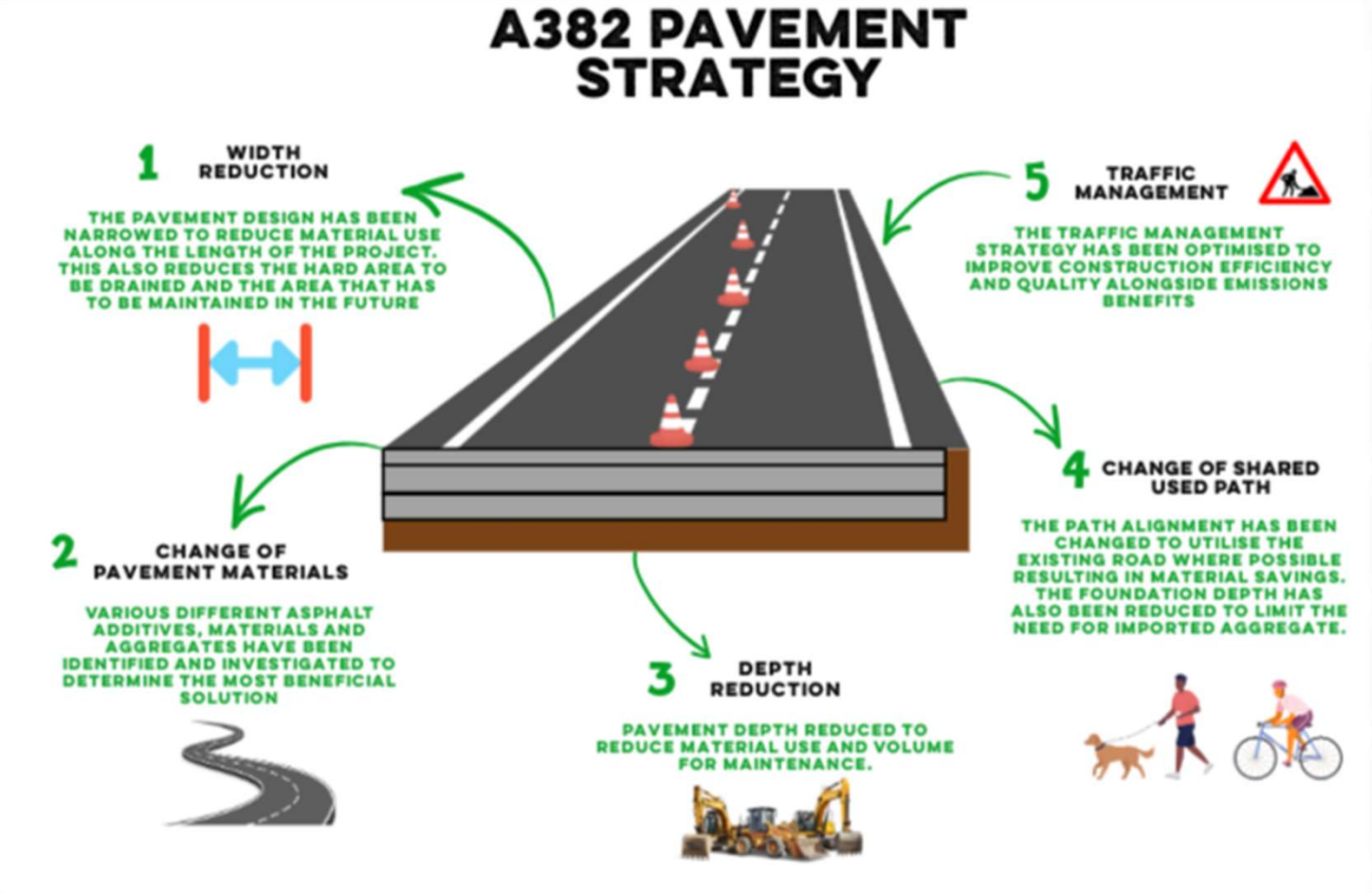
What did we change?

Golf bund



What did we change?

Pavement strategy



What did we change?

Do all the trees need to be removed?

Business as usual

Vegetation within the construction footprint would normally be cleared, with replacement planting subsequently used to address the loss.

Changed approach

The project considered whether suitable trees could be retained and translocated rather than removed and replaced.



