

TIMELI: Traffic Incident Management Enabled by Large Data Innovation

Abstract: TIMELI aims to use emerging large-scale data analytics to reduce the number of road incidents through proactive traffic control and to minimize the impact of individual incidents that do occur through early detection, response, and traffic management and control. This will be achieved using end-to-end machine learning for situational awareness, the design and rapid solution of geo-temporally aware traffic models using partial differential equations, stochastic model predictive control, and user-centric advanced visualization techniques for decision assistance. Current technology gaps in data handling and archiving, analysis for decision support, and the design of output formats will be addressed using big data technologies. Multiple large data streams will be ingested and data analytics will be performed for quality assurance and anomaly detection. New algorithmic approaches, machine learning, and a stochastic framework will be used to detect anomalous outliers and implement context-sensitive traffic models. An advanced human machine interface will provide information visualization and decisions recommendations in an intuitive format to minimize any cognitive bottlenecks.