Appendix A

Proposed 5-Year Vehicle Replacement Programme

Introduction

1. This report contains the findings from a review of the Council's Vehicle Replacement Programme and presents a proposed rolling 5-year replacement programme for the whole vehicle fleet.

2. The overall aim of the project is to create a considered rolling 5-year replacement programme that allows the Council to:

    - Move to a modern fleet of commercial vehicles;
    - Ensure the fleet remains resilient;
    - Adapt to changing service requirements;
    - Lower our maintenance and vehicle hire costs over the longer term;
    - Identify changing infrastructure requirements.

3. As will be discussed later, to ensure that the replacement programme remains current it is proposed that it is reviewed annually. Updates would take place in the autumn to inform budget setting for the following year and the Medium-Term Financial Strategy

4. To ensure that the Vehicle Replacement Programme (VRP) is considered and well thought out a project team including officers from Corporate Services, Finance, Property, and Streetscene was formed.

5. The team analysed a number of aspects:

    - Current fleet management;
    - Wider influences e.g. legislation;
    - Fuel and vehicle types:
        - Technological development;
        - Costs;
        - Availability;
        - Experiences of other Council/fleets;
    - Maintenance considerations;
    - Infrastructure requirements.

6. The next section of the report gives an overview of what the Council's fleet looks like now and our approach to fleet management.

Vehicle Types and Numbers

7. The Council's fleet is made up of a diverse range of vehicles that reflects the wide-ranging nature of our service provision. The list provided below is the number of vehicles, by type, in the fleet as of February 2023.

8. 21 Refuse Collection Vehicles (RCVs) 26 tonne that are used on our refuse, recycling, garden waste, and trade waste collection rounds.

9. 6 HGVs consisting of**:**

- 5 and 7.5 tonne – used for grounds maintenance;
- 7.5 tonne – used for Street Cleansing;
- Two HGV Specials – used as road sweepers;
- 16 tonne – narrow access refuse collection vehicle.

10. 60 Light Vehicles made up of:
11. 54 vans used by:

- Building Services;
- Enforcement;
- Environmental Health;
- Public Spaces;
- Refuse & Recycling;

- Street Cleansing;
- Transport Repair Unit (TRU).

12. 6 4x4s used for mainly towing by:
    - Transport Repair Unit;
    - Public Spaces;
    - Countryside.

13. 13 Specialist Vehicles made up of:
    - 7 tractors used for grounds maintenance and winter maintenance by:
        - Public Spaces;
        - Daedalus;
    - 6 large road sweepers.

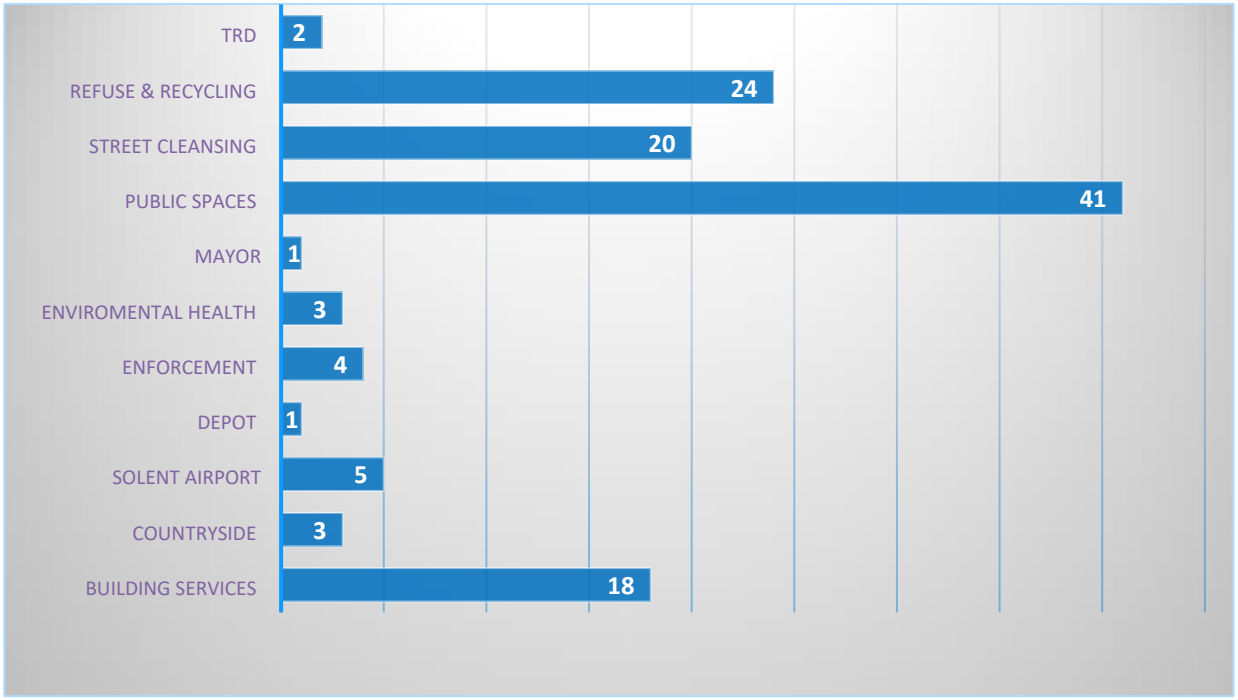
14. 16 small vehicles made up of:

- 14 ride on mowers;
- 2 small sweepers used primarily on town and district centres.

15. In addition to the main fleet above, the Council also runs and maintains the Mayor's car a Volvo S80, which is used to transport the Mayor to and from civic engagements.

16. Figure 1 below shows how the fleet is distributed by service area.

Figure 1: Vehicle Fleet by Service Area



17. It can be seen in Figure 1 above, that Public Spaces has the largest number of vehicles followed by Refuse and Recycling. The reason Public Spaces has the largest number is because it has the broadest range of vehicle types needed for service delivery. It consists of vans, 4x4s, mowers, tractors, and a couple of HGVs.

