THE ROAD SURFACE TREATMENTS ASSOCIATION

Whole Lifecycle Cost Planning for Sustainability

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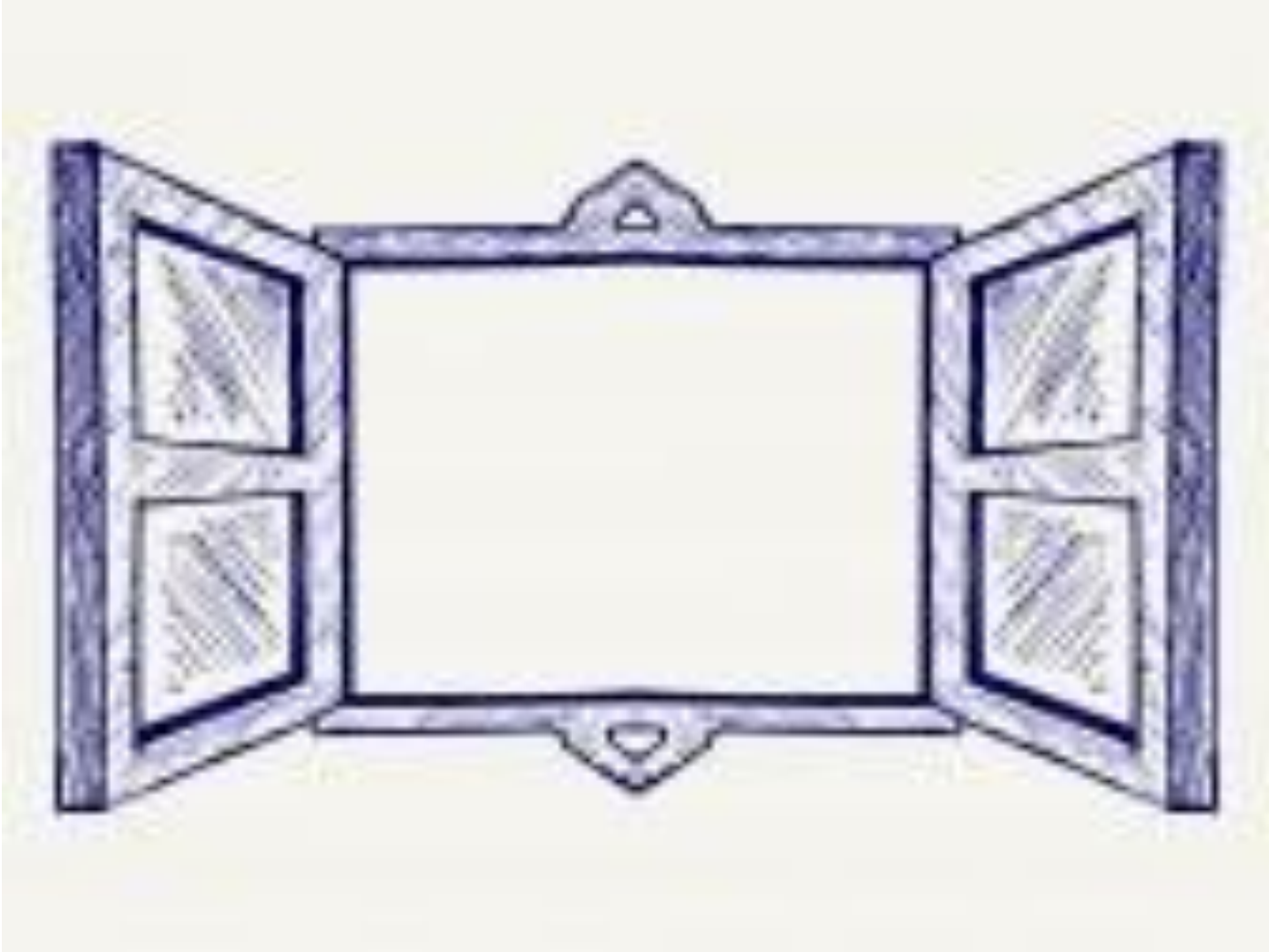
Whole Life Cost

By considering an asset over its whole life cycle its possible to select the optimum point to intervene with the optimum treatment and hence provide the best whole life cost



Treatment / Costs

- Surface Dressing £ 3
- Inlay Surfacing £15
- Binder/Surface £30

How long does it last?

