Maidstone Borough Council

Green Fleet Strategy

Introduction

Maidstone Borough Council currently operates 64 fleet vehicles, excluding operational plant such as tractors or mowers. These range from heavy goods vehicles including 26 tonne refuse compaction vehicles and specialist sweepers to 3.5 tonne vans, pick-up trucks and cars. Most of these vehicles are operated by the Council's depot services. Data shows that on average the entire fleet produce 264 tonnes of CO_2e and travel over 430,000 miles per year.

Maidstone Borough Council declared a climate change emergency in April 2019 and has committed to an action plan to reduce emissions and mitigate the environmental impact of its vehicle fleet.

The Street Cleansing Team has already invested in two electric supervisors' vans and two further electric vans are on order for Grounds Maintenance and Parking Services. A feasibility study into the infrastructure requirements is also underway for the Council's Depot as there are currently only two charging points installed.

The Council operates a Fleet Replacement Programme which sets out the annual capital investment to replace end of life vehicles. Generally, vehicles are depreciated over a 5-year period, and are then replaced based on mileage, condition, annual running costs and business need.

New vehicles are purchased using a procurement framework operated by CTS, a trading company of Kent County Council.

Objectives

The primary objective of this Strategy is to enable the purchasing of vehicles that deliver the business needs and consider their whole life costs whilst minimizing their environmental impact.

It is important that when purchasing new vehicles, attention is given to whether the vehicle is necessary and if so, whether there is a commercially viable electric or hybrid alternative. This requires the consideration of several factors including the whole life costs (WLC) of the vehicle and its operational requirements.

This Strategy sets out the decision-making process for selecting new or replacement fleet vehicles and how the Council will seek to deliver its commitment to reducing emissions, miles, and fuel usage.

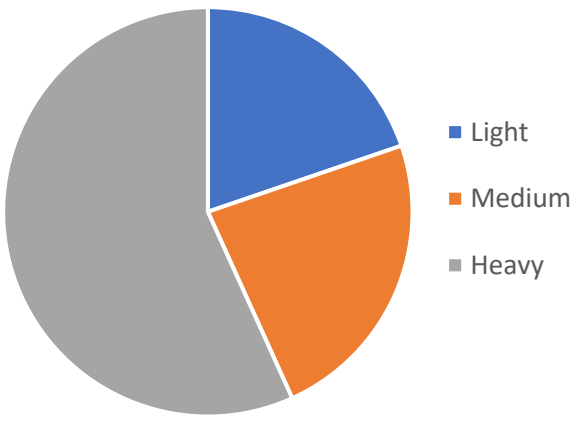
Fleet Profile

Table 1 below outlines the fleet profile of the Council; these are separated into light, medium and heavy commercial vehicles.

This data shows that 264 tonnes of CO_2e were emitted in 2020/21, with the 10 heavy commercial vehicles responsible for the highest proportion of this.

Graph 1 shows the average CO_2e per vehicle by class. Whilst collectively the light, medium and heavy commercial vehicles contribute similar levels of CO2e, this is skewed by the number of vehicles operated and therefore the average CO2e per vehicle is more reflective of the situation.

