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Public sector impact studies

Infrastructure: National underground asset register to prevent accidental strikes and delays





The problem

The UK's underground infrastructure comprises over 4 million kilometres of buried pipes and cables, managed by over 600 different organisations ranging from major utility companies to local authorities. This means that when planners or excavators need to dig, they face a fragmented and inefficient system to locate these assets. Analysis of a 2022 public consultation indicated that the largest proportion of respondents contacted between six and ten organisations per project when requesting maps. These records arrive in varying formats, scales, and timeframes.

The consequence of this data fragmentation is severe. On average, a hole is dug every seven seconds in the UK, and there are approximately 60,000 accidental strikes on underground assets every year. These accidents endanger lives and cause significant disruption to businesses and the public. The estimated economic cost of these strikes is £2.4 billion annually, reflecting the costs of repair and delay. Furthermore, the administrative burden of requesting data creates a significant lag. On average, it takes 6.1 days to request, receive, and prepare the necessary data for a single project.

This public sector impact study is based on a talk at Productivity Pitches, a series of events hosted by the Institute for Government and The Productivity Institute, which aims to share and support ways to improve public sector performance levels. The talk is available to watch on the [Institute for Government's website](#).



The innovation

To address this, the Geospatial Commission developed the National Underground Asset Register (NUAR), an interactive digital map that revolutionises how underground data is shared. The project shifts the model from a manual, reactive request and wait system to a secure, centralised, always-on platform. The innovation rests on several key pillars:

- *Unified data ingestion:* NUAR aggregates data from across the energy, water, telecommunications, and transport sectors. It solves the interoperability challenge by transforming disparate data formats (including digitising PDF maps) into a standardised digital model.
- *Secure, role-based access:* Recognising the security risks of mapping critical national infrastructure, the platform includes baked-in security features developed with the National Protective Security Authority and the National Cyber Security Centre. Access is permission-based, with users restricted to viewing data relevant to their role rather than the entire network.
- *Legislative support:* While the project began with voluntary engagement, it is being cemented through legislative reform such as the Data Use and Access Bill. This moves the system from a coalition of the willing to a mandatory statutory register, ensuring comprehensive coverage.





The impact

The transition to this centralised digital platform has delivered immediate and projected productivity gains:

- *Process efficiency:* The primary metric of success is the reduction in preparation time. The platform has reduced the time taken to access essential asset data from an average of 6.1 days to a matter of seconds.
- *Economic impact:* It is estimated that NUAR will grow the UK economy by over £400 million per year. These gains are derived from increased efficiency in construction and planning, as well as a reduction in the costs associated with accidental damage and service disruption.
- *User adoption and satisfaction:* Even in its Minimum Viable Product (MVP) phase, the service facilitated over 80,000 transactions a month with over 4,000 users. User satisfaction was high, with a satisfaction rate of 8.4/10 and a Net Promoter Score of 9.2/10. Now the service is in public beta these figures are increasing month on month. At the end of 2025, user numbers exceeded 7,500, with more than 115,000 transactions being carried out each month.
- *Safety improvements:* By providing excavators with a complete, standardised view of what lies beneath their feet, the platform directly addresses the root cause of the 60,000 annual accidental strikes.

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Takeaways

The NUAR case study offers three critical lessons for productivity in central government.

- First, it demonstrates the unique role of central government in solving collective action problems. The productivity drag caused by underground strikes was not due to an absence of data, but because that data was trapped in siloes across 600 entities. No individual utility company had the incentive or authority to fix this fragmentation. This case demonstrates how central government can provide substantial value by building the shared infrastructure that allows the market to function efficiently.
- Second, successful digital transformation is driven as much by getting the right buy-in from the right people, as it is by getting the technology right. While building the platform was feasible, the greater hurdle was the cultural resistance to sharing data. This challenge was overcome using a three-pronged strategy to turn potential users into partners.
 - First, by actively listening to industry stakeholders, the team identified ways to ensure the system delivered value back to asset owners.
 - Second, the team made it easier for partners to adopt the platform by taking on the technical burden of transforming their raw data.
 - Third, it actively sought feedback from users, during the MVP phase, to help inform how the platform should look and function. Along with co-designing training to help partners adapt their workflows. This reinforces that technology is more successful when users are treated as co-creators rather than passive recipients.
- Third, this case illustrates how innovation matures within the public sector. The initiative began with a small, agile team conducting preliminary research and user testing to validate the concept. However, expanding this from a pilot to a national asset required executive leadership to recognise the opportunity and provide high-level political backing.

In this instance, that meant securing the legislative reform (the Data Use and Access Bill) necessary to make data sharing mandatory. This suggests that a key role for leaders in government is to identify valid ideas emerging from the frontline and leverage their influence to provide the leadership necessary to scale that success across the country.



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The Productivity Institute is an organisation that works across academia, business and policy to better understand, measure and enable productivity across the UK. It is funded by the Economic and Social Research Council. (grant number ES/V002740/1).

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