An Attachment to Lamp Posts

Richard Webster MBA PGDMS
Suffolk County Council, UK

Suffolk –Overview

- 1500 sq miles (30miles x 50) Cities, Towns & Rural
- Population – 750,000
- 80,000 lights
- Smart controls (“CMS”) installed 2011-2012

Update Over Last 10 Years

- Part Night Lighting Extended
  - Supporting Academic Research
  - Crime Reduction
- European SLiC Funding (£300k)
- DfT Funding (£4.4M)
- LED Replacement Programme
  - 1st Phase 20,000 units
  - 2nd Phase 43,000 units <8months
- Energy Cost now approaching £0.40 per kwh!

Smart Lighting Concepts (SLiC)

- Researchers from Avans University of Applied Sciences and Portsmouth University
- Four Countries Participating
  - UK
  - Belgium
  - Netherlands
  - France

  Goal: Can investment in sustainable public lighting contribute to reducing carbon emissions?

DfT Live Labs

- Smarter Suffolk – Bsi & UoS Key Partners
- 2 year £30M Dollar Project
  - 8 Municipalities in England
  - Over 70 vendors
  - 115 locations
  - Sensors at scale

Innovation in SMART communications, transport, highways maintenance, energy, materials and mobility

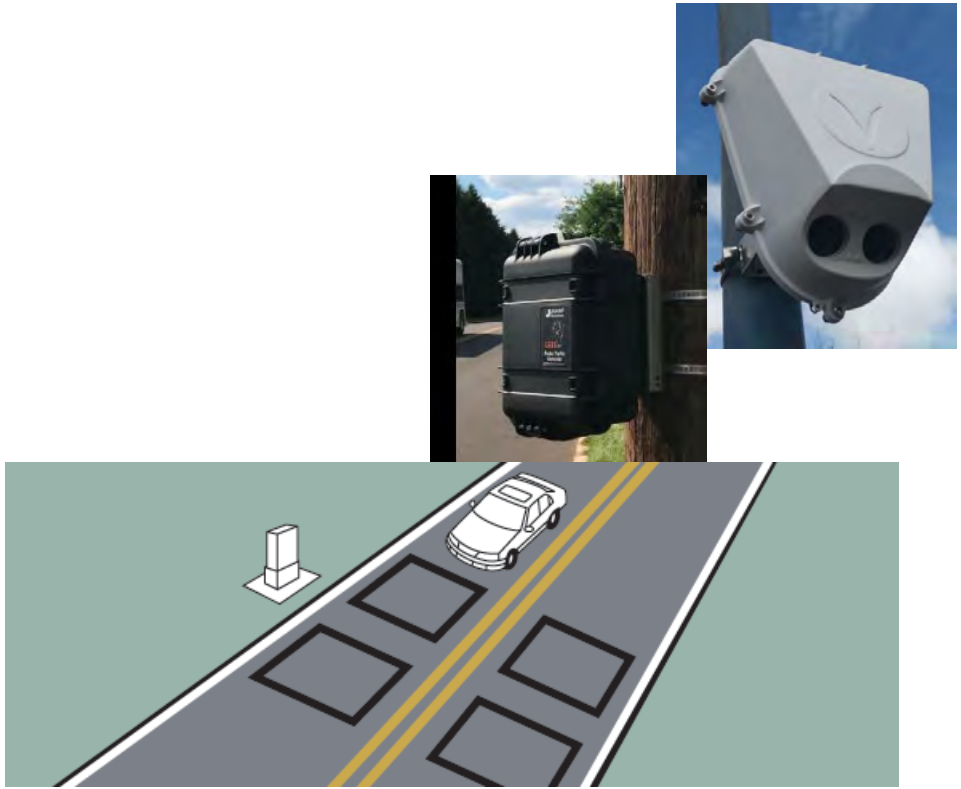
Range of Sensors Deployed

Central Management Systems

- Benefit to others
- Differing environments – Long / Short Range
  - Urban / Rural / Coastal
- Communications
  - Mobile, LoRa, Radio UNB

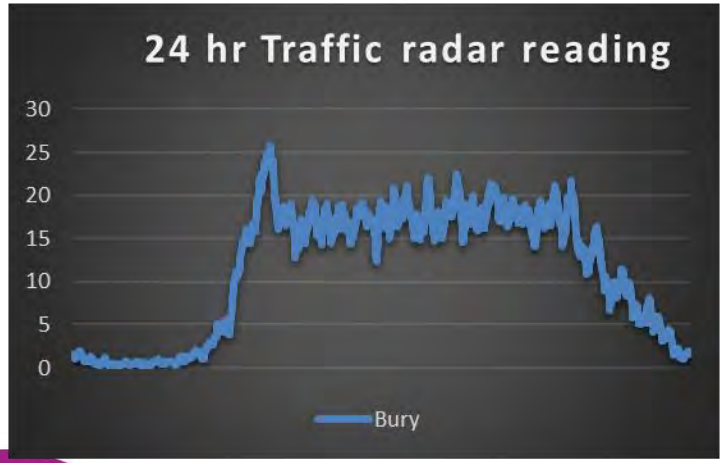
Adaptive Lighting

- Range of technologies:
  - Radar, video, loops
- Automated dimming
- Low latency / Hysteresis

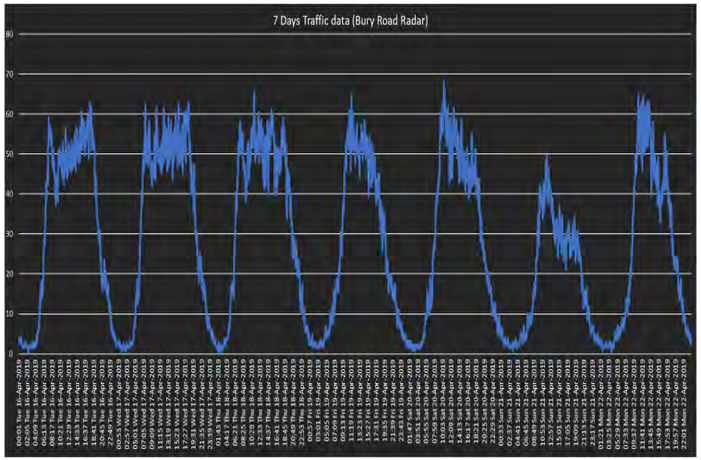


Adaptive Lighting

Traffic Monitored 2 minute interval basis

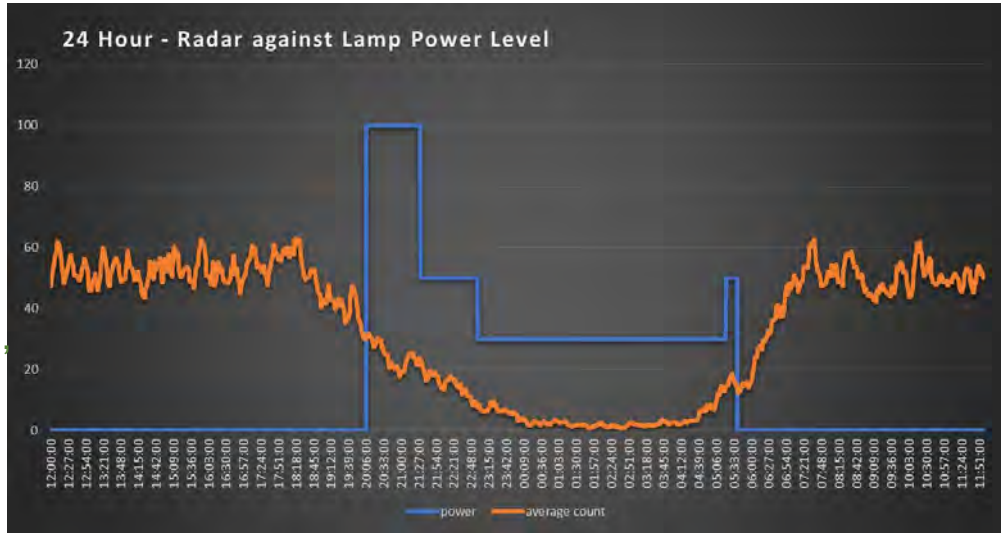


Weekday Changes



Adaptive Lighting

- Proof of concept Control Program.
- On at 70 lux falling. (20:07)
- Dim to 50% at 21:30 (veh = 50% peak)
- Adaptive control begins at 21:30 -
  Traffic drops below threshold at 22:59,
  Traffic rises above threshold at 05:21.
- Off at 05:39 35 lux rising.
- Adaptive control ends at 06:00



Adaptive Lighting

Resultant Control program

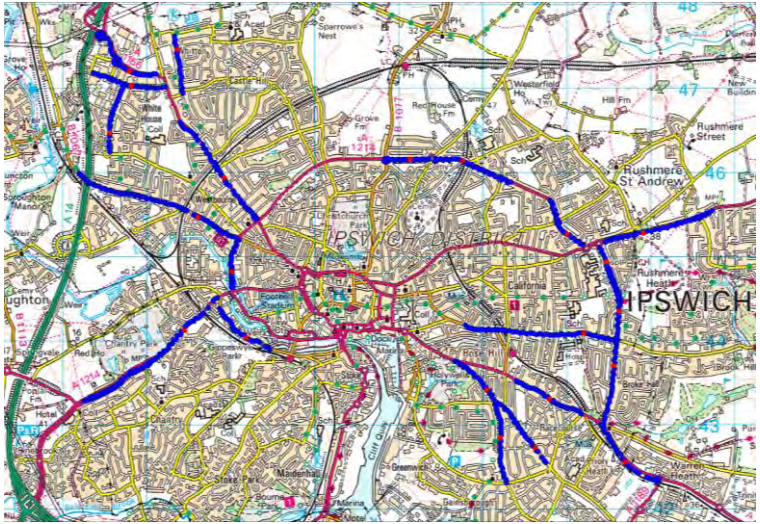
- All routes assessed were P2 class
- First dim allowed to 75% full power to P3 Class
- Second dim by further 33% of P3 class to P4 class.
- Adaptive lighting control extended from 18:30 to 06:00
- Dim by or dim to?!

Table 4: BS 5489-1:2013 - Lighting Classes of comparable level

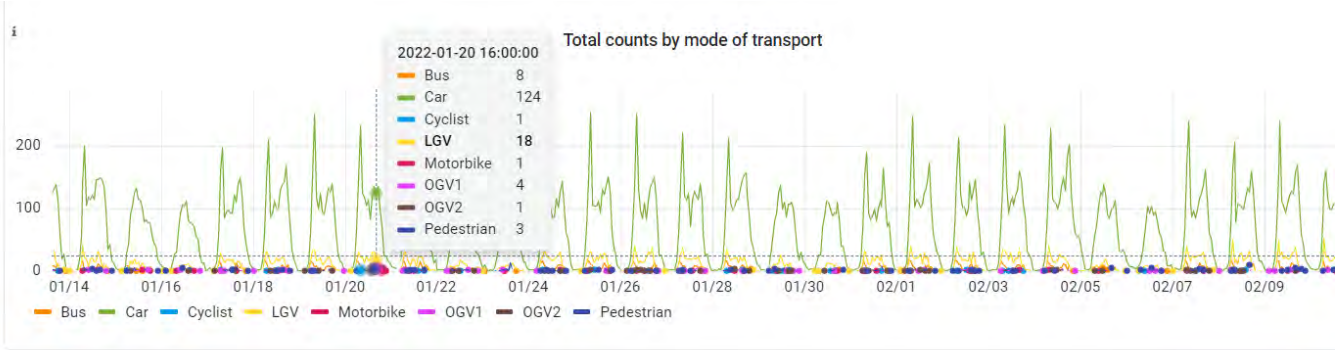
ME Class	CE Class	P Class	Required average illuminance (lux)	% dimmed compare to above class
–	C0	–	50	–
M1	C1	–	30	40%
M2	C2	–	20	33%
M3	C3	P1	15	25%
M4	C4	P2	10	33%
M5	C5	P3	7.5	25%
M6	–	P4	5	33%
–	–	P5	3	33%
–	–	P6	2	33%

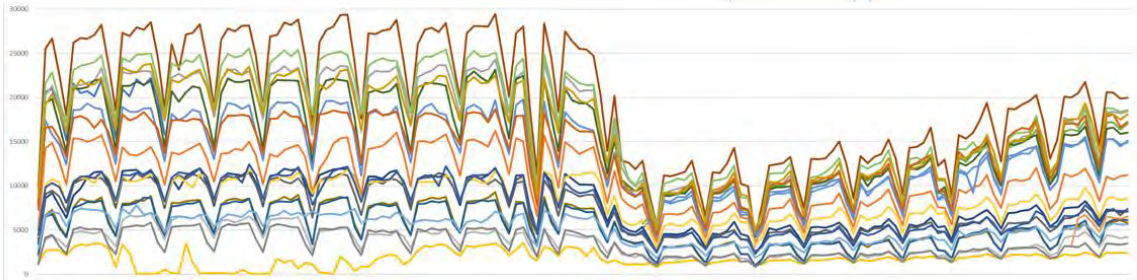
Adaptive Lighting

- Nearly 1000 lights controlled
- Savings of 40% energy and cost above change to LED
- Energy price predicted to increase again next year (was 70% this year)
- Articles in national publication



Adaptive Lighting





Stakeholder Engagement Highlights

- 2021 Speakers at HEA National Conference
- Published in National Journal for Lighting Professionals
- Speaker and Panel Member at National Highways Conference
- East of England Lighting Professionals(ADEPT) Presentations

- Stakeholder Management / Public Engagement….


ADAPTING TO THE FUTURE

Suffolk County Council has been piloting radar-based traffic-dependent dynamic streetlight dimming on arterial routes across Ipswich, as part of a wider research project into how carbon emissions associated with public lighting can be reduced. It is also potentially an important step on the council's 'smart city' journey'

Winter Maintenance

- Road Surface Temperature
- Increased granularity
- Forecasting integration
- Grit Bin monitoring

Highway drainage

- Locations of interest
- Asset system integration
- Automated signage?

intouch smartwater
drainage · sensors · management

Air Quality

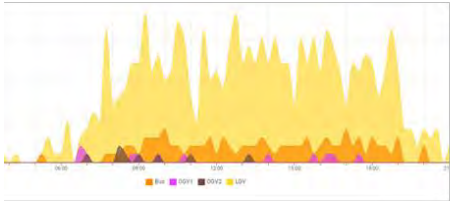
- Huge increase in data
- NO_2, O_3, $PM_{2.5}$, PM_{10}
- Multiple users
- Potential end uses / Clear Air Routes

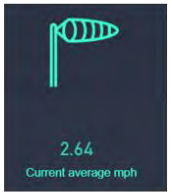
Data Insights

Adaptive Lighting

Wind Speed / Direction

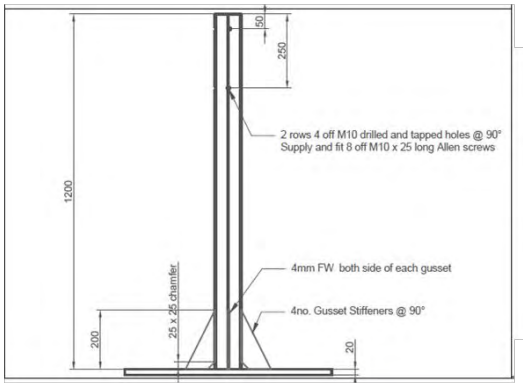
Air Quality





Relieving congestion / modelling?

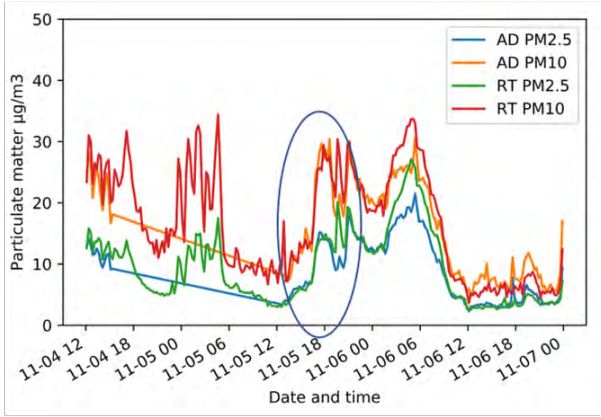
Solar



- Use of Planters
- Engineering Difficulty
- Bespoke baseplate designs
- Public Feedback

Selection of positive outcomes

- Adaptive Lighting up to 40% energy savings above the change to LED
- First large-scale particulate matter monitoring in Suffolk
- Accurate data being provided for winter maintenance and gully levels
- Public Feedback of solar solution very high
- Knowledge Share Platform to use and scale up nationally
- Business Cases formulated



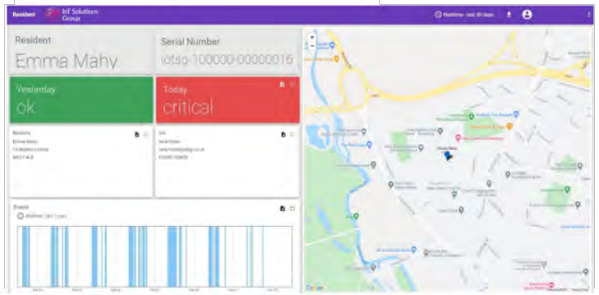
Challenges

- COVID and delivery issues
- Bespoke Terms and Conditions
- Buy in from Asset Owners

- ***Sensor installation***
- Benefits of plug and play option
  - Negates most traffic management and associated road space booking
  - No drilling of asset
  - No additional forces applied to lighting column that may reduce asset life
  - Speed

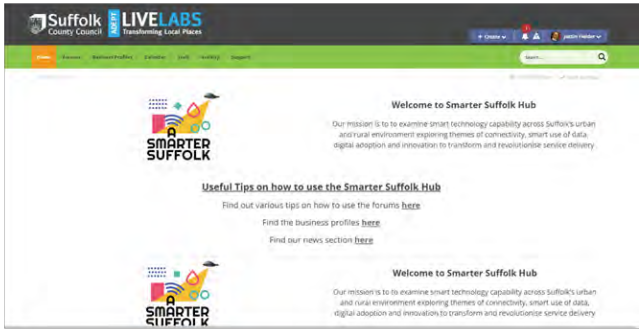
Non Highway Sensors

- Movement
- Temperature / Humidity
- Water Leak
- Light Path
- Our user experience



Knowledge share platform

- Repository for information
- Encouragement of debate and challenge
- Celebrate good practice
- Advice and guidance



Transforming road verges
- for wildlife, for climate, for us

Mark Schofield
Road Verges Advisor
mark.schofield@plantlife.org.uk

A whole ‘Dorset’s-worth’ of land - hidden in plain sight

Road verge total area in GB
2,600km^2 (Phillips et al. 2021)

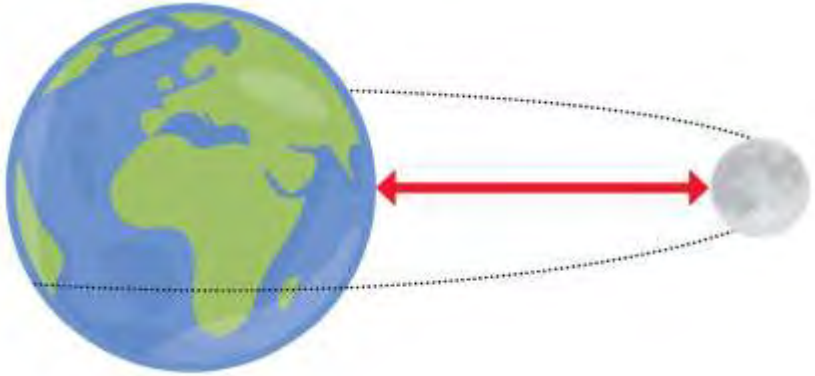
1.2% of GB total land area

4% of urban areas

approximately the size
of Dorset

40,070 km

NASA



406,700 km

ESA

Public roads
in Great Britain

428,119 km

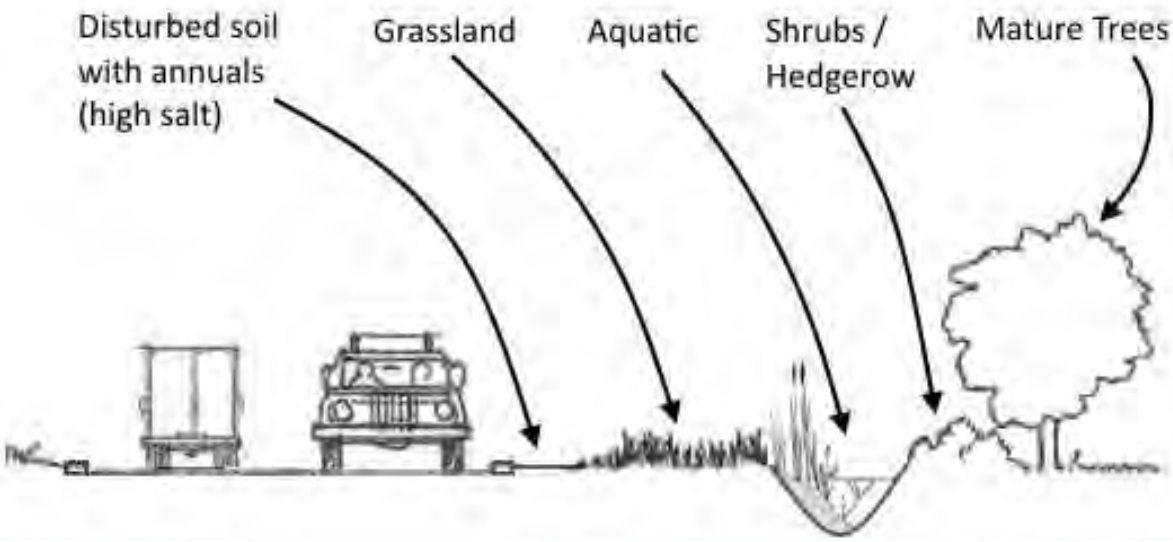
Ordnance Survey

Value of road verges for biodiversity

Sanctuary

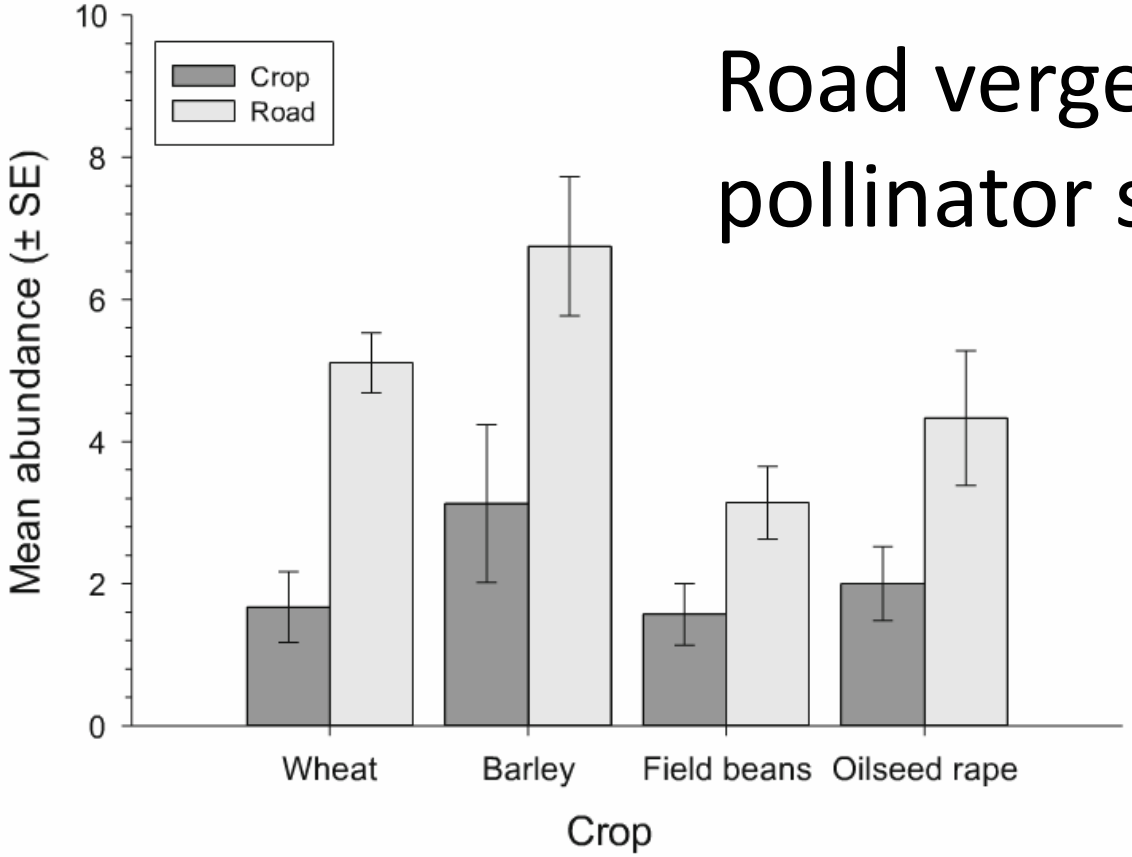
- Over 700 species of wildflowers grow on verges
- Nearly 45% of our total plant diversity
- 87 species threatened with extinction
- UK rural road verges area equivalent to our remaining lowland flower-rich grasslands

