

Decision Equipped.

proving

ADEPT

Association of Directors of
Environment, Economy, Planning & Transport

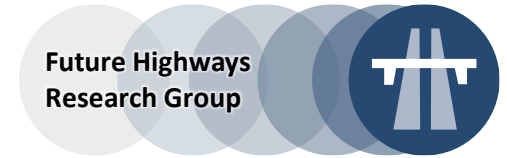
Highways
PART OF TRANSPORT NETWORK

Future Highways Research Group

Waypoint Meeting, Q1, 2021

ADEPT / Proving Research Partnership

Agenda

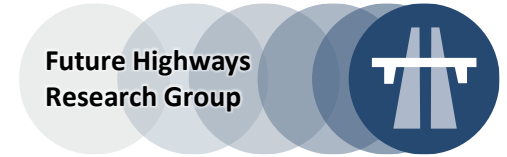


- **Welcome & Introductions (Hannah Bartram)**
- **ADEPT & Sector News (Hannah Bartram)**
 - ADEPT Sponsors Innovation Conference feedback.
 - BT Mesh Networking Projects (Business Case Sponsorship)
 - Highways Magazine (Research Portal, Research Collation & Publishing)
- **Individual Authority Updates (All)**
 - Members' news and announcements.
- **Highways Authority Challenges (Roundtable Discussion)**
 - What concepts and innovations are members exploring?
 - What economic impact do authorities expect from Covid-19?
 - Are there any other early signs of change within the market?
- **UK e-Scooter Trials: Initial Findings**
 - Issues, Opportunities & Future Expansion (Paul Hodgins, Ginger)

- **Break (10 Minutes)**
- **“Solar to Load”: Cases Review (SCC, CBN & SSE)**
 - Research Project Overview & “Solar to Load” Use Cases
 - Research Outputs & Findings
- **Research & Innovation Framework (SW)**
 - A framework for enabling private sector sponsorship.
 - Unified Innovation Route Map (SW)
 - Fair & Transparent Engagements (SW & Hannah Bartram)
 - Interested Private Sector Organisations (SW)

Agenda

Continued...



- **Benchmarking Club 2020 (AP)**
 - Update from the peer reviewers meeting (AP).
 - Assessments scheduling (AP).
- **New Technical Assessment (SW)**
 - Big Picture: New Technical VfM Factor Set (SW & HB)
- **Break (10 Minutes)**
- **Standardising Carbon (HB & Emma Pye)**
 - Understanding the timescales and challenges.
 - Developing a shared set of standards and tools.
- **Software Development: Toolsets Road Map (SW)**
- **A.O.B (All)**
- **Close**

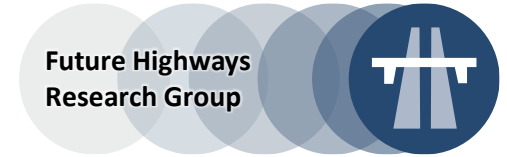
Welcome & Introductions

Hannah Bartram

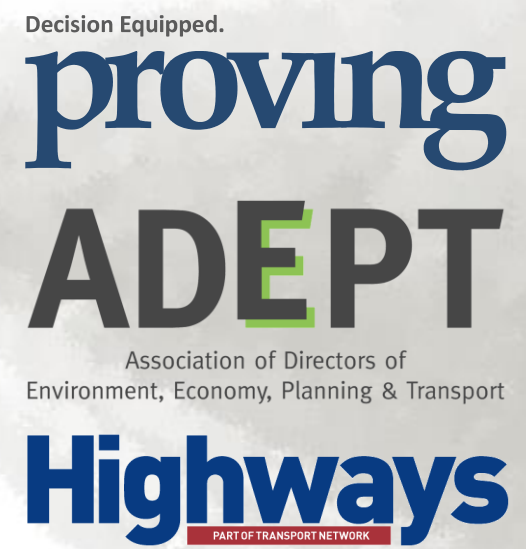
Sector News

ADEPT (Hannah Bartram) & Dominic Browne (Highways Magazine)

ADEPT & Highways Magazine News

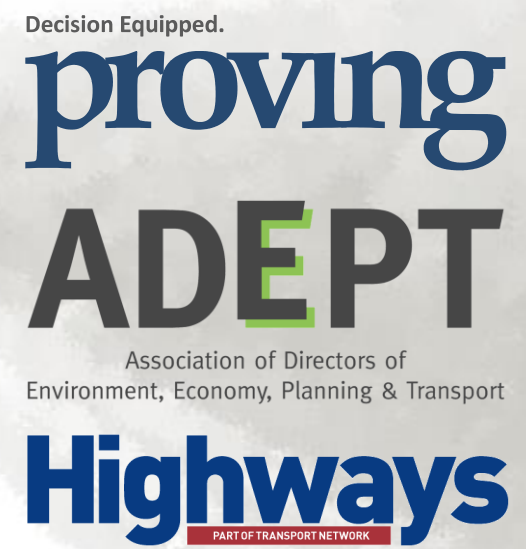


- **ADEPT News (Hannah Bartram)**
- **FHRG / Highways Magazine Collaboration (Dominic Browne)**



Individual Authority Updates

Members' News, Announcements & Updates

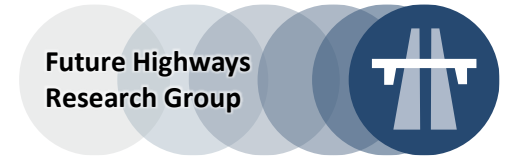


Highways Authority Challenges

Roundtable Discussion

Highways Authority Challenges

Roundtable Discussion



- **What concepts and innovations are members exploring?**
 - New partnerships and / or contracts?
 - New technologies and / or methods?
 - New market opportunities?
- **What economic impact do authorities expect from Covid-19?**
 - Impact on future funding?
 - Impact on resources utilisation / deployment?
 - Impact on services resilience?
- **Are there any other early signs of change within the market?**
 - Changing use of assets?
 - Changing internal structures (migration to mixed economy models)?
- **Any other business / sector changes and / or challenges?**

Ginger e-Scooter Trials: Initial Findings

Paul Hodgins, Ginger



GINGER

12



JANUARY 2021

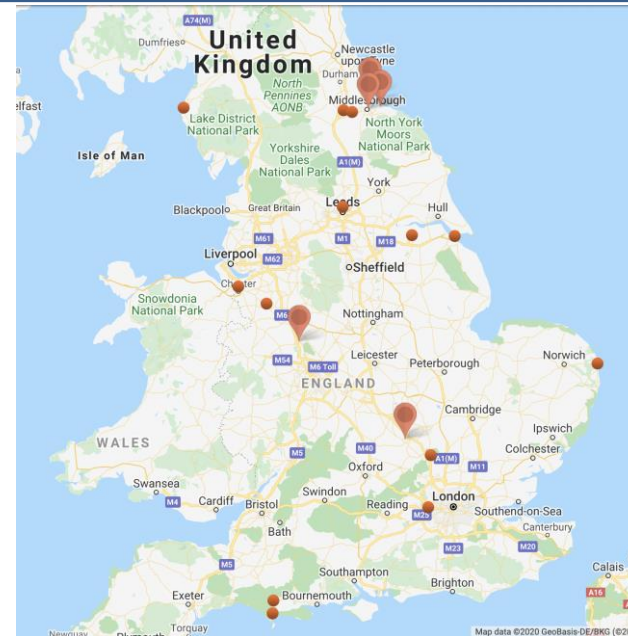
GINGER: OPERATES E-SCOOTERS ACROSS ENGLAND

- Ginger were the first operator in the country to launch an e-scooter service - in the Tees Valley in July
- Since July we have been awarded contracts to provide e-scooters in 16 regulated locations
- All deployments will use our fixed parking location model

GINGER EXISTING LOCATIONS

1. Middlesbrough
2. Hartlepool
3. Milton Keynes
4. Stafford
5. Whitehaven
6. Scunthorpe
7. Chester

GINGER UK

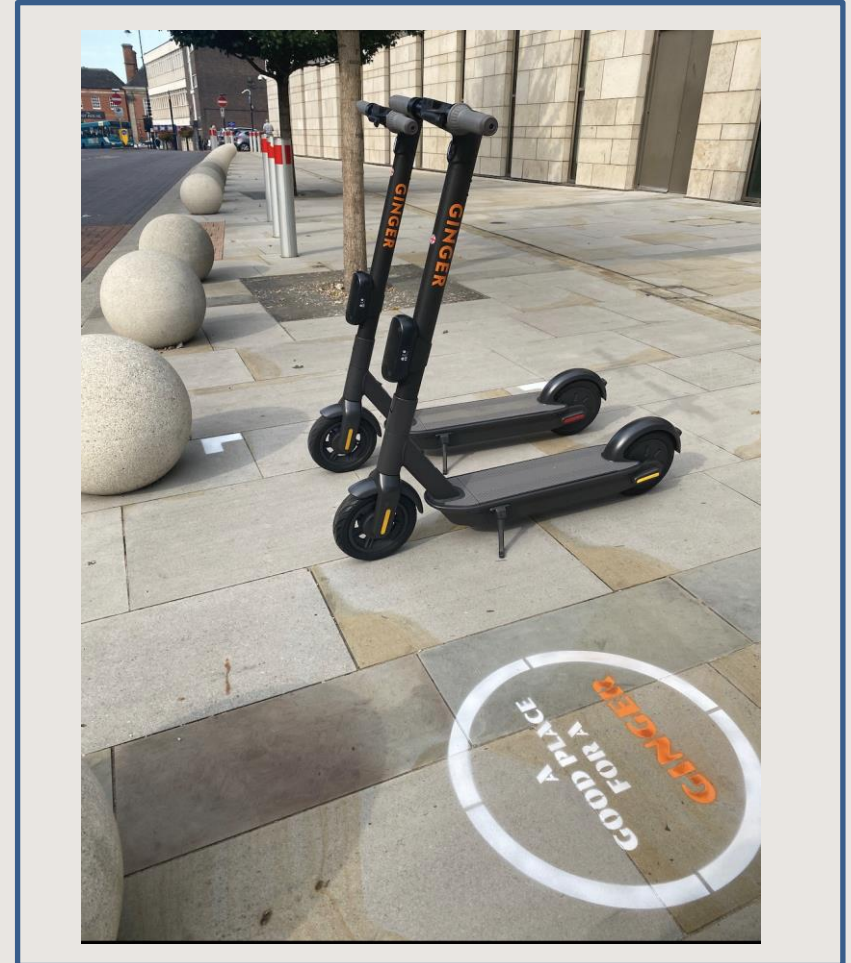


GINGER – KEY STATISTICS FROM OUR DEPLOYMENTS

MILES RIDDEN SINCE JULY 2020	180,000
NUMBER OF RIDES	33,500
AVERAGE RIDE LENGTH (DISTANCE)	4.2 miles
AVERAGE RIDE LENGTH (TIME)	37 minutes

GINGER – WE OPERATE A FIXED PARKING BAY STRUCTURE – ELIMINATING STREET CLUTTER AND THE STANDARD SCOOTER PAVEMENT OBSTACLE COURSE

- We only allow scooters to start and finish in fixed locations
- A location is marked on the street and enforced using GPS powered Geofencing
- There needs to be no physical infrastructure
- We believe it's the **only** way to run a scooter fleet safely and efficiently for **all** stakeholders – especially as a fleet scales
- With over 180k miles ridden we have yet to have a single complaint of poor parking in any of our fleets

