

THE HIDDEN ROAD-KILLER

Why Highway Asset Management Must Start with Drainage

HIGHWAYS & INFRASTRUCTURE REPORT

JANUARY 2026

EXECUTIVE SUMMARY

02

The Pothole Paradox

In the UK, road maintenance budgets are shrinking while public complaints about potholes are rising. The standard political reaction is to "fill the holes" and "resurface the roads." This creates a cycle of reactive spending where millions are poured into new blacktop, only for it to fail again within 3 to 5 years.

This whitepaper argues that this cycle is caused by a fundamental misunderstanding of failure mechanics. **The road surface is not failing because of traffic; it is failing because of water.**

We present data proving that blocked gullies, silted carrier drains, and saturated sub-bases are the "hidden killers" of highway assets. We advocate for a mandatory "Drainage-First" policy: verify and cleanse the drainage asset before laying a single ton of asphalt.

The Cost of Ignorance: Resurfacing a road with a blocked drainage system reduces the asset lifespan by up to 60%. It is effectively throwing budget down a blocked drain.

90%

PREMATURE FAILURES CAUSED BY WATER

2x

LIFESPAN INCREASE WITH WORKING DRAINS

The Hidden Road-Killer

Civil Connect

FAILURE MECHANICS

03

01. Why Roads Die Young

A road is a complex structure designed to distribute load. The strength of the pavement relies entirely on a dry, stable sub-base. When drainage fails (blocked gullies, collapsed carrier pipes), water cannot escape the road profile. It saturates the sub-base.

The Hydraulic Pumping Effect

When a heavy vehicle drives over a saturated road, the water trapped in the sub-base cannot compress. Instead, it is forced upward under immense pressure (hydraulic pumping). This pressure blasts apart the bond between the asphalt layers.

The Result:

- **Stripping:** The bitumen is stripped from the aggregate.
- **Voiding:** Voids form under the surface.
- **Potholes:** The unsupported surface collapses under the next wheel load.

The Freeze-Thaw Multiplier

In winter, trapped water freezes and expands by 9%. This expansion acts like a slow-motion explosion inside the road structure, rapidly accelerating disintegration.

The Hidden Road-Killer

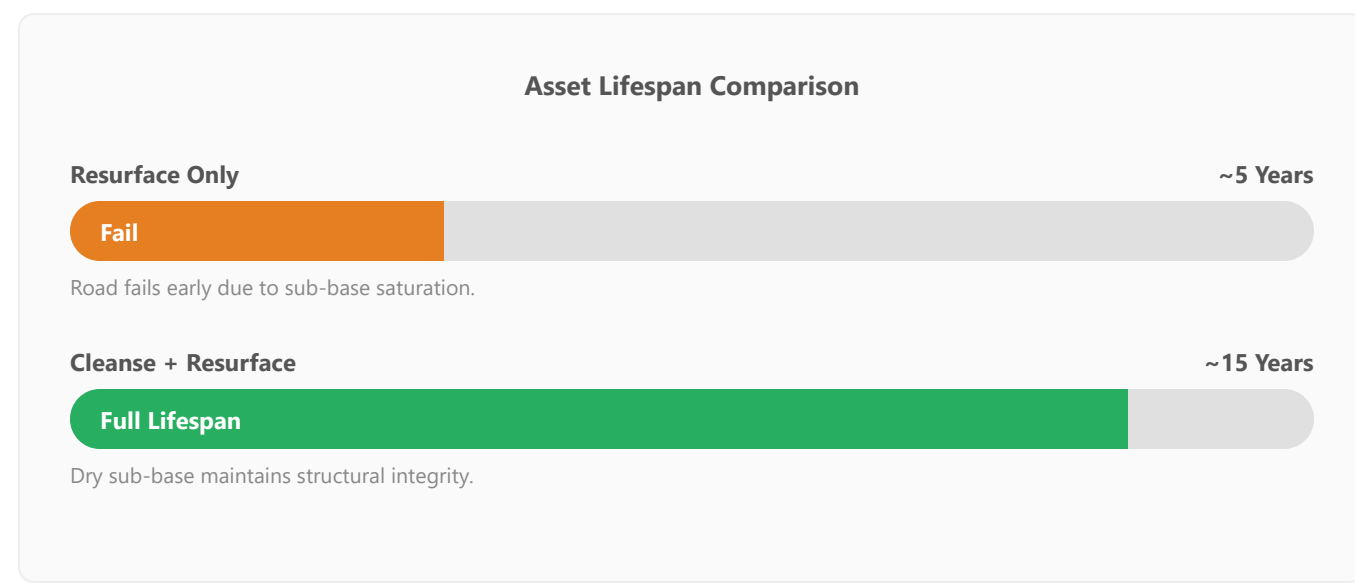
Civil Connect

ASSET MANAGEMENT STRATEGY

04

02. The "Drainage-First" Policy

Asset Planners must shift from a "Surface-Led" strategy to a "Foundation-Led" strategy. Allocating just 10% of a scheme's budget to pre-works drainage verification generates a massive Return on Investment (ROI) by extending the asset lifespan.



The Civil Connect Workflow:

- 1. Survey**
CCTV map of all gullies and carriers.
- 2. Restore**
High-pressure jetting to restore flow.
- 3. Pave**
Resurface on a dry, stable base.

The Hidden Road-Killer

Civil Connect

STRATEGIC VALUE

05

03. Smart Highways Data

Beyond the physical benefits, engaging Civil Connect provides a digital dividend. Our "Smart Highways" approach digitizes your drainage inventory.

GIS

LAYER INTEGRATION

£££

DEFENSIBLE BUDGET SPEND

Defensible Decision Making:

When councillors ask why a road is being dug up, you have the data to prove that the drainage was the root cause. When legal claims arise from flooding or aquaplaning accidents, you have a timestamped audit trail proving your maintenance regime was robust.

04. Conclusion

You cannot solve a hydrology problem with asphalt. To fix the roads, you must first fix the drains.

Civil Connect offers Local Authorities and Tier 1s the specialist capability to audit, clean, and repair highway drainage at scale, ensuring your resurfacing budget delivers genuine, long-term value.

The Hidden Road-Killer

Civil Connect

CIVIL CONNECT

Stop Potholes at the Source.

Adopt a "Drainage-First" strategy and double your road lifespan. Partner with Civil Connect.

Trial the "Drainage-First" Model

Select a pilot scheme and let us demonstrate the asset condition data we can provide.

Contact Civil Connect

© 2026 Civil Connect PLC. All Rights Reserved.

References:

- [1] Adept (2024). *Potholes: A Repair Guide*.
- [2] Highways Sector Council. *Asset Management Framework*.
- [3] TRC Reports. *Water Damage in asphalt pavements*.