

Extending the Reach of Roadside Safety with ImpactAlert™

Long-Distance Impact Detection on Cable Barriers



ROADCONNECT™

Introduction

Roadside safety assets such as cable barriers, guardrails, crash cushions, and bridge structures play a critical role in protecting motorists and reducing the severity of roadway departures. However, these assets only fulfill their purpose when they are fully functional. Undetected impacts can leave damaged infrastructure in place for extended periods, increasing the risk of secondary crashes, exposing maintenance crews to hazardous conditions, and driving up repair and liability costs for Departments of Transportation (DOTs).

As transportation agencies seek more efficient, reliable,

and cost-effective ways to monitor roadside assets, remote impact detection has emerged as a powerful tool. ImpactAlert™, developed by Lindsay, is designed to address these challenges by providing real-time notification of impacts across a wide range of asset types. Recent observations from two cable barrier locations, one in Nebraska and one in Utah, highlight the system's ability to detect impacts from distances up to one mile. While detection distances can vary depending on site-specific conditions, these results underscore the sensitivity, robustness, and flexibility of ImpactAlert in demanding real-world environments..

Long-Distance Impact Detection on Cable Barriers

Cable barriers are among the most dynamic roadside safety systems in use today. Unlike rigid assets such as crash cushions or bridges, cable barriers are designed to deflect and absorb energy during an impact. This dynamic behavior, while beneficial for occupant safety, can pose challenges for impact detection systems due to vibration dissipation along long cable runs.

In both Nebraska and Utah, ImpactAlert devices installed on cable barrier systems demonstrated the ability to detect impacts occurring as far as one mile away from the device location. While it is not possible to definitively state that all impacts will always be detected from that distances, since factors such as vehicle mass, speed, impact angle, cable tension, terrain, and environmental conditions all influence impact detection, the results are highly encouraging.

These observations indicate that ImpactAlert possesses the sensitivity and detection logic required to identify impact events across extended cable barrier segments while maintaining system reliability. Equally important, the system demonstrated the robustness needed to avoid false positives, ensuring that DOT personnel are not overwhelmed by unnecessary alerts caused by wind, temperature changes, or routine roadway vibrations.

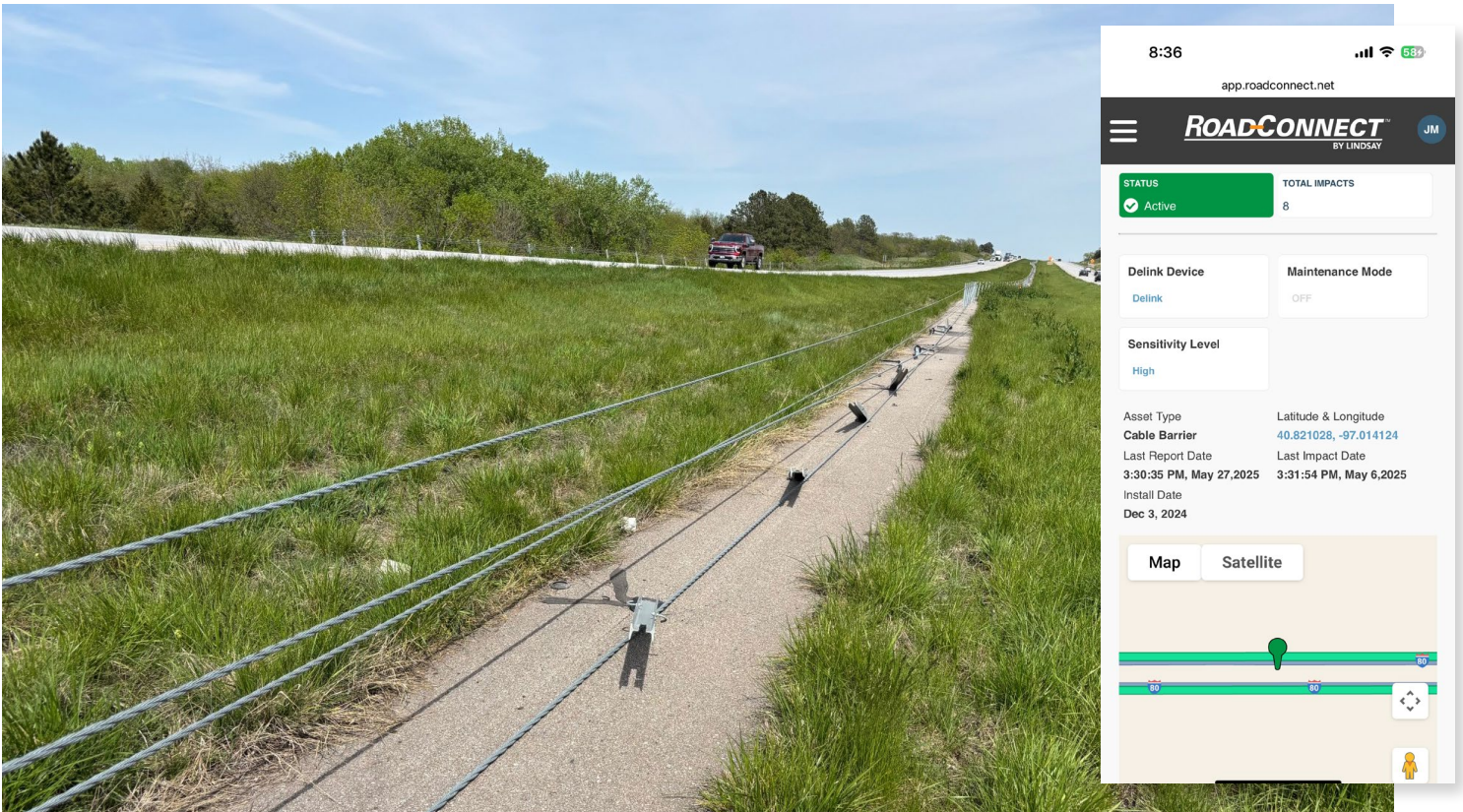
Ultimately, the DOT determines the spacing and placement strategy for Impact Alert devices. Agencies are best positioned to make these decisions based on their knowledge of local crash history, vehicle mix, roadway geometry, environmental conditions, and driver behavior. However, the ability to detect impacts at distances approaching one mile provides DOTs with greater flexibility in deployment strategies and the potential to reduce the number of devices required along long stretches of cable barrier.