Road verge habitats



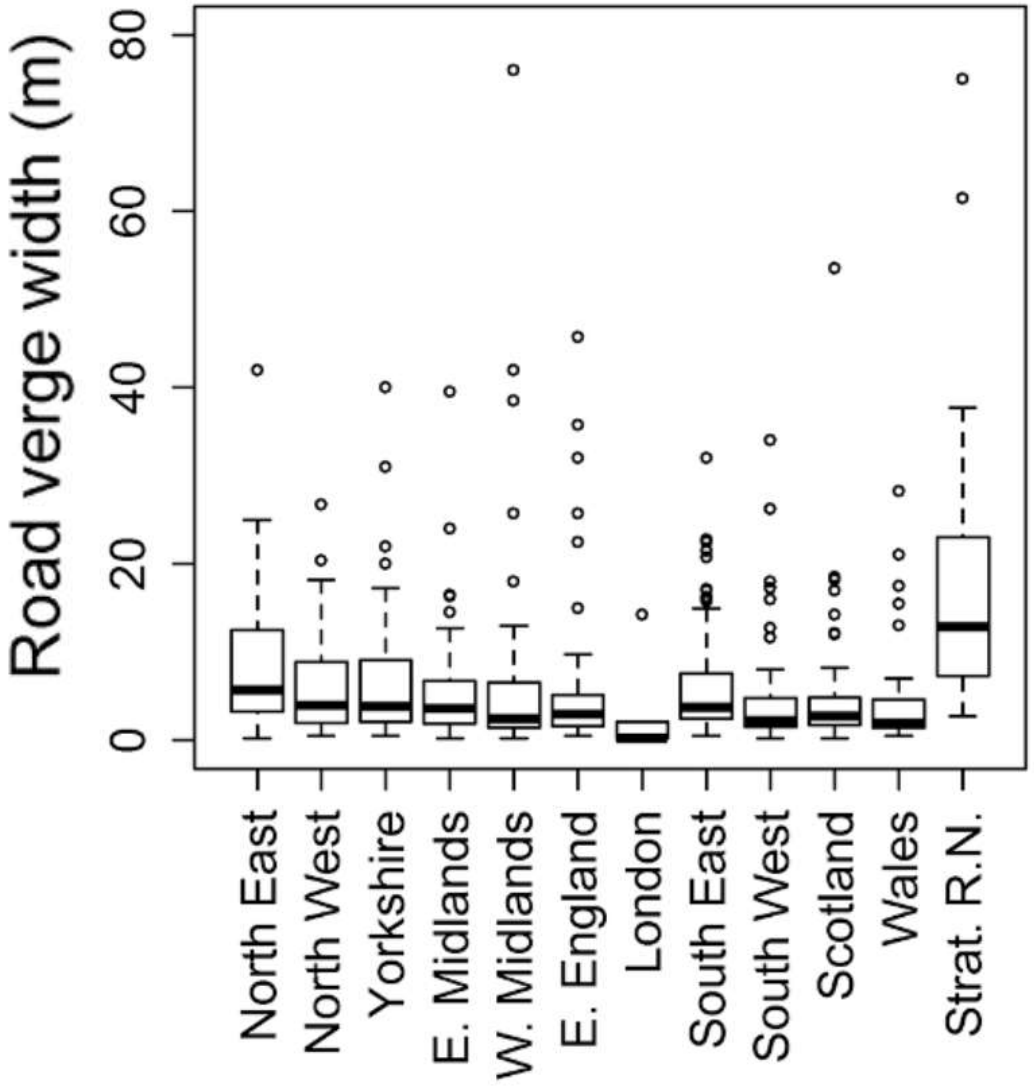
Verge habitat	Number of species	% of all species
Grassy verges	579	36.3
Disturbed verges	86	5.4
Wooded verges	187	11.7
Salted verges	17	1.1
Total verge species	**724**	**45.4**
Ditches	51	3.6
Hedgerows	290	18.2
Total roadside species	**809**	**50.7**

Road verges act as pollinator sanctuaries



- Study in Devon and Cornwall by Plymouth University 2014
- Bumblebee abundance on roadsides >2x on field margins
- Total flowering plant species and abundance of ‘bumble bee’ flowers both consistently higher on roadsides
- Road verges could be used more for pollinator conservation

Hanley, M. and Wilkins, J. 2014. On the verge? Preferential use of road-facing hedgerow margins by bumblebees in agro-ecosystems. *Journal of Insect Conservation*. 19, 1 (2014).



Region	Mean total verge width (m)	Total verge area (km2)	Area rank
	(avg 6.4m)		
SRN	21.3	475	1
North East (rural)	12.3	87	14
North East (urban)	10.7	104	10
South East (rural)	9.9	279	2
East England (rural)	8.8	203	3
W Mids (rural)	8.4	139	5
Yorks & Hum (rural)	8.1	122	7
E Mids (rural)	7.9	138	6
Scotland (rural)	7.4	161	4

- The Strategic Road Network greatest opportunity for verge biodiversity
- SRN has greatest share of road verge area (18.4%)
- SRN more likely to contain road verges, much wider than other roads
- Nevertheless - approximately half of all verges are 3 m wide or more

Phillips et al. 2021

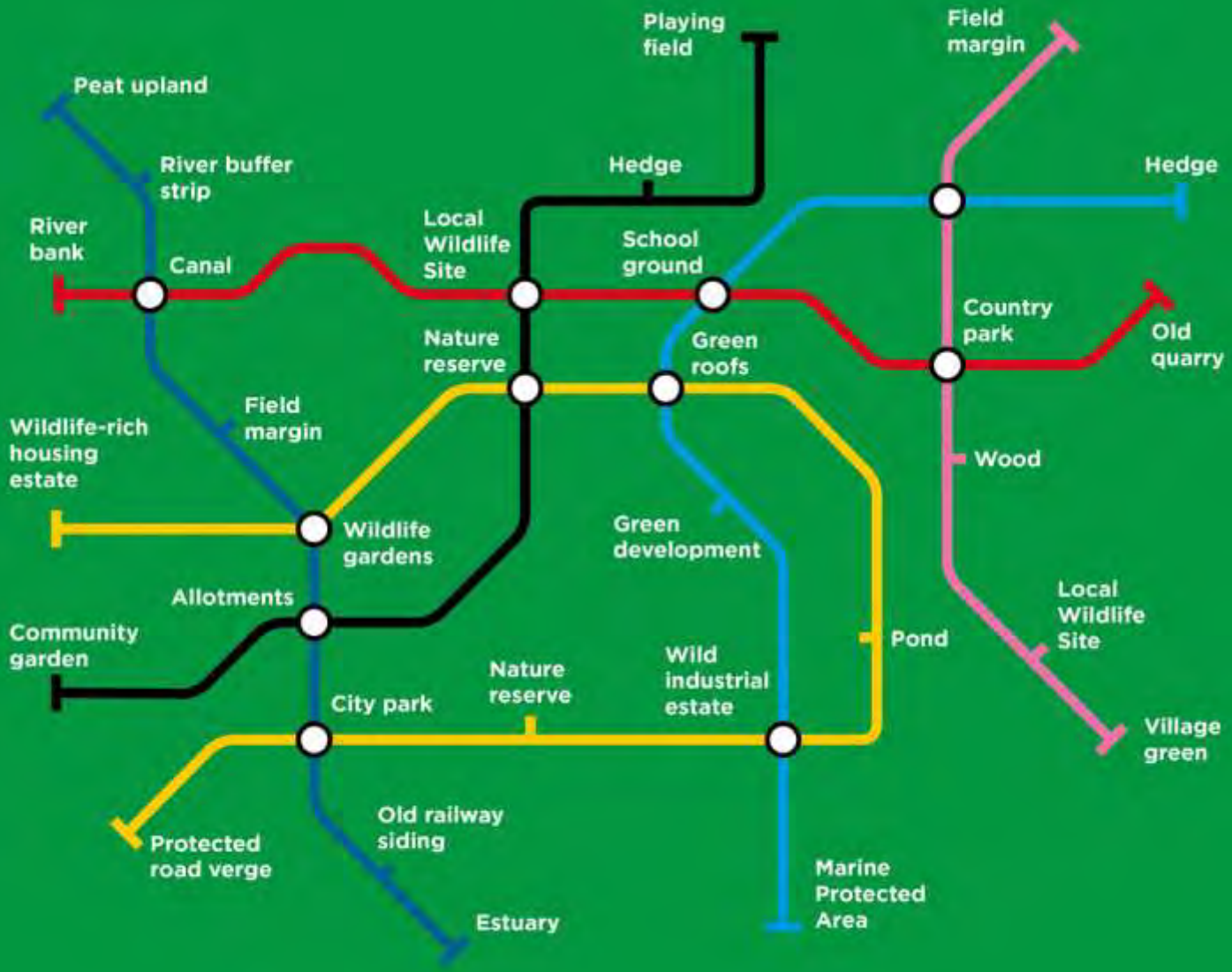
Roadside lawns:

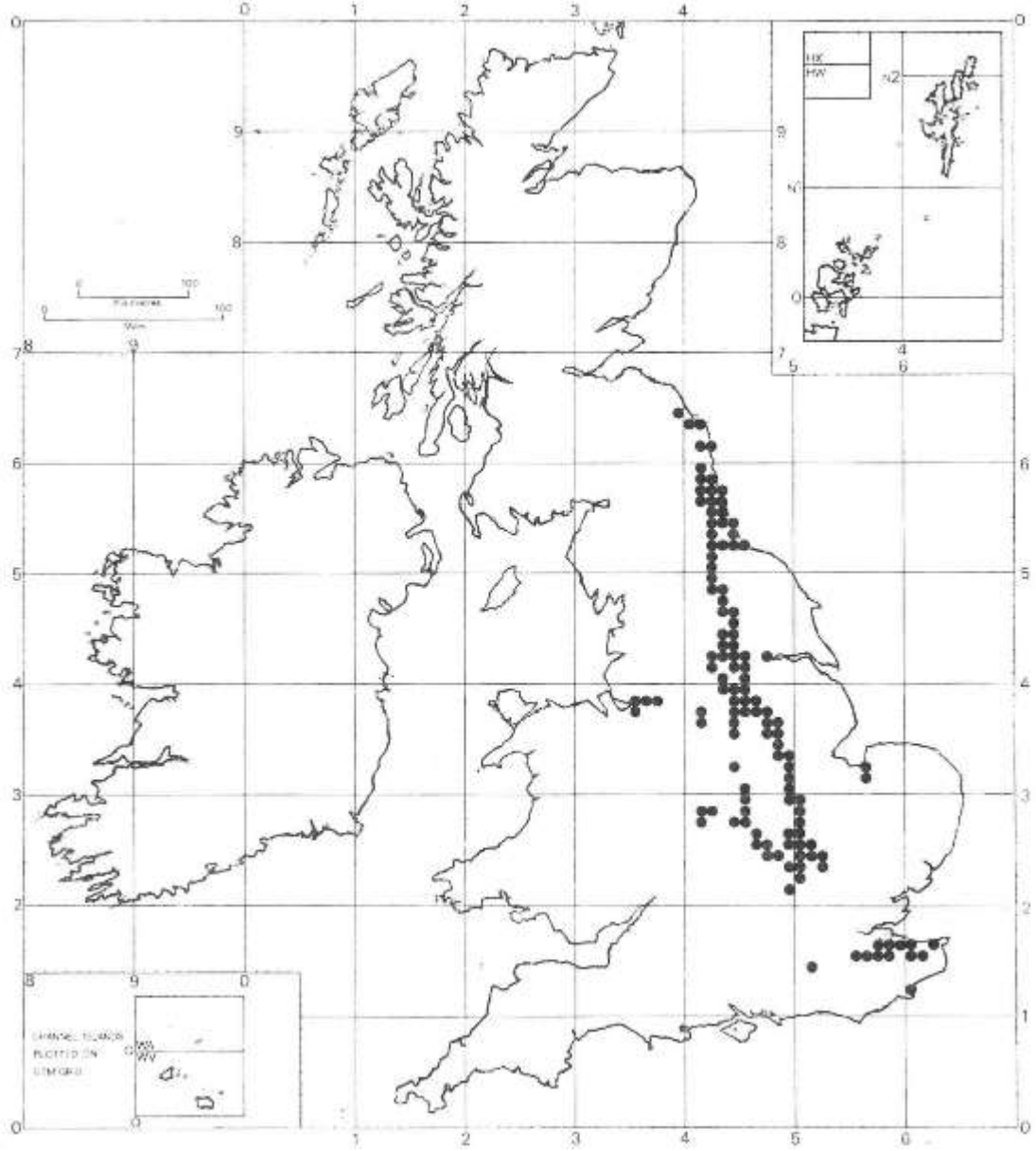
Opportunity lost or quick win for wildlife?

- 707 km^2 (27.5%) of road verge area is short, frequently-mown grassland (lawn)
- 56% of lawn verges were found in urban areas
- Of all lawn verges, 65% were greater than 2 m wide

Phillips et al. 2021

Connectivity



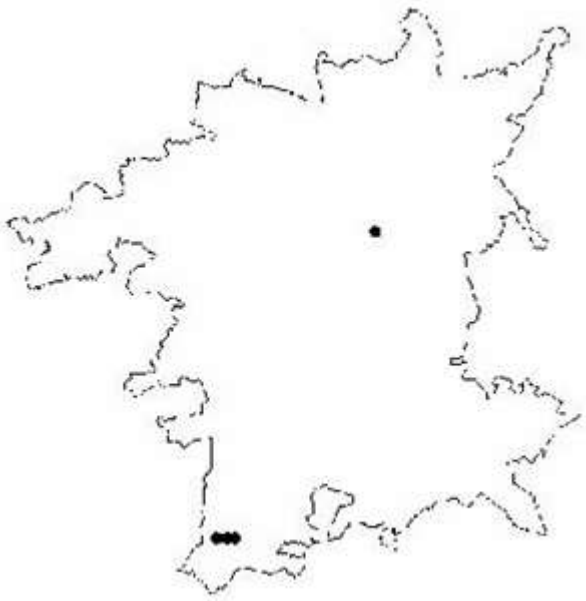


Scott and Davison
Watsonia, 1982.

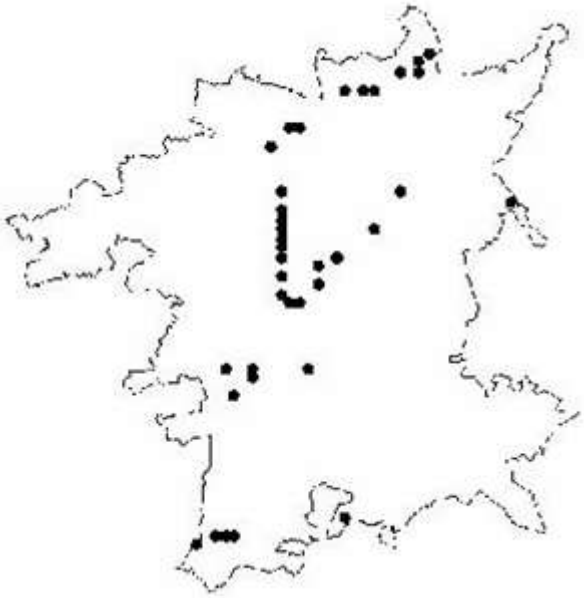
Distribution of Reflexed Saltmarsh Grass (*Puccinellia distans*)
Correlating with routes of the A1 and M1

Spread of Danish Scurvygrass (*Cochlearia Danica)* throughout Worcestershire

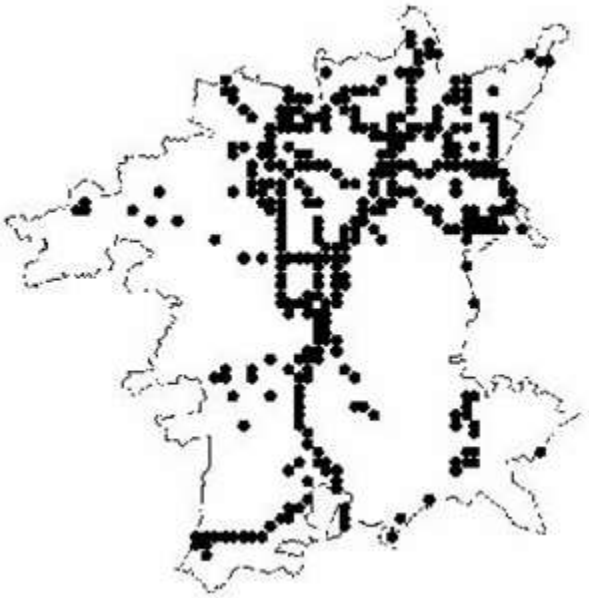
1989



1995



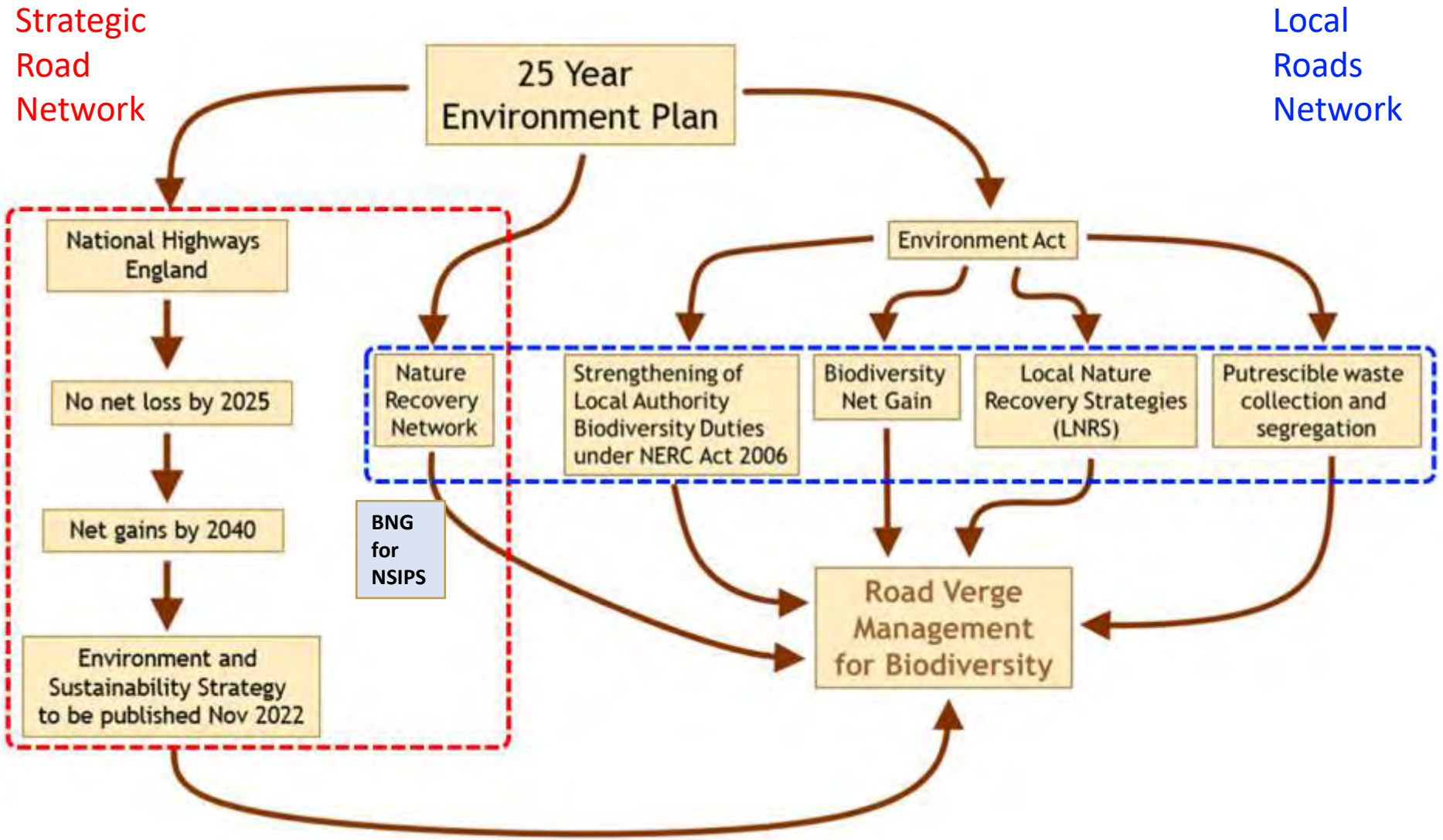
2002



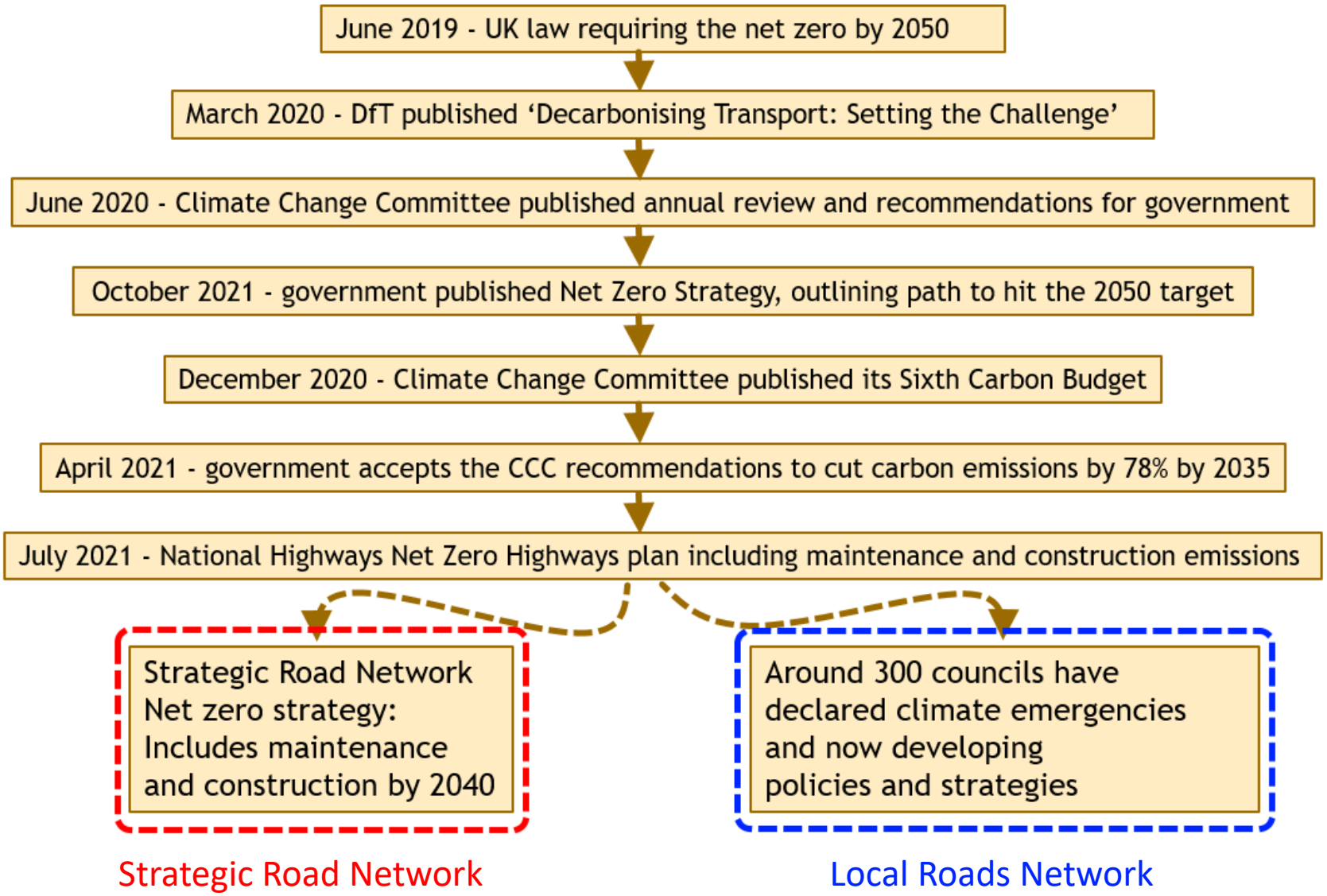
M5, M50, M42 and A449 now clearly visible

wbrc.org.uk

Drivers for more biodiversity on road verges



Drivers for net zero highways management



Principal pressures on public grassland

Cuts too frequent or too infrequent

Too many cuts: diversity lost

No cuts: tussocks → scrub → trees

- >2 cuts per year / no cuts

Smothering mulch

Only vigorous minority of species survive

- No collection of cuttings

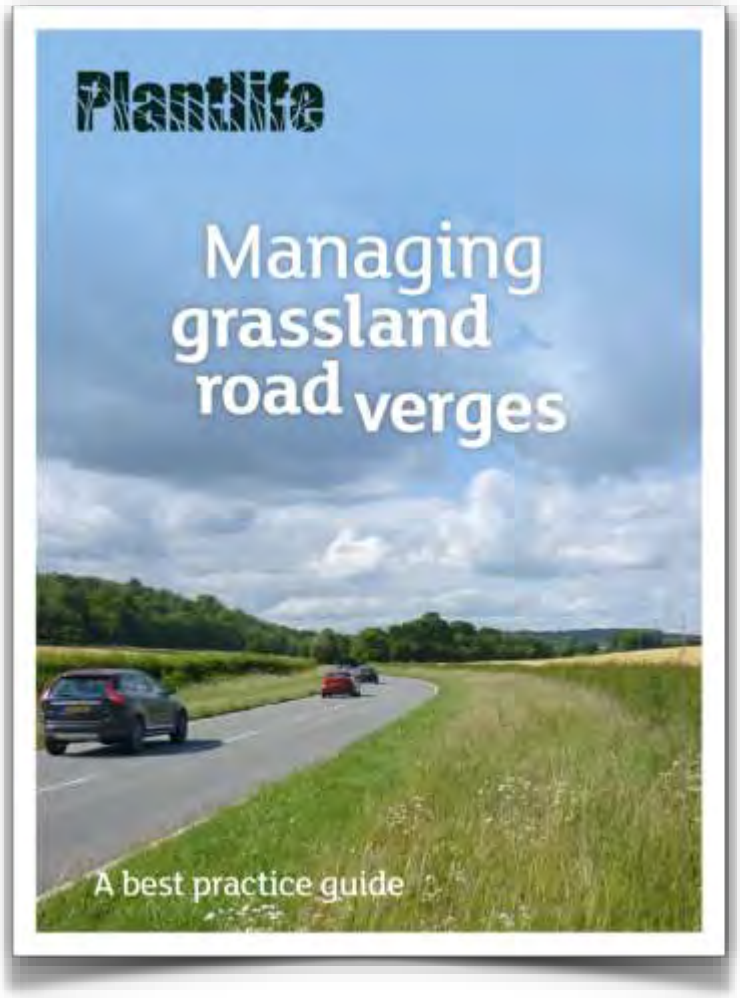
Accumulating fertility

Tall growth of nettles, hogweed, thistles

- Mulching cuts, indirect chemical inputs from agriculture and vehicle emissions

CS2000 (Lowland England, Scotland and Wales)

Design Manual for Roads and Bridges (DMRB) updated



Managing grassland road verges: a best practice guide

- sets out different management approach
- improve biodiversity value of verges and **reduce long-term management costs**

Timing of management is key

Wildlife-friendly verges doesn't mean no cutting at all
and maintaining safe roads is crucial

Management option		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
One cut									full cut				
Two cuts	Summer and autumn cutting								partial cut		full cut		
	Late winter and autumn cutting		full cut							full cut			
	Dry verges (short vegetation)	regular cuts								regular cuts			
	Species-rich verges with mown edge		1m strip							full cut			

A ***two-cut*** management approach is ideal

- suppresses coarse grasses and taller herbs

If only ***one cut*** possible:

- cut once between Aug and Sep

Remove cuttings where possible

Organic Waste Management Options: The Waste Hierarchy

Unsustainable

Linear economy promoting the single use of resources

Landfill

Least favourable

- Responsible for over 30% of methane emissions in the UK.
- Toxic leachate contaminates water systems.
- Landfill tax makes it an expensive option for food waste management.