On-site nursery

2,000 + suitable trees were moved into a dedicated nursery so that established stock could remain part of the project and be reused.

What did we change?

Using every part of the natural resource

- Retain and translocate suitable trees
- Process suitable timber locally
- Return timber as construction products
- Use residual biomass for biochar
- Use vegetation and soil strategies to support future sequestration



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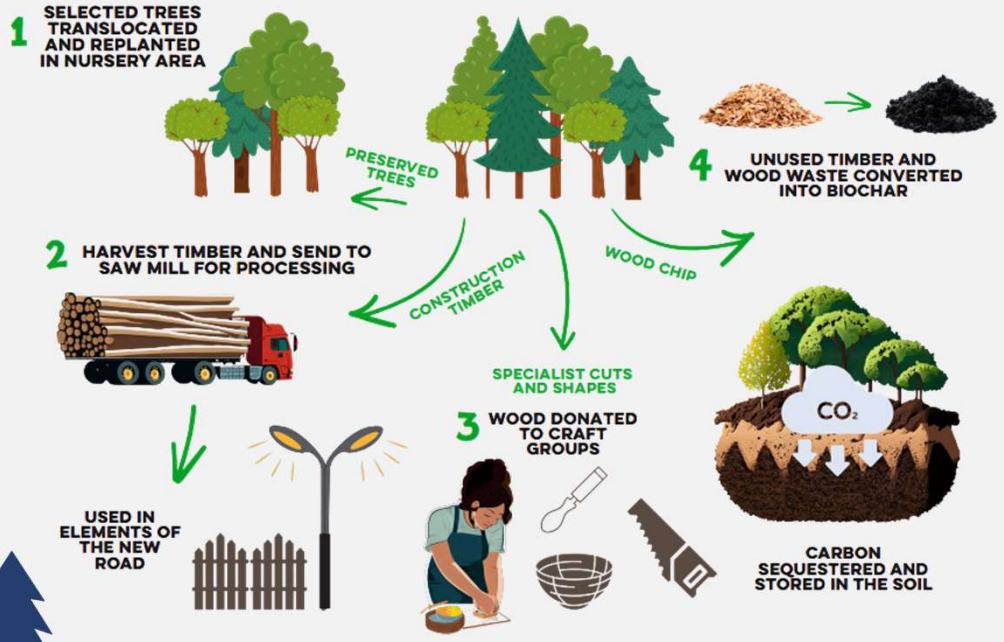
What did we change?

Vegetation and soil strategies

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A382 VEGETATION CLEARANCE STRATEGY



A382 SOILS STRATEGY

A RESEARCH BASED APPROACH TO MONITORING SOIL HEALTH AND CARBON THROUGHOUT CONSTRUCTION AND MAINTENANCE



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What did we change?

Rethinking project delivery

- Business as usual: staged construction under temporary traffic signals
- Changed approach: full closure of the route using dynamic diversion
- Overall programme reduced by one year
- Reduced repeated activities and temporary arrangements
- Construction-stage carbon benefit still to be quantified



What did we change?

Design out the need before changing the product

Volumetric concrete production

- Electric volumetric mixer was considered for producing concrete on demand for the scheme
- Earlier design decisions significantly reduced the amount of concrete required, meaning the remaining quantities did not justify the intervention



Alternative to bat culvert

- Original design 2 m high bat culvert beneath the road
- Road included large gas mains, water and fibre-optics. Difficult construction with unknown benefits for wildlife and long-tern maintenance liability.
- Instead used translocated vegetation to form a hop-over feature which aligns with current flight paths

How did we make those changes happen?

