

The Increasing Adoption of Electric Vehicles (EVs) in The Last-Mile Delivery Operations



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ABSTRACT

Global demand for electric vehicles is accelerating as consumers become more eco-conscious and countries set new targets for cutting carbon emissions. The rise of e-commerce has catapulted electric vehicles to prominence. Concern about greenhouse gas emissions is driving the move away from diesel delivery vehicles towards trucks and vans using alternative power sources. Electric vehicles with a range of up to 150 miles are ideally suited to “last mile” deliveries, those with a limited radius. As global couriers and retail giants take steps to become more energy efficient, more of them are turning to electric vehicles for the last mile section of the delivery journey. Charging is one of the key considerations; substations with charging points for vehicles need to be incorporated into existing warehouse plots. While it won’t necessarily change the structure of many existing buildings, those with more space available will be a step ahead.

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The recent growth of the e-commerce industry has transformed the global marketplace. According to Digital Commerce 360, consumers spent \$861.02 billion on online shopping in 2020, a 44% rise over the prior year.

As digital marketplaces continue to grow, we are witnessing a shift in consumers' demands and expectations. Today they're looking for cost-effective yet quick delivery options.

When it comes to shipping logistics, improving the last-mile delivery process — the stage at which the parcel is delivered to the customer's doorstep — is the most critical prerequisite in ensuring customer loyalty to online stores. But last mile-delivery service comes with its own set of challenges and hurdles.

As convenience, delivery speed, and efficiency continue to define customer experience, there is a steady growth in the use of Electric Vehicles to carry out last-mile operations. EVs are eco-friendly and offer some hidden business gains to supply chain enterprises. Over the past few years, there has been a tremendous boom in the e-commerce industry. The COVID-19 pandemic has further escalated it, causing significant shifts in consumer buying behaviors and establishing online shopping as another new normal for all of us.

The bygone year also created a massive surge in demand for same-day and next-day home deliveries, dynamic on-demand services, and hyperlocal shopping. It is only fair to say that convenience is driving customer satisfaction, now more than ever. And as convenience takes the center stage, so does the demand for fast, efficient, and consistent last-mile operations.

Having said that, there has been a steep rise in the number of vehicles on road carrying out last-mile delivery operations. This has led to an increase in carbon emissions and greater fuel consumption. The growing demand for last-mile deliveries is expected to result in 36% more delivery vehicles in the top 100 global suburbs by 2030. This is also expected to increase carbon emissions up unless effective measures are taken.

For enterprises involved in the final mile race, whether it is retail, e-commerce, direct-to-consumer selling, third-party logistics, food, and grocery deliveries, or home services, good logistics is a true litmus test for success in the marketplace.

But at the same time, as socially responsible corporates, businesses also have a commitment towards the environment — to control the devastating impacts of logistical activities on the planet and build sustainable supply chains.

Many supply chain enterprises are therefore embracing greener logistics practices with the aim of reducing carbon footprint and minimizing the impact on the environment.

E-commerce giant Amazon plans to run on 100% renewable energy by 2030 and is working with Rivian Automotive Inc. to include 100,000 battery-electric delivery vans for its Prime deliveries. In August 2020, Walmart-owned Flipkart announced its commitment to transition to 100% adoption of electric

vehicles by 2030, joining The Climate Group's global electric mobility initiative, EV100. Walmart also aims to operate an entire fleet of all-electric vehicles powered with 100% renewable energy, to support their road to zero emissions by 2040.

Switching to Electric Vehicles in the Final-Mile: An Eco-Friendly Move

The adoption of EVs or electric vehicles for last-mile deliveries is perhaps one of the coolest trends towards implementing green logistics in supply chains. These electric vehicles run on electric motors, instead of internal-combustion engines that generate power by burning a mix of fuel and gases.

There are two types of EVs popularly used — All-Electric Vehicles (AEVs), which run solely on electricity, and Plug-in Hybrid Electric Vehicles (PHEVs), which have both an internal combustion engine and electric motor, running partially on fuel and electricity.

Either way, EVs are seen as an effective replacement for fuel-intensive automobiles, in order to address the issue of rising pollution, global warming, and depleting natural resources. Apart from being environmentally friendly, electric vehicles also offer supply chain enterprises with many other business benefits.

Business Benefits of Using Electric Vehicles (EVs) for Last-Mile Deliveries

1. Minimal fuel consumption

The logistics industry relies heavily on transportation, and that translates into excessive quantities of fuel consumption, throughout the supply chain journey. The U.S. used nearly nine billion barrels of petroleum in 2018, two-thirds of which went towards transportation. No petrol, CNG, or diesel is needed in a fully electric vehicle, and very little fuel is required even for a hybrid EV. By using electric vehicles for carrying out last-mile deliveries, supply chain enterprises can, therefore, minimize fuel consumption significantly.

2. Cost-efficient logistics

It goes without saying: fuel consumption and logistics costs go hand in hand, so when you go all-electric with last-mile operations, it also reduces operating costs along with lesser fuel consumption. The operational cost of a conventional three-wheeler is 3.3 times higher than an electric three-wheeler. Over the life of the asset, it adds up to sizable cost savings. Also, with technological advancements, switching to an electric delivery fleet is no longer a huge monetary investment, as compared to a few years ago.