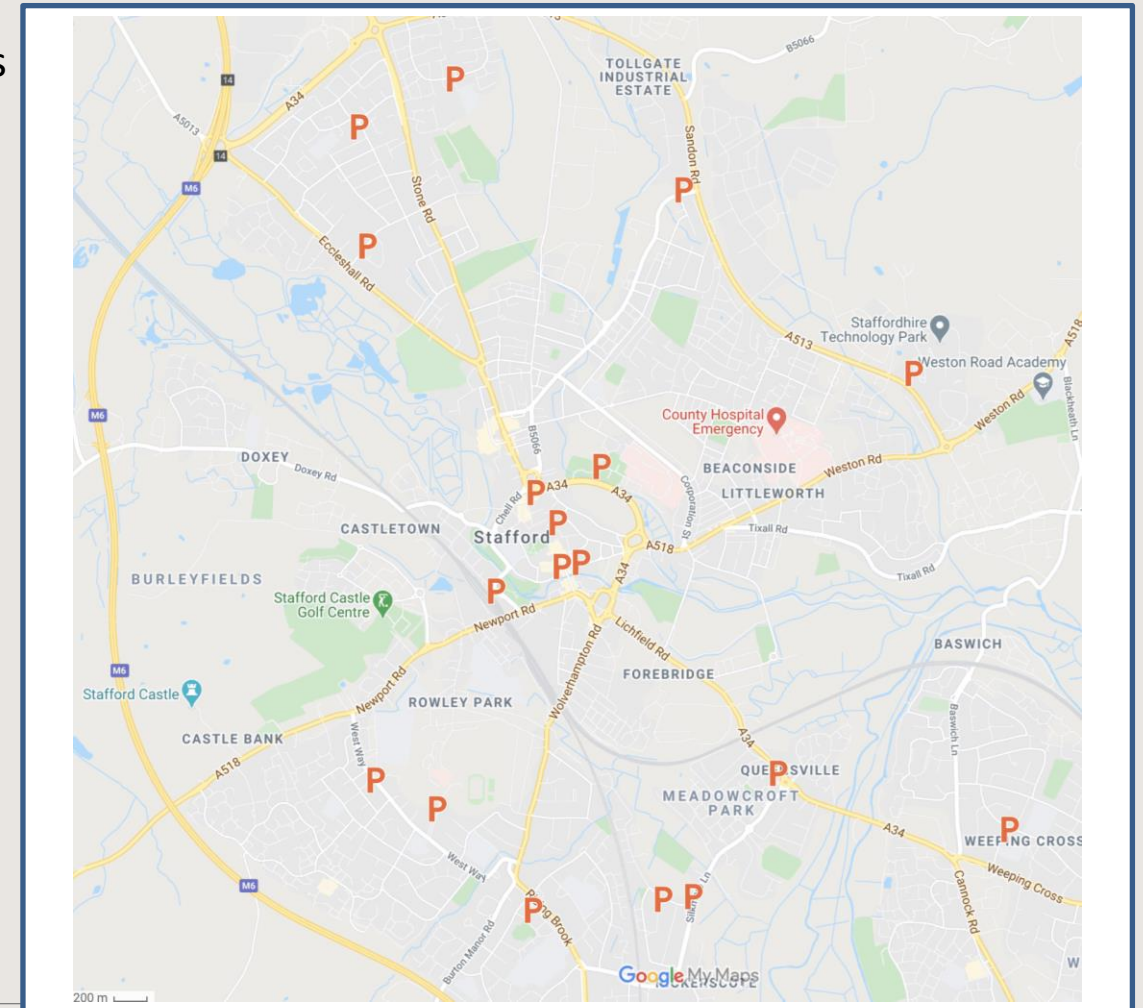


GINGER – A FIXED PARKING BAY STRUCTURE ALLOWS A CONNECTED TRANSPORT INFRASTRUCTURE TO BE BUILT

- An e-scooter network needs to support the existing transport infrastructure
- Connecting key locations together is vital for the system to work properly
- Only through integration can the system deliver **genuine Modal Shift**
- Key locations that in our experience must be included in any successful network
 - Bus stations
 - Train stations
 - Key work locations
 - Key shopping locations
 - Residential locations

GINGER – STAFFORD IS A PRIME EXAMPLE OF A TOWN WHERE E-SCOOTERS CONNECT THE TOWN TOGETHER

- Stafford suffers from major congestion due to traffic pinch points
- An extensive cycle lane infrastructure exists to encourage modal shift
- 18 E-scooters parking bays have been established to connect to cycle lane infrastructure and key destination points
 - Stafford Station
 - Stafford General Hospital
 - Main shopping zones
 - Key residential areas
 - Key work areas
 - Key leisure facilities
- The bays support a fleet of 85 scooters



GINGER – A BAY SYSTEM ALLOWS FOR ACCURATE PLACING OF SCOOTERS TO ENCOURAGE MODAL SHIFT – AND ALLOWS FOR DETAILED ANALYSIS OF MODAL SHIFT

- Bay monitoring allows us to understand not just the bay performance – but the behaviour of users
- This analysis allows us to understand modal shift taking place within the system...and which bays are more useful for driving modal shift
- Early data from Stafford indicates evidence of modal shift taking place
 - **56% of journeys are point to point (indicating modal shift)**
 - **44% of journeys are circular (indicating leisure trips)**
 - Longest distances are from bays with more direct journeys

Parking Bay	Average Distance	Circular Journey Count	Direct Journeys	Count
Post House	2.82	22	Total	35
			Post House to City Council	7
			Post House to Gaolgate	1
			Post House to Highfield	6
			Post House to Isobel Trail	1
			Post House to Old Rickerscote Ln	2
			Post House to Rising Brook	4
			Post House to Rowley Park	1
			Post House to Silkmere Ln	2
			Post House to Silmore CC	2
			Post House to St. Georges	2
			Post House to Stafford Station	7
City Council	2.6	13	Total	10
			City Council to Holmcroft Shops	1
			City Council to Market	2
			City Council to Parkside Ave	3
			City Council to Post House	1
			City Council to Rising Brook	2
Tech Park	4.4	9	Total	8
			Tech Park to Bodmin Avenue	3
			Tech Park to Post House	1
			Tech Park to Rising Brook	1
			Tech Park to St. Georges	2
Bodmin Avenue	5.02	13	Total	13
			Bodmin Avenue to Parkside Ave	5
			Bodmin Avenue to Post House	2
			Bodmin Avenue to Stafford Station	2
Market	3.3	2	Bodmin Avenue to Tech Park	4
			Total	10
			Market to City Council	2
			Market to Holmcroft Shops	1
			Market to Old Rickerscote Ln	2
			Market to Post House	3
			Market to St. Georges	1
			Market to Stafford Station	1

GINGER – THERE IS A DANGER THAT HIGH USAGE PRICES PREVENT SCOOTERS FROM BECOMING A GENUINE ALTERNATIVE TO STANDARD TRANSPORT OPTIONS

- Key to the success of a scooter deployment is “**genuine affordability for all**”
- We believe that it must be affordable on a daily multi use basis
- Too high a price per minute **excludes** key demographics, **lowers** adoption and drives **occasional** rather than **regular** use
- Ginger charges £2 for 20 minutes riding – c. 3.5 miles
 - It’s easy to understand and budget for
 - It’s equivalent to public transport

GINGER – DETAILED DEMOGRAPHIC ANALYSIS IN MIDDLESBROUGH SHOWS EARLY SUCCESS IN MAKING E-SCOOTERS A TRANSPORT OPTION FOR ALL INCOME GROUPS – AND FOR NON STUDENT GROUPS

- Middlesbrough is the most deprived Local Authority in England
- Lower car ownership on average than most places in England
 - Central Middlesbrough has on average 0.5 private cars per household
- **Vital** that an e-scooter transport alternative meets income challenges of local community
- December 2020 rider research shows:
 - **82% of riders earn less than £30k**
 - **62% of riders earn less than £20k**
- This is not driven by heavy student usage:
 - **55% full/part time employed (47%/8%)**
 - **10.5% unemployed**
 - **24% student**

SURVEY CONDUCTED DECEMBER 2020: 22% RESPONSE RATE OF ALL RIDERS WHO'VE TAKEN AT LEAST 1 RIDE

GINGER – HOWEVER IT ALSO REVEALS THAT WORK NEEDS TO BE DONE TO ENCOURAGE UPTAKE AMONGST WOMEN – AND AMONGST THE OLDER GENERATIONS

- **Gender:** **71% of riders are male**
 - **Age profile:** **67% of riders are <30 years old**
 - **Typical user:** **Male, 20-24 years old (30%)**
-
- Whilst 4,000 rides have been ridden by the over 40s and our oldest reported rider is 65 there is work to do to get wider acceptance
 - Marketing campaigns are being designed to address the barriers to take up amongst women and the older
 - This will include specifically targeted training courses to build confidence and skill amongst "reluctant rider"

user groups

- We will be trialling a rural e-scooter solution with Staffordshire County Council from March
- Two core locations – both c. 10 miles from Stafford town centre
 - Both have significant daily travel volumes to Stafford town centre, are connected by cycle infrastructure – and are underserved by public transport
- We will be testing three key factors:
 - Public acceptance of e-scooters as a realistic alternative to public and private transport in rural areas
 - Commercial viability of an e-scooter service without Local Government support
 - Key infrastructure requirements to drive success

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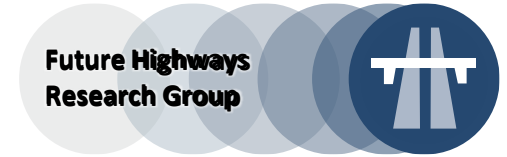
Comfort Break

5 Minutes

“Solar to Load”: Cases Review

SSE, Suffolk County Council & CBN

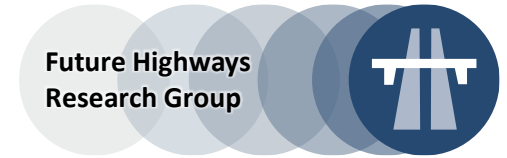
Activity Review



- **Overview of the research assignment.**
 - Partners and roles.
- **Lessons learnt.**
- **Template business cases (strategic outline).**
- **Next steps.**
 - Rapid opportunities assessments.
 - Outline business case tailoring.
 - Programme development toolkit.
 - Working with CBN and SSE.

- **SSE have sponsored Proving Services to develop business cases for both solar to load and Electric Vehicle Hub case study.**
- **As SSE have past experience in working with Local Authorities in delivering similar projects, SSE have sponsored this piece of work to establish a strategic outline business cases that can be replicated across local authorities.**
- **SSE have provided Proving Services with high level technical assumptions to support the development of business cases.**
- **These case studies can be deployed by Local Authorities looking to assess opportunities across local land, ensuring optimal commercial decisions are taken whilst accelerating the journey towards Net Zero.**

Research Collaborative: Partners' Roles



- A research and feasibility project using the principle of value exchange (ie, realised value of land owned by the council) as a means to secure short-term revenue for Suffolk CC
- Target to reduce barriers to rapid decarbonisation and stimulate commercial investment in a way that encourages innovation.

SSE Enterprise

- Project sponsor
- Technical and commercial advice.
- Gaining understanding of LA drivers and needs.

