

The future of urban mobility is green and connected

Combatting last mile emissions with
micromobility vehicles and data analytics

Industry: Micromobility

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We have shown that connected data makes micromobility vehicles a viable alternative to traditional internal combustion engines for last mile logistics. Using data connectivity, real-time vehicle vital signs (RVVS) and advanced analytics for a fleet of micromobility vehicles, we improved delivery efficiency and minimised vehicle downtime, demonstrating the business case for the switch to micromobility electric vehicles. Read on to find out how.

Micromobility solutions for last mile logistics

The transportation sector is under significant pressure to address carbon emissions, with urban areas in particular receiving attention from regulators and consumers alike. Simultaneously, the need for “last mile” logistics vehicles has exploded, with the increasing consumer demand for home delivery of all kinds. The use of micromobility (or small form factor) electric vehicles (EVs) for last mile delivery has emerged as a sustainable way to meet the increasing demand, but there is still scepticism amongst fleet owners about the reliability and business viability of switching to EVs. By combining the latest advances in connected vehicle technology with data analytics, we have shown how the challenges of switching are overcome, and how last mile logistics companies can significantly reduce carbon emissions relative to traditional internal combustion engine (ICE) vehicles.

Switching resistance

The difference in emissions per mile between ICE vehicles and electric micromobility vehicles like e-cargo bikes or electric scooters is stark, especially during short urban journeys. Stop-and-go urban traffic and idling during delivery drop-offs also exacerbate emissions from ICE vehicles.

In contrast, micromobility alternatives produce minimal emissions, especially when partially powered by human effort or recharged with electricity from renewable sources.

However, micromobility vehicles face challenges in their use for last mile delivery, including:

- **Scalability of journey distances:** Micromobility vehicles have limited range and can't be refuelled quickly like an ICE can, requiring careful planning or a larger fleet
- **Inadequate maintenance:** Desire to keep vehicles in-use and on the road leads to infrequent maintenance and reduces life span
- **Harsh driving:** drivers are typically incentivized to optimise delivery times and often treat vehicles harshly resulting in damage which reduces delivery efficiency as well as life span, and increased risk of parts failure

Left unsolved, these issues can contribute to a poor reputation, and cause fleet owners and their customers to lose confidence in micromobility solutions. The result—sticking with ICE vehicles—is continued environmental impact and a missed opportunity to build a more sustainable brand image.



EVMI's unique edge

By combining Beam Connectivity's industry-leading vehicle connectivity solution with EVMI's best-in-class e-cargo bikes, we were able to address all of these challenges and more.

The micromobility vehicles provided by EVMI offer a lightweight alternative to polluting ICE vans, specifically designed for last mile delivery: short-distance journeys within urban settings. While they bring enormous benefits in reducing carbon emissions, they still need to be reliable and flexible to meet the demands of the delivery fleet.



"Beam Connectivity's platform has been pivotal in enhancing our products. The data insights have given us a unique edge. We can now offer a sustainable micromobility vehicle solution with significantly improved delivery efficiency and minimal downtime, enabled with Real-time Vehicle Vital Signs. Additionally, it has helped our customer to reduce emissions. This partnership has transformed our capabilities and set us apart in the industry."

Andrew Firmston-Williams, CEO of EVMI Solutions

To achieve this, it is crucial to extract operational data from the vehicles and leverage analytics—at both vehicle- and fleet-level—to develop a deep understanding of individual journeys and wider usage patterns, without compromising the privacy of vehicles' drivers.