3. Convenient and easy to maintain

Electric vehicles are quite low maintenance. Just like a smartphone, electric vehicles can be connected to an external power supply in order to recharge. Once recharged, most EVs have a mileage of 80 to 100 miles and can last up to 12 hours. Electric vehicles also have fewer auto parts compared to regular vehicles — such as the engine, a radiator, pistons, spark plugs, fuel pumps, cooling systems, exhaust systems, and timing belts, which makes vehicle maintenance a lot more hassle-free. These vehicles only

need a battery replacement or maintenance, once every couple of years. Research by automotive data experts KeeResources revealed that an electric car is at least 30% cheaper to service and maintain than an internal combustion-engine vehicle.

Plans of electrification of major fleet operators

Fleet operators are companies that own or lease vehicles to businesses or organizations to be used in a variety of ways including the transportation of goods. Many of these large and small supply chain enterprises/fleet operators are embracing environment friendly logistic practices:

- E-commerce giant Amazon was one of the first to sign the Climate Pledge and made a commitment to become net carbon zero by 2040. The company has ordered 100,000 electric delivery vans from Rivian, an American electric car manufacturer, and is testing them in various locations. Amazon also ordered 1,800 electric vans from Mercedes-Benz for its European delivery fleet.
- FedEx plans to electrify its entire parcel pickup and delivery fleet by 2040. Moreover, it plans to invest USD 2 billion dollars for vehicle electrification, sustainable energy, and carbon sequestration during that period. With close to 3,000 electric vehicles in service, they recently placed an order with General Motor for 500 EV600s, an electric light commercial vehicle.
- UPS is investing in Arrival, a UK based electric vehicle manufacturer, and has ordered 10,000 electric vehicles to add to its fleet in North America and Europe. The initial 10,000 will roll out from 2020 to 2024 and UPS has an option for an additional 10,000 during this period. In addition, on the truck front, UPS has placed orders for 125 Tesla semi-trucks and is collaborating with Daimler Trucks to develop a Class 8 electric truck.
- IKEA also has a goal of zero emission home deliveries. IKEA's goal is to have 25% of its last mile deliveries done by electric vehicles by 2025. IKEA prioritized New York City, with 40 vehicles and the Los Angeles area with 50 trucks. To help them attain their goal, they are using Fluid Truck, an online vehicle rental platform with a fleet of electric trucks, that can be lease as needed.
- In line with its sustainability goals, DHL intends to reduce all transport-related emissions to zero by 2050. With 18% of the current fleet electric, DHL plans to electrify 60% of its fleet by 2030. Recently, they accelerated their carbon neutral roadmap by investing over USD 8 billion to reduce their CO2 emissions over the next 10 years covering, not only zero-emission vehicles, but also alternative fuels for aviation and investments in climate-neutral buildings. DHL announced a partnership with Fiat E-Ducato for 14,000 electric vans in Europe by 2030.

Conclusions

Implementing efficient last-mile delivery processes offers e-commerce brands an invaluable opportunity to adapt to changing customer demands, and differentiate their offerings from the competition. Those desiring to succeed with an online store need to confront last-mile delivery challenges proactively. And that requires the right technology, complete transparency, and smooth communications between the delivery team and your customers.

Though the concept of electric vehicles has been around for a long time, lately it has drawn considerable interest among supply chain enterprises due to its efficiency and sustainability. But the big question is whether it is ideal for a business to adopt EVs for its last mile operations?

While all sorts of delivery businesses can easily implement an EV delivery fleet, it is most suited to businesses that perform last-mile deliveries within a fixed and limited radius — such as retail delivery, e-commerce, home service businesses, milk, groceries, or food delivery businesses, etc.

Electric vehicles are gradually gaining popularity in the final-mile game, and it is certainly a worthy investment to consider in 2021 and beyond. If a retailer further wants to optimize its supply chain above and beyond implementing EVs in the supply chain, smart route optimization powered by Artificial Intelligence can help in accurately planning delivery routes, day-to-day dispatches, while driving lesser miles and improving last-mile visibility for the business.

References

- [1] Brind, J. (2020) – “How Demand for Electric Vehicles Will Impact the Supply Chain”
<https://www.supplychainbrain.com/blogs/>
- [2] Gupta, A. (2021) – “Covid-19 Pandemic Acts As A Catalyst To Accelerate The Adoption Of Electric Vehicles In The Last-Mile Delivery Sector” <https://inc42.com/resources>
- [3] Karvi, R. (2020) – “EVs: The Future of Last Mile Delivery” <https://www.logisticsinsider.in/>
- [4] Muhhamad, M. (2021) – “Last Mile Delivery Vehicles Aiming for Electrification”
<https://powertechresearch.com/>
- [5] Perryman, A. (2021) – “A growing appetite for EVs tasks the supply chain to scale”
<https://www.supplychaindive.com/news/>
- [6] Skylar, R. (2021) – “Seven Last-Mile Delivery Challenges, and How to Solve Them”
<https://www.supplychainbrain.com>
- [7] Shweta, S. (2021) – “Electric Vehicles (EVs) - The Future of Last-Mile Deliveries in 2021 and Beyond” <https://blog.locus.sh/>
- [8] Sumit, C. (2021) – “Last-mile delivery opens doors for adoption of electric vehicles”
<https://www.livemint.com/news/>