

Highways: The New Economics

Pre-Sponsor Launch Abstract

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July 2026

Executive Summary

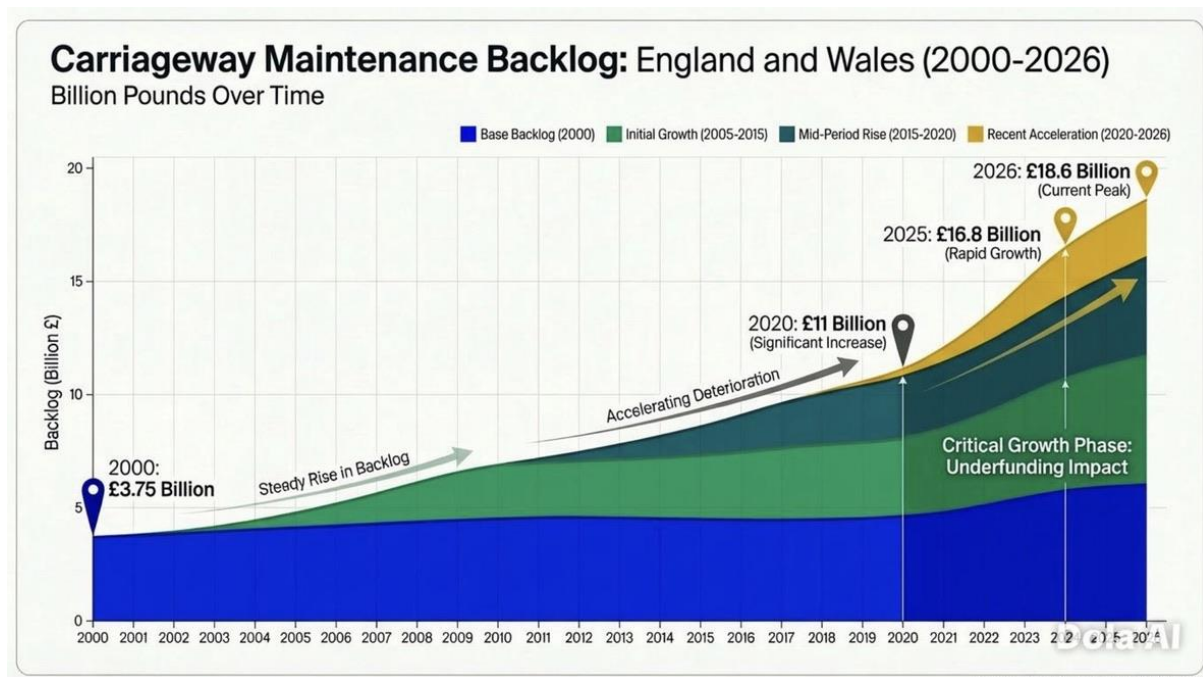
Britain's highway challenges are not primarily engineering problems, they are economic problems, created by misaligned incentives, fragmented responsibilities, and underfunded maintenance that compounds over time.

With a reported maintenance backlog of **£18.6 billion** and road crashes costing around **£1Bn per week**, the national bill for “doing nothing” is already far larger than the bill for targeted prevention.

This document argues that the root cause of poor network condition is the economics of how we fund, specify, inspect, and prioritise work, so the solution must also be economic: clear accountability, smarter targeting, and measurable outcomes.

By using data-led inspections, practical legal compliance, and a collaborative “Win-Win-Win” model, highway authorities can deliver common-sense improvements without requiring additional budget.

The Economic Crisis



The UK once treated motoring revenue as a direct contribution to the roads on which vehicles depend, and that alignment shaped both maintenance expectations and delivery discipline.

Historically, Winston Churchill established an approach where vehicle taxation was effectively treated as **100%** dedicated to roads, creating a clear economic link between road use and road upkeep, yet over time that link weakened, and budgets became competing political choices rather than a protected service obligation.

Today, the funding gap shows up as an escalating maintenance backlog that is increasing by **10.7%**, equivalent to roughly **£5M per day**, while road crashes impose an estimated societal cost of about **£1Bn weekly**.