Fleet Asset Review

18. In 2021/22, a Fleet Asset Review was undertaken by the Transport Manager, working with Heads of Services to ensure that the fleet matched their service requirements. As part of the review, six RCVs/HGVs and three Light Vehicles were removed from the fleet.

The fleet continues to be reviewed annually to meet service delivery and to ensure every vehicle is required.

Current Vehicle Replacement Approach

19. Fareham tends to run its vehicles for longer than many other Council's. For example, our oldest vehicle is a van which is 20 years old, whilst our youngest is a 1-year-old sweeper. There are a number of variables that can impact on a vehicle's lifespan; however, we could generally expect vehicles to last for (includes age of vehicle when purchased):

    - 4x4: 16 years;
    - Vans: 15 years;
    - Tractors: 15 years;
    - RCVs: 12 years;
    - HGVs: 12 years;
    - Sweepers: 10 years;
    - Mowers: 10 years.

20. RCVs will move to different services as they age. For example, a newer RCV may start work on refuse and recycling, but as it ages it may move to other services such as Trade Waste or Garden Waste collections.

21. As well as being discretionary services, Trade Waste and Garden Waste vehicles tend to carry lighter loads than refuse and recycling ones.

22. This approach ensures that our newest vehicles help provide our core statutory services i.e., refuse and recycling, helping to ensure the resilience of these key services.

23. We generally only replace vehicles when:

    - The cost of maintaining them becomes too excessive. Manufacturers of many vehicles particularly HGV's and specialist vehicles such as tractors will only produce spare parts for 10 years. Beyond this, parts can often be fabricated or sourced from a vehicle saved for parts.
    - However, the market for these is relatively small and tend to become more expensive the older the vehicle becomes. If the cost of maintenance becomes too expensive, then the vehicle is no longer deemed viable.
    - There is a high level of downtime: If the amount of time a vehicle is broken down and off the road impacts on the resilience of the service, then a replacement vehicle may be sought. This can result in temporary vehicles being hired until a replacement is sourced.

Council Vehicle Fleet Age Comparison

24. Table 1 below shows a comparison of the average age of RCV and van fleets in Hampshire. All the authorities listed below purchase their vehicles outright and run in-house services. As can be seen in the table, FBC's fleet has the highest average age for both RCVs and vans.

Table 1: Average Age of Hampshire Authority Vehicle Fleets

	Average Age (Years)	
Local Authority	**Refuse Collection Vehicles**	**Light Vehicles (Vans)**
Fareham	8	10
Eastleigh	6	6
Test Valley	5	4
New Forest	4	6

25. Our RCV fleet provides a good example of why the average age of our vehicles is higher. Many Councils will run an RCV for around eight years before replacing, whereas we will aim for around 12 years, which is 50% longer.

Vehicle Purchases Annual Spend and Budget

26. Table 2 below shows the annual capital spend on vehicle purchases since the financial year 2016/17 and the corresponding annual budget.

Table 2: Annual Spend and Budget on Vehicle Purchases

Year	Annual Spend	Annual Budget	Amount relative to Budget
2022/23	£472,968	£494,700	-£21,732
2021/22	£436,101	£505,800	-£69,699
2020/21	£732,250	£838,000	-£105,750
2019/20	£290,797	£646,000	-£355,203
2018/19	£898,918	£800,000	£98,918
2017/18	£894,661	£800,000	£94,661
2016/17	£302,660	£360,000	-£57,340

27. It can be seen in the table that the annual spend varies each year. Depending on the types of vehicles that need replacing that year. For example, the cost of replacing a Refuse Collection Vehicle is £135,000 more than replacing a van.

28. Over the past seven years (including the current financial year) the amount spent relative to budget has never exceeded more than around £100,000 and there are five years when spend has been underbudget. Overall, over the period 2016/17 – 2022/23 the average annual spend on replacement vehicles is £575,479.

Vehicle Fleet Annual Running Costs

29. It can be seen in Table 3 below that there are a number of different aspects involved as part of vehicle running costs.

Table 3: Annual Vehicle Running Costs

	2019/20	2020/21	2021/22	2022/23
Fuel	£370,265	£324,731	£382,362	£555,032
Vehicle Maintenance (Repairs)	£348,628	£391,756	£383,415	£529,791
Vehicle Hire	£65,757	£57,243	£114,032	£210,835
Insurance	£114,757	£82,893	£96,867	£91,491
Tyres	£45,605	£32,182	£35,255	£47,363
Road Tax (licenses)	£32,298	£31,330	£24,518	£20,564
Cleaning	£21,194	£35,541	£16,377	£20,038
Trackers	£14,362	£17,914	£22,579	£20,953
MOT	£10,617	£6,659	£7,939	£4,940
Servicing	£2,450	£2,050	£1,944	£2,050
Other	£1,617	£1,617	£1,617	£1,617
Total	**£1,027,550**	**£983,916**	**£1,086,905**	**£1,504,674**

30. The financial year 2022/23 has seen a significant increase in vehicle running costs, particularly fuel, maintenance, and hire vehicles. In 2022/23 we spent £1,504,674 on vehicle running costs, this is an increase of £477,124 over 2019/20. The following issues have contributed to this top-level increase:

31. Vehicle maintenance: We spent £348,628 on maintenance in 2019/20, with this figure growing by £181,163 to £529,791 in 2022/23. This is in part caused by increases in the cost of spare parts, which also tend to be more expensive for older vehicles, but are also linked to the higher number of maintenance required for an older vehicle.

32. Fuel: The price of fuel has been volatile since the beginning of the war in Ukraine in February 2022. Prices for diesel and HVO were higher than before the start of the war throughout 2022/23.

33. Vehicle hire: Vehicle hire to replace vehicles off the road has more than tripled since 2019/20 going from £65,757 to £210,835 in 2022/23. An older fleet has a significant effect on these figures.