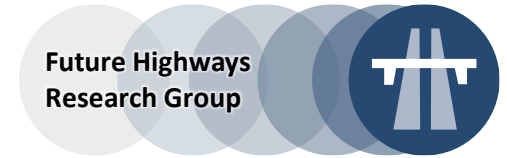
SCC

- Access to land with potential for value exchange from agricultural use to renewable energy.
- Assessed 58 sites (over 5,200 Hectares) for solar to load, wind generation and biomass generation.

Proving/CBN

- Proving Services: research project coordination and management.
- CBN: specialist consultant in infrastructure services, innovative business models and '5 Case' Development.

SCC's Objectives



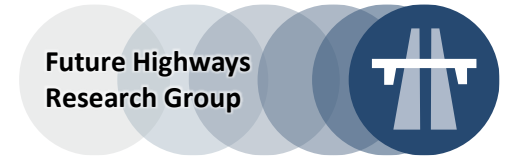
Background

- **Climate Emergency declaration, net zero by 2030 for own emissions.**
- **Cabinet Direction – July 2020**
- **“to develop and implement an investment programme to maximise renewable energy generation on the SCC estate (and to) investigate the feasibility of supplying our own energy needs by 2030”.**

Approach

- **Pragmatic, systematic review of agricultural holdings.**
 - Seeking external support/advice.
- **Portfolio approach – not ‘cherry picking’.**
- **Financial returns in context of parallel response to Suffolk Climate Emergency Plan**
 - As it develops (expected Spring 21).

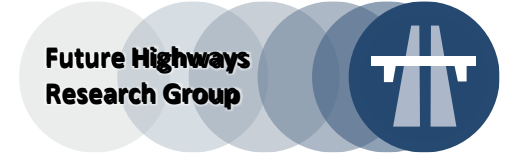
Suffolk Climate Emergency Plan



Theme	Suggested action
Grow local renewables capacity	Plan positively for renewables
	Support community energy
	Set a renewables/local ownership target
	Biodiversity net gain policy
Grid modernisation	Increase grid capacity for new connections
	Network innovation
	Local Area Energy Planning
National power infrastructure	Withhold support from fossil fuel infrastructure
	Promote Suffolk's nationally significant renewables
	Low carbon economy and skills
Public sector leadership	Renewables on public sector land/buildings
	Buy power from local renewables
Encourage and enable action	Renewable energy advice service
	Collaborating and convening
	Establish climate emergency fund for renewables

Summary of draft priority actions: energy sector.

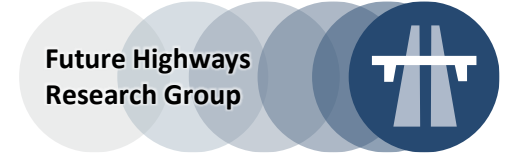
Lessons learnt



- **Cases explored (case studies).**
- **Challenges and opportunities.**
 - Costs.
 - Risks and barriers to success.
 - Business benefits (focusing on cashable benefits).
 - Strategic and social value outcomes.
- **Key considerations for the business case.**
- **Lessons for other authorities.**

Creating Template Business Cases

Illustrative 'Templates', Based On Real Sites



Approach

- Rapid opportunities assessments.
- Reusable template business cases.
- Identify 'programme development' toolkit.
 - Market and technical information from industry partner
 - 5 Case Template for Treasury 'Green Book'

Cases Considered

- 'Solar to Load'
 - Nearby Big Industrial "Off-taker".
 - Transfer over local network (for a fee) for LA use ("Sleeved").
 - "Wholesale" sell to grid (Grid Spill).
- Electric Vehicle Hub – owner operator model on LA land with solar and storage.
- Early look at battery storage for supporting distributed network development.

Suffolk Solar Farm Example



- **Total site size over 50 hectares.**
- **Nearby major off taker (<3 km away).**
- **5MW estimated demand from off-taker, which would require the use of only 9ha.**
- **The areas shaded blue shows the land in SCC's holding that is Agricultural Grade 3 or 4 and therefore potentially available as a solar farm.**



Solar Farm Project: Illustrative Example

Cost Benefit Summary (Different Operating Models)

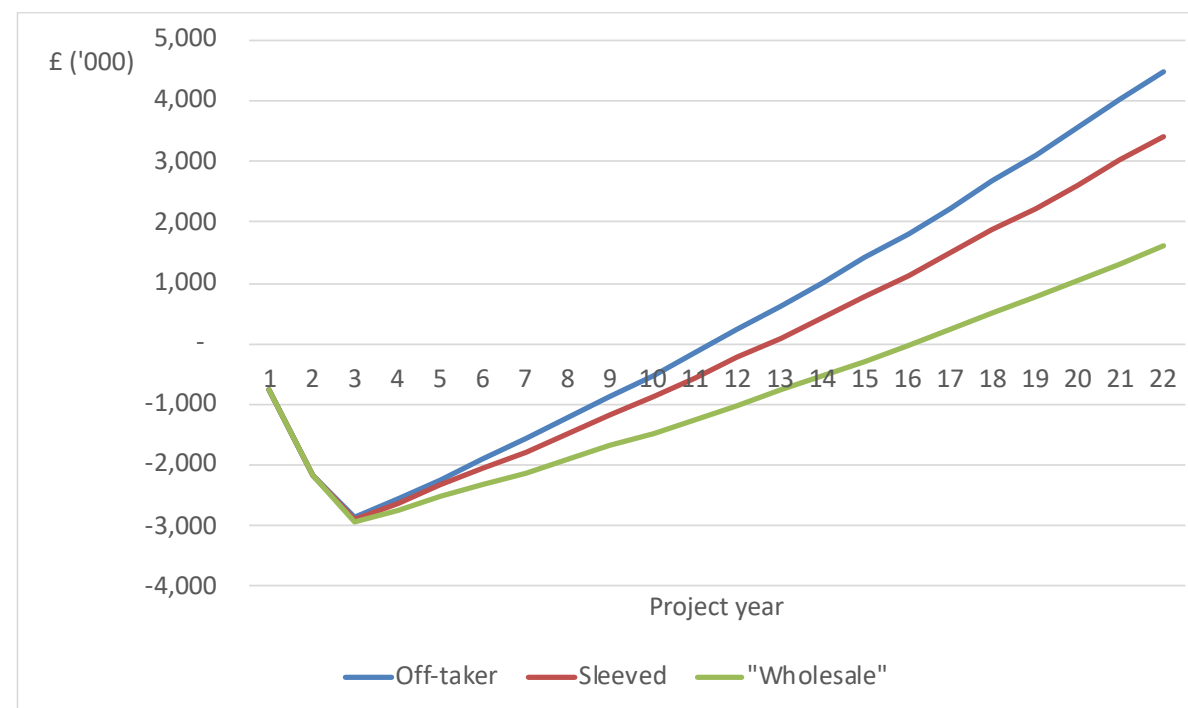
Project Cost Benefit Summary

Project Costs - NPV 20 years	(£)
Capital Expenditure	2,668,794
Upfront Project Costs	126,326
Operating Expenses	1,536,012
Lifecycle cost of solar project	4,331,133

Project Revenues - NPV 20 years by commercial model	PPA nearby direct offtaker	PPA - Sleeved	"Wholesale" to grid
Project Revenues	7,062,158	6,187,897	4,701,653

Net Project NPV	2,731,025	1,856,764	370,520
------------------------	------------------	------------------	----------------

Project IRR (pre-finance costs)	9.51%	7.64%	4.03%
Payback time (years)	12	12.5	16
Leverage	1.63	1.43	1.09



EV Hub

Illustrative Example

- **EV Hub** located near a main arterial route with associated retail site with good access and amenity benefits
- Solar farm to power the Hub located in nearby fields with associated storage
- Additional solar could be added beyond needs of EV hub (not modelled – would need an off-taker nearby)
- EV charging likely to become part of our social infrastructure
- EV charging enables areas to de-carbonise transport
- And there may be an attractive investment opportunity.



EV Hub

Potential Scale



- Illustrative example showing an area of 53 ha of LA owned land close to a busy highway.
- The EV hub example would require only 2.5 ha for a 1.4 MW solar farm (ie less than 5% of LA land in this case) – shown in blue and would be linked to a nearby existing retail location.
- Available for public charging 0600 – 2100 and for local authority or fleet anchor tenant 2100 – 0600.
- Models strongly place and utilisation dependent.

EV Hub: Illustrative Example

Cost / Benefit Summary & Cashflow



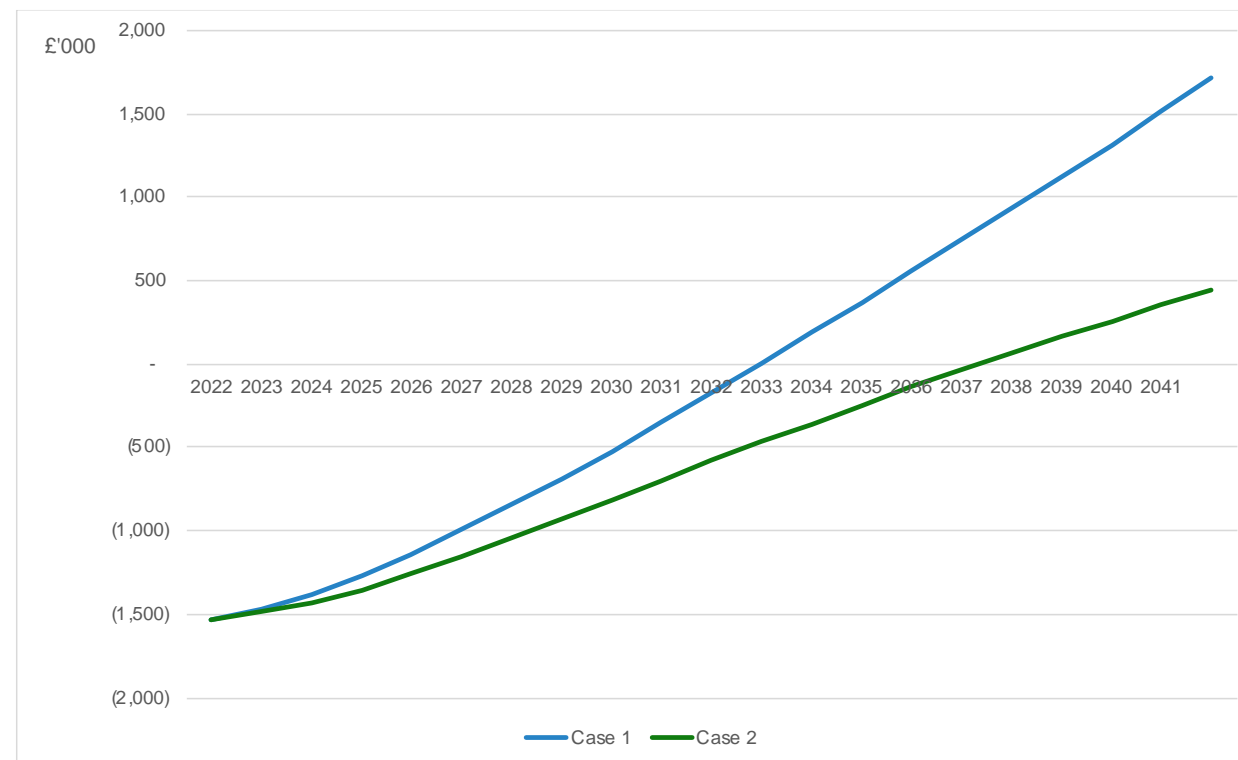
Project Cost Benefit Summary

Project Costs - NPV 20 years	(£)
Capital Expenditure	1,425,000
Upfront Project Costs	98,000
Operating Expenses	921,028
Lifecycle cost of solar project	2,444,028