Treatment Type	Heavily Trafficked ('A' & 'B' Class)	Lightly Trafficked ('C' & 'U' Class)
Surface Course	10 Yrs	20 Yrs
Binder/Surface Course	15 Yrs	30 Yrs
Surface Dressing	10 Yrs	15 Yrs

Carriageway Lifecycle Cost

Treatment Type	Heavily Trafficked ('A' &'B' Class)	Lightly Trafficked ('C' & 'U' Class)	Cost (£/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Course	10 Yrs	15 Yrs	15
Surface Course	10 Yrs	15 Yrs	15
Binder/Surface Course	10 Yrs	15 Yrs	30
Surface Course	10 Yrs	15 Yrs	15
Surface Course	10 Yrs	15 Yrs	15
	60 Yrs	90 Yrs	90

Carriageway Lifecycle Whole Lifecycle Cost

Treatment Type	Heavily Trafficked ('A' &'B' Class)	Lightly Trafficked ('C' & 'U' Class)	Cost (£/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Dressing	10 Yrs	15 Yrs	3
Surface Dressing	10 Yrs	15 Yrs	3
Surface Course	10 Yrs	15 Yrs	15
Surface Dressing	10 Yrs	15 Yrs	3
Surface Dressing	10 Yrs	15 Yrs	3
	60 Yrs	90 Yrs	27

Treatments Cradle to Gate Co2 Emissions

- Preservation = 0.43kg/m2
- Surface Dressing = 1.00kg/m2
- Slurry Microsurfacing = 2.00kg/m2
- 40mm Asphalt Surface Course = 8.43kg/m2

Carriageway Lifecycle Carbon Generation

Treatment Type	Heavily Trafficked ('A' &'B' Class)	Lightly Trafficked ('C' & 'U' Class)	Carbon (kg/CO2 /m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Course	10 Yrs	15 Yrs	8.50
Surface Course	10 Yrs	15 Yrs	8.50
Binder/Surface Course	10 Yrs	15 Yrs	20.0
Surface Course	10 Yrs	15 Yrs	8.50
Surface Course	10 Yrs	15 Yrs	8.50
	60 Yrs	90 Yrs	54.0

Carriageway Whole Lifecycle Carbon

Treatment Type	Heavily Trafficked ('A' &'B' Class)	Lightly Trafficked ('C' & 'U' Class)	Carbon (kg CO2/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Dressing	10 Yrs	15 Yrs	1
Surface Dressing	10 Yrs	15 Yrs	1
Surface Course	10 Yrs	15 Yrs	8.5
Surface Dressing	10 Yrs	15 Yrs	1
Surface Dressing	10 Yrs	15 Yrs	1
	60 Yrs	90 Yrs	12.5

Cost v Carbon

Carriageway Lifecycle Cost = £90 / M2

Carriageway Lifecycle Carbon = 54kg Co2 / m2

Carriageway Whole Lifecycle Cost = £27 / m2

Carriageway Whole Lifecycle Carbon = 12.5kg Co2 / m2

Renew

Category	R199B			Annual Treatment Length		Maintenance Rate	Maintenance Value			
	Length	% of Total	C'way Width	Length/ service life	% of Total	From "Maint Rates"	Cost per year	% of Total		
	km		m	km		£/m²	£'000s			
A Urban	301	5.2%	8.5	5.02	5.6%	31.6	1,347	11.3%		
A Rural	394.8	6.9%	8.5	6.58	7.3%	31.6	1,767	14.8%		
B Urban	139.5	2.4%	7	2.33	2.6%	30.3	493	4.1%		
B Rural	199.9	3.5%	7	3.33	3.7%	30.3	707	5.9%		
C Urban	336.7	5.9%	7	4.21	4.7%	30.3	893	7.5%		
C Rural	1030.5	17.9%	7	12.88	14.3%	30.3	2,732	23.0%		
U/C Urban	2002.9	34.8%	5.5	33.38	37.0%	15.5	2,846	23.9%		
U/C Rural	1342.6	23.4%	5	22.38	24.8%	10.0	1,119	9.4%		
Total	5,747.9	100%		90.10	100%		11,904	100%		
Maintenance Assumptions									Service Life (years)	
A - Urban and Rural: 100% Reconstruction 70mm DBM 35mm SMA									60	
B - Urban and Rural: 100% Reconstruction 70mm DBM 35mm SMA									60	Service life allows for a resurface and up to 3 surface dressing treatments between renewals.
C - Urban and Rural: 100% Reconstruction 70mm DBM 35mm SMA									80	
D&U - Urban: Surfacing course replacement 35mm SMA									60	
D&U - Rural: 50mm DBM Overlay									60	