Risk To Service Provision

34. In addition to rising maintenance and hire costs, having and older fleet presents risks to service provision. In February 2023, 16 hire vehicles were used to support daily service delivery of front-line services, with 11 of these replacing vehicles off the road due to mechanical problems.

35. Currently just under 10% of the fleet is off the road due to mechanical problems. This puts significant pressure on service delivery and in particular puts waste collections at risk.

36. On several occasions in early 2023, a third of the RCV fleet was off the road. On one day, the narrow access waste collections could not be completed as the vehicle broke down and could not be repaired in time to complete the collections scheduled for that day.

Vehicle Replacement Programme Influences

37. Taking into account the increasing costs and significant risks to service provision and resilience our current approach to fleet management presents, it is wise to look at alternative approaches. There are a number of influences such as changing service needs, vehicle technologies and the Council's medium-term financial challenges for any new approach to consider.

Environment Act 2021: Twin Stream

38. This legislation sets out targets ranging from biodiversity, air and water quality through to recycling. Whilst detailed guidance is still being awaited from the Government, the Act is anticipated to require separate collections for Containers (e.g. glass, cans, plastics) and Fibres (i.e. paper and card). There is also a proposal for a new Materials Recovery Facility (MRF) in Hampshire to sort the material streams. It is anticipated that collections will start from 2025 onwards with an 18-month phased introduction.

39. The Council will need to determine how the different material streams will be collected and in what type of RCV. However, at this stage the assumption is to use the existing open back RCV fleet, and seek to avoid the need to the purchase additional or replacement vehicles.

Environment Act 2021: Food Waste

40. We are still awaiting statutory guidance, but it is anticipated that in 2025/26 mandatory food waste collections will be introduced.

41. The modelling undertaken indicates a maximum of seven specialist 12 tonne food waste collection vehicles will be required. Six vehicles would be for weekly rounds, and one would be required to cover maintenance.

42. The current cost for a new 12 tonne Food Waste Collection vehicle is £145,000. It is not yet confirmed but it is anticipated that New Burdens funding will cover the capital expenditure cost of these vehicles, but they will need to be purchased, ahead of the new collections starting in 2025.

43. There is currently only a very small second-hand market for food waste vehicles, and it is not deemed feasible to procure a fleet of second-hand vehicles for the 2025 start.

44. Demand for new RCVs in particular the smaller food waste collection vehicles, will be high in the run up to 2025.

45. This will impact on waiting times and potentially vehicle costs meaning we will likely need to procure them in 2024. Opportunities to jointly procure with other Councils will be explored.

46. It is worth noting that to accommodate food waste and twin stream recycling, collection rounds would need to be rebalanced, with bin days changing for many residents in 2025.

Depot's long-term configuration

47. A Depot short-term Asset Management Plan was approved in 2022 and covers the next three years up until the end of 2025. The focus of the plan is on safety, legal, and operational requirements.

48. Based on the Twin Stream and Food Waste collection assumptions discussed above, it is anticipated that the Depot will need to accommodate a maximum of seven additional food waste vehicles in 2025/26.

49. Any considered transition to alternative fuels e.g. electric in the medium term, will also require infrastructure improvements, with more detailed consideration needed about infrastructure for a wider role out.

Vehicle Technology

Diesel and Petrol Vehicles

50. The majority of the Council's vehicle fleet is currently run-on diesel. In 2020, the Government announced its Road to Net Zero Strategy with the following targets for the end of sale of new diesel and petrol vehicles:

- Cars and vans: Sales of new diesel and petrol vehicles will end in 2030: New hybrid vehicles will continue to be sold up until 2035;
- Heavy Goods Vehicles (HGVs) including RCV's: Sales of new vehicles will end in 2035.

51. The Council's approach to vehicle replacement has been to buy second hand diesel vehicles whenever possible. The Government's targets for ending the sale of new vehicles will impact on this approach. The market for second hand vehicles will likely shrink and become more expensive as we approach and go beyond 2030 and 2035. The market for spare parts will also likely shrink too.

52. Whilst there are longer term restrictions on their continued use, the lifetime cost analysis discussed later highlights that used diesel vehicles are still the cheapest vehicle type for most of our fleet and require no additional infrastructure.

Electric Vehicles

53. An electric vehicle (EV) uses electric motors for propulsion powered by a battery. The batteries are plugged in to chargers as they become depleted. The main benefit of EVs is the eradication of tail pipe emissions. There are zero carbon emissions from the vehicle itself.

54. EVs currently have two main downsides when compared to other vehicle types:

- Reduced range: EVs have limited range due to battery constraints;
- Long recharging time: EV's take considerably longer to fully re-charge when compared to the time it takes to re-fuel a diesel vehicle.

55. The electric vehicle market is fast growing and there are already a number of vans and cars available on the market. Electric versions of specialist vehicles do exist such as E-RCVs, however, these are newer to the market and therefore, are considerably more expensive than their diesel counterparts.

56. EVs are significantly cheaper to fuel than diesel. For example, it costs around £13,675 a year to fuel an RCV with diesel. To power an electric RCV would cost around £5,820 a year, which is £7,855 cheaper based on current prices.

57. The infrastructure required for EV's depends on the number and type of EV's purchased. Light vehicles (Vans) only require a 7.5kw charger to be able to be operationally efficient. HGVs require larger chargers due to the larger batteries. A 22kw charger would be the minimum required for an E-HGV.

58. The Depot does not currently have any EV charging infrastructure in place for an increased EV fleet.

Hydrogen Vehicles

59. There are two types of hydrogen vehicles. These are, Hydrogen Combustion Engine Vehicles (HICEV), which act in the same way as a conventional diesel, and Hydrogen Fuel Cell Electric Vehicles (HFCEV) which are similar to electric vehicles.

