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Digital Solutions

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Advancing Public Transport through AI: Smart Solutions for Urban Mobility

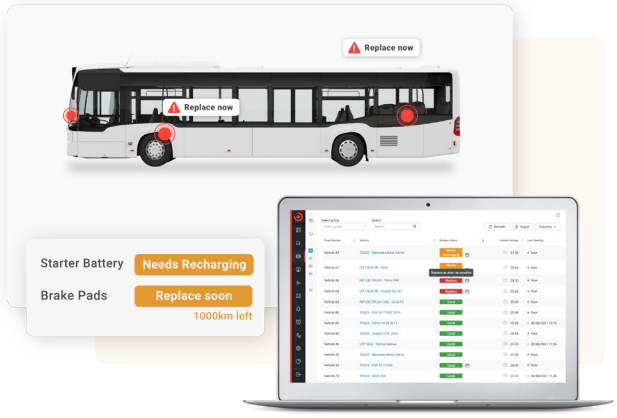
Transport operators face a unique array of challenges, including shifting governmental regulations regarding net-zero targets, rising fuel costs and the complexities of the transition to electric vehicles (EVs).

However, in the rapidly evolving landscape of smart cities, transport providers have the opportunity to spearhead technological innovation and address these challenges head-on. Many have now begun to leverage artificial intelligence (AI) to digitally transform their operations and increase the reliability and efficiency of the services they offer passengers.

Recognising the Role of AI in Improving Maintenance Operations

According to UITP, the international association of public transport, 86% of stakeholders are embracing AI and have plans to integrate it into their operations. This signals an industry-wide recognition of the potential associated with new technologies and digital transformation, which can dramatically change the way operators and passengers think about elements such as ticketing, journey planning, maintenance and scheduling.

In the realm of maintenance, AI is being used for solutions like predictive maintenance, which employs AI and ML algorithms to analyse vehicle sensor data and identify patterns indicating possible component or system failures. This provides maintenance teams with a significant advantage, enabling them to take



corrective actions before a potential issue escalates into a vehicle breakdown and, consequently, a service disruption.

AI Predictive Maintenance

By leveraging data from vehicle sensors, predictive maintenance facilitates early detection of component failures. Fleet managers can proactively address issues before they lead to breakdowns, enhancing reliability, sustainability, and cost-effectiveness.

While utilising predictive maintenance as an early warning system to minimise breakdowns is crucial for operators aiming to offer a punctual and reliable service, there are other ways in which this technology can maximise efficiency. For instance, having visibility over the precise time when a component will need replacement – rather than relying on estimates – gives maintenance managers the ability to schedule vehicle servicing during off-peak periods with the assurance that the vehicle remains safe to operate.

Furthermore, maintenance teams can reduce engineering dead kilometres by remotely conducting

the initial analysis of vehicle issues, eliminating the need to dispatch a technician on-site.

Real-world success stories of companies employing this approach include Arriva Czech Republic's collaboration with Stratio. Over the course of a year, the transport operator managed to increase the time between failures by 13.5% and reduce the number of required vehicle recoveries by 66%.

Using AI to Enhance Maintenance Productivity

Engineers and workshop technicians don't only replace components and repair broken-down vehicles. Their daily tasks encompass activities like fluid level checks, odometer readings, and planning distance-based maintenance interventions.

With AI, many repetitive tasks can be automated, freeing up technicians' time to focus on higher-priority tasks. The digitisation of these tasks also enhances the accuracy of collected data and enables real-time monitoring and sharing of information that would otherwise likely remain siloed and fragmented.

Monetising Electric Buses

The benefits of predictive maintenance extend beyond short-term gains. Continuous AI monitoring facilitates algorithm evolution and accuracy and enables the coverage of different vehicle categories. When it comes to electric vehicles, it provides operators with a comprehensive view of electric bus conditions, enabling maintenance teams to optimise asset usage and extend their life cycle. This reduces the whole-life cost of EVs and accelerates the return on investment.

Metrics such as battery performance, range and usage optimality can be tracked to anticipate energy needs and minimise the depletion of this critical component. Predictive battery analytics can also assist operations teams in route and charging point planning.

Using AI to Ensure Compliance with Service Level Agreements (SLAs)

SLAs require transport operators to maintain the number of lost kilometres – defined as the distance

that a bus fails to cover on its scheduled route due to various factors such as service disruptions, delays, breakdowns or other operational issues – below a certain percentage. This metric is a good indicator of the quality of service offered to passengers, as it reflects the unplanned disruptions that may affect regular schedules.

With this in mind, predictive maintenance and AI become even more valuable tools for transport operators to minimise unplanned downtime, anticipate and rectify faults and avoid penalties for breaching SLAs.

AI and the Future of the Public Transport Industry

The incorporation of AI into public transport maintenance and operations promises heightened efficiency, reliability and sustainability. With AI-powered predictive maintenance at the helm, transport providers are empowered to pre-empt component failures, optimise resource allocation and extend the longevity of electric vehicles, all while enriching the passenger experience.

Embracing AI's transformative potential is a collective commitment to innovation, propelling the evolution of urban mobility towards a future of reliable, sustainable and accessible transportation for all.

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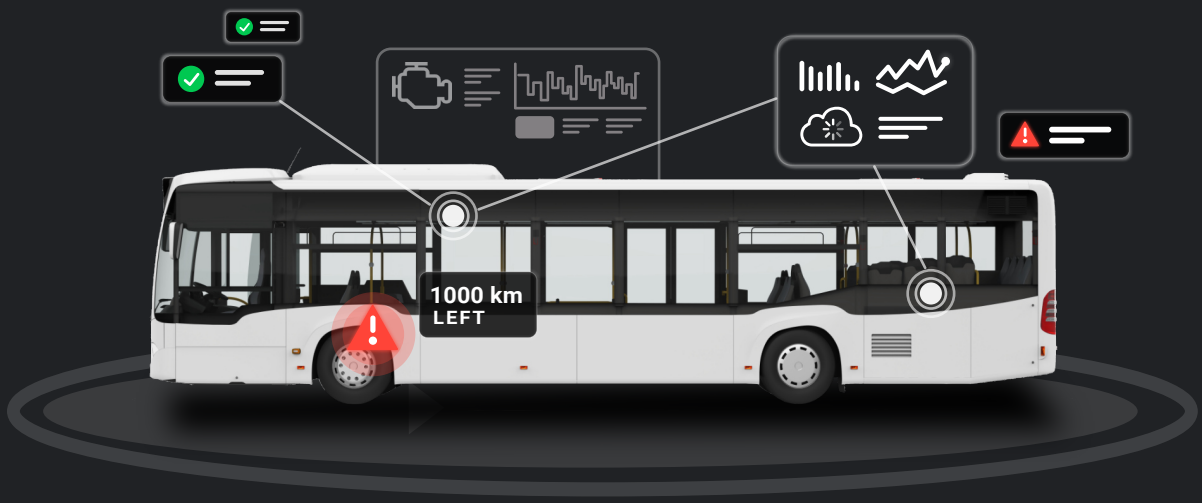
Do you have visibility over your fleet?

Transport operators are using predictive maintenance to minimise unplanned downtime, reduce costs, and offer passengers a service they can trust.



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