# State of the City Report 2023

## London's Highways infrastructure Health Report

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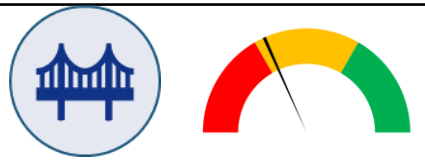
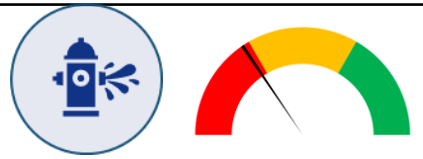
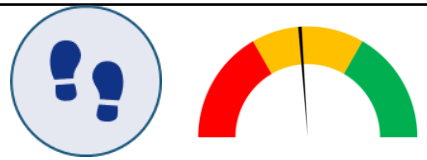
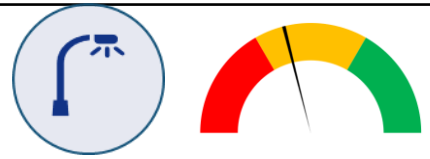
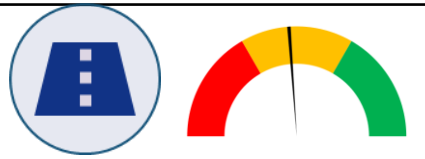
|---|---|---|---|---|---|
| **Asset & Status** |  **4,500+ structures with an area of 2 million m$^2$** |  **Over 670,000 pipes and gullies** |  **17,400 miles of footways & cycleways covering 21sq miles** |  **650,000 lights using up 160 GWh of energy annually** |  **9,300 miles of road covering 43sq miles** |
| **Trends** | • Spending on structures r**emains low following an 80% decrease in 2021/22.**<br>• Current investment is less than 10% of budget estimated to maintain current condition level.<br>• Overall condition is in a state of **managed decline**<br>• Many of London's iconic historical and key bridges utilise **materials that are susceptible to the impacts of climate change**, such as high temperatures (+35°C) | • **Drainage** remains an area with **low levels of accurate data**.<br>• **Limited coordination and collaboration** across boroughs, TfL and partners in managing surface water flooding.<br>• Historically funding has focused on the symptom, not the cause.<br>• However, London Councils are coordinating the development of a **Surface Water Strategy.**<br>• Year on year total spending on drainage has been decreasing since 2019. | • Investment on footways and cycleways in Greater London has been **steadily decreasing since 2018.**<br>• **Footway funding has either reduced or stayed steady for many**, however several London boroughs report an increase in footway/cycleway funding.<br>• Overall, reported footway and cycleway condition is improving, but improvements are focused in boroughs with additional investment. | • Despite recent increases in funding in lighting assets, **2023 saw a slight reduction in funding compared to 2022**.<br>• **Over half** of lighting funding is **spent on energy costs.**<br>• Capital spend has focused on **reducing energy consumption** of the lighting stock and **retro-fitting EV chargers** in columns.<br>• Investment has **reduced the annual energy consumption and $CO_2$e production by 50%** compared to 2009 figures. | • Reported carriageway condition shows a decrease in condition compared to the 2022 report.<br>• The estimated area of carriageway in a **Poor Condition has doubled in the 6 years since the 1st report (2017).**<br>• Expenditure on carriageways has decreased year on year since 2020, with the **backlog increasing by c. £85 million since 2022 report**. |
| **So What?** | • **£238 million** of annual maintenance investment required to preserve current condition levels.<br>• This **excludes funding for climate change mitigation**.<br>• If mitigation actions are not funded, more future restrictions and closures maybe necessary. | • Not possible to estimate annual need based on available data.<br>• However, empirical evidence indicates that **current funding levels are inadequate**.<br>• Without additional funding, resources and coordination, flooding on a similar scale to 2021 is highly likely to reoccur. | • The Greater London annual need is **£66 million**, if funding is below this level, **footway condition is likely to decline**.<br>• Declines in footway / cycleway condition can **act as a barrier**, preventing people **walking and cycling due to safety and accessibility concerns.** | • Annual need of **£38 million** to maintain current condition level.<br>• Declining condition of lighting columns may **slow the uptake of EVs** as many are adapted into charging points.<br>• Underinvestment could present risks around **structural integrity of lighting columns**. | • **£245 million** annual investment is required to hold the network in its current condition.<br>• Climate change is anticipated to bring increased rainfalls. The deteriorated state of the roads will allow water to ingress into the structure, **accelerating the degradation**, forming potholes. |

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Climate change poses a significant risk to London and its highways infrastructure. In 2022, London recorded the highest temperature ever seen in the UK with **air temperature highs of 40.2°C in July**. These high temperatures can adversely impact the short- and long-term **performance and condition** of assets across the network, particularly in the case of many of **London's historic structures** which use materials such as Iron and wood.

**Hammersmith Bridge highlights the challenges posed by climate change**, with the urgent addition of a pioneering cooling system to the bridge's cast-iron chain pedestals (see photograph, right) during the heatwave to keep the bridge a safe temperature and alleviate any stresses in the pedestals. **The cooling system prevented any temporary closures** to pedestrians, cyclists and river traffic, during the heatwaves.

