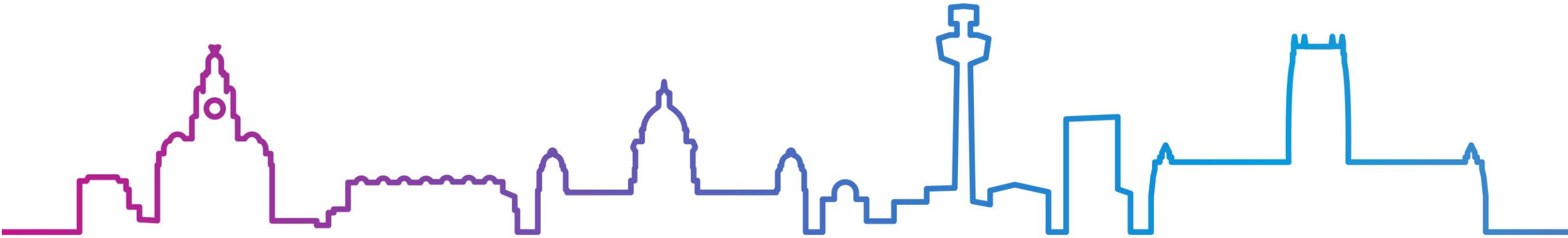
Liverpool City Council

Liverpool Live Lab

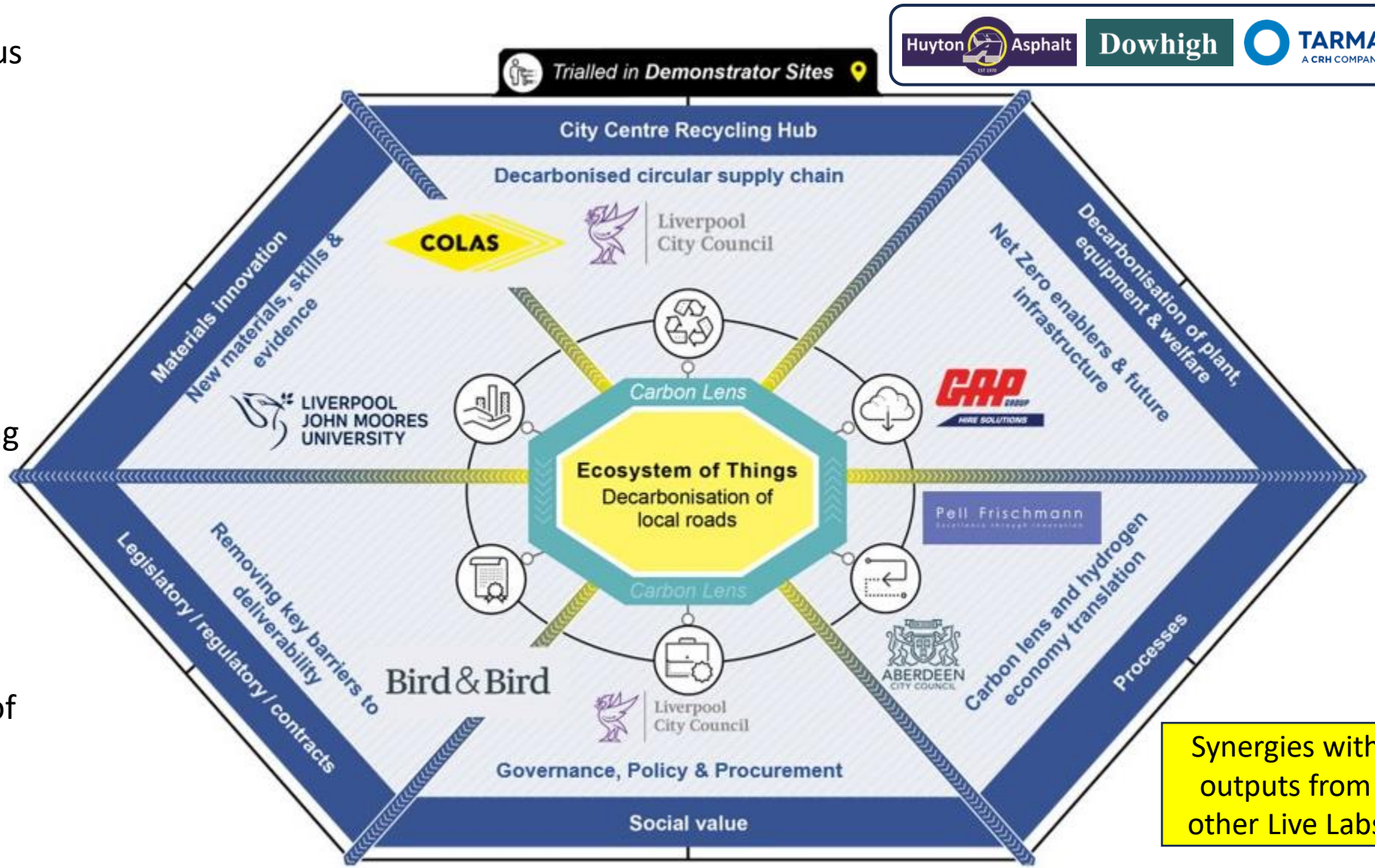
Carbon Plenary Workshop



25th September 2023

ECOSYSTEM OF THINGS - STANDARDISING CARBON MEASUREMENT & ANALYSIS ACROSS THE VALUE CHAIN

- General approach to focus on capital schemes – extrapolated to Council service-level
- Different baselining opportunities
- Data sourced within the Ecosystem we are forming
- Data gathering toolkits and surveys aligned with PAS 2080 carbon stages
- Independent validation of carbon and collateral benefits by FHRG