Severe weather accelerates deterioration: Winter **2026** damage is a visible example of how freeze, thaw cycles and water ingress turn minor defects into rapid asset failure when routine intervention is delayed.

These are not isolated “bad seasons” but predictable outcomes of an economic model that rewards reactive patching over preventative care and treats inspection as overhead rather than risk control.

⚠ **Key point** — If vehicle taxation had remained 100% dedicated to roads since 1936, Britain would likely have the best maintained, safest roads in the world.

Common Sense Economic Breakthrough

The breakthrough is to treat highways as an economic system: define value, measure outcomes, and continuously improve the process that converts limited resources into safety and serviceability.

Instead of “more money” as the default answer, the approach focuses on better targeting, faster learning loops, and eliminating avoidable rework, so that the same budget delivers materially better network condition and public confidence.

This means shifting from reactive activity metrics (e.g., number of jobs raised) to outcome metrics (e.g., defects prevented, risk reduced, repeat failures eliminated), while aligning contractors, inspectors, utilities, and communities around shared goals.

Increase potholes fixed per day starting with a common-sense fix potholes plus surrounding defects, through triage that prioritises risk, repeat-failure locations, and high-traffic corridors.

Target meaningful information by focusing surveys on the small proportion of the network driving many defects, claims, and collisions.

Improve staff utilisation by separating “inspection,” “validation,” and “planning” workflows so skilled staff spend time on high-value decisions.

Increase highway inspections using scalable methods (including AI-enabled capture and volunteers) so emerging defects are found earlier and fixed smaller.

Strengthen condition knowledge with consistent ratings, repeatable survey methods, and clear defect thresholds that remove ambiguity. Drive up from data-rich to information rich.

Reduce the repair backlog by eliminating repeat repairs, preventing defect growth, and focusing first-time-right interventions **with no additional budget**.

Build a continuous improvement culture that reviews outcomes weekly, learns from failures, and standardises what works.

Transition from negativity to positivity by publishing measurable improvements, closing the loop on reports, and demonstrating visible safety gains.

Align incentives so all parties benefit from prevention, not from delay, dispute, or repeated reactive patching.

History of a Pothole: The True Cost of Delay

The Radstone Road case study illustrates the compounding economics of delay: a small defect becomes a large intervention, generates repeated reports, and triggers repeated repairs that fail, each step increasing cost and risk.

Rather than a single “pothole event,” the timeline shows a predictable growth curve where the asset deteriorates faster than the maintenance system responds.

