PUBLIC TRANSPORT PASSENGER COUNTING SOLUTION

INTRO

Many people around the world rely on public transport in their daily lives, so any issues and inconveniences there can have a big impact on them. Sadly, most of today's public transport systems, especially in multimillion cities and metropolitan areas, have significant challenges. With this in mind, Teltonika is ready to offer its solution to increase the efficiency and safety of the public transport fleet.
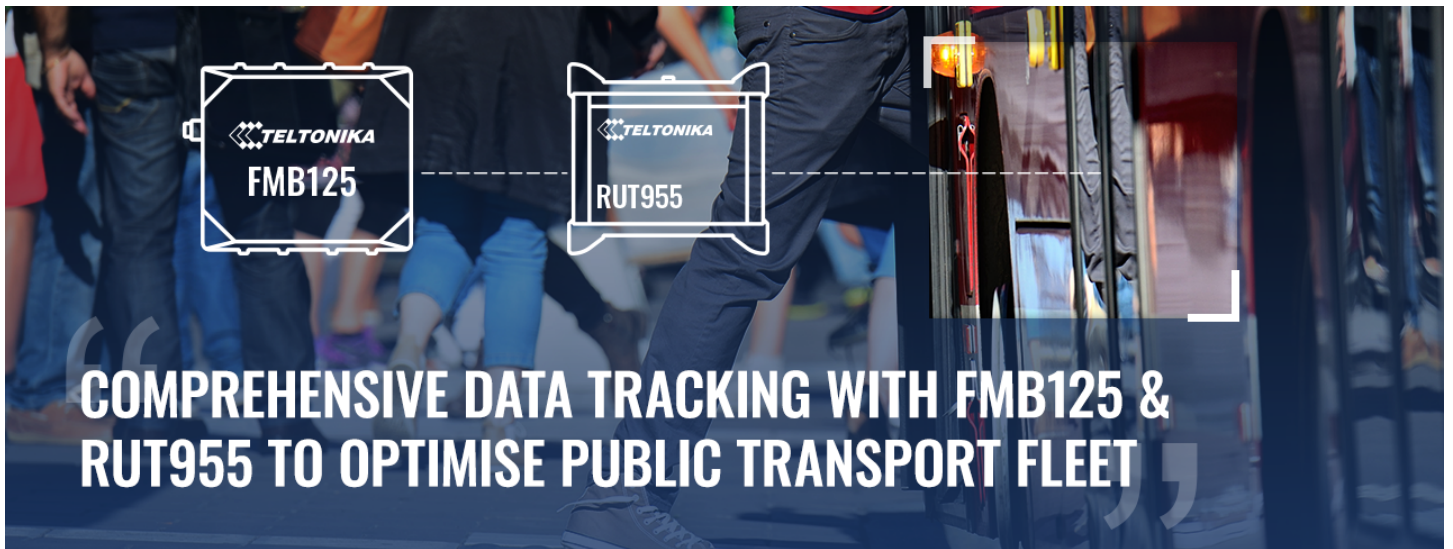
CHALLENGE

The world's population is now more than 7.9 billion and is growing by around 120,000 people every day. So, our cities and towns - 56.2% of the global population now live there.

Predictably, it makes a significant impact on public transport planning and management - some even say that traffic jams are inevitable. Most cities face traffic management challenges including congestion, long commutes, parking issues, large fleet costs, urban sprawling, impact on the economy and so forth. Consequently, this may result in a poor customer experience, increased ecological footprint and greenhouse gas emissions and, in some cases, a deterioration in transport system efficiency and safety.

Ticket pricing? According to a Statista.com report, in 2018, public transport in London was most expensive with an average ticket cost of $5.66, then Stockholm - $5.43, and the 3rd - Copenhagen with $4.64. In the context of soaring inflation and rising energy prices, the situation does not look promising either…

But IoT technology can make a major contribution to solving urban transport challenges. Contemporary digital devices can help cities plan sensible public transport systems and optimise them based on the quantifiable needs of the urban population. Even more, they can be effectively tackled with Teltonika wide range of products portfolio and smart features.

