NET ZERO ROADS
WESSEX LIVE LAB

www.adeptnet.org.uk/livelabs2

www.linkedin.com/company/net-zero-roads-wessex-live-lab

Department for Transport

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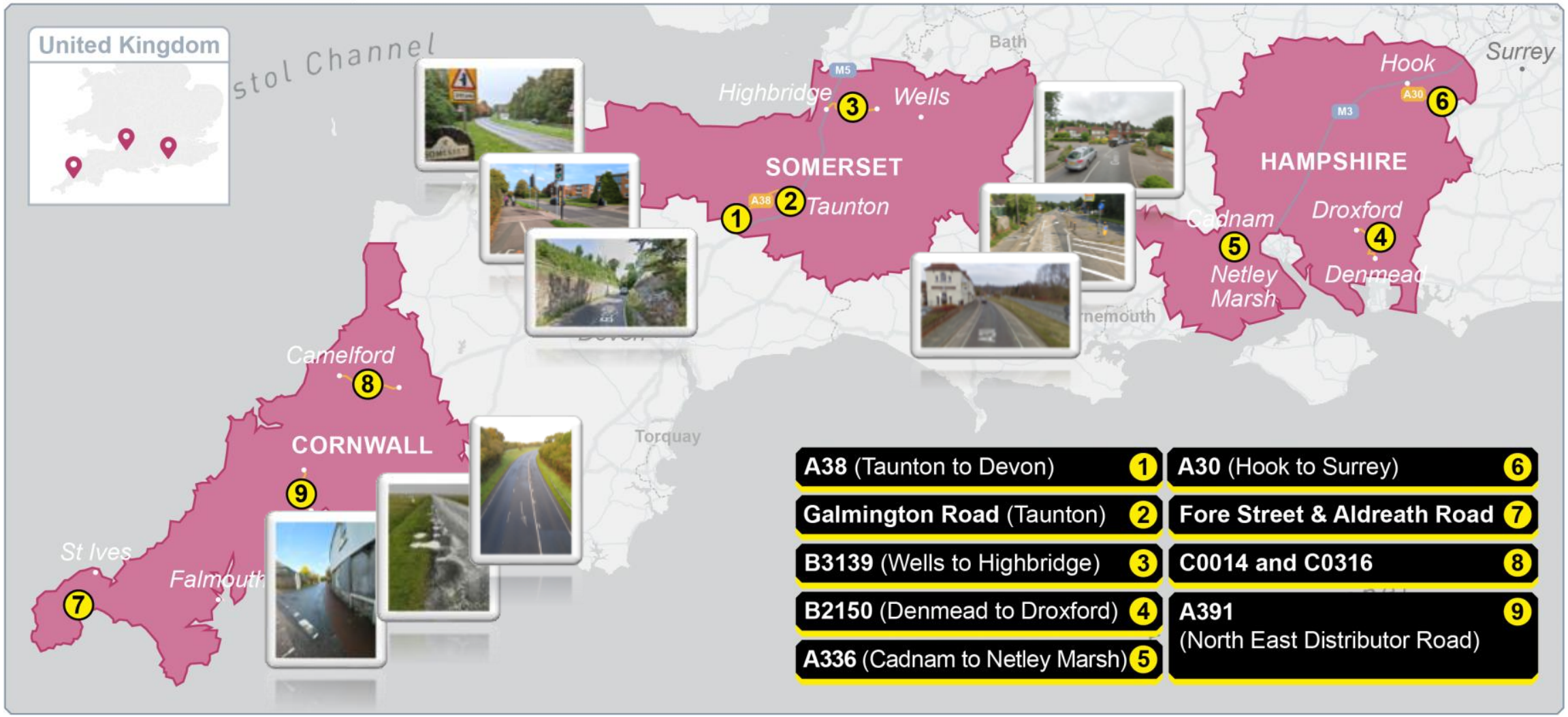
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WESSEX LIVE LAB – testbeds for innovating across the full service

MAP OF THE SOUTH WEST



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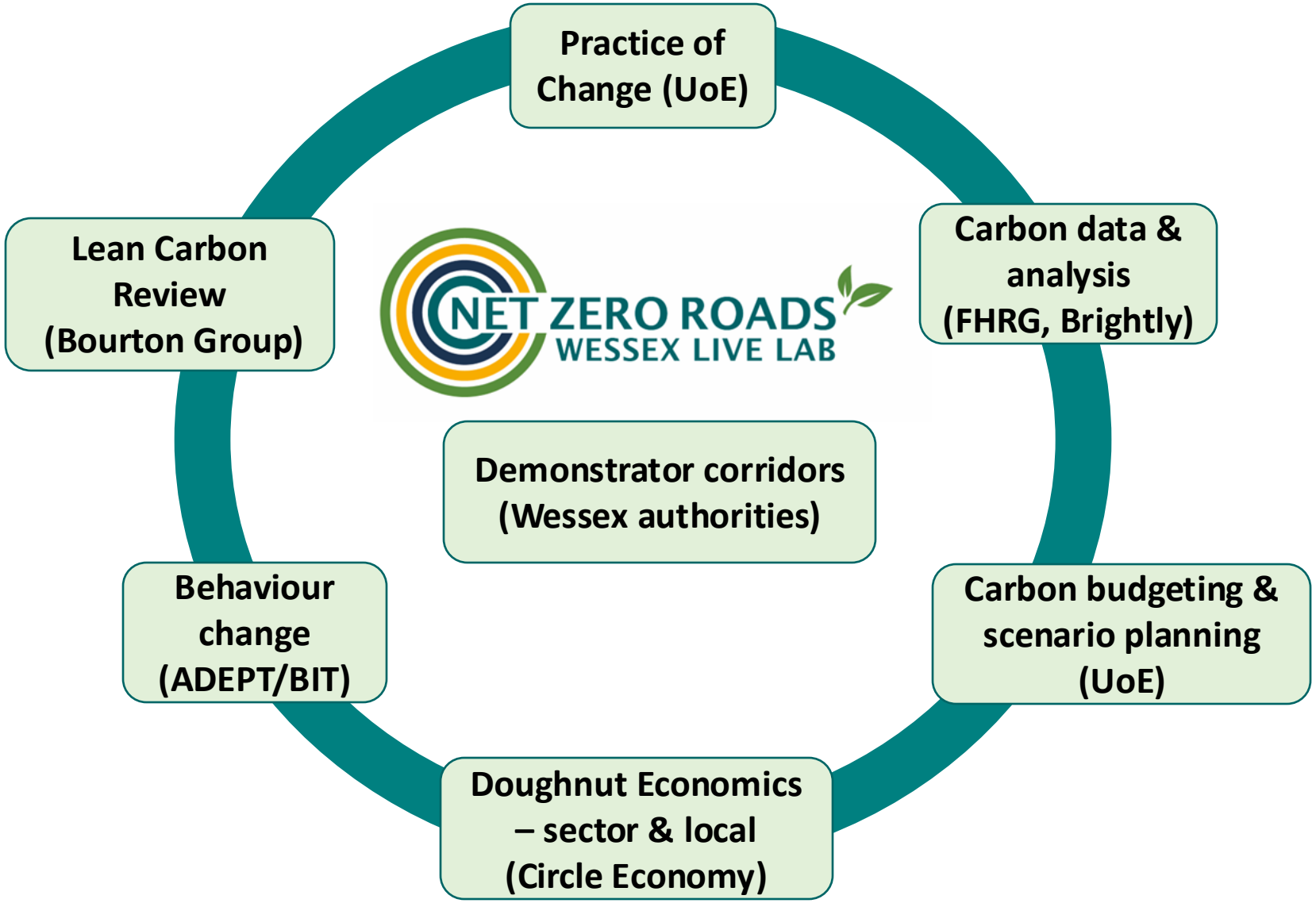
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THE INTERLINKED WORKSTREAMS

Aligning process and toolkit development with the demonstrator corridors



Key Outcomes / Outputs

- Highways Doughnut Toolkit
- Carbon Budgeting Toolkit
- Lean Traffic Management Inspection Report
- % CO2 saved on each of the Local Authorities
- Value for Money in terms of 40 year life cycle Carbon savings per Local Authority?
- Carbon specific outcomes – which are the top innovations that we must do now?