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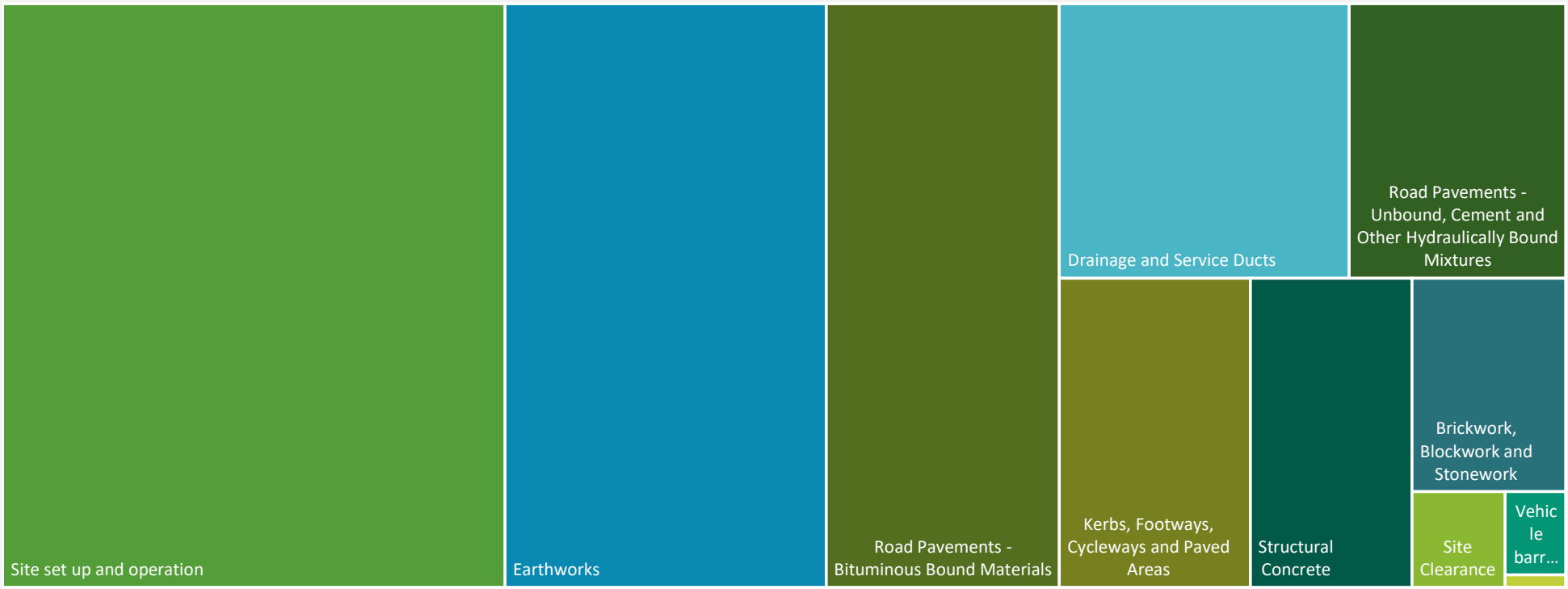
Changing the commercial approach

- Carbon requirements in ECI procurement
- ECI before design decisions hardened
- Shared carbon expectations
- Delivery input into design and method



