

LOGISTICS AND ITS PROVISION

ASSIGNMENT NO. 2
BST804
INDIVIDUAL REPORT

TRANSPORT FOR LONDON

A Future Perspective on
De-carbonising Last-mile
Van Logistics



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Introduction

The Transport for London (TfL) group is one of the leading organisations in the UK that is driving impactful decarbonisation efforts to achieve the UK's ambitious goal of achieving Net Zero greenhouse gas (GHG) emissions by 2050. This report examines their current efforts, explicitly focusing on the main influential regulations and incentives implemented within London and their impact on logistics providers utilising urbanised last-mile van deliveries. Additional recommendations within the next decade will be provided to further fuel a greener transition.

The transportation industry is currently the largest producer of GHG emissions, contributing to 27% of all total emissions (Logistics UK, 2022). Van traffic has grown substantially since the 1990s, more than doubling to over 51 billion miles, mainly due to the popularity of last-mile logistics providers, within the same period, van emissions have increased by 67% (Department for Transport (DfT), 2020). The urbanised nature of last-mile delivery, denser traffic and frequent stop-and-start, can account for up to a third of a city's carbon emission (Perlmutter, 2022), highlighting the importance of decarbonising to achieve set goals.

1. Evaluating TfL Progress to provide Environmentally Responsible Logistics

1.1 Current Regulations

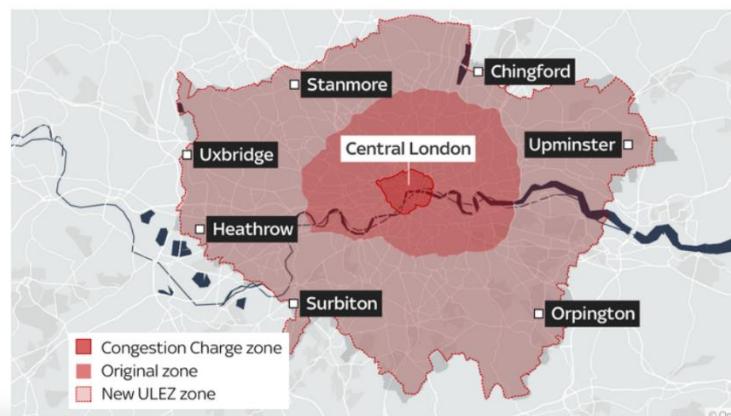
TfL has implemented the Ultra Low Emission Zone (ULEZ), one of the most impactful decarbonisation regulations. ULEZ was introduced and expanded on the previous Low Emission zone guidelines set out in 2008, which included stricter environmental compliance for vehicles passing within the zone (Ulez, 2024). In 2023, ULEZ was enlarged to incorporate a wider proportion of Greater London within the M25 belt (Greater London Authority, 2024). The regulation aims to improve air quality within the city by reducing vehicle-related emissions and road noise from traffic congestion (Roberts, 2023). Petrol vehicles under 3.5 tonnes must comply with the Euro 4 emission standard established in 2006, and diesel vehicles must meet the Euro 6 standards (National Infrastructure Commission, 2019). The zone utilises Automatic Number Plate Recognition (ANPR) cameras to scan vehicle registration plates and ensure obligation (TfL, 2024). Failure to meet those standards must pay £12.5 per day for vehicles under 3.5 tonnes, and non-payments will result in a £190 charge (**Figure 1**) (RAC, 2018). This challenges last-mile delivery as 96% of new van registrations during 2015 were diesel-based and non-compliant with Euro 6 standards (Gov, 2016).

Figure 1

ULEZ ZONE AND ASSOCIATED CHARGES AND PENALTY FEES

Source (Transport For London [TFL], 2024, Sky News, 2023)

ULEZ Restriction Zone



Vehicle Type	Emmition Standard	Non Compliance Charge	Penalty Fee
Motorbike	Euro 3	£12.5	£190
Petrol Vehicles under 3.5 tonne	Euro 4	£12.5	£190
Diesel Vehicle under 3.5 tonne	Euro 6	£12.5	£190
Vehicles Over 3.5 tonne	Only LEZ Charge apply Euro 4	£100	up to £2,000

Furthermore, the TfL has recognised the operational inefficiencies of operating hybrid or electric vans, specifically the significant weight increases due to current battery technology and consequently has increased the standard licence holder to operate “alternatively fuelled vehicles with a maximum weight of 4,250 tonnes” without the need to satisfy complex HGVs regulations (Logistics UK, 2022; Roberts, 2023).