Incineration

- Expensive for organic waste.
- Managed by strict environmental regulation.
- Emits GHGs.
- Can lock cities into producing high volumes of waste to 'feed' the incinerator.

Sustainable

Circular economy promoting the recycling of resources

Compost

- Converts food waste into a valuable fertiliser.
- But emits CO_2 as waste decomposes.
- However, it does not generate any green energy..

AD

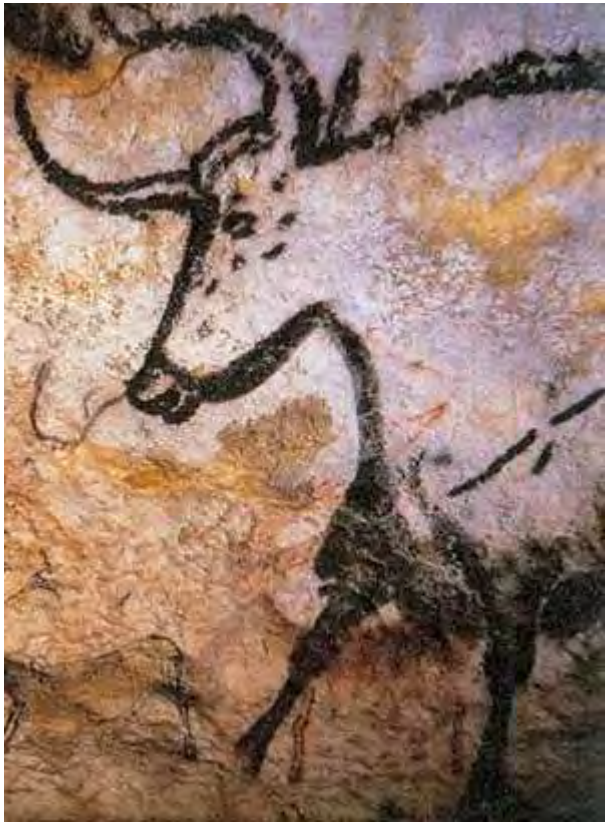
Most favourable

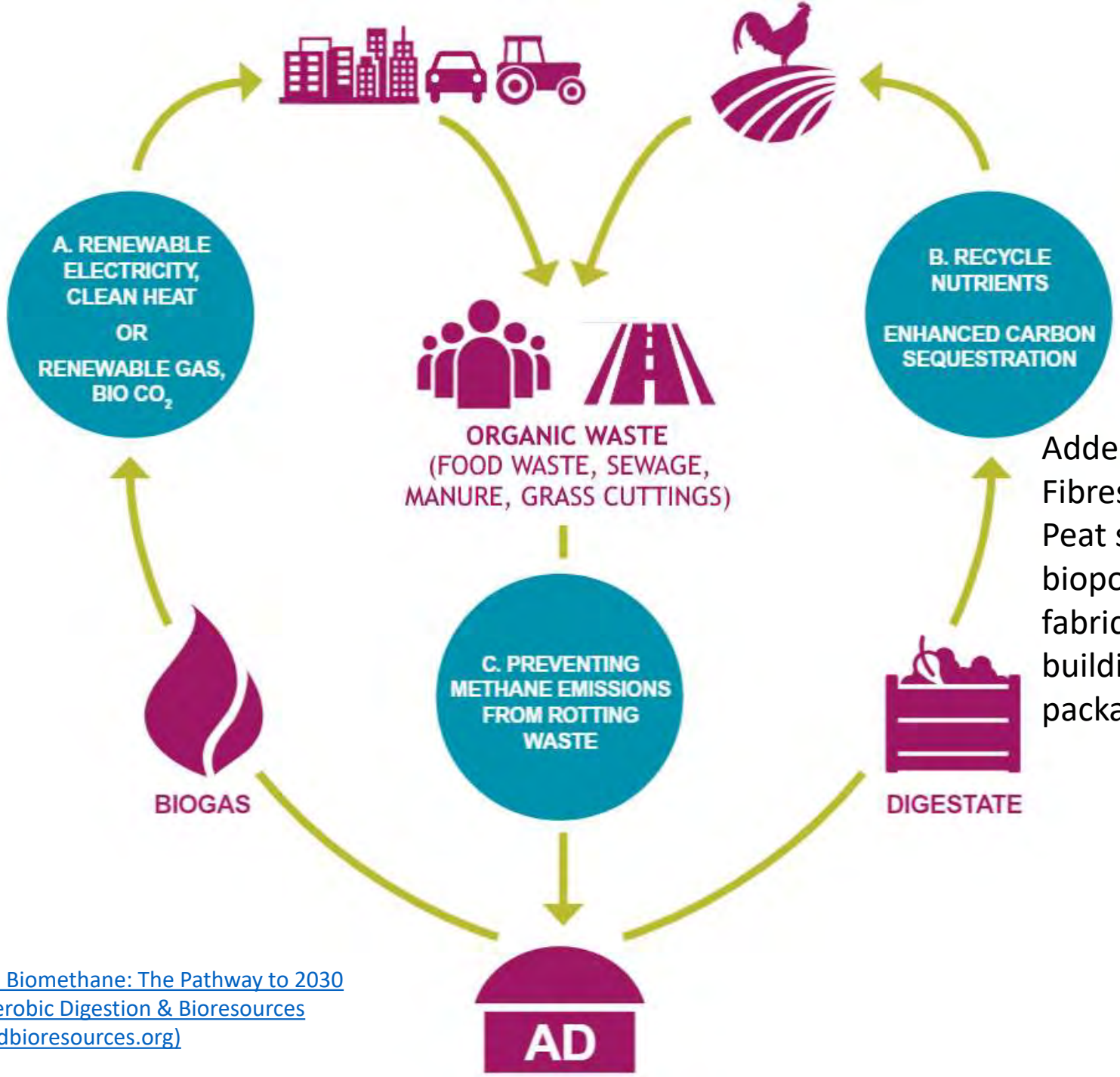
- Captures methane emissions, to produce renewable energy.
- Recovers nutrients in the form of digestate, an organic biofertiliser.
- Concentrates biogenic CO_2, suitable for industrial use or permanent storage, actively reversing emissions.
- Most economic.

Potential solution: Biomass harvesting with anaerobic digestion of cuttings

+

=

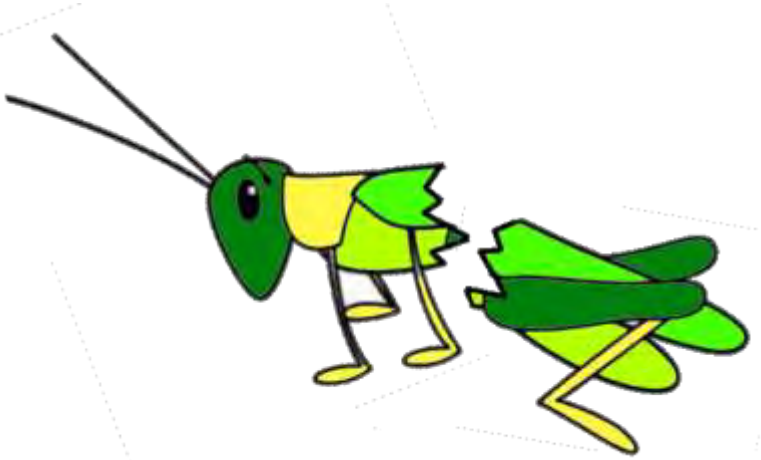




Added value:
Fibres =
Peat substitute
biopolymers
fabrics
building
packaging

[ADBA Report - Biomethane: The Pathway to 2030 | ADBA | Anaerobic Digestion & Bioresources Association (adbioresources.org)]

Risks of biomass harvesting and how to mitigate them



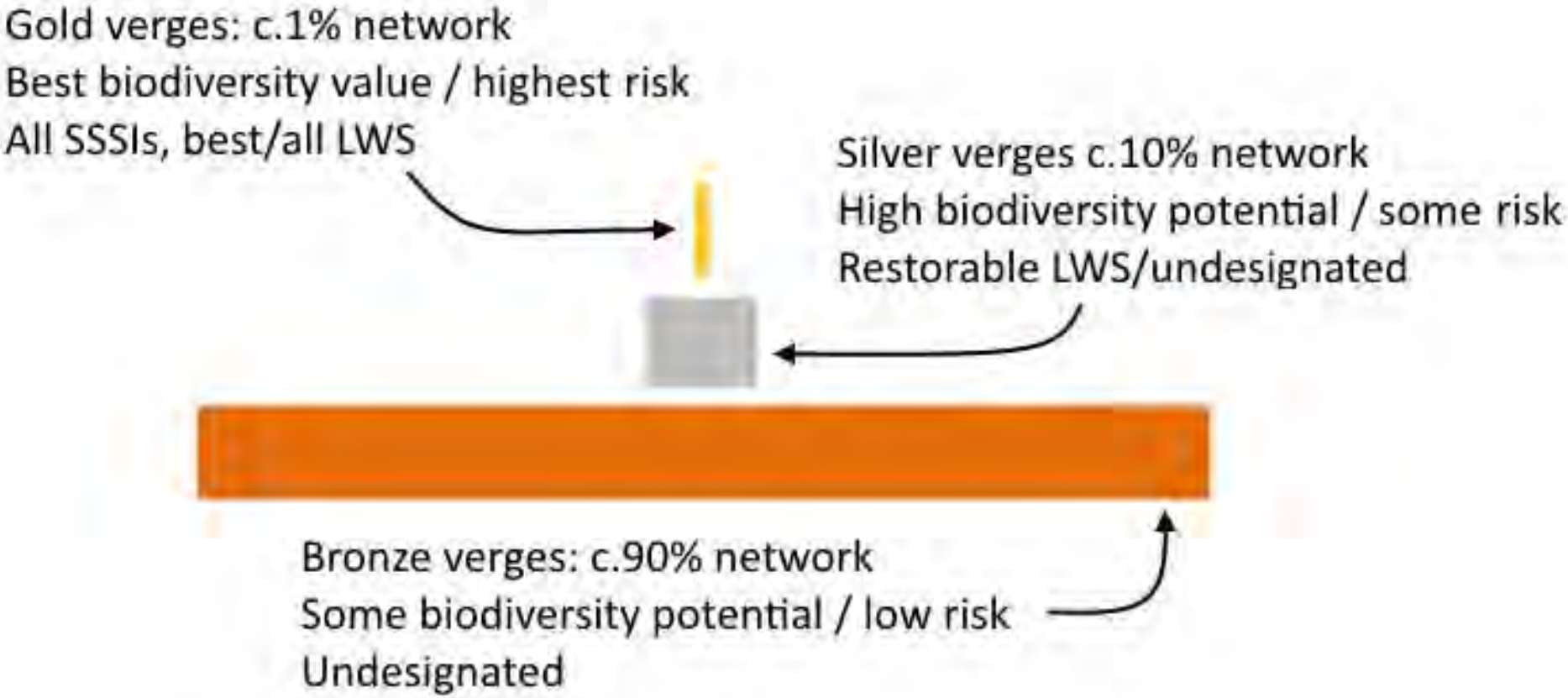
Potential risks of biomass harvesting

- Damage to invertebrate populations
- Interruption of plant lifecycles and removal of seed
- Removal of shelter for wildlife
- New market for AD feedstock drives intensive management of verges
  - Lose roadside grassland diversity
  - No resources in local authorities to regulate private sector

How could we mitigate that risk?

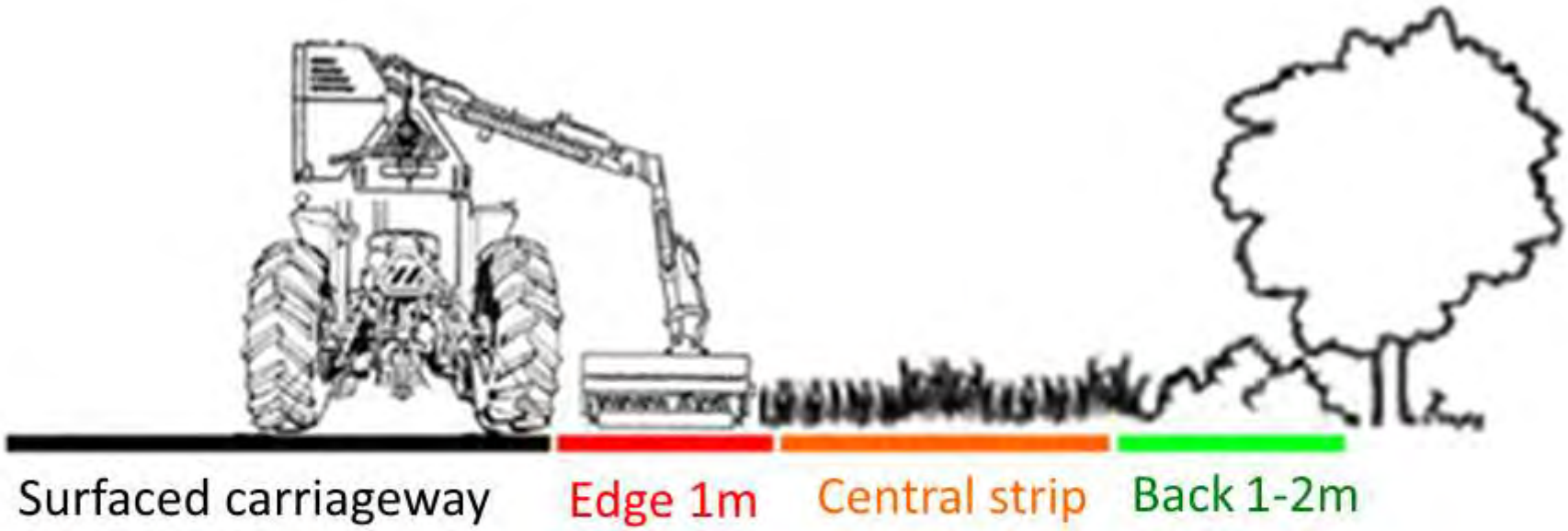
- Establish clear map of verge quality and biodiversity opportunity
- Optimise management of the best and ‘mainstream’ better management for the rest
- Incremental and rotational management with sanctuary zones

Verge ‘Quality Pyramid’



Summary of results – ‘Life on the Verge’ 2009-16, Lincolnshire Wildlife Trust

Linear mosaic cutting



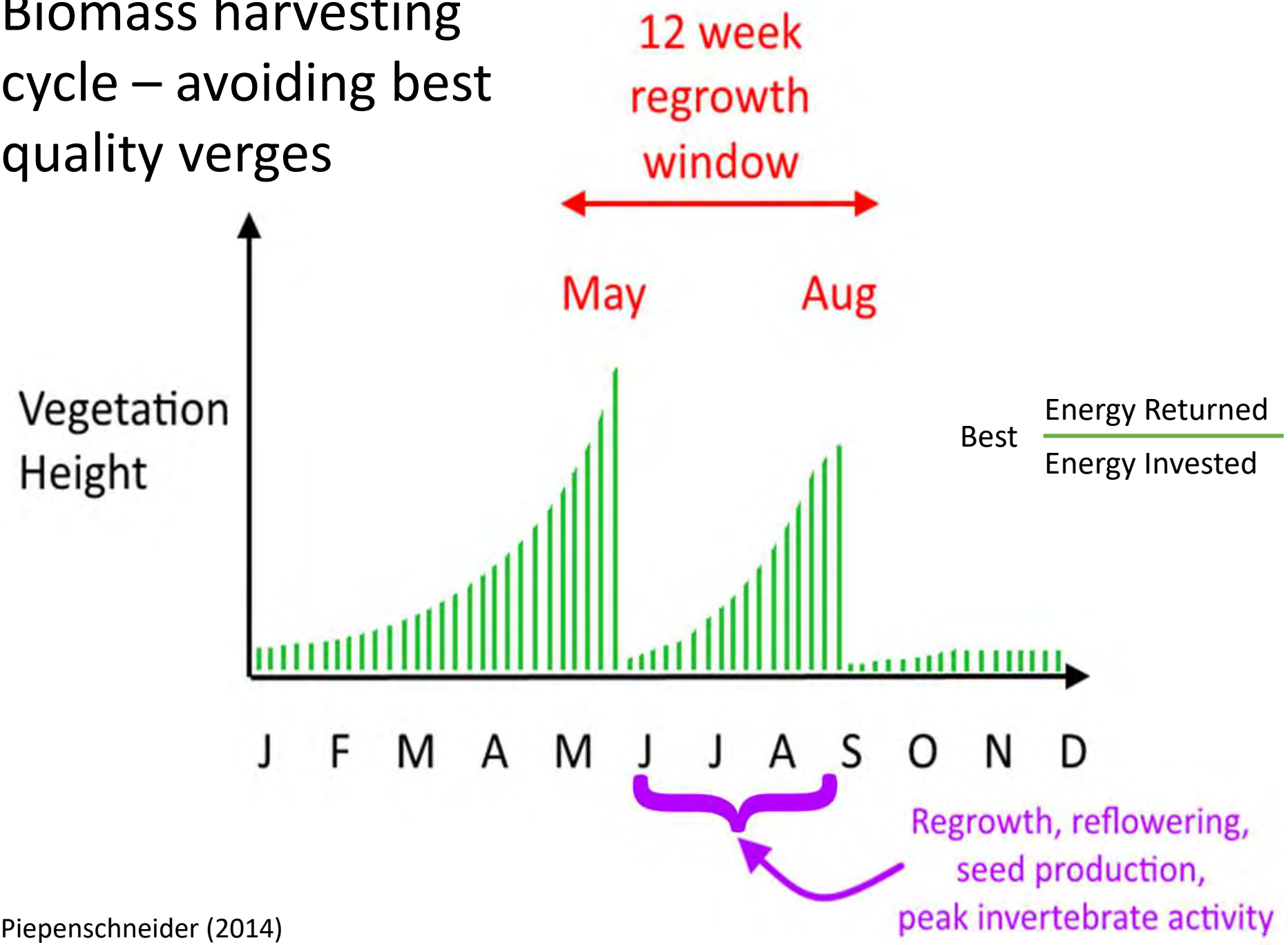
Edge: Cut and collect in May and August

Centre: Cut and collect in August only (also in May if productive)

Back: Cut with/without collection only once (Aug-Oct) every 2-3 years (alternate sides where possible)

Sanctuary strip mowing

Biomass harvesting cycle – avoiding best quality verges



Piepenschneider (2014)

Cut and collection harvester systems

Cut and collection harvester systems

- Mastenbroek Herder
- LCC, Leeds Univ., London Business School, Peakhill Assoc.
- PAHs / PTEs / C:N / pH / solubility all favourable
- Operating cost offset by value of grass for AD

Cut and collection harvester systems

Amazone Profihopper 1500

Amazone Profihopper 1250

Amazone GHS Drive Groundkeeper Smart Cut

Rytec C2200 CHS Super, heavy duty flail mounted mower

Rytec C1600 CH Super Cut and Collect flail

Rytec M1200 CH

Avant 635 Multi Loader with flail and collector attachments

Trackmaster BCS 630

Partneriaeth **Bioamrywiaeth** Cymru
Wales **Biodiversity** Partnership

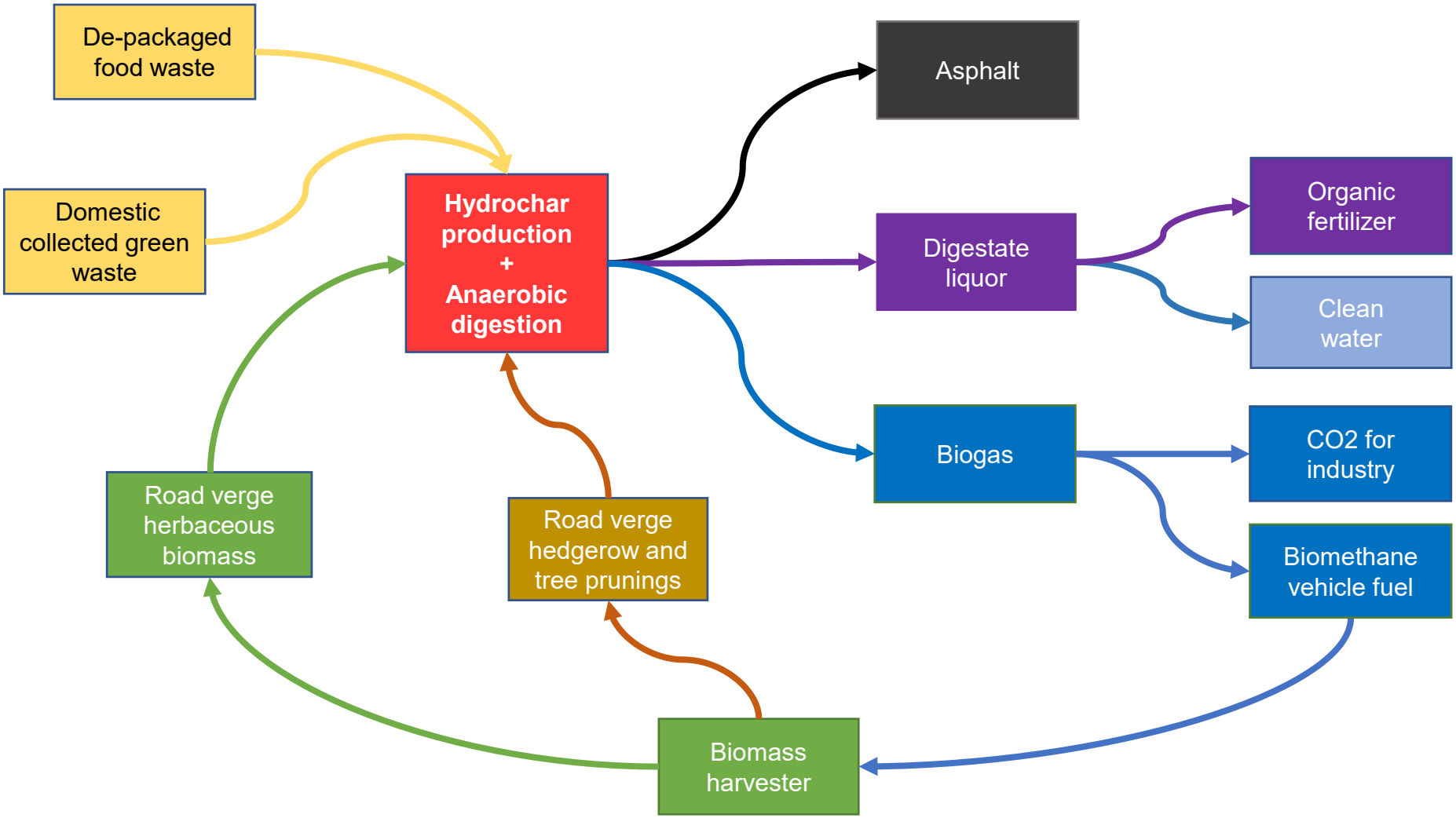
[Machinery for managing roadside verges and wildflower grasslands - https://www.youtube.com/watch?v=8IKDgkSdL5A](https://www.youtube.com/watch?v=8IKDgkSdL5A)

