

POTHOLE PREVENTION

“THE WAY BACK”



THE MAJOR CHALLENGE...

54%

THE AMOUNT OF SURFACE DRESSING CARRIED OUT IN 2023 COMPARED TO 11 YEARS AGO. THIS IS THE LOWEST EVER RECORDED BY THE ROAD EMULSION ASSOCIATION.

CLIMATE CHANGE...

The primary threat to road infrastructure will be flooding and heavy precipitation. Other threats included extreme heat and cold, landslides and high winds.

High temperatures will result in expansion (which can lead to cracking), bleeding and rutting.

When road surfaces are waterlogged for a prolonged time, asphalt can become weakened, leading to **POTHOLES** and faults.

* Source: Climate Change Adaptation and Transport Infrastructure – NatCen Social Research 2022

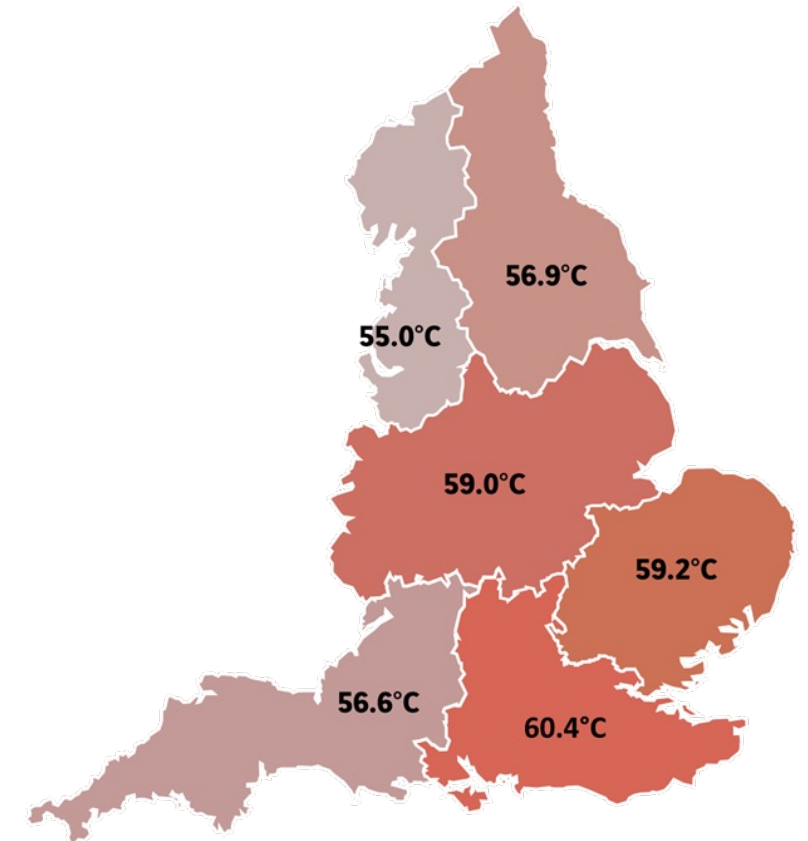


CLIMATE CHANGE...

Maximum road temperatures

REGION	NUMBER OF DAYS			
	2020	2021	2022	TOTAL
North West	4	1	2	7
North East	5	9	10	24
Midlands	21	33	21	75
East	29	19	26	74
South West	20	9	17	46
South East	29	19	33	81

* Source: National Highways



WHAT MAKES A HIGH PERFORMANCE BITUMEN EMULSION..

Good Quality Heavy Crude Source



Country	Millions of Barrels
Venezuela	302.81
Saudi Arabia	267.03
Canada	168.90
Iran	155.60
Iraq	145.02
Russia	196.20
Kuwait	101.50
UAE	97.80
USA	50.00
Libya	48.39
Nigeria	36.97
Kazakhstan	30.00
China	25.70
Qatar	25.20
Brazil	12.80
	1663.92

WHAT MAKES A HIGH PERFORMANCE BITUMEN EMULSION..

