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Construction Worker Injuries Can Be Avoided Through Use of New Technologies in Work Zone Areas

IRISE researchers conducted a broad technology scan to identify remote-controlled and autonomous technologies with potential to reduce worker injury risk during pavement testing and other high-risk activities in work zones adjacent to active traffic. A benefit analysis suggests use of several of these technologies will improve both the safety and efficiency of construction activities in these high-risk work areas, leading to fewer worker injuries due to vehicle intrusions.

The analysis examined PennDOT crash and worker injury data related to vehicles entering the work zone and injuring highway construction workers that could potentially be mitigated through use of remote-controlled technologies. Technologies now available or in development include:

- Automated Real-Time Thermal Profiling for Asphalt Paving

- Remote-Controlled GPR (Ground Penetrating Radar)

- Autonomous Impact Protection Vehicle (AIPV)

Based upon a review of these technologies and the PennDOT crash data, it was concluded that 23 highway worker injuries that occurred in Pennsylvania from 2017 to 2020 had the potential to be eliminated if these methods were implemented. This was determined by evaluating the type and cause of the injuries as they related to the technologies being evaluated. These preventable injuries were determined to have a cost of $779,538 to the highway construction workers for that time period (in 2017-2020 dollars). These injury costs are based upon an average highway worker injury cost of $20,227 in 2002 that represents medical and workers compensation costs (Mohan, S. B., & Gautam, P. "Cost of highway work zone injuries." (2002)). An inflation factor for medical costs was then applied to update the 2002 data (U.S. Bureau of Labor Statistics 2022) for the PennDOT crash data from 2017 to 2020.

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