	Case 1 (£)	Case 2 (£)
Project Revenues - NPV 20 years	3,704,769	2,488,037

Net Project NPV	1,260,741	44,009
------------------------	------------------	---------------

Project IRR (pre-finance costs)	7.22%	2.44%
Payback time (years)	11	16
Leverage	1.52	1.02



SCC “Value Exchange” Options



Trust the Market

- E.g.: Land value exchange
- ✓ Short-term cash
- ✓ Low risk
- × Zero control
- × No equity value

Meet the Market

- Eg, Joint Venture with commercial partner
- ✓ Medium-term clarity
- ✓ Benefit from commercial and technical expertise of industry partner
- × Shared risk
- × Trade-off on value

Manage the Market

- Eg, Determine and own the project, sub-contract operation
- ✓ Invest to save
- ✓ Own the asset
- ✓ Long-term control
- × Short-term revenue returns may be harder to realise
- × Buy in technical support
- × Own the risk

- **Rapid opportunities assessments.**
- **Template business case tailoring.**
 - Generic, reusable models.
- **Programme development toolkit.**
 - Five Case elements of the HM Treasury 'Green Book' business case and guidance for its completion.
 - Adaptable to address specific needs and aspirations of individual local authorities.
- **Working with CBN and SSE.**

Energy Development Options

SSE specialise in developing revenue producing assets on variable land types for Local Authorities, accelerating their journey toward Net Zero.

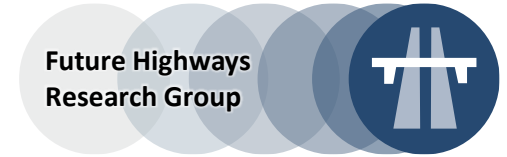
	CHP/heat network	Solar PW	Solar CPPA	EV Hubs	Battery storage
Grid connection	✓	✓	✓	✓	✓
Construction access	✓	✓	✓	✓	✓
Suitable for brownfield sites	✓	✓	✓		✓
Dual use	✓	✓	✓	✓	
Large land footprint (plus 25 acres min)	✓	✓	✓		
Particular topography		✓	✓	✓	
Location specific	✓	✓		✓	
Planning complexities	✓	✓	✓		
South facing		✓	✓		
Close to large electricity demand (within 3km)	✓	✓			
Public highway access	✓			✓	
Noise sensitivity	✓				✓
Does site need to be in close proximity to residential housing	✓				

Research & Innovation Framework

Private Sector Engagement

Private Sector Engagement

Opportunity & Benefits



- **Opportunity**

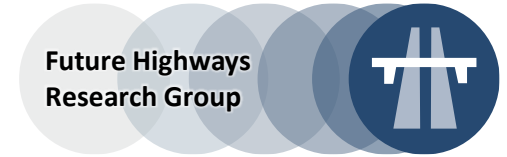
- Private sector organisations would like to participate in the research programme.
 - Based on feedback from the ADEPT Innovation Conference for ADEPT corporate partners.
- Current interests include, inter alia:
 - Creating new standards.
 - Collaborative methods and technologies development.
 - Product and services trials.
 - Issues and opportunities qualification and quantification.
 - Future relationships.
- Each area of interest spans multiple research themes.

- **Benefits**

- Increased research funding and “in authority” trials using new technologies.
- Greater access to a wider knowledgebase and experiences.
- Additional specialist resources for designing and embedding trials.

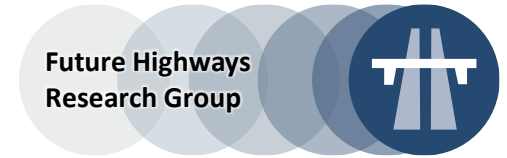
Private Sector Engagement & Collaboration

Proposed Protocols



- **Focus on trials that benefit the sector as a whole.**
 - Both private sector and public sector.
- **All trials are open to new concepts and ideas... from any organisation.**
 - Unless trials are specifically to test product / service claims.
- **All research outputs, including raw data, are made publicly available.**
 - “Warts and all” analysis and publishing.
- **Research processes will be required to follow FHRG protocols.**
- **All trials assessments are conducted independently by Proving.**
- **Trials must include sufficient project resources to conduct the research.**
 - Under the co-supervision of participating organisations.
- **Spring and autumn Innovation Conferences will provide a forum for corporate partners.**
 - ADEPT corporate partners cannot become FHRG members.

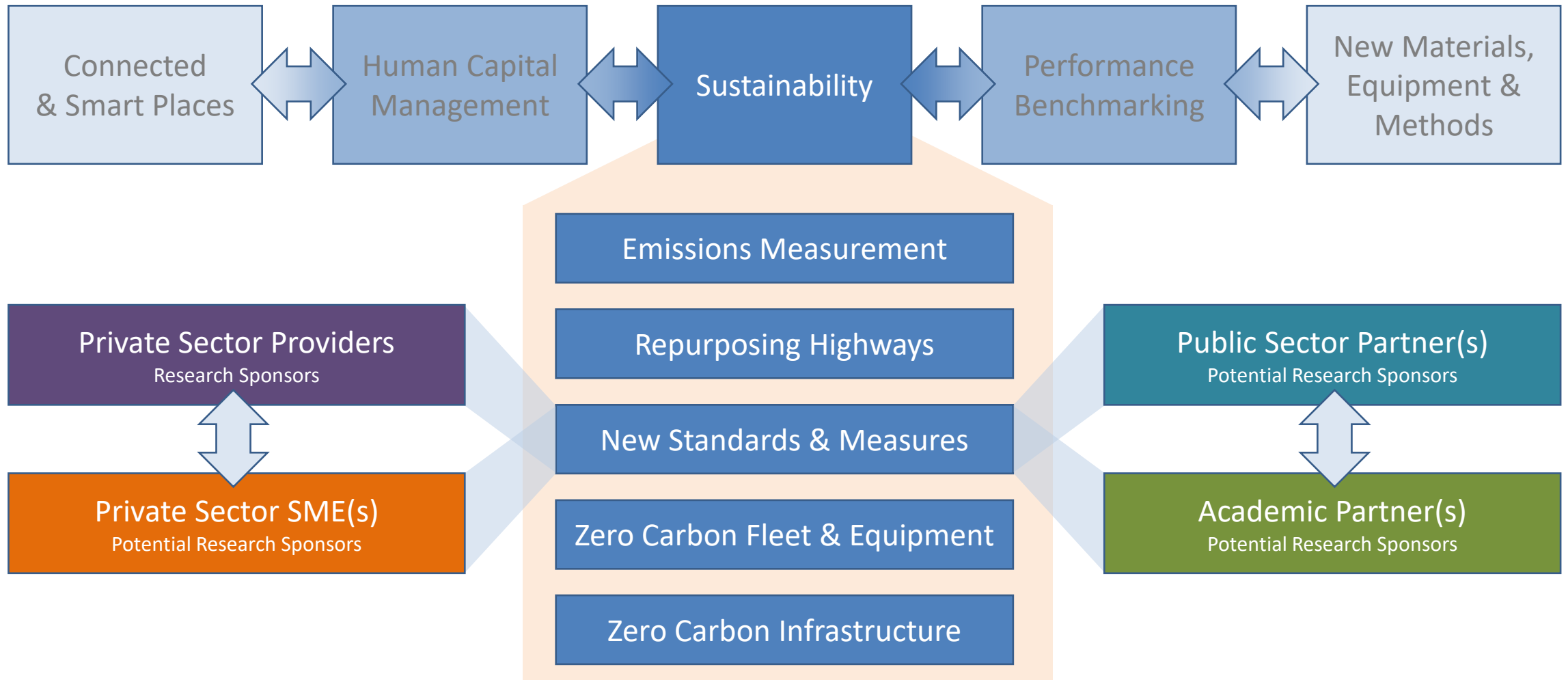
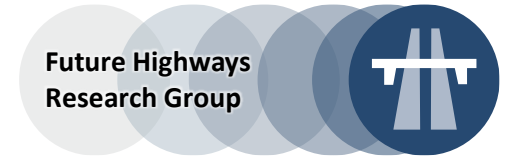
Research & Innovation Framework



Future Highways Research Group: High-Level Research Themes

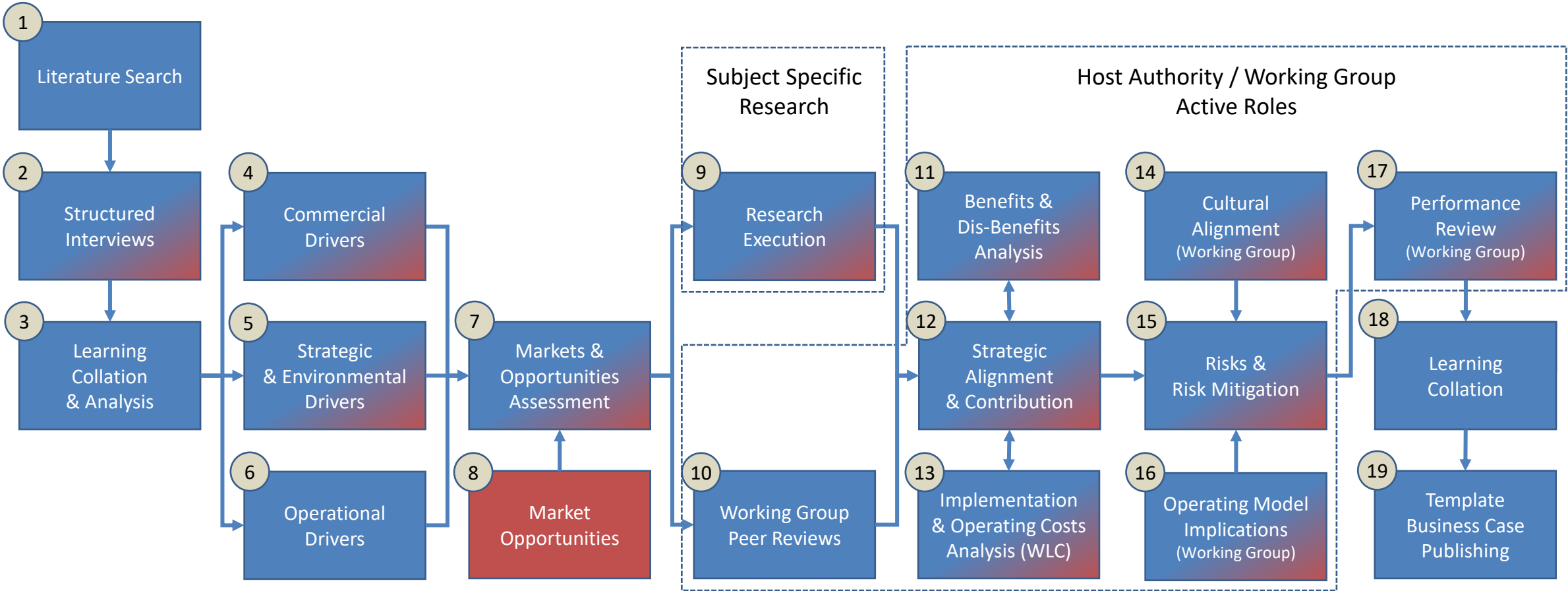
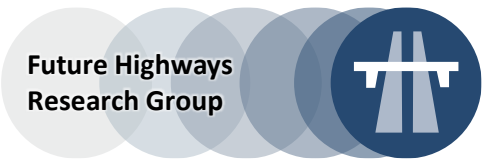