Synergies with outputs from other Live Labs

MEASURING CARBON WITHIN PELL FRISCHMANN CARBON HIERARCHY LENS APPROACH

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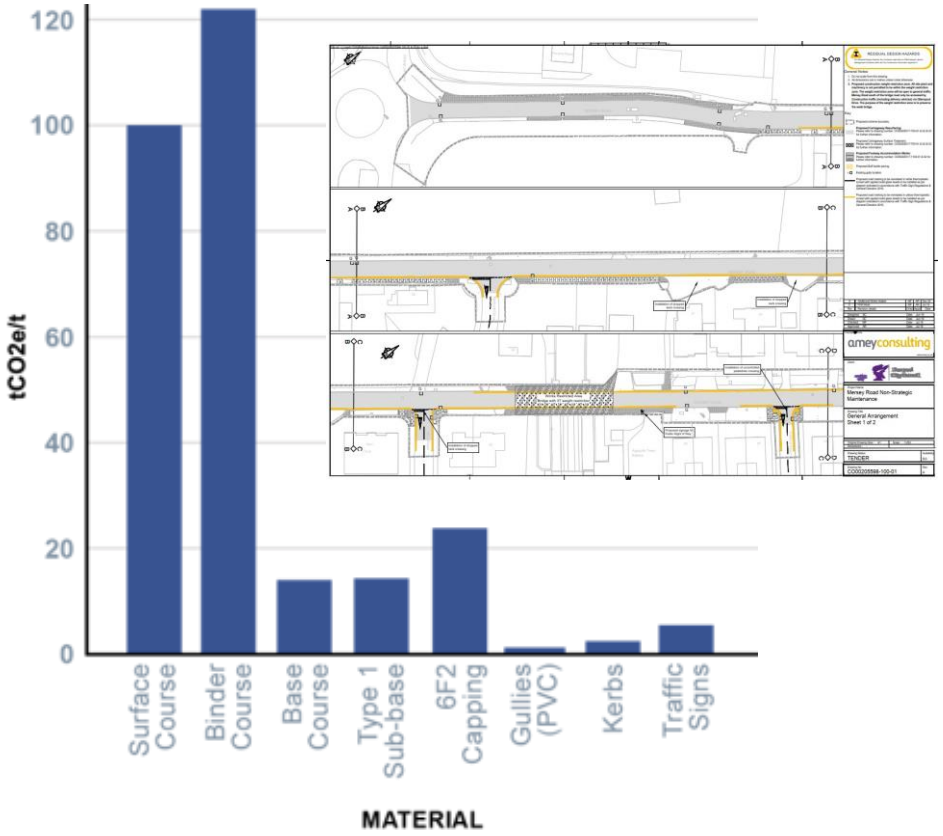
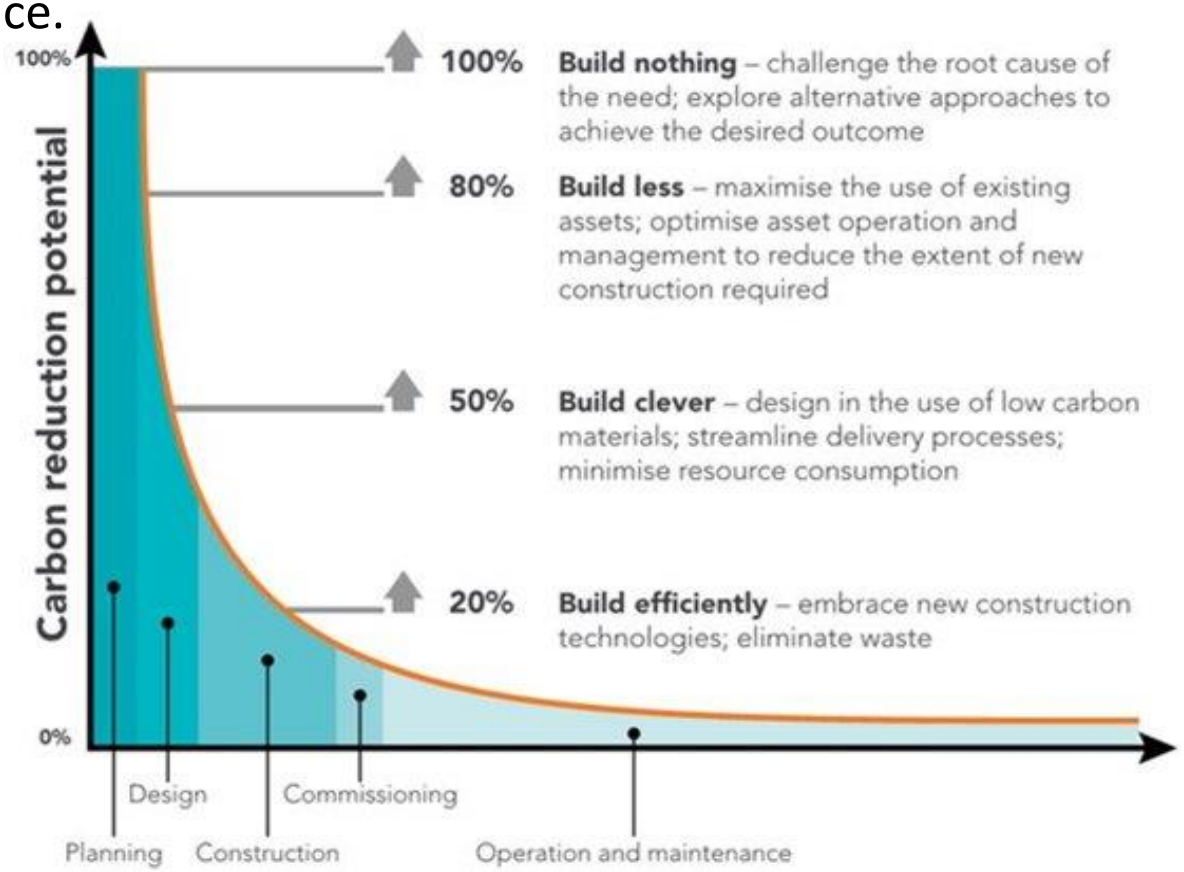
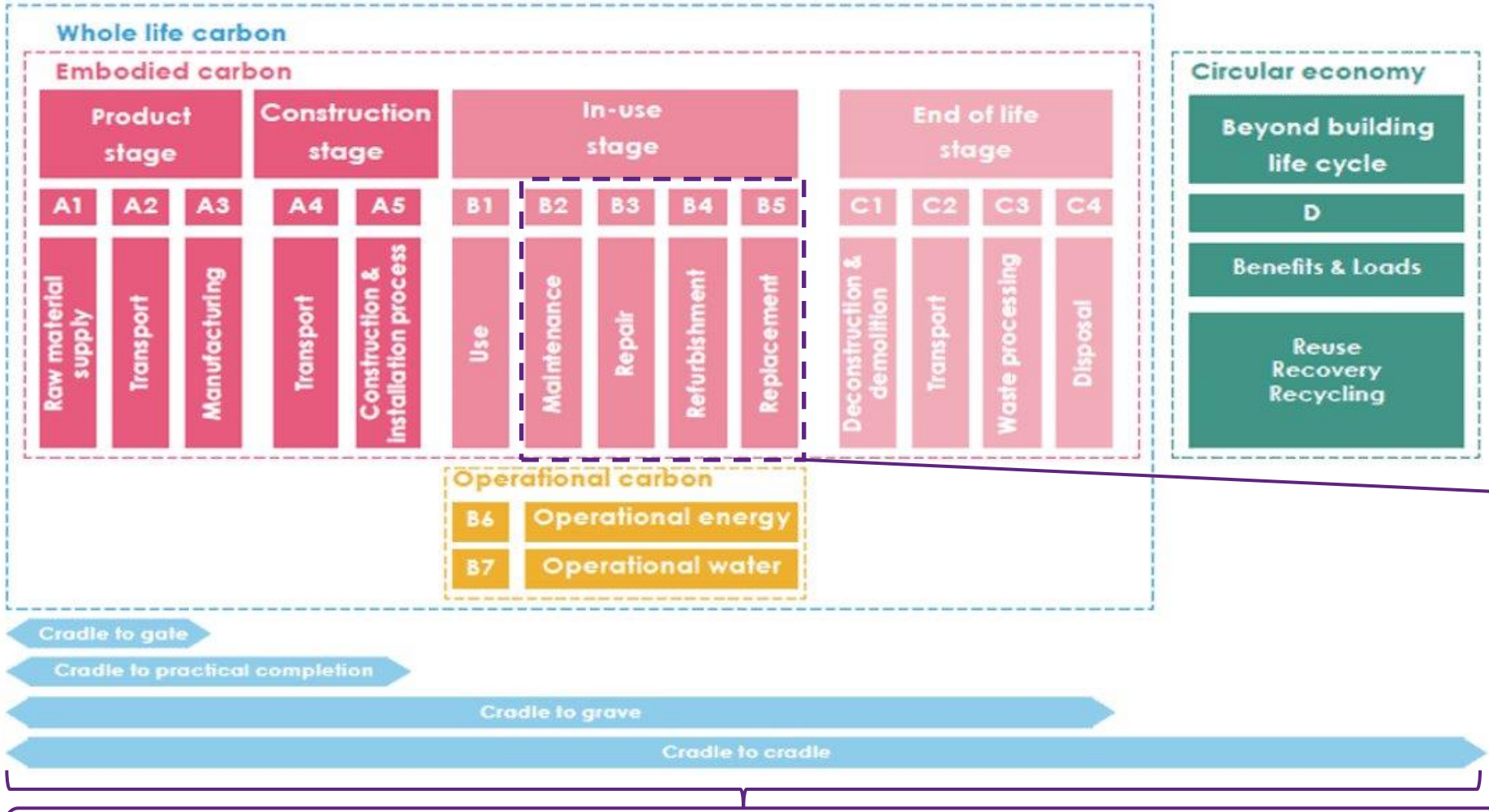
Pell Frischmann
Excellence through innovation