Additionally, TfL has agreed with the wider Department for Transport (DfT) on set phase-out dates for current combustion-based LCVs, pledging that new van production would be net zero emissions-based by the end of 2035 (DfT, 2020).

To support this transition, the TfL group has collaborated with the Office of Zero Emission Vehicles (OZEV) to introduce a plug-in scheme started in 2011 to provide a financial incentive to purchase brand-new, more environmentally friendly vans. However, it has faced numerous financial cuts and strict qualifying standards, limiting the financial availability provided. The initiative has now shifted and is eligible for vehicles that emit at least 50% less emissions than the Euro 6 standards, providing a maximum grant of £2,500 for small vans and up to £5,000 for larger vans (Logistics UK, 2022). Organisations can claim a generous amount of up to a thousand vehicles per year (OZEV, 2022).

2.1 Appraising Performance

The transition towards more environmentally friendly vehicles is indisputable. The ULEZ scheme has proved to be highly successful, with a compliance rating for vans rising from 12% in 2017 up to 86% in 2023, including the expanded region (TfL, 2023; TfL, 2024), suggesting that a significant majority of vans operating within London comply with the set Euro emission standards or have shifted towards more sustainable alternatives of last mile logistics. These regulations convey a strong message to logistics operators regarding the direction the government is heading. Large logistics providers are starting the transition towards a more sustainable provision of logistics, phasing out older vehicles for electrified versions and more environmentally sustainable ones (**Figure 2**), contributing to a reduction of

52% of Carbon Dioxide responsible for significantly contributing to GHG emissions

(London.Gov, 2024).

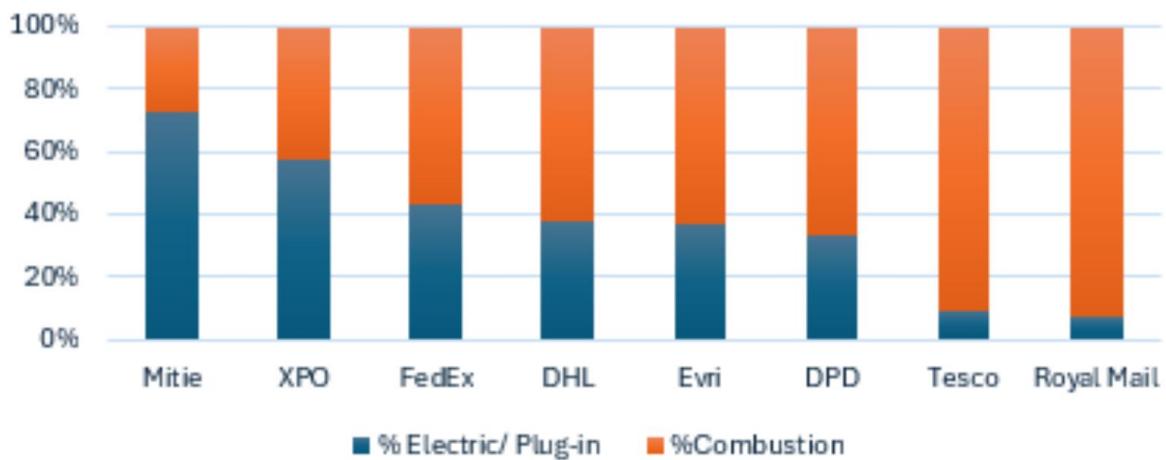
Substantial investment into plug-in infrastructure further supports this transition, averaging approximately 210 public electric chargers per 100,000 people, significantly surpassing the UK average of 80 chargers per hundred thousand (HM Treasury, 2024). This robust network ensures accessibility to a ChargePoint, facilitating Electric Vehicle (EV) adoption and reducing logistics providers' overreliance on fluctuating fuel prices. This transition extends past the economic gains, providing social benefits, as clean air directly reduces health-related respiratory illnesses, alleviating pressures on the NHS with a cost saving estimated at £963 million annually (University of Bath, 2024; Public Health, 2019). Ultimately, it achieved its initial goals and positioned 6th on the Arcadis sustainability index, one of the leading cities highlighting its success in impactful, sustainable regulations and incentives (Arcadis, 2024).