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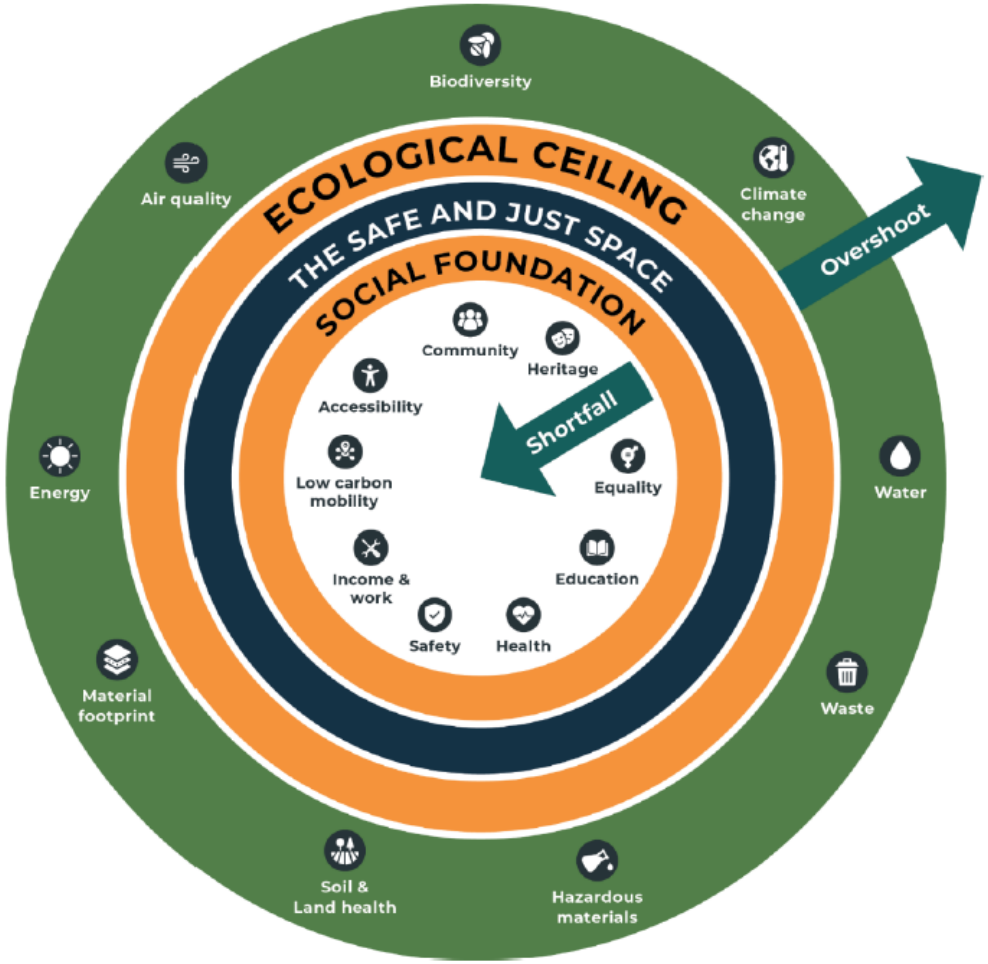
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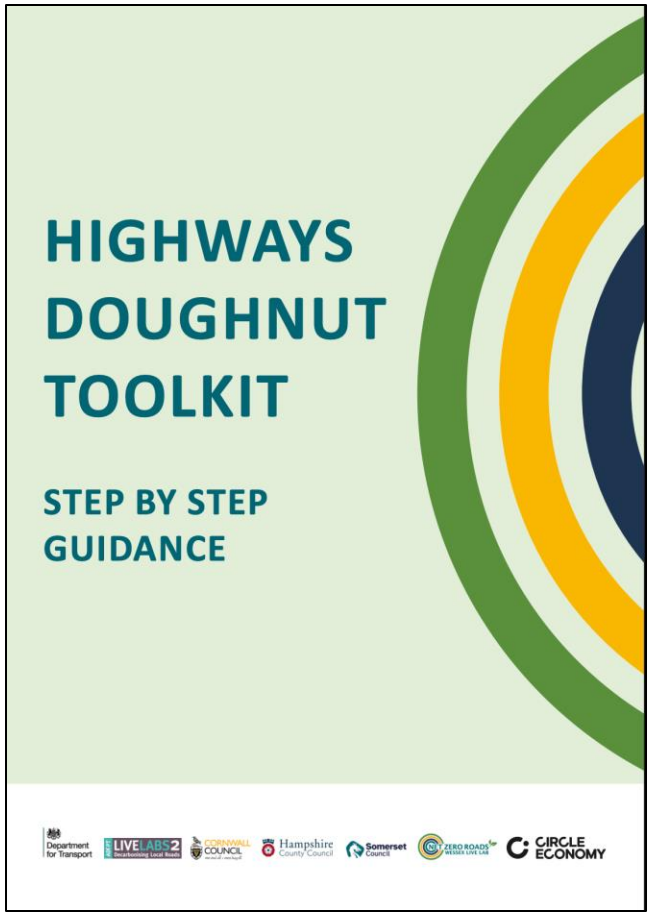
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Doughnut Economics

Highways Doughnut toolkit and guidance – for strategic and activity-level application





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Doughnut Economics

Highways Doughnut toolkit – progression of implementation trials into an operational setting using the project scorecards

S Strategic — Social

ACCESSIBILITY

	BASELINE	MITIGATIONS
Average AMBITION score out of 5	0.0	0.0
Average IMPLEMENTATION score out of 5	0.0	0.0

Doughnut State

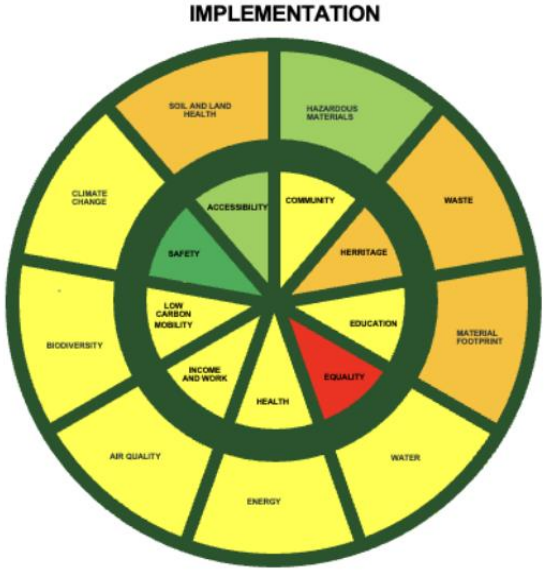
The delivery of highway maintenance service enables road networks to be accessible and usable by all intended users, considering their diverse capabilities and needs.

	AMBITION		IMPLEMENTATION	
	Targets	**Monitoring framework**	**Systematic implementation**	**Risk mitigation**
	Do the targets in place align with the Doughnut State for accessibility?	Are there mechanisms in place to measure the effectiveness of the accessibility targets?	Is there a plan or process in place to integrate accessibility measures into road maintenance activities?	Is there a plan to address risks and overcome barriers to ensuring a road network that is accessible for all its intended users?
Score				
Weight	50%	50%	50%	50%
Justification				
Mitigation				
Re-score				
Justification				

AMBITION



IMPLEMENTATION



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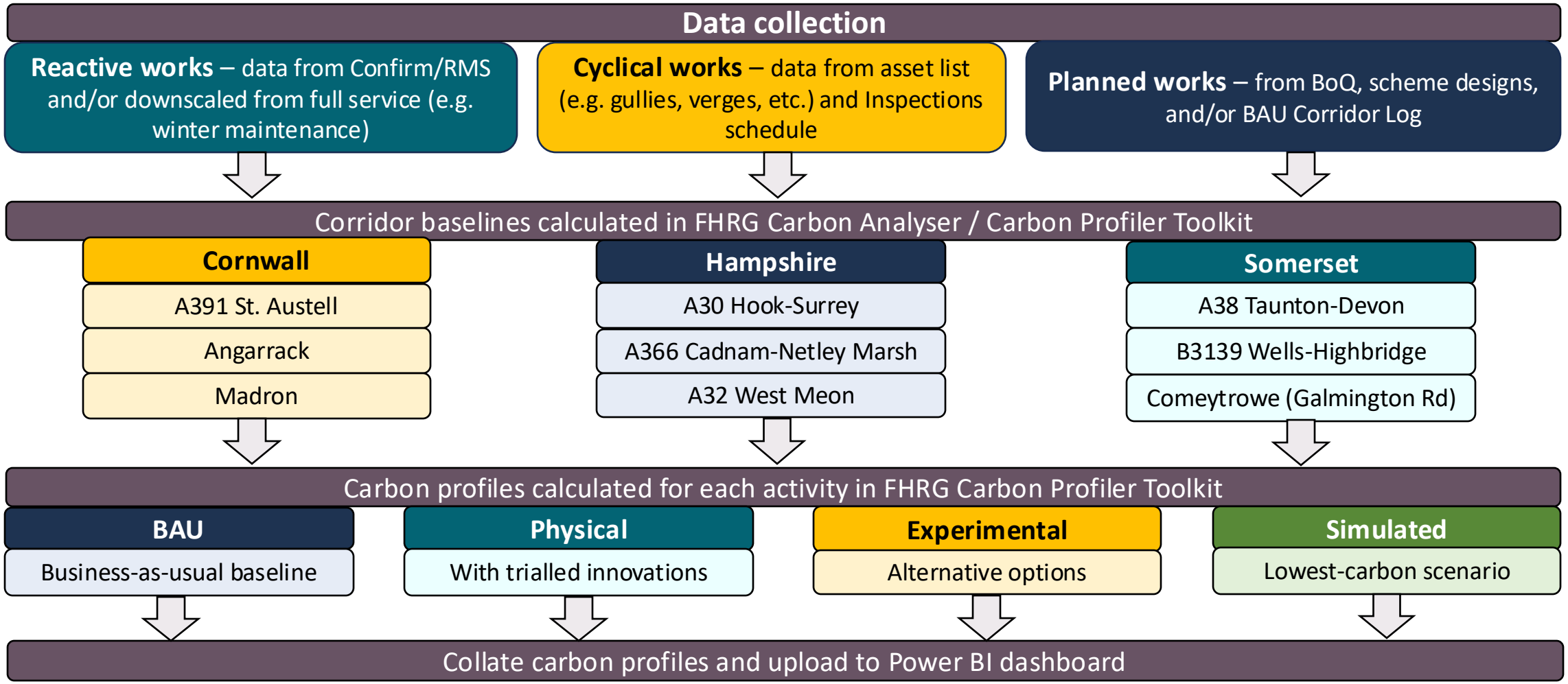
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Carbon analysis – corridor baselining & profiling