Research & Innovation Framework



Strategic & Technical Research Process

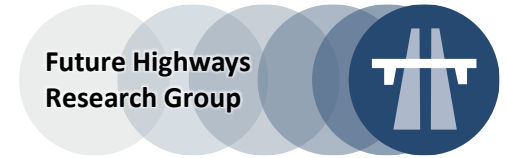
Unified Process, All Themes, Template Business Cases Development



Local Authority / Authorities (FHRG & ADEPT Members), Institutes & Academic Partners

Traditional Private Sector & New Entrant Partners (New Research Engagement Framework)

Research & Innovation Framework (RIF)



- **Do the members think a Research & Innovation Framework (RIF) is useful?**
 - For managing engagements.
 - For accelerating access to new technologies.
- **Where is research investment most needed?**

Proposed Next Steps:

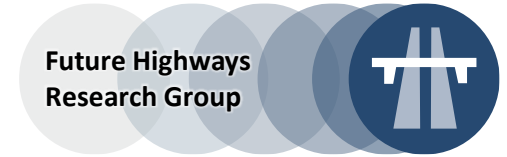
- **Create an expanded RIF for all themes and topics.**
- **Share the RIF with interested parties.**
 - Both public sector and private sector.
 - Agree the research assignments and future funding.
- **Consider the implications / benefits for Live Labs II.**

Benchmarking Club 2021

Update & Feedback

2021 VfM Assessments

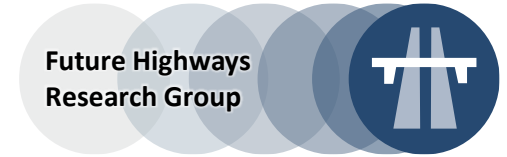
Scope and Format



- **Each Strategic VfM review will entail an assessment against the five standard VfM dimensions: Economy, Efficiency, Effectiveness, Strategic Value and Stakeholder Value.**
- **We will develop a separate dimension and factor set for Sustainability**
 - A finite number of key indicators pertaining to Sustainability may be incorporated into the relevant dimension(s) within the Strategic VFM Assessment.
- **No clear consensus at this stage of specific CQC and NHT metrics we might usefully incorporate but any specific metrics included should be outcome focused and aligned to local authority priorities.**
- **For virtual workshops, individual authorities will be consulted as to whether they wish to conduct the Stakeholder Scoring Workshop over one day or two.**
- **A pre-assessment information request will be issued to authorities six weeks prior to a review.**
- **This request will include or be complemented with a section for the Portfolio Holder to complete.**
- **Given the demonstrably independent nature of the VFM reviews, our recommendation is that members/the portfolio holder be involved at least in the Improvement Planning Workshop.**
- **Will look to schedule reviews for the period 1 Feb – 31 Aug 2021.**

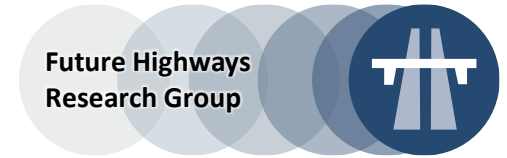
VFM Benchmarking Club

Peer Reviewers



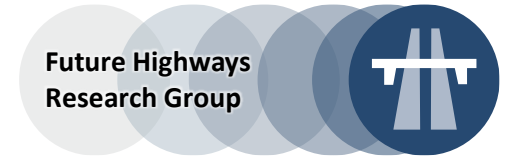
- **Andy Wilde - Shropshire Council**
- **Dave Farquhar - Bucks Council**
- **David Kinsey - Derby City Council**
- **David Laux - Northumberland CC**
- **David Walters - Staffordshire CC**
- **Jack Wiltshire - Dorset CC**
- **Jade Jones - Central Beds Council**
- **Jon Evans - Lincolnshire CC**
- **Kully Boden - Derby City Council**
- **Mark Stevens - LB Haringey**
- **Matt Davey - W Sussex CC**
- **Neill Bennett - Derbyshire CC**
- **Owen Jenkins - Oxfordshire CC**
- **Pat Clarke - Leicestershire CC**
- **Paul Rusted - Lincolnshire CC**
- **Steve Smith - Shropshire CC**
- **Tom Blackburne-Maze - Derbyshire CC**
- **Tom Gifford - Lincolnshire CC**

Peer Reviewers: Roles & Engagement



- **Lead and peer reviewers will be appointed to each review based on availability, and discussion with the reviewee authority about the type of peer background/skill set they would find most useful.**
- **Each review will be assigned two peer reviewers to maximise the breadth of expertise deployed and facilitate constructive challenge.**
- **The primary responsibilities of peer reviewers will be:**
 - Constructive challenge from a subject matter expertise (SME) perspective during the Stakeholder Scoring Workshop.
 - Review of the draft report and outcomes (draft produced by Proving)
 - SME support and advice during the Improvement Planning Workshop.
 - Submission to Proving of a one-page post assessment summary of general observations and best practice identified.
- **Peer reviewer succession planning will be assured through:**
 - Further opportunities for other FHRG members to join the peer reviewer cohort.
 - Peer reviewers nominating members of their own team to firstly observe and then assist in reviews.

Development of the Strategic Factor Set

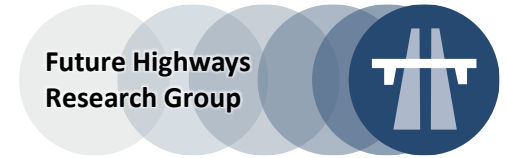


- **The peer reviewer group will review the existing standard factor set to:**
 - Ensure it remains contemporary and comprehensive.
 - Suggest qualitative factors that should be added or are no longer relevant.
 - Suggest a finite number of quantitative measures (NHT, CQC, CIPFA, DFT, APSE metrics etc.) that should be added.
 - Agree the correct descriptor for 'Good' for each factor (Proving will then recalibrate the descriptors for 'Excellent', 'Satisfactory', 'Requires Improvement' and 'Poor' accordingly).
- **In developing the factor set, we need to be cognisant of our desire to keep the process lean and focused; we do not want too voluminous a factor set.**
 - Function specific VFM assessments can be used where a deeper dive is required.
- **The factor set will be reviewed annually to reflect the pace of change in the sector and that what represents good value for money is continuously evolving.**

New Technical VfM Assessment

Factor Set Development

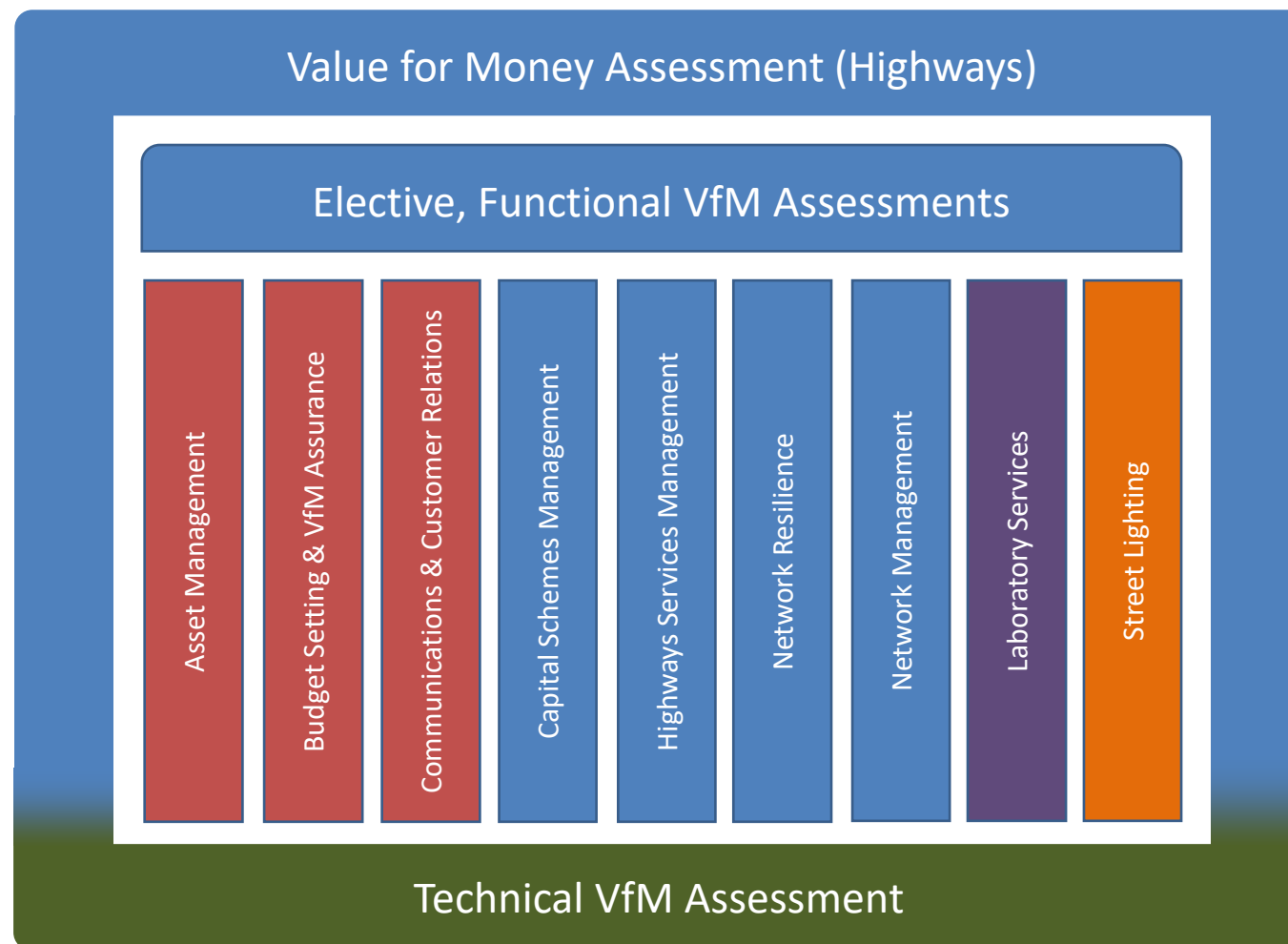
Development of the Technical VfM Factor Set