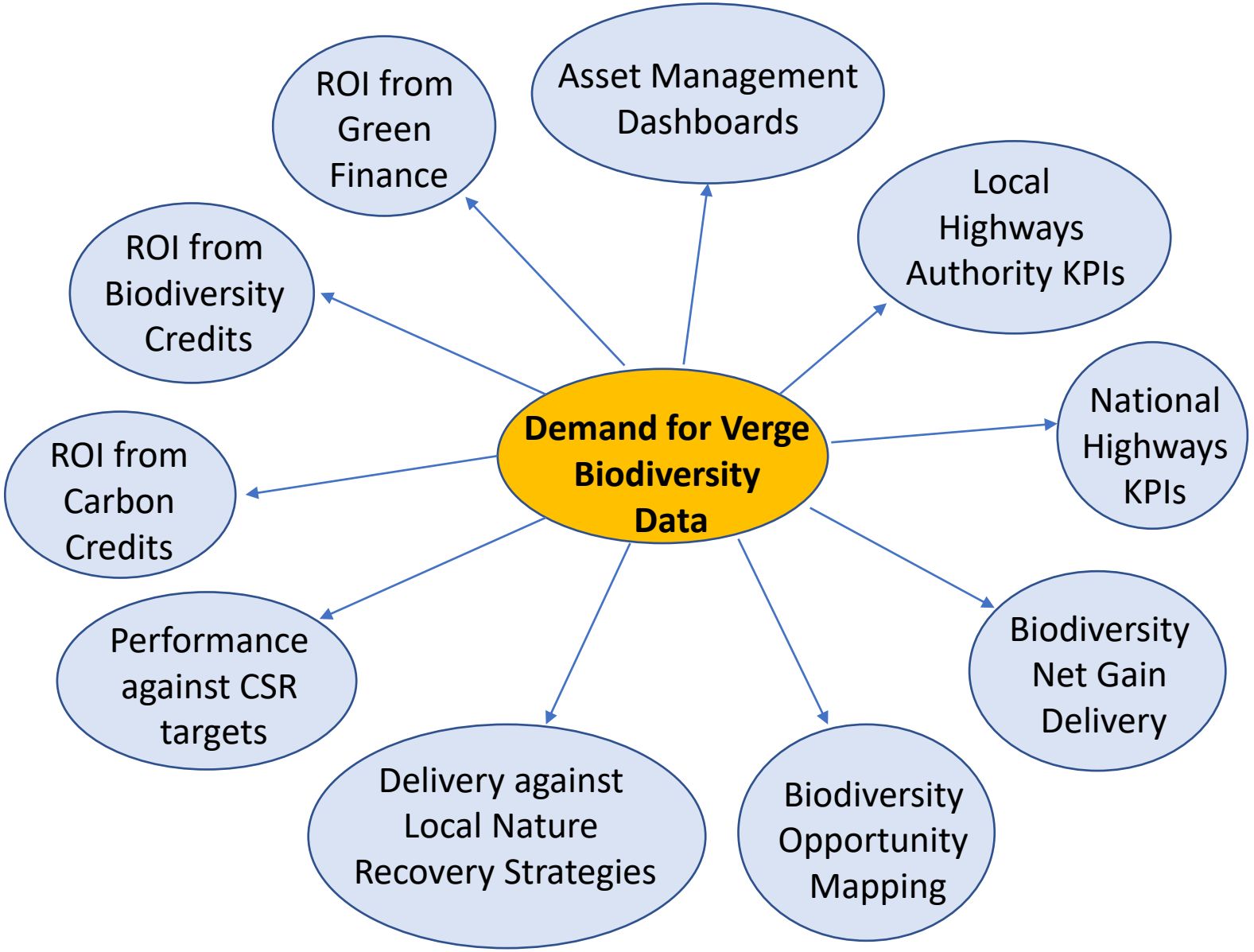
2x harvests / year in GB
of herbaceous biomass
= 130 onshore wind turbines
or power for 215,000 homes

Waste Permit

(assuming 2 harvests per year of herbaceous biomass from only 50% of the area)

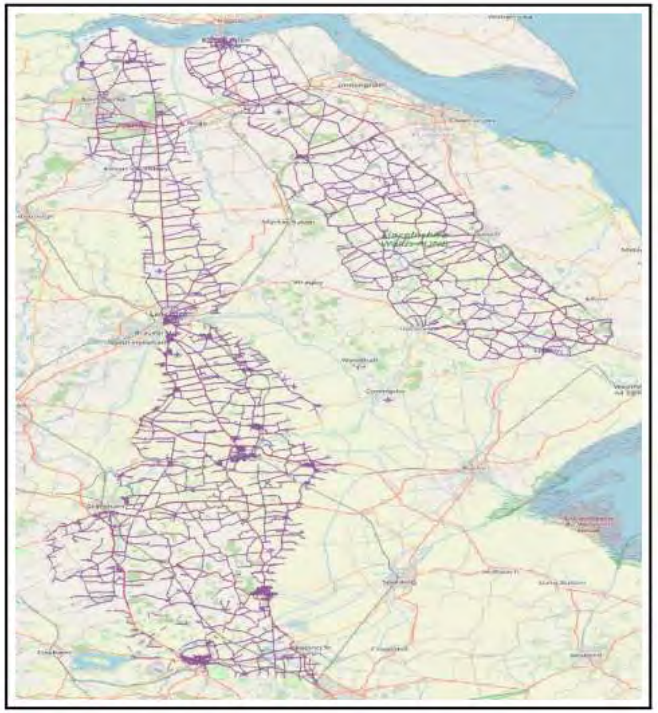
A novel process flow for nature-based circular economy




Demand for Verge Biodiversity Data
ROI from Green Finance
Asset Management Dashboards
Local Highways Authority KPIs
ROI from Biodiversity Credits
National Highways KPIs
ROI from Carbon Credits
Performance against CSR targets
Biodiversity Net Gain Delivery
Delivery against Local Nature Recovery Strategies
Biodiversity Opportunity Mapping

Deep Verge

- AI-based approach to automate surveying of road verge habitat quality using convolutional neural networks (CNNs) and Google Street View imagery of roadside verges.
- Using ground truth survey data from 3,900km of verges achieved a mean accuracy of 88%.



UNIVERSITY OF LINCOLN

Lincolnshire Wildlife Trust

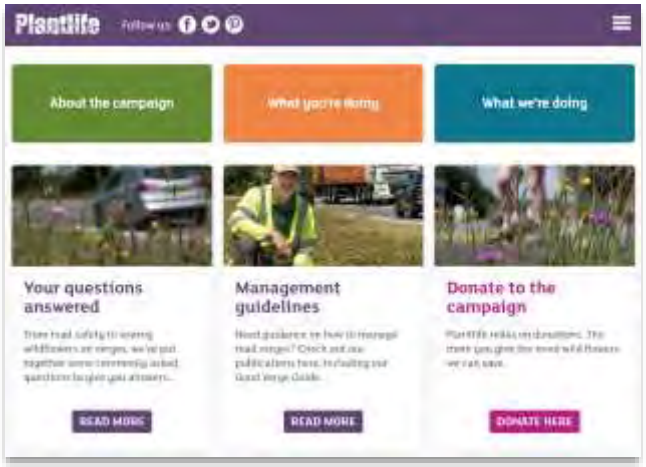
gaist

Google

Plantlife

Raising the bar together

- *creating the space:*
  - to share learning
  - to showcase progress
- *working with:*
  - councillors, highways teams, waste teams, contractors
- *providing:*
  - guidelines for LAs and communities
  - business cases/ workshops / strategies
  - publicity - sharing good news



roadverges.plantlife.org.uk

Gul-e by ODS

ODS

OXFORDSHIRE COUNTY COUNCIL

Designed by Local Authorities
For Local Authorities

OXFORD CITY COUNCIL

No Driveway? No Problem.

Solving a Nationwide Problem

Around 25% or 6.6 million* UK households rely on on-street parking.

Residents across the UK are resorting to trailing cables or using electrical cable protectors. Both options are unsafe and impact on inclusive mobility.

A rapidly implementable solution for on-street charging is urgently needed.

No Driveway? No Problem.

*Field Dynamics (2020): https://www.field-dynamics.co.uk/25-drivers-no-off-street-parking/

Introducing Gul-e

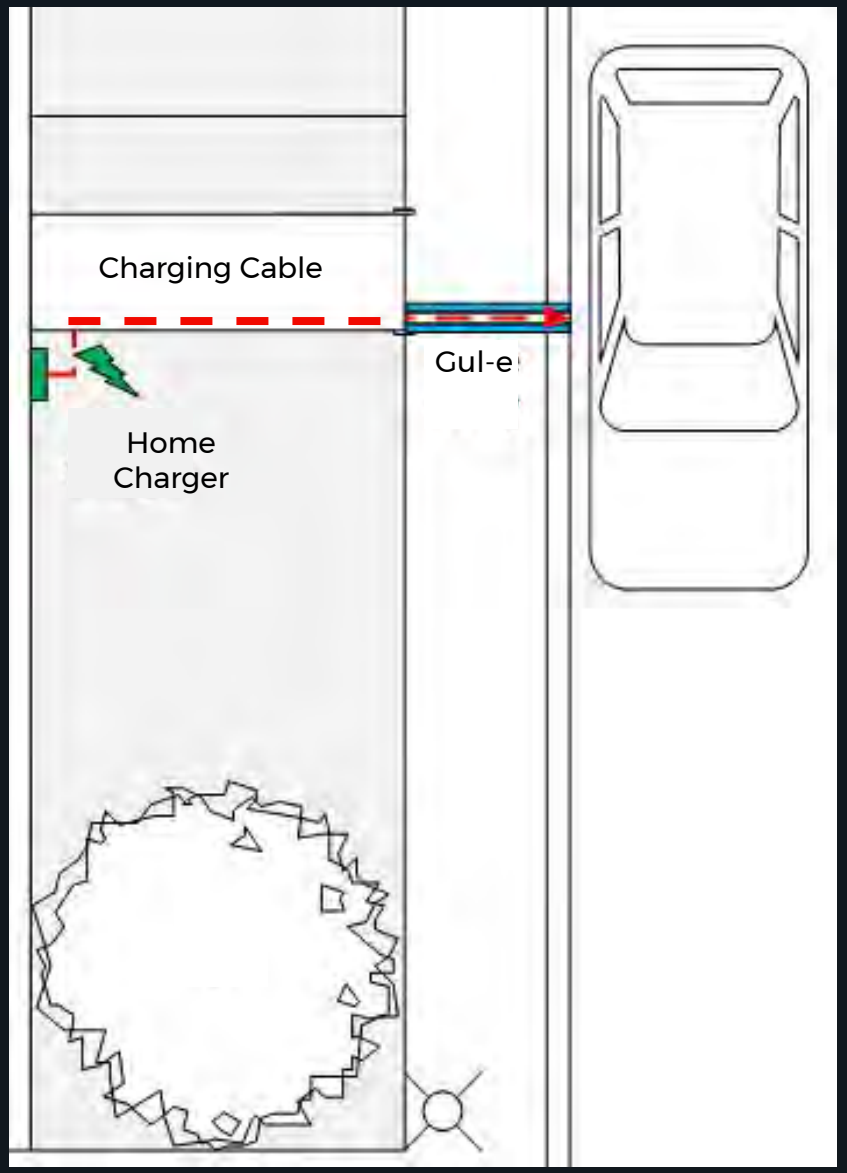
Gul-e enables residents to conveniently & safely charge electric vehicles on the street, using their home energy supply.

Gul-e

No Driveway? No Problem.

To charge, the user simply:

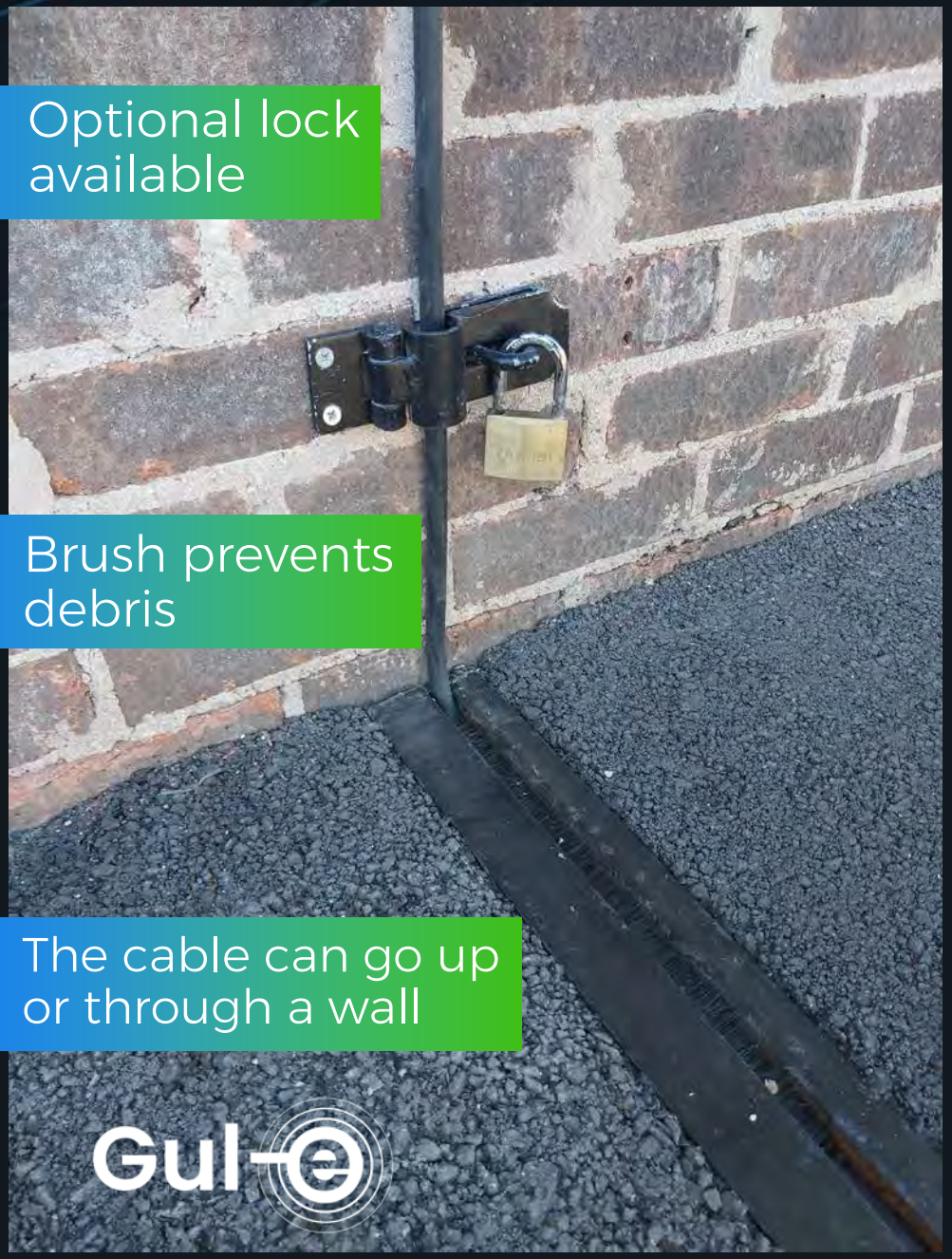
1. Parks in front of their home
2. Plugs the charging cable into their home charger
3. Presses the charging cable into the Gul-e
4. Plugs the cable into their electric vehicle



Optional lock available

Brush prevents debris

The cable can go up or through a wall



Anti-slip finish

Water drains to the kerb

The cable can go through a gate or fence

The contrast between new and old tarmac will fade over time

8 Design Criteria

Gul-e prioritises pedestrian safety and inclusive mobility. It has been designed in collaboration with Oxfordshire County Council's Highways Authority and Planning Lawyers from Oxfordshire County Council and Oxford City Council.

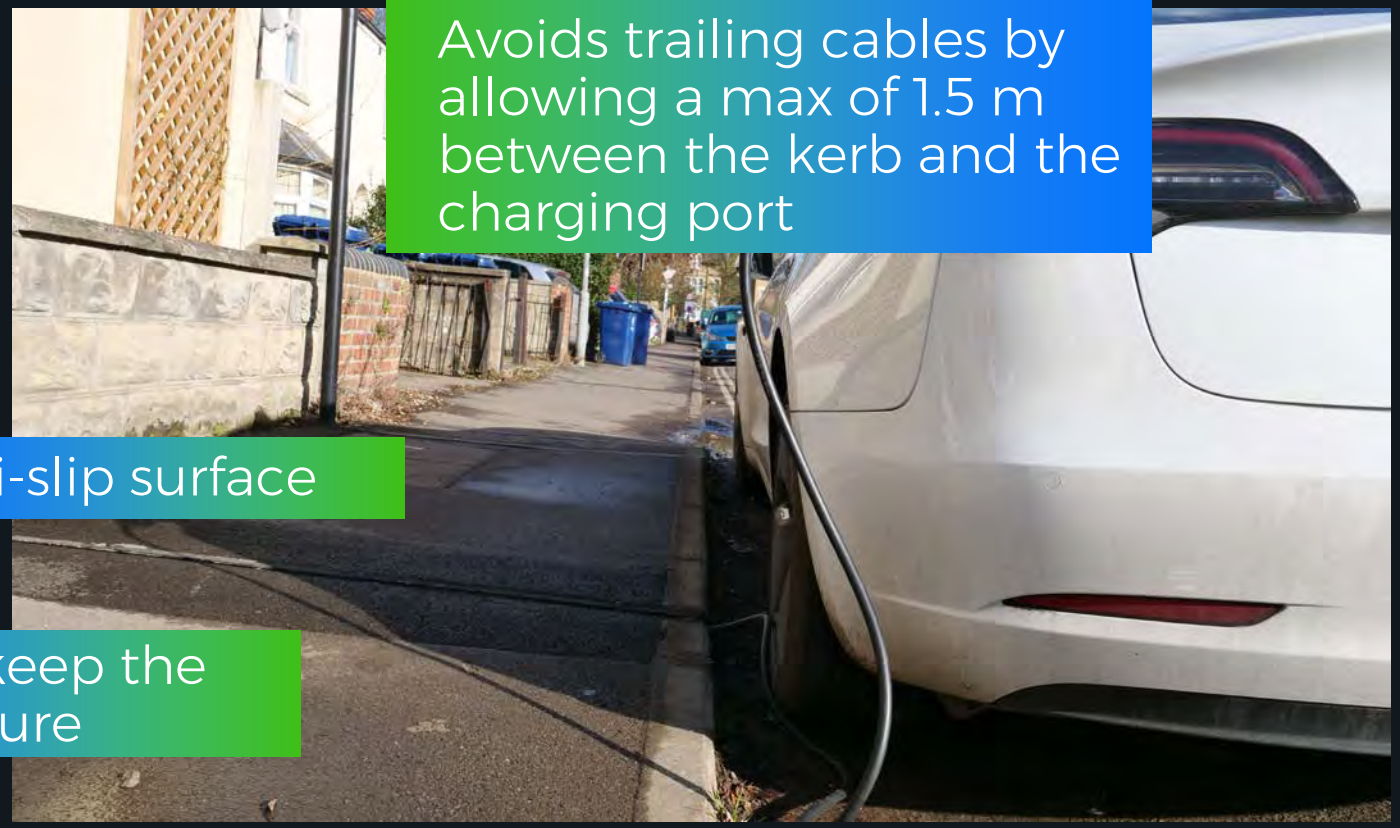
- Function
- Safety
- Installation
- Usability
- Maintenance
- Quality
- Price
- Sustainability

The contrast between new and old tarmac will fade over time

Designed for Safety

Gul-e prioritises pedestrian safety and inclusive mobility. It has been designed in collaboration with Oxfordshire County Council's Highways Authority and Planning Lawyers from Oxfordshire County Council and Oxford City Council.

Gul-e is recessed into the footway causing no raised bumps or humps



Avoids trailing cables by allowing a max of 1.5 m between the kerb and the charging port

Anti-slip surface

Brushes keep the cable secure

Electrical safety tested

Load tested to C250

Corrosion testing

Nylon brush durability testing

The slot width poses minimal risk by following the British Standard for drainage channels on the highway

The contrast between new and old tarmac will fade over time

Gul-e User Benefits

Cheaper charging via home energy rates

Reduces trip hazards from trailing cables on the footway

Highly convenient, reliable & safe

Encourages night charging which is better for the planet & grid

Gul-e Council Benefits

Supports decarbonisation goals & EV growth

Supports inclusive mobility by reducing street clutter & reducing hazards

Provides new income stream

Avoids grid connection & reinforcement costs

Reduces on-street charging infrastructure spend

The contrast between new and old tarmac will fade over time

What Next?

26 trial units have been successfully installed in Oxford and Cherwell districts in Oxfordshire

Central Bedfordshire Trial of 20 units commenced

Durham Trial of 35 units to start

To organise a trial in your area or to learn more, go to www.gul-e.co.uk/

ODS™

Gul-e

No Driveway?
No Problem.

Solar Powering Our Way to Net Zero

Vehicle Maintenance, Transport, Highways and Street Lighting Advisory Group Forum

Chris Gough

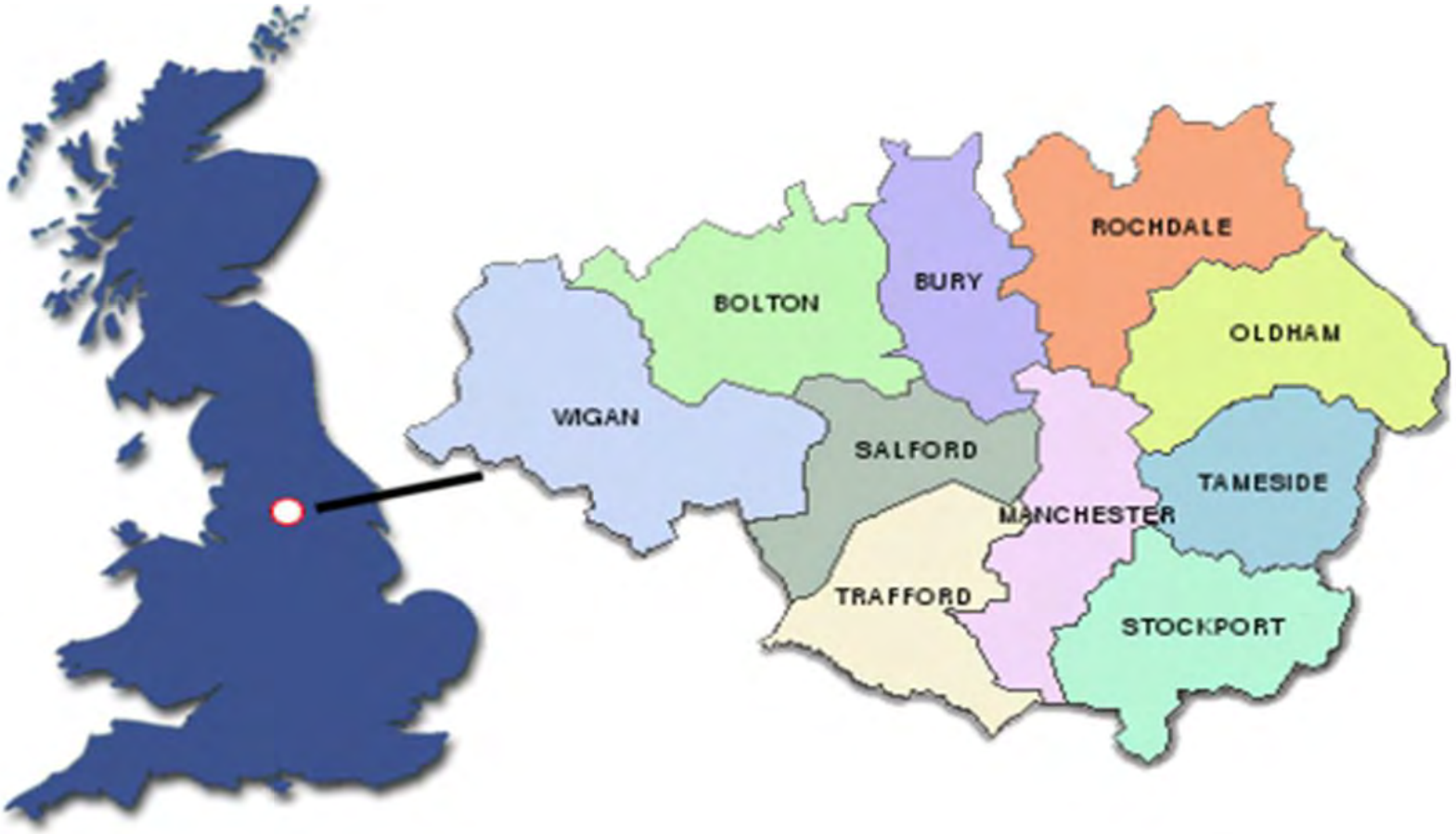
Street Lighting Engineer

Date: 20 October 2022

Topic

- Street Lighting Technology
- Reducing Energy and Carbon Emissions
- Solar Powered Lighting
- Questions & Answers

Wigan Council - Overview



Confident Place, Confident People.