Figure 2

LOGISTICS PROVIDERS FLEET COMPOSITION: % OF ELECTRIC VS COMBUSTION

Source (Mitie, 2024; XPO, 2024; FedEx, 2024; DHL, 2024; Evri, 2024; DPD, 2024; Logistics UK, 2024; Tesco, 2024; EO, 2022; Royal Mail, 2024; Roberts, 2024)

LCVs Fleet: Electrified Vs Combustion % (Within the UK)



Despite its success, certain limitations persist, notably that the proposal for the extension was only announced in 2022 (Sky, 2023), a year before implementation, providing insufficient time and support for individuals to transition. As a result, facing remarkable public backlash, reports indicate that up to 59% of individuals opposed the extension into greater London (Lydall, 2023). Most vehicles operational within Greater London were non-ULEZ compliant, placing a significant financial burden on individuals who must upgrade to more sustainable vehicle models or face the ULEZ penalties.

Furthermore, the Euro 3 standard for petrol and Euro 6 for diesel standards established in 2007 and 2016 are outdated and still allow individuals to operate older polluting vehicles. The adoption of plug-in and electrified vans has also slowed, where newly registered vans between 2021 and 2024 have stagnated at around 3-6% annually and only represents 1.5% of all Light Commercial Vehicles (LCVs) (Edwards, 2024) (**Figure 3**), suggesting that a large majority of logistics providers are still heavily reliant on emission-based vehicles. This is due to technological inefficiencies and longer downtimes, as E-LCVs feature a lower drivable range and require up to 12 hours to be fully charged, the high upfront cost further deteriorates their market competitiveness (Dericioglu, 2018). The pace of adoption of hybrid and electrified LCVs remains critically low, and there is “no plausible way of achieving net zero at this current rate” without major reform (DfT, 2020, pg. 58).