Resurface

Category	R199B			Annual Treatment Length		Maintenance Rate	Maintenance Value			
	Length	% of Total	C'way Width	Length/ service life	% of Total	From "Maint Rates"	Cost per year	% of Total		
	km		m	km		£/m²	£'000s			
A Urban	301	12.5%	8.5	10.03	14.6%	15.0	1,279	16.5%		
A Rural	394.8	16.4%	8.5	13.16	19.2%	15.0	1,678	21.7%		
B Urban	139.5	5.8%	7	4.65	6.8%	15.0	488	6.3%		
B Rural	199.9	8.3%	7	6.66	9.7%	15.0	700	9.0%		
C Urban	336.7	14.0%	7	8.42	12.3%	15.0	884	11.4%		
C Rural	1030.5	42.9%	7	25.76	37.5%	15.0	2,705	35.0%		
Total	2,402.4	100%		68.69	100%		7,734	100%		

Maintenance Assumptions	Service Life (years)	
A - Urban and Rural: 35mm SMA	30	Service life allows for up to 3 surface dressing treatments between resurfacings
B - Urban and Rural: 35mm SMA	30	
C - Urban and Rural: 35mm SMA	40	

Surface Treatments (SD)

Category	R199B			Annual Treatment Length		Surface Dressing Rate	Surface Dressing Value		
	Length	% of Total	C'way Width	Length*% of Total/ service life	% of Total		Cost per year	% of Total	
	km		m	km		£/m²	£'000s		
A Urban	301	5.2%	8.5	27.09	6.8%	3.0	691	10.3%	
A Rural	394.8	6.9%	8.5	37.51	9.4%	3.0	956	14.3%	
B Urban	139.5	2.4%	7	12.56	3.1%	3.0	264	3.9%	
B Rural	199.9	3.5%	7	18.99	4.7%	3.0	399	5.9%	
C Urban	336.7	5.9%	7	20.20	5.0%	2.5	354	5.3%	
C Rural	1030.5	17.9%	7	65.27	16.3%	2.5	1,142	17.0%	
U/C Urban	2002.9	34.8%	5.5	133.53	33.4%	2.5	1,836	27.4%	
U/C Rural	1342.6	23.4%	5	85.03	21.2%	2.5	1,063	15.9%	
Total	5,747.9	100%		400.17	100%		6,704	100%	

Maintenance Assumptions	% of Total	Service Life (years)
A - Urban - assumed proportion of the network suitable for surface dressing: -	90%	10
A - Rural - assumed proportion of the network suitable for surface dressing: -	95%	10
B - Urban - assumed proportion of the network suitable for surface dressing: -	90%	10
B - Rural - assumed proportion of the network suitable for surface dressing: -	95%	10