Good Quality Heavy Crude Source

Currently available to the UK



Country	Millions of Barrels
Venezuela	TRADE EM BARGO
Saudi Arabia	267.03
Canada	DO NOT EXPORT
Iran	TRADE EM BARGO
Iraq	145.02
Russia	TRADE EM BARGO
Kuwait	101.50
UAE	97.80
USA	DO NOT EXPORT
Libya	TRADE BLOCKADES
Nigeria	36.97
Kazakhstan	30.00
China	DO NOT EXPORT
Qatar	25.20
Brazil	12.80
	716.32

The **pothole pandemic** grows each year resulting in damage to vehicles travelling over them.

However, we have **sustainable surface treatments** that can prevent pothole formation.

SO WHY ARE WE LOOKING FOR A POTHOLE SOLUTION WHEN WE HAVE SURFACE TREATMENTS THAT CAN SUCCESSFULLY TREAT THE PROBLEM?



LOCAL AUTHORITY PRESSURES

Local authorities have a statutory **RESPONSIBILITY** to ensure that their road networks are maintained to a safe and serviceable condition.

There is mounting pressure for local authority Highway Engineers and Asset Managers to:

OPTIMISE the use of allocated highway maintenance funding.

Deliver value for road users and taxpayers.

Minimise the **FINANCIAL** implications, risks and **ENVIRONMENTAL** impacts.

Preventative Surface Dressing treatments must be considered as a highly advantageous solution.



SOME FACTS TO BEGIN WITH

Local authorities in England and Wales maintain **97%** of our road networks.

With an asset value of over £400 billion, it is the largest physical asset owned by the public sector.

The road network is fundamental to economic growth and prosperity.

It connects communities, workers, consumers and businesses.

In addition, the network provides opportunities for investment and development.



Success is dependent on Asset Managers taking the strategic decision to prioritise proactive preventative interventions, to ensure long-term resilience and lifetime value.



A LONG-TERM APPROACH IS WHAT IS NEEDED..

Pothole repairs are extremely **EXPENSIVE** and **DISRUPTIVE** to the UK taxpayer.

In 2021/22, a pothole was filled every 19 seconds, with a total annual cost of £107m– the highest cost since 2015/16*

Repairing a significant number of potholes **is not a sign of success, but a sign of failure.**

WHY?