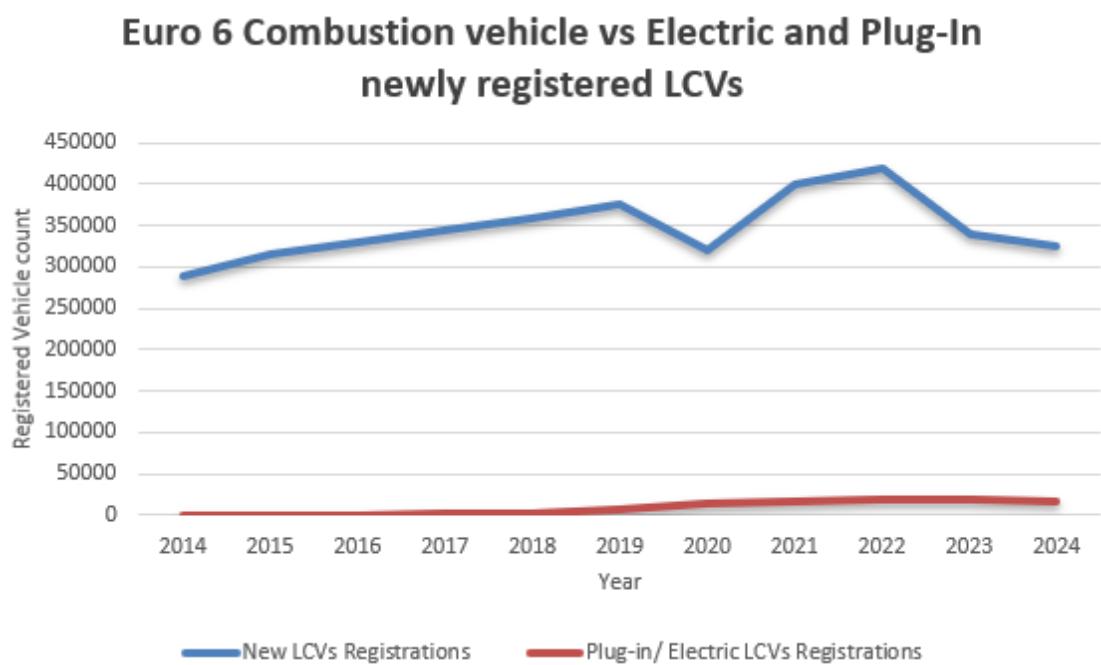


Figure 3: Electrified Van adoption, Created by C21084397 (Appendix)

The Plug-in incentive aims to support businesses transitioning towards electrifying fleets. But it exhibits substantial systemic bias against smaller businesses. The scheme only provides a negligible set grant depending on the number of vehicles purchased. Larger companies can afford a more significant number of brand-new LCVs. Therefore, a larger proportion of the financial aid pool is given to larger logistics providers who can afford to upgrade instead of smaller businesses struggling to adapt and facing expensive repercussions due to non-compliance to ULEZ standards.

2. Decarbonising LCVs Over the Next Decade

2.1 Tackling the Affordability Concern

Recently, UK businesses have faced several financial difficulties stemming from the Brexit deal and the COVID-19 crisis. These have caused inflation rates and the price of imports to increase, fuelling the cost-of-living crisis and plunging businesses into higher-than-expected operational costs (Reuters, 2022). As a result, this hinders the ability of businesses to invest in the high upfront cost of electrified models, which cost, on average, 60% more than their traditional combustion counterparts (Figure 4), this is further exacerbated by the rise in LCV insurance premiums, which have skyrocketed by 82% since 2021 (Panjwani, 2024; McDonnell, 2024).

Figure 4

PRICE COMPARISON OF TOP 10 SELLING VANS: COMBUSTION VS ELECTRIFIED

Source (Ford, 2024; Toyota, 2024; Renault, 2024; Citroen, 2024; Volkswagen, 2024; Mercedes, 2024; Peugeot, 2024; Vauxhall, 202; Fiat, 2024; AutoTrader, 2024)

	Van Model	Price Increase between Combustion Vs Electric	Lease Price (Per month)
	Ford Transit Courier	107.7%	£513
	Mercedes-Benz Sprinter	81.3%	£514
	Renault Kangoo	72.1%	£421
	Fiat Ducato	63.2%	£690
	Peugeot Expert	54.3%	£421
	Vauxhall Vivaro	52.6%	£516.42
	Toyota Proace City	45.6%	£570
	Volkswagen Transporter	45.2%	£435
	Citroën Berlingo	44.7%	£442
	Mercedes-Benz Vito	32.7%	£585

On the other hand, Vehicle manufacturers must abide by the UK government's mandate to produce a growing proportion of electrified or hybrid vehicles each year, risking fines for non-compliance. This has led to the overproduction of EVs due to lower-than-expected stagnated sales and a storage crisis of approximately 2.2 million unsold units (Fischer, 2024; Topham, 2023).

With financial support from the TfL, a percentage of idle vehicles can be repurposed and subsidised to widen the availability of a government-backed leasing scheme that can provide a more attractive contractual rate towards the growing 35% of businesses that prefer to lease rather than buy (ACL, 2023; Atasu, 2021), subsidising a proportion of the average leaser price of £510 per month to make it comparable with operational costs of combustion vehicles, significantly reducing the financial barrier for businesses to transition (*Figure 4*). A trade-in policy can further strengthen this incentive, scrapping non-compliant polluting vehicles for an additional discount on the lease price. This approach not only accelerates the adoption of E-LCVs but also provides a proactive approach to reducing highly polluting vehicles in second-hand circulation.