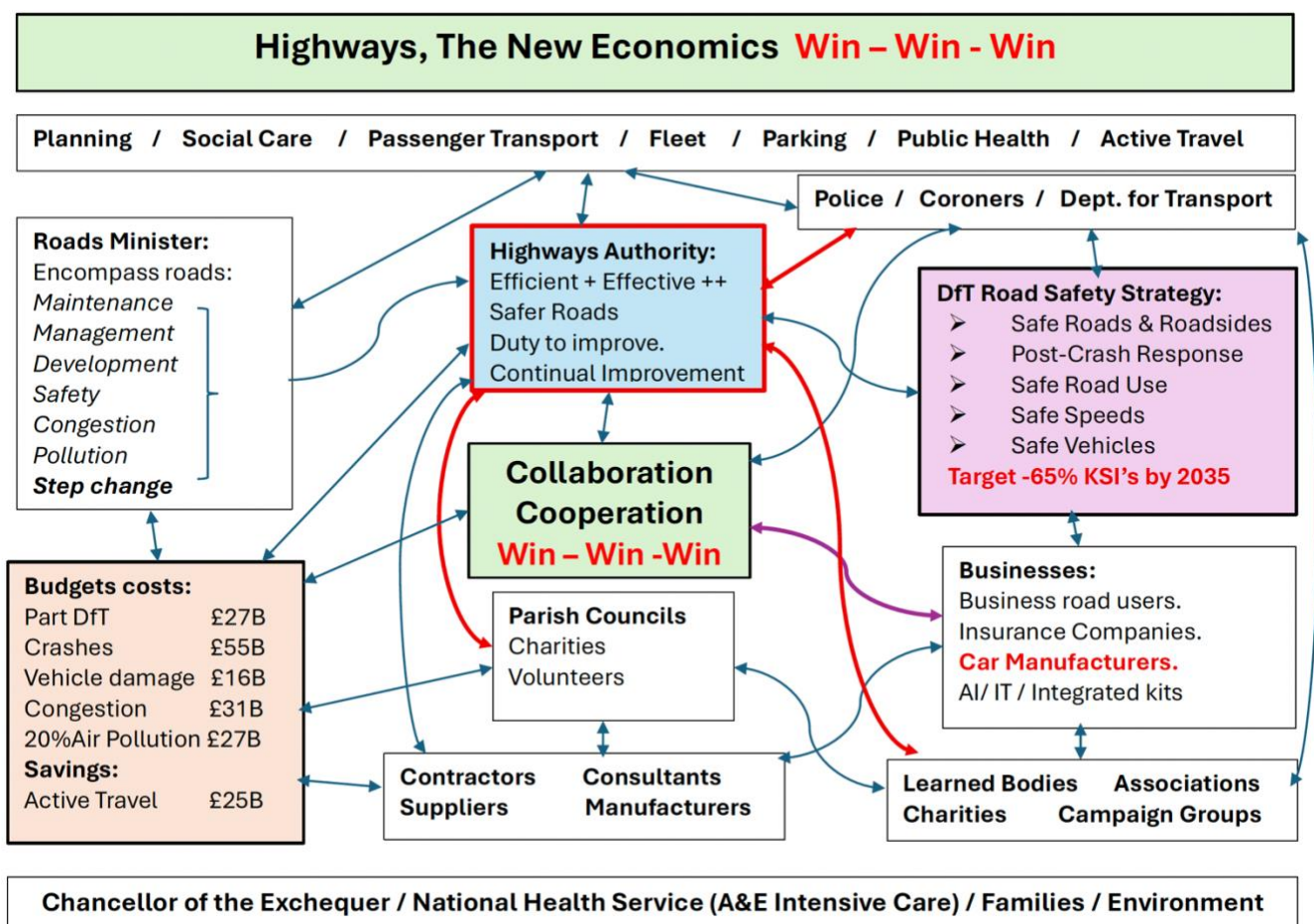
The result is not only a bigger defect, but also higher disruption, higher claims exposure, and more wasted effort through rework that does not address root cause.

Metric	Details
Initial size	10×10×3cm = 300cm³
First report date	8/1/20 — NOT FIXED
Growth after 8 months	50×35×8cm = 14,000cm³ — 47× bigger
Number of reports	20 reports over 5 years

Repairs attempted	5 repairs, all failed
Final comparison	700× potential intervention size

🚧 **SEVEN HUNDRED TIMES** the potential intervention size or **23 times** the original reported size.

Win-Win-Win Collaboration Model



Highway outcomes improve fastest when the model stops pitting stakeholders against one another and instead aligns incentives around prevention, safety, and reduced total cost.

The “Win-Win-Win” approach connects policy, delivery, technology, and community capability so each group gains measurable benefits from the same operational changes.

Stakeholder Group	Key Players	Benefits
Government	Roads Minister, DfT, Chancellor	Lower national crash costs, reduced claims exposure, demonstrable value-for-money outcomes
Highway Authorities	Local councils, contractors	Backlog reduction, fewer repeats, clearer prioritisation, stronger compliance evidence
Businesses	Haulage companies, couriers, Insurance, manufacturers, AI/IT	Lower incident rates, targeted innovation opportunities, improved data quality for risk and product design

Community	Parish councils, volunteers, charities	Visible local improvements, faster reporting-to-action loops, shared ownership of safety outcomes
Public Services	Police, NHS, Coroners	Fewer casualties, reduced demand pressure, stronger prevention pathways following serious incidents

Highway-Related Laws & Requirements

Highways Act

Section S58 — inspection and repair expectations can be strengthened using **AI-enabled surveys** and verified community inputs to improve evidence, frequency, and prioritisation.