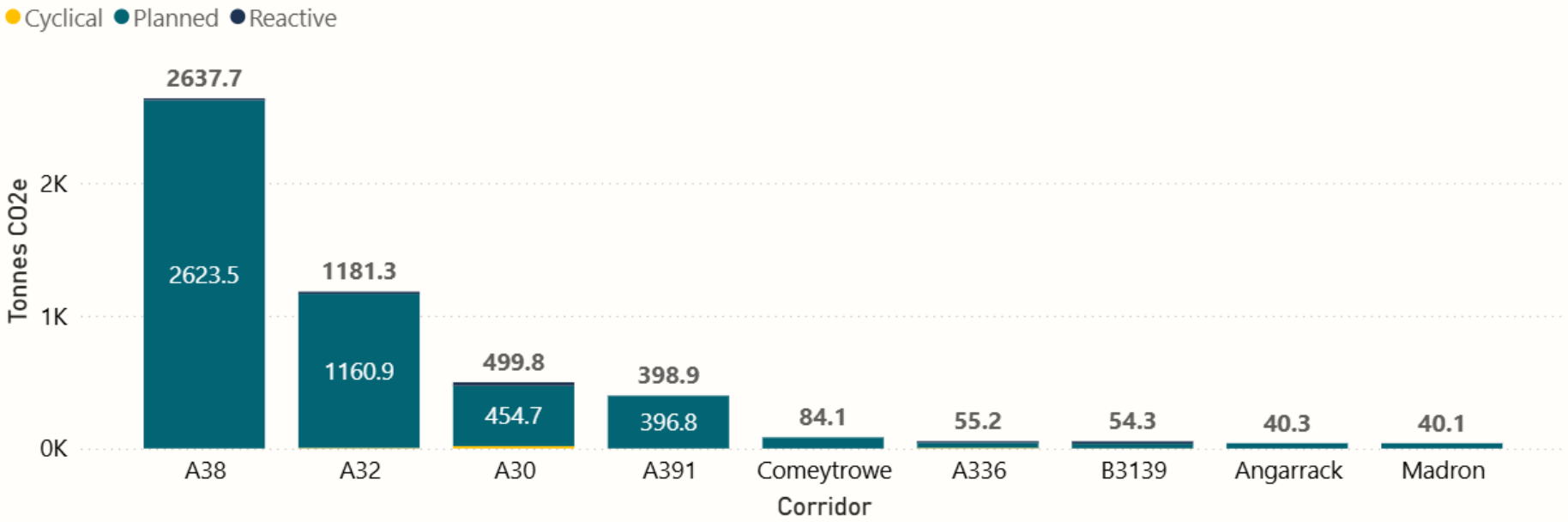


Wessex Carbon Dashboard

Wessex Live Lab Corridor Carbon Baselines (Business As Usual)

Old CFs

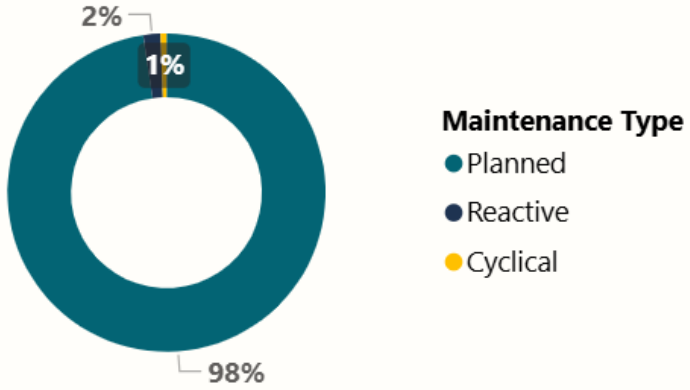
Tonnes CO2e by Corridor and Maintenance Type



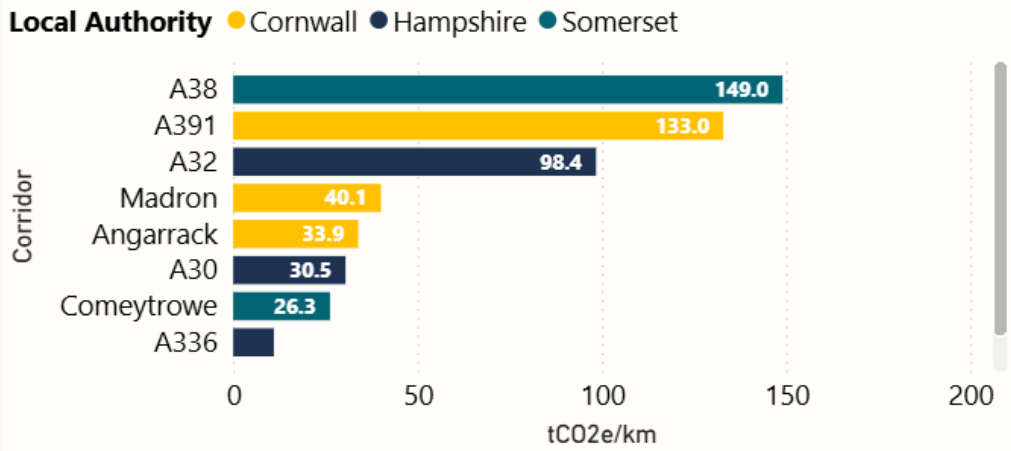
Select corridor

- Cornwall
  - A391
  - Angarrack
  - Madron
- Hampshire
  - A30
  - A32
  - A336
- Somerset
  - A38
  - B3139
  - Comeytrowe

Proportion of CO2e from each maintenance type



Tonnes CO2e per km (corridor length)



Select maintenance type

- Cyclical
- Planned
- Reactive

Average Confidence

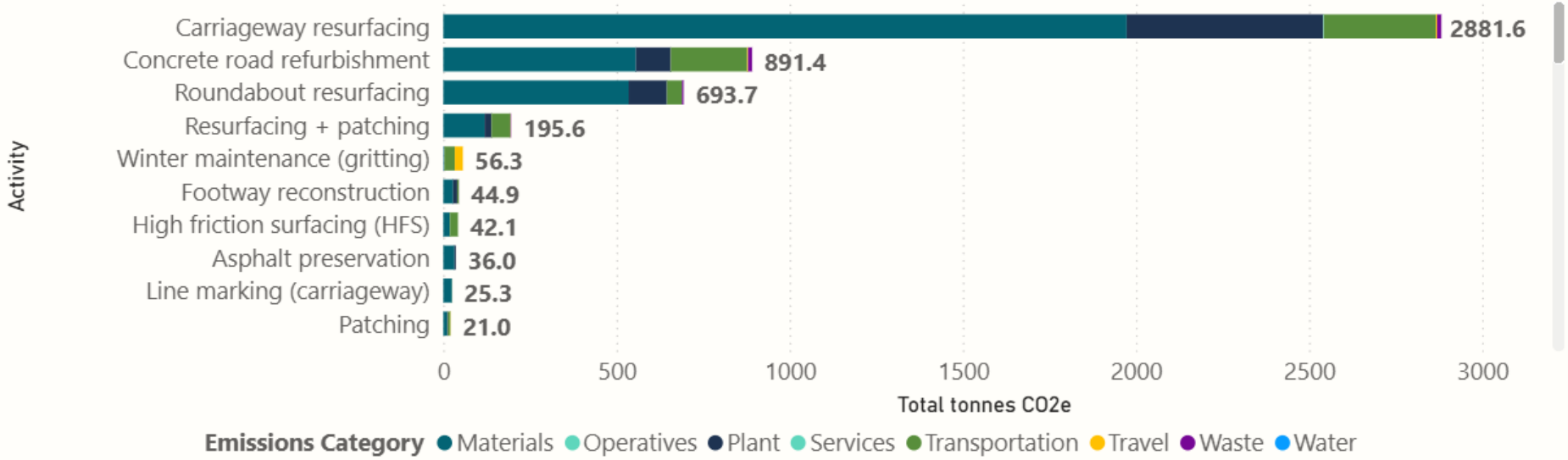
30.92

Wessex Carbon Dashboard

Wessex Live Lab Activity Carbon Baselines (Business As Usual)