A stable monthly price and convenience of liquidating older vans simplify operational planning and budgeting for organisations, reducing uncertainty and streamlining the transition (Dasgupta, 2008). The added flexibility of cancellation provides reassurance for businesses, allowing them to upgrade or exit the leasing contract if their business environment changes. Conversely, this benefits manufacturers by monetising their current idle stock, reducing storage costs and ensuring compliance with UK mandated quotas as some of the largest vehicle manufacturers, such as Ford, Volkswagen, and Stellantis, are all facing potential fines exceeding £100 million (Lea, 2024; Jasper, 2024).

If the initiative aims to provide 100,000 E-LCVs per year, emission savings by 2030 could account for 2.4 million tonnes of CO₂ and a reduction in 27% of van-related emissions, marking impactful decarbonising progress (Appendix 4). In the long term, as EV technology continuously improves, the cost of production is likely to decline, reducing the reliance on government subsidies and allowing scalability within the initiative, making impactful progress towards Net Zero by 2050.

While initial government spending is required, economic development and benefits likely offset some costs through taxation. Affordable EVs will likely increase the rate of adoption. However, this does not ensure that all providers will make the transition, as other factors, such as operational inefficiencies regarding range and payload limitations, will also play a critical role in the decision-making process. Recommendation two will aim to directly address this issue.