* Source: AIA Alarm Survey 2022

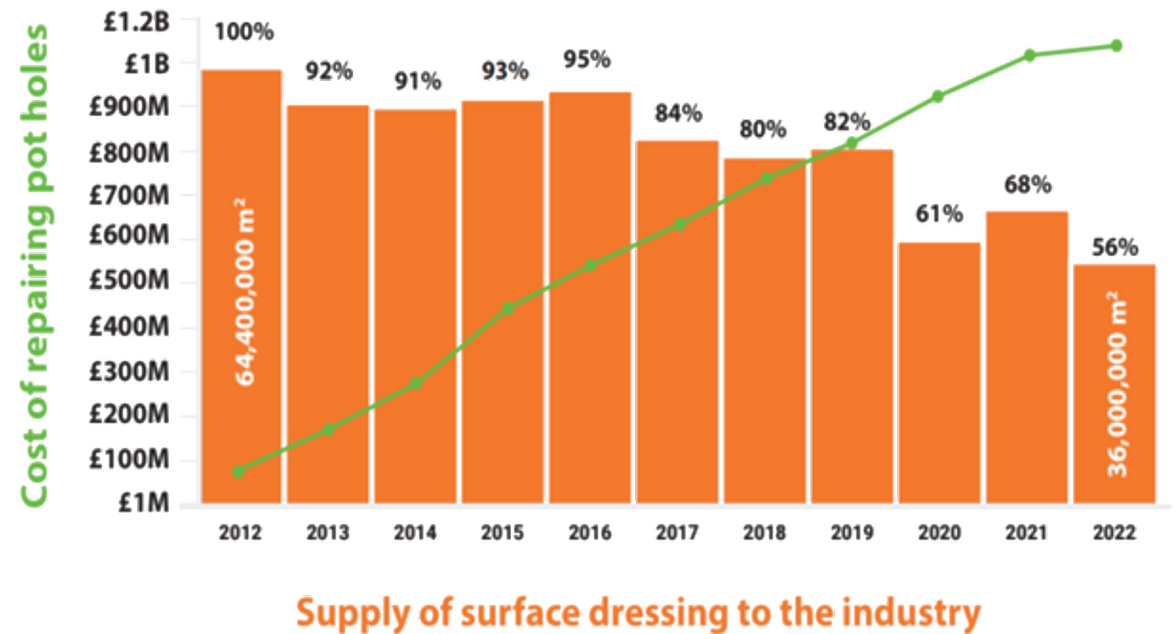


THE DECLINE OF SURFACE DRESSING TREATMENTS

According to statistics from the Department for Transport the percentage of roads (A, B & C) receiving Surface Dressing treatment has **DECLINED 30%** since 2016.

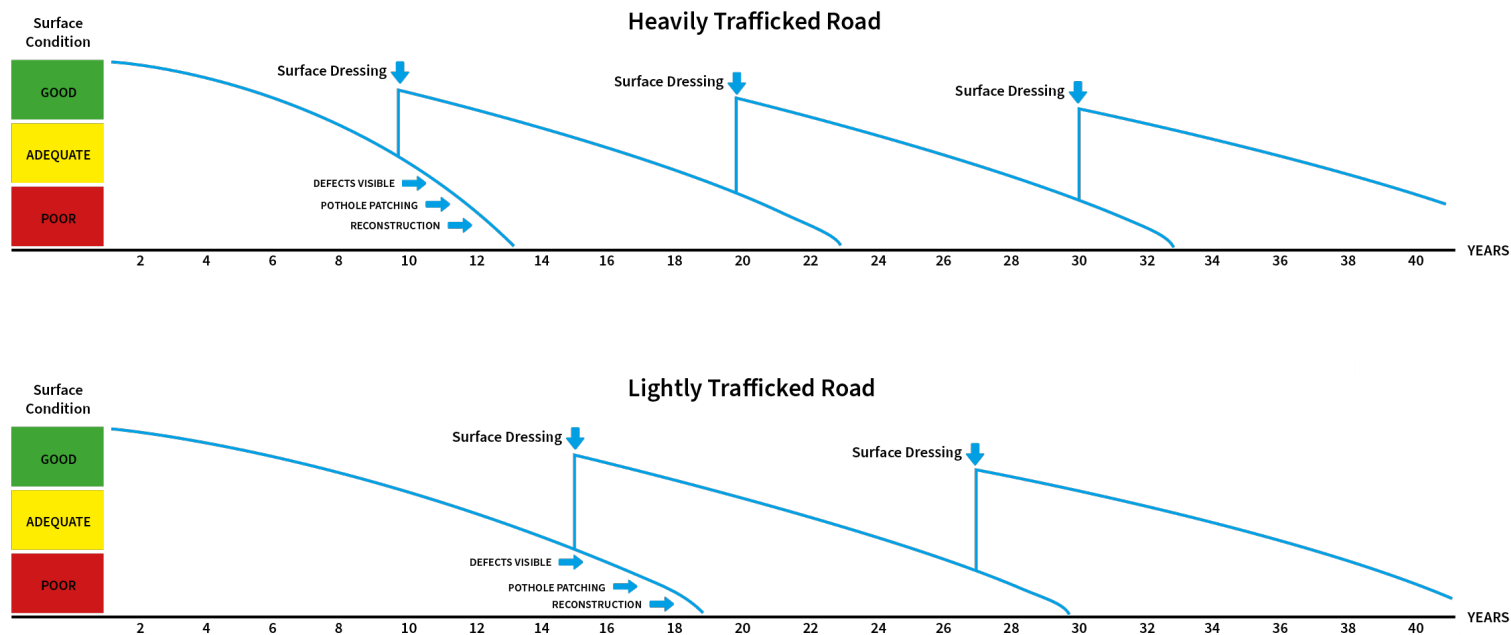
This is mirrored by feedback from REA Members who report a **44% DECLINE** in the application of Surface Dressing over the 10-year period from 2012 to 2022.