Old CFs

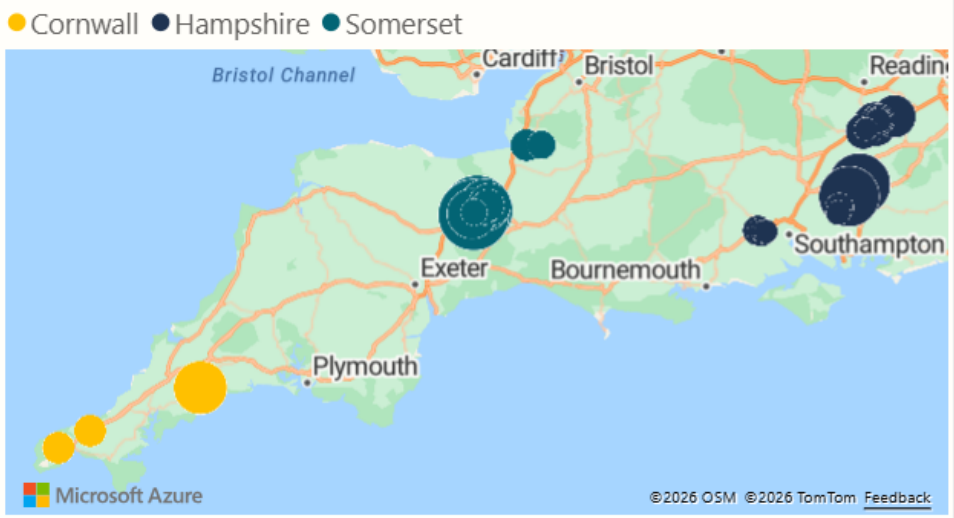
Total tonnes CO2e by Activity and Emissions Category (top 10 - scroll down for more activities)



