

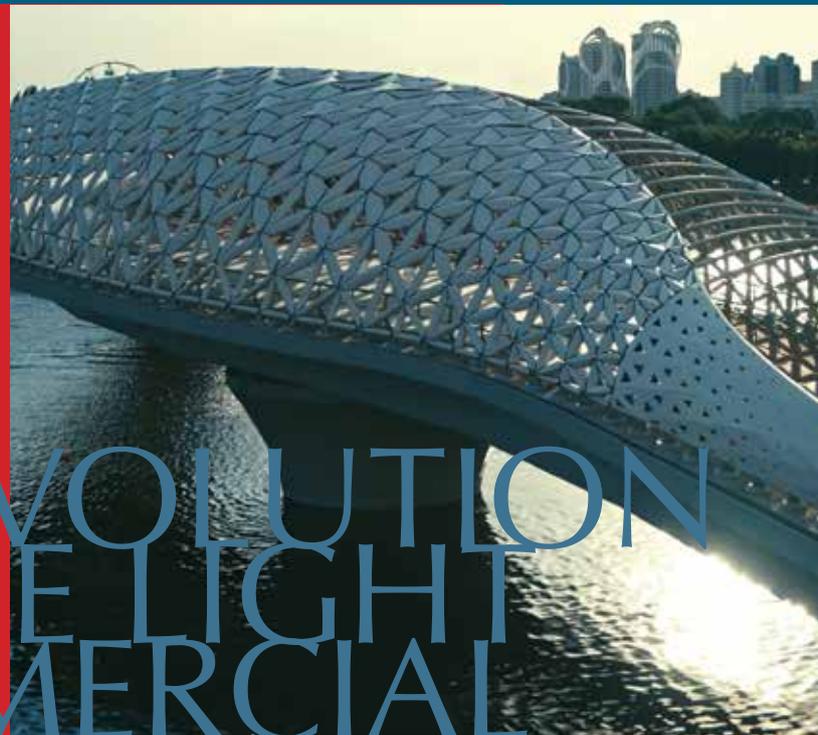
# IVOTY WHITE PAPER 2020:

THE EVOLUTION OF THE  
LIGHT COMMERCIAL VEHICLE  
IN THE URBAN ENVIRONMENT



IVOTY  
WHITE  
PAPER

2020



THE EVOLUTION  
OF THE LIGHT  
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## Contents

## Page

Introduction	4
The experience of the delivery driver	5
Development of Smart Delivery vehicles by OEMs and start-ups	6
Zero-emissions technology advancements	7
Return on investment - potential viability of projects/concepts	8
Government Departments	9
Autonomous driving – concepts/prototypes	9
Last mile deliveries - concepts/prototypes	10
Road safety aspects: Protection of vulnerable street users	11
Societal acceptance	11
Possible challenges/solutions	12
Conclusions	13
Key to acronyms	14
References	14

# INTRODUCTION



**The future is urban.** More than half of the human race already live in cities and by 2050, 68% of the world's population is projected to be urban.<sup>1</sup> Light Commercial Vehicles (LCV) will have to adapt to the new urban landscape, growing environmental concerns, and the new market forces caused by e-commerce.

More home deliveries mean more vans on the road, which is compounding congestion. At the same time ecological fears are escalating up boardroom agendas and cities are implementing initiatives to drastically reduce traffic and pollution. As a consequence of all this, vans will have to become slicker, safer, smarter and – crucially - cleaner.

The growing importance and complexity of urban logistics means that LCVs are at the forefront of the challenges and solutions facing global supply chains.

Rapid urbanisation is defined by PWC as an inescapable “Megatrend”.<sup>2</sup> Another trend is the inexorable rise of e-commerce and the consequent demand for home deliveries. DPD Group estimates that by 2025, the total parcel volume delivered to individuals will have doubled in Europe: almost 15 billion parcels per year will be delivered, mainly in cities.<sup>3</sup> This represents a huge challenge, and also a huge opportunity for light commercial vehicle manufacturers and operators.