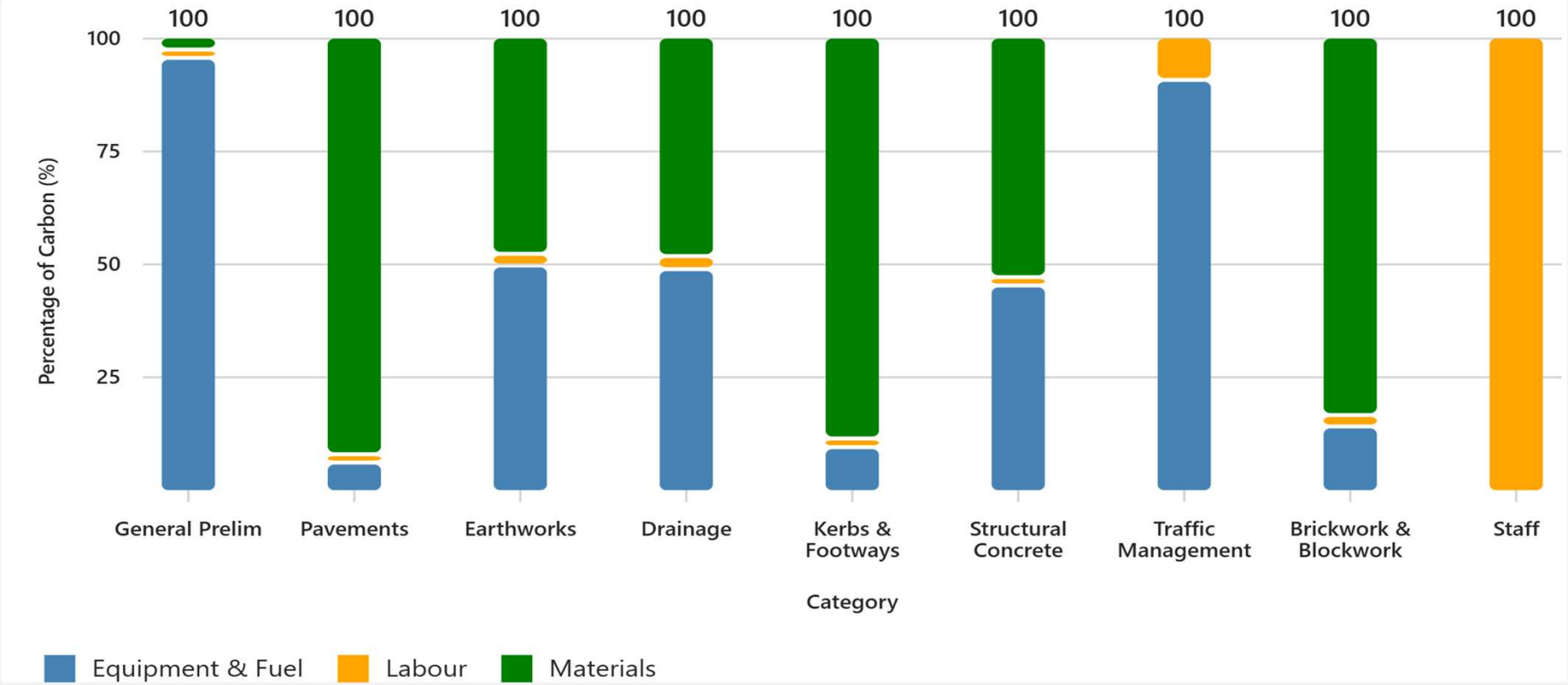
How did we make those changes happen?

Carbon calculation



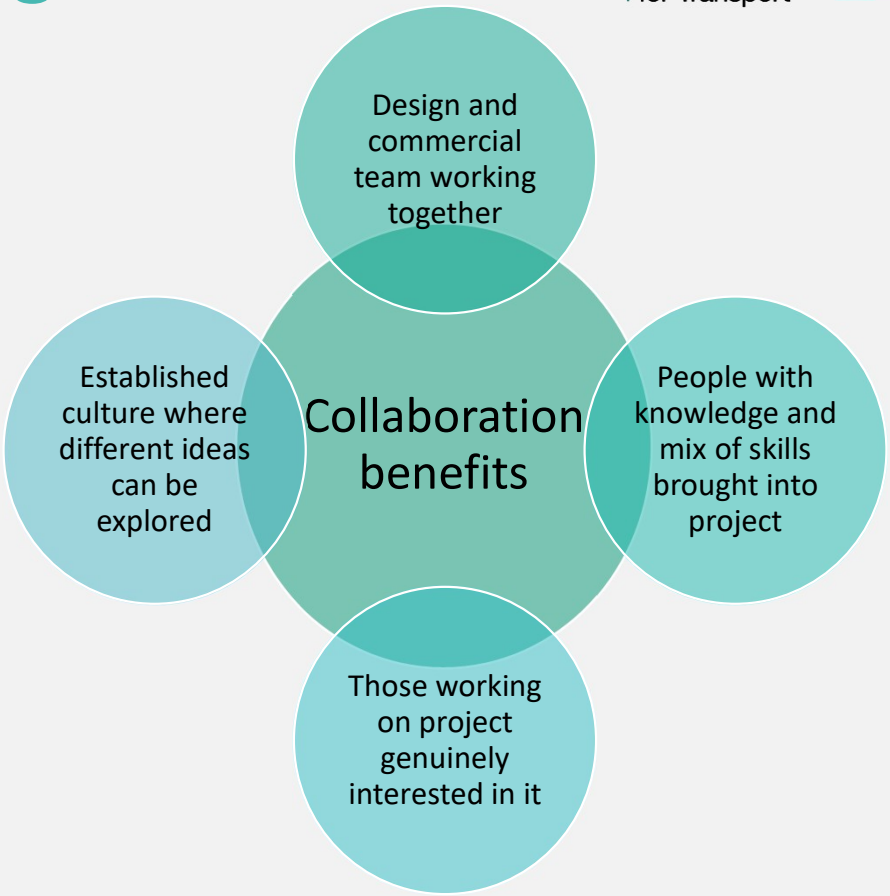
How did we make those changes happen?

