

Carbon & Cost Benefit Analysis



CARBON BENEFIT ANALYSIS

Traditional hand patching					
Item	material	unit	weight / volume	CO2e conversion factor	total carbon / ton
Asphalt	asphalt	tons	1.5	132.0	198.0
Emulsion	bitumen	tons	0.02	222.0	4.4
7.5 ton pick up	diesel	litres	30.00	2.6	77.7
Lpg gas	gas	kg	0.0	2.9	0.0
Roller	diesel	litres	10.00	3.40	34.0
Disc cutter	petrol	litres	8.0	2.8	22.4
Wacker plate	petrol	litres	1.6	2.8	4.5
Waste disposal	inert waste	tons	1.5	1.0	1.5
Material delivery	asphalt	tons	1.5	4.5	6.8
25% of yard hot box	gas	kg	10.0	2.9	29.0
Typical shift is 9m ² , therefore CO2e/m ² =					42.0

Roadmender Patching - materials					
Item	material	unit	weight / volume	CO2e conversion factor	total carbon / ton
Mastic	asphalt	tons	0.7	4.9	3.4
Emulsion	bitumen	tons	0.0	222.00	0.0
7.5 ton pick up	diesel	litres	30.0	2.6	77.7
Lpg gas	gas	kg	30.0	2.9	87.0
Roller	diesel	litres	0.0	0.0	0.0
Wacker plate	petrol	litres	3.0	2.8	8.4
Material delivery	mastic	tons	0.7	4.5	3.2
Asphalt	asphalt	tons	0.5	132.0	66.0
Asphalt delivery	asphalt	tons	0.5	4.5	2.3
8.3% of yard hot box	gas	kg	3.3	2.9	9.6
Typical shift is 35m ² , therefore CO2e/m ² =					7.4

based on an average delivery radius of 76 miles from Sheffield @1.55kg CO2e per mile = 118kg / 26 tons so 4.5kg/t of Mastic

COMPARATIVE ANALYSIS

Number of m ² completed by Roadmender team per annum	8,820	m ² per annum
Associated CO2e	63,479	kg
CO2e for traditional team to complete the same number of m ²	370,705	CO2e
Annualised carbon saving not including temps	307,226	kg
Daily carbon savings	1,219	kg

NOTE: the ability to shrink patches to their actual size and shape significantly increases the actual carbon savings

COST BENEFIT ANALYSIS

Traditional permanent repair team	
Men	£300
7.5 ton truck	£80
Fuel	£80
Roller, saw breaker and wacker	£60
Gas 25% yard hotbox	£10
1.5 tons of Asphalt plus waste disposal	£225
Total	£755
m ²	9
Cost per m²	£84

Roadmender 3-man team	
Men	£450
7.5 ton mastic truck	£130
Fuel	£80
1 ton of Asphalt plus 15% gas for yard hotbox	£145
Gas heating and drying, wacker and SCJ	£70
Mastic delivered	£578
Total	£1,453
m ²	35
Cost per m²	£42

*The cost of the mastic truck in the above figures assumes £50 per day to cover the cost of the twin mastic boilers, compressor, lance, tool heater and tools - fitted to the truck
The cost of the mastic incorporated into the above figures is £16.50 per 20kg bag delivered*

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