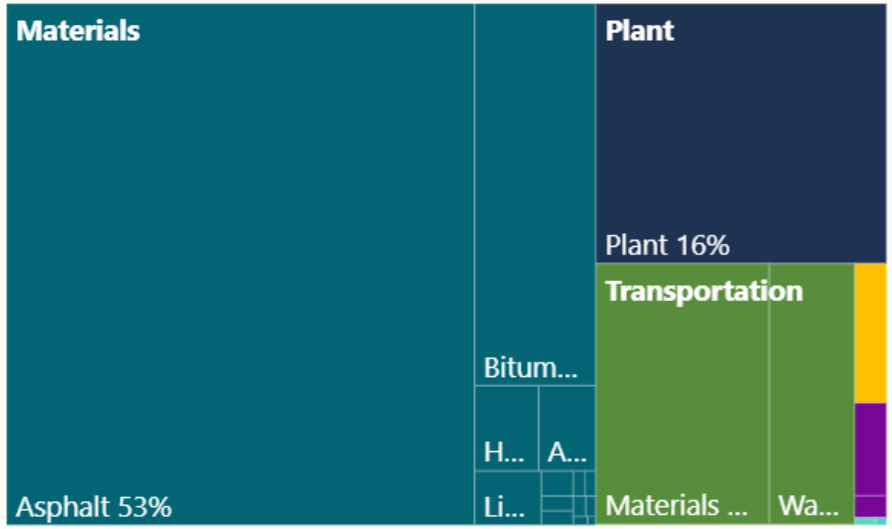
Select corridor & job

- Select all
- Cornwall
- Hampshire
- Somerset

Tonnes CO2e by location



% CO2e by Emissions Category



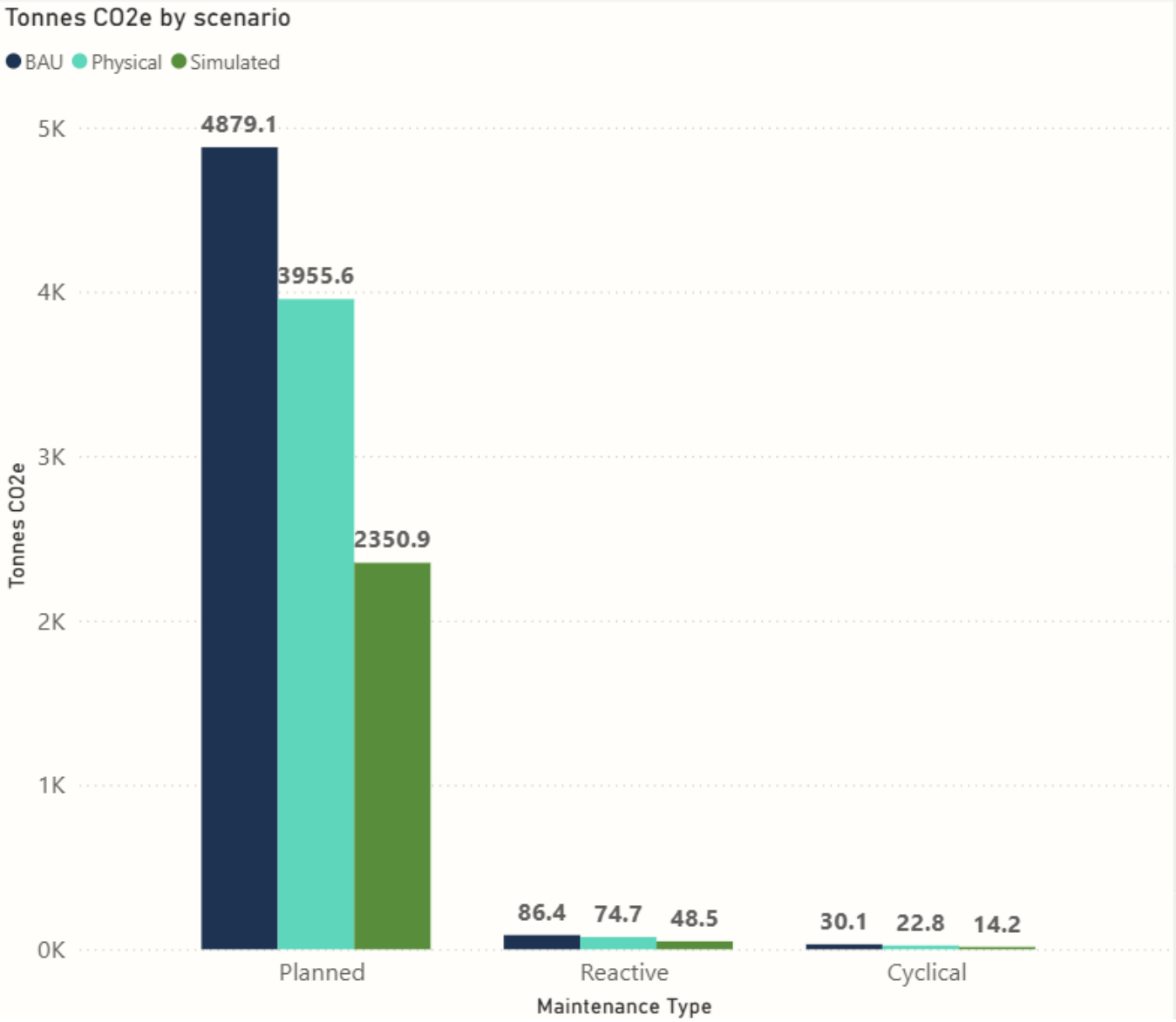
Select maintenance type

- Select all
- Cyclical
- Planned
- Reactive

Average Confidence

30.92

Physical & Simulated carbon savings



Select activity

- Select all
- Cyclical
- Planned
- Reactive

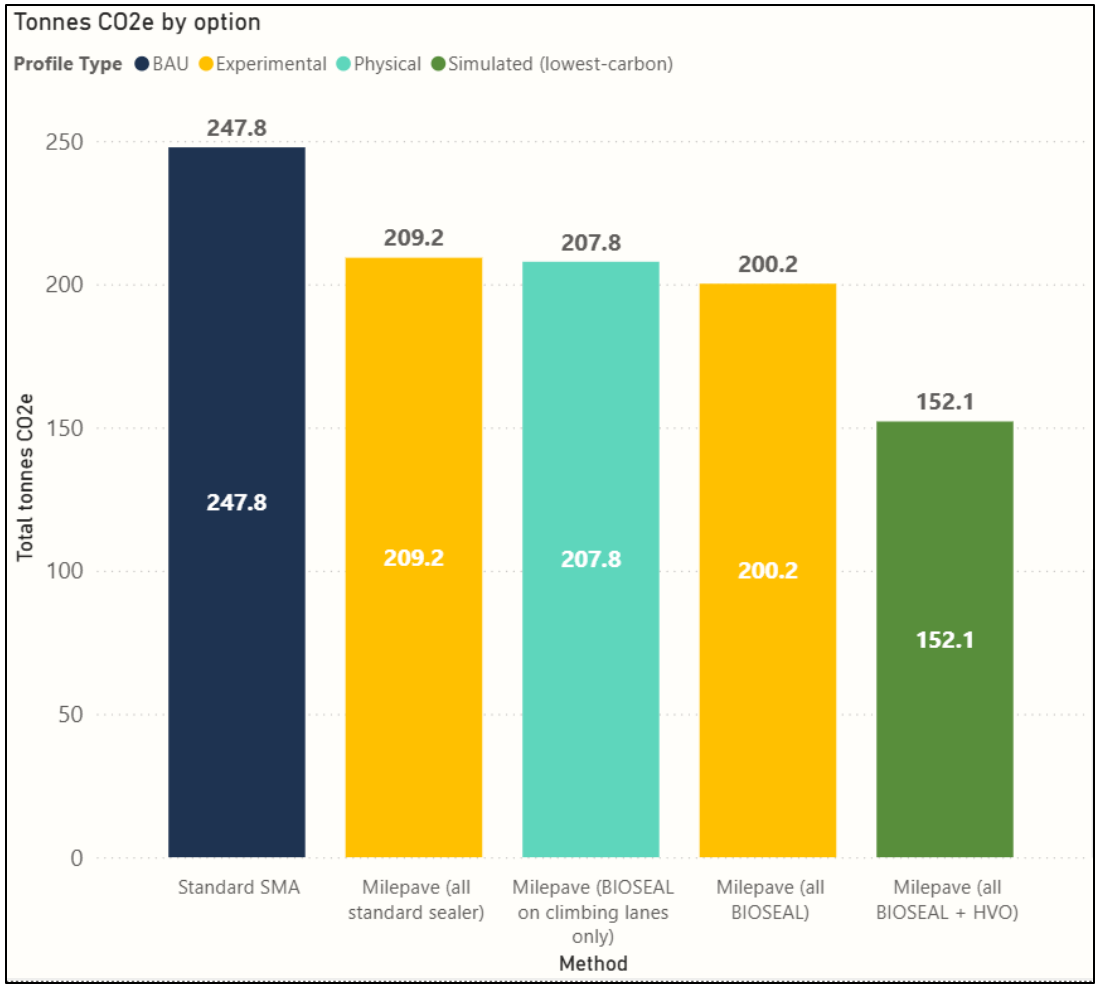
Select corridor & job

- Select all
- Cornwall
- Hampshire
- Somerset

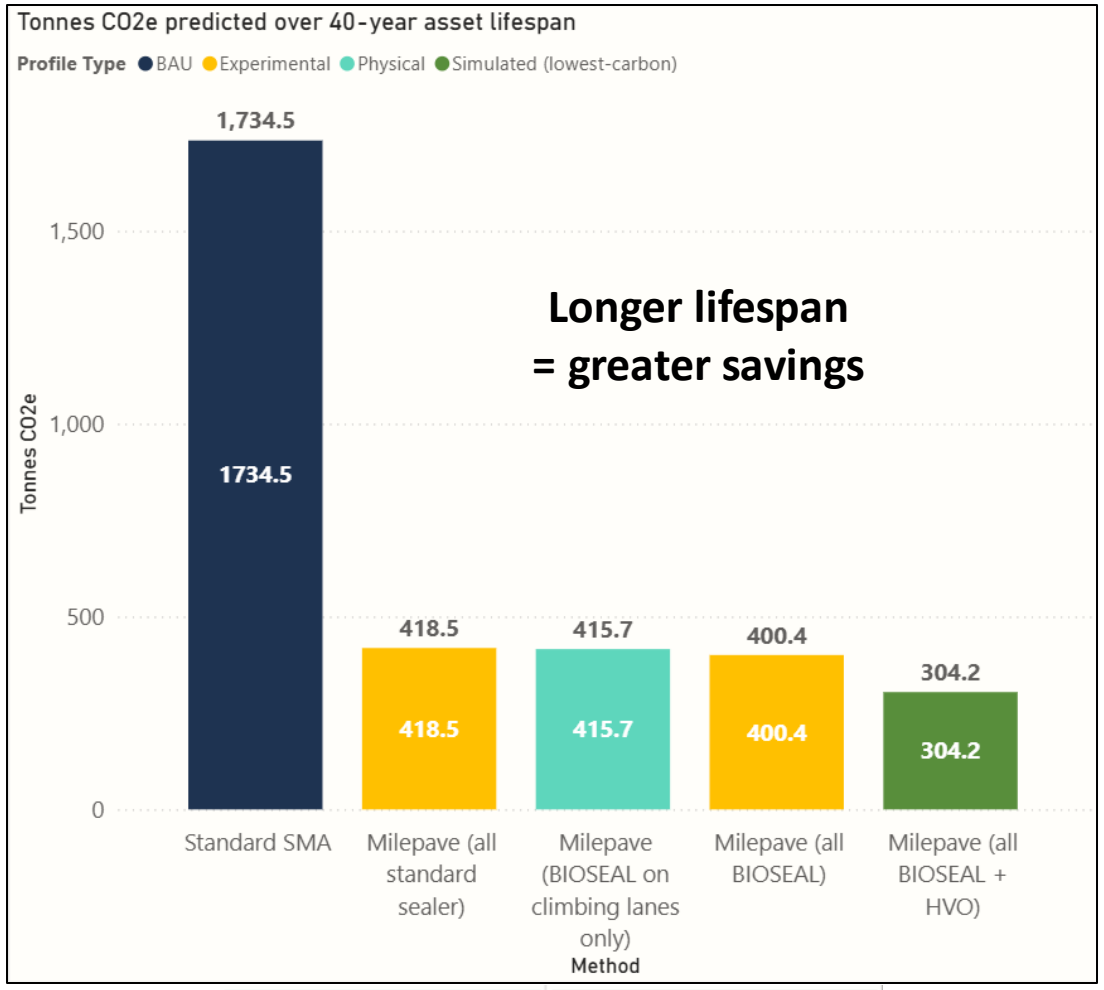
Physical saving (tCO2e) 942.5	Simulated saving (tCO2e) 2582.0
Physical saving (%) 19%	Simulated saving (%) 52%

Average Confidence
31.62

Upfront vs. long-term savings – A391 example

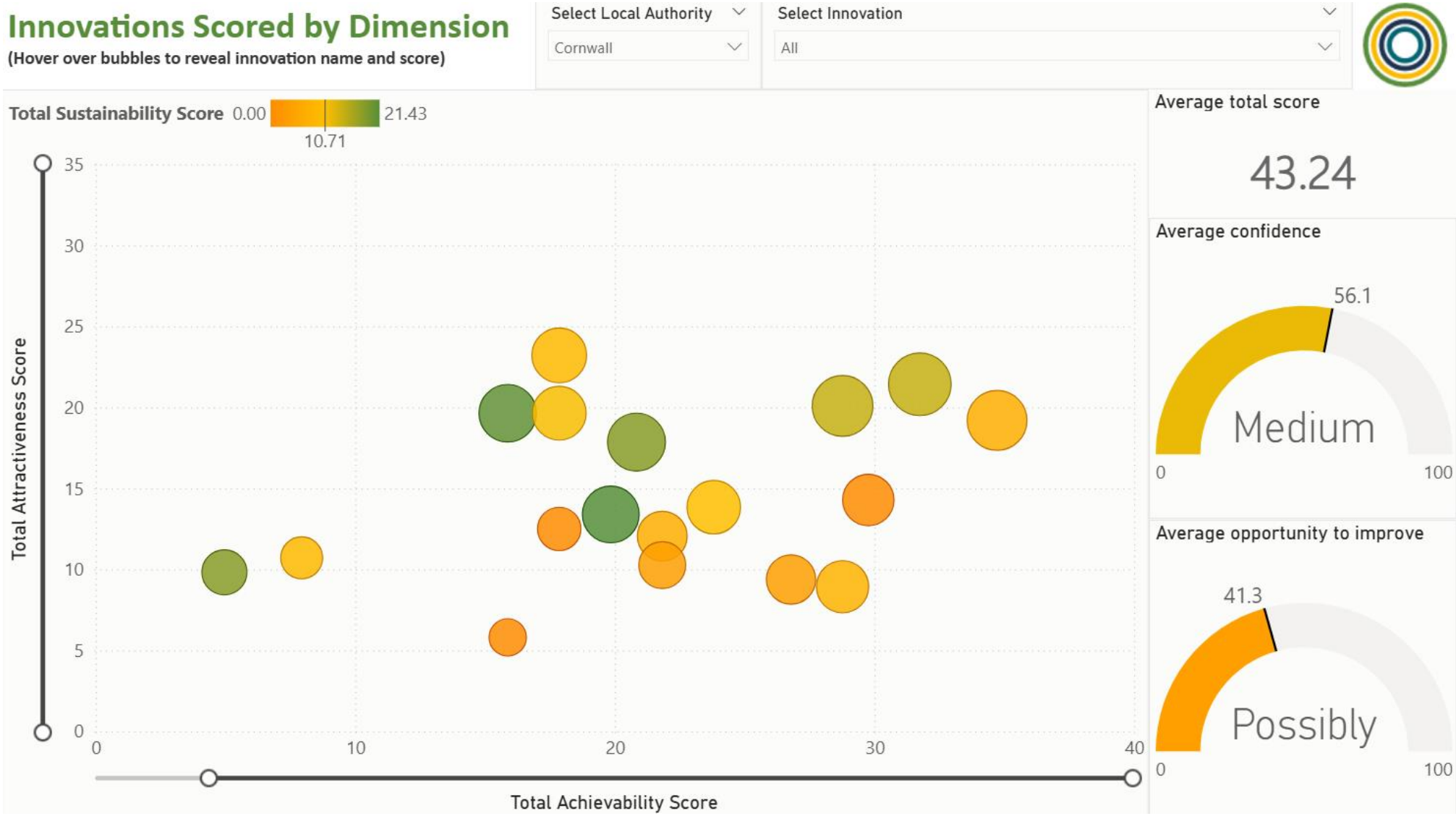


Physical saving (tCO2e)	Simulated saving (tCO2e)
39.9	95.7
Physical saving (%)	**Simulated saving (%)**
16%	39%



Physical Saving (tCO2e)	Simulated Saving (tCO2e)
1318.8	1,430.3
Physical Saving (%)	**Simulated Saving (%)**
76%	82%