Road networks are struggling with swelling populations and congestion is a massive problem. A result of that is pollution, and the steps to battle it such as emissions restrictions, alternative fuels, and electric vehicles are significant concerns for owners and manufacturers of LCVs. These issues represent a cocktail of complex challenges, with each problem exacerbating the others.

This White Paper will examine how the LCV market can face these problems and develop innovative designs for vans in the increasingly urban landscape of the future. The 25 members of the International Van of the Year Jury are considered to be the pre-eminent journalists in the LCV field in their respective countries. They have shared their insights to create this exploration of the key factors shaping the industry, and suggested potential solutions to the big issues.

## The experience of the delivery driver

Driver experience is widely viewed as one of the most important factors of all in van design. The driver is the key to the whole process. They influence and determine so many things – from fuel efficiency to road safety. All of the pressures of urban delivery fall on the driver, and the vehicle's role in assisting the driver is of key importance.

Providing a comfortable, ergonomically sound working environment is essential. And the standard is already very high. In the last decade vans and transporters have started to offer the same safety and comfort features that we have come to expect from cars.

Different features will improve experience for different drivers, and there are new ideas coming through that are changing the way we view vans as work spaces. The new automatic gear boxes (9 and 10 shift) are a big contribution to current high standards of driving comfort. And ZF's Safe Human Interaction Cockpit (SHI Cockpit)<sup>4</sup> which can automatically adjust the seat position to suit each driver.



There is space in the market for more focus on delivery functionality. Existing vans are not designed or produced to provide drivers with enough efficient delivery actions. Driving is only part of the job. Drivers now have to utilise multiple IT systems, record key stages in the journey such as electronic proof of delivery.

There is too much time lost in getting in and out of vehicles that then require locking and unlocking. A cab-to-cargo walk-through system is essential as are remotely operated rear doors potentially with a bus style electric door fitted to the kerb side of the vehicle for easy access for the driver.

There are some new developments appearing for cargo areas. But there are still recurrent issues, such as

the step from the rear which is often too high. There are reasonably priced led lights on the market which improves cargo interiors significantly though these can have their own issues.

The new Renault Master/Opel-Vauxhall Movano/Nissan NV400 is promising, with its “work desk” and large storage facilities beneath.<sup>5</sup> Unfortunately, this configuration is not available in right-hand-drive with an airbag which is a major concern for passenger safety.



The improvements in standards of driver experience are caused by competition between OEMs. There are other factors at play too, such as the falling costs of driving assistance systems resulting from the growing scale of that market, driven by the increase in urban deliveries.

An entrenched problem that has drawn focus to driver experience is the skills shortage across the logistics sector, specifically the scarcity of drivers. This will become particularly acute as the demand for home delivery drivers grows. There are hopes that offering a comfortable, quiet, safe driving experience will open up the career to a wider base and attract more drivers to the sector.

An interesting deviation from this general pattern is in Switzerland, where high wages have become a limiting factor. Larger vehicles are preferred there because they require fewer drivers per delivery. In effect the skills shortage is shaping the way delivery works. This is not expected to happen in larger cities that are growing today, but it is perhaps worth taking note of the significance of the drivers' role.

The demands on van drivers of the future are growing. With e-commerce causing more and more urban deliveries the pressure is on drivers to navigate more traffic than ever, and to fulfil a more technical role than ever including electronic proof of delivery (EPOD) and other information driven processes on top of the core function of delivering. LCVs of the future will also be expected to do more to assist drivers. Offering a comfortable working environment is already the norm. Future

urban vans will have to enable smarter choices, more efficient driving, safer working and faster deliveries as well as offering seamless communication with a wider IT environment.

## Development of Smart Delivery vehicles by OEMs and start-ups

The continued growth of e-commerce means that delivery volumes are straining extant systems. The final mile is crucial but complex, and zoning requirements such as parking or emissions restrictions are an added challenge. To navigate these hurdles efficiently now generally requires sophisticated telematics, parcel tracking, e-pod, ERP or WMS systems which require the delivery van to connect to the wider business. So the vehicle acquires a far more complex data orientated function than simply delivering. It must be smart.

In fact several smart delivery vehicles have already entered the market. There are various prototypes and concepts from existing commercial vehicle manufacturers such as Renault, Mercedes-Benz and Iveco, while some start-ups are collaborating with the likes of Amazon to create electric delivery vehicles. All are offering alternative powertrains to diesel/petrol engines.