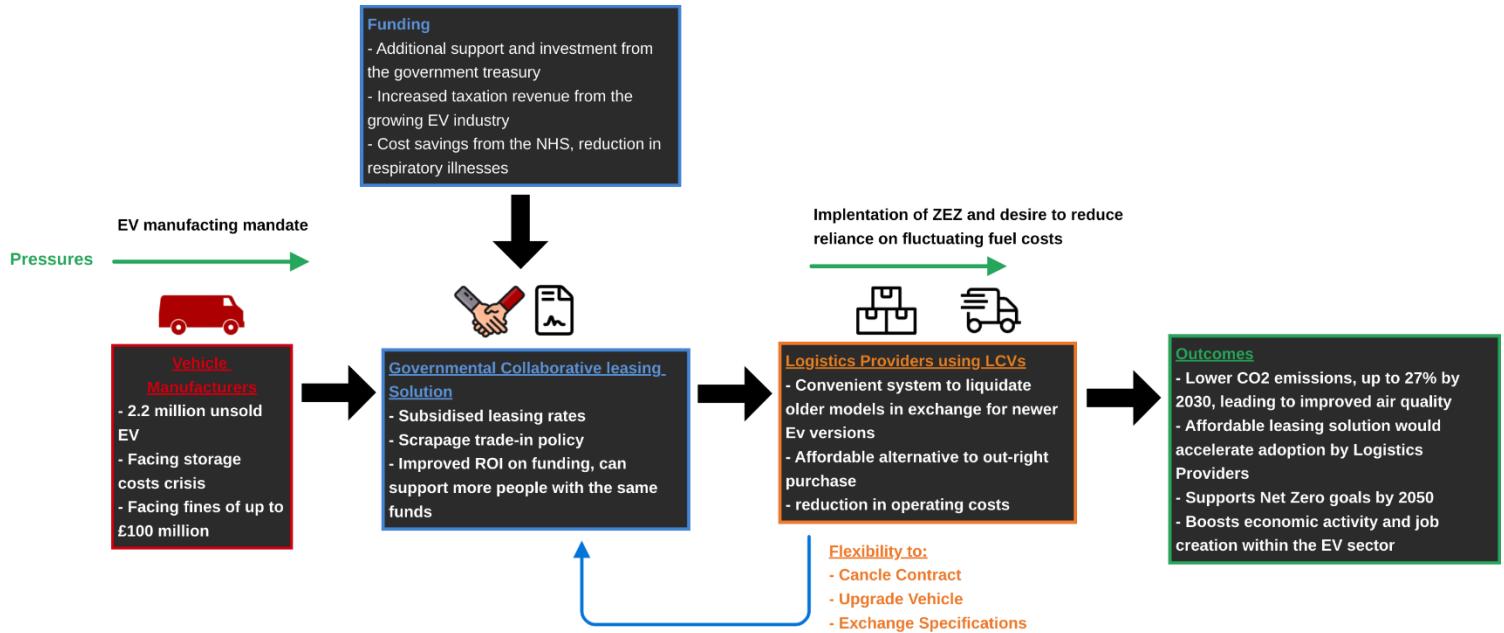


Figure 5: Lease Collaboration in Practice

2.2 Introduction of Zero Emission Zone

Another solution TfL could implement is a Zero Emission Zone (ZEZ) for vehicles under 4.250 tonnes within central London in the next decade, implementing a zone restricted to only zero emission-based vehicles, enforcing a fine for non-compliant vehicles. There are no announcements to strengthen the London ULEZ standards beyond their current scope (Ulez, 2024). The zone should expand on current ULEZ goals, to motivate the transition towards E-LCVs while using current ANPR infrastructure systems. ULEZ has been highly successful, but qualifying standards still encompass older polluting vehicles contributing to 113.2 million tonnes of CO₂ annually, a more stringent regulation is required to accelerate progress (Logistics UK, 2022). Additionally, the current phase-out dates for LCV combustion engines set at 2035 only apply to newly produced vehicles. Considering the prospering second-hand vehicle market and the 15–20-year lifespan of current LCVs, which is likely to increase

further, Net zero by 2050 remains unachievable without purposely prematurely retiring combustion-based vehicles (Accardo, 2023).

The timing of implantation is critical to ensure EV technological efficiency has improved and price of purchase has become more affordable to avoid placing unrealistic barriers to businesses. Additionally, the city must handle the influx of EV vehicles. Adequate charging infrastructure must be situated around the city, along with satisfactory energy production to meet the growing use of EVs. Research indicates that 30% of EV drivers reportedly had to wait an hour for public charging points, suggesting that although London's charging infrastructure is considered developed, it still lacks the capacity to meet the current pace of EV adoption (Edwards, 2024). Appropriate analysis is required to ensure a smooth implementation of ZEZ. This initiative should be introduced a few years after the leasing scheme, and changes to sensitive regulations should also be announced prior to the public, providing at least three years for individuals to save up and transition to mitigate public backlash.

However, the shift from volatile fuel prices towards cheaper, cleaner electric energy can reduce costs by around £4,000 per vehicle annually (McLoughlin, 2023). This initiative aligns with current Net Zero goals and offers a strong foundation to be later expanded towards greater London outside the 10-year scope. While the initial transition possesses considerable challenges, the combination of reduced emissions, improved air quality, and lower operational costs brings long-term efficiency gains that can propel London to achieve net zero by 2050.