Wigan Council - Overview

- Regional & National Benchmarking
  - 2020 APSE Best Service Team Award
  - 2021 APSE Performance Network Awards
  - 2021 APSE Innovation Awards
  - DfT self assessment - Band 3 (top)
  - IeSE UK Council of The Year 2021

UK Council of the Year 2021

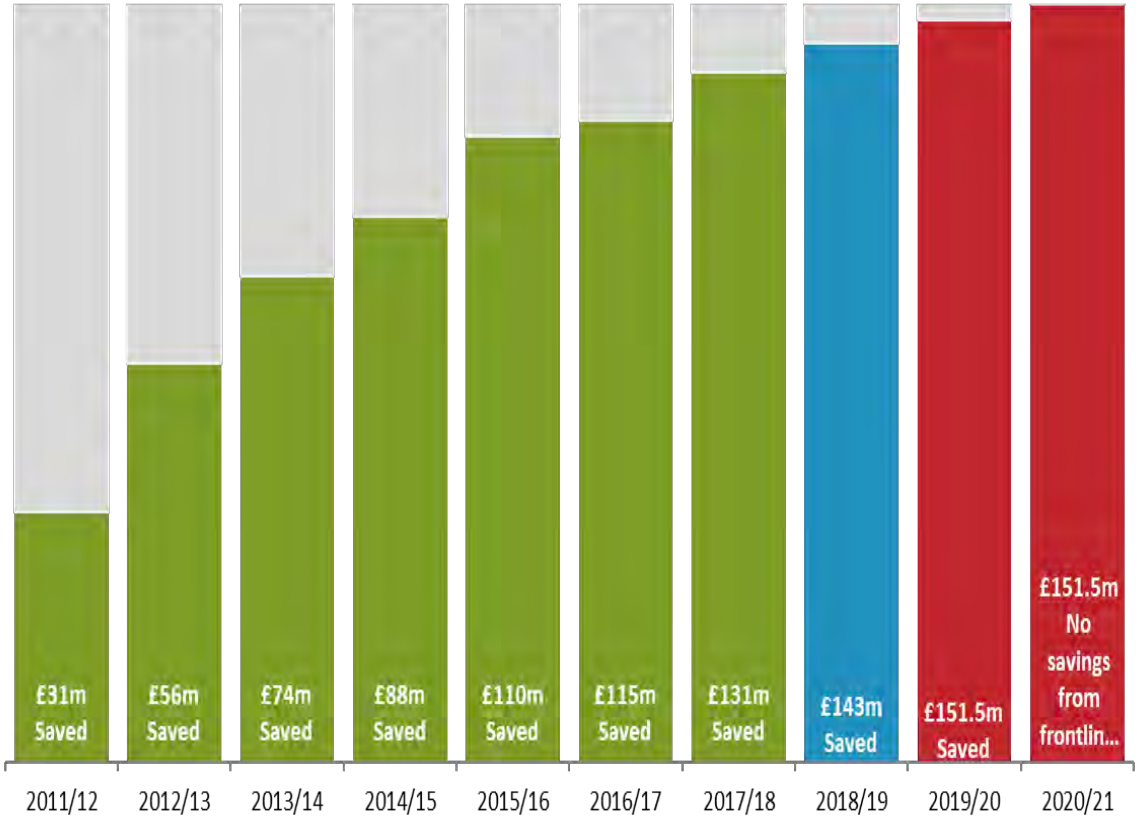
GOLD WINNER: Wigan Council

iese
The public sector transformation partner

Confident Place, Confident People.

Drivers for Change

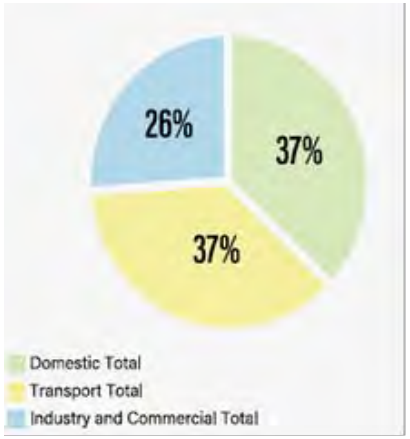
Our response to austerity meant we have had to save **£150m** since 2010 – and more to come



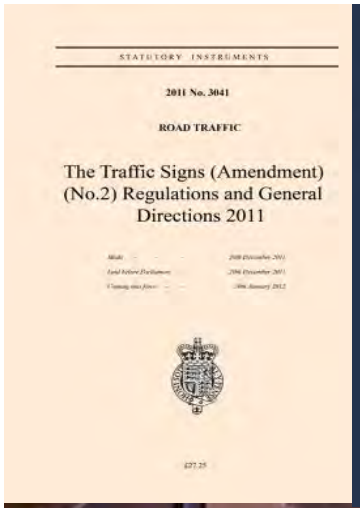
Confident Place, Confident People.

Drivers for Change

- Kyoto Agreement 1997
- UK Government Climate Change Act 2008 – 80% by 2050
- GMCA Commitment 2009 – 48% by 2020
- Wigan Council – Declared Climate Emergency 2019
- Wigan Council Outline Climate Change Strategy – Net Zero Carbon by 2038
- UK Government Climate Change Act 2019 – Net Zero (GHG) by 2050



Traffic Bollards


STATUTORY INSTRUMENTS

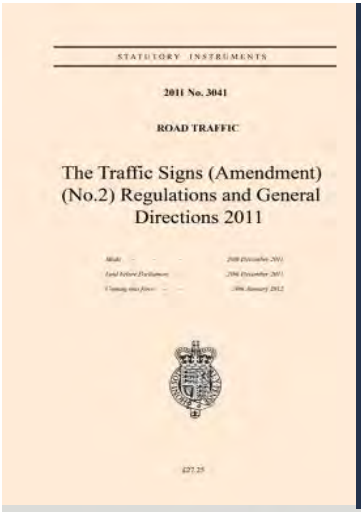
2011 No. 3041

ROAD TRAFFIC

The Traffic Signs (Amendment) (No.2) Regulations and General Directions 2011

- Transformation Through Technology
- Reduced Planned Maintenance
- Reduced Reactive Maintenance
- Eliminated Energy – Zero Carbon Emissions

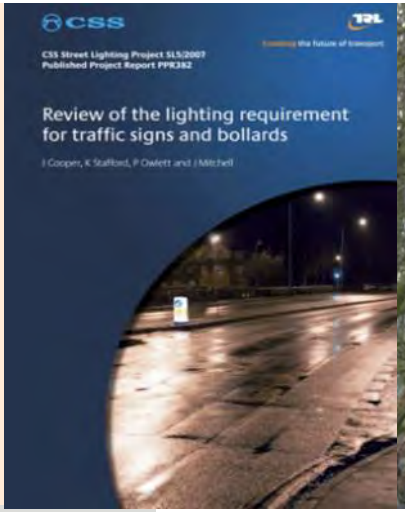
Illuminated Traffic Signs


STATUTORY INSTRUMENTS

2011 No. 3041

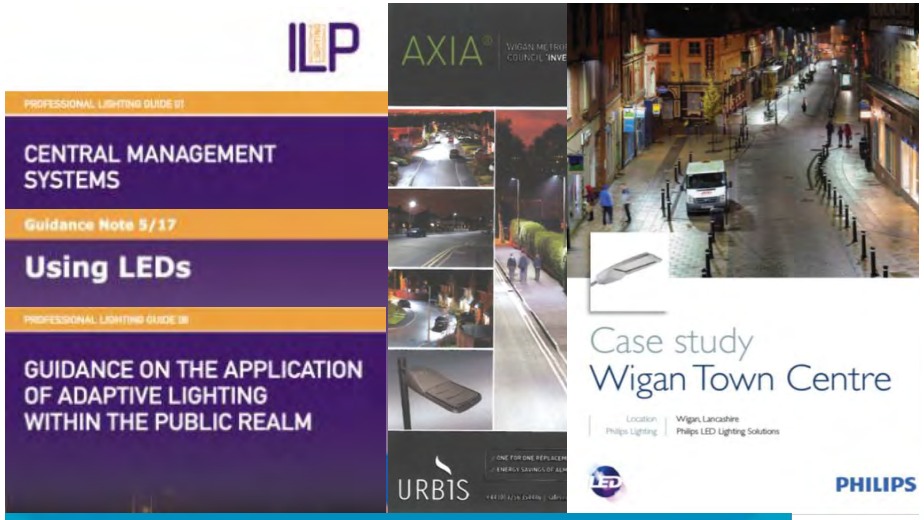
ROAD TRAFFIC

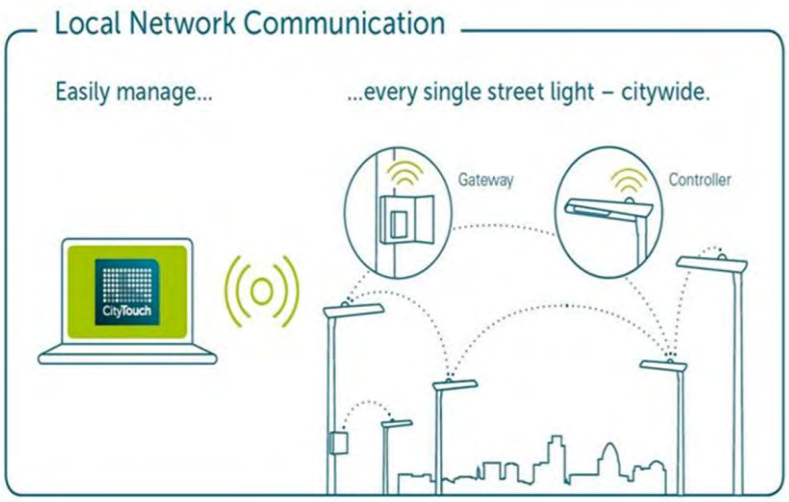
The Traffic Signs (Amendment) (No.2) Regulations and General Directions 2011



- Review the need to be illuminated
- Transformation Through Technology
- Reduced Planned Maintenance
- Reduced Reactive Maintenance
- Reduced Energy Consumption
- Solar - Zero Emissions

Street Lighting

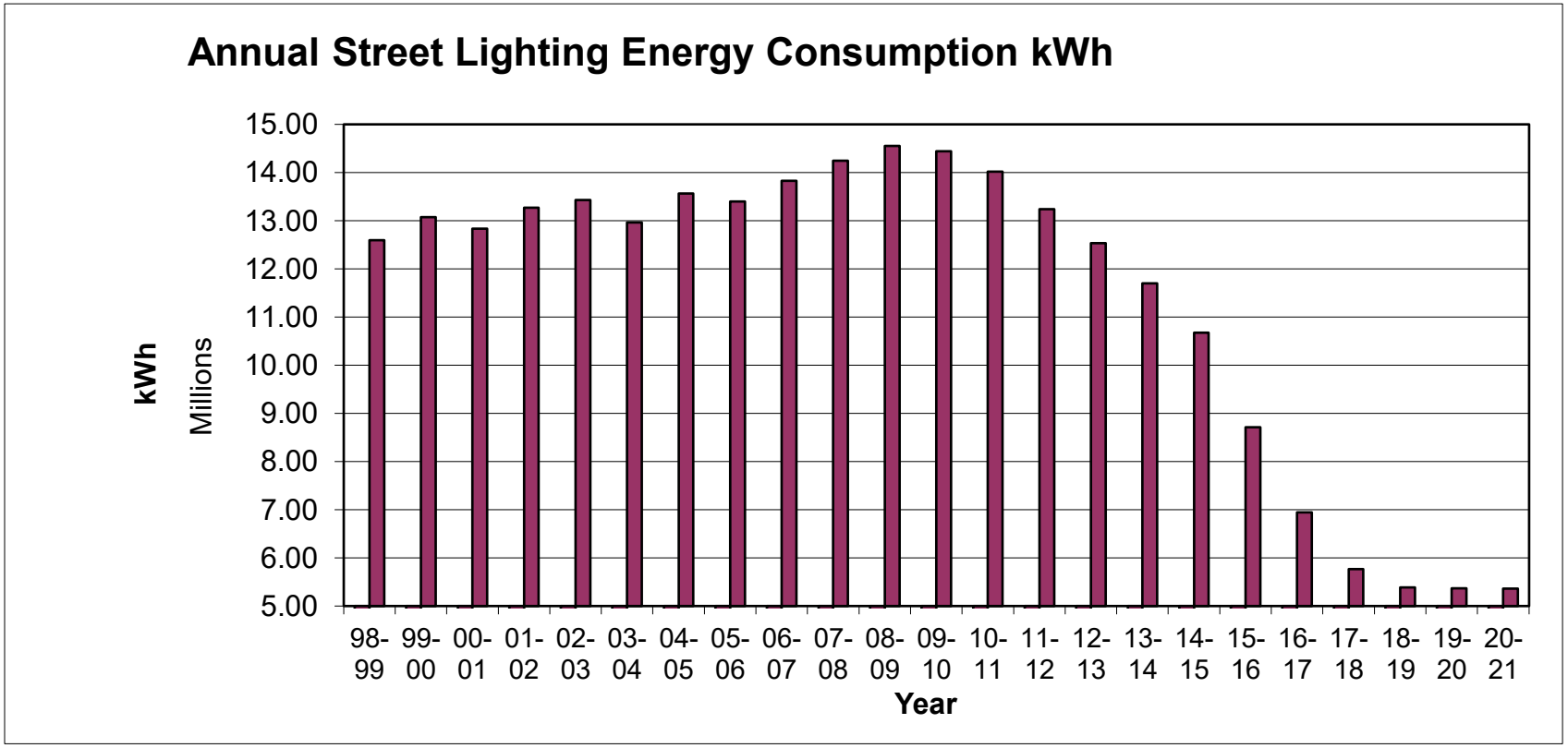




- Review the lighting levels and hours of operation
- Right Light, Right Place, Right Time
- Transformation Through Technology
- Reduced Planned Maintenance
- Reduced Reactive Maintenance
- Reduced Energy and CO_2

Confident Place, Confident People.

Outcome – so far…



- Energy reduced 63.11% from Peak Consumption
- Approximately 4,900 tonnes CO_2 emissions avoided per annum
- (NB - 57% reduction from our oldest baseline data)

Street Lighting – Net Zero?

- July 2020 - Home Office Safer Streets funding
- Neighbourhood area which was particularly affected by acquisitive crimes such as burglary, vehicle theft and robbery
- Resident Survey showed improved lighting as number 1 priority – rear alleyways unlit
- Lighting shown to reduce this type of crime and improve perception of safety
- Developed scheme with Community Safety Team, GMP, Local Councillors and Community

Street Lighting – Net Zero?

- Around 70 Lighting units
- Lack of electricity power supplies
- Limited accessibility for heavy plant and equipment
- Potential for spill-light to fall onto properties and bedroom windows
- Impact of Covid-19 on contractor availability and enhanced safe working practices
- Impact of Brexit on product availability
- Deadline to complete by March 2021

Street Lighting – Net Zero?

- Solar Powered Lighting – offered a solution
- Avoidance of @ 2,200m of trenching
- Reduced disruption to residents - installation reduced from forecast 75 to 10 working days
- Scheme cost was reduced by around 45% compared to conventional scheme
- Avoid @ 115,000 kWh planned life-time energy consumption and 58 tonnes CO_2
- Avoid @ £17k energy charges over the planned life-time of the lighting units
- Feedback very positive comments '*great idea, feel safer with lights in the alley'* and *'great that they only stay on when people move*'.
- Process/product is scaleable and is being used in a new Safer Streets grant initiative.

Summary – Energy Reduction

- Energy Reduction
  - Traffic Bollards – Eliminate
  - Traffic Signs – Significantly Reduce
  - Street Lighting – Significantly Reduce
- Net Zero Carbon
  - Trial of Solar Lighting – offset growth
  - Scale-able for certain locations
  - Invest to Save – typically 1kW rated 1m^2 panel generates to power 150 to 200W per annum
  - Grid connected may be used to offset energy consumption with surplus energy generated

Thank you for your time and attention.

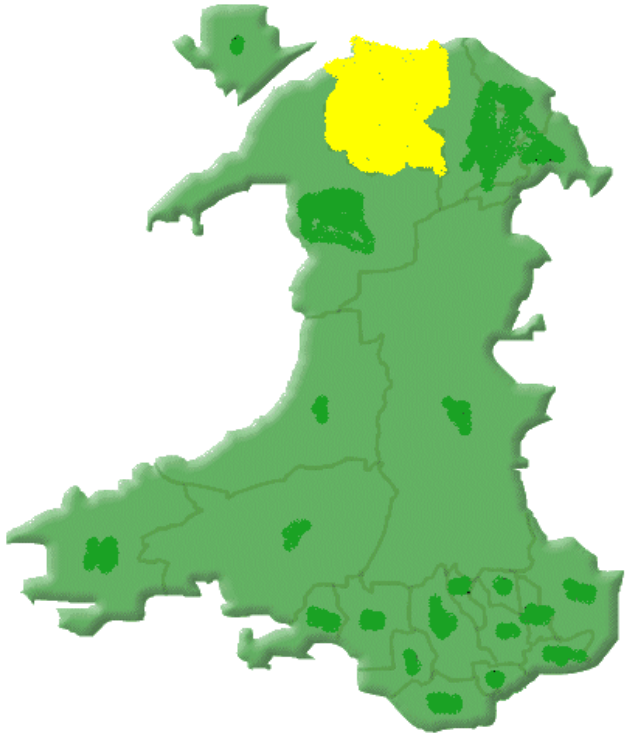
Questions and Answers

Managing Data, Making Decisions

Simon Billington - Open Spaces Manager
Sophie Birchall-Rogerson – Environmental Strategy Lead Officer &
ADB Project Manager

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Conwy County



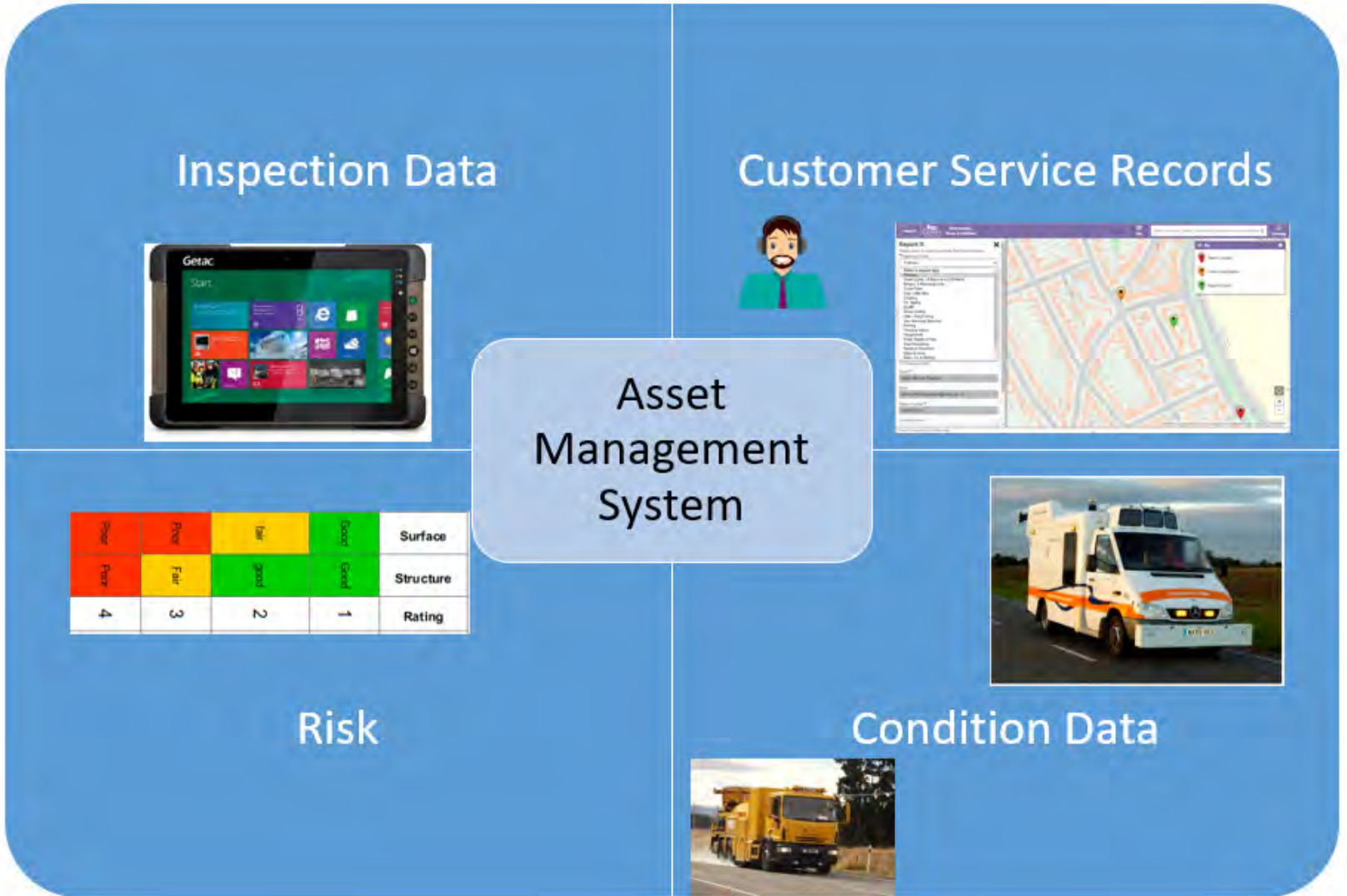
- Population 116,000
- Towns - Llandudno, Colwyn Bay, Conwy
- 1,688km highway network
- 16,356 street lights
- 570 bridges
- 795 hectares of parks and green spaces
- 20% of artificially protected coastline in Wales

Environment, Roads & Facilities

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Asset Management Foundations for Service Delivery

1. High Quality Asset Data



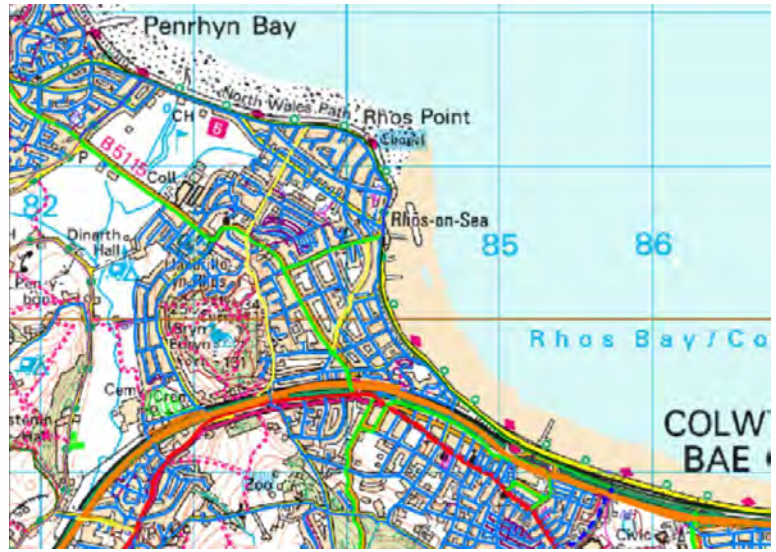
CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Asset Management Foundations for Service Delivery

2. Highway Network & **hierarchy**

Carriageways	
New Category	**Description (approximate daily traffic volume)**
CHSR	Route enabling travel between locations of regional significance (NA, Strategic routes are identified based on their importance regionally rather than their traffic volume)
CH1	Travel between locations (traffic volume 10,000 - 20,000)
CH2	Travel between locations (5,000 - 10,000)
CH3	Travel between locations (1,000 - 5,000)
CH4	Access to housing (200 – 1,000)
CH5	Access to properties (housing and farms) (< 200)

