i-Probe Presents Technology Development Study at International Road Federation Conference

i-Probe, in partnership with Transtek International Group, presents a joint development study on the application of Connected Vehicles and related technologies to pavement and bridge maintenance.

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i-Probe President and Chief Executive Officer Dr. Daisuke Oshima presented the summary of an ongoing study on Connected Vehicles at the International Road Federation (IRF) Global R2T Conference from December 10-13 in Orlando, FL.

i-Probe has been carrying out joint research activities on Connected Vehicles (i.e., vehicles that can communicate bidirectionally with other systems separate from the vehicle) with Transtek International Group of Florida since 2021. The study premises that the onboard array of sensors in most Connected Vehicles, such as GPS, accelerometers, cameras, etc. can be utilized as an effective tool for data collection and analysis in the field of pavement and bridge maintenance. Furthermore, when data is crowdsourced from a fleet of Connected Vehicles, such an arrangement can overcome greater operational challenges and offer unparalleled spatial and temporal resolution at the network level.

Specifically, the presentation covered pavement monitoring applications employing connected vehicles and fleets, featuring highly consistent and accurate sample results from Florida roadways. The effectiveness of Connected Vehicles in bridge monitoring studies, especially on a network level, was also illustrated with comparative examples conducted on the Florida coastline from 2023-24. Finally, the discussion extended to potential future advancements in Connected Vehicle technology, emphasizing the integration of AI-driven predictive analytics to proactively address pavement and bridge deterioration, thereby enhancing maintenance strategies and infrastructure resilience.

On the significance of the study, Dr. Oshima said, “Proper infrastructure management requires accurate sensing of its condition. Traditional sensing technologies sometimes come with high costs and can expose workers to hazardous situations. However, the emergence of new technologies, such as mobile sensing, cloud-based sensing and AI, bring us new possibilities for infrastructure condition monitoring. By leveraging these technologies, i-Probe aims to contribute to safer and more efficient infrastructure management.” Professor Necati Catbas, co-founder of Transtek International, stated that “Connected vehicles enable a new era of real-time monitoring for roadways, bridges, and other infrastructure. We’re excited to collaborate with i-Probe Inc. to advance this innovative approach to smarter, safer infrastructure management.”

The IRF Global R2T Conference, aimed at global leaders in roads and mobility, offers a forum for innovators, decision-makers, and industry professionals to share the latest advancements and best practices in transport and infrastructure, and network for valuable collaboration and partnerships. The annual event is of vital importance for professionals and organizations to remain at the forefront of transport infrastructure innovation and shape the future of the industry.

i-Probe and Transtek International will continue research and development on the applications of Connected Vehicles and related technologies to pavement and bridge maintenance to address the traditional challenges of infrastructure management and to seek technology-based solutions for the common industry problems related to time efficiency, resources, and budget constraints.

Looking ahead, i-Probe and Transtek intend to explore the opportunities utilizing technologies in Connected Vehicles, cloud-based data collection, Artificial Intelligence and Deep Learning. The study team may share results of its joint research in related publications and future conferences, such as the IRF Global R2T.

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i-Probe Inc. (IPI) is one of the world's first providers specializing in collecting and analyzing Big Data obtained from vehicle sensors to provide infrastructure condition information services. IPI services include pothole/crack detection, pavement roughness condition monitoring, and deterioration alerts, which come with map overlay and are generated from continuous monitoring. IPI in partnership with Honda are carrying out vehicle-based road asset assessment projects in the U.S.

Transtek International Group LLC (TIG) is a technology spin-off company with extensive experience in modeling, simulation, sensing, imaging, field testing and assessment of structural systems for maintenance, rehabilitation, preservation and management decision-making for civil, aerospace and energy structures. TIG's particular focus is non-contact (image-based) local and global monitoring of structures for rapid, cost-efficient and effective assessment. The mission of TIG is to conduct advanced research, to develop technology products and to provide services that meet and exceed client needs. TIG's team is composed of engineers, academics and businesspeople. It maintains strategic partnerships in the US and Japan to complement its capabilities.

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