The possibilities with connectivity and data collection are seemingly endless. Telematics systems currently offer fleet optimisation programmes as well as fraud prevention and security cameras. Many vehicles already use wireless technologies such as RFID to communicate with toll booths. As the urban landscape becomes more connected, vans may be expected to automatically communicate to facilitate tolls, parking fee payment, fuel card schemes without the tiresome cards, and more.

Verizon Connect's telematics and mobile workforce management platform is now embedded in all new Iveco Dailys along with Iveco's Daily Business Up system,<sup>6</sup> and the Opel Movano now comes with Navi 50 IntelliLink Pro which connects to Apple CarPlay and Android Auto via USB or Wifi.<sup>7</sup>



This represents a challenge for fleet owners. Wise decisions are needed when choosing from the ever-increasing pack of different digital solutions, to avoid simply adding to the drivers' job.

There is a consensus that developing smartphone technology will be harnessed in the cab, but integration of such technology does not simply mean using smartphones plugged into the dash. Many business models do rely on the fact that drivers will have their own smartphones, but being able to link personal devices into enterprise software presents the potential for security breaches and could put drivers in compromising positions. Innovative LCVs will incorporate their own touch screens, voice and gesture controls and smart connectivity.

The real challenge for the manufacturers is to make an interconnected, easily navigable interface of data display, navigation, parcel tracking, infotainment and fleet management systems. Digital concepts that connect vehicles, couriers and logistics processes with each other offer great potential for making the work of parcel couriers easier and more efficient.

Such interconnected systems also offer the potential to facilitate a smarter urban environment. The Internet of Things could automate many delivery processes, and could form an IT eco-system that could eventually lead to safe smart running practices for automated vehicles and drones.



## Zero-emissions technology advancements

Transport margins are still low, and adoption of alternative power sources are still an aspiration for many businesses, particularly SMEs. However, possibilities for the advancement of combustion engines (in terms of achieving cleaner running) seem to be exhausted. Thus zero-emission technologies and alternate fuels are increasingly important.

This has opened the door for new manufacturers, as in the bus sector, and new players like brands Solaris or BYD are now fairly well established.<sup>8</sup> Start-ups have also benefitted by working in collaboration with more established OEMs. Volkswagen Commercial Vehicles' "Future Logistics Challenge" for example funds pilot projects with emerging start-ups.<sup>9</sup> In fact Volkswagen Commercial Vehicles say they are changing from a vehicle manufacturer to a "platform operator" to promote both internal and external innovations.



The push for lower emissions technologies could also pave the way for the development of new breeds of vehicle, with very specific features for particular niche roles in the urban delivery process, such as autonomous vehicles, or in terms of LCVs, roaming fulfilment centres.

Initially it seems that the winner in terms of road ready LCVs is battery powered electrification. Urban delivery vans are well suited to this technology as they typically have a lower mileage drive range, and cities will also be most proactive in developing the charging infrastructure required. First there will be increased interest in plug-in hybrid electric vehicles such as the Ford Transit Custom PHEV, and then a move towards hydrogen fuel cell vehicles is likely, as trialled by Renault Commercial Vehicles.



In the meantime, OEMs are reducing the weight of their vehicles, often with targets of up to 45kg, in order to reduce fuel consumption and thereby reduce CO<sub>2</sub> emissions. This is generally going to be achieved by using high strength steel or aluminium for larger vehicles.

OEMs have made huge advances already, as electric vans are road-ready. Many mainstream manufacturers are designing and developing alternative drivetrains such as electric, hybrid and hydrogen sourced range extenders. For example the LDV Maxus EV8010 electric performs the same as other vans and is, in some cases, cheaper.



It is possible that some manufacturers feel they were burned by early investment in alternative fuels, such as hydrogen which has been abandoned in some cities, or that they've lost important market share in their conventional vehicles whilst focussing on more idealistic projects. At the same time other manufacturers may perhaps have taken a more opportunistic approach, by sitting back and reaping the rewards of others' costly experiments.