SOLUTION

The effective way to address this challenge and help optimise urban transport fleets is to know precisely the passenger flows on a given route and across the whole of the city's public transport sector. In other words, we need not only to count passengers accurately in real time but also to automate this process as far as possible. This also includes fleet vehicle whereabouts tracking, monitoring, and maintenance planning too.

To showcase the solutions, we use a combo of a few devices - ADVANCED category 2G connectivity vehicle GPS tracker FMB125 with LV-CAN200 bus adapter from Teltonika Telematics, industrial cellular router RUT955 from Teltonika Networks and any overhead people counting IP camera model supported by the router. In this case, only 1 SIM card is needed, which is inserted in the RUT955. This results in a significant increase in data cost efficiency as the tracker and camera operate without separate cards. The whole set has to be installed on urban buses.

The vehicle tracker is connected to the router via the RS-485 serial port using the 'Log Mode' function. This allows the FMB125 to send the created automatic vehicle locator (aka AVL) record to the RUT955 via RS-485 and requires a unique analysis on the touch panel PC and control room server side. People counting cameras communicate with routers via Ethernet - networking technology commonly used in local area networks (aka LAN). The LV-CAN200 adapter reads fuel level, odometer, fuel consumption, engine RPM, engine temperature, door status and similar data from a vehicle CAN bus. A touch panel on-board computer (or PPC) together with a bus ticketing system, also connected to RUT955 via LAN. Finally, all monitored and collected data will be sent and stored on a dedicated control room server via the GSM network and the internet.

How it works - IP cameras mounted on the top of each bus door accurately detect people's movements and record the number of passengers getting on and off the bus. Therefore, all entries and all exits will be counted. The collected data is sent to the onboard PPC via LAN and RUT955.

The FMB125 device, together with the LV-CAN200 adapter, tracks the coordinates of the vehicle location via a GNSS satellite and reads predefined CAN bus data which is sent to the PPC too via RUT955 and RS-485 cable. In addition, the bus ticketing system validates passengers' e-tickets when they were touched and transmits the relevant data to the PPC via RS-232 cable. Finally, the cellular router allows the live steaming of IP cameras. It also sends AVL data received from the tracker and CAN adaptor to the PPC, provides a network and communication link between all these devices, ensuring real-time monitoring and further data analysis.

The result? Thanks to comprehensive data gathering, public transport fleet managers and journey planners can optimise public transport routes, vehicle travel and stop times, the number of buses per route, their model types (e.g., minibus, single-decker, double-decker or bendy bus), monitor fuel consumption and relevant engine

parameters, plan a fleet schedule of maintenance and budget needed, track behaviour of drivers such as harsh braking or aggressive driving, improve passenger and staff safety, etc.

If installed additionally, 1-Wire or Bluetooth accessories can also be used to identify all drivers and track their working hours and shifts. To improve safety further, panic buttons and instant alarm notifications can be set up too. The solution is as automated as possible, and the live data can be accessed anytime from any computer, tablet or smartphone with an internet connection.

Finally, all Teltonika vehicle GPS trackers can be updated and configured remotely using the FOTA WEB tool, significantly saving time and company resources. Please note that the presented solution only works with GPS devices, CAN bus adapters, and routers manufactured by Teltonika.