60. Most hydrogen vehicles are HFCEVs. These use hydrogen to generate electricity which is used to power electric motors. The benefits of HFCEV's are as follows:

- Good range: Hydrogen vehicles have a similar range to that of diesel vehicles;
- Fast 're-fuelling' time: The re-fuelling time of a hydrogen vehicle is similar to that of a diesel;
- Good load capacity: For an EV to increase its range it requires more and more batteries. For hydrogen vehicles a larger fuel cell is not required to increase range. This means that HFCEV's have a higher payload than EVs.

61. These benefits mean that hydrogen fuel cells are ideal for HGVs which travel long distances and need to be able to refuel quickly. However, there are a number of downsides of HFCEVs:

- Less efficient than EVs: The process of powering a HFCEV has more stages than the process used to power an EV. Therefore, more energy losses occur in the process of powering a HFCEV;
- Safety requirements: Hydrogen can be extremely flammable and therefore, needs to be used carefully. However, this risk can be minimised with proper safety measures in place;
- Availability and cost: There are currently very few commercial vehicles available. Hydrogen RCVs are available but cost over £500,000 each with very long lead in times;
- No fuel available locally yet: Hydrogen is an emerging fuel and currently there is no available fuel supply of hydrogen in the South of England. The Solent Cluster has recently been set up by the Solent Local Enterprise Partnership (LEP), with an aim of supporting hydrogen production in region. If successful, this could enable a source of commercially available hydrogen, but this does not look likely in the next five years.

62. Hydrogen can be produced by using a number of different power sources. The main five types of hydrogen are:

- Green: produce using renewable electricity e.g. wind or solar;
- Blue: produced mainly from natural gas. Carbon dioxide is trapped and stored through a process called carbon capture and storage (CCS);
- Grey: this is essentially blue hydrogen without CCS;
- Pink: produced by using nuclear energy;
- Black and Brown: uses black or brown coal to produce hydrogen. This is the most environmentally damaging form of hydrogen.

63. Due to the lack of fuel available locally and vehicles on the market hydrogen is currently not a viable option and only used diesel and electric vehicles will be considered as part of the first iteration of the replacement programme. When the programme is reviewed annually, the availability and cost of hydrogen vehicles and fuel will be considered.

Potential Alternative Fuel RCV Trial

64. To inform annual updates to the rolling 5-year vehicle replacement programme it may be beneficial to conduct an alternative fuel RCV trial as market testing. This would either be an electric or hydrogen RCV and would aid future decision making when deciding which technology type will be more suited to FBC when the crossover point from diesel to alternative fuel RCV takes place.

65. The trial could vary in length from one week to one year and the Council would most likely look to lease the vehicle. An electric RCV currently has a purchase cost of £425,000, whereas a hydrogen RCV is in the region of £500,000.

66. An electric RCV would require a 22kw. This would require a significant electrical upgrade at the Depot which would likely not take place till towards the end of the 5-year programme.

67. As discussed above, the issues around availability of hydrogen fuel means that it is not a viable fuel source for running a permanent fleet of vehicles. However, if the Council wanted to trial a hydrogen RCV it could have hydrogen delivered in canisters to the Depot site. This would be through the company providing the hydrogen vehicle. The canisters would be sufficient to power one vehicle and the arrangement would be suitable for the length of the trial period.

Price Volatility and the Energy Crisis

68. Since 2021 the price of diesel has risen significantly from 1.22 £/litre to a peak of 1.77 £/litre in summer 2022. At the end of 2022, the price had stabilised to around 1.54 £/litre which is a 26.2% increase on 2021 prices. We do not anticipate the price of diesel reducing to pre-2022 levels for the foreseeable.

69. Electricity has also seen significant price increases over the past 12 months. Between October 2021 and October 2022, the p/kWh day rate has increased by 200%. Despite this significant increase, EV's are still cheaper to run than an equivalent diesel. In the long run the price of electricity is likely to reduce as the country invests in a more resilient electricity network.

70. Table 4 shows the average cost of diesel and both night and day rates for electricity per mile travelled in a van for 2022.

Table 4: Fuel Price Comparison

	p/Mile Van (2022)
Diesel	25p
Electricity (Night)	9p
Electricity (Day)	12p

71. In the first couple of months of 2023 the price of diesel has seen a significant decrease of around 4p/Mile. It is anticipated that electricity will also see a decrease in p/Mile as with move further into 2023.

Medium Term Financial Strategy

72. The Council's Medium Term Financial Strategy approved by the Executive on the 9 January 2023, projected a revenue shortfall over the next four financial years.

73. Taking into account our financial challenges, the proposals in this report are driven by the need to ensure the best use of public money alongside meeting service needs.

5-Year Programme Rationale

74. The main benefits of a 5-year programme is that it would enable the procurement of vehicles in a considered manner, which will support the ongoing resilience of the fleet and facilitate good financial management over the medium term.

75. The vehicle market is currently very volatile and due to a number of different global factors new vehicle lead in times have gone from 12 months to 24 months over the last year. This means that the whole process can take over two years and therefore, the Transport Manager must consider the procurement of a vehicle a significant amount of time prior to its replacement. A 5-year plan can be used to inform procurement decisions and ensure service resilience.

76. Maintenance and hire of vehicles in 2022/23 cost £529,791 and £210,835 respectively. In most cases when a vehicle breaks down and needs maintenance, the Council must hire a vehicle in its place to ensure service delivery.

77. A 5-year programme would aim to reduce the level of expenditure on maintenance as it would enable the replacement of vehicles before major issues occur. This in turn would most likely reduce the expenditure on hire vehicles as these vehicles would not be required. Overall, the programme would help ensure service resilience and also efficiency of service as additional expenditure would not need to be spent on ensuring service delivery.

Vehicle Modelling Assumptions

78. The following section analyses the assumptions, each of which have been influenced by the findings outlined above, used to create the vehicle replacement programme. The general approach is:

- We will continue to mostly buy used (1 – 3 years old) diesel vehicles;
- We run our vehicles until they are no longer financially and operationally viable. This is likely to be 1-2 years on average less than currently but will depend on the state of each individual vehicle;
- Where financially and operationally viable we will consider electric vehicles;
- Long – term vehicle leasing is not currently financially viable;
- Plant e.g. vehicle attachments and non-registered vehicles included in costings.