Innovation management



Scoring dimensions

Achievability:

- Novelty
- Scale
- Specialist external support
- Trial affordability
- Volatility

Attractiveness:

- Anticipated scale of carbon reduction
- Financial impact
- LA reputational impact
- Relevance within experimental corridor
- Service performance impact
- Uniqueness

Sustainability:

- Environmental impact
- Social value impact

Carbon budgeting

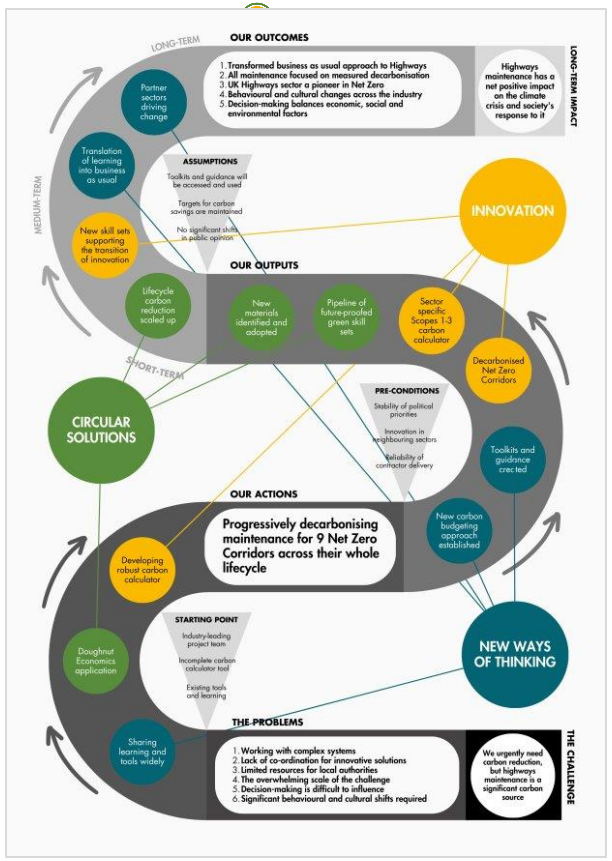
Development of a Power BI dashboard to visualise the carbon trajectories for each LA
Exploring the application of this methodology to individual activities

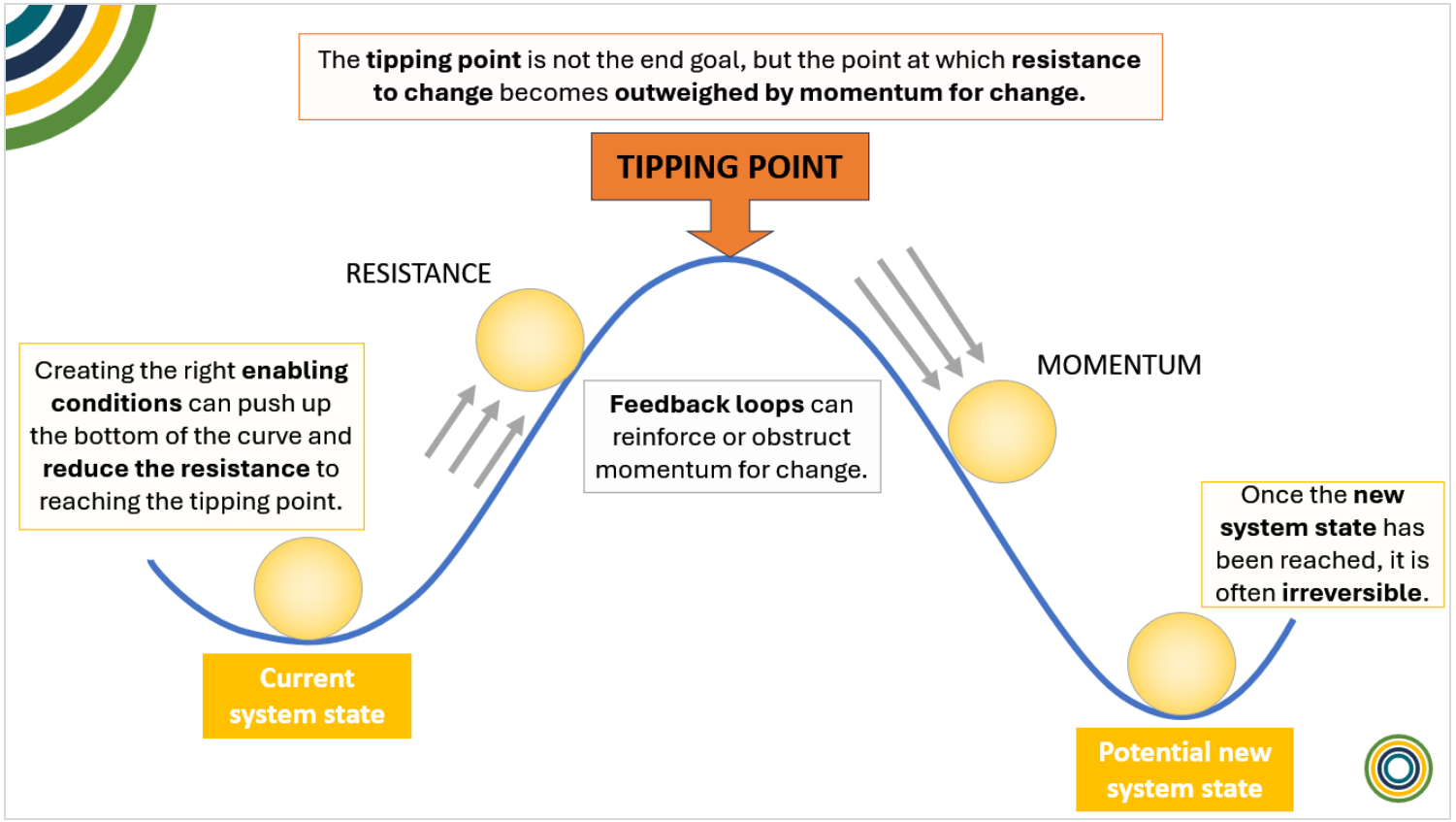


Data visualised above is a mock dataset for illustration purposes.

Behavioural change

Applying the theory of Positive Tipping Points into a practical local roads test case





Demonstrator corridors - Cornwall

- Reducing Carbon, benefiting communities:









- Madron scheme (completed) – low carbon surfacing, first use in the UK of bio-resin virtual footway, biochar enhanced tree planting.
- A391 (completed) – Includes enhancing safety with solar road studs, innovative low carbon coatings to chevron paving, low carbon surfacing laid in echelon to remove joints and maximise life of surfacing. Innovative count-down planting to roundabout approaches.
- Angarrack, C325, replaced the proposed Green Pastures corridor. 50 tonnes of AC10 surface course was laid with 1% locally sourced wood derived biochar and 50 tonnes of AC10 was laid with 1% olive stone derived biochar provided by Nottingham University.

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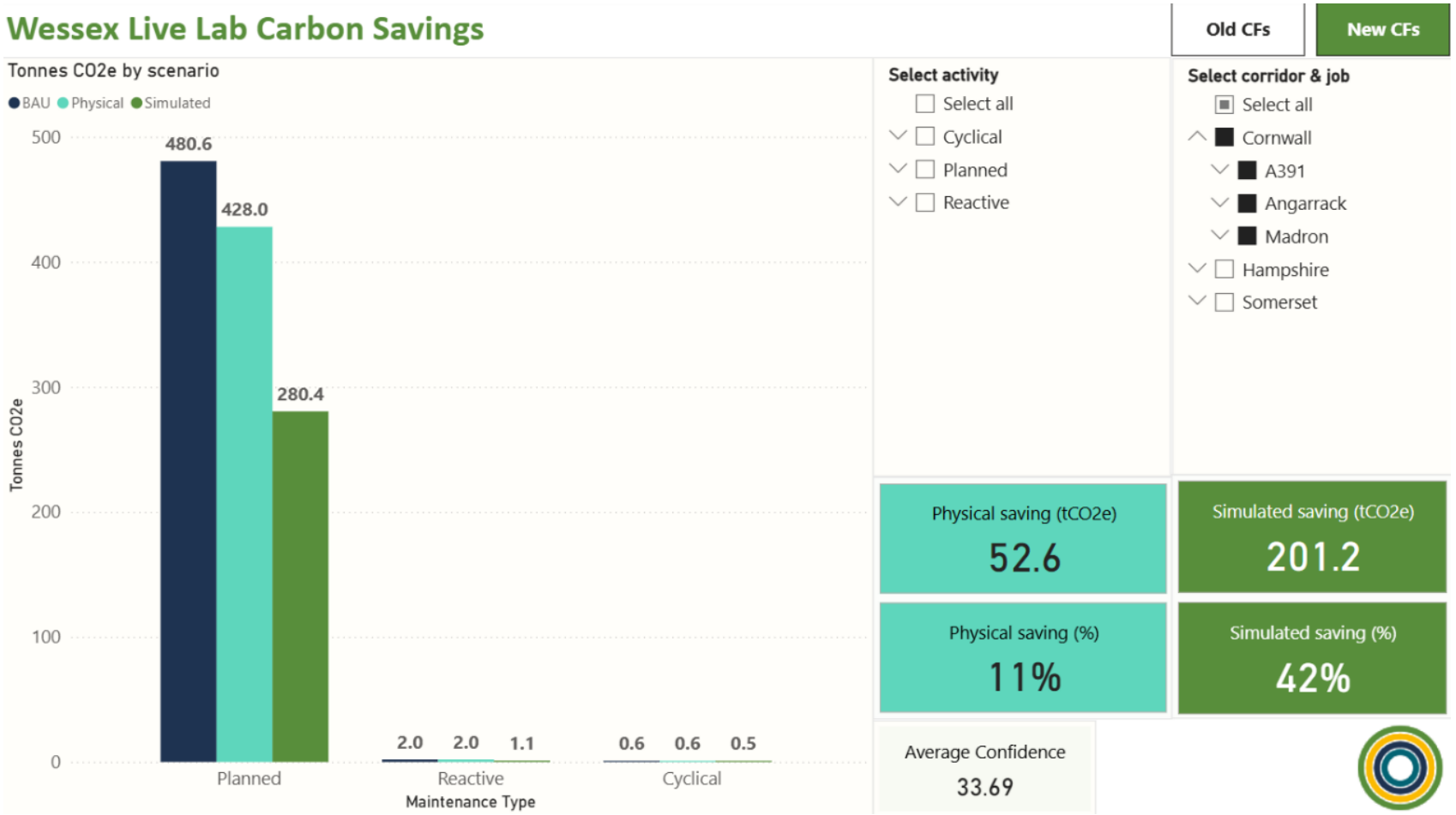
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Cornwall Carbon Savings