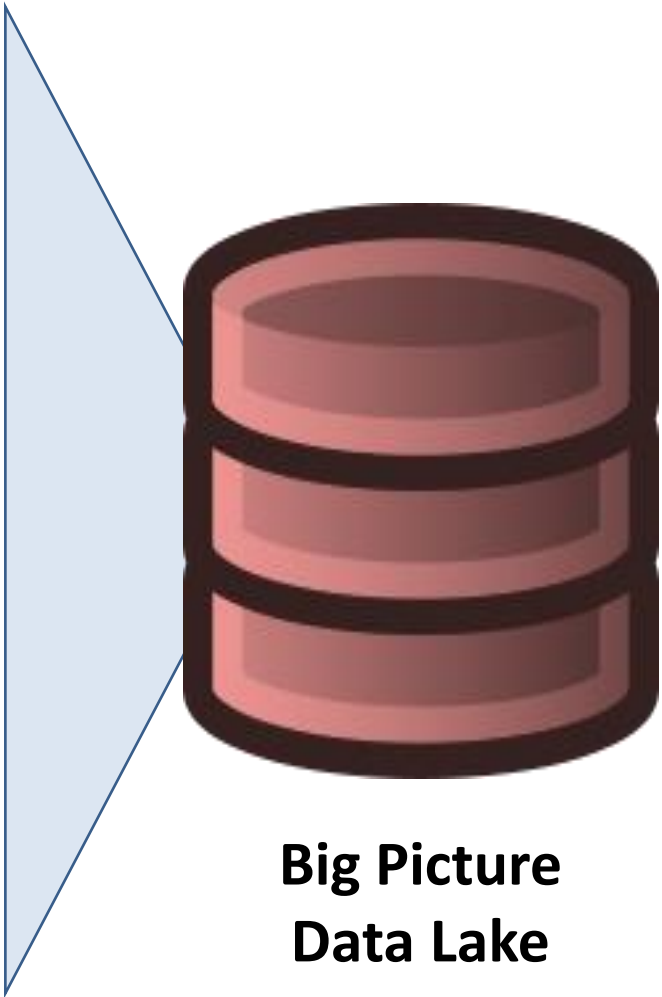
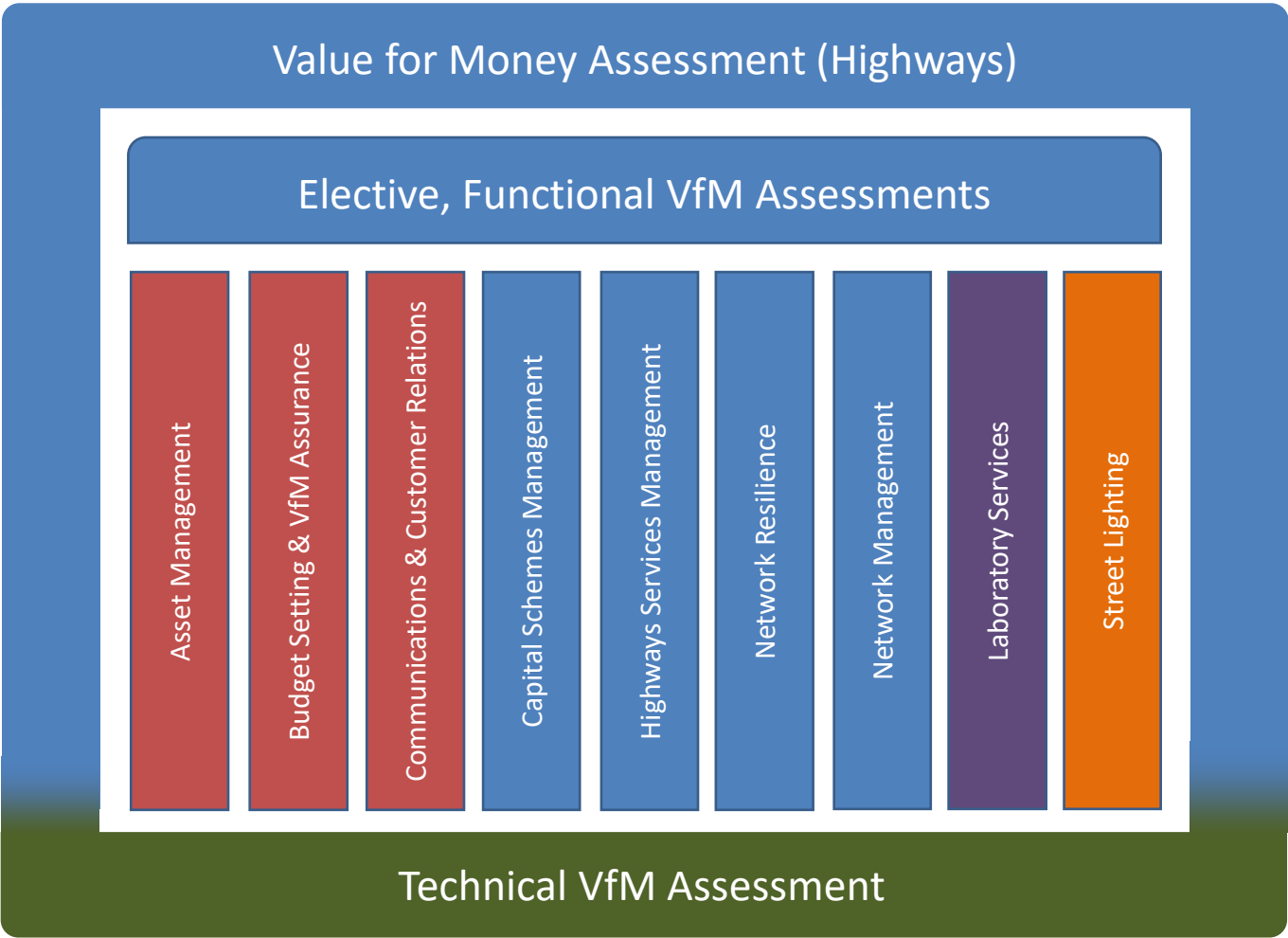
- **Unanimous consensus we should continue to develop the Technical Factor Set and that the wider FHRG should be consulted for suggestions and feedback at regular interval as factor set and methodology are developed.**
- **The proposed dimensions are considered the right ones:**
 - Asset Condition and Network Requirements
 - Performance of Materials
 - Performance of Methods
 - Performance of Workmanship
- **‘Assets’ must encompass all assets, not just roads.**
- **The assessment could usefully consider sustainability from the perspective of the revenue income streams available to support the ongoing maintenance of capital investment.**

Technical VfM Factor Set

Positioning & Purpose



Creating “Big Picture”



Technical VfM Factor Set

Part 1: Network & Operating Environment Profile



Sections & Factors	Value (Quantitative)	Score (Qualitative)	Dimension
Assets Profile, Condition & Network Requirements			
Network Profile (By Road Classification or Hierarchy: A, B, C, Unclassified)			
Length	Miles		Strategic Value
Condition	% RAG	X	Strategic Value
Condition RAG Vector (Improving / Declining)	% RAG	X	Strategic Value
Network Profile (Footways & Cycleways)			
Length	Miles		Strategic Value
Condition	% RAG	X	Strategic Value
Condition RAG Vector (Improving / Declining)	% RAG	X	Strategic Value
Bridges & Structures Profile			
Number In Use On Network	#		Strategic Value
Condition	% RAG	X	Strategic Value
Condition RAG Vector (Improving / Declining)	% RAG	X	Strategic Value
Asset Management Strategy & Funding			
Scale of Asset Expansion Programme	£M PA	X Range of %	Strategic Value
Scale of Asset Maintenance Programme	£M PA	X Range of %	Strategic Value
Weather & Weather Event Adjustments (Number of Events * Number of Days)			
Weather Event Adjustments (Winter)	#	X	Strategic Value
Weather Event Adjustments (Summer)	#	X	Strategic Value
Weather Event Adjustments (Flooding)	#	X	Strategic Value

Technical VfM Factor Set

Part 2: Materials Assessments

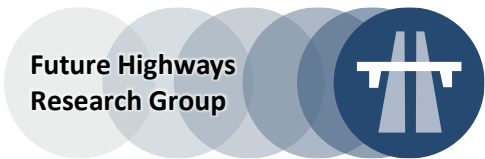


Material Profile			
Sourcing			
Quality of Procurement Processes		X	Economy
Quality of Provider (Materials At Point of Delivery)	# of Remedials	X	Efficiency
On Time Deliveries	%	X	Efficiency
Cost of Standard Material Procured	£K/M PA per tonne.		Economy
Cost of Proprietary Material Procured	£K/M PA per tonne.		Economy
Quantity of Standard Material Procured	PA, tonnes.		Economy
Quantity of Proprietary Material Procured	PA, tonnes.		Economy
Impact of Sourcing Policy / Strategy		X	Stakeholder Value
Trials of New Materials	# Per Annum	X	Strategic Value
Environmental Considerations			
Materials Recovery	%	X	Sustainability
Materials Recycling	%	X	Sustainability
Use of Secondary Materials	Type	Yes / No	Sustainability
Waste Materials Disposal	Tonnes	X	Sustainability
Reduced Temperature Mixtures	%	X	Sustainability
Scale of Haulage	%	X	Sustainability
Energy Consumption	KWh	X	Sustainability
Wastage	Tonnes	X	Efficiency
Environmental Impact (By Emission Type)			
CDE	CDE Tonnes	X	Sustainability
AQ	COMEAP Grade	X	Stakeholder Value

Repeated for four classes of materials: **Asphaltic Concrete, Hot Rolled Asphalt, Stone Mastic Asphalt, Thin Surface Course Material**

Technical VfM Factor Set

Part 3: Performance On Network Assessment



Repeated for each classes of highway (**A, B, C, Unclassified**)

Performance on Network			
Skidding Resistance (IL: Investigatory Level)	% Above IL	X	Stakeholder Value
Asset Treated By Reconstruction	%	X	Effectiveness
Asset Treated By Preventative	%	X	Effectiveness
Asset Treated By Resurfacing	%	X	Effectiveness

Technical VfM Factor Set

Part 4: Quality of Scheduling & Workmanship



Job Management

Cost Per Gang Per Day (Average)	£	X	Efficiency
Actual Number Visits Per Day (Average)	#	X	Efficiency
Actual Defects Per Day (Average)	#	X	Efficiency
Number of Aborted Visits	#	X	Efficiency
Number of Revisits	#	X	Efficiency
Jobs Cancelled In Adverse Weather	%	X	Efficiency

User Experience

Perceived Condition	NHT Feed	X	Stakeholder Value
Quality of Journeys	CSC Feed	X	Stakeholder Value

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Comfort Break

5 Minutes

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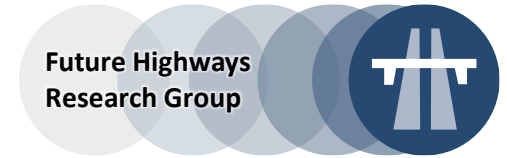
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Standardising Carbon

Dr Helen Bailey & Emma Pye

Introductions



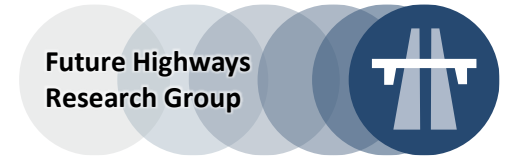
- **Helen Bailey FIAT, FIQ, FHEA, PhD CEng**

- Director of The Driven Company Associates Limited
- Programme Lead for Asphalt and Pavements, Derby University
- Materials Engineer, specialising in highways and product development
- Worked with major suppliers and TRL (UK and International)

- **Emma Pye FIEMA MSc CEnv**

- Director of PYE-Management Ltd (Protect your Environment)
- 20 years experience (15 years in Highways)
- Environmental expert specialising in systems
- Worked with Mouchel, Amey, WSP (May Gurney/Kier)
- Worked on local authority contracts for Suffolk, Bedfordshire, Hertfordshire, Northamptonshire etc.

Challenges for FHRG and ADEPT Members



- **Challenges**

- Fragmented approach to collection of carbon data across local authorities.