Why Reliable Impact Detection Matters

Timely detection of roadside impacts is not just a matter of convenience, it is a critical safety and operational concern. When an impact goes undetected, damaged assets may remain in service longer than intended, compromising their ability to protect motorists in subsequent crashes. This could potentially increase the danger level of secondary incidents, which are often more severe and place both drivers and emergency responders at greater risk.

ImpactAlert enables DOTs to receive near real-time notifications via email and SMS, allowing maintenance teams or contractors to respond quickly and assess damage. Faster response times translate into quicker repairs, reduced exposure of workers to live traffic, and safer roadways for the traveling public. In rural or remote locations (where cable barriers are often deployed) remote monitoring is especially valuable, as routine patrols may be infrequent and time-consuming.



Operational and Financial Benefits for DOTs

Beyond safety, the operational and financial benefits of reliable impact detection are significant. Traditional inspection methods require regular patrols, which consume labor hours, fuel, and vehicle wear. By contrast, Impact Alert provides continuous, 24/7 monitoring, allowing agencies to shift from reactive inspections to targeted, data-driven responses.

From a financial perspective, timely impact detection can also support cost recovery efforts. When alerts are received immediately after an incident, DOT personnel or contractors may be able to collect police reports, photographic evidence,

and driver insurance information before vehicles leave the scene. This improves the likelihood of recovering repair costs through insurance claims and reduces the financial burden on public agencies.

Additionally, minimizing the time that damaged assets remain in place can help prevent further deterioration and reduce the scope and cost of repairs. Over time, these efficiencies can result in substantial savings while improving overall asset management performance.

Flexibility Across Asset Types

While long-distance detection on cable barriers is particularly noteworthy, ImpactAlert is designed to be both asset-agnostic and brand-agnostic. The same core technology can be deployed on stable assets such as crash cushions, bridge structures, utility poles, and guardrails, as well as more dynamic systems like cable barriers.

This flexibility allows DOTs to standardize on a single monitoring platform across diverse asset inventories. Through the RoadConnect platform, users can adjust sensitivity settings, manage alert notifications, and activate maintenance modes as needed to accommodate different asset behaviors and site conditions. This adaptability is key to ensuring accurate detection while minimizing false alerts across a wide range of applications.



Conclusion

The observed ability of ImpactAlert to detect cable barrier impacts from distances of up to one mile in Nebraska and Utah highlights the system's advanced sensitivity, intelligent detection logic, and real-world robustness. While detection performance will always depend on site-specific variables, these results demonstrate that Impact Alert is capable of monitoring long, dynamic cable barrier installations without sacrificing reliability.

By enabling faster impact detection, improving worker and motorist safety, supporting insurance cost recovery, and reducing operational inefficiencies, ImpactAlert delivers meaningful value to DOTs. Combined with its flexibility across both stable and dynamic roadside assets, the system provides transportation agencies with a powerful tool to enhance roadway safety, optimize maintenance practices, and make more informed asset management decisions today and into the future.

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