Inspection & repair — demonstrate a repeatable system: defect identification, response times, repair quality, and audit trail of decisions.

Volunteers (supported) — enable structured reporting and supervised low-risk activities that improve network knowledge and speed escalation.

Road Traffic Act

Section 39.3 — authorities **MUST** pursue road safety outcomes through systematic action, not only reactive repair.

Duty to prevent future deaths — use collision learning to target the small set of locations driving disproportionate harm.

Evidence-based prioritisation — link road condition, speed environment, and collision patterns into a single risk-driven plan.

New Roads & Street Works Act

Section 52 — volunteers can support **emergency repairs** where appropriate, safely governed, and coordinated to minimise risk and disruption.

Section 59 — improve coordination of works to reduce repeat trenching damage and improve reinstatement quality.

Utilities collaboration — use shared data to identify recurrent failure corridors and enforce consistent reinstatement standards.

Well Managed Highway Infrastructure

Liverpool precedent — adopt actionable thresholds such as **4cm roads / 2cm footways** to standardise intervention triggers.

AI survey requirements — enable consistent condition capture, repeatability, and defensible prioritisation across the network.

Crawley vs Barnsley — focus on measurable compliance: inspection frequency, defect response, and documented decision-making.

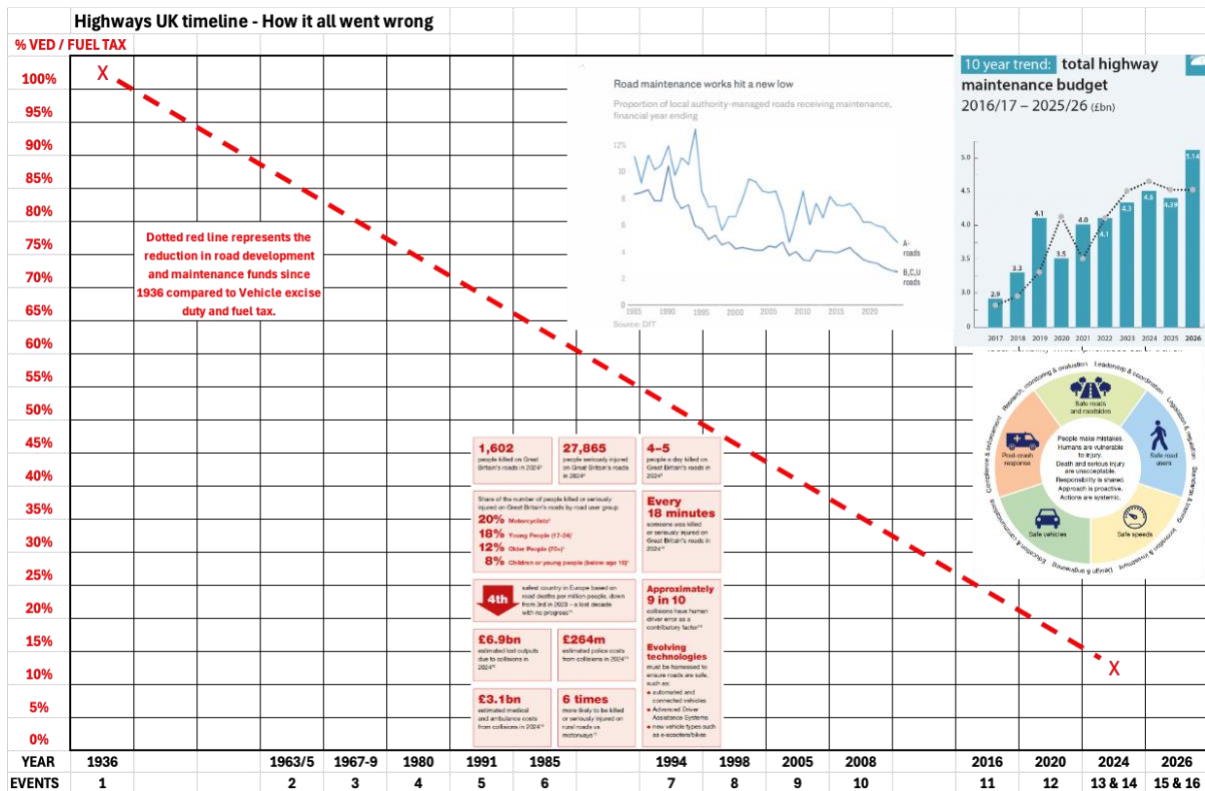
Roads Funding Over Time:

How It All Went Wrong

The decline in road maintenance quality is closely tied to a long-term shift away from dedicated funding and toward general taxation where roads compete with every other spending priority.

As the link between vehicle taxation and road upkeep weakened, preventative maintenance was repeatedly deferred, turning predictable wear into accelerated failure and compounding backlog growth.

This timeline highlights major policy and economic moments that helped move the system from an economically aligned model to one where funding is effectively near **0%** dedicated to roads.

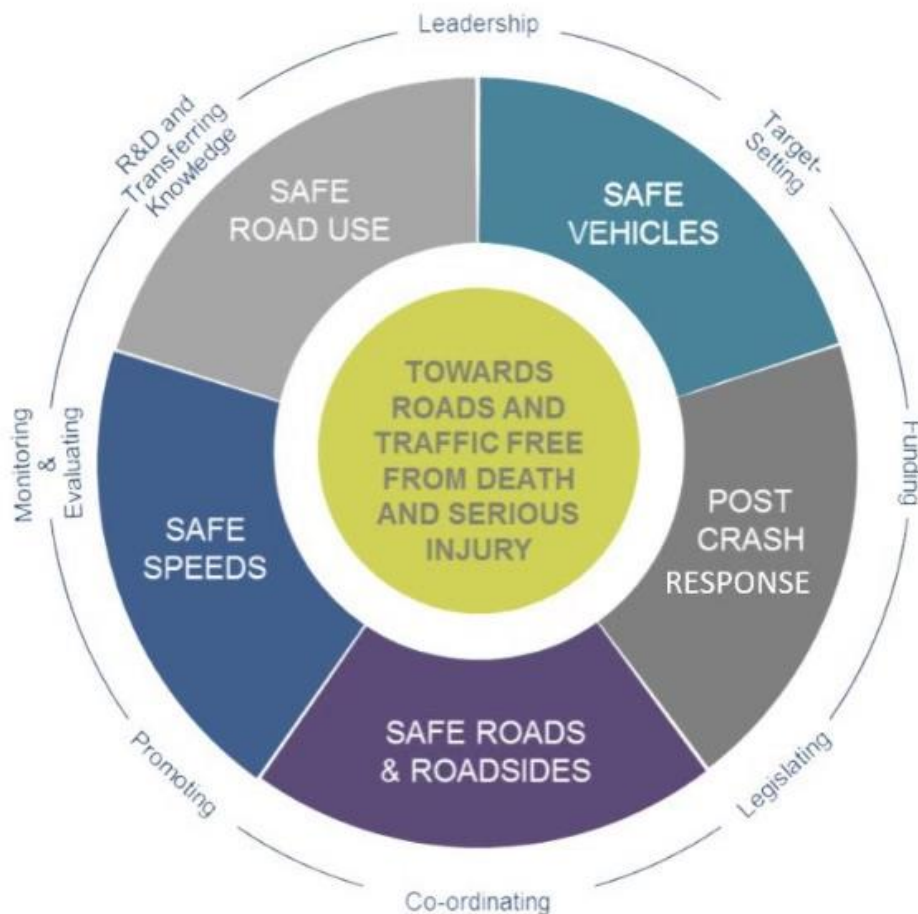


Year	Event	Impact
1936	Churchill abolishes 100% road tax dedication	Breaks the direct economic link between motoring revenue and road upkeep
1963–1965	Beeching rail cuts	Modal shift pressure increases road reliance, raising wear and demand on highways
1980	Highways Act	Clarifies duties and expectations, but does not guarantee sustainable funding alignment
1994	12% of roads receiving maintenance	Signals shrinking preventative programmes and the start of larger reactive cycles
2008	Financial Crisis	Capital and revenue constraints intensify deferral of planned maintenance