The biggest challenges for a zero-emissions fleet is establishing adequate charging infrastructure. Even cities

with extensive charging infrastructure in place often don't have enough to power future requirements.

Rolling out charging infrastructure will certainly require Government buy-in. But there are also private businesses that are pushing the initiative along. Several of the top 5 UK supermarkets offer EV charge points, and Lidl is rolling them out at new stores across the UK and Ireland.<sup>11</sup> Finnish retail-chain Kesko is building charging stations in every supermarket it has.<sup>12</sup> Kesko also distributes Volkswagen vehicles in Finland, so the synergy there is clear.

There are lots of private initiatives and investments started, such as the H2 association in Switzerland. There are manufacturers investing in production of batteries, which have tested electric and gas vehicles at length and finalised more reliable products, that have the autonomy necessary to answer the customers' needs.

Despite the appetite for investment in biofuels and alternative energy sources, there is something of a question mark over how true the moniker of "zero emissions" can be, as for instance, battery production must be taken into consideration. Likewise, the disposal or second hand use of batteries, and the route source of electric power which often comes from unsustainable resources at present, although Nissan should be credited for its ROAM programme, which reuses end of life battery packs from its electric cars and vans as power banks at airports and event venues/stadiums.

## Return on investment - potential viability of projects/concepts

There are issues with alternatively powered vehicles regarding return on investment (ROI). The business case for ownership is often difficult to prove in financial terms alone, but there are wider forces at work: tax incentives, city regulations, ideological priorities, and the brand value of being seen to be green.

There's no escaping the fact that initially, development costs by the brands will be high. However as the raw materials requirement increases in volume, these cost should reduce. Established manufacturing brands in this area will have an advantage over start-ups, offering a broad, experienced aftermarket network.

From an operator's point of view, the retail price of electric vehicles is still too high for many SMEs, so it is the larger blue-chip companies that will fly the flag as the fleet customer that can afford these investments and use them as positive PR.

For larger operators new concepts of city vans should be easy to rationalise. It should be relatively easy for fleets to determine which routes have a suitable mileage for electric use. And where it is possible to run an electric vehicle there are often financial rewards.

On the Total Cost of Ownership, there is potential for vast savings, as relatively little maintenance is required and electricity charging can be very economical with free charging in some cities and the wider availability of low tariffs such as overnight.

It is just a matter of time until alternatively powered vehicles become cheaper to buy and run than internal combustion (ICE) vans, and at that point they will really take off. There are already businesses for which the total cost of ownership works out as cheaper in the mid-term. We will soon see competitively priced electric LCVs, and with the coming Euro 7 regulations the price gap with ICE vans will quickly close.

Beyond purchase costs there are a range of incentives that come into play to determine ROI. In Norway for example EVs never pay more than 50% of the road toll fees. The national yearly road tax is approximately €300 for a conventional van and just €45 for an electric van, and there is a new discount scheme of up to €5,000.

There is a fear that ecological aims and tax incentives can be manipulated. If tax schemes can be problematic, there are plenty of other incentives that are persuading operators to try alternatively powered vans. In Norway for example, city regulations are having a dramatic influence. In Oslo's inner ring, almost all-street parking is removed and the few spaces that remain are exclusively for Mobility Vehicles or Electric Vehicles, some strictly for EV-vans with ample free charging points.

Return on investment can also be delivered when alternative vehicles become a differentiator, and help firms to win business. Many multinational companies like Continental, IKEA, Delhaize Group, Coca-Cola now require their services providers to include CNG/LNG trucks to their fleets to carry their products. Even if the motivation is branding, the tide is changing.

Construction companies are encouraged to invest in EVs as many public tenders now demand zero or low emission building sites. This is mostly a question of pressure from different city councils such as Copenhagen, Stuttgart, Paris, Milan and London. If you don't invest in green transport, you won't get a transport-job in the city – or will not be allowed to enter the various low emissions zones in these city centres. For operators working in and around cities with emissions compliance requirements, investment is becoming a requirement.

