

## **Blockchain for Transport: Performance Simulations of Blockchain Network for Emission Monitoring Scenario**

**Authors :** Dermot O'Brien, Vasileios Christaras, Georgios Fontaras, Igor Nai Fovino, Ioannis Kounelis

**Abstract :** With the rise of the Internet of Things (IoT), 5G, and blockchain (BC) technologies, vehicles are becoming ever increasingly connected and are already transmitting substantial amounts of data to the original equipment manufacturers (OEMs) servers. This data could be used to help detect mileage fraud and enable more accurate vehicle emissions monitoring. This would not only help regulators but could enable applications such as permitting efficient drivers to pay less tax, geofencing for air quality improvement, as well as pollution tolling and trading platforms for transport-related businesses and EU citizens. Other applications could include traffic management and shared mobility systems. BC enables the transmission of data with additional security and removes single points of failure while maintaining data provenance, identity ownership, and the possibility to retain varying levels of privacy depending on the requirements of the applied use case. This research performs simulations of vehicles interacting with European member state authorities and European Commission BC nodes that are running hyperledger fabric and explores whether the technology is currently feasible for transport applications such as the emission monitoring use-case.

**Keywords :** future transportation systems, technological innovations, policy approaches for transportation future, economic and regulatory trends, blockchain

**Conference Title :** ICTLT 2021 : International Conference on Transportation and Logistics Technology

**Conference Location :** Vienna, Austria

**Conference Dates :** December 27-28, 2021