As the **DECLINE** in Surface Dressing continues, the **AMOUNT** and cumulative **COST** of fixing potholes over the 10-year period **HAS RISEN** significantly.

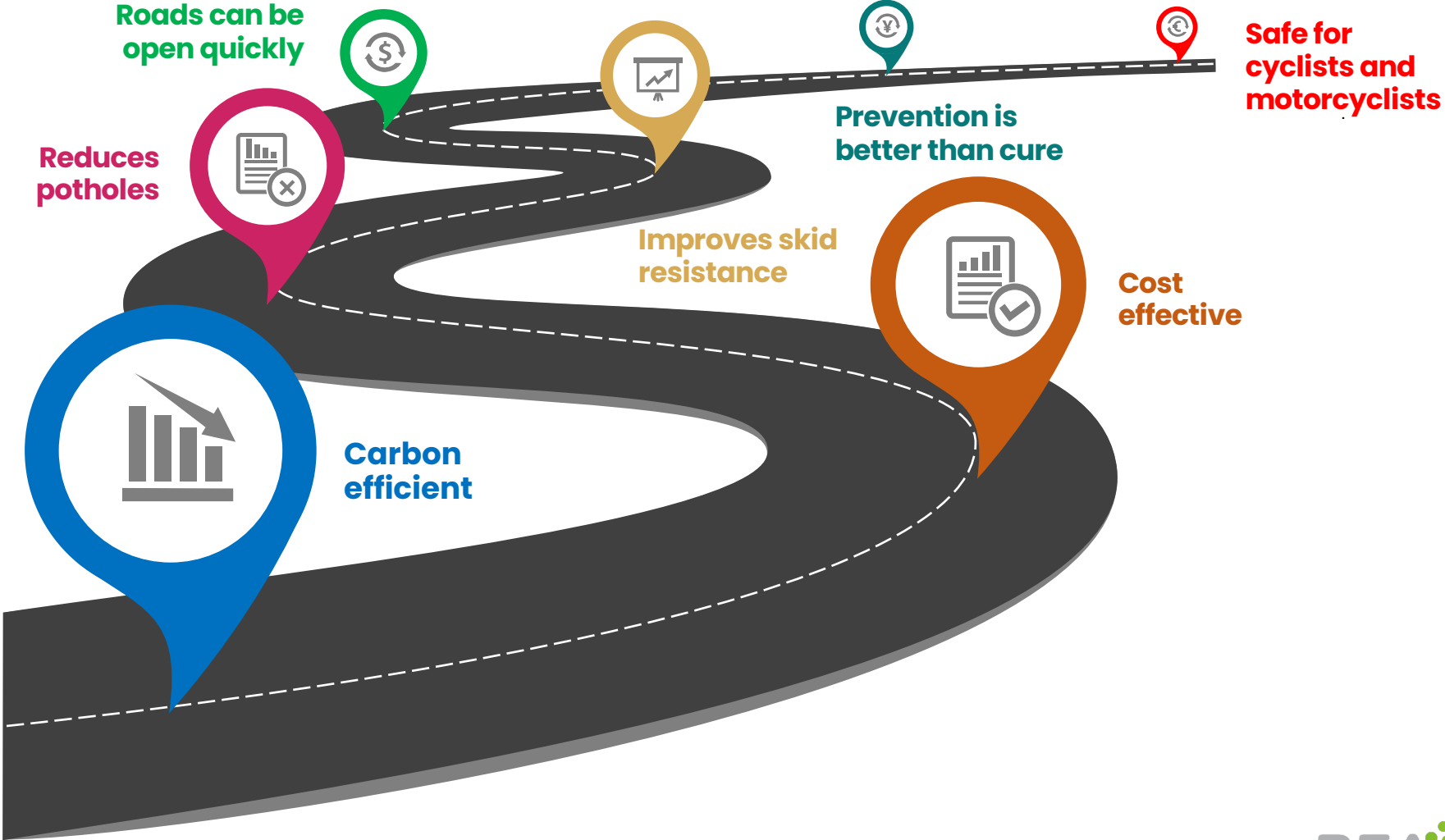


THE CASE FOR SURFACE DRESSING

The application of Surface Dressing at the correct intervention periods is the most **COST-EFFECTIVE** method, **FINANCIALLY** and **ENVIRONMENTALLY** to **IMPROVE** skid resistance and **SEAL** the road surface. It will stop the **INGRESS** of water and help to **PREVENT** pothole formation.



THE ROAD TO SUCCESS WITH SURFACE DRESSING



SAFER ROADS SAVE LIVES

A MODERN APPROACH...

Using **PROVEN** technology, polymer modified, high performance bituminous emulsions, are used together with modern plant and equipment.

The development and introduction of proprietary encapsulation systems has also improved the chipping retention that provides a “new road” look for a fraction of the cost.

ENCAPSULATION enables Surface Dressing chippings to be **LOCKED** into the surface, resulting in a **SAFER** drive, especially for cyclists and motorcyclists.

It also gives an aesthetic **APPEARANCE** to the road surface and can enable the carriageway to be trafficked **QUICKLY** following application.