## Regulations introduced by City Authorities and National Government Departments

Regulations and low emissions zones (LEZs) are a massive issue for urban vans. On one hand regulations are a pain for operators to negotiate, but on the other hand they are also what drive OEMs to improve their offerings and in turn help our environment. The dramatically speeding climate crisis and the demands of the Paris Agreement are forcing a serious and swift response. All over Europe communities are forced, often by Court orders, to fulfil the EU-regulations for clean air and to lower pollution levels, especially in NOx and soot particles. As a result, sales of ICE vans will diminish, and logistic suppliers are already preparing for the change in their fleets.

When Government and City Authorities establish low emission zones, they really ought to back this up and facilitate the smooth running of low emission delivery vehicles with special access on bus lanes, more loading/unloading bays and priority parking areas. Governments must also put the infrastructure in place to support the production of regenerable electricity and renewable fuels, and the production of green fuel cells/batteries too.

While first-world countries are leading the charge when it comes to such schemes, there are some third-world countries that also have a strong environmental focus. In 2012, more than 2,000 deaths in Rwanda were attributed to ambient air pollution. For this reason, Volkswagen is starting to trial electric vehicles in the country and the Government isn't just looking at implementing legislation; it is ready to support all such green initiatives through a Green Fund It and is also partnering with investors to introduce electric vehicles for the transportation of people and goods.

By far the most significant problem facing the industry is the discrepancy between various different regulations from city to city. National Governments allow individual cities and provinces to come up with their own rules and LEZs have been adopted in a rather haphazard fashion. In theory it is still possible to buy and drive a diesel van in one region and be barred from entry to an LEZ 20 km away.

In an ideal world we would see a well-defined common framework of zero and low emission vehicle use, to decide and benchmark significant standards. This would answer a lot of problems facing van operators and manufacturers alike.

## Autonomous driving – concepts/prototypes

Autonomous driving could solve many problems for urban LCVs. The potential to eradicate driver errors and inefficiency is promising. The difficulty is in integrating it into current road networks. It is probably that they will only work as a standalone solution, in specific protected lanes for automated vehicles.

There have been many trials of various types of automated vehicles. They are already widely used for transporting goods in off-road applications and there have been successful incidences of autonomous people movers at airports such as Schiphol Amsterdam Airport and Sendai in Japan. Swiss firm Rinspeed's SNAP and microSNAP are self-driving chassis with exchangeable bodies for different purposes. And recently Ford Mondeos fitted with autonomous technology operated on public roads in London, UK.<sup>13</sup> Also, of note is the Mercedes-Benz Vision Urbanetics development.



Then there is the Renault EZ series of electric, autonomous and connected vehicles introduced by Renault through 2018 aimed at highlighting new po-



tential directions for the automotive industry and some future styling cues of the Renault marque. The Renault EZ-POD, designed primarily as a robotized automated platform to provide first and last mile transportation of people, can also be provided in a goods delivery version. Built on a Twizy chassis, Renault EZ POD is inspired by the lines of the EZ-GO concept car and the modular platform concept of EZ-PRO. The new Renault EZ-FLEX concept showcased at Viva Tech 2019, was first revealed in April, as an experimental, electric and connected LCV that is compact and easy to handle and features a modular rear design.

We are still some time away from autonomous LCVs operating on standard road networks. The nature of van work involves lots of stops and that means interactions with other road users when parking. The value of the equipment and goods in the van also represents a security risk. Making this work will involve a sophisticated landscape of interconnected safety systems, potentially requiring specific traffic flows. Communication between vehicles and infrastructure - the Internet of Things - is crucial for this step.

These issues cause a degree of unease within the public, and from a pure business point of view regulations and liability are a huge stumbling block for now. The risks and insurance costs are prohibitive. However, the biggest cost for most delivery businesses is the cost of the driver so the bigger parcel delivery specialists will push development and investments in autonomous LCVs.

The cities of the future are growing apace in the developing world, and all the issues of urban logistics will apply there. At the moment the dynamics are different, but with the net result that here too, autonomous LCVs are not viable yet. In emerging cities wages are low and drivers are plentiful. As economies of scale come into effect and autonomous vehicles become cheaper, and as those cities themselves develop and grow, the need will be felt and autonomous vans may well be on the agenda.