- **Due to the lack of standards, data that is captured is not always comparable.**

- Authorities are using many different tools for Scope 1 and Scope 2 analysis.
- Diverse measurement mechanisms and protocols lead to wildly different results.
- Different algorithms, and a lack of tailoring for highways services, leads to inaccurate calculations.

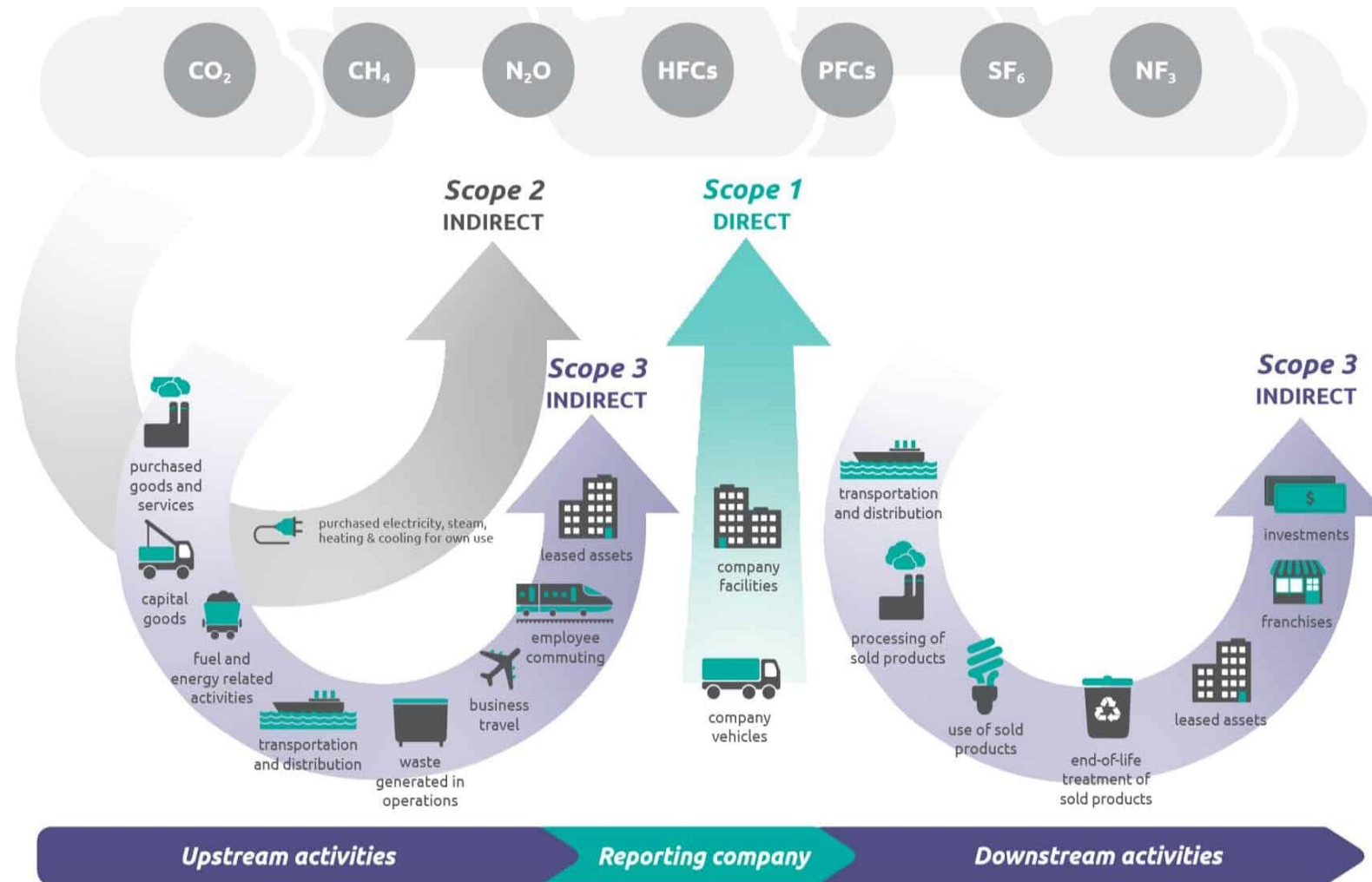
- **Carbon boundaries are unclear, leading to:**

- Data variation across the sector.
- Frustration!

- **Research Questions/Approach**

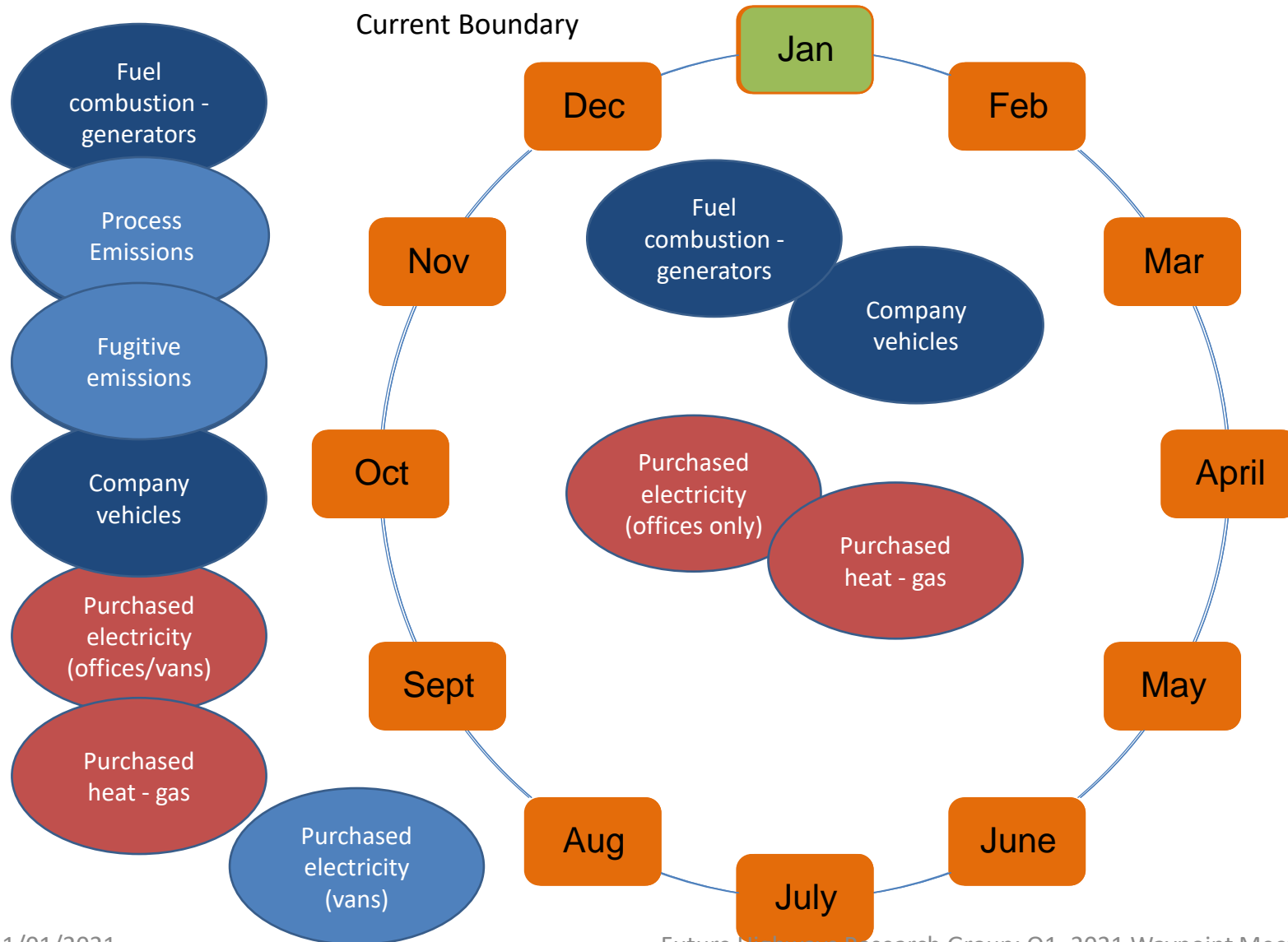
- Where can we get the data from?
- What to do if you can't get the data?
- Conversion factors – bespoke or gov.uk?
- What does this exactly include? Boundaries?

Defining Scope



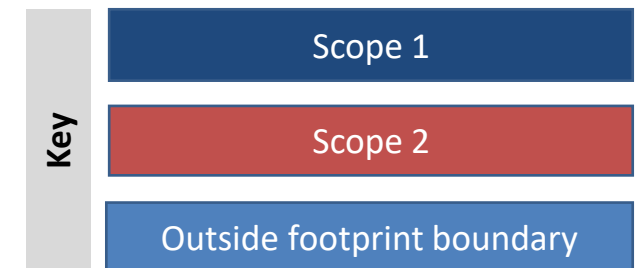
Problem Example

Scope 1 & 2



Scope 1: Direct emissions that result from activities within your organisation's control. This might include on-site fuel combustion, manufacturing and process emissions, refrigerant losses and company vehicles.

Scope 2: Indirect emissions from any electricity, heat or steam you purchase and use. Although you're not directly in control of the emissions, by using the energy you are indirectly responsible for the release of CO₂.

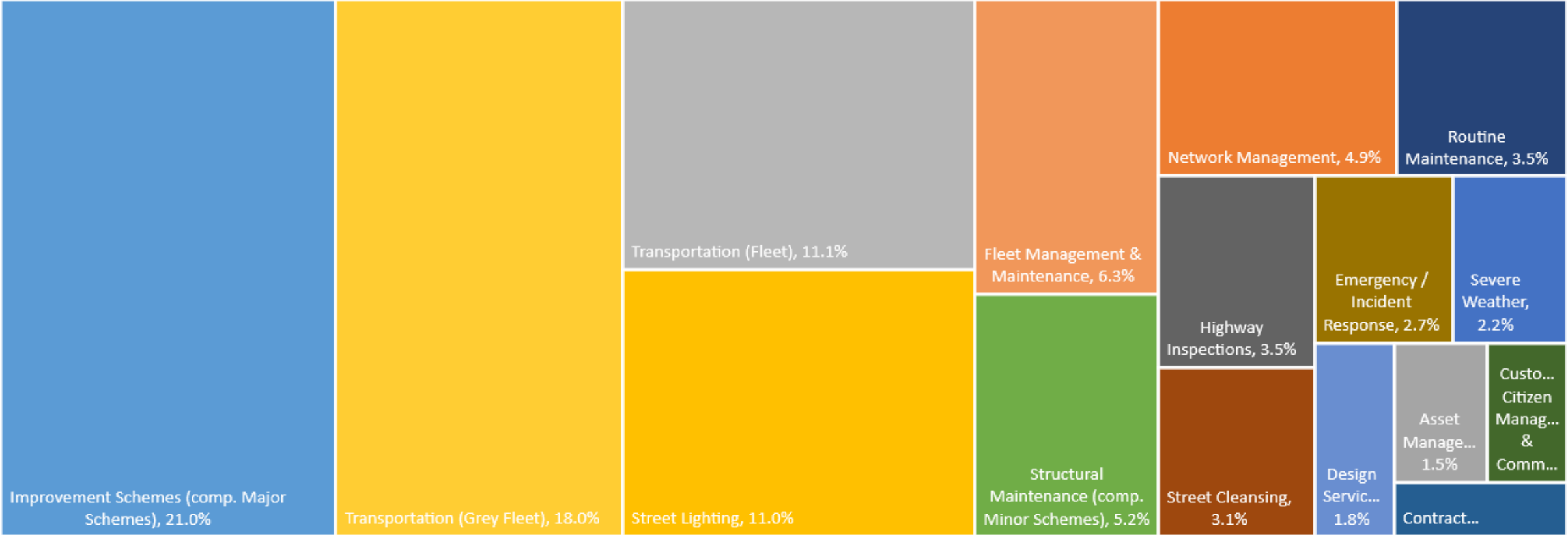


What is our baseline position?