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Demonstrator corridors - Hampshire

Delivering change - A30, A336 and A32 Resurfacing, Patching and Footway Innovations



- Multevo Hydrohog – part hydrogen powered multi tool
- Electric jetting machine
- MMA lining
- Concurrent sign and drainage cleaning A30



- OCL MLS negative carbon asphalt
- HVO and Electric plant
- MMA Lining



- Low temperature HRA (warm CL943) - 1st time trial
- Tarmac Bio Binder
- Ex-situ Cold Recycled Bound Material (CRBM)
- Electric Plant
- MMA lining

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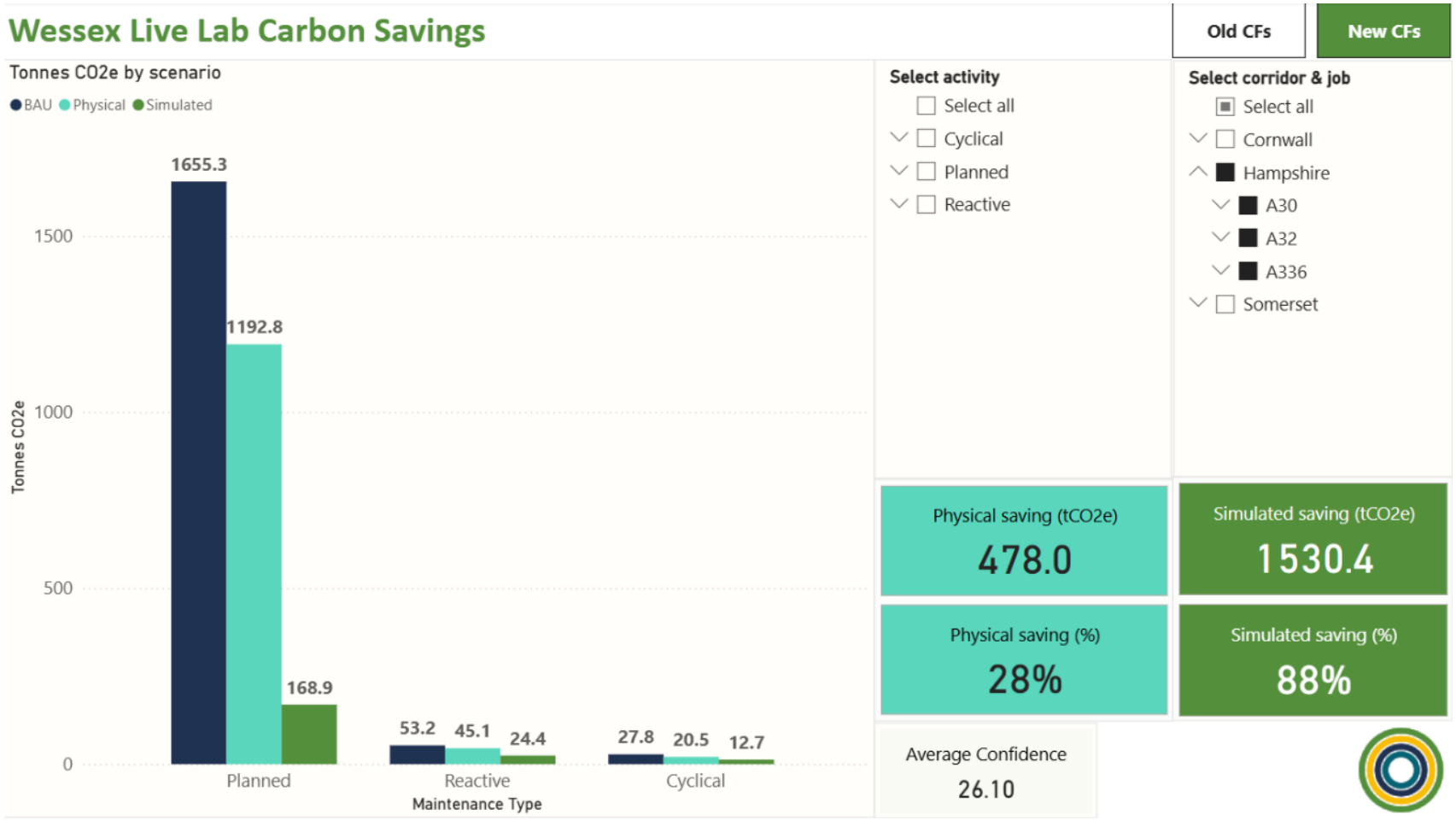
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Preparing to turn concrete plans into lower carbon rehabilitation of a concrete road on the A38 in Somerset

Demonstrator corridors - Somerset





- Resurfacing, utilising rubbilisation to in-situ recycle existing 50-year-old concrete surface at A38 to M5 link road
- Ex-situ recycling and trial of mobile cold recycling mixer plant for two resurfacing schemes on A38 plus bio-synthetic binders and negative carbon asphalt
- Early lifecycle carriageway rejuvenation on B3139
- Low carbon footway scheme in Galmington, using in-situ recycling & CRBM
- Applying doughnut economics toolkit to Winter and Emergency service and beyond