- Carbon optioneering models and toolkit aims to support early decisions at **programme** and **scheme** level, accounting for full lifecycle carbon & cost.
- Core work package to introduce carbon hierarchy approach & toolkit – the objective is to extend carbon assessments to Scope 3, full lifecycle, and edge-to-edge urban parameter space.





CARBON STAGES – SETTING BOUNDARIES FOR DATA GATHERING ALIGNED WITH PAS 2080:2023



- Primary focus on measuring the carbon that can be controlled at scheme level within Live Labs.
- The full lifecycle component of the carbon factors can be investigated through the experimental profiles.

Stretch target for Project Year 3 – aligned with development of open-access recycling infrastructure

APPROACH TO CARBON ACCOUNTING – EMBEDDED WITHIN CARBON HIERARCHY LENS TOOLKIT

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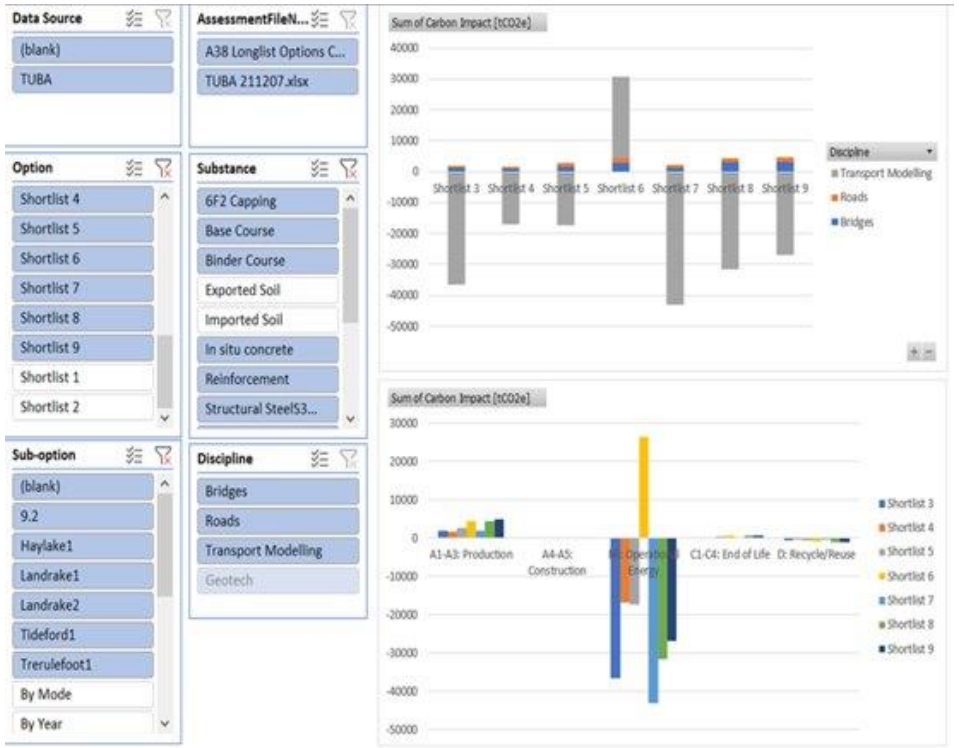
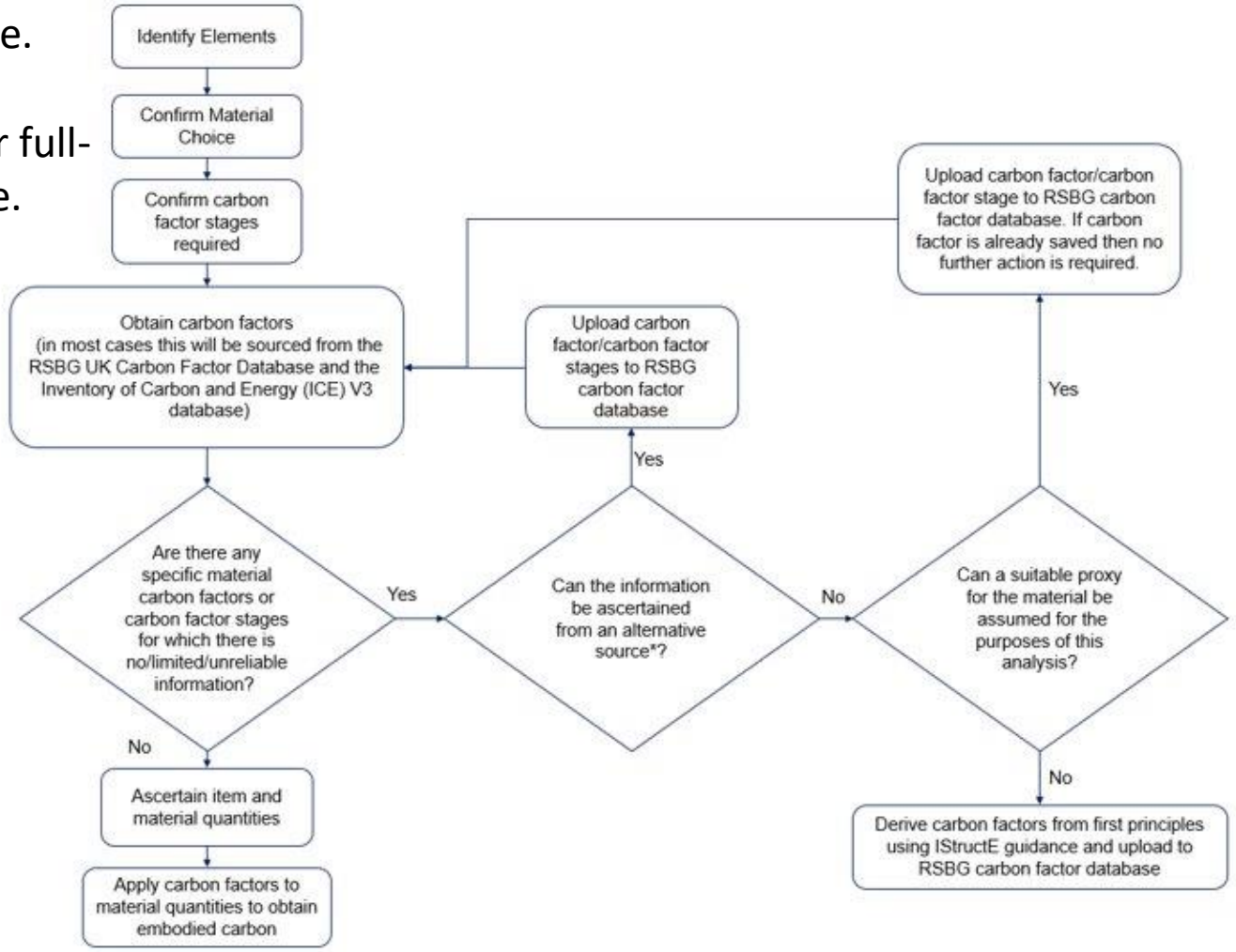
The PF Carbon tool will standardise process and enable us to:

- Calculate and analyse the carbon footprint of a scheme.
- Identify and assess alternative low carbon options.
- Calculate baselines at scheme level, extended to cover full-lifecycle factors from a design/engineering perspective.