Lifetime Costs

79. Lifetime vehicle cost analysis has been conducted to determine the best vehicle replacement option based on financial cost. The lifetime cost assumptions used for the analysis are:

- Capital purchase and fuel/electricity running cost over a 10-year period;
- Average Van Fuel Cost:
    - Diesel: 25 p/Mile;
    - Electricity: 10.5 p/Mile.

80. During 2022 we have seen significant fluctuations in the price of Diesel and Electricity due to the current energy crisis. Therefore, the prices used in the model for the p/Mile estimates are based on the average price of each fuel type during 2022. This means that the costs are higher than those seen pre-crisis in 2021 but are lower than the peaks seen in 2022. This means that the figures are suitable as predictions for lifetime cost analysis over 10 years as it is hard to predict when/if prices will return to levels seen in 2021.

Vehicle Lifespan Assumptions

81. The vehicle lifespan assumptions used are:

- Electric vehicles are assumed to have lifespan of 10 years;
- Batteries are warranted for 8 years;
- Lifespan of diesel vehicles between 10 – 15 years.

82. Table 5 below lists the number of vehicles by vehicle type and the associated estimated lifespan of the vehicle. The estimated lifespans are for the current fleet and not replacement vehicles. The lifespan could be less depending on running costs of the vehicle.

Table 5: Vehicle Modelling Assumptions – Current Fleet Lifespan

Vehicle Type	Sub-Type	Number	Est. Maximum Lifespan Years
RCV	RCV's 26t	21	12
HGV	HGV 16t	1	12
	HGV 7.5t	2	17.5
	HGV 5t	1	15.5
	HGV Special	2	12
Light Vehicles	Van	55	15
	4x4	7	16
Specialist Vehicles	Large Sweeper	6	10
	Tractor	7	15
Small Vehicles	Ride on Mower	15	10
	Small Sweeper	2	10

Maintenance Costs

83. When comparing diesel and electric vehicles the maintenance costs associated with each have been omitted from the lifetime cost analysis. The reason for this is that based on research conducted, it was found that there is no significant difference between conventional and electric vehicles in terms of maintenance costs. Therefore, it would not

provide any benefit to include these costs when comparing the lifetime costs of each fuel type.

Proposed 5-year Vehicle Replacement Programme

84. The following section outlines the proposed rolling replacement programme for each vehicle type within the Council's fleet.

Refuse Collection Vehicles (RCVs)

85. Diesel: A used diesel RCV costs around £165,000. The annual fuel cost is around £15,464.

86. Electric: There are currently electric RCV's available on the market that match the performance requirements of the fleet. A new E-RCV costs around £425,000. The annual fuel cost is significantly cheaper at £6,581.

87. Hydrogen: A hydrogen RCV costs around £500,000. These are available on the market; however, fuel availability makes them currently an unviable option in the South of England.

Table 6: 10 Year Lifetime Cost Comparison

RCV		
	Diesel	**Electric**
Capital Cost	£165,000	£425,000
10yr Fuel Cost	£154,641	£65,807
10yr Total Lifetime Cost	**£319,641**	**£490,807**

Proposed Approach

88. Based on the findings above it is proposed that the Council continue purchasing used diesel RCVs for the next five years. This is because used diesel RCV's are currently the best financial option.

5-Year Replacement Programme Proposal

89. Over the next five years up until the end of 2027/28, eight RCVs are due to be replaced.

90. Table 7 below shows that the RCVs due to be replaced are spread out across the programme with no more than two being replaced in any one year. This helps spread out the financial burden of replacing these large vehicles. The programme also ensures that the Council will have a resilient fleet in preparation for Twin Stream collections in 2025/26 as it will have purchased a number of replacement vehicles around this date.

Table 7: RCVs 5-Year Programme

	23/24	24/25	25/26	26/27	27/28
Diesel RCVs (Used)	1 	2 	2 	2 	1 
Capital Cost	£165,000	£330,000	£330,000	£330,000	£165,000
Food Waste RCVs (New)		7 			
(Possible) Capital Cost		£1,015,000			
Total Cost	**£165,000**	**£1,345,000**	**£330,000**	**£330,000**	**£165,000**

91. In 2024/25 it is anticipated that the Council will have to procure seven Food Waste vehicles in preparation for collections in 2025/26 at a cost of £1,015,000. The Council anticipates that it will receive new burdens funding which will cover the capital cost of the vehicles, however, this is yet to be confirmed. Therefore, the figure has been labelled 'Possible Capital Cost'.

Heavy Goods Vehicles (HGVs)

HGV 7.5 tonne

92. Diesel: A used diesel HGV 7.5t costs around £140,000. The annual fuel cost is around £2,266.

93. Electric: There are currently electric HGV 7.5t vehicles on the market, however, they cost around £230,000. The annual fuel cost is around £964.

94. Hydrogen: There are currently no hydrogen alternatives on the market.

Table 8: 10 Year Lifetime Cost Comparison

HGV 7.5t		
	Diesel	**Electric**
Capital Cost	£140,000	£230,000
10yr Fuel Cost	£22,656	£9,641
10yr Total Lifetime Cost	**£162,656**	**£239,641**

Proposed Approach

95. Based on the findings above it is proposed that the Council purchase a used diesel HGV 7.5t.

HGV 5 tonne

96. Diesel: A used diesel HGV 5t costs around £33,000. The annual fuel cost is around £3,101.

97. Electric: There are currently electric HGV 5t vehicles on the market which cost around £45,000. The annual fuel cost is around £1,320.