Some estimates put the last mile mobility market in the US, Europe, and China at a value of US\$300 - \$500

billion by 2030.<sup>14</sup> This will mean massive growth in autonomous vehicles – but only after adequate legislation, and interconnectivity via the IoT is established.

## Last mile deliveries - concepts/prototypes

E-commerce has changed the way people shop, and it is still transforming our logistics practices. The biggest pressure point of the supply chain is now on the doorstep of the customer, and the “last mile” up to that point. The urban landscape typically involves several deliveries per mile and so is even more complex. The quantities of consignments are growing while space within inner cities is becoming increasingly scarce and the search for couriers ever more challenging. So developments and innovations in last mile deliveries represent a massive opportunity for manufacturers of light commercial vehicles.

The sheer scale of the e-commerce market means that the money is there to support widescale adoption of new technologies from lower emissions vehicles to completely new delivery concepts. And the rate of innovation is impressive. From parcel motels, and “click and collect” options to autonomous delivery robots and drones, and even utilising resources such as bike couriers and convenience stores which are widely used as drop off and collection points.

Micromobility is increasing in popularity as electric bikes and scooters are cheap to buy and run, they are agile and nimble in dense cities and obviously they are zero emissions options. However they have been controversial. Adding another vehicle profile into the already complex mix of urban traffic has proven to be problematic. The influx of professional cyclists has been unpopular with other road users, and there is a problem of insufficient cycle-lanes. In addition, micromobility solutions are labour intensive which is an issue particularly because wages are one of the biggest costs for logistics operators. It is estimated that an electric van is capable of doing three times the work with the same singular person and is more secure.

Cargo bikes, on the other hand, have operated successfully for years. They typically use larger vehicles (such as LCVs) as mini-hubs based on the outskirts of the city. Some of the latest iterations are focussing on offering a more van-like offering, for example the P1 developed by EAV in collaboration with UK parcel business DPD, which can carry 150 kg and is described as being “engineered down” from a light commercial vehicle rather than “engineered up” from a bicycle. This is an example of demand for lighter LCVs.



Drones and autonomous mini vehicles will certainly come into play. There are plenty of applications for aerial drones, but they are often limited by legislation prohibiting their use in cities. This will probably change and become workable in time.

None of these developments spell disaster for the LCV sector. It is possible that they could encroach on LCV market share to some extent, but this possibility should inspire innovative new designs and roles for vans. Manufacturers will need to focus on synergies with these alternative transport modes.

Future LCVs might blend with new tech. There are already prototypes of vans acting as roaming parcel lockers. Even for autonomous delivery and micromobility solutions, vans would probably be required to act as mobile charging and docking stations, and as mini-hubs.

Vans will be crucial to store and secure parcels to replenish alternative final mile delivery modes without leaving the city centre. And in the meantime there will be increased demand for smaller and more versatile LCVs.

## Road safety aspects: Protection of vulnerable street users

This is of crucial importance and must be a focus at every stage of the design and production of LCVs. Aside from the obvious requirement to protect people, safer roads mean smoother journeys and more efficient work flows.

Urban environments will be at the forefront of safety innovation. Every OEM offers now a city brake assist and blind spot detection systems are common. And with EVs in the mix beep sounds, lighting and stop/start functions

are becoming more popular, though stop/start slows driving considerably.

There is concern that increasingly dense traffic brought about by servicing e-commerce home deliveries will make roads busier and more dangerous. The nature of urban traffic is changing with the difference between fast and slow moving in question. New hordes of e-bikes and e-scooters are clogging roads and sometimes pavements which brings safety concerns for the operators and bystanders alike. However, these fears are tempered by the hope that the drive for efficiency from manufacturers and logistics operators alike will focus on safety as a key for improvement.

Safety is an area where connectivity will play an important role in future. Cameras and sensors will not be enough on their own, they must be connected to communicative systems. One safety focussed smart solution is Porokello (reindeer bell) that is developed in northern Finland. It allows every driver to warn other vehicles about reindeers with smartphone app.<sup>15</sup> The cities of the future will be smart cities, with integrated processes working to eradicate danger.