Graph 1: Average CO_2e per vehicle by class



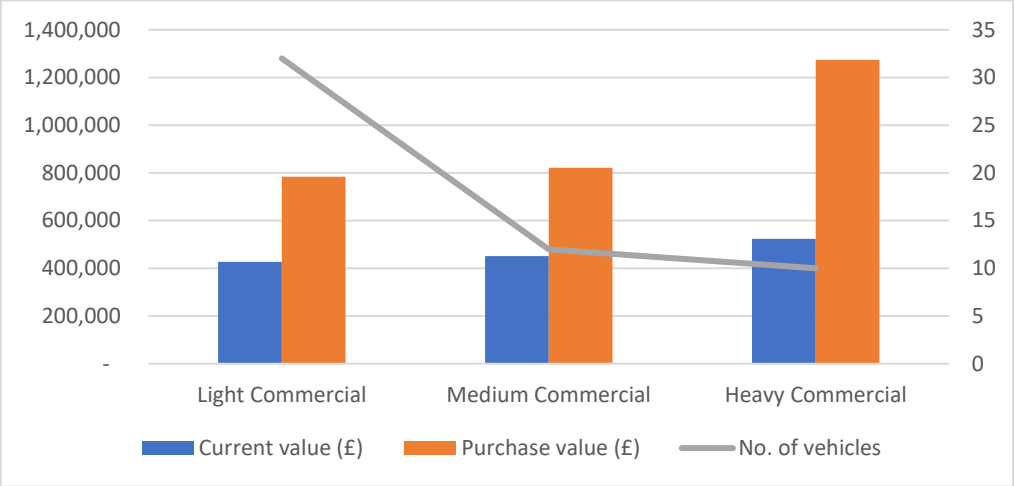
Category	Total	Vehicle Type	Quantity	Total Annual Mileage	Total Annual fuel usage (Litres)	Total CO_2e	Combined Total CO_2e
Light Commercial (up to 2 tonne)	32	Van	16	101,659	15,538	39.47	89.85
		Pick up	7	56,057	9,883	25.64	
		Flatback	7	39,151	7,575	19.24	
		Other	2	11,186	2,164	5.50	
Medium Commercial (from 2.25 tonne to 7.5 tonne)	22	3.5 tonne	19	121,437	26,124	66.35	78.64
		Sweeper	2	12,781	3,392	8.80	
		Other	1	6,391	1,375	3.49	
Heavy Commercial (over 7.5 tonne)	10	7.5 tonne	3	17817	9293.94	24.11	95.09
		Refuse Compaction Vehicle (RCV)	2	25902	17369.85	45.06	
		Sweeper	5	15833	9992.95	25.92	
TOTAL	64		64	408,214	102,708	264	264

Table 1: MBC fleet profile

When considering the vehicle emissions, the Street Cleansing Service is the largest contributor. However, when averaging the emissions based on vehicle numbers, commercial waste is the largest contributor, highlighting this as a priority area for the future.

Vehicle Replacement Programme

The total value of the current fleet is estimated to be £1.4 million, and the replacement cost is projected to be £2.9 million taking into account current market conditions. Graph 2 below illustrates these costs according to vehicle class.



Graph 2: Value of Council's current fleet

The average age of the fleet is 3 years 11 months. As shown in the table below the average age of the heavy commercial vehicles is almost a year higher at 4 years 10 months, indicating that several of these vehicles are due or approaching replacement:

Vehicle Class	Average age
Light Commercial	3 yrs. 11 mths
Medium Commercial	3 yrs. 8 mths
Heavy Commercial	4 yrs. 10 mths

The oldest vehicles in the fleet are 9 years old, these include a manager's van, a 3.5 tonne caged vehicle and a 7.5 tonne lorry, all of which are due for replacement this year.

Vehicle capital costs are depreciated over 5 years. The Council operates a Vehicle Replacement Programme which is funded from the Capital Programme to purchase replacement vehicles when required. This programme is currently built around the services' requirements and is shown in the table below.

		Five Year Plan					
	Projected Budget 2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	Total 21/22 to 25/26
	£000	£000	£000	£000	£000	£000	£000
Fleet Vehicle Replacement Programme	748	149	456	457	270	96	1,428

Additional capital funding was secured in 2020/21 to support the higher costs of purchasing electric vehicles and further funding has also been made available through the Biodiversity and Climate Change Capital Fund. Any income achieved from the sale of vehicles is reinvested in the Vehicle Replacement Programme.

Whole Life Costs (WLC)

The whole life cost of a vehicle takes into consideration not only the purchase or lease costs of the vehicle but also the fuel, maintenance, and insurance costs from operating the vehicle.