98. Hydrogen: There are currently no hydrogen alternatives on the market.

Table 9: 10 Lifetime Cost Comparison

HGV 5t		
	Diesel	**Electric**
10yr emissions	50.6	12.9
Capital Cost	£33,000	£45,000
10yr Fuel Cost	£31,010	£13,200
10yr Total Lifetime Cost	**£64,010**	**£58,200**

Proposed Approach

99. Based on the findings above it is proposed that the Council purchase an electric HGV 5t vehicle. The reason for this is that over a 10-year lifespan the electric HGV 5t is cheaper than a used diesel vehicle. This is because of the savings associated with using electricity rather than diesel to power a vehicle.

5-Year Replacement Programme Proposal

100. As Table 10 shows below, over the next five years, the HGV 5t and HGV 7.5t are due to be replaced.

Table 10: HGVs 5-Year Replacement Programme

	23/24	24/25	25/26	26/27	27/28
7.5t Diesel (Used)				1 	
Capital Cost				£140,000	
5t Electric (Used)			1 		
Capital Cost			£45,000		
Total cost			£45,000	£140,000	

101. The 7.5t vehicle would be replaced in 2026/27 with a used diesel and the 5t vehicle with an electric version in 2025/26.

Specialist Vehicles - Sweepers

102. Diesel: A used diesel sweeper will cost around £80,000. The annual fuel cost is around £4,596.

103. Electric: There are currently electric sweepers on the market, however, they cost £250,000. Due to the sweepers being specialist pieces of equipment, the market for them is small and this means that new technology prices are extremely high.

104. Hydrogen: There are currently no hydrogen alternatives on the market.

Table 11: 10 Year Lifetime Cost Comparison

Sweeper		
	Diesel	**Electric**
Capital Cost	£80,000	£250,000
10yr Fuel Cost	£45,956	£19,556
10yr Total Lifetime Cost	**£125,956**	**£269,556**

Proposed Approach

105. Based on the findings above it is proposed that the Council continue purchasing used diesel sweepers for the next five years.

5-Year Replacement Programme Proposal

106. Over the next five years up until the end of 2027/28, five sweepers are due to be replaced towards the end of the programme.

Table 12: Specialist 5-Year Programme

	23/24	24/25	25/26	26/27	27/28
Sweeper Diesel (Used)				2 	3 
Capital Cost				£150,000	£230,000

Light Vehicles – 4x4s

107. Diesel: A used diesel 4x4 costs around £39,000. The annual fuel cost is around £608.

108. Electric: There are currently no viable electric alternatives on the market due to the low towing capacity of electric 4x4s.

109. Hydrogen: There are currently no hydrogen alternatives on the market.

Proposed Approach

110. Based on the findings above it is proposed that the Council continues purchasing used diesel 4x4s.

5-Year Replacement Programme Proposal

111. Over the next 5 years up until the end of 2027/28, three 4x4s are due to be replaced.

112. It can be seen in Table 13 below that the three vehicles are spread out across the programme with no more than one being replaced each year.

Table 13: 4x4 5-Year Programme

	23/24	24/25	25/26	26/27	27/28
4x4 Diesel (Used)	1 	1 	1 		
Capital Cost	£39,000	£39,000	£39,000		

Light Vehicles - Vans

113. Diesel: A used diesel van costs around £34,000. The annual fuel cost is around £1,546.

114. Electric**:** An electric van costs around £45,000. The annual fuel cost is estimated at £658.

115. Hydrogen: There currently no readily available hydrogen alternatives on the market.

Table 14: 10 Year Lifetime Cost Comparison

Van		
	Diesel	**Electric**
Capital Cost	£34,000	£45,000
10 yr Fuel Cost	£15,458	£6,578
10 yr Total Lifetime Cost	**£49,458**	**£51,578**

Proposed Approach

116. As can be seen in Table 14 above the lifetime cost between a used diesel van and an electric van is only £2,120. This is for a van with average mileage. When looking at high usage vans of which the Council has four, the lifetime cost of an electric van is lower than that of a used diesel.

117. It is anticipated that running diesel vehicles will become more expensive as we near the Government's ban of diesel/petrol vehicle sales in 2030, through different forms of taxation. It is currently hard to quantify this and it has not been included in the lifetime cost analysis. However, when the lifetime costs are as close as seen in Table 14, it is considered that we are at a transition point in technologies for this vehicle type.

118. Therefore, it is proposed that the Council adopted a phased approach with regards to the replacement of the van fleet. This would involve replacing around 50% of the vans with used diesel vehicles and 50% with electric. The reasons for this considered approach are:

- Not committing to a single fuel type e.g. hydrogen may have a future role;
- Phased transition allows us to learn lessons before future phases of procurement;
- Time to upskill Transport Repair Unit (TRU) staff to work on electric vehicles;
- Spread the cost of additional infrastructrue.

119. The speed of transition to electric may increase/decrease depending on the annual reviews of the programme.

5-Year Replacement Programme Proposal

120. The following section provides a summary of the overall proposed rolling programme. Over the next five years up until the end of 2027/28, 27 vans are due to be replaced. Table 15 below shows the split of electric and used diesel van replacements each year

Table 15: Van 5-Year Programme

	23/24	24/25	25/26	26/27	27/28
Van Diesel (Used)	5	3	2	2	
Capital Cost	£155,000	£93,000	£63,000	£58,000	
Van Electric (New/Used)	3	3	3	3	3
Capital Cost	£121,200	£135,000	£118,000	£131,200	£135,000
Total cost	**£276,200**	**£228,000**	**£181,000**	**£189,200**	**£135,000**

121. It can be seen that the proposal is to purchase three electric vans each year and then the remainding vans with used diesel. This means that over the 5-year programme the Council would purchase 12 used diesel vans and 15 electric vans. To aid procurement the electric vans could be either new or used (1-3 years old) depending on what is available on the market at time of replacement.

122. Over the next five years it is proposed that up to 15 light electric vans be purchased. Table 16 below shows that each service has been identified for replacement EV's.