Safety could also be instrumental. Automatic braking systems as used in self-driving vehicles, for example, could become embedded in city architecture creating safe zones or lanes thus enabling the environment required for wider use of autonomous vehicles.

## Societal acceptance

In general, society and Governments have decided to embrace the alternative fuels agenda. People are aware that something must change concerning traffic in the urban environment. When they see new EVs in action people feel that society is moving forward, and city dwellers are proud of their LEZs which make life safer, cleaner and quieter.

General social acceptance of the green agenda is also a driving force for change. Businesses know that environmentally friendly investments look good in terms of publicity, but also that they can be a differentiator and actually win contracts.

But it is not quite so simple. Everyone wants cleaner air, but not everyone wants to give up on the privilege of their car or to take the leap and convert their fleet from ICEs. Tax incentives and total cost of ownership value are important motivators for individuals' investment decisions.

The OEMs are heavily under pressure because of the various emissions penalties. They can't force their customers to buy e-vehicles, so they have to sell the solutions "with fire and engagement" and with a clear business model and focus on total cost of ownership.

In practical terms the transition to electric vehicles will take some changes in people's mindsets. Drivers must adjust to operating an electric vehicle for instance as it drives and engages differently. Also, they have to ensure that the batteries are fully charged to run for the day or distance required.

There are of course issues with emerging trends. But there is a general feeling that as the market matures society will embrace all the good solutions.

## Possible challenges/solutions

The most immediate problem facing LCVs in urban environments is the pressure of e-commerce. The staggering demand for home delivery has placed the van at the very centre of the logistical challenge.

Consumers are part of an "instant economy" and they want their shopping delivered now; but they don't want to pay high transport costs which are at present being absorbed by retailers and carriers. This means that vans have to deliver at the lowest possible cost and must deliver optimum efficiency.

The boom in home delivery also means even more traffic which in turn makes the process more difficult. Alternative methods such as e-scooters and e-bikes also exacerbate the problem, as well as taking LCV market share.

Potential solutions to these issues involve night time deliveries, out of town drop boxes, and working in synergy with alternative transport modes. LEZs can also help as they have a relatively small footprint and are versatile. But van design will also come into play, with smoother delivery functionalities being key.

Autonomous devices will require legislative follow-through and a forward reaching, considered approach to planning. Rules must be set in place to allow these vehicles to use city streets and sidewalks safely and securely.

Rules and legislation are also a problem for electric vehicles and low emissions zones. The major concern is the divergence between standards in different cities. It is widely believed that a global strategy would be beneficial for all.

The market for electricity powered vehicles is certainly growing though there is some uncertainty over other alternative fuels and it remains to be seen which will prosper. Biofuels and gas fuels are popular in some quarters. Filling infrastructure is a stumbling block.

Infrastructure is a major challenge for alternative power sources. While electric charging infrastructure seems to be developing well there are still concerns about it keeping up with demand. Some estimate that honouring current political pledges will require 725 new charging stations every day until 2030.<sup>16</sup> It will be important to hold politicians to account and to stick to these promises, so those working to fulfil these pledges or simply working with these plans in mind, are not left with lost investments.

It is widely felt that electric vehicles also require a universal standard for charging. Having different mutually exclusive charging networks will be a huge waste of opportunity. Even when charging networks will physically function with different vehicles the operator payment structure should also be as open as possible. In some cities people need to register with four different firms in order to access reasonable charging facilities, with different keys and access cards for each. One proven solution is Government regulation as seen in Norway

The cost of electric vehicles is an issue. It is expected that costs will fall as the technology is taken up more but this will need to be supported by tax incentives and city initiatives such as offering more loading bays, access to bus lanes, free parking and charging.

Another concern for zero-emission technology is that it must have a complete green supply chain, the energy source must be fossil-free – from wind, solar or water power sources.

## Conclusions

The role of the driver has been transformed. Drivers are now expected to do a lot more than just drive. From navigating congested city streets to logging e-pods they must be in command of several core business processes, and they require vehicles to facilitate this. Driver comfort and cab design is generally at a high standard, but as the driver's job expands the onus will be on manufacturers to anticipate their needs and offer the functionality to satisfy the new requirements of the drivers of the future cities.