SURFACE DRESSING IS COST EFFECTIVE

Typically, a **6-METRE-WIDE ROAD** of one kilometre in length (6,000/m²) can be Surface Dressed for approximately **£30,000** resulting in a service life of **10-15 years**.

10 to 15 years is equivalent to the service life of an untreated asphalt surface course system.

To fully resurface the same road, in traditional asphalt surface course using primary aggregate could cost up to ten times the amount and without surface treatment intervention, may not last any longer.

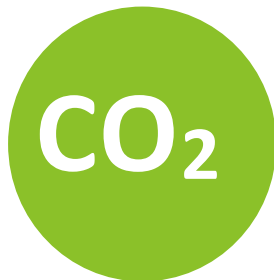
Therefore, for the cost to repair potholes an additional **3,500 KM** of local roads could be Surface Dressed, thus preventing the need for costly and time-consuming interventions and the future costs of pothole repair.



SURFACE DRESSING IS MORE CARBON EFFICIENT

According to the latest RSTA research – RSTA Carbon Emissions for Road Surface and other Maintenance Treatments – Report and Guidance – launched in April last year, **SURFACE DRESSING** was confirmed as one of the most carbon efficient surface treatment solutions available to highway asset managers.

Surface Dressing uses up to **75% LESS BITUMEN** and up to **80% LESS AGGREGATE** per square metre than thin asphalt surface courses.

