ygomi

Vehicle Emissions Reductions by Innovative Software

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Road Data Can Improve Fuel Economy

Input for Powertrain Processes

- Powertrain processes can be helped by reliable knowledge of the road ahead
  - Information about upcoming hills and curves
  - Information about upcoming speed limit changes and stop signs
  - Information about traffic signals phase and timing
  - Information from variable signs such as speed limit and lane usage
  - Information about pavement surface quality
  - Information about difficult weather conditions
  - Information about traffic conditions

Benefits of Data Input

- Help the environment with a 6% reduction in fuel use and CO_2 emissions

Use of Probe Data about Actual Emissions Instead of Bench Tests to Set Vehicle Emissions Regulations

Current Approaches to Emissions and Fuel Economy Regulations

- Most jurisdictions use simulated driving conditions in laboratory tests to determine vehicle manufacturer compliance with fuel economy and emissions regulations
- The tests do not accurately represent actual use and maintenance of vehicles
- Vehicle manufacturers develop vehicles to maximise *laboratory test results*, not real-world behaviour
- Bottom line
  - More fuel used than necessary
  - More CO_2 produced than necessary

An Alternative Approach Using Vehicle Probe Data

- Fuel economy and emissions regulations can be based on real-world performance
- In-vehicle connectivity allows direct tracking of fuel usage and emissions as *probe data,* generated from vehicle sensors
- This probe data can be used to determine actual average fuel consumption during a vehicle's service life under actual
  - Driving conditions
  - Driving styles
  - Maintenance protocols

Impact: More Fuel Usage Reduction for the Same Investment

- With fuel efficiency based on the current regulatory approach, determined by the current testing methods
  - Vehicle manufacturer investment may reduce **real** average fuel usage per kilometre driven by 30% for new vehicles in 2025
- But if fuel efficiency and emissions regulations become based on real-world, vehicle-life fuel averages
  - The same vehicle manufacturer investment could reduce **real** average fuel usage per kilometre driven by over 50%* for new vehicles in 2025

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* Based on reliable private estimates by senior vehicle manufacturer engineers

Operating Environment

- All the relevant technology already exists and is commercially available
- Connected vehicles are becoming widespread
- UNECE WP.29 can create the appropriate regulatory structure

Regulatory Environment

- Strategies must be put in place to manage privacy issues
  - For example, probe data should only include enough of the VIN data field to identify vehicle year and model
  - Regulation mandating real-world emission enforcement could require vehicles that *violate* emission rules to send the entire VIN
    - The VIN can be matched to license plate records to enforce proper repairs

Thank You