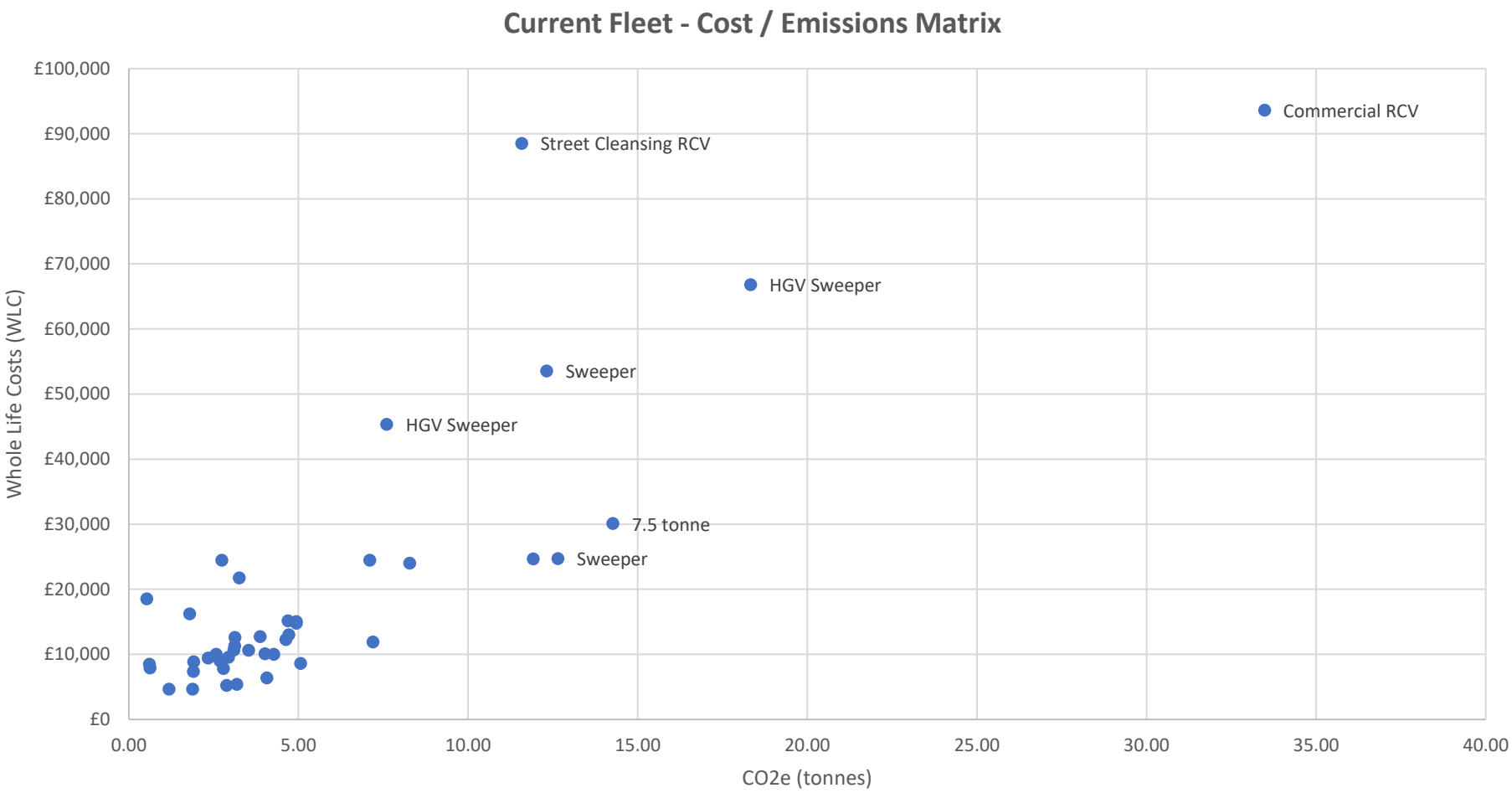
The table below shows an example comparison between the actual whole life costs of a flatback grounds maintenance vehicle (Fiat Doblo) and a comparable electric vehicle on the market.

Whole Life Cost Comparison	Fiat Doblo Cargo 1.3 Multijet 1.1	Nissan e-NV200 109 Visia
TOTAL Purchase Price	£21,324	£31,500
Energy Source	Diesel	Electric
Fuel / Electricity Cost	£1,071	£511
Maintenance Costs	£884.00	£201.25
Insurance	£789.96	£789.96
TOTAL Running costs	£2,745	£1,502
Vehicle depreciation	£4,264.80	£6,300.00
Annualised WLC	**£7,009.94**	**£7,801.84**
Annual CO2e (tonnes)	2.81	0.68

Table 2: Whole Life Cost Comparison of diesel and electric small van

In this example, whilst the electric vehicle has a substantially higher purchase price, this is offset by the reduced fuel and maintenance costs and the benefits of reduced carbon emissions.

Comparing the whole life costs with the carbon impact provides an overall picture of the true cost of the vehicle. Graph 3 shows this for the Council's current fleet. As expected, the heavy commercial vehicles have the greatest cost to the Council and environmental impact, with the commercial refuse compaction vehicle (RCV) contributing over 33 tonnes of CO_2e and an annualised WLC of over £90,000.



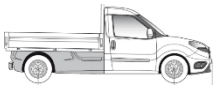
Graph 3: Whole Life Cost verses CO_2e comparison for current fleet (based on 2020-21 data)

The average annual WLC for the Council's fleet is £19,500. However, across the fleet this ranges from £4,659 to £93,627.