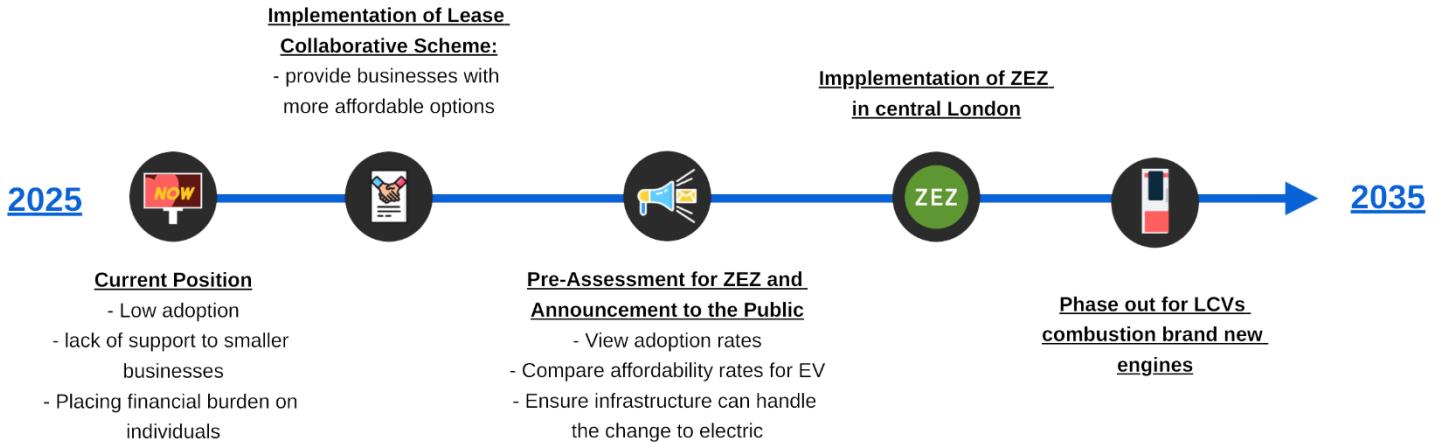


Figure 6: Future Timeline

Conclusion

Overall, the TfL group has demonstrated a strong commitment to decarbonising city and last-mile logistics transport within London, including the ULEZ zone and licencing adaptations along with the plug-in incentive to further encourage a greener transition. These efforts have significantly reduced emissions and improved air quality within the city, positioning it as one of the sustainable leaders in the world. However, adoption within last-mile logistics LCVs remains critically low.

To address the slow adoption, two initiatives are recommended. A strengthened incentive that aims to support individuals and businesses who cannot afford electrified vehicles through a collaborative leasing arrangement and further tightening regulatory standards by implementing a ZEZ in the heart of London, driving London ever closer to a net zero future.

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Appendix

All Figures, cover page and graphs created by writer (C21084397)

1. Excel data for figure 3

LCVs Fleet Composed of (within the UK)		
Company	% Electric/ Plug-in	%Combustion
Mitie	73	27
XPO	58	42
FedEx	43	57
DHL	38	62
Evri	37	63
DPD	33	67
Tesco	9	91
Royal Mail	7	93

Data Collected from (Mitie, 2024; XPO, 2024; FedEx, 2024; DHL, 2024; Evri, 2024; DPD, 2024; Logistics UK, 2024; Tesco, 2024; EO, 2022; Royal Mail, 2024; Roberts, 2024)

2. Excel data for figure 3

Year	New LCVs Registrations	Plug-in/ Electric LCVs Registrations	Percentage of Van registration which is electric/ plug in
2014	290000	580	~0.2%
2015	315000	630	~0.2%
2016	330000	990	~0.3%
2017	345000	1380	~0.4%
2018	360000	2160	~0.6%
2019	375000	6750	1.8
2020	320000	13500	1.8
2021	400000	17000	3.6
2022	420000	19875	5.9
2023	340000	19875	5.9
2024	324,613	17238	5.3

Data Collected from (Gov Vehicle Registrations, 2014-2024; DfT, 2020-2024)

3. Excel data for figure 4

Van Model	Diesel Price (£ Excl VAT)	Electric Price (£ Excl VAT)	% Price Increase between Combustion Vs Electric	Lease Price (Per month)
Ford Transit Courier	16,200	33,655	107.7	£513
Mercedes-Benz Sprinter	40,400	73,260	81.3	£514
Renault Kangoo	20,250	34,850	72.1	£421
Fiat Ducato	28,000	49,485	63.2	£690
Peugeot Expert	26,710	41,210	54.3	£421
Vauxhall Vivaro	27,555	42,055	52.6	£516
Toyota Proace City	23,360	34,005	45.6	£570
Volkswagen Transporter	30,995	45,015	45.2	£435
Citroën Berlingo	19,375	28,042	44.7	£442
Mercedes-Benz Vito	32,850	43,600	32.7	£585

Data collected from (Ford, 2024; Toyota, 2024; Renault, 2024; Citroen, 2024; Volkswagen, 2024; Mercedes, 2024; Peugeot, 2024; Vauxhall, 2022; Fiat, 2024; Autotrader, 2024)

4. Calculations

Each E-LCV saves approximately 3.43 tonnes of CO2 annually.

Seven years, with 100,000 vehicles added to the leasing scheme each year, will result in 2.4 million tonnes of CO2 saved by 2030. ($700,000 \times 3.43$ tonnes = 2.4 million tonnes)

Annual van pollution is 8.89 million tonnes annually (2.4 million/ 8.89 million = 27% reduction)