The Beam Connectivity effect

EVMI's partnership with Beam Connectivity has revolutionised the micromobility fleet. The Beam Connectivity solution provides rich data analytics, bringing better business performance to EVMI and their customers. Examples of the value unlocked by connectivity include:



Reduced battery consumption: Optimize routing by using real-time traffic data to choose the most efficient route



Minimised charging downtime and right-sized fleet: Monitor the battery status of all vehicles allowing for proactive charging and more efficient resource allocation



Lower maintenance costs: Monitor location, vehicle status and fault reports in real time, to manage maintenance schedules



Safer and more efficient driving: Track driving signals to highlight opportunities for educational materials, direct training or censure of repeat offenders



Happier drivers: Provide a responsive and user-centric mobile application for vehicle rental and navigational assistance

Reducing emissions

Compared to ICE vehicles, micromobility solutions demonstrate a significant potential for emissions reduction. This is primarily attributed to the following factors:

Zero emissions:

Electric micromobility vehicles produce zero emissions, mitigating air pollution in urban environments and reducing greenhouse gas emissions.

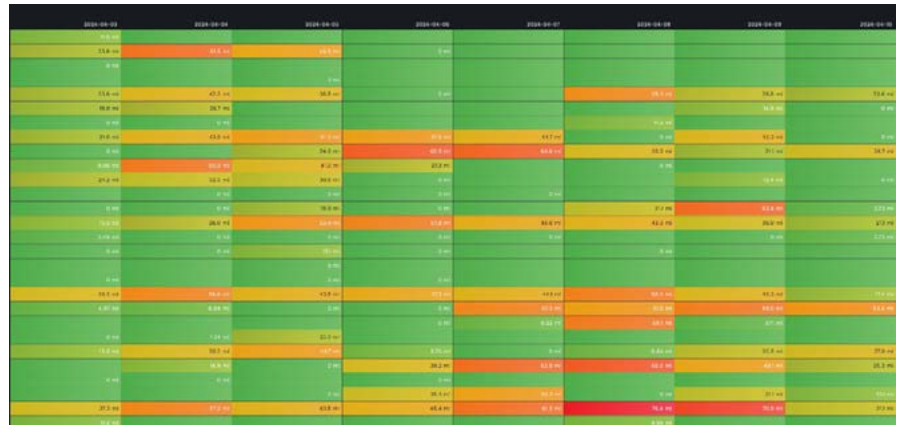
Energy efficiency:

Electric powertrains are inherently more energy-efficient than internal combustion engines, resulting in lower energy consumption per mile travelled.

Renewable energy:

Electric vehicles can be charged with renewable energy, further reducing the environmental impact.

To illustrate the emissions reduction benefits of micromobility compared to ICE vehicles, let us consider the average miles travelled per day by each mode of transportation. Figure 1 displays the typical miles travelled in a day for a micromobility fleet operating in London. If these journeys were completed by a typical diesel van this would emit 259.4 g CO₂/mile, per vehicle.



Screenshot from the connected-vehicle-as-a-service data analytics application provided by Beam Connectivity, showing distance travelled per day heatmap for 28 different EVMI vehicles over 8 days.

By promoting sustainable urban mobility as a viable alternative for short-distance trips, micromobility solutions reduce the reliance on ICE vehicles for urban transportation, helping to curb emissions.

An essential solution

Combining Beam Connectivity's industry-leading connectivity solution with EVMI's best-in-class micromobility vehicles demonstrates that micromobility is not only a viable option for last mile delivery, it is an essential component of sustainable urban transportation. By equipping every vehicle with advanced connectivity features, EVMI have unlocked the value of vehicle data, leading to a unique edge in the market. Their vehicles, powered by data and real-time insights, are not only more reliable and efficient but also a formidable force in reducing urban emissions and building a sustainable brand for customer-facing delivery companies.

Liked what you read? Want more information on how you can benefit from any of these solutions? Contact hello@beamconnectivity.com today.

About Us

We build best-in-class connected vehicle systems, supporting our customers to focus on and interpret the value of their vehicle data. Founded in January 2020, we are a truly multi-disciplinary team with decades of experience in user-centric design and delivery of connected consumer products. Understanding the need for an agile delivery of software-centric systems, our robust end-to-end IoT solution offers superior performance thanks to our deep understanding and drive for innovation.

To schedule in a demo, please contact:
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