TOPOLOGY
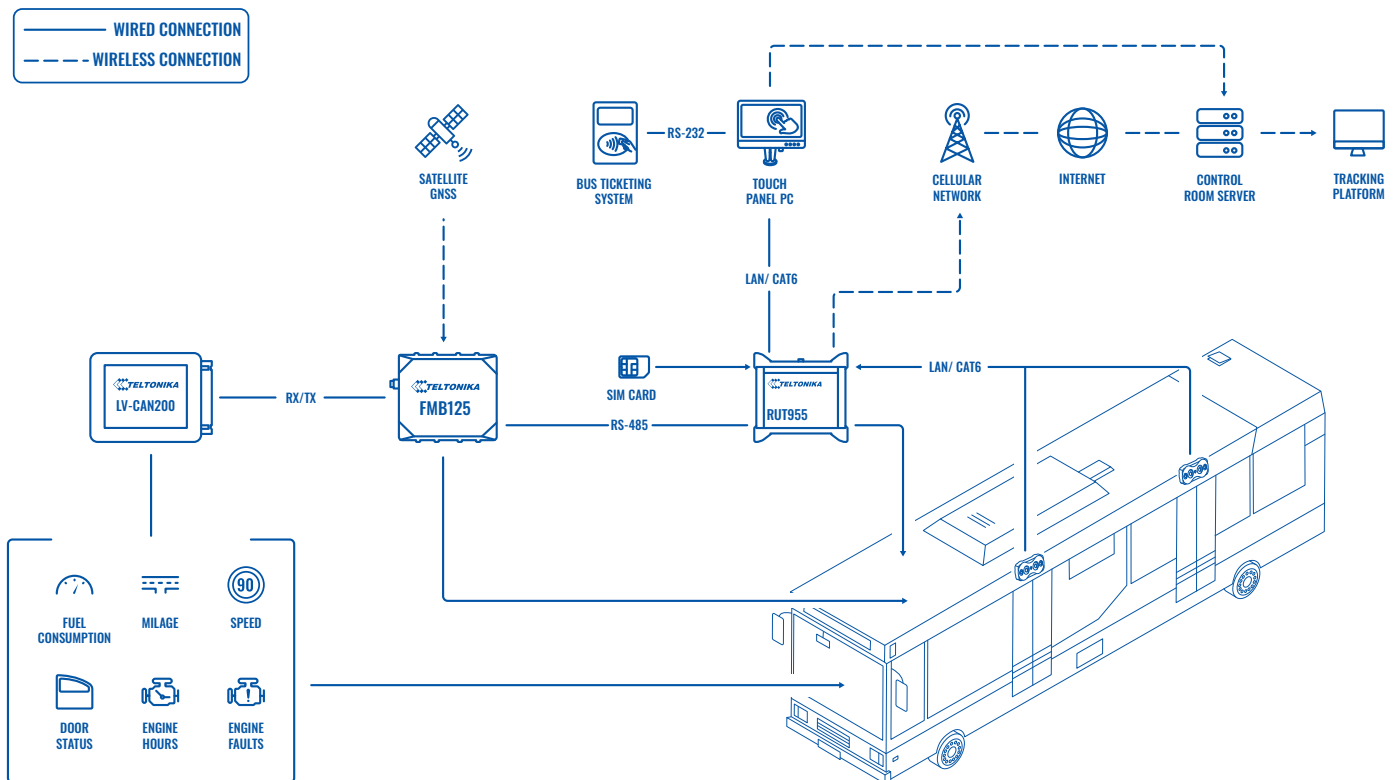
BENEFITS

- **Comprehensive data tracking to optimise public transport fleet** - passenger flow, drivers, vehicle whereabouts, fuel consumption, maintenance procedures and behaviour patterns are being tracked, monitored, and optimised.

- **Smooth fleet operation and exceptional efficiency** – impeccable traceability and accountability for what matters most to the public transport business improve fleet productivity and safety.

- **Significant savings in company resources** thanks to low-cost 2G connectivity, 1 SIM card, public fleet optimisation and decision-making based on actual data analysis. No more guesswork.

- **Timely maintenance and service** – fleet drivers, managers and owners can be confident that all public transport vehicles are in good condition and working as intended.

- **It boosts fleet workforce discipline, desirable habits and work ethics** - continuous monitoring of fleet drivers, combined with an appropriate motivation system, will optimise workflow and operating costs.

WHY TELTONIKA?

To help plan and manage public transport efficiently, saving precious company resources and city budget expenditure, we offer a unique and beneficial combo from Teltonika Telematics and Teltonika Networks - ADVANCED category vehicle GPS tracker with CAN bus adapter and industrial cellular router.

Teltonika is the right place to get all you need to succeed - the most abundant variety of top-quality certified IoT devices, accessories, and solutions for any use case imaginable in telematics. From the start of the company 24 years ago until today, we are 2,400 strong and growing team that has manufactured over 16 million devices, helping to succeed thousands of customers and business partners in over 160 countries across the globe.

FEATURED PRODUCT

FMB125

RECOMMENDED PRODUCTS

FMC125, FMM125

RECOMMENDED ACCESSORIES

LV-CAN200