New technology will enable a more sophisticated flow of goods, but this will rely on smart use of data. IT systems such as telematics, parcel tracking and various apps are already widely used to increase the efficiency of deliveries. Such smart solutions will be cornerstones of future developments, and will be embedded in LCV design. Significantly, these interconnected data pathways will form the basis of a fully integrated IT eco-system. This environment will enable exciting innovations such as autonomous driving that are currently held back by our chaotic and unpredictable road networks.

The driving force of progress for zero emissions vehicles is battery powered electrification. It is ideally suited to urban LCVs which never roam far from the city's charging points. This charging infrastructure is absolutely crucial, and government buy-in as well as corporate and wider social acceptance will be instrumental.

Return on investment in lower emissions vehicles is still contentious. In general, alternatively powered vehicles are relatively expensive, though this will change as production volumes rise and stricter emissions regulations for ICEs (such as Euro 7) come into play. There are also hefty tax incentives and benefits such as free parking or charging in many cities which influence total cost of ownership. These incentives are working and in the meantime there is an undefined but real value in being seen as a low or zero emissions service provider.

Regulations and standards such as LEZs are proving effective in reducing emissions. The biggest concerns for urban emissions regulations are the divergent approaches taken by different cities and countries. Coming to agree some kind of international standards would be tremendously useful for owners and manufacturers alike.

As yet there are still too many issues with autonomous driving to be a big influence on urban vans. Progress is limited by the wider environment they have to work in, as interacting with city traffic will remain too risky until greater interconnectedness is established. As city infrastructures and prices of smart vehicles come down, the potential savings in terms of driver wages mean the concept will surely be adopted, eventually.



Finessing the final mile is now crucial, and will remain so as urban deliveries continue to increase. E-commerce has brought innovative approaches to delivery. But there is no doubt that vans will remain an essential link in the chain. This is a dynamic sector and will certainly inspire exciting developments for urban LCVs.

Safety is a priority. The volumes of last mile fulfilment agents will make safety a real challenge for future cities, but it is in everyone's interest to avoid danger and inefficiencies of unsafe working practices. Safety driven developments in automated systems and the IoT could even be instrumental in creating the safe-zones that would be required for further roll-out of autonomous vehicles.

The world has woken up to the environmental agenda. While there are dissenting voices and of course the transition to alternative power sources and emissions regulation is challenging, people generally embrace the steps that have been taken. In fact acceptance is driving further change. People are voting for ecological policies, legislation demands change, and brand advantage encourages take-up of green systems.

Overall urban environments are developing into far more well-organized, clean and safe spaces than current cities. E-commerce will continue to push forward innovation and efficiency for home delivery in general, but LCVs in particular. And social demands for a cleaner environment mean that alternatively powered vehicles will become increasingly common.

Technical progress can be used simply to drive business, but it can also be harnessed to improve people's lives and to shape our urban landscapes. The future of urban logistics depends on businesses, politicians and Local Authorities working together across the globe to steer innovations on the right course. Seeking a better, greener and truly sustainable society is a noble and urgent aim, but it will also enable smarter transport and delivery processes, and the evolution of a new breed of LCVs.

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## Key to acronyms

CNG: Compressed natural gas  
EPOD: Electronic proof of delivery  
ERP: Enterprise resource planning  
EV: Electric vehicle  
ICE: Internal combustion engine  
IOT: Internet of Things  
LCV: Light commercial vehicles  
LEZ: Low emissions zone  
LNG: Liquefied natural gas  
LPG: Liquefied petroleum gas  
OEM: Original equipment manufacturer  
PHEV: Plug-in hybrid electric vehicle  
RFID: Radio frequency identification  
ROI: Return on investment  
SME: Small and medium sized enterprise  
TCO: Total cost of ownership  
WMS: Warehouse management system

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- 4 The Safe Human Interaction Cockpit made by ZF in partnership with Faurecia brings clarity to handover scenarios between manual and automated driving modes. Driver and vehicle can communicate easily regardless of which of them is driving the vehicle at the time. [https://press.zf.com/press/en/media/media\\_11158.html](https://press.zf.com/press/en/media/media_11158.html)
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