Prevent Sinkholes and Minimize Risks of Geohazards with Early Detection of Cavities

Detect subsurface anomolies without causing any disruption

Background

Roads are essential components of urban infrastructure, providing the backbone for transportation and connectivity. However, maintaining the integrity of these pavements is a complex task, as they are susceptible to various forms of damage, including the formation of cavities or voids beneath the surface. These cavities, often caused by factors like water infiltration, soil erosion, or subsurface utility failures, can lead to significant structural issues and pose a risk to public safety if left undetected.

Regular inspections are crucial for early detection and rectification of such issues, ensuring road safety and longevity. Traditional inspection methods, while valuable, sometimes require supplementary techniques to accurately diagnose and assess the extent of subsurface anomalies.

Challenges

Subsurface cavities beneath road pavements are challenging to detect using conventional inspection methods alone. Visual inspections and basic imaging techniques may not always reveal the full extent of subsurface issues, leaving potential hazards unaddressed.

Lack of precise and timely information can delay decision-making, increasing the risk of further road collapse and leading to higher repair costs if the problem escalates. Additionally, the presence of other subsurface utilities can complicate the identification and characterization of these cavities, necessitating advanced techniques that provide clear and reliable data.

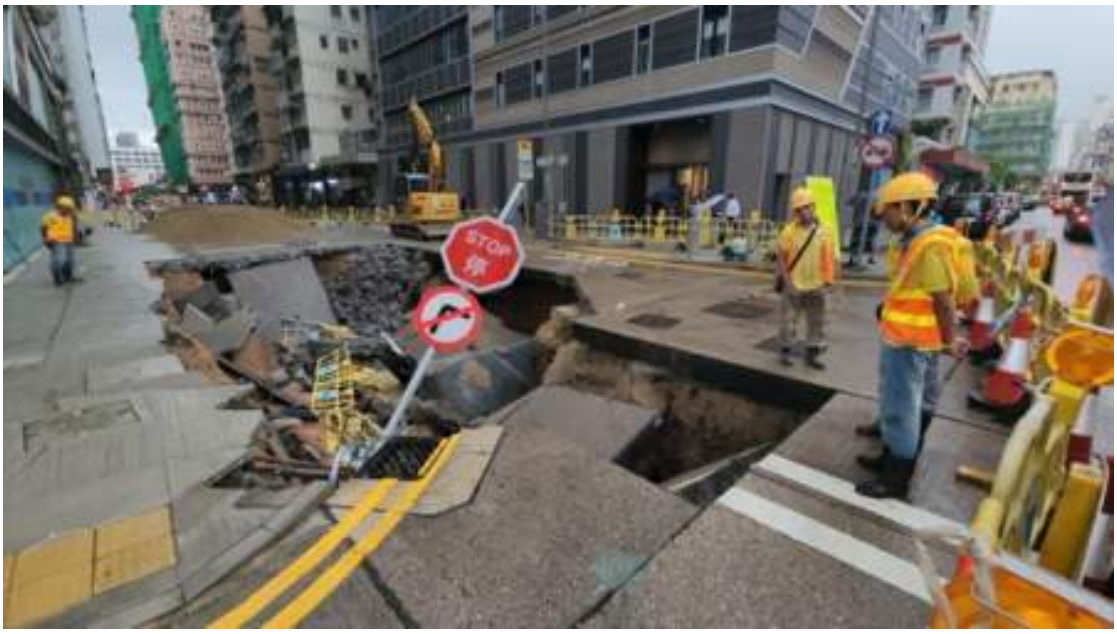


Image credit: PD Tech in Hong Kong

Solutions

Advanced Ground Penetrating Radar (GPR) technology offers a highly-effective, non-invasive solution for detecting and mapping subsurface cavities beneath road pavements. Unlike traditional inspection methods that may require disruptive excavation, GPR systems enable thorough subsurface analysis without disturbing the pavement structure.



Image credit: PD Tech in Hong Kong

The GS8000 and GS9000 GPRs provide high-resolution imaging that can accurately detect voids, cavities and other anomalies across various subsurface conditions. The real-time data visualization capabilities of modern GPR systems allow for immediate assessment and verification of suspected cavities, enabling swift and informed decision-making. This technology can be employed to inspect a wide range of pavement types and subsurface conditions, ensuring comprehensive coverage and reliable results.

Conclusion

The application of advanced GPR technology for subsurface cavity detection in road pavements represents a significant improvement over traditional inspection methods. By providing accurate and timely data, GPR systems enable infrastructure managers to proactively address potential hazards, reducing the risk of road collapse and minimizing the associated costs of emergency repairs.

The integration of GPR into routine inspection programs enhances the overall safety and durability of road networks, supporting better urban infrastructure management. The unique real-time data visualization and augmented reality views from the GS8000 and GS9000 GPRs bring a new level of efficiency for this application, enabling informed decisions to be made faster.

With thanks to our partners at PD Tech in Hong Kong for collaboration on this case.

Read more case studies on subsurface mapping and infrastructure inspection in our Tech Hub.

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