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Oklahoma State University

Customer Story

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Case Study

Examining Surface Conditions to Mitigate Road Incidents

Background

Oklahoma State University (OSU) is a global leader in applying innovative technologies to improve road safety. Dr. Joshua Li, Ph.D. in Civil Engineering and Associate Professor of Transportation Engineering at OSU, spearheads research to help Departments of Transportation (DOTs) reach **Vision Zero** – a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. Dr. Li's research is focused on enabling DOTs to better understand road conditions using new technologies so they can more cost-effectively prioritize infrastructure projects that will curb crashes and fatalities. Analyzing road safety to determine opportunities for improvements is complex. It starts with looking at the basics:

where people are speeding, and where there is congestion. Both indicate a high risk of accidents. However, getting a granular understanding of how safe the roads are requires more than just location and speed data. It requires information on the condition of the roads themselves, specific to their surfaces. Variations in road surfaces, from potholes to areas prone to becoming slippery in bad weather, can also be indicative of unsafe driving conditions. But finding this information is a challenge and often comes with a high price tag.

Dr. Li and his team at OSU are pioneering new approaches to studying road surfaces, experimenting with advanced laser

triangulation and Internet of Thing (IoT) sensors to glean insights on conditions. While promising, those technologies are also expensive to implement, sometimes costing millions of dollars to install just one instrument. Other methods to finding out road conditions are more manual, involving things like measuring friction on tires which typically only involves a few cars and thus can be limited in nature.

In an effort to seek out supplemental data sources that could show a more complete picture of road conditions, Dr. Li and the OSU team came to Wejo.

The Potential of Smart Mobility Data

Dr. Li and his team see Smart Mobility Data as having the potential to be fundamental for DOTs looking to understand road variations and make the necessary investments to reach **Vision Zero**. That's why they turned to Wejo, who have collected trillions of Connected Vehicle

Data points generated by millions of active connected vehicles. Wejo's sheer scale of Smart Mobility Data not only offers a cost-effective understanding of speed and vehicle location, but it extrapolates insights on road surface based on how vehicles are driving.

Putting Smart Mobility Data to the Test

A surprising stat that came out recently shows while traffic significantly decreased during the pandemic-led lockdowns in spring of 2020, overall accidents, severe accidents, and fatalities increased. While it's assumed this is partly because the vehicles that were traveling were going at a much higher average speed, Dr. Li and his team believe road surface conditions were also a factor and have therefore kicked off a pilot study using Smart Mobility Data to analyze them. According to Li, May is often the rainiest month in Oklahoma and usually

crashes are related to rain and speed infrastructure conditions. January, on the other hand, tends to be the coldest season with icy roadways, while August presents its own challenges with temperatures upward of 100 degrees, and busy roads with children going back to school. By looking at Connected Vehicle Data from the four-month period between May 2020 and August 2020, Dr. Li hopes to find out just how powerful data from millions of connected vehicles can be at assisting DOTs in understanding road conditions.





Reaching Vision Zero

Smart Mobility Data is far more cost-effective than large laser sensors and could be key for DOTs as they decide how to best utilize the newly available funds coming out of the recent Bipartisan Infrastructure Law. The pilot study at OSU could demonstrate just how compelling Smart Mobility Data is for government organizations, especially since it also considers the privacy of drivers.

By using Smart Mobility Data to gain accurate insight into not only speed and location of vehicles on their network but also road conditions, DOTs can more effectively identify areas of improvement while determining which projects are most critical to addressing first on the road to **Vision Zero**.