2010s	Persistent austerity pressures	Maintenance becomes easier to defer than frontline services, expanding latent failure
2020	Covid austerity impacts	Backlog growth accelerates while defects expand due to delayed intervention
2026	Backlog peak reaches £18.6B	System faces compounding costs: larger defects, higher rework, and greater crash risk

Vision Zero: Safer Roads

Strategy



Vision Zero treats serious harm as preventable and focuses the system on eliminating the conditions that produce predictable death and injury, rather than accepting crashes as “inevitable.”

The strategy is to target the minority of locations driving most of the harm and defects, using condition data, collision data, and enforceable standards to concentrate effort where it changes outcomes fastest.

Key Statistics

55% of road issues are concentrated in **3%** of the network.

55% of urban potholes are attributed to **utilities** activity and reinstatement failure patterns.

65% of crashes occur in **5%** of the network.

A safer network does not require **£19.6B** of blanket fixes—only tactical focus on the right locations.

Actions

Use AI for utilities management, reinstatement monitoring, and repeat-failure detection.

Tactically cure issue areas where defects and crashes cluster, prioritising prevention over patch volume.

Liverpool precedent — apply **4cm/2cm** thresholds to standardise intervention triggers.

Crawley vs Barnsley — implement urgent, documented inspection regimes for defensible compliance.

Enable AI inspections to increase frequency, consistency, and auditability.

Enable volunteers with governance to expand reporting capacity and speed escalation of high-risk defects.

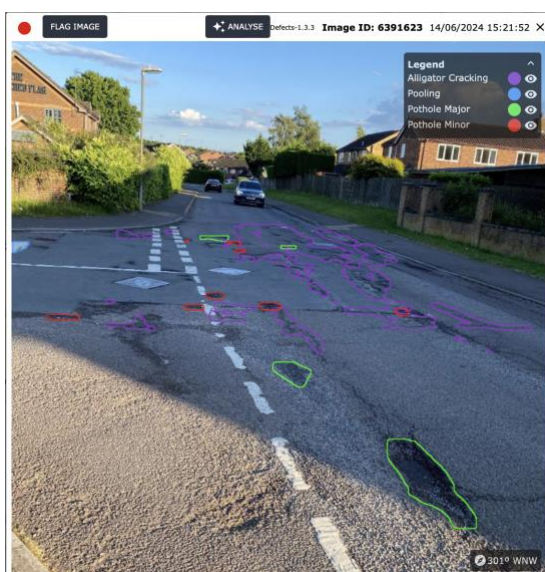
AI Road Surveys: The Technology Solution