Photograph of Hammersmith Bridge pioneering cooling system during the summer 2023 heatwave, ensuring the bridge remained safe and operational. Source – Hammersmith & Fulham Council website

Many of London's structures were constructed during the 1960's to 1990's, before impacts of climate change were considered. Even though these were constructed using modern materials, such as steel and concrete, these structures were designed with an expansion tolerance up to 35°C. Temperatures above 35°C mean that materials expand outside tolerance, **accelerating degradation and increasing the risk of premature failure.**

**Structures are key to delivering a resilient and available highway network**, allowing the movement of buses, people and goods across rivers, canals, railway lines, roads and other obstacles throughout Greater London. However, there are **significant challenges in monitoring condition of structures**, due to critical components of structures being inaccessible without expensive and disruptive specialist surveys. Issues of funding and network availability means that it is challenging for London's Boroughs to fund and programme these specialist inspections, which often means the true extent of deterioration and understanding of remedial costs are not fully understood until works start and the hidden components become accessible.

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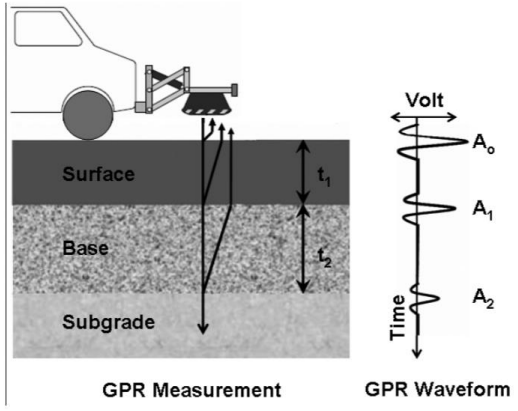
### Hidden Risks

Buried assets such as utilities are a constant challenge for highway maintenance, though these are mapped by the equipment owners and detectable through standard procedures.

However, in Central London, cellars beneath the highway, which have been bricked up and the current property owners are unaware of are a big concern.

A cellar collapse would cause disruption to the network, significant liability to owners and the potential risk of harm to road users.

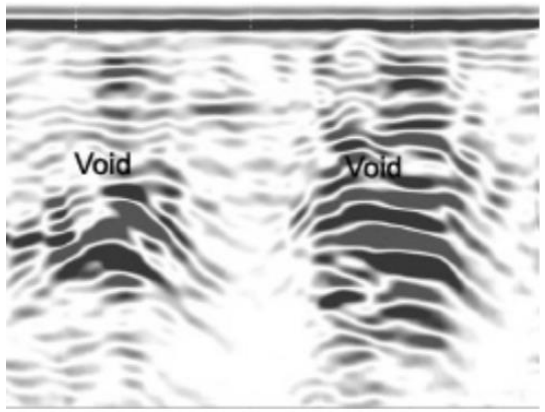
Cellars and voids under the highway could be potentially located and mapped with GPR (Ground Penetrating Radar), similar to the device used in Channel 4's Time Team; however current funding levels are not sufficient to fund the current priorities, lest proactive risk management.




GPR Measurement



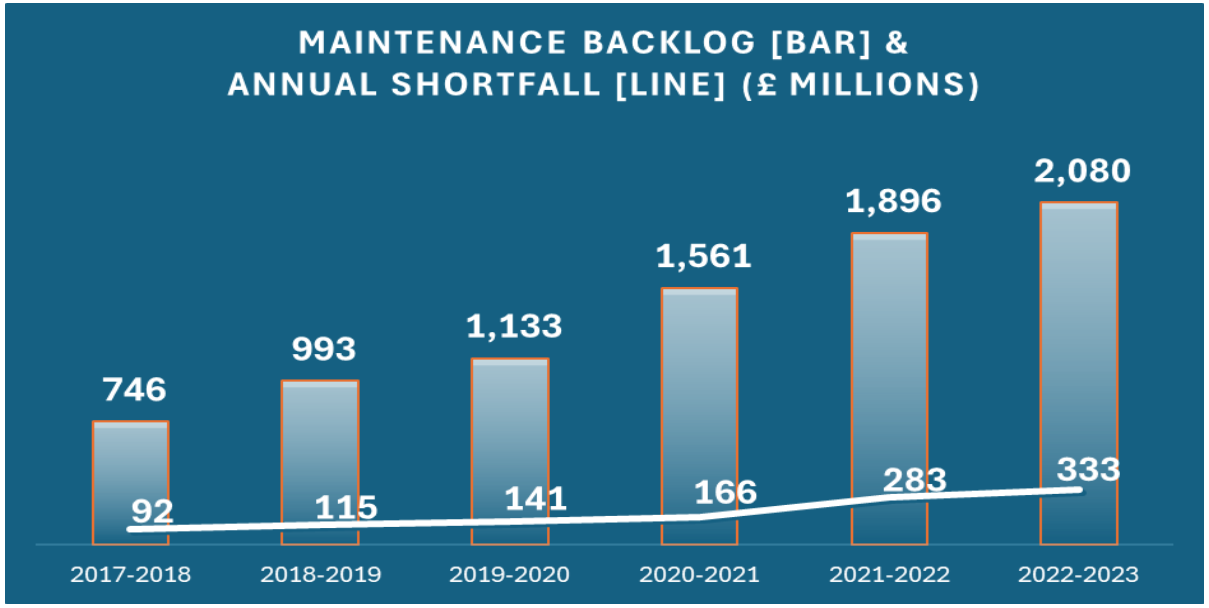

GPR Waveform




Illustrations: Sonyok, D. R and Zhang, J. GPR for Highway Infrastructure Condition Diagnostics, New Mexico State University, August 2007.

### Mind the Gap

Current and historical investment levels in local roads across London have been below levels needed to maintain a 'State of Good Repair', meaning the infrastructure is in managed decline, with funding prioritised on maintaining a safe network and short-term priorities.




The 2023 annual maintenance funding gap was estimated to be £319 million (Annual Need £586 million vs reported spend £267 million) which is a year-on-year increase since £92 million was reported in 2017.

This shortfall, in combination with inflation, has also increased the overall maintenance backlog to £2.08 Billion.