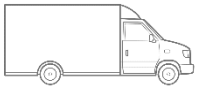
The data from the Council's fleet indicates that the heavy commercial and specialist vehicles, predominately sweepers and refuse compaction vehicles (RCV) have the greatest impact. However, at the present time, there are very little alternative fuel options for these vehicles on the market.

Greening the Fleet

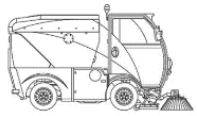
From Maidstone's data, several conclusions can be drawn regarding the future fleet options:



Small vans contribute the lowest emissions and the WLC are relatively low, however these are the highest proportion of the fleet and viable electric alternatives are already available on the market.



The average emissions from medium commercial vehicles are only marginally higher than the light commercial vehicles (small vans), however there are currently limited alternative options available.



Heavy commercial vehicles and specialist sweepers are the highest contributors to CO_2e emissions, with the average emission over 3.5 times greater than the medium commercial vehicles. Whilst this is clearly a priority area to target for green alternatives, these have only recently been brought to market and are exceptionally expensive.

It is important that the future fleet delivers lower emissions whilst remaining financially viable and meets the needs of the service. This can be a challenge to ensure that both the cost and environmental impact are taken into consideration during the decision-making process, particularly where technology is developing so quickly.

For the Council's current fleet profile, it is evident that there are limited green options for many of the large and specialist vehicles, or the cost of them is probative at this time. For example, an electric refuse compaction vehicle is currently available on the market for £415,000 compared to £230,000 for the diesel equivalent. However, for the smaller and medium vehicles, there is an increasing range of green alternatives, which have comparable whole life costs to their diesel equivalents.

Therefore, to deliver a green fleet for the future, this Strategy sets out several principles for the decision-making process. This will enable decisions to consider the most current information and options available at the time of purchase.

Chart 1 shows the decision-making process for all future vehicle purchases.

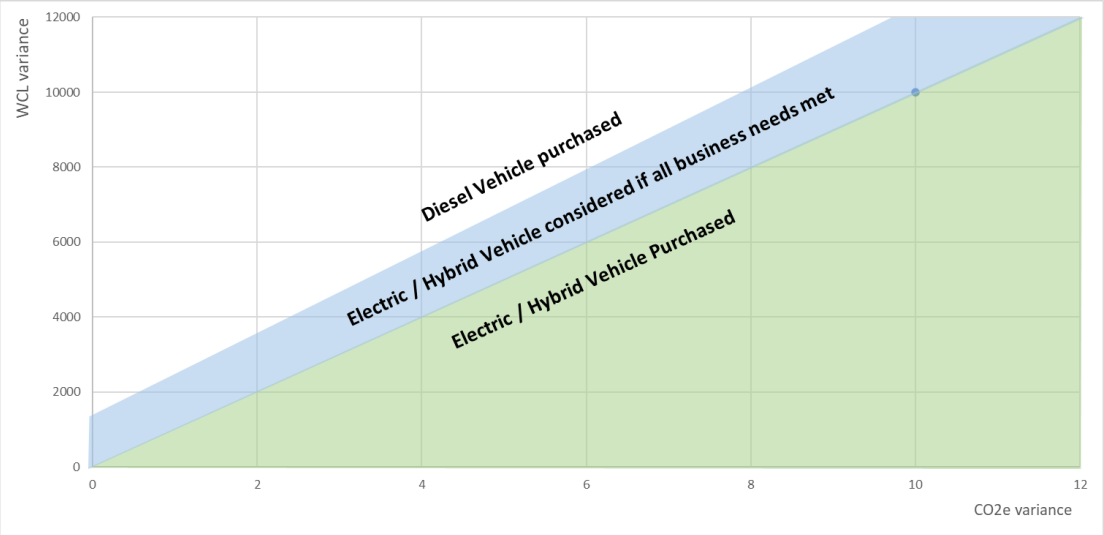
Use of telematics on the vehicles will enable managers to determine whether the vehicles are truly needed to deliver the service and what their environmental impact is. This will be fundamental to the decision-making process going forward and will not only seek to deliver a greener fleet but also reduce the fleet and improve efficiency.

Cost Viability Matrix

Given the price variance for electric vehicles, further consideration of the cost viability is required to determine whether any additional costs are sufficiently offset by the environmental benefits.