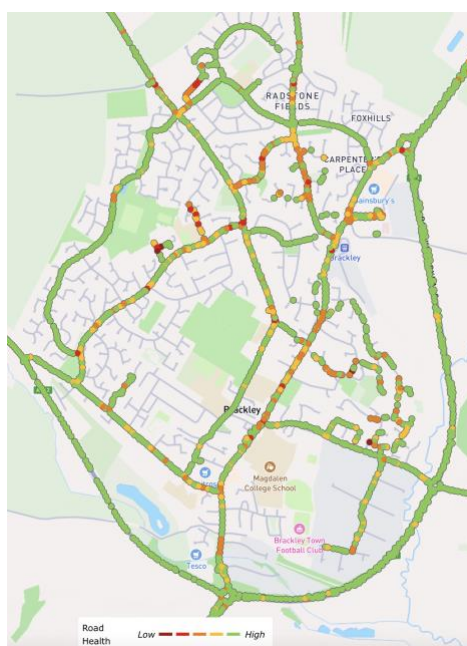
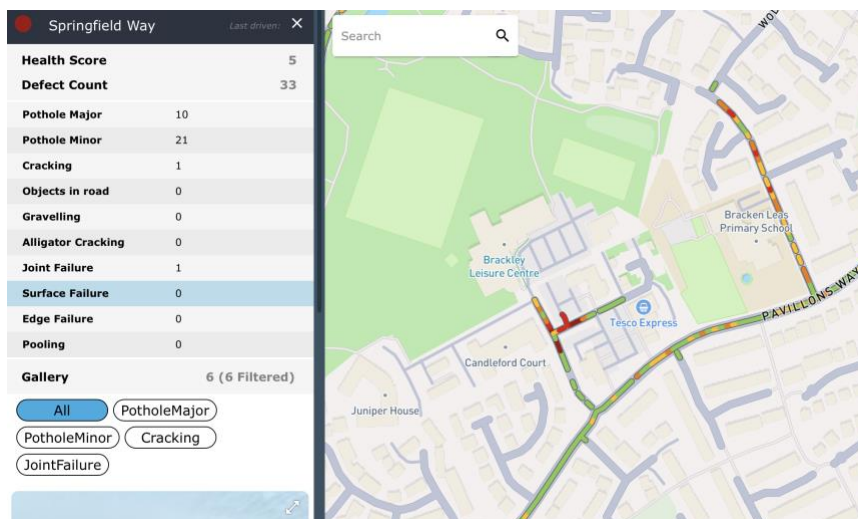
AI-enabled tools such as Stan and Smart Vision allow authorities to capture and interpret network condition at scale, turning inspection from a limited sampling exercise into a repeatable measurement system.

These tools can produce three practical levels of mapping: an overview of the whole town, a drill-down view of a specific locality, and a targeted view of a failing junction or corridor where intervention will reduce the most risk fastest.

Outputs can include **RAG ratings** that show decay speed and indicative date ranges, helping teams move from “fix what shouts loudest” to “fix what will fail next.”

When integrated with systems such as **Crashmap**, authorities can identify dangerous roads and correlate collision clusters with condition defects and repeat-failure maintenance patterns.





i Key takeaway — AI-powered surveys enable **Section 58** compliance, condition assessment, and tactical planning—transforming highway management from reactive to proactive.

The Four Voices of Quality

Quality improvement becomes practical when it is defined through four complementary “voices” that shape decisions from strategy to frontline delivery.

By balancing **Customer**, **Process**, **People**, and **Asset**, highway organisations can reduce repeat failures, improve safety outcomes, and deliver visible improvements within constrained budgets.

Voice	Key Principles
Customer	Define outcomes in safety, ride quality, and trust. Close the loop on reports with clear communication and evidence of action. Measure success through reduced harm, fewer repeats, and improved satisfaction.
Process	Standardise inspection, triage, and repair decision rules. Design out rework through first-time-right interventions. Use data to prioritise the small % of network driving most cost and risk.

People	Train teams on defect thresholds, evidence standards, and consistent ratings. Create feedback loops so learning is rapid and shared. Align incentives to prevention, collaboration, and measurable outcomes.
Asset	Maintain a defensible condition baseline using AI surveys and repeatable measurement. Prioritise interventions that slow decay and prevent defect growth. Link condition strategy to safety risk, utilities impact, and lifecycle cost.

The Path Forward

Highway performance will improve when decisions are anchored in **economic principles**: prevent small problems from becoming large costs, target effort where it changes outcomes most, and measure results that matter to safety and serviceability.

By operationalising the **Win-Win-Win** collaboration model, stakeholders can align around prevention—reducing crashes, claims, disruption, and repeat repair cycles at the same time.

With **AI technology** providing scalable condition knowledge and with clear application of **legal frameworks** to inspections, prioritisation, and safety duties, authorities can move from reactive firefighting to proactive risk management.

The lasting shift comes from a **continuous improvement culture**: weekly learning loops, transparent metrics, and standardised best practice that turns limited budget into compounding network gains.