Establishing the carbon baseline and hotspots



How did we make those changes happen?

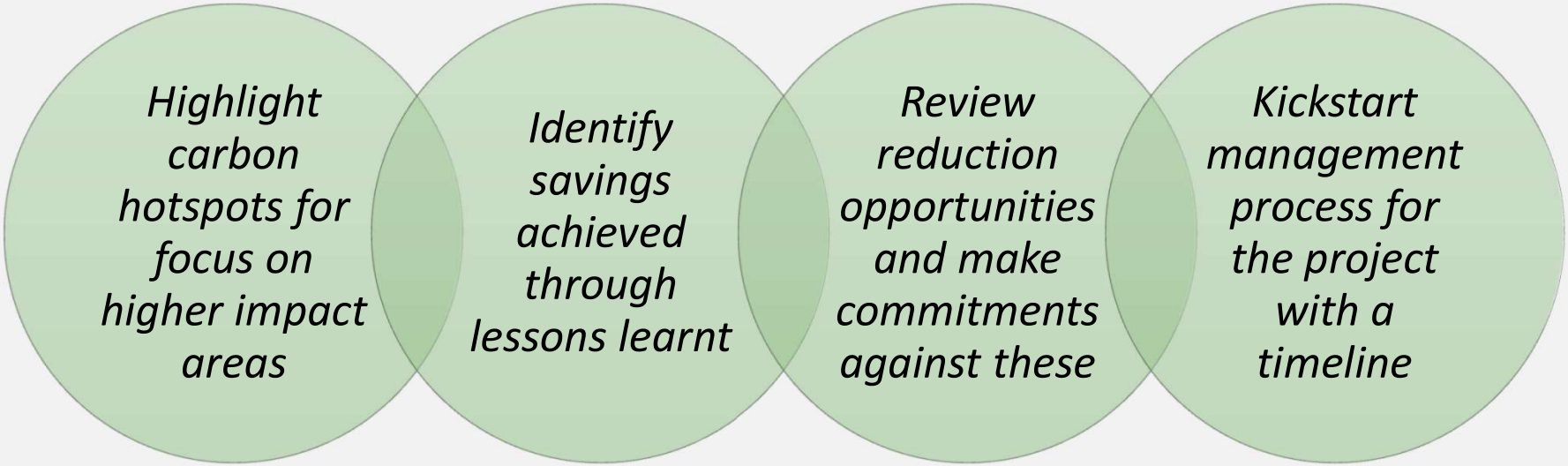
Creating the right team culture



How did we make those changes happen?

Turning ECI into project decisions

- Early contractor engagement and tender including emphasis on carbon reduction
- Carbon workshop held aiming to:



Why does this matter for future highway projects?

Why does this matter for future highway projects?

Why change the way local roads are delivered?