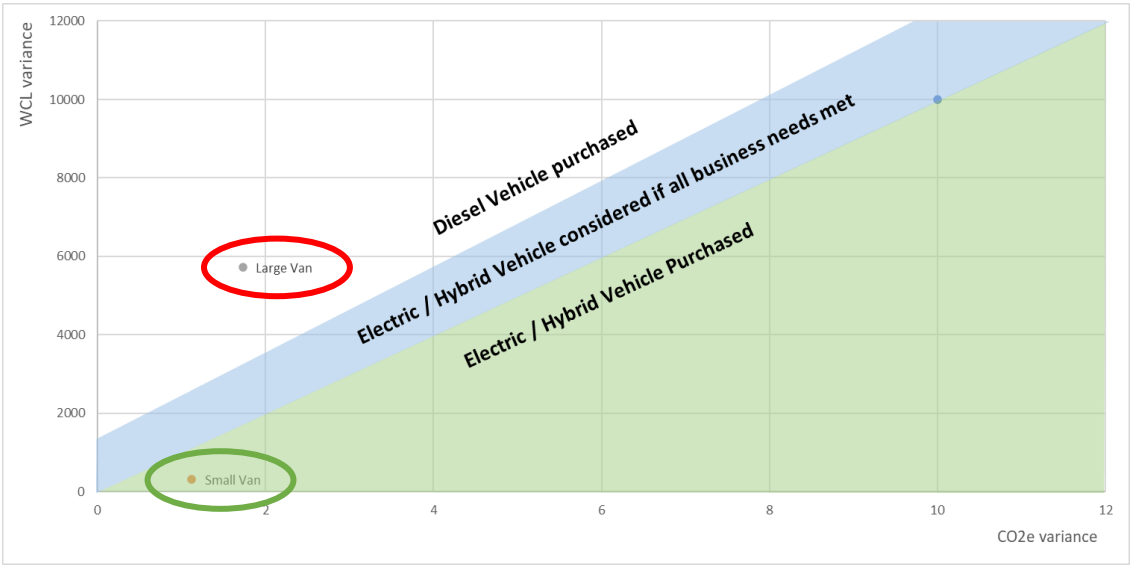
Graph 5 shows the variation in cost and emissions for electric and diesel vehicles, based on data from the Energy Saving Trust. Using this information to compare electric, hybrid and diesel options enables the Council to determine which vehicle should be purchased and will most closely meet the Council's objectives.

The Cost Viability Matrix (shown below) considers the variance in the CO_2e emissions and annualised whole life costs (based on 5-year depreciation) between an electric and diesel vehicle. If the variance of the two variables falls within the green section, it indicates that the electric vehicle is financially viable to purchase. However, if the variance falls within the white section, then the diesel vehicle offers the most viable option. A middle blue area enables further consideration to be made regarding which vehicle meets all the business needs and would be most appropriate for the service.



Cost Viability Matrix – Green Fleet Purchase

Graph 4 below shows how the matrix applies to the purchase of a small van and a large van. The small electric van falls within the green section and therefore is financially viable. However, the high variance in annualised WLC for a large electric van means that the environmental benefit is not sufficiently offset by the high additional cost. It would be expected that over time, the cost of the larger electric vehicles will reduce as more vehicles are developed and the market broadens.



Graph 4: Cost Viability Matrix for the purchase of small and large vans

Conclusion

The priority for this Strategy is to reduce the impact our fleet has on the environment in a sustainable and deliverable way. It is paramount that the vehicles purchased can support staff to deliver the high standard of work expected by residents and visitors to the Borough. Overall reducing our fleet and increasing efficiency delivers the most benefit, both in terms of