Table 16: Light Vehicle EV Replacement by Service

	23/24	24/25	25/26	26/27	27/28	Total
Building Services	1		1	1		3
Enforcement	1		2			3
Environmental Health		1				1
Public Spaces	1	1		1	1	4
Refuse & Recycling					1	1
Street Cleansing		1		1	1	3

123. Based on early discussions with Heads of Service a roleout of EV vans is relatively simple for each of the service areas except from Building Services. Every service except from Building Services store vehicles over night at either the Depot or another Council owned site. This means that charging the vehicles would be relatively simple.

124. Building Service operatives take their work van home. This means that charging the vehicles is not simple as they would not have any downtime at the Depot site to charge. We currently have identified three vehicles within Building Services that could function as electric vehicles due to the specific nature of the operatives jobs, however, further rollout would require some alternative thinking.

Small Vehicles – Ride on Mowers

125. Diesel: A used diesel mower costs around £30,000. The annual fuel cost is estimated at £2,472.

126. Electric: There are currently electric mowers on the market, however, the range is insufficient for the Council's requirements.

127. Hydrogen: There are currently no hydrogen alternatives on the market.

Proposed Approach

128. Based on the findings above it is proposed that the Council continue purchasing used diesel mowers.

Small Vehicles - Small Sweepers

129. Diesel: A used diesel small sweeper costs around £50,000. The annual fuel cost is estimated at £1,110.

130. Electric: An electric small sweeper costs around £120,000. The annual fuel cost is estimated at £473.

131. Hydrogen: There are currently no hydrogen alternatives on the market.

Table 17: 10 Year Lifetime Cost Comparison

Small Sweeper		
	Diesel	**Electric**
Capital Cost	£50,000	£120,000
10yr Fuel Cost	£11,104	£4,725
Total Lifetime Cost	**£61,104**	**£124,725**

Proposed Approach

132. Based on the findings above it is proposed that the Council continue purchasing used diesel small sweepers.

5-Year Replacement Programme Proposal

133. Over the next five years up until the end of 2027/28, 10 ride on mowers and two small sweepers are due to be replaced.

Table 18: Small Vehicle 5-Year Replacement Programme

	23/24	24/25	25/26	26/27	27/28
Mower Diesel (Used)	4 	1 	2 	2 	1 
Capital Cost	£120,000	£30,000	£60,000	£60,000	£30,000
Small Sweeper Diesel (Used)		1 	1 		
Capital Cost		£50,000	£50,000		
Total	£120,000	£80,000	£110,000	£60,000	£30,000

134. In Table 18 above it can be seen that the two small sweepers are due to be replaced in 2024/25 and 2025/26. The ride on mowers are relatively spread out except for in 2023/24 where there are four due to be replaced.

Mayor's Car

135. Diesel: The mayor's car is currently a Euro 5 diesel engine. Therefore, there are no significant NOx emissions associated with the vehicle. The car is currently 10 years old and could be used for at least another five years. It costs £427 per annum to run the vehicle on diesel.

136. Electric: There are a number of different EV's on the market that could be used as a mayor's car. However, due to the requirements of the service the replacement vehicle would most likely need to be a saloon, as it is currently. The only saloon EVs on the market are upwards of £50,000.

137. Hydrogen: There are currently no viable hydrogen vehicles due to the lack of hydrogen refuelling stations within the area.

Proposed Approach

138. There is currently no need to replace the vehicle as it has not yet reached the end of its useable life. Therefore, there is no financial or operational argument for replacing the vehicle.

Vehicle Replacement Programme Total Costs

139. This section of the report summaries the costs associated with the proposed replacement programme above.

140. Table 19 below shows that the rolling programme involves replacing 41 vehicles with used diesel and 16 with electric. The electric replacements are only where it makes financial/operation sense. The table also includes the cost of 18 pieces of Plant equipment that are due to be replaced during the 5-year programme.

Table 19: 5-Year Programme Proposal Summary: Full Fleet

	RCVs	*Food Waste RCVs	HGVs	Special	Light	Small	Plant
Used Diesel	8	7	1	5	15	12	18
Cost	£1,320,000	£1,015,000	£140,000	£380,000	£486,000	£400,000	£396,500
Electric			1		15		
Cost			£45,000		£640,400		
Totals	£1,320,000	£1,015,000	£185,000	£380,000	£1,126,400	£400,000	£396,500
5-year total	£3,807,900 + *£1,015,000						

141. The estimated total cost of the proposed programme would be £3,807,900 over five years. During the programme it is anticipated that £1,015,000 will needed to be spent on procuring seven food waste collection vehicles. However, this figure has been separated out from the programme total as it is expected that New Burdens funding will cover the capital cost of these vehicles.

142. Table 20 below splits the programme cost year by year. Based on the above the programme would require an annual budget of around £762,000. As mentioned previously, it is anticipated that New Burdens funding will cover the £1,015,000 for seven food waste collection vehicles in 2024/25.

Table 20: Proposed Fleet Programme by Year

	2023/24	2024/25	2025/26	2026/27	2027/28
RCV	£165,000	£330,000	£330,000	£330,000	£165,000
*Food Waste RCVs		£1,015,000			
HGV	£0	£0	£45,000	£140,000	£0
Special	£0	£0	£0	£150,000	£230,000
Light	£315,200	£267,000	£220,000	£189,200	£135,000
Small	£120,000	£80,000	£110,000	£60,000	£30,000
Plant	£78,000	£127,000	£19,500	£97,000	£75,000
Total	**£678,200**	**£804,000 + *£1,015,000**	**£724,500**	**£966,200**	**£635,000**

143. The proposed programme includes the purchase of 16 electric vehicles. Running a vehicle on electricity is cheaper than using diesel. Therefore, the Council would see small revenue savings in fuel cost as it adopts more electric vehicles.

144. Table 21 below shows that as the Council adopts more electric vans each year in line with the proposed plan the revenue savings increase.

