**Wipro AWS Connected Cars Challenge**

Use Cases

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# Community Driver Data for Public Roads and Fuel Efficiency Improvements

- Cars are fitted with a low-power device that connects to OBD II port and runs AWS IoT Greengrass core with local lambda and ML inference

- Wheel vibration sensor data is streamed to the greengrass core device; ML inference spots patterns that indicate bad roads and hazards

- Data about bad road spots along with GPS coordinates is uploaded to AWS S3 when next connected

- Connectivity to AWS cloud can be either through SIM module in the greegrass device (expensive) or through a smartphone app (similar to Torque app that connects to OBD II scanner through Bluetooth)

- City administration can use crowdsourced data to more efficiently spend taxpayer money on roads / spots that need repairs more promptly

- Benefits: improve fuel efficiency, reduce emissions, reduce maintenance costs, reduce accidents due to driving hazards

- Local ML inference reduces the need to upload huge amounts of data to the cloud and provides real-time results that can be used to assist driver through audible beeps / alerts and feedback
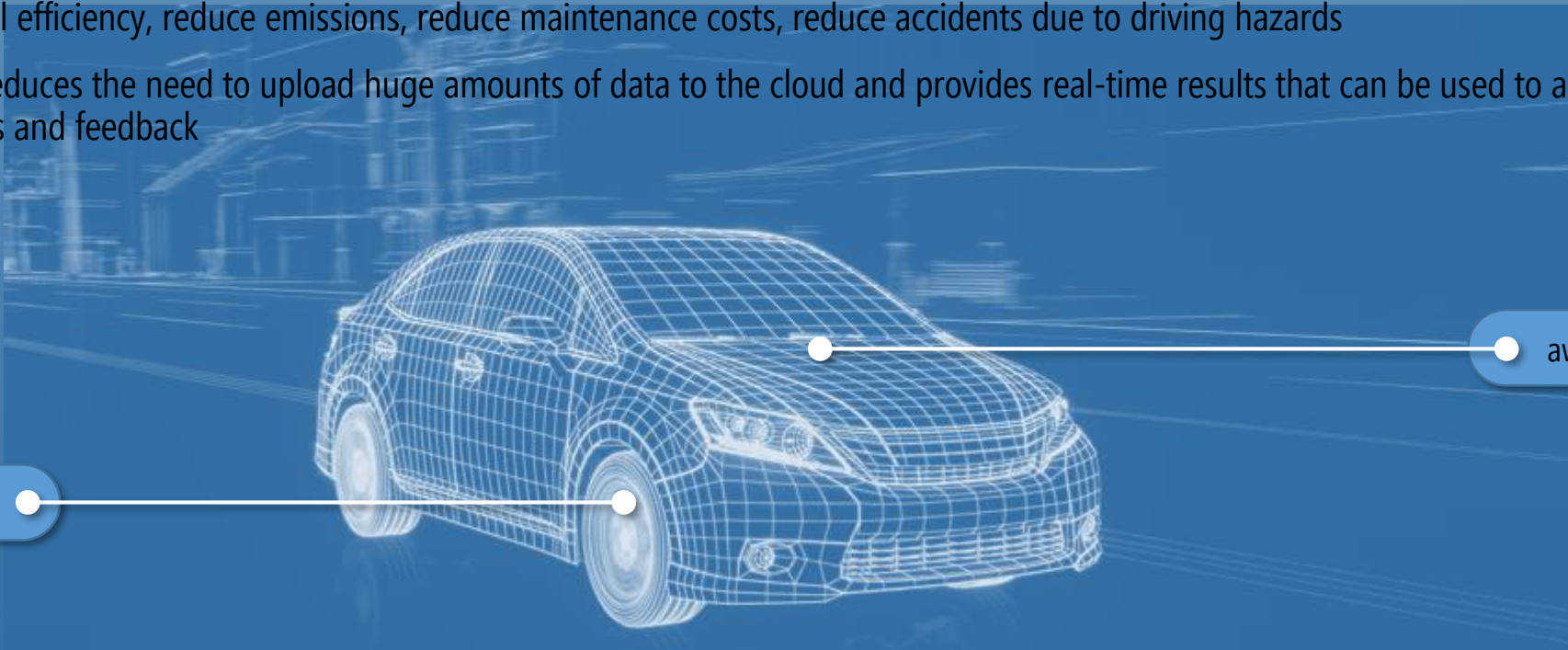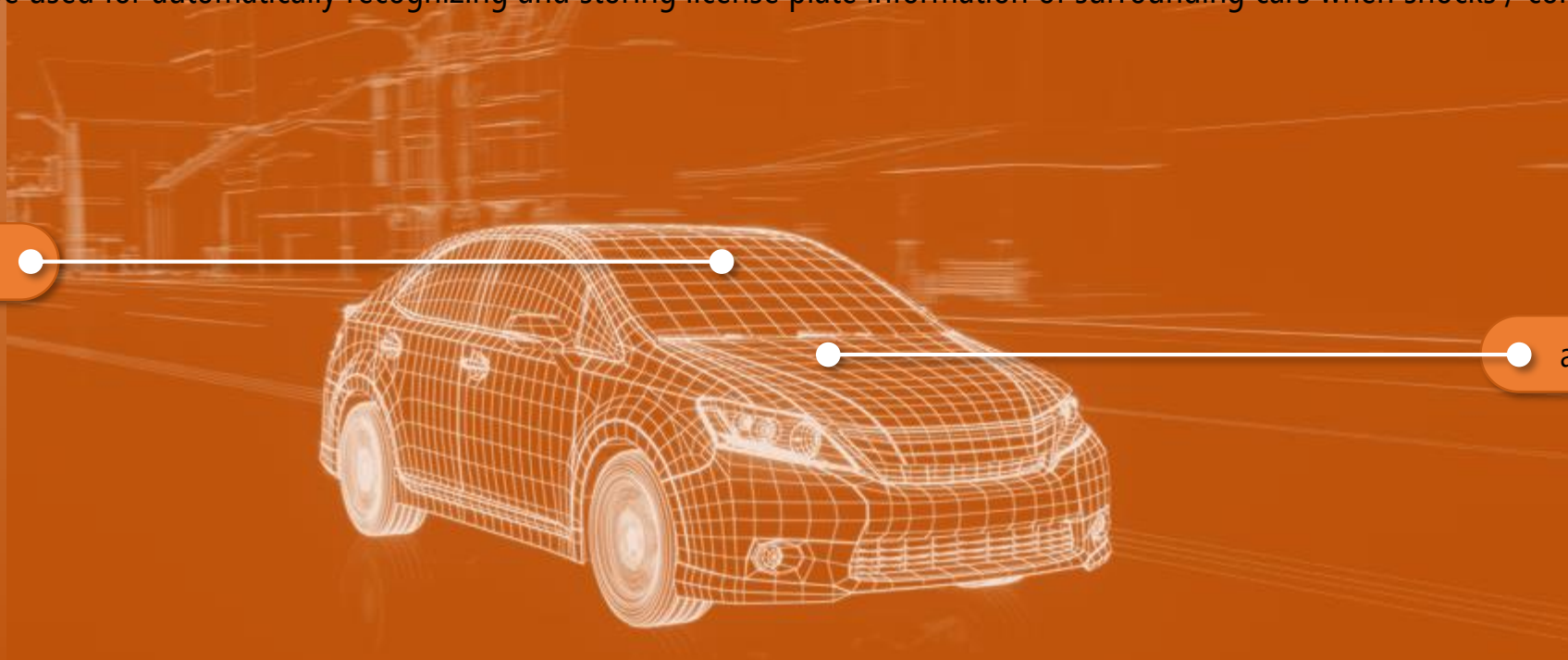
aws iot greengrass + OBD II