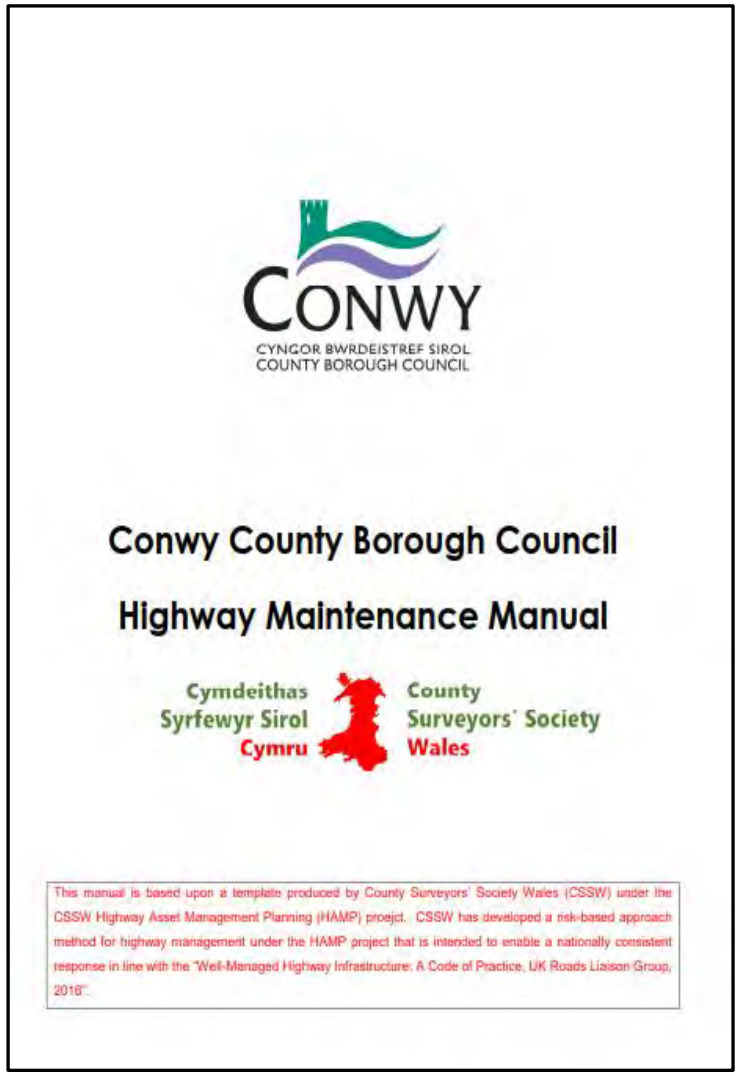
Footways	
Category	**Description (approximate daily footfall)**
FH1	High use pedestrianised zones and footways in town centres (5,000 – 10,000)
FH2	Footways outside busy public building such as train/bus stations, hospitals, schools and colleges or small parade of shops etc. that generate significantly higher levels of use than the adjacent footways (1,000 – 5,000)
FH3	Footways that link housing estates and industrial estates to other centres /routes (500 – 1,000)
FH4	Footways in housing areas (<500)
FH5	Rural footways used very infrequently (<100)



CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Asset Management Foundations for Service Delivery

3. Highway Maintenance Manual –**Risk Based Approach**



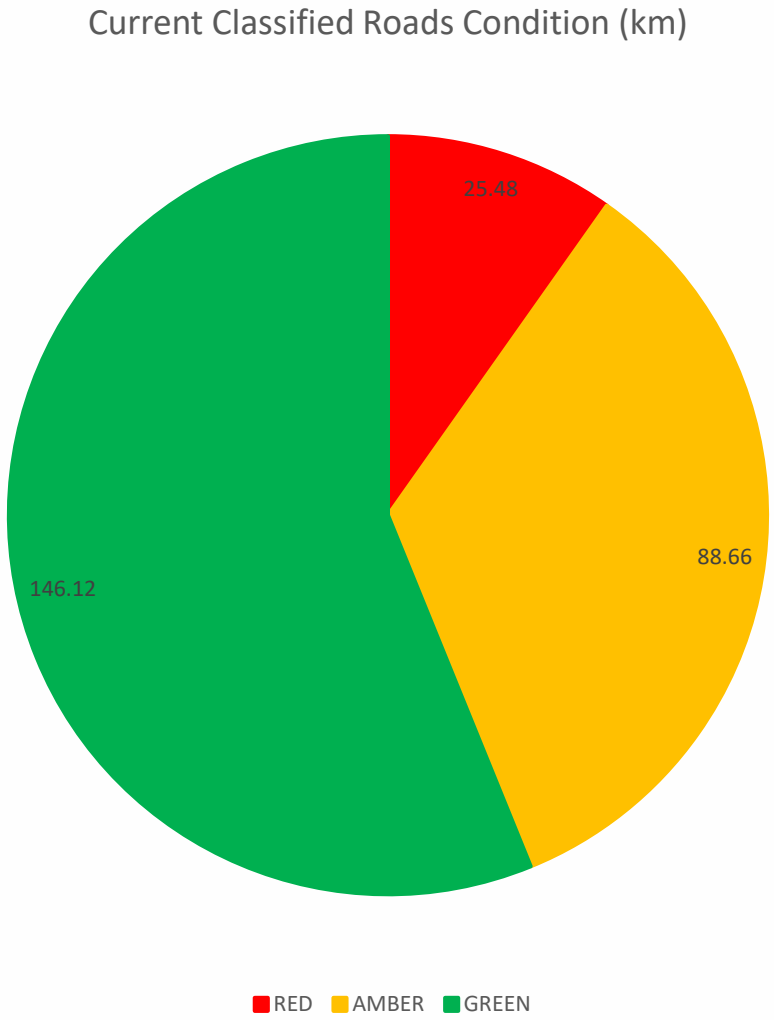
- National Policy (All Wales Approach) through CSS Wales
- Risk based - Network hierarchy
- Hierarchy on exposure
- Safety in numbers and strength in aligning highways asset management

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Managing Data, Making Decisions:

Highways Capital Schemes Matrix

Current Position – Classified Road Network



44% of Classified Road Network requires treatment

This does not include the condition of unclassified roads (896km)

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Highways Capital Scoring System

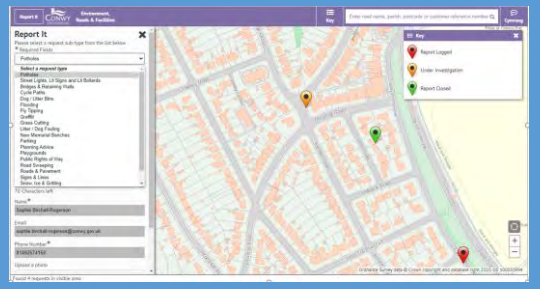
- Informed decisions based on evidence from asset data
- Prioritising schemes based on condition & risk
- Making the most of limited budgets

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

How?

Inspection Data

Customer Service Records



Asset Management System

Risk

Condition Data

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Recording Potential Schemes – Wish List

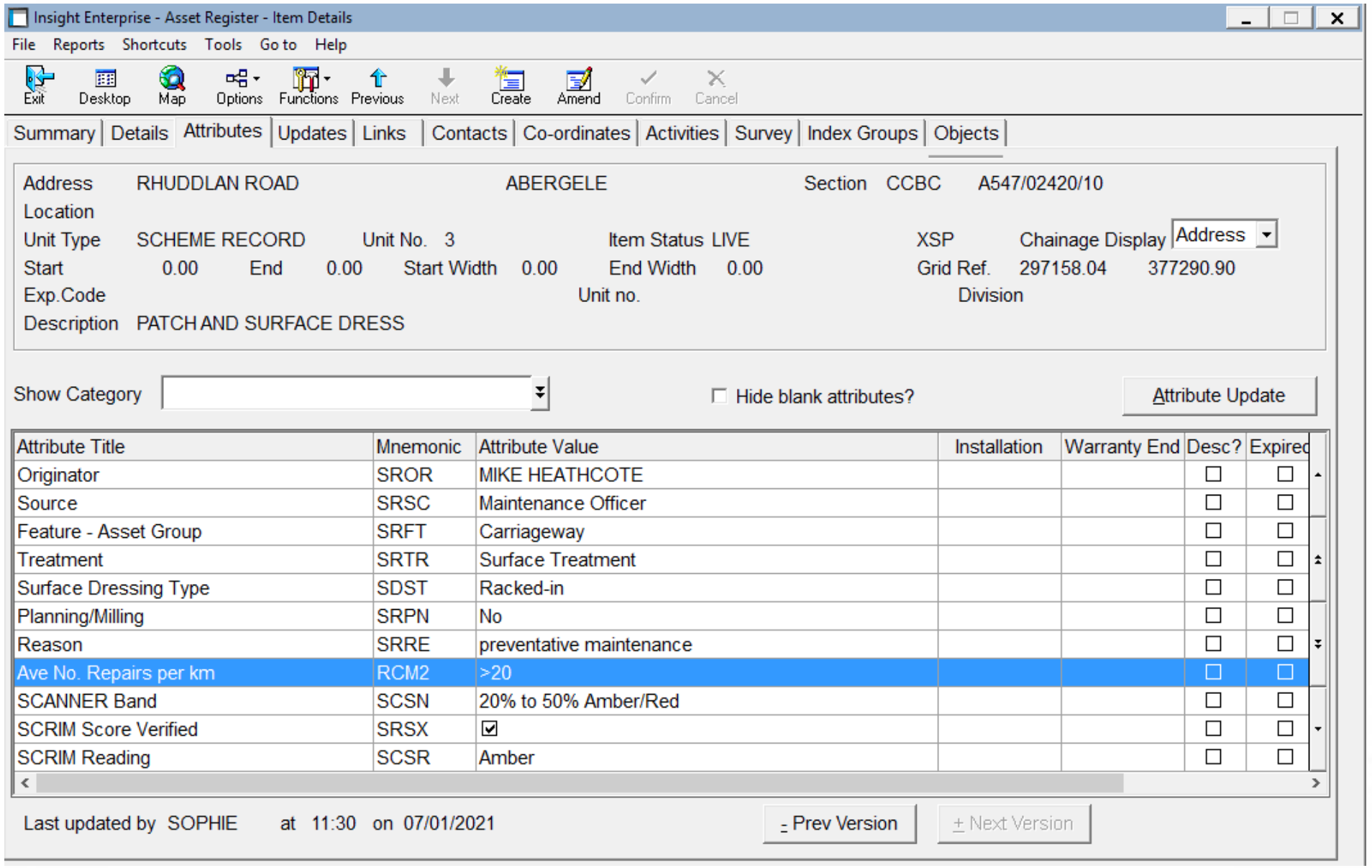
Summary | Details | Attributes | Updates | Links | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

Address	RHUDDLAN ROAD			ABERGELE			Section	CCBC	A547/02420/10		
Location											
Unit Type	SCHEME RECORD		Unit No.	3		Item Status	LIVE		XSP	Chainage Display	Address
Start	0.00	End	0.00	Start Width	0.00	End Width	0.00		Grid Ref.	297158.04	377290.90
Exp.Code					Unit no.				Division		
Description	PATCH AND SURFACE DRESS										

Attribute Title	Attribute Value
Scheme Type	SURFACE DRESS
Scheme Year	2019/20
Scheme Status	WISHLIST
Engineers Ranking	Previous Priority - Part of Wider Scheme
Originator	MIKE HEATHCOTE
Source	Maintenance Officer
Feature - Asset Group	
Treatment	
Surface Dressing Type	
Planning/Milling	
Reason	
Ave No. Repairs per km	
SCANNER Band	
SCRIM Score Verified	☐
SCRIM Reading	

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Scheme Scoring Matrix



CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

No. Defects per km

13/10/2016	142909	fill Potholes	CARRIAGEWAY	Pothole
13/05/2016	136795	fill potholes	CARRIAGEWAY	Pothole
07/11/2016	143727	fill potholes	CARRIAGEWAY	Pothole
16/11/2016	144127	Fill Pothole	CARRIAGEWAY	Pothole
16/11/2016	144101	Fill Pothole	CARRIAGEWAY	Pothole
18/10/2017	158253	fill Potholes	FOOTWAY	Pothole
18/04/2016	135670	Fill Pothole approx 2 tubs	CARRIAGEWAY	Pothole
29/11/2017	160303	Fill Pothole	CARRIAGEWAY	Pothole
01/05/2018	167306	Fill Potholes	CARRIAGEWAY	Pothole
05/09/2018	172885	Fill pothole	CARRIAGEWAY	Pothole
08/02/2019	179400	There is a large hole in the westerly carriageway on the A547	CARRIAGEWAY	Pothole
19/03/2018	165184	Dinner plate size. Nearly Tennis ball depth	CARRIAGEWAY	Pothole
31/01/2018	163245	Fill Potholes	CARRIAGEWAY	Pothole
26/06/2018	169767	fill pothole	CARRIAGEWAY	Pothole
22/12/2017	161402	size of a football	CARRIAGEWAY	Pothole

	Number	Avg. No. Defects Per KM	Repair Score Value
Footway:	2	4.02	2.00
Carriageway:	21	42.22	5.00

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

SCANNER Data – Condition Survey

Insight Enterprise - Asset Register - Item Details

File Reports Shortcuts Tools Go to Help

Exit Desktop Map Options Functions Previous Next Create Amend Confirm Cancel

Summary | Details | Attributes | Updates | Links | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

Address RHUDDLAN ROAD ABERGELE Section CCBC A547/02420/10
Location
Unit Type SCHEME RECORD Unit No. 3 Item Status LIVE XSP Chainage Display Address
Start 0.00 End 0.00 Start Width 0.00 End Width 0.00 Grid Ref. 297158.04 377290.90
Exp.Code Unit no. Division
Description PATCH AND SURFACE DRESS

Show Category ☐ Hide blank attributes? Attribute Update

Attribute Title	Mnemonic	Attribute Value	Installation	Warranty End	Desc?	Expired
Originator	SROR	MIKE HEATHCOTE			☐	☐
Source	SRSC	Maintenance Officer			☐	☐
Feature - Asset Group	SRFT	Carriageway			☐	☐
Treatment	SRTR	Surface Treatment			☐	☐
Surface Dressing Type	SDST	Racked-in			☐	☐
Planning/Milling	SRPN	No			☐	☐
Reason	SRRE	preventative maintenance			☐	☐
Ave No. Repairs per km	RCM2	>20			☐	☐
SCANNER Band	SCSN	20% to 50% Amber/Red			☐	☐
SCRIM Score Verified	SRSX	☑			☐	☐
SCRIM Reading	SCSR	Amber			☐	☐

Last updated by SOPHIE at 11:30 on 07/01/2021 - Prev Version + Next Version

AA001 HIGHWAYS LIVE 27/09/21

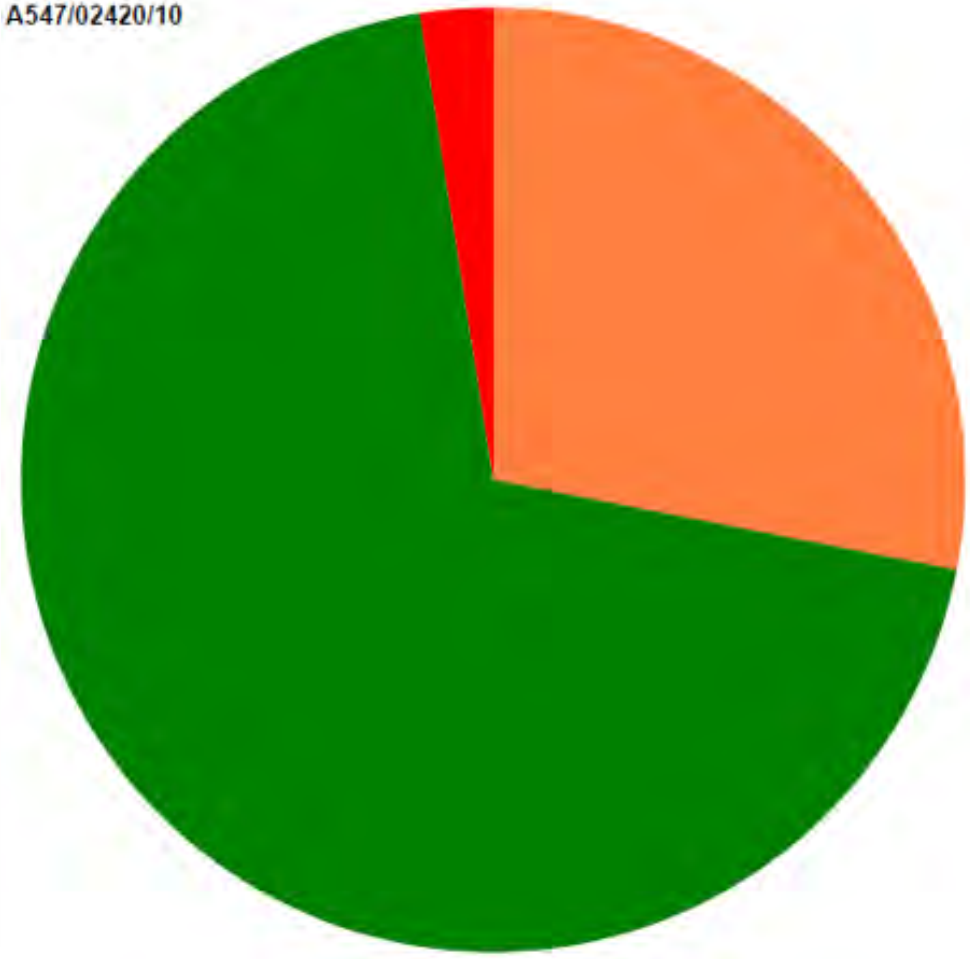
CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

SCANNER

HIGHWAYS CAPITAL PROGRAMME - UKPMS SCANNER RESULTS

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

A547/02420/10



SCANNER BAND SUMMARY

AMBER: Plan investigation soon	28.0%
GREEN: Generally good condition	69.4%
RED: Plan maintenance soon	2.6%
Total:	100.0%

SCRIM – Skid Resistance Data

Insight Enterprise - Asset Register - Item Details

File Reports Shortcuts Tools Go to Help

Exit | Desktop | Map | Options | Functions | Previous | Next | Create | Amend | Confirm | Cancel

Summary | Details | Attributes | Updates | Links | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

Address RHUDDLAN ROAD ABERGELE Section CCBC A547/02420/10
Location
Unit Type SCHEME RECORD Unit No. 3 Item Status LIVE XSP Chainage Display Address
Start 0.00 End 0.00 Start Width 0.00 End Width 0.00 Grid Ref. 297158.04 377290.90
Exp.Code Unit no. Division
Description PATCH AND SURFACE DRESS

Show Category ☐ Hide blank attributes? Attribute Update

Attribute Title	Mnemonic	Attribute Value	Installation	Warranty End	Desc?	Expired
Originator	SROR	MIKE HEATHCOTE			☐	☐
Source	SRSC	Maintenance Officer			☐	☐
Feature - Asset Group	SRFT	Carriageway			☐	☐
Treatment	SRTR	Surface Treatment			☐	☐
Surface Dressing Type	SDST	Racked-in			☐	☐
Planning/Milling	SRPN	No			☐	☐
Reason	SRRE	preventative maintenance			☐	☐
Ave No. Repairs per km	RCM2	>20			☐	☐
SCANNER Band	SCSN	20% to 50% Amber/Red			☐	☐
SCRIM Score Verified	SRSX	☑			☐	☐
SCRIM Reading	SCSR	Amber			☐	☐

Last updated by SOPHIE at 11:30 on 07/01/2021 - Prev Version + Next Version

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Highways Safety Inspection

Insight Enterprise - Asset Register - Item Details

File Reports Shortcuts Tools Go to Help

Exit | Desktop | Map | Options | Functions | Previous | Next | Create | Amend | Confirm | Cancel

Summary | Details | Attributes | Updates | Links | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

Address RHUDDLAN ROAD ABERGELE Section CCBC A547/02420/10
Location
Unit Type SCHEME RECORD Unit No. 3 Item Status LIVE XSP Chainage Display Address
Start 0.00 End 0.00 Start Width 0.00 End Width 0.00 Grid Ref. 297158.04 377290.90
Exp.Code Unit no. Division
Description PATCH AND SURFACE DRESS

Show Category ☐ Hide blank attributes? Attribute Update

Attribute Title	Mnemonic	Attribute Value	Installation	Warranty End	Desc?	Expired
Source	SRSC	Maintenance Officer			☐	☐
Feature - Asset Group	SRFT	Carriageway			☐	☐
Treatment	SRTR	Surface Treatment			☐	☐
Surface Dressing Type	SDST	Racked-in			☐	☐
Planning/Milling	SRPN	No			☐	☐
Reason	SRRE	preventative maintenance			☐	☐
Ave No. Repairs per km	RCM2	>20			☐	☐
SCANNER Band	SCSN	20% to 50% Amber/Red			☐	☐
SCRIM Score Verified	SRSX	☑			☐	☐
SCRIM Reading	SCSR	Amber			☐	☐
HSI CONDITION RANKING	SRCC	Surface			☐	☐

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Visual Condition Assessment

Cymdeithas Syrfewyr Sirol Cymru — County Surveyors' Society Wales

Highway Asset Management Planning: Carriageway Visual Condition Assessment Manual

4 Rating Criteria

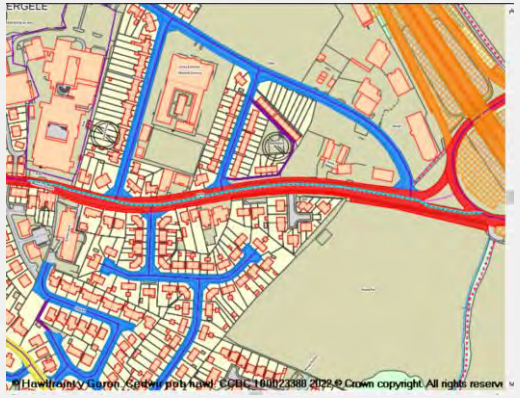
Surface	Structure	Rating	Visible Distress	Potential Treatment	Comment
Good	Good	1	Little or no surface defects (<10% of surface)	Nil	New surfaces or other surfaces where no treatment is required
fair	good	2	Surface defects (ravelling or bleeding) up to 30%, some localised structural distress may be present in small quantities (edge deterioration, potholes), occasional patching, generally in reasonable condition, road shape good	Preventative maintenance	Preventative treatment design to prevent escalation of deterioration.
Poor	Fair	3	Rutting or alligator cracking up to 25%. Some localised structural distress may be present in small quantities, pavement out of shape, with some surface distortion.	Resurface; overlay / inlay	Replacement of the surface layer will restore to an acceptable condition.
Poor	Poor	4	Rutting and alligator cracking over 25%; pavement out of shape with significant surface distortion, Significant edge problems present, potholes, patches generally in poor condition.	Structural overlay or inlay	Structural overlay / inlay required to strengthen road, localised patching and repairs required prior to overlay or inlay.