Table 21: Revenue Fuel Savings by Year

	2023/24	2024/25	2025/26	2026/27	2027/28	5 Year Fuel Saving
Van	£2,664	£5,328	£7,992	£10,656	£13,320	**£39,959**
HGV 5t			£1,781	£1,781	£1,781	**£5,343**
Total	**£2,644**	**£5,328**	**£9,773**	**£12,437**	**£15,101**	**£45,302**

145. In total the Council would be looking at an estimated fuel saving of £45,302 over the five years.

Infrastructure Requirements

Infrastructure Approach

146. The infrastructure required for the proposed programme has been split into two phases:

- The infrastructure for the first 5-year replacement programme;
- The infrastructure for later programmes.

147. This is deemed to be a considered and phased approach which reflects the proposed replacement programme and service needs. By having two phases it would allow the Council to be flexible regarding the following points:

- Long-term future of the Depot;
- Future fuel types e.g., hydrogen;
- Ensure that we don't over provide;
- Potential future distributed charging network across Borough.

148. When the programme would be reviewed annually these factors would be part of the review to ensure that the Council's approach is up to date and is in line with service need at the time of review.

149. The infrastructure for phase one would be split into two parts:

- Space requirements;
- EV charging infrastructure.

Infrastructure Phase One (Space Requirements)

150. In 2025/26 it is anticipated that food waste collections will begin and to be able to deliver the service a maximum of seven food waste collection vehicles will need to be acquired.

151. The Broadcut Depot site is currently the operating centre for the operator's licence for vehicles 3.5t and above. As these vehicles would be 12 tonnes, they would need to be stored at the Broadcut Depot Site.

152. The current Depot site is already near maximum capacity. This means that reconfiguration of the site would be required to accommodate the new food waste vehicles.

153. One option to be explored is the operation of a partially distributed vehicle fleet. This would involve identifying existing Council sites across the Borough that could be used for the storage of smaller vehicles such as vans.

154. A number of vans are already stored across the Borough at sites such as Osborn Road car park. The Council potentially has capacity at Hook Tip recreation ground which currently stores a number of pieces of grounds maintenance equipment.

Infrastructure Phase One (EV Charging)

155. The second aspect of the phase one infrastructure upgrade focuses on EV charging. The proposed 5-year replacement programme includes 16 electric vehicles.

156. To accommodate EVs at the Depot the electrical capacity at the site would need to be upgrade from 50 KW to 100 KW. The estimated cost of the upgrade is currently £50,000. This figure includes the installation of 6 – 8 vehicle chargers. These chargers would all be installed at the same time.

157. Analysis suggests that 6 - 8 chargers would be sufficient to cover charging requirements for the whole 5-year programme. However, as the proposed programme suggests a phased approach of three EV vans a year, it would mean that each vehicle would have its own charger for the first two years of the programme.

158. This approach would allow the Council to gather real world data which could be used to inform subsequent years of the programme, before the purchase of more EV vans, in case additional chargers are required.

Infrastructure Phase Two

159. Any further electrical upgrades would require a significant capital investment. Therefore, it's prudent to wait until the Depot's configuration requirements are clear before proceeding.

160. Beyond the first 5-year replacement programme, the Council would need to further upgrade the electrical capacity at the Depot site if it was considering a more electrified vehicle fleet. The size of the upgrade would depend on the local network electrical capacity. The timing of an upgrade depends on a number of factors:

- Timing of alternative fuel RCVs;
- Potential role of hydrogen vehicles;
- Potential role of other sites for charging and vehicle storage.

161. As the programme is reviewed annually the specifics of phase two will become clearer as the direction of the vehicle market towards alternative vehicle fuel types becomes clearer.

Proposed Programme Summary

162. The proposed 5-year replacement programme consists of three main aspects.

Vehicle Purchase:

- 57 vehicles to be replaced at a total of £3,807,900:
  - 41 used diesels,
  - 15 electric vans,

- 1 electric HGV 5t.

Running Costs:

- Over the 5-year programme the Council would save an estimated £45,302 on fuel costs by changing vehicle fuel types;
- Other changes to vehicle maintenance and hire costs will be monitored as part of the annual review.

Infrastructure Upgrade:

- Phase one upgrade £50,000 – first 5-year programme;
- Phase two upgrade significant cost – future programmes (detailed cost is dependent on future approach).

163. The £3,807,900 figure is the anticipated minimum cost of replacing the vehicle fleet over the next 5 years as each vehicle comes to the end of its useable life. The identified replacement vehicles have been chosen based on the requirement that they are the most viable financial option. The addition of a number of electric vehicles would incur an infrastructure cost of £50,000, however, the majority of this would be covered by the revenue savings that occur from operating electric vehicles.

Proposed Annual Updates

164. Due to the fast-changing nature of the vehicle industry it is proposed that annual updates to the 5-year rolling programme take place.

165. This is to reflect changing:

- Depot requirements;
- Service changes;
- Infrastructure requirements;
- Legislation and guidance;
- New and used vehicle market;
- Availability of spare parts;
- Market volatility e.g., fuel prices;
- Electrical network capacity.

166. By having annual updates to the programme, the Council can ensure that it has an up to date and dynamic vehicle replacement programme. This ultimately will ensure that the Council is in control of its vehicle expenditure, has service resilience, and can meet service need efficiently.

167. To aid annual updates, officers are working to improve data gathering by recording the number of vehicles off the road throughout the year and are looking to be able to attribute repair costs to specific vehicles on the Council's finance system.

168. These measures should quantify the effect the programme has had and will also provide more data that can be used to aid the Transport Manager when making decisions on when vehicles need replacing.

Conclusion

169. In conclusion, this paper presents a proposed 5-year vehicle replacement programme at a cost of £3,807,900. The programme has been designed around the assumption of only replacing vehicles when they have reached the end of their life. The criteria used for identifying replacement vehicles is that they are the best financial option available to the Council while also ensuring that they meet service requirements.