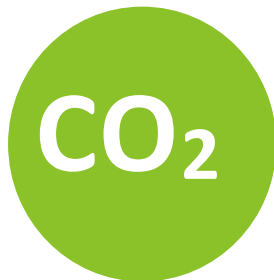


SURFACE DRESSING IS MORE CARBON EFFICIENT

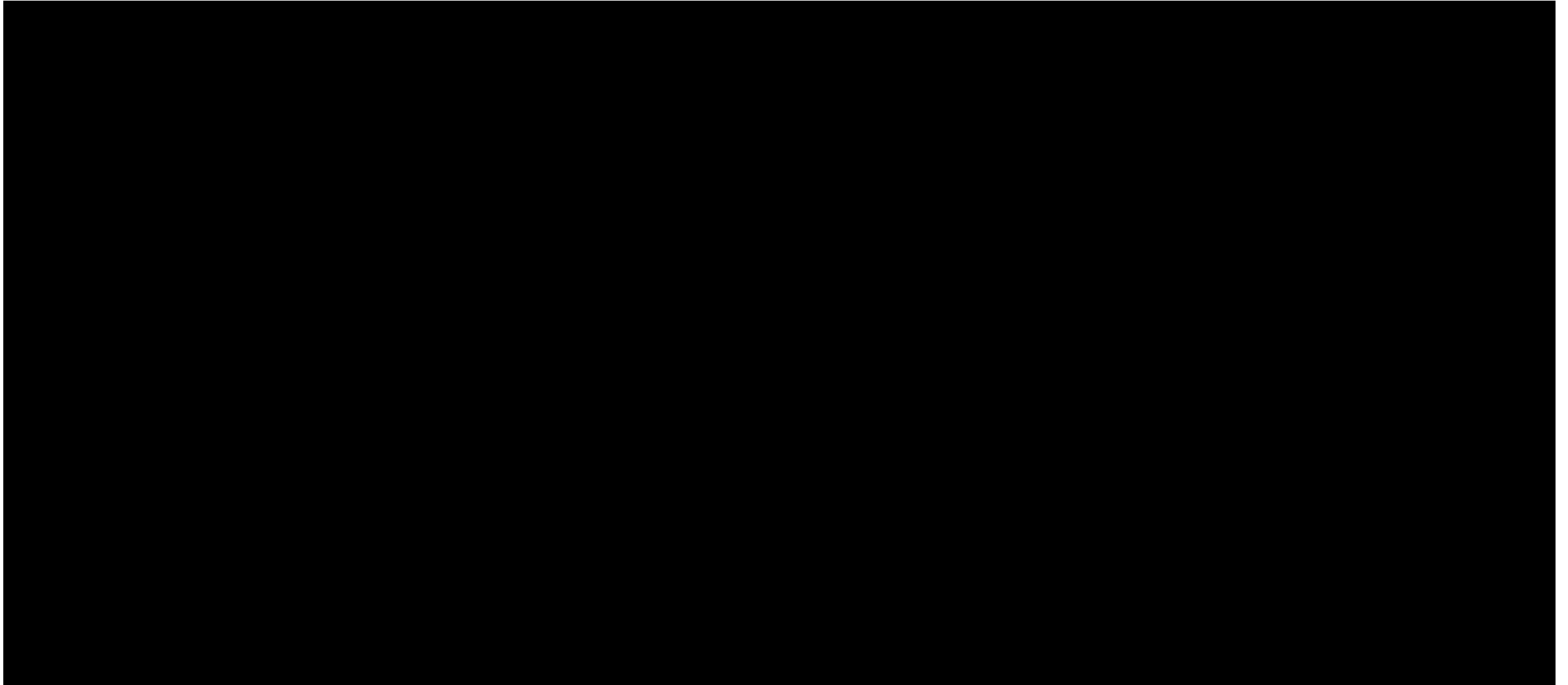
Surface Dressing interventions extend the surface course design life. If untreated, deterioration eventually results in the need to resurface.

Resurfacing a **6,000 M² ROAD** with a **40 MM SURFACE** course being laid on top, the amount of aggregate used will be approximately **580 TONNES**. To transport this aggregate to site will take 30 vehicles, plus the same again for the disposal of the planed surface.

Bitumen emulsion binders used in Surface Dressing are sprayed between **85°C** and **90°C** meaning significantly less embedded carbon is required than in asphalt surfacing.



The Case for Surface Dressing



How long does it last?

<u>Treatment Type</u>	<u>Heavily Trafficked</u>	<u>Lightly Trafficked</u>
	('A' & 'B' Class)	('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

<u>Treatment Type</u>	<u>Heavily Trafficked</u>	<u>Lightly Trafficked</u>	<u>Cost</u>
	('A' & 'B' Class)	('C' & 'U' Class)	(£/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Course	10 Yrs	15 Yrs	19
Surface Course	10 Yrs	15 Yrs	19
Binder/Surface Course	10 Yrs	15 Yrs	40
Surface Course	10 Yrs	15 Yrs	19
Surface Course	10 Yrs	15 Yrs	19
	60 Yrs	90 Yrs	116

Carriageway Whole Lifecycle Cost

<u>Treatment Type</u>	<u>Heavily Trafficked</u>	<u>Lightly Trafficked</u>	<u>Cost</u>
	('A' & 'B' Class)	('C' & 'U' Class)	(£/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Dressing	10 Yrs	15 Yrs	5
Surface Dressing	10 Yrs	15 Yrs	5
Surface Course	10 Yrs	15 Yrs	19
Surface Dressing	10 Yrs	15 Yrs	5
Surface Dressing	<u>10 Yrs</u>	<u>15 Yrs</u>	<u>5</u>
Total	60 Yrs	90 Yrs	39

Treatments Cradle to Practical Completion Co2 Emissions

- **Surface Dressing = 0.938g/m²**
- 40mm Warm Mix Asphalt Surface Course = 6.292g/m²

Carriageway Lifecycle Carbon Generation

<u>Treatment Type</u>	<u>Heavily Trafficked</u>	<u>Lightly Trafficked</u>	<u>Carbon</u>
	('A' & 'B' Class)	('C' & 'U' Class)	(Kg/CO2/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Course	10 Yrs	15 Yrs	6.292
Surface Course	10 Yrs	15 Yrs	6.292
Binder/Surface Course	10 Yrs	15 Yrs	13.940
Surface Course	10 Yrs	15 Yrs	6.292
Surface Course	<u>10 Yrs</u>	<u>15 Yrs</u>	<u>6.292</u>
Total	60 Yrs	90 Yrs	39.108

Carriageway Whole Lifecycle Carbon

<u>Treatment Type</u>	<u>Heavily Trafficked</u>	<u>Lightly Trafficked</u>	<u>Carbon</u>
	('A' & 'B' Class)	('C' & 'U' Class)	(Kg CO2/m2)
New Road/Renewal	10 Yrs	15 Yrs	
Surface Dressing	10 Yrs	15 Yrs	0.715
Surface Dressing	10 Yrs	15 Yrs	0.715
Surface Course	10 Yrs	15 Yrs	6.292
Surface Dressing	10 Yrs	15 Yrs	0.715
Surface Dressing	<u>10 Yrs</u>	<u>15 Yrs</u>	<u>0.715</u>
Total	60 Yrs	90 Yrs	9.152

Cost v Carbon

Carriageway Lifecycle Cost = £116 / M2

Carriageway Lifecycle Carbon = 39.108kg Co2 / m2

Carriageway Whole Lifecycle Cost = £39 / m2

Carriageway Whole Lifecycle Carbon = 9.152kg Co2 / m2



IN CONCLUSION

Surface Dressing not only significantly **EXTENDS** the service life of the pavement, it provides a reduced impact on the environment, and can also be reapplied over several years.

IN SUMMARY:

As a result of the **DECLINE** in the use of Surface Dressing, there has been a significant increase in the amount of potholes and in the costs to repair the damage. This is of no coincidence and there is a need to **REVERSE** this decline to help **SOLVE** the UK pothole pandemic.

Surface Dressing is a **LOW-COST** solution for **RESTORING** and **PROTECTING** road surfaces.

It provides a good **RESISTANCE** to skidding.

It is one of the most **CARBON EFFICIENT** surface treatments.

It prevents water **INGRESS**, reducing **CRACKS** and **POTHOLES** from forming.

It can be up to **TEN** times cheaper than other methods.

It is a **QUICK** process and roads can be trafficked sooner.



FINALLY

And finally.... the application of **SUSTAINABLE**, low-carbon, Surface Dressing systems on some of the “Amber” and “Green” local authority roads, will further **EXTEND** the life of that road. It will result in **FEWER** potholes and prevent these routes from becoming “Red” thus resulting in **COSTLY** and **DISRUPTIVE** repairs.

Taking the appropriate decisions by adopting **LONGER TERM** strategies for the future, together with early intervention to **PREVENT** rather than cure road defects, local authorities can achieve significant financial advantages.