Determining the Boundaries



% of Total CO₂ By Highways & Transportation Function



*Highways Agency (Replaced By Highways England), Cambridge to Huntingdon Improvement Scheme, Environmental Impact Assessment, August 2015

Standardising Carbon Measurement



- **Next steps**

- Establish boundary, review activities, common carbon emissions.
- Establish baseline position regarding available data (agree year).
- Gap analysis of carbon data across authorities.
- Drafting a standard approach for each activity for scope 1 and 2 only.

Understanding Our Current Position & Targets

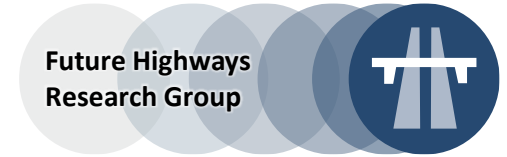
Authority	Climate Emergency Yes or No	Climate Change Target Date	GHG Protocol Scopes
Barnet LB	No	2050	1, 2 and 3
Bedford Borough	Yes	2030	1, 2 and 3
Buckinghamshire	Yes	2050	1
Central Bedfordshire	No	2030	1 and 2
Cheshire East	Yes	2030	1 and 2
Derby City	No	N/A	1
Derbyshire	Yes	2032	1 and 2
Dorset	Yes	2040	1, 2 and 3
East Sussex	Yes	2050	1, 2 and 3
Essex	No	N/A	1 and 2
Hampshire	Yes	2050	1
Havering	No	N/A	1 and 2
Herefordshire	Yes	2030	1, 2 and 3
Hertfordshire	Yes	N/A	1 and 2
Milton Keynes	No	2030	1, 2 and 3
Kirklees	Yes	2038	1 and 2
Leicestershire	Yes	2030	1 and 2
Lincolnshire	No	N/A	1, 2 and 3
Oxfordshire	Yes	2030	1 and 2
Northumberland	Yes	2050	1, 2 and 3
North Yorkshire	No	2030	1
Shropshire	Yes	N/A	1 and 2
Somerset	Yes	2030	1 and 2
Staffordshire	Yes	2030	1 and 2
Suffolk	Yes	2030	1 and 2
Surrey	Yes	2050	1 and 2
West Sussex	Yes	2030	1 and 3

The role of FHRG members:

- Present current carbon footprint process and data collection, including conversion factors (if available) through interviews/workshops.
- Peer review proposed draft standard and agree content.

Applications for Business Planning & Change

Standardised Approach: Advantages & Benefits



- **Aligns with the climate change research theme.**
 - Climate Change Impact Analysis & Response Management
- **Reduces costs, increased efficiency.**
 - Standardised approach... build once, available to all.
 - Creates a future standard for review and adoption by ADEPT.
- **Creating benchmarkable datasets.**
 - Enabling performance comparisons and tracking over time.
- **Ability to track path to net zero.**
 - A 'launchpad' for carbon reduction.
 - Highways... and beyond...
- **Used to inform the development of “Prospectus Builder”.**
 - Live Labs project.

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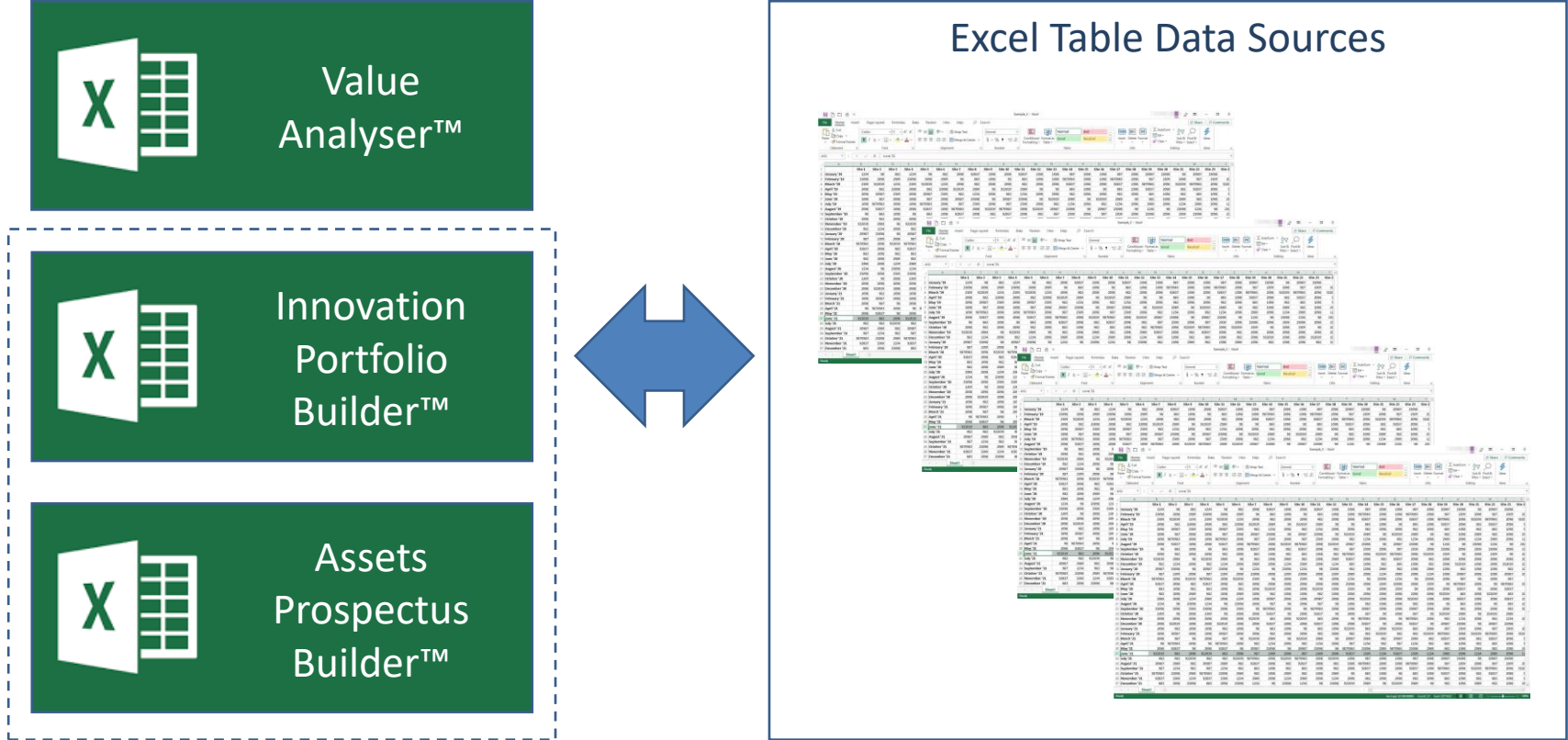
Highways

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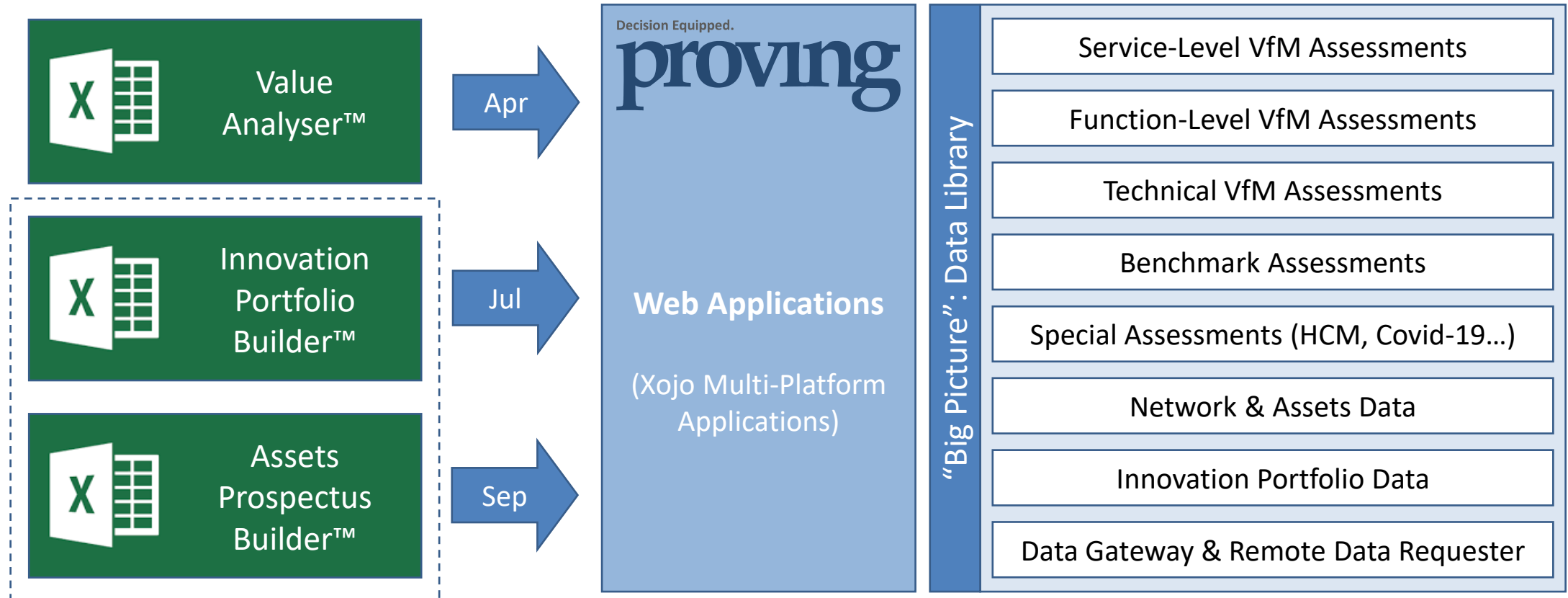
Software Toolset Roadmap

Web-Based Tools for FHRG & ADEPT Members

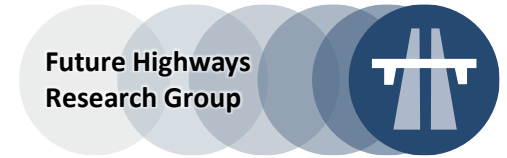
Current Toolsets & Data Sources



Future Web-Based Services



Benefits



- **Centrally managed applications and data.**
- **Continuously updated data libraries.**
 - Crowd-sourced new assessments and data.
- **Instant publishing of new assessments.**
- **Client-side ability to restrict access.**
 - To the applications.
 - To the data.
 - Ability to anonymise the data.
- **Remote data requesters for BI analysis.**
- **Free for FHRG members.**
- **Anonymised access to ADEPT members.**

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A small red rectangular box containing the text "PART OF TRANSPORT NETWORK" in white capital letters.

End of Document

Future Highway Research Group