SCHEME-LEVEL DATA PROCESS MAP

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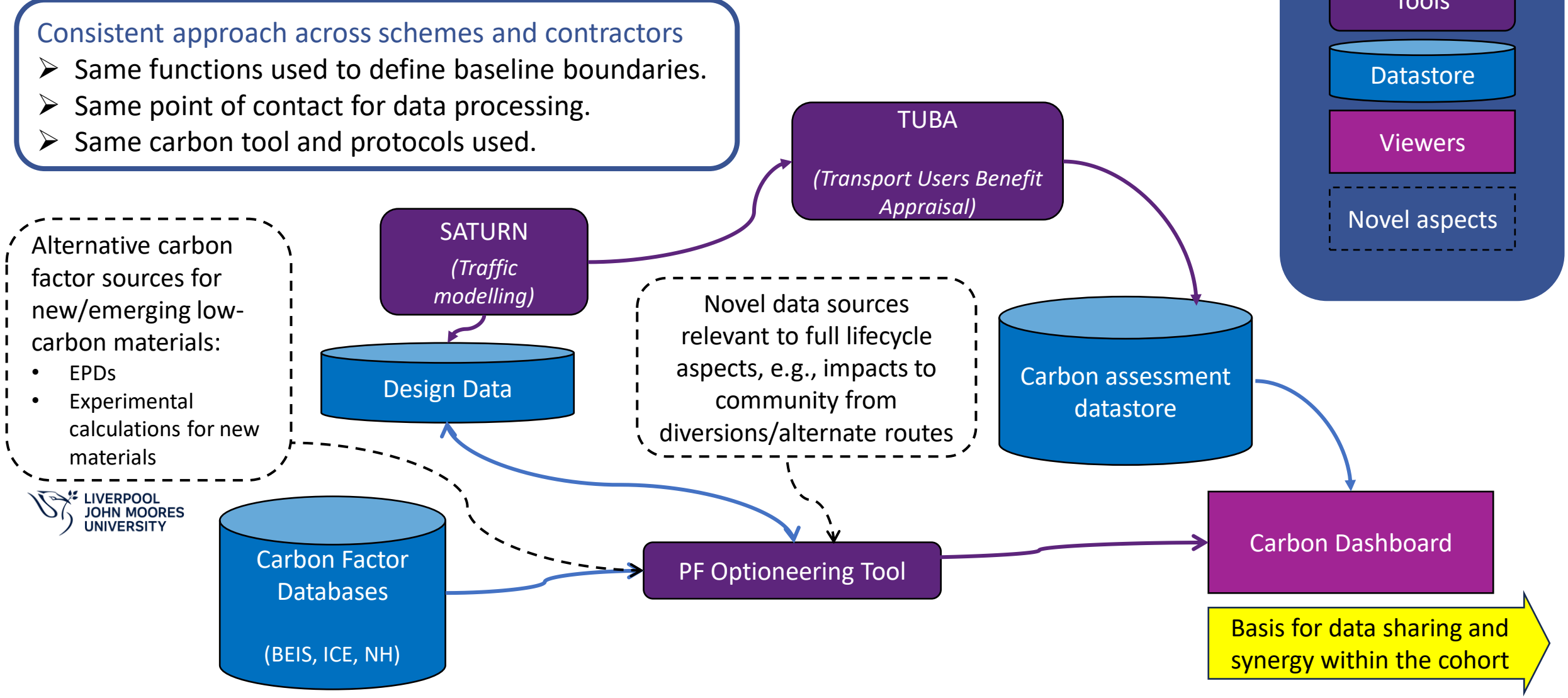
Data harmonised across baselining & analysis of trials – carbon factors and carbon assessment data store common across scheme-level and full-service carbon analysis

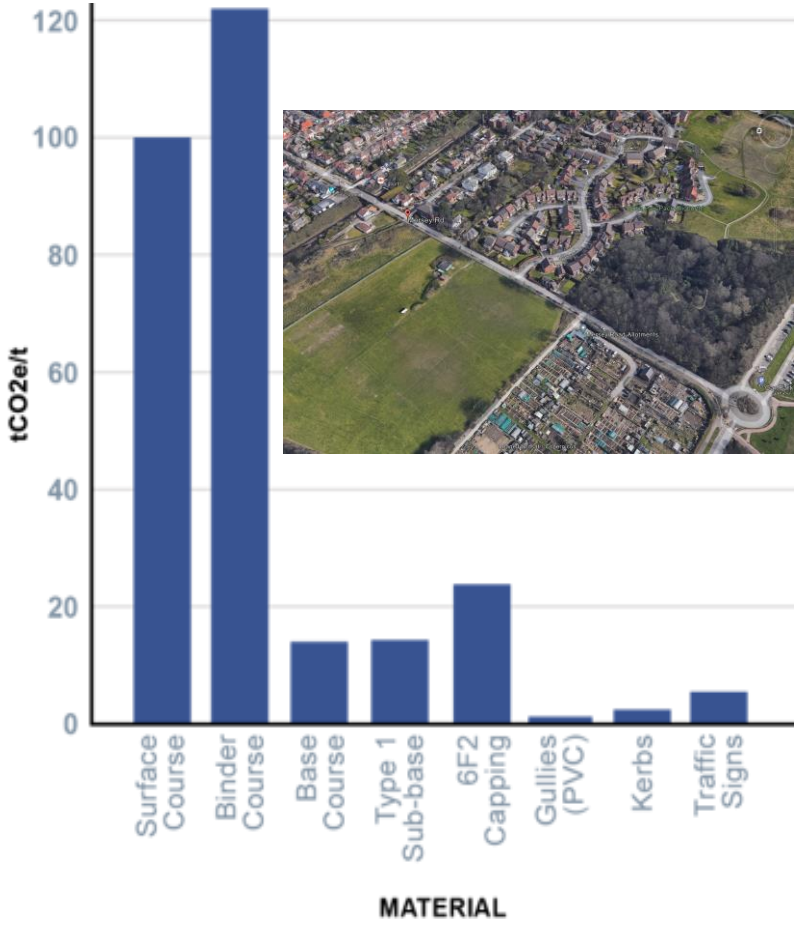
Consistent approach across schemes and contractors
- Same functions used to define baseline boundaries.
- Same point of contact for data processing.
- Same carbon tool and protocols used.