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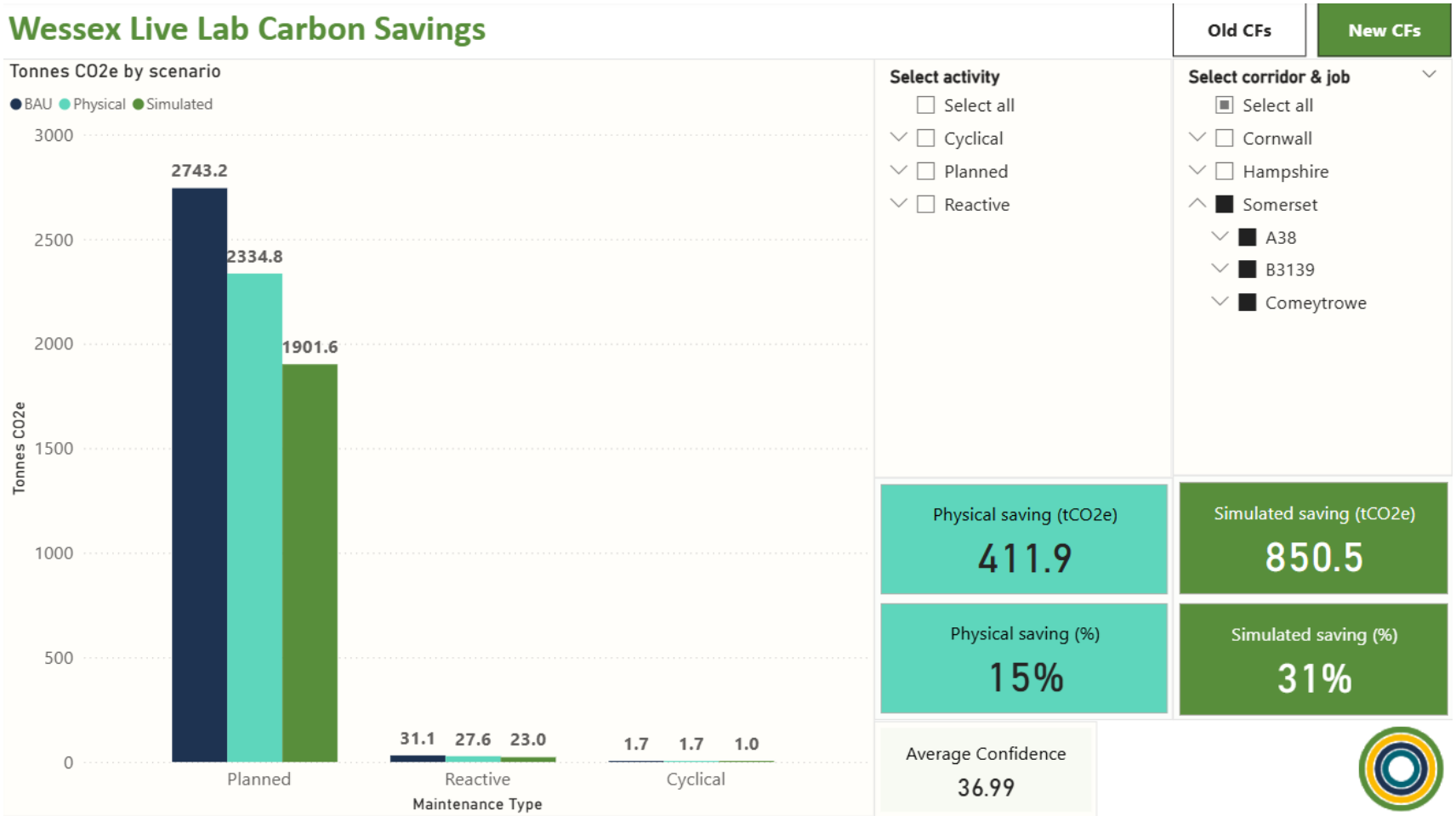
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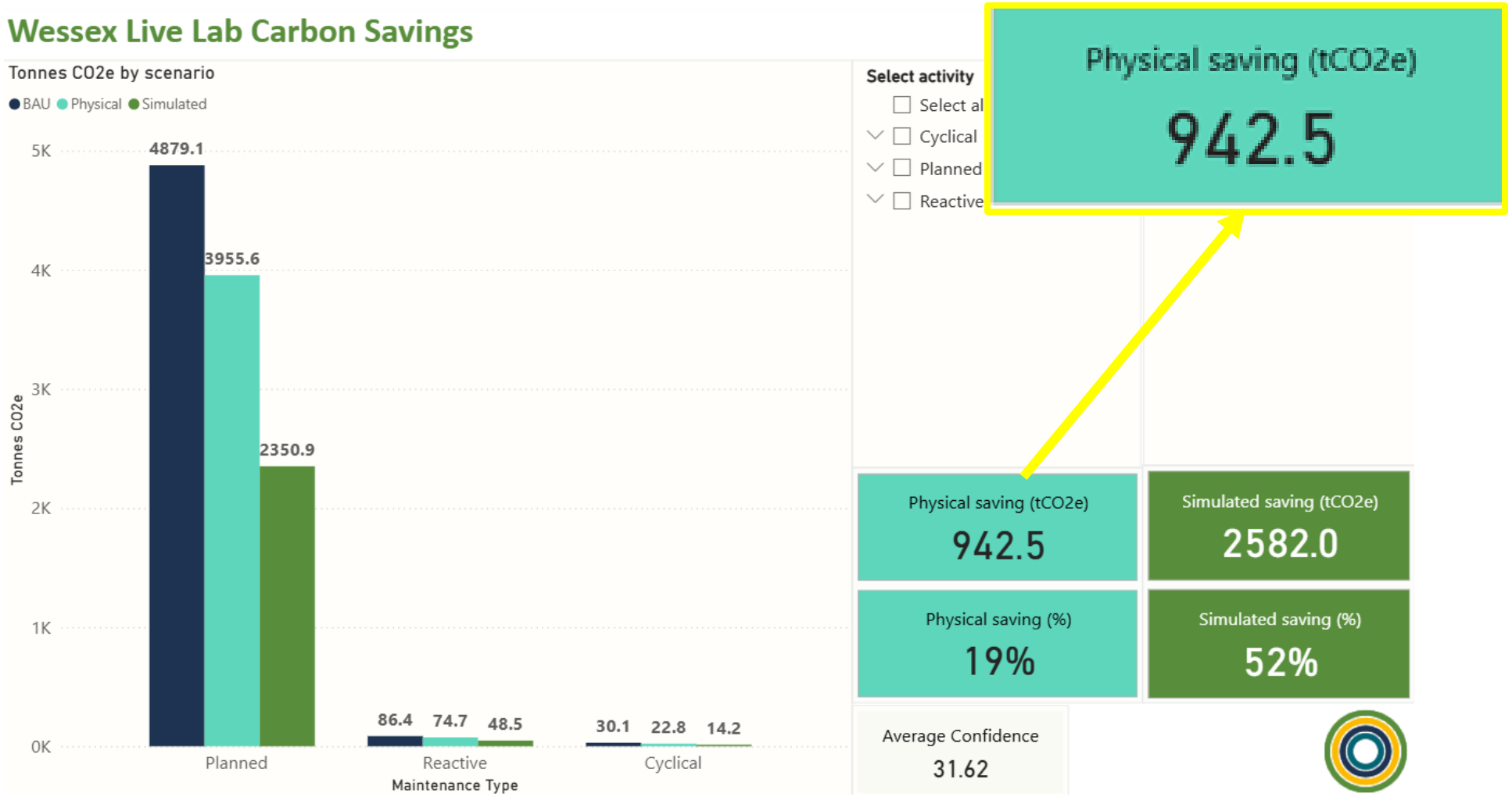
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A collaboration between local authorities and partners from across the industry and academia...

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CORMAC

Heidelberg Materials

KIELY GROUP

KIER

MILESTONE INFRASTRUCTURE A part of MGroupServices

OCL regeneration ltd SUSTAINABLE MATERIAL SOLUTIONS

Brightly A Siemens Company

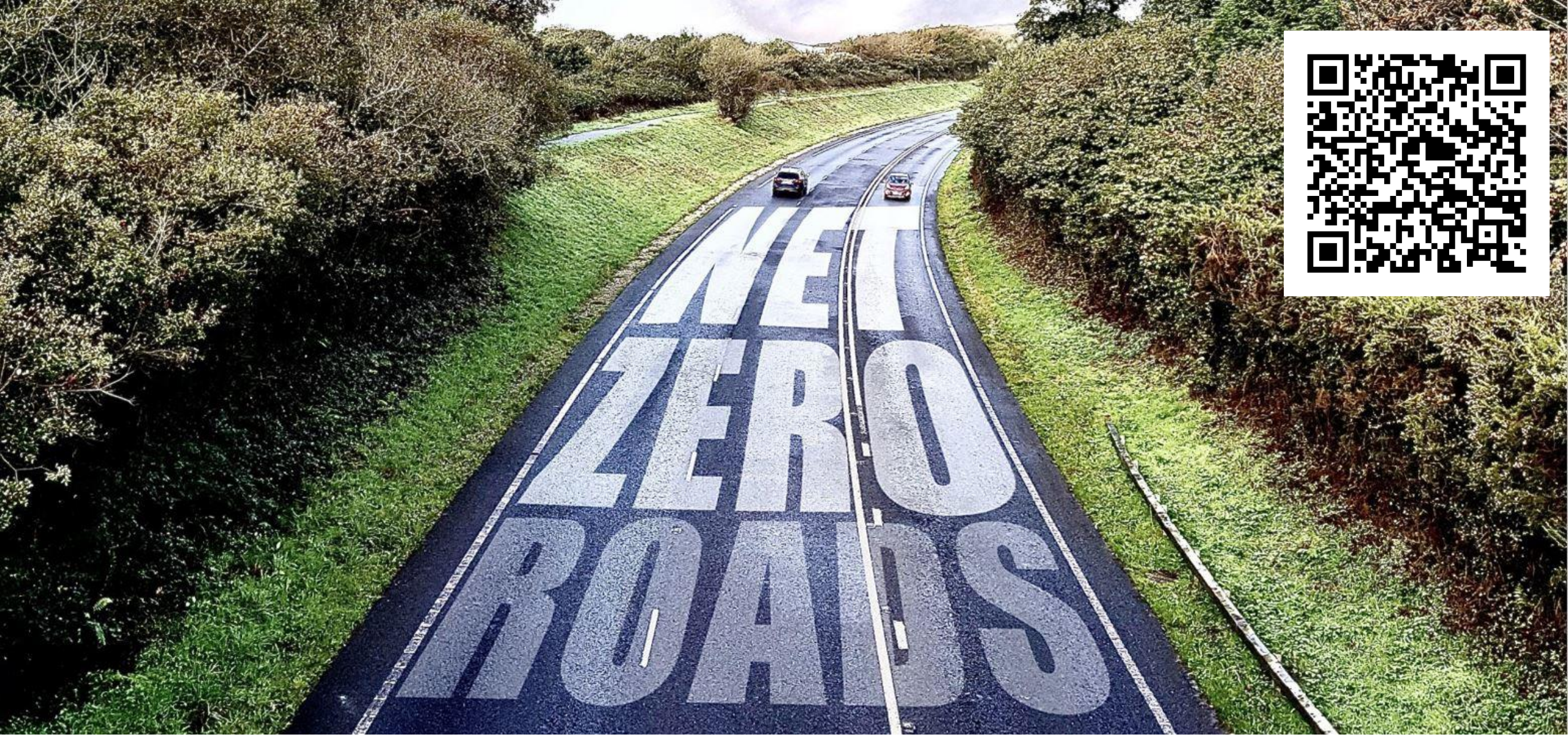
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University of Exeter

octavius regional civil engineering

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