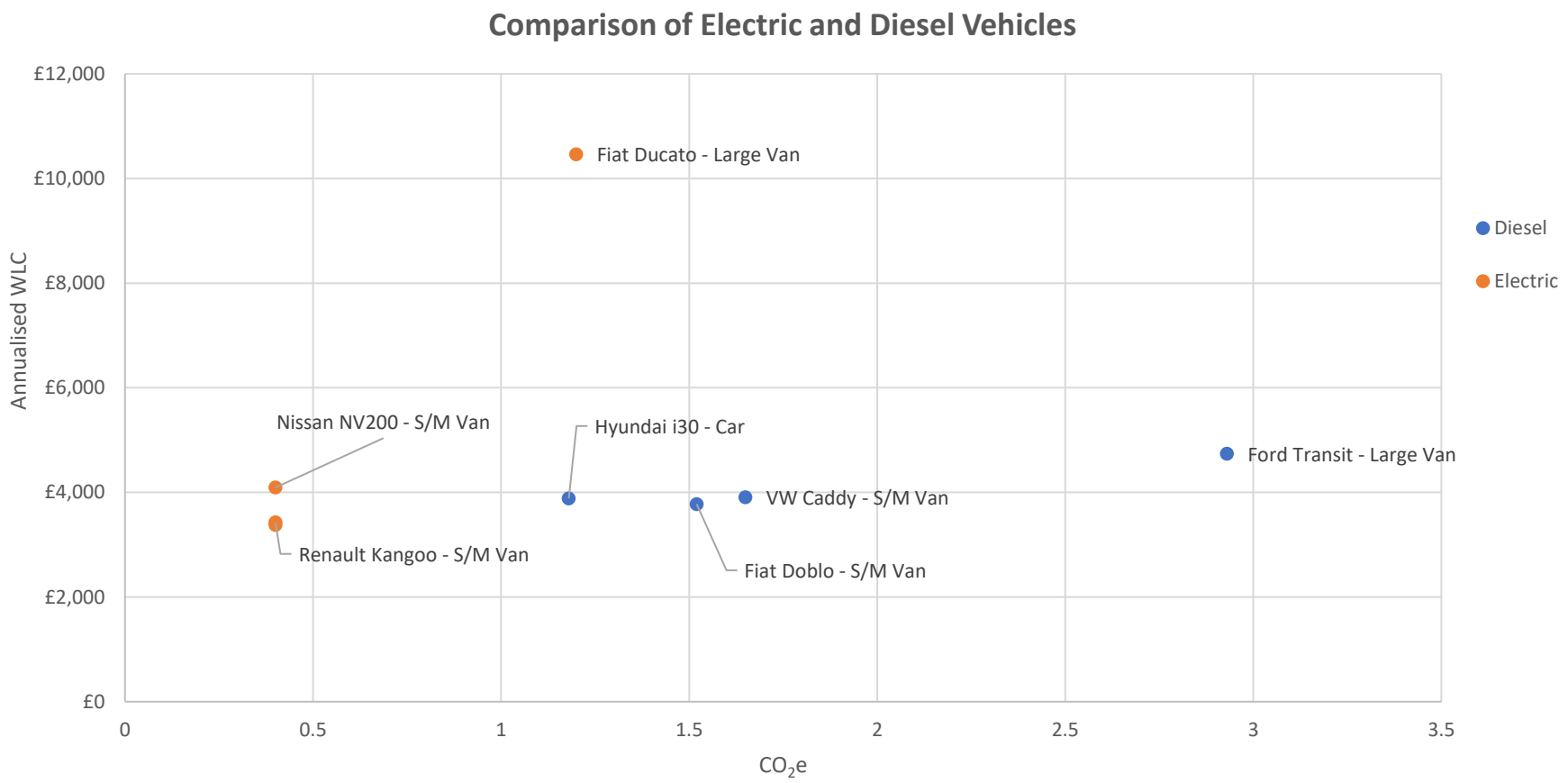
environmental and financial impact. Therefore, this is our priority for the future and telematics within all vehicles will be used to deliver this.

Investing in electric or alternative fuels, where they offer sufficient environmental benefits to offset any additional costs, will remain a priority. The Cost Viability Matrix will be used to determine this and ensure that the Council invests appropriately in emerging technologies.

Actions

The data analysis and application of the decision-making process and cost viability matrix enables us to identify several actions to be taken forward. These are outlined below and will evolve over time as the process and strategy remains live and responsive to market changes.

Class	Actions
All	For the Compliance and Transport Manager and Head of Service to independently assess whether replacement vehicles are required to meet the business need
Light	Priority for electric or alternative technologies as market is more developed and data indicates that these offer viable alternatives to current diesel fleet
Medium	Some opportunities currently exist for hybrid or full electric vehicles, which will be considered where the whole life costs are sufficiently offset by the real environmental benefits
Medium / Heavy	To extend the life – where financially and operationally viable – of medium and heavy commercial vehicles in the fleet to enable alternative options to be considered in the future



Graph 5: Based on Data from Energy Saving Trust – Comparison of Annualised WLC and CO2e emissions from comparable electric and diesel vehicles