BASELINE SCOPE & BOUNDARIES

- Proposed summer & winter baseline for **2023/24**, also enabling us to directly support the **as-built data gathering** in Q3/Q4 to secure/standardise inputs.
- Extend to 2022/23 to map the BAU trajectory, subject to data availability.
- **Hybrid approach**:
  - Primarily bottom-up to enable the **scheme-level** engineering focus.
  - Aspiration to include top-down baselining to investigate **full-service** operational impacts and corresponding long-term impacts on the full-lifecycle carbon footprint.
  - Use models for new data sources, e.g., using SATURN for diversion route/TM impacts.
- Schemes selected from within existing **Highways Improvement Programme (HIP)** to capture the variety of functions & activities across the service.

Highways Management	Network Management	Project Delivery
Planned maintenance	Streetworks	Major projects
Routine maintenance	Traffic control	
Street lighting, drainage & EV charging	Transport planning	
Highways development control	Traffic management	
Operational control	Road safety engineering	



City-wide & across contractors

North Liverpool

Central Liverpool

South Liverpool

CARBON BASELINING PROCESS OUTLINE – ALIGNED WITH FHRG CCAS/CARBON ANALYSER

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Establishing the baseline scope & boundaries – e.g., which activities are included?

Establishing data availability, sources, and collection protocols & responsibilities

Maintaining rigour

- Ongoing validation process to identify and rectify data gaps & inconsistencies.
- Regular meetings to discuss progress with key players and request further actions.
- Assumptions documented for auditability.

Data collection

Premises & Sites	Staff & Contractors	Vehicles & Plant	Products & Services
• Electricity • Gas • Refrigerants	• Home working • Daily commute • Business travel	• Fleet / plant inventory • Mileage / fuel consumption	• Materials* • Transport • Waste • Water • Digital services • Design & consultancy

Carbon assignment & baseline calculation

Carbon hotspot identification

***New carbon factors will also be obtained for novel materials**

PROPOSED DATA SOURCES FOR BASELINE

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	Premises & Sites	Staff & Contractors		Vehicles & Plant		Products & Services
Data source	Electricity & gas meter readings	Staff commute surveys	Business mileage claims	Vehicle mileage records	Plant fuel usage records	Invoices, POs, job codes, and/or BoMs
Data provider	Facilities manager	H&T staff & operatives	HR	Fleet manager	Plant manager	Purchasing staff
Organisation(s)	LCC & contractors	LCC & contractors		LCC, contractors, & subcontractors		LCC, contractors, & subcontractors

To ensure high quality, data must be:

- Verifiable - records favoured over estimates.
- In statistically significant quantities.
- Accurate – data gaps & inconsistencies will be followed up and rectified.

Best-practice approach to carbon baselining

- Alignment with standards incl. EN 15978 and PAS 2080.
- Carbon factors shared with FHRG Carbon Analyser.
- Validated against target of 90-95% of emissions at 80% confidence level – next slide, shared with Wessex.

