Safe Vehicle

As noted above, regulatory enforcements frame a substantial aspect of ensuring that vehicles traversing a city's road network are safe and reliable. Considerations for the short-to-medium term, however, require a more "real-time" monitoring of the vehicle status. Telematics allows for such monitoring within the IoT/ITS context and is facilitated by several options. The first includes having dedicated sensors, such as accelerometers, Carbon Monoxide (CO) level sensors, etc., mounted on the vehicle to gather and log information [15]. Such setups can be augmented with a communication module so that the collected data can be transferred to a local unit or to the cloud.

An alternative telematic approach involves accessing a vehicle's Controller Area Network (CAN), which is the network that interconnects a vehicle's computing and sensing capabilities [16]. Such access is made possible by a North American standard ratified in 1996, namely, the second-generation On-Board Diagnostics, or OBD-II. Since their introduction, OBD-II dongles have come a long way, with some models offering a mix of connectivity including Bluetooth, WIFI, and cellular (e.g., [17]). Through the OBD-II, various real-time and diagnostic information can be accessed, logged, and communicated, including RPM, speed, pedal position, coolant temperature, etc. This has allowed for applications such as TorquePro [18], which monitors a vehicle's fuel efficiency, and advises the driver more fuel-efficient driving behavior. More relevant here, another application has made it possible to identify when maintenance is required for a vehicle [19]. Meanwhile, OBD-II manufacturers, such as MUNIC [17], offers cloud-based portals for aggregating, processing, and visualizing sensed data, and that can be access for further processing by users.

The viability made by the above setups provides a key thrust to this work, especially as they enable an immediate assessment of a vehicle's safety.