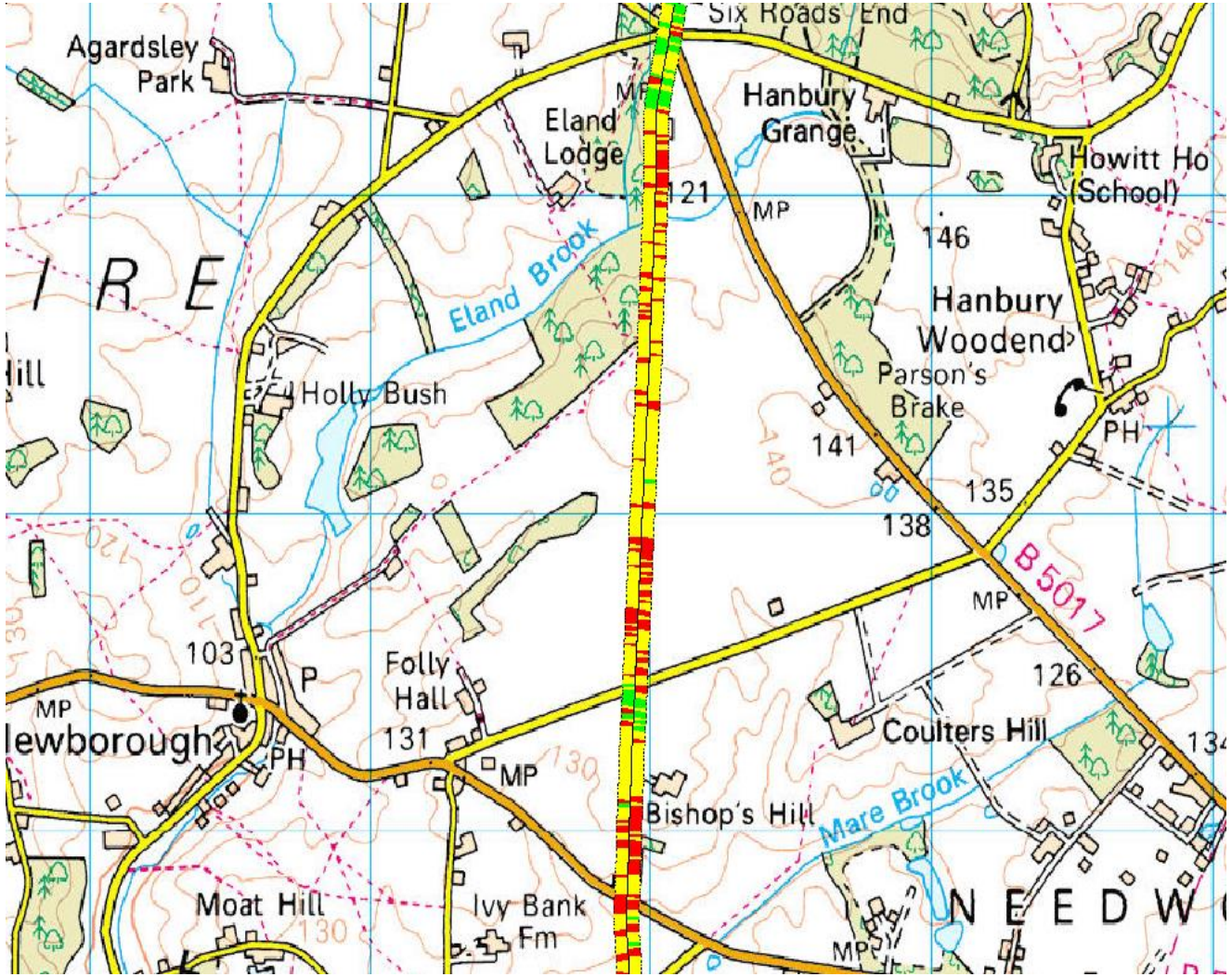
Footway

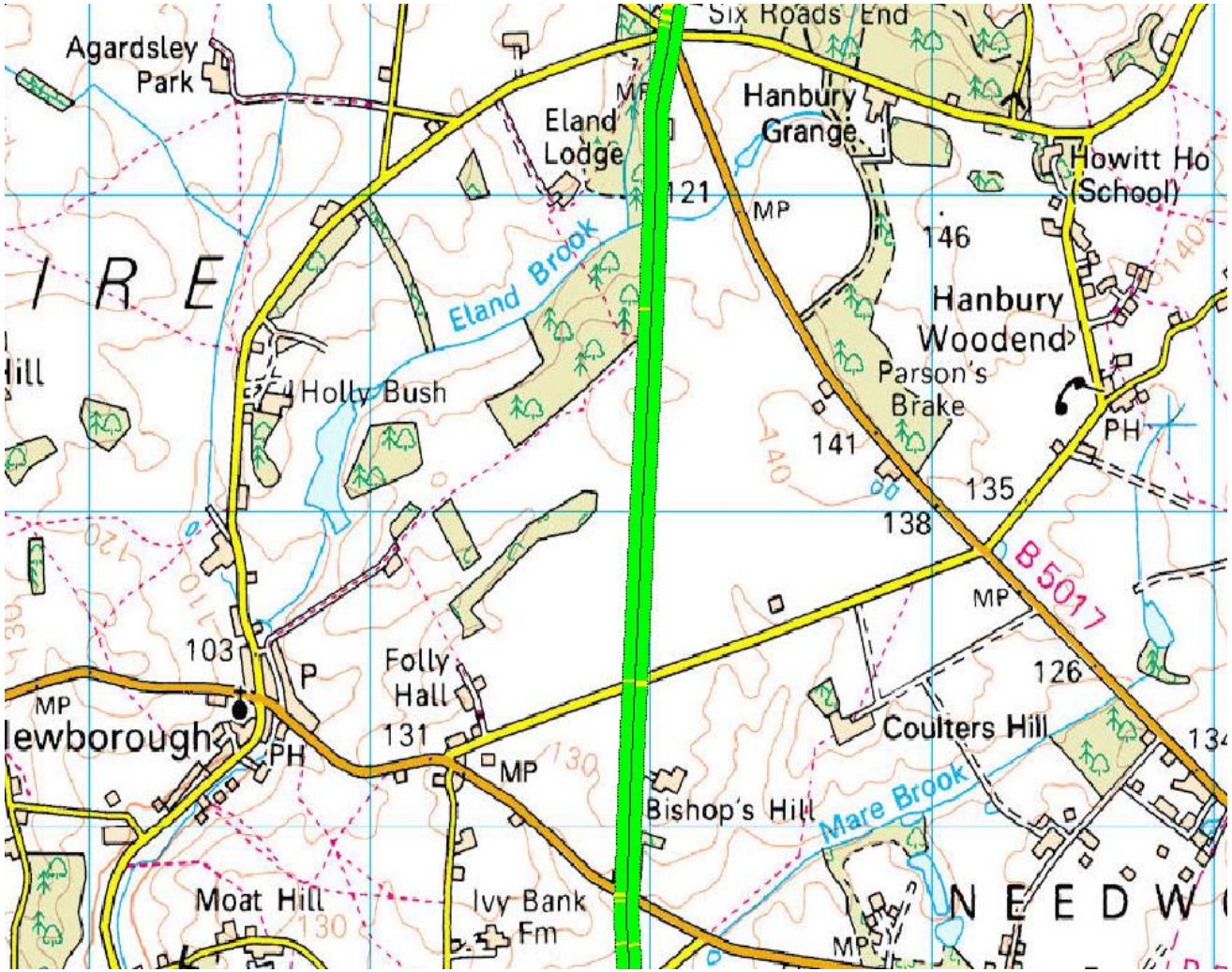
Footway							
Renew							
				Annual	Annual Treatment		Annual Cost
Length (km)	Width (m)	Total (m2)	Service Life (yrs)	Treatment (m2)	Length (km)	Cost per M2	(000's)
4144	2.3	9531200	60	158853.3333	69.06666667	18	2859
Slurry Seal		9531200	15	635413.3333	276.2666667	8.5	5401

Summary		
Carriageway		
Renew		11,904
Resurface		7,734
Surface D.		6,704
Footway		
Renew		2,859
Slurry Seal		5,401
Total Per Annum (£M) =		34,602

Sustainability Options Appraisal

Treatment Type				C'way	Hierarchy				
Carriageway	1	2	3	4	5	6	7	8
Asphalt Preservation	1	1	1	1	1	1	1	1
Surface Dressing	1	1	1	1	1	1	1	1
Surface Dressing plus Lockdown	1	1	1	1	1	1	1	1
Microsurfacing	N/A	N/A	N/A	N/A	2	2	2	2
Semi-Structural Microsurfacing	2	2	2	2	3	3	N/A	N/A
Shallow Recyling 75 - 100mm	N/A	N/A	N/A	N/A	4	4	3	3
Medium Recycling - 150mm	N/A	N/A	N/A	N/A	5	5	4	4
Deep Recycling	3	3	3	3	6	6	5	5
Asphalt Inlay Surface Course	4	4	4	4	7	7	6	6
Asphalt Binder Course Overlay	N/A	N/A	N/A	N/A	N/A	N/A	7	7
Asphalt Inlay Surface & Binder C'se	5	5	5	4	8	8	8	8
Asphalt Surface, Binder & Base C'se	6	6	6	4	9	9	9	N/A
Reconstruction	7	7	7	7	N/A	N/A	N/A	N/A





THANK YOU

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