INDEPENDENT VERIFICATION BY FHRG – FHRG RESEARCH CERTIFICATION FRAMEWORK

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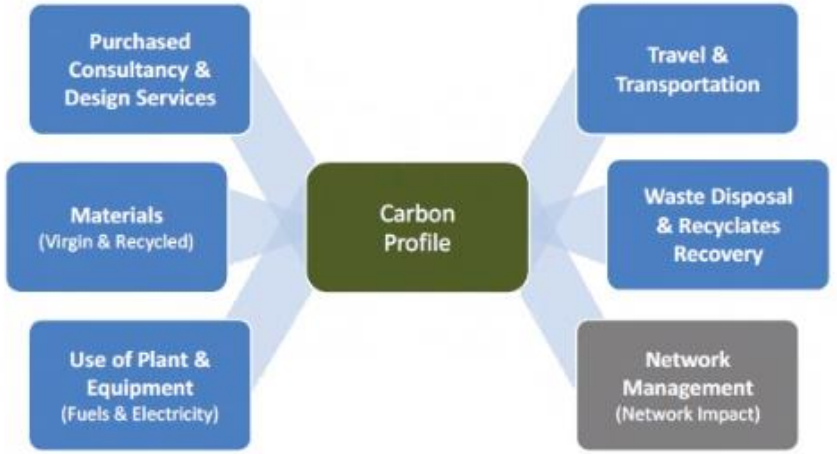
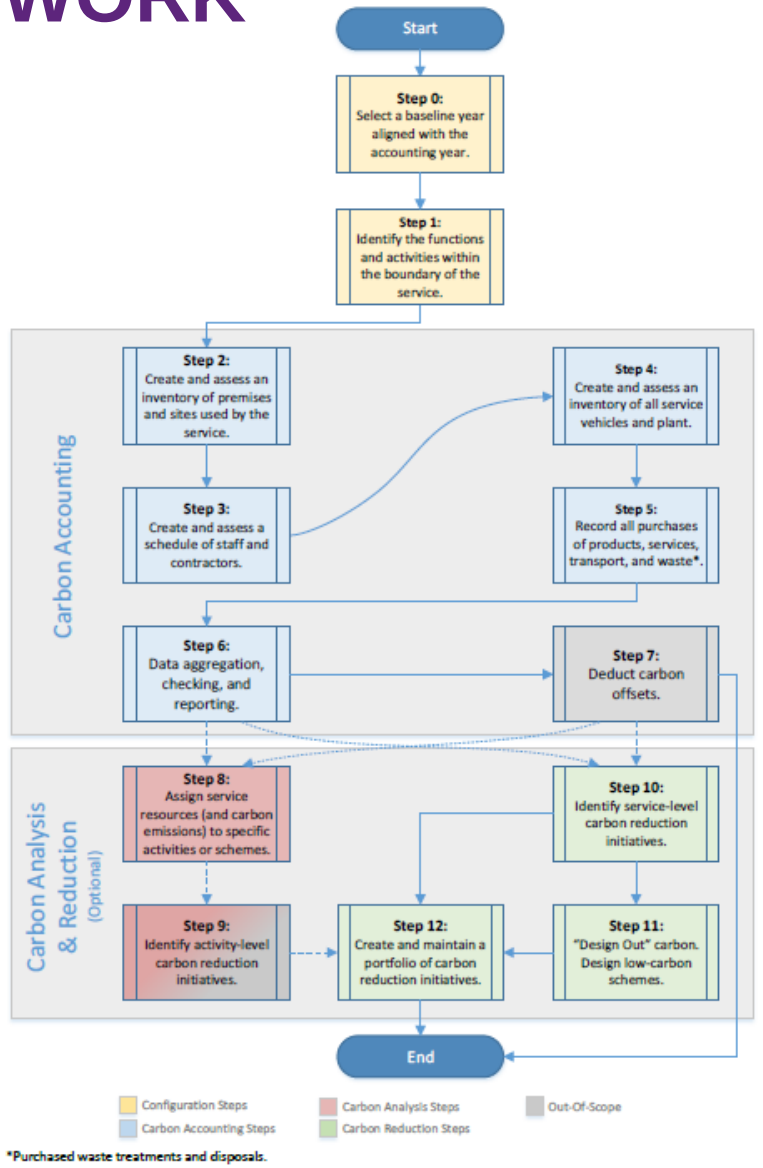
- FHRG to provide support for the duration of the Live Labs including:
  - ➢ Independently assessing the CHL carbon baseline footprint assessments
  - ➢ Independent **retrospective** assessment and certification of experimental carbon profiles for veracity, accuracy, and completeness
  - ➢ Broader assessment framework for both BAU & experimental profiles to include carbon intensity, costs, operational longevity, and data sources confidence
- Provides a direct benchmark using analogous inventory modules and same carbon factors – results from CHL should match those from FHRG Carbon Analyser





Ref. Carbon Calculation & Accounting Standard (CCAS)
Carbon Reporting Guidance for Local Highways Authorities

Dissemination and socialisation of outcomes to wider sector through FHRG membership

- Our programme has both synergies and contrasts with other Live Labs
- Most prominent is with Wessex (Doughnut Economics)
- We are looking forward to exploring how these can be leveraged for maximum benefit and VfM

Thank You

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