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Sensors and Safety

SENSORS HELP AGENCIES AVOID THE COSTS ASSOCIATED WITH THE STRUCTURAL DETERIORATION OF BRIDGES.

ESPRIDA CORP.

Esprida Corp., www.esprida.com, Mississauga, Ont., is a provider of remote management software that collects and aggregates data generated by large populations of devices using software-orientated architecture to bridge communication between multiple disparate device types into a unified view for improved service delivery and reporting capabilities.

Consider the possibility of a structure, let's say a bridge, equipped with technologies that provide the ability to predict and take corrective action to prevent potential failures whether they're caused by natural disasters, man-made threats, or the cumulative effects of climactic conditions. Every time a bridge collapses there are catastrophic results. The communities and economies affected by the disruption in service suffer greatly, yet the most tragic loss is that of human life—compromised public safety. But, in a world where everything connects, critical transportation infrastructure (bridges, dams, roadways, and tunnels) shouldn't be any different.

There are a number of technological advances that make this possible; wireless communication, sensor networking, and remote monitoring technologies are all critical components of the solution.



During construction, shock/impact-resistant sensors are embedded in the concrete. They generate data that provide real-time status readings on structural health for better quality testing and control during all stages of construction and through the entire lifecycle. Using wireless technology, the data is transmitted to an infrastructure management system where, through a central console, an entire inventory of structures is managed and controlled from a distance. The console, using GPS (global positioning system) technology, provides a visual mapping of structures in the network so you can identify the location of the structure and which section is affected.

If there's a hero in this interplay of sensors and wireless technology, it's the data—a constant stream of intelligence on stresses and their impact on structural integrity. The infrastructure management system sends alerts on weak points before they reach the point of catastrophic failure, and through its analytics, reports patterns of damage. Alerts and escalations on thresholds are sent to appropriate personnel allowing them to respond promptly and take preemptive action either by dispatching a crew or restricting access.

Patterns of wear and tear and realtime intelligence on a structure's health allow for condition-based maintenance—the ability to deliver service based on actual instead of estimated component wear. Service personnel are assigned and dispatched as needed to optimize staff workflow, reduce cost of operation, and most importantly, reduce the risk of failure and its impact on public safety. An intelligent structure equipped with technologies to reduce and potentially eliminate unreliable processes is invaluable, delivering cost-savings and ensuring a level of safety the public demands and deserves.

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