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Risk – Hierarchy

Details | Lengths | UKPMS | Co-ordinates | Index Groups | Activities | Fields | Objects

Network	CCBC	Section Ref.	A547/02420/10	Length	497.40
Address	RHUDDLAN ROAD		ABERGELE	Start	0.00



Link Id		
Section Ref.	A547/02420/10	
Date Opened		
Status		
Speed Limit	30	
Inspection Category	03	CH2 - Secondary Distributor
Road Type	S2	Single 2-Lane Carriageway
Road Hierarchy	3a	Main Distributor
Urban or Rural	Urban	☐ Nominated? Class/Index S23AU
Description	BRIDGE STREET TO ROUNDABOUT	

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Conwy County Borough Council

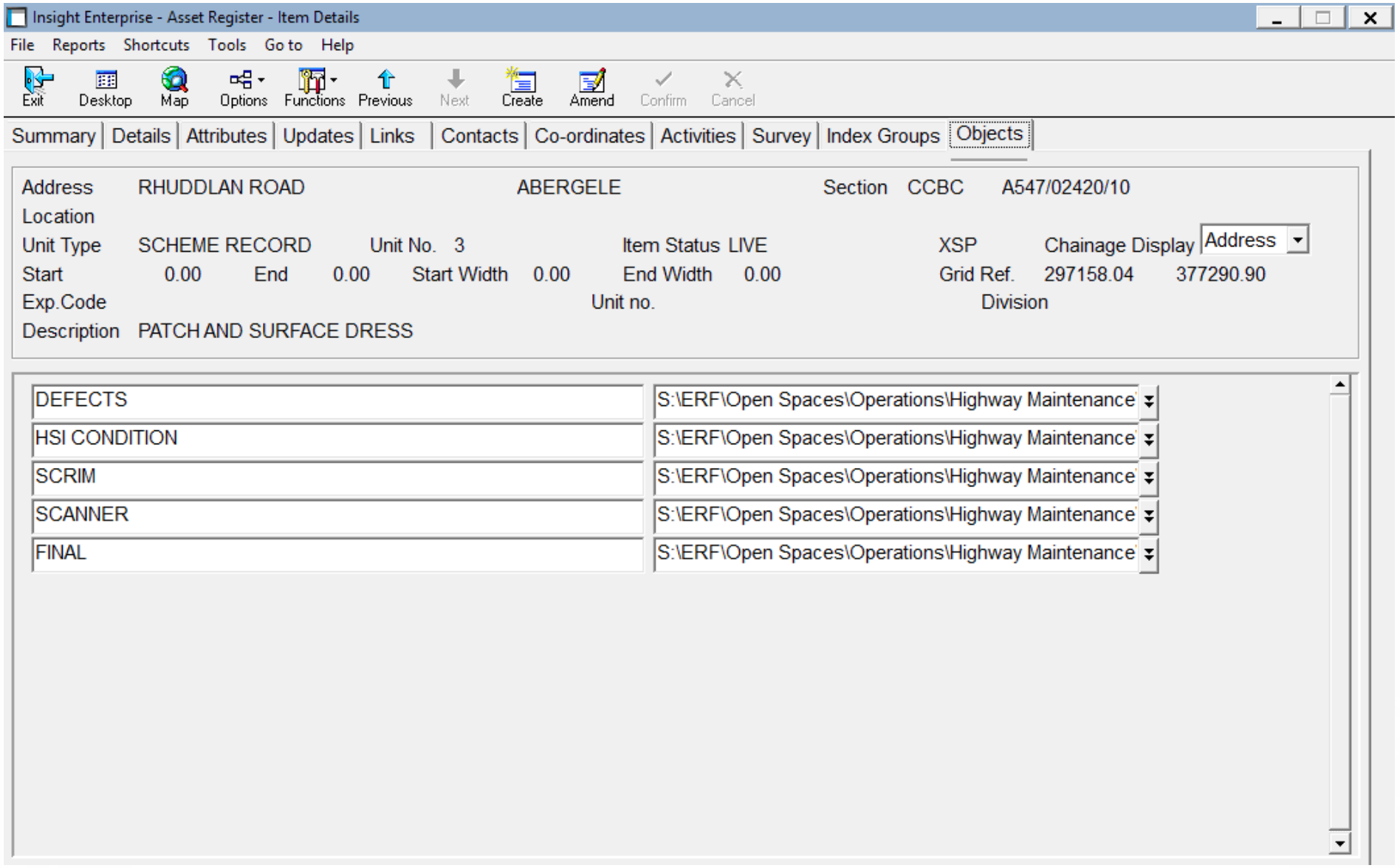
Highway Maintenance Manual

Cymdeithas Syrfewyr Sirol Cymru
County Surveyors' Society Wales

This manual is based upon a template produced by County Surveyors' Society Wales (CSSW) under the CSSW Highway Asset Management Planning (HAMP) project. CSSW has developed a risk-based approach method for highway management under the HAMP project that is intended to enable a nationally consistent response in line with the "Well-Managed Highway Infrastructure: A Code of Practice, UK Roads Liaison Group, 2016".

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Evidence Data Saved against Scheme Asset



CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Overall Scheme Score

Criteria	Value	Score	Weighting	Weighted Score
Engineers Ranking	Previous Priority - Part of Wider Scheme	4	2	8
Ave No. Repairs per km	>20	5	2	10
SCANNER Band	20% to 50% Amber/Red	2	1	2
SCRIM Reading	Amber	1	2	2
Community Priority		0	1	0
Network Hierarchy	Secondary Distributor	3	2	6
Scheme Cost Band	£50-£100K	1	2	2
Preventative Maintenance	5 Year Old Surface - Score 4	4	2	8

SCHEME SCORE 38

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Decisions

Scheme Score	Section Ref	Location		Area Symology	Est. Rate
38	A547/02420/10	RHUDDLAN ROAD, ABERGELE		15482.60	£4.00
36	B5383/07984	DOLWEN ROAD, OLD COLWYN	*DOLWEN ROAD, OLD COLWYN TO DOLWEN ROAD, BETWS YN RHOS.*	19621.94	£3.00
35	A543/06477/10	PENTREFOELAS TO PONT TYDDYN, PENTREFOELAS	*FROM HAFODTY HAFOD DRE TO TYRPEG MYNYDD*	6222.00	£3.00
33	C/05256	BODNANT ROAD, EGLWYSBACH	*BODNANT GARDENS TO TY GWYN JUNCTION*	13338.10	£3.00
33	B4501/99648/20	FFORDD BALA, LLANGWM	*FROM GELLIOEDD CHAPPEL TO CTY BOUNDARY*	9487.00	£3.50
32	B5384/05424	GWYTHERIN TO PONT RHYDLECHOG, GWYTHERIN	*GWYTHERIN TO PONT RHYDLECHLOG*	98184.60	£3.00
31	B5106/00776	GWYDYR ROAD, DOLGARROG	*FROM GWYDYR ROAD TO DOLGARROG BRIDGE*	10241.71	£3.50
31	U/05578	FFORDD SGRIVEN, TYN Y GROES	*FROM B5106 TO ROWEN ROAD*	4387.00	£2.00
31	U/05818	MAES TYDDYN, LLANFIHANGEL GLYN MYFYR	*FROM B5105 TO END*	2500.00	£2.00
30	A544/06417/10	CAE GORONWY TO RHOS, BYLCHAU	*FROM CLWT TO RHOS*	4276.00	£3.00
29	C/00683/10	ABER ROAD, LLANFAIRFECHAN	*FROM HRA JOINT O/S FARM LODGE TO LANE LEADING TO CEMETERY*	8649.25	£3.00
29	C/01084/10	SYCHNANT PASS ROAD, CONWY	*FROM JNC ST AGNES ROAD TO JNC F/P NO 8 BEFORE WALLS*	16416.05	£3.00
29	B5106/01099/10	LLANRWST ROAD, CONWY	*FROM 30/40MPH SIGN AT 'THE STABLES' TOWARDS THE GROES PUB*	16804.97	£3.00
29	C/06570/10	SYCHNANT PASS ROAD, DWYGYFYLCHI	*FAIRY GLEN PUB TO END OF WALLS JNC F/P N0 8*	7658.49	£3.00
29	B5113/99646/10	FFRIDD UCHAF TO FAWNOG FAWR, TROFARTH		47732.75	£3.00
28	C/05515/10	EGLWYSBACH ROAD, EGLWYSBACH	*TY GWYN JUNCTION TO 30MPH*	47586.60	£3.00
28	B5381/99874/20	FFORDD LLANELWY, BETWS YN	*FROM TYDDYN Y FRON TO JUNCTION OF CAMBWLL*	10300.32	£3.80

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Summary

- Evidence Based
- Insufficient funding to cover road maintenance backlog
- Striving to target roads in worst condition posing the highest risks and best value for money – only way to do this is…

- Managing data, to make decisions

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Managing Data, Making Decisions:

Ash Die Back Disease (ADB)

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

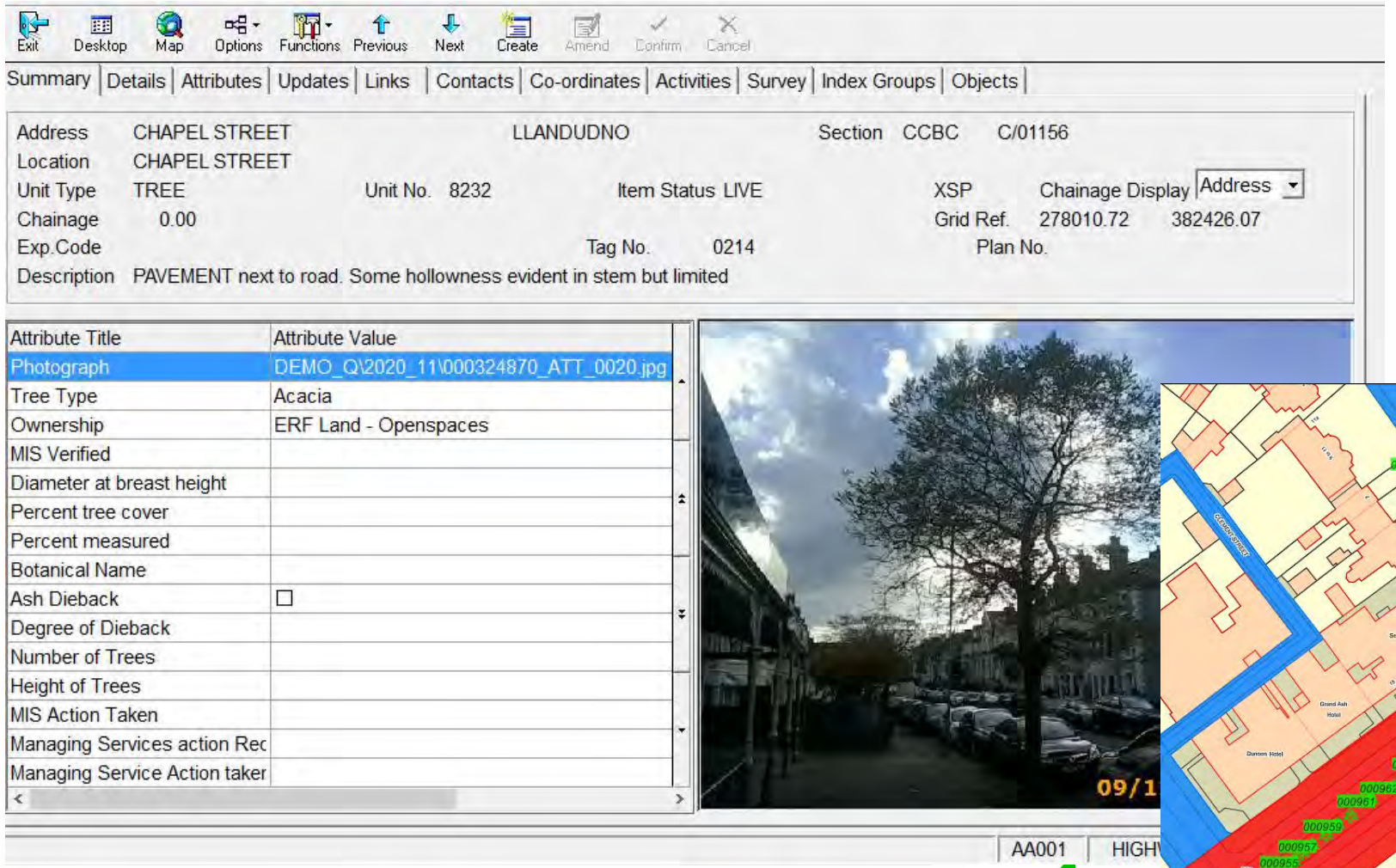
Background

- 2018 – ADB discovered
- Most populous tree across North Wales
- Scale????
- Threat???
- Cost???

UNKNOWN!

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Existing Data



Pretty Good Asset Inventory?

- Highway Network Layer
- Adopted Highway Layer
- Started digital **urban street** tree data collection in 2014

Problem…

- Ash - more prevalent on
  - highway verges
  - woodland
  - in informal self-seeded growths

- Left clueless…
  - How many ash trees in the County?
  - Where are they?
  - What degree of risk?

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

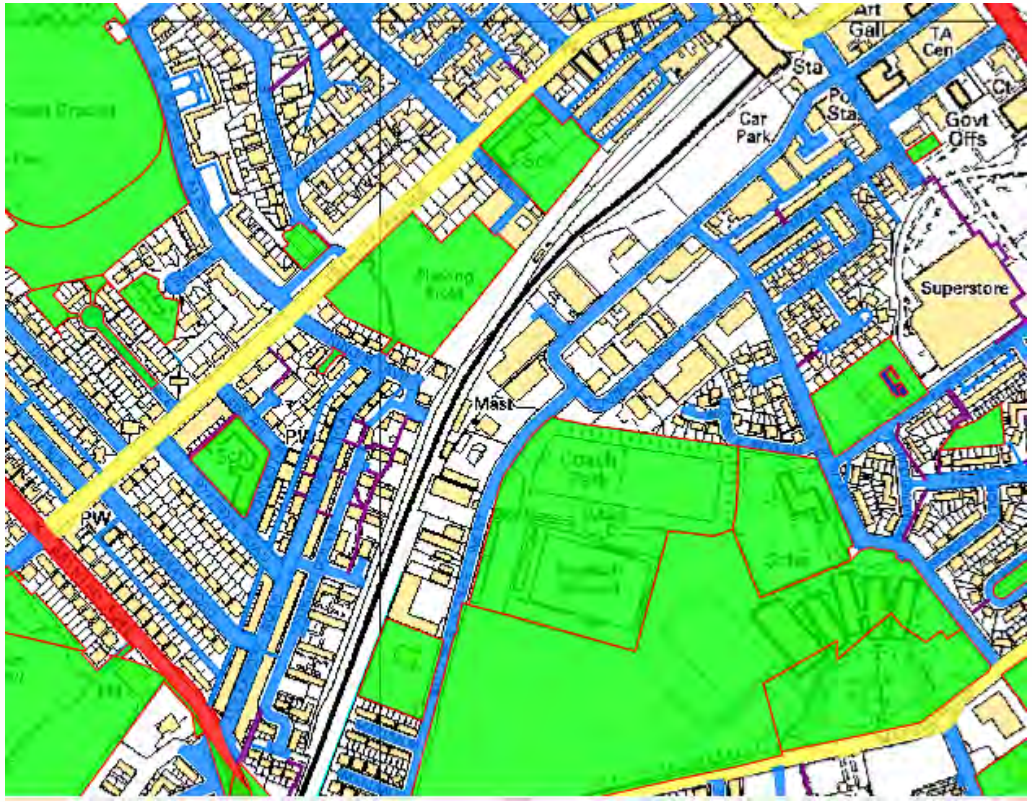
Next Steps

- Our “Trusty” Tablets
- Traditional Data Collection Methods

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Scale - Too big

- 1669km Highway Network
- >11 million m2 of CCBC Land
- >17 million m2 of adopted highways



Timescales - Worrying

High risk of falling onto public areas - highways/ parks/ playgrounds/ schools

Survey data

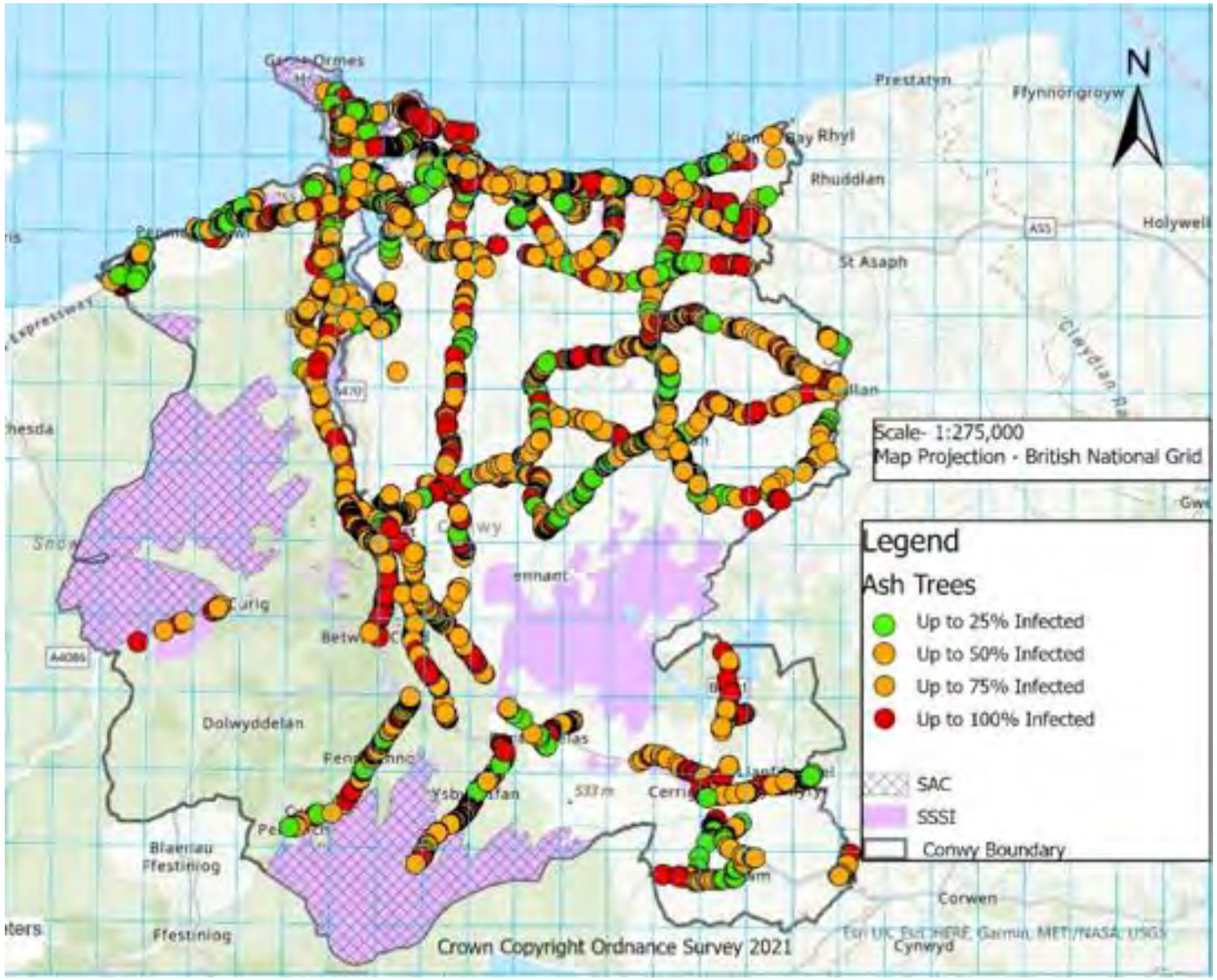
Network Hierarchy	Length Surveyed (km)	Overall Highway Network	Overall Survey Coverage %
CHSR	0	4	0%
CH1	41	41	100%
CH2	100	100	100%
CH3	192	192	100%
CH4	153	153	100%

In just 1 season – 30% Highway Network Surveyed based on routing by network hierarchy and USRN

Moata Survey provided by Mott MacDonald

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Spatial Analysis



ADB Located CH1-CH4 Network ✓

Scale of ADB ✓

Degree of ADB ✓

Tree Height ✓

Photographic evidence ✓

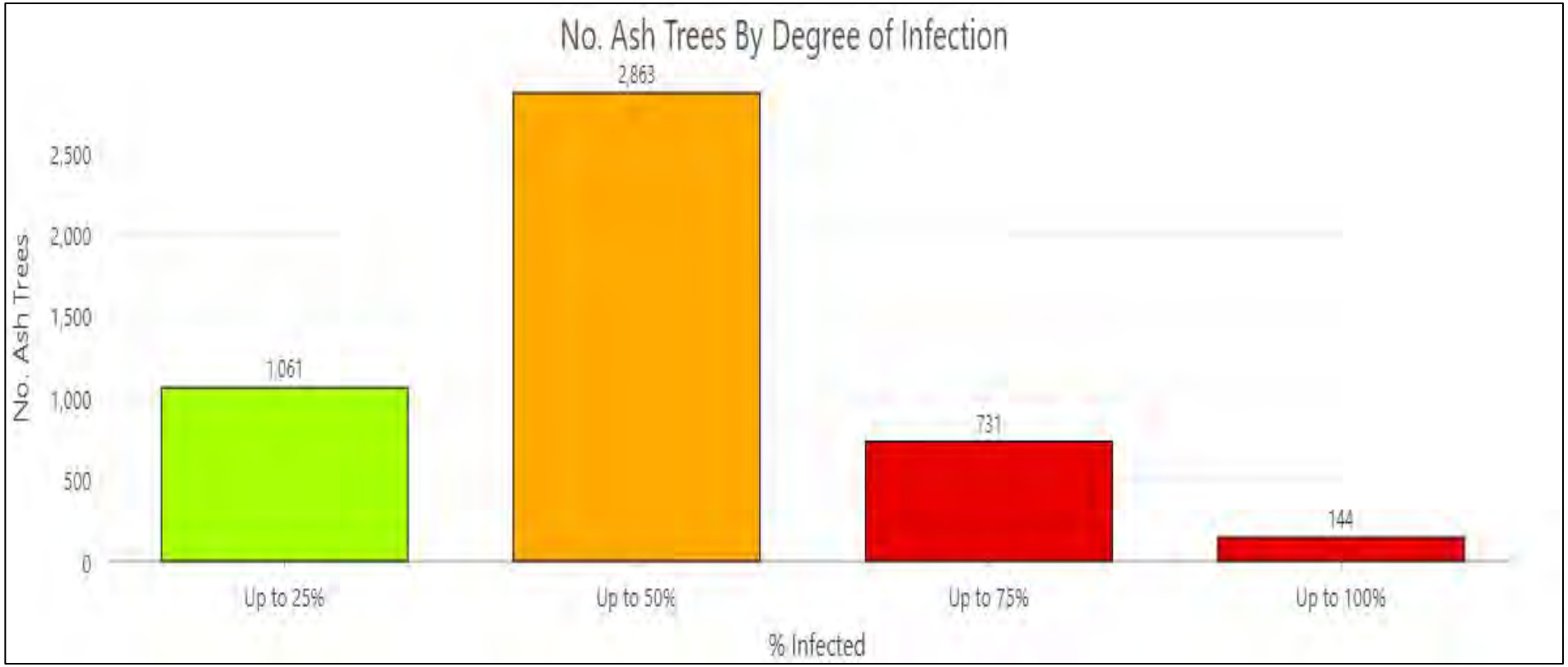
Overlaid with environmental data

- SSSI
- SAC

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

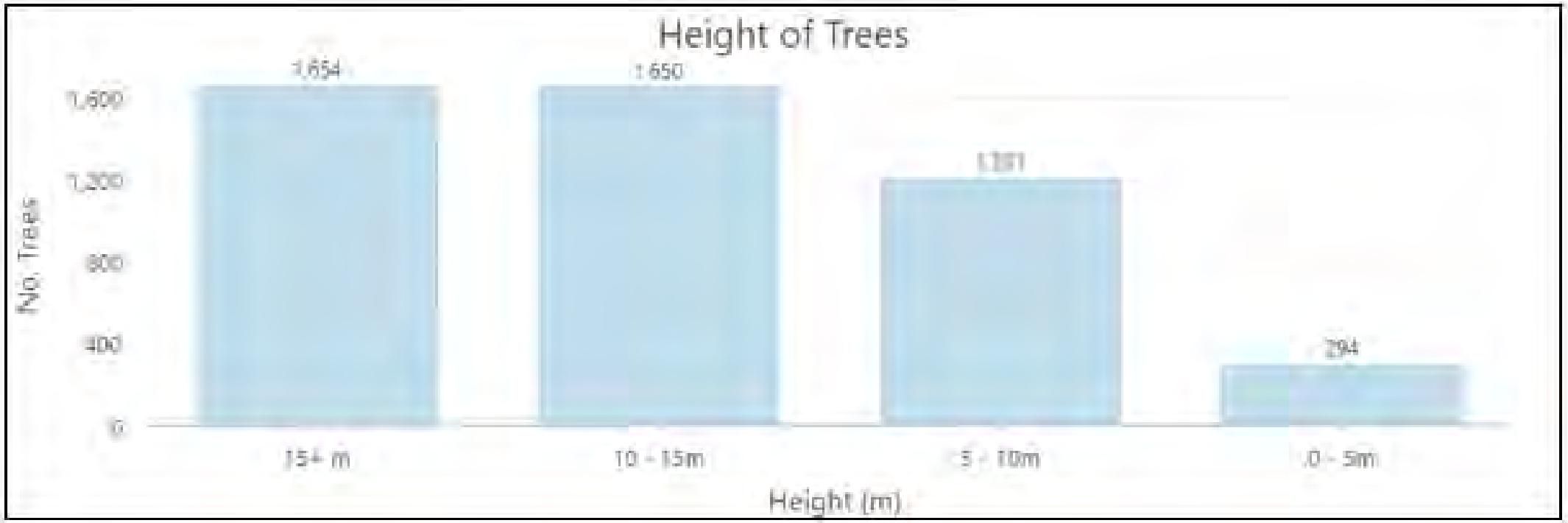
Data Analysis

- Interrogate data
- Identify trees by condition
- Target prioritisation based on risk



CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Data Analysis



- Survey data picked up height of trees

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

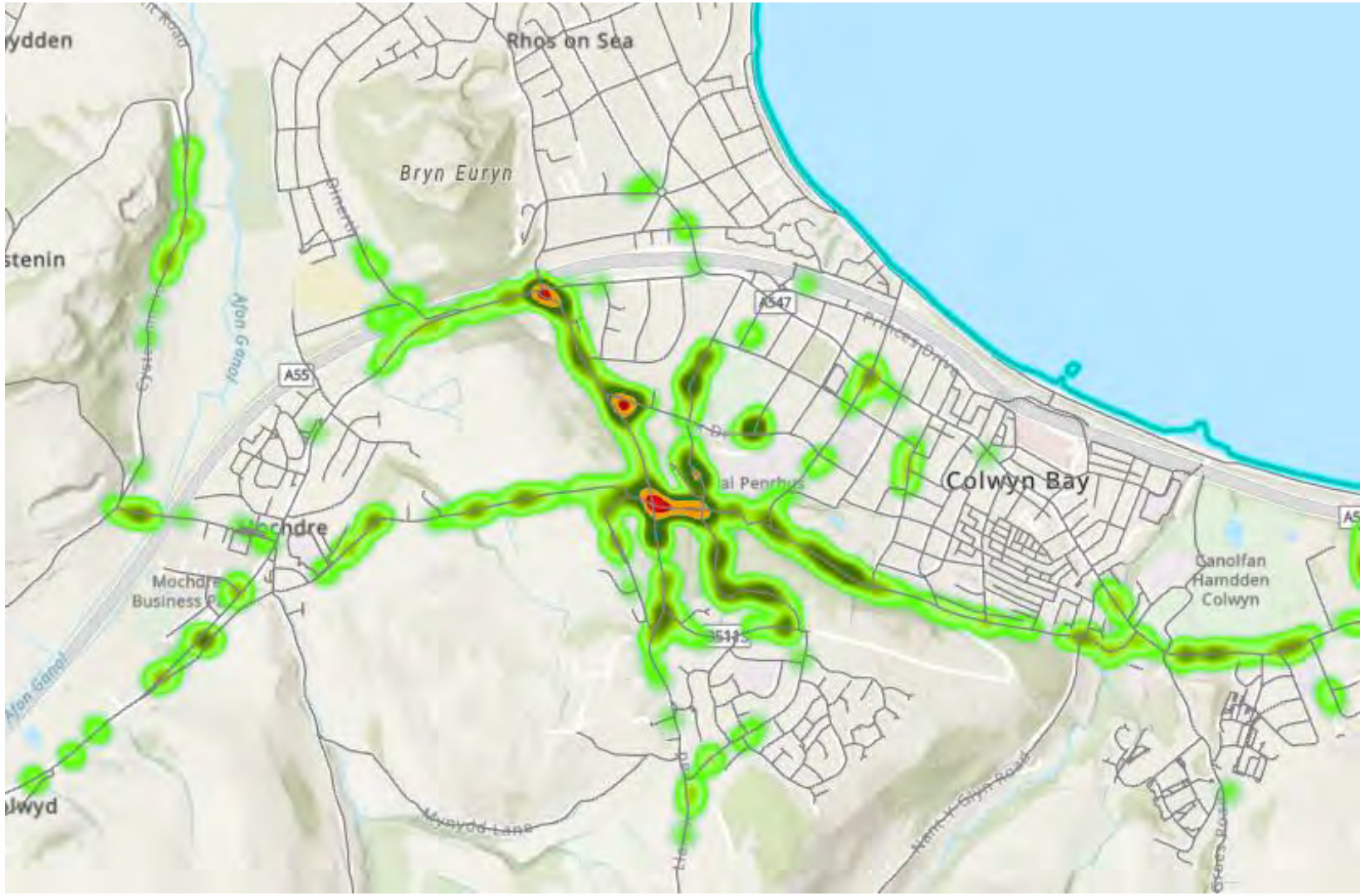
Cost – Actual Cost Forecast

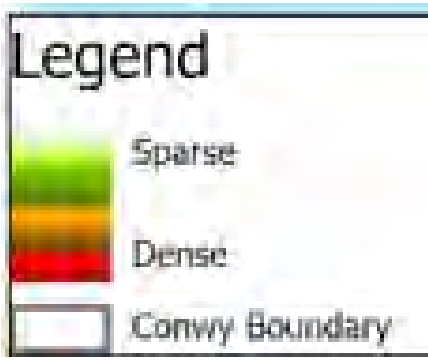
Height of Trees	Average Daily Cost	Average No. Trees Removed Day Rate	Average Cost per Tree (£)	Degree of Dieback				Total Costs Raw Survey Inventory (£)
				Up to 25%	Up to 50%	Up to 75%	Up to 100%	
0-5m	1960	35	56	69	165	40	20	£ 16,464.00
5-10m	1960	27	72.59259	300	672	180	49	£ 87,183.70
10-15m	2503	8	312.875	367	987	244	52	£ 516,243.75
15m+	2503	4	625.75	325	1039	267	23	£ 1,034,990.50
Total No. Trees				1061	2863	731	144	
Total Cost				£ 343,835.65	£ 1,016,984.10	£ 258,723.42	£35,338.79	£ 1,654,881.95

- Condition & Height data enabled us to calculate short, medium and long term risks and costs associated with managing ADB

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Prioritisation - Risk Based Approach – Tree Density





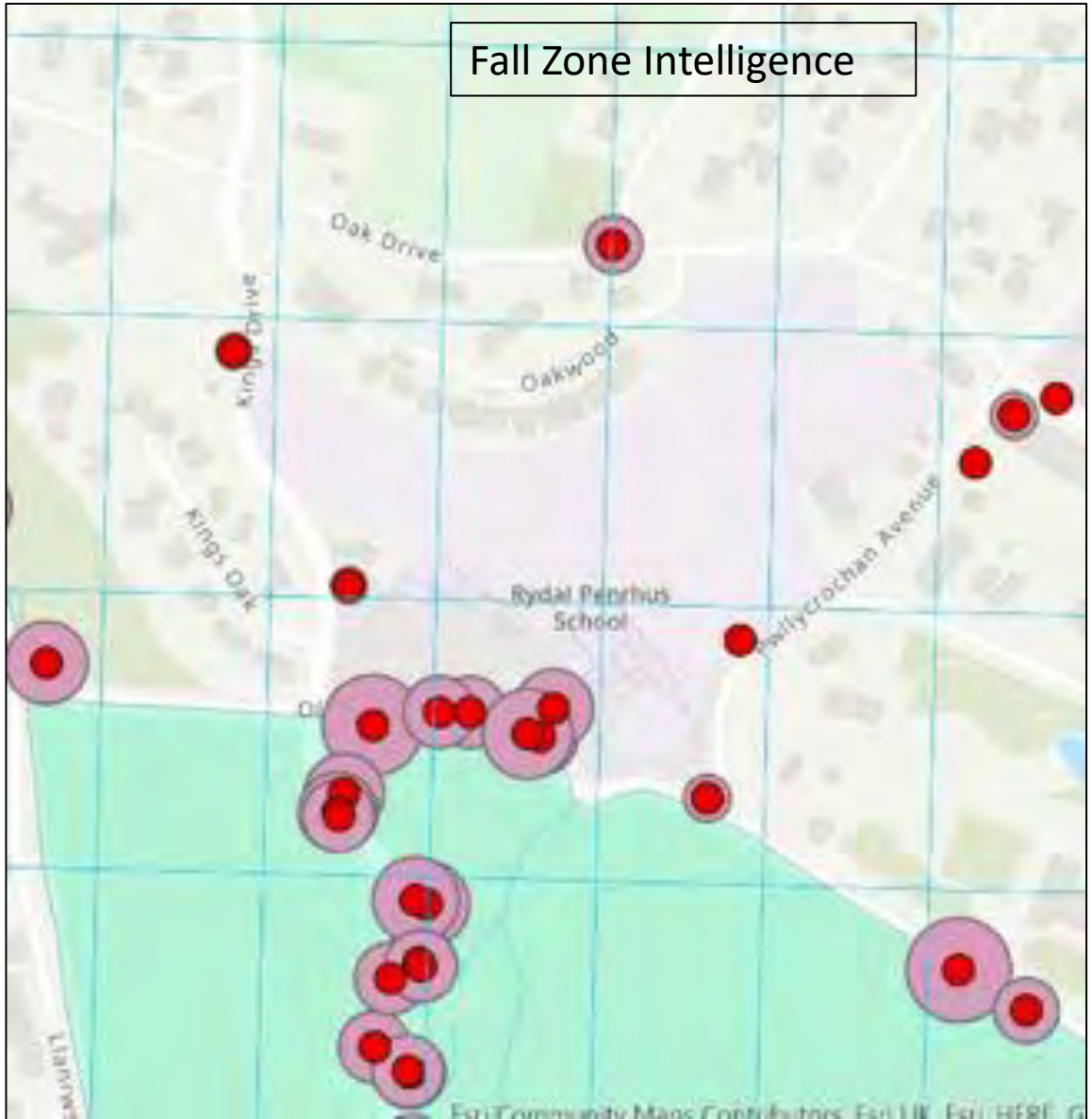
Prioritisation Intelligence

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

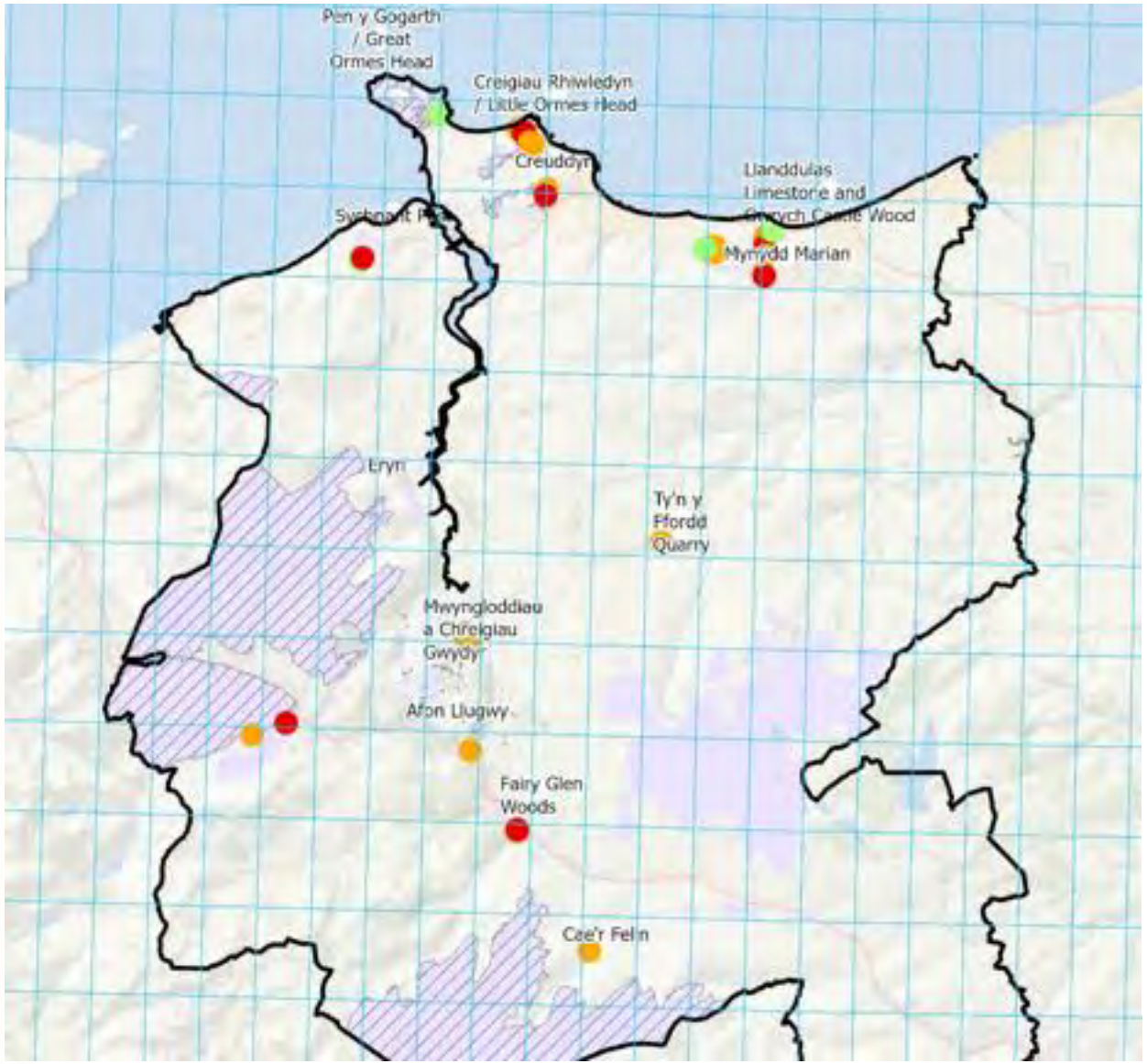
Prioritisation - Risk Based Approach – Fall Zones

Identify Network Sections and USRN's with greatest volume of dangerous trees

Network Section	No. Trees Up to and >75% ADB
B5106/99647	48
B5113/01766	33
B5113/99646/10	28
B5106/06421	19
A548/06419/20	15
B5113/99646/30	14
B4407/06420/30	12
A543/06477/20	11
A547/02258/35	11
B5113/06428	11
C/05403/10	11
C/05490	11
U/01803/20	11



Prioritisation - Early Mitigation – Trees SSSI/SAC



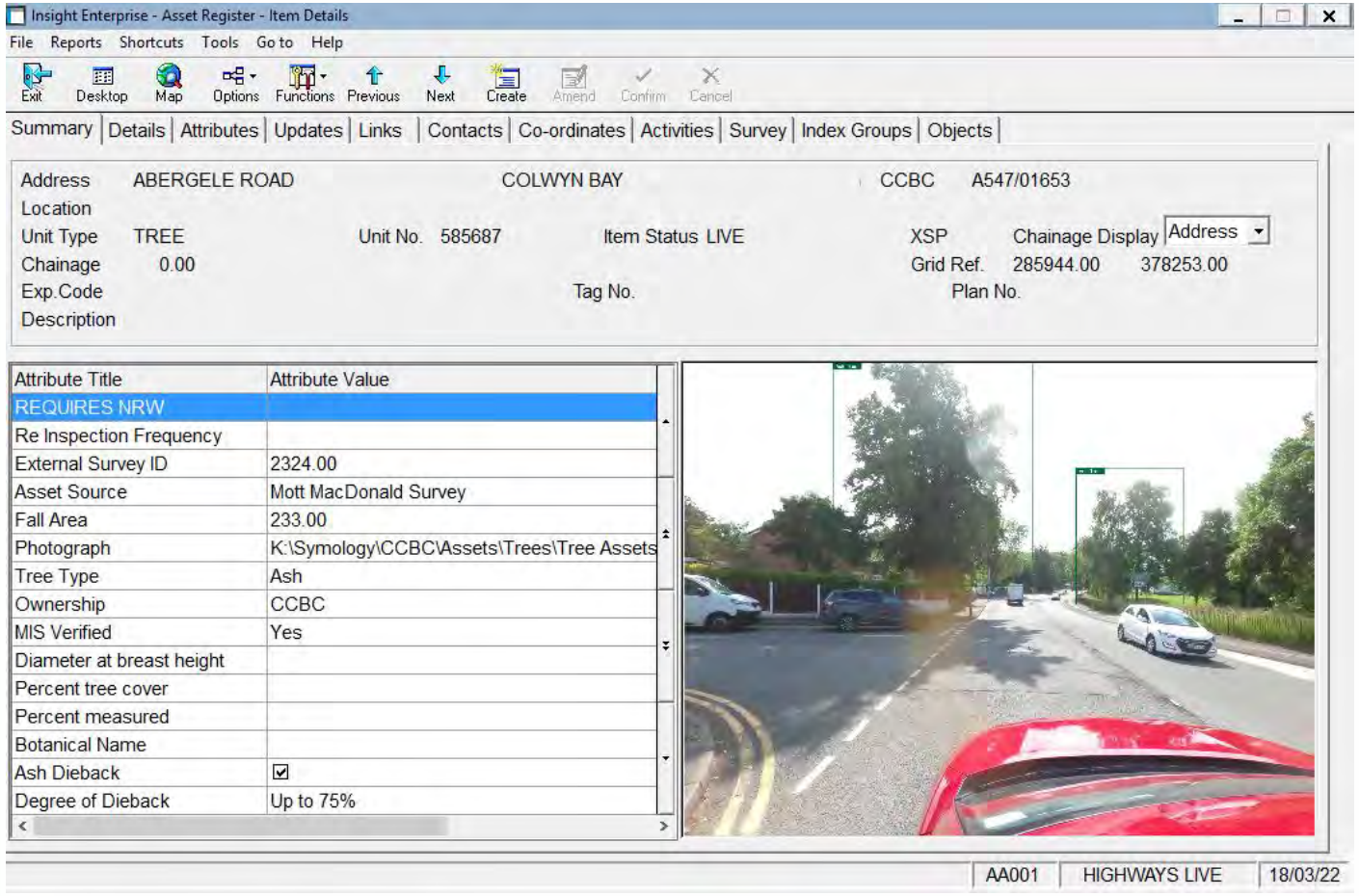
Quantity by Degree ADB

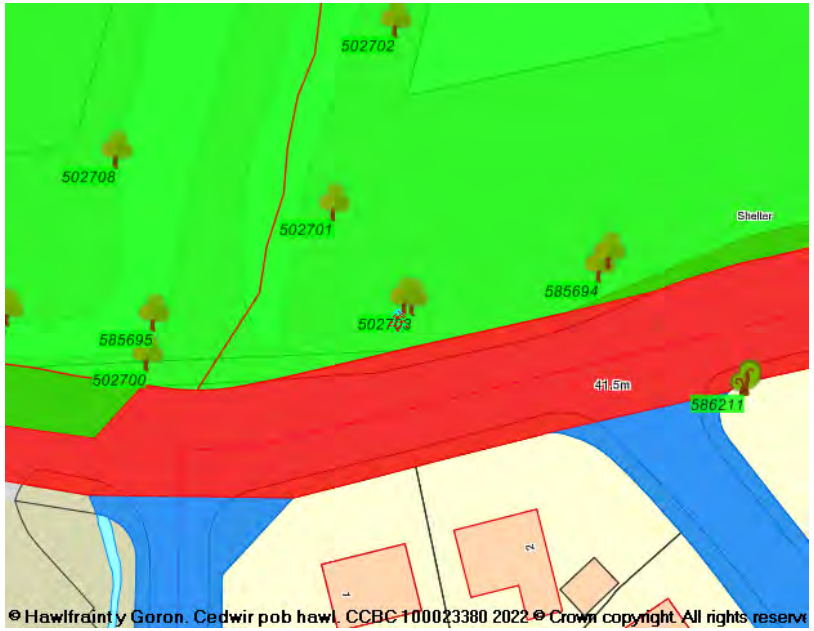
Degree of Dieback	No. Trees within SSSI Area	No. Trees within SAC Area
Up to 25%	17	8
Up to 50%	41	9
Up to 75%	13	3
Up to 100%	2	0
Total	**73**	**20**

Quantity by Location

Special Designation Location	Quantity of Trees with ADB
Afon Llugwy	1
Cae'r Felin	1
Creigiau Rhiwledyn / Little Ormes Head	5
Creuddyn	15
Creuddyn Peninsula Woods	7
Eryri	2
Fairy Glen Woods	6
Gwydir Forest Mines	6
Llanddulas Limestone and Gwrych Castle Wood	11
Mwyngloddiau a Chreigiau Gwydyr	6
Mynydd Marian	14
Pen y Gogarth / Great Ormes Head	14
Sychnant Pass	3
Ty'n y Ffordd Quarry	2
Total No. Trees	93

Asset Management System





Data loaded into existing Asset Management System

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Issuing Informal & Formal Highways Act Notices

Licence No.	00043325	Stage	COMMENCED	Licence Type	AD3 Ash Dieback 3 Month Notice
Charge Code	00043318			External Ref.	☐ T/S ☐ P/S ☐ L/R
Address	NANT ISAF TO BRYN RHUG			Unit Type	LAND QUERY ☐ Permit Scheme ☐ E/D ☐ S/R ☑ Oth
	CAPEL GARMON			Unit No.	686
Location	CYM767840				Grid Ref. 281718.00 357624.00

Adran Yr Amgylchedd, Ffyrdd a Chyfleusterau
Environment, Roads & Facilities Department

Pennaeth Gwasanaeth
Head of Service - Geraint Edwards, BEng(Hons) CEng FICE

Cyfeiriad Post / Postal Address: P.O. Box 1, Conwy, LL30 9GN

[redacted]

☎ 01492 57-5337
01492 57-5199
erfmis@conwy.gov.uk

Ein Cyf / Our Ref: 43325

Eich Cyf / Your Ref:

Dyddiad / Date:13/01/2022

Dear Sirs,

ASH DIEBACK DISEASE - CYM[redacted]

We recently identified an overhanging ash tree(s) from your property which is exhibiting severe symptoms of ash dieback disease (*Hymenoscyphus fraxineus*) and which therefore endangers the passage of vehicles / pedestrians. The location of the ash tree(s) is shown on the enclosed plan.

The law says that landowners are responsible for trees and vegetation growing on their property. Owners have a duty to ensure that they do not obstruct or endanger roads and footpaths. Please arrange to address the danger presented by this tree(s) within 3 calendar months of the date of this letter (this will normally involve felling the tree). Failure to address the danger will result in the issue of a formal Notice requiring compliance within 14 days. In the event of non-compliance we will undertake the works ourselves and recover costs from you.

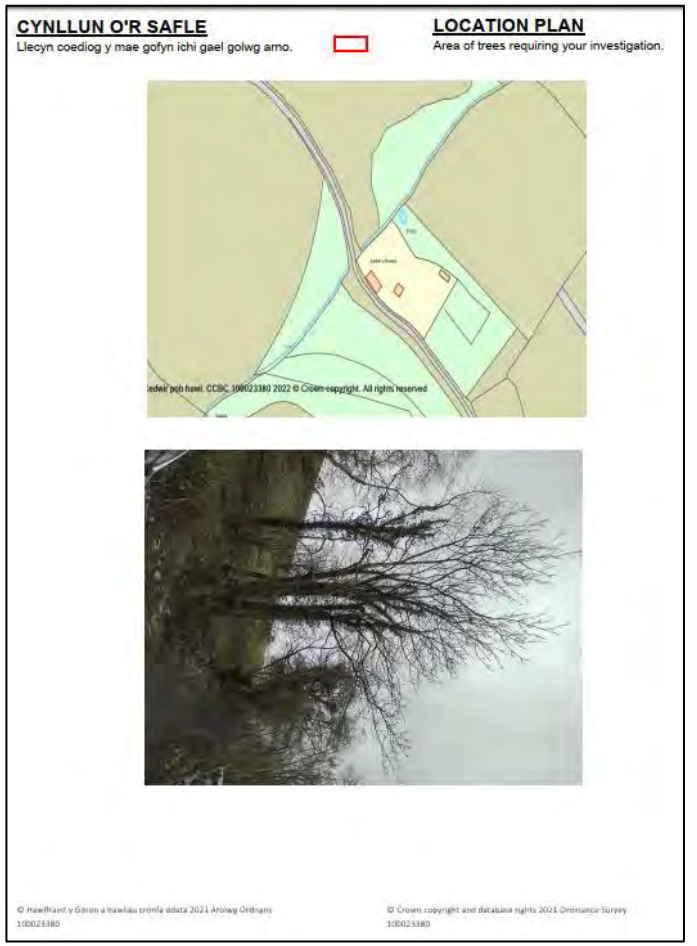
When you do the work, please make sure that you immediately remove cuttings which fall onto the road, roadside ditches or footpaths. You can find more advice and guidance on our website, including information about nesting birds and small mammals:
https://www.conwy.gov.uk/en/Resident/Planning-Building-Control-and-Conservation/Trees-and-High-Hedges/Trees-and-Hedges-General-Information.aspx (or search "Trees and Hedges" from the website's homepage).

Please act on this request to avoid the need for us to take any formal action.

Yours faithfully,

for G.B. Edwards
Head of Environment, Roads & Facilities

Rydym yn croesawu gohebiaeth yn Gymraeg. Byddwn yn ymateb i unrhyw ohebiaeth yn Gymraeg ac ni fydd hyn yn arwain at unrhyw oedi.
We welcome correspondence in Welsh. We will respond to any correspondence in Welsh which will not lead to a delay.



CYNLLUN O'R SAFLE
Llecyn coediog y mae gofyn ichi gael golwg arno.

LOCATION PLAN
Area of trees requiring your investigation.

© Hawlfraint y Goron a hawliau cronfa ddata 2021 Arolwg Ordnans 100023380

© Crown copyright and database rights 2021 Ordnance Survey 100023380

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Highlights

Survey Data

- Simplicity of routing survey based on highway network– Network Hierarchy, Network Section, Town, Locality
- Quickly program survey and identify routes
- Speed Motts Technology
- Cost savings in inspection costs (TM)
- Great indicator - Authority focus

CCBC Analysis

- Post survey processing accelerated action & resulted in risk based approach
- Highway network data provided an index for linking various highway and environmental datasets together
- Including prioritisation of Trees by condition and density

Results

All dangerous trees from CH1-CH4 survey removed 6 months – achieved by using asset data and turning it nto information that enables us to manage data to make decisions!

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

Summary

- Robust asset Inventory – linked to highway network and underpinned by strategy and policy is cornerstone!
- Enables the efficient and effective management of services
- Data is meaningless unless it is managed
- Managing Data creates information that allows us to make informed decisions….
- Based on evidence…

THANK YOU!

CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL