Choosing the right road surface

Our road treatment programme is in place to help maintain the County’s roads to a safe and serviceable level. This will ensure adequate skid resistance, help minimise road traffic accidents and reduce the need for expensive structural maintenance. A range of treatment types are available for road surfacing, and each scheme is assessed and the appropriate method chosen.

We use three treatment types. As a comparison an average stretch of 7m wide and 100m long carriageway would cost approximately:

- Surface Dressing £5,950
- Micro Surfacing £8,750
- Inlay Resurfacing £24,500

All costs/m² quoted will vary on a site to site basis, depending on the overall square meterage of the site and of the sizes of the individual patches within it. Life expectancies listed are the average time before significant further maintenance intervention might be expected.

Surface dressing and micro surfacing normally require varying amounts of patching or localised reconstruction work before the treatment is applied, this can affect the overall cost/m² significantly.

Surface dressing involves spraying the road with a coating of hot bitumen followed by a covering of stone chippings. The chippings are then rolled into the bitumen. Cost: £8.50/m² (including preparatory works)
Life: 7 years

Surface dressing is the most cost-effective way of extending the life of a road, as long as the surface has not already deteriorated too far. It is used to restore skidding resistance and to seal the surface to stop water seeping into the road. Surface dressing also protects the road against the majority of damage caused through severe winter weather.

As the bitumen will not adhere to the road in wet conditions, surface dressing must be carried out during warmer weather. This also allows for a “bedding in” period before the weather becomes colder so that the treatment is effective during the winter months. An advisory temporary speed limit is enforced during the treatment to protect our workers and for up to 4 weeks after completion to reduce the risk of damage from loose chippings.
Following the surface dressing and initial vacuum-sweep of loose chippings, we then sweep the road again between 2-4 weeks after completion after which white lines can be repainted.

Micro surfacing involves spreading cold mixed thin asphalt over the road surface. It is also used for footway pavements.
Cost: £12.50/m² (including preparatory works)
Life: 7 years

Micro surfacing is a fast, effective and economical way to preserve and protect the road and pavement surface and is generally used where surface dressing is not suitable but where a full surface inlay reconstruction is not required. The surface is ready for use just hours after application. It improves skid resistance without producing loose chippings and fills small cracks and imperfections in the surface with a capability to smooth out bumps in the roads.

For micro surfacing to be effective the work must be undertaken during the spring/summer months with the surface being laid by hand on footways or by larger vehicles (plant) on carriageways. The asphalt performs best when applied to a dry road surface and as such the treatment cannot be applied during wet weather.

Micro surfacing does require a significant bedding in period, which is assisted by warm weather. White lines are normally put in place 2 to 3 weeks after the initial treatment, once the surface has bedded in.

Resurfacing involves digging out (planing) the worst affected areas of the road surface and laying hot bituminous material.
Cost: £14 - £36/m²
Life: 8 - 20 years

When a road is too badly damaged for either micro surfacing or surface dressing to be effective we may need to replace the whole surface. The plane and patch method treats larger areas of road than can be done by an individual pot hole repair team and can range from a short length up to several hundred metres. Longer lengths or road can take several days or nights to complete.

There are three different materials that we currently use for resurfacing operations and it is important that we use the right material for the road in question. We continually monitor which materials are best for our roads taking into account the scale of repair and road usage. Currently we use:-

- **Hot Rolled Asphalt (HRA)** – this is the most expensive material to lay. A 50mm layer costs approximately £36/m², but the material is durable and flexible giving it the longest life expectancy of the materials, typically between 10 and 20 years.
- **Thin Surface Course Systems (TSCS)** – this is a hard wearing, easy to lay material suitable for heavily used roads, but should only be laid where a solid foundation already exists. It lasts for between 8 and 15 years and costs approximately £24/m² when laid as a 40mm thick surface course layer but will increase to around £43/m² if, in addition, a new base course is required.
- **Close Graded Macadam (CGM)** – this is the cheapest, on average, to lay but is not as durable as the other materials. It is ideal for more lightly trafficked roads.
or as a patch prior to surface dressing and lasts between 10 to 16 years and costs in the order of £18/m2 for a 40mm thick layer.

Haunching is a treatment generally aimed at targeting edge failures by digging out and replacing the road structure right down to the foundation. Cost: £82/m2  Life: 18 years

Sometimes the road has failed completely and needs to be dug up and rebuilt. Both surface dressing and micro surfacing can sometimes be combined with small scale structural improvements such as haunching when a small area of the road being treated needs more substantial repair. By doing this we can treat the worse sections of road and then use the more cost effective treatments to cover larger areas. Reconstruction is very expensive and time consuming and is only used where no other treatment can be used.

Concrete and Tar
Cost: £18-£100/m2
Life: 7-20 years

Many of the county's roads are concrete roads that have been overlaid by asphalt. These concrete roads present a number of problems when we need to resurface them. If the concrete base is sound then we generally only need to treat the joints in between the sections to stop cracks developing and then apply a geotextile grid on top to form a joint between the concrete and the new asphalt. This adds considerably to the cost of a resurfacing scheme.

If the concrete is not sound then this presents even more problems, in these cases we need to remove the concrete and reconstruct the carriageway which significantly increases the overall cost and time to complete a scheme.