wheel vibration sensors

# Dashcam integration for improved navigation and safety

- Cars are fitted with a low-power device that connects to OBD II port and runs AWS IoT Greengrass core with local lambda and ML inference

- Dashcam (front+back) supplies streamed video data to the onboard greengrass device – which is processed using a pre-trained model to identify road signs (ex: temporary detours, traffic alerts) , traffic and driving conditions (ex: accidents, wet roads)

- Assist the driver's navigation as per preferences – ex: audible alerts when a new detour sign is spotted, add a future alert if a traffic alert warns of an upcoming event that will cause congestion or diversion (ex: "Marathon on Sun 10/28, use Exit 95")

- Upload the intelligence to community maps application (like Waze) to share and benefit from other users' data

- Dashcam + ML can be used for automatically recognizing and storing license plate information of surrounding cars when shocks / collisions are detected

dashboard camera

aws iot greengrass + OBD II

# Preventive Maintenance and Driver Behavior Profiling for Leased Cars, Fleets, etc.

- Some insurance providers (Ex: Progressive's "snapshot" device) already offer voluntary signup for driver profiling devices that connect to OBD II port and offer discounts on insurance premium to safe drivers. This can be extended further –

- When leasing a car or even as a owner, one could voluntarily sign up to have a device measure driving behavior and the maintenance/health of the vehicle over long periods of time. Better driving behaviors and maintenance schedules can be rewarded through higher rating (similar to CarFax score) that will bump up the re-sale value of the car

- Fleet operators like Hertz or Uber can use such devices to collect maintenance/health (DTC codes) or driver patterns – to spot beneficial patterns and reward them, or respond to maintenance needs at scale

- Car manufacturers could promote owner community forums (moderated by staff) that facilitate exchange of maintenance tips based on frequent DTC code information, and offer benchmarking of vehicle health against the best run/maintained cars of that make/model, suggest maintenance schedules based on actual data, etc.
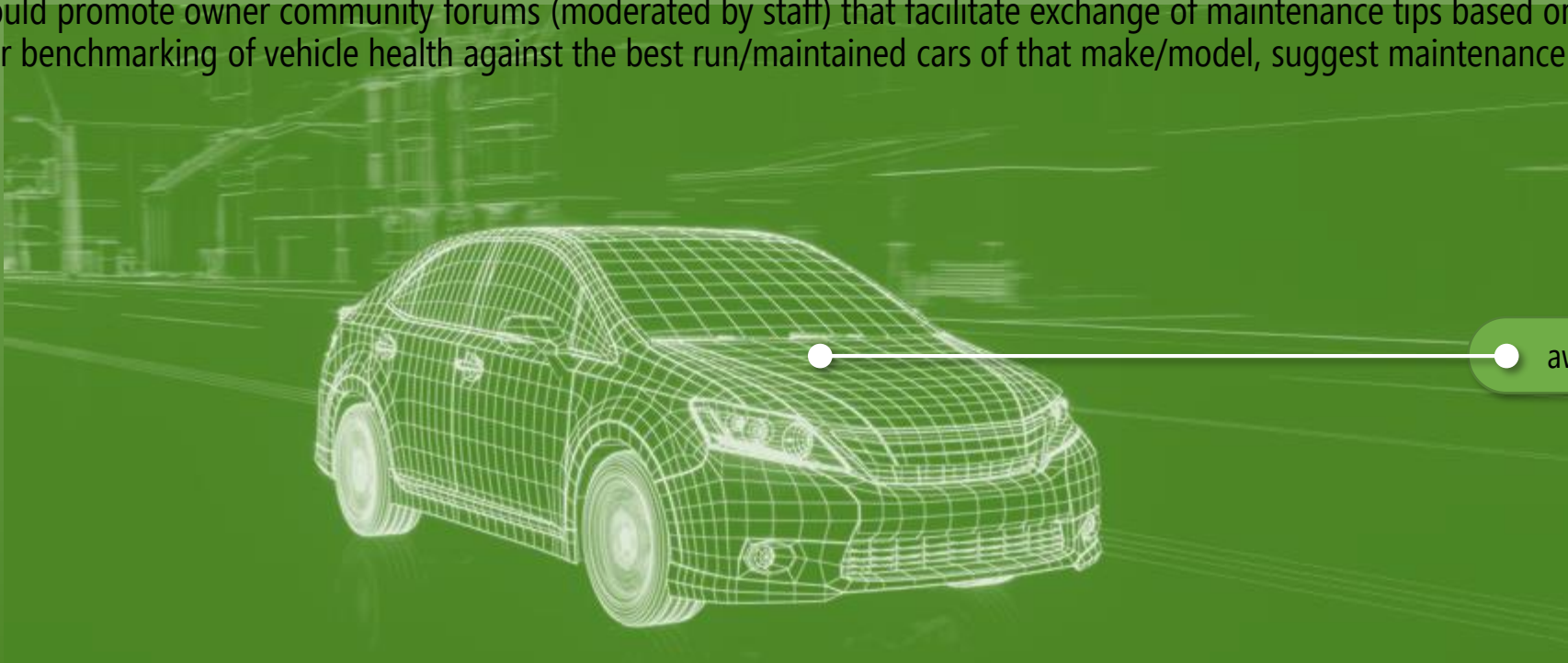
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# General Notes

- In all these cases, there would be important considerations of end-user privacy and liability

- Data should be anonymized on the local device before being uploaded to the cloud to minimize privacy concerns

- Cities that have free public wifi projects could leverage that infrastructure for connectivity to the cloud and reduce the device expense (SIM module) / user engagement level (app installation) needed for connectivity