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THE CHALLENGE



THE OPPORTUNITY



THE AMBITION

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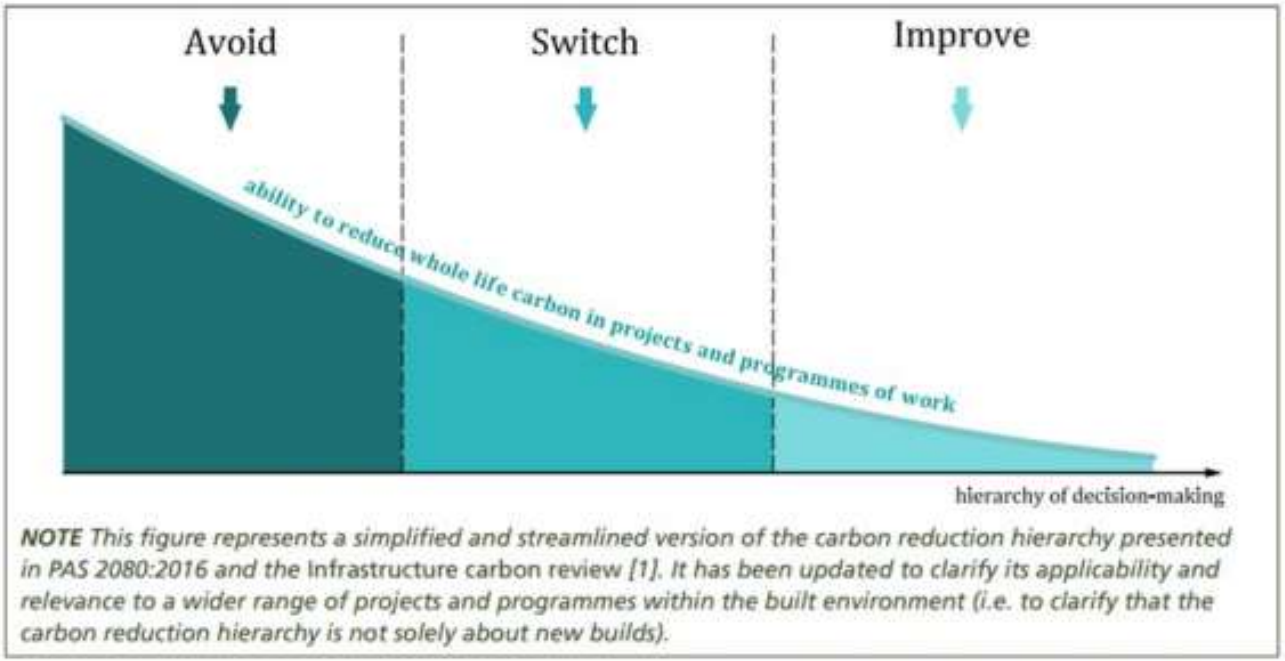
Why does this matter for future highway projects?

Why early decisions matter

Avoid – avoid constructing a new asset or element through re-use/retrofitting/repurposing.

Switch – adopting low(er) carbon materials and methods of working.

Improve – use solutions which extend design life and promote end of life reuse/recycling.



NOTE *This figure represents a simplified and streamlined version of the carbon reduction hierarchy presented in PAS 2080:2016 and the* Infrastructure carbon review *[1]. It has been updated to clarify its applicability and relevance to a wider range of projects and programmes within the built environment (i.e. to clarify that the carbon reduction hierarchy is not solely about new builds).*

Why challenge business as usual?

- Challenge the **need** for the asset
- Challenge the **scale** of the solution
- Challenge the **material and method**
- Challenge the **delivery assumptions**
- Confirm that safety and performance remain protected

Why design out need before changing the product?

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- **Avoid** the asset or activity where possible
- **Reduce** its scale or quantity
- **Reuse** existing resources
- **Switch** to a lower-carbon material or method
- **Optimise** what remains



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Why retain existing resources?

Conventional approach

Excavated materials and natural resources can be treated primarily as clearance or disposal issues.

Resource-led approach

Test whether an existing resource can be retained, reused, improved or repurposed before specifying a replacement.

Benefits to consider

- Avoided disposal
- Reduced replacement demand
- Fewer material movements
- Retention of established natural assets
- Potential cost and environmental benefits

Why carbon can deliver wider value

Carbon
Avoided construction, reduced quantities, retained materials and lower-carbon solutions.



Cost and programme
Reduced disposal requirements, potential disposal-cost reductions and a shorter delivery programme.



Environment
Retention of natural assets, opportunities for habitat creation, permeable structures and reduced demand for replacement resources.



Whole-life value
Fewer assets can mean less material to inspect, maintain, repair and replace



What future highway projects can apply

1. **Set carbon outcomes at project inception**
   Carbon must be considered while meaningful design choices remain open.
2. **Build the baseline early**
   Identify where the largest material, plant and delivery impacts sit.
3. **Bring delivery expertise in before the design is fixed**
   Use procurement and ECI to create a project partnership.
4. **Challenge requirement before selecting products**
   Avoid, reduce and reuse before moving to substitution.
5. **Record what was adopted, trialled and not progressed**
   The reasons for rejecting an innovation can be as transferable as the reasons for implementing one.



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Thank you for listening

Any comments or questions?

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