

17 December 2020

Report of	Assistant Director Environment	Author	Rosa Tanfield Tracy Allen 2256
Title	Fleet Transition Forward Plan		
Wards affected	Not applicable		

1. Executive Summary

- 1.1 This report is to set out the programme for the transition of the Council's diesel fleet to a zero-carbon fleet by 2030. This is in line with the Council's commitment to tackle the climate emergency as set out in the Climate Emergency Action Plan and to be carbon neutral by 2030.
- 1.2 By 2030 the Council's ambition is to transition to a fully electrified fleet. During this ten-year programme diesel vehicles will be replaced where viable with electric vehicles (EV), but other options may be considered such as hybrid alternatives.

2. Recommended Decision

- 2.1 To note the content of the report, the recommendations made, and endorse the rolling programme of EV or hybrid replacement as diesel vehicles come to the end of their recommended life span (or earlier where financially and operationally viable).

3. Reason for Recommended Decision

- 3.1 One of the key priorities of the strategic plan for 2020 – 2023 is tackling the climate challenge and leading sustainability. A key element is to reduce carbon emissions to help achieve a net zero carbon footprint by 2030, and to improve air quality across Colchester.

4. Alternative Options

To develop and deliver an alternative timeframe for the transition of the Council's fleet from diesel to EV.

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5. Introduction

- 5.1 On 17 July 2019, Colchester Borough Council declared a climate emergency, acknowledging that urgent action is required to mitigate the impact of climate change. One of the key priorities of the strategic plan 2020/23 is tackling the climate challenge and leading sustainability. A key element is to improve air quality and reduce the Council's direct carbon emissions and achieve a net zero carbon footprint by 2030.
- 5.2 The Climate Emergency Action plan identifies the Council fleet as accounting for 1,384 tonnes of Scope 1 emissions in 2019/20 which is approx. 22% of its total emissions for that year. As the grid continues to decarbonise and purchased electricity becomes 'greener' emissions from the Council's fleet will become an increasingly larger portion of the overall footprint. An action from the Plan is to take a phased approach to renewal of the fleet as new technologies and associated infrastructure becomes available.
- 5.3 The Council is working with the Carbon Trust to develop a detailed Carbon Management Plan. As a result of the potential for change over a 10-year period this plan is likely to be set out in phases with incremental milestones setting a clear pathway to the net zero target over 10 years. Phase 1 covering the next 3-5 years will contain the detail of projects, impact on emission targets and funding implications (see separate report on Carbon Management Plan). The timeline for fleet replacement will be included in the wider footprint work to be covered in the Carbon Management Plan timeline.
- 5.4 This report sets out the strategy for achieving this transition and has been supported with expert advice from the Energy Savings Trust (EST) who have assisted the development of this programme. They have provided detailed reports, extracts of which are provided within this document.
- 5.5 This report will set out:
1. The Council's current fleet
 2. The fleet transition strategy
 - a. The principles
 - b. Short/immediate plans (2020 and 2021)
 - c. Medium term plans (2022 to 2025)
 3. Development of the strategy

6 The Council's current fleet

- 6.1 The Council's fleet is used to deliver a range of important and front-line services, including Neighbourhood Services (street cleansing and maintenance, country park operations, refuse, recycling and trade collections), Pest Control and the Helpline Service. All of which relate to fulfilment of statutory duties.
- 6.2 The Council has a responsibility to ensure that all fleet complies with national standards, is adequate in terms of capacity, reliable, and is fit for purpose to deliver against the agreed outcomes for the service.
- 6.3 The Council's full fleet is listed below (except for North Essex Parking Partnership - NEPP)

Table 1: Council's Full Fleet, Lifespan and Replacement*

Vehicle Type	Vehicle Count	Purchase/Lease date	Estimated Life Span	Replacement Due Date
3.5t van	1	2007 (purchase)	5 years	Not to be replaced

Refuse Collection Vehicles (RCV)	2	2018 (used vehicle purchase)	4 years	If it can be supported by infrastructure
Food vehicle	1	2020 (used vehicle purchase)	3 years	If it can be supported by infrastructure
JCB	2	2020 (lease)	3 years	2023
Refuse Collection Vehicles (RCV)	27	2018/2019 (purchase)	7 years	2025
Sweepers	6	2019 (purchase)	7 years	2026
Food Vehicle	7	2020/2021 (purchase)	7 years	2027
Caged tippers	21	2021 (purchase)	7 years	2028
4x4	2	2021 (purchase)	7 years	2028
Medium Vans	3	2021 (purchase)	7/10 years EV	2028
Small van/car	12	2021 (purchase)	7/10 years EV	2028
Small van/car	4	2021 (purchase)	7/10 years Hybrid	2028

*Note, NEPP's contract runs until 31/03/2022, and a project will soon be in place to review the new arrangements with Essex County Council. Once these decisions have been made NEPP intends to move to EV for its car and van fleet, being able to sell the ICE (Internal Combustion Engine – Petrol/Diesel/Gas) cars and vans it owns, to move quickly to a new cleaner, greener fleet.

7. The Fleet Transition Plan

7.1 The Council has an ambition to transition all its current fleet to EV by no later than 2030. In order to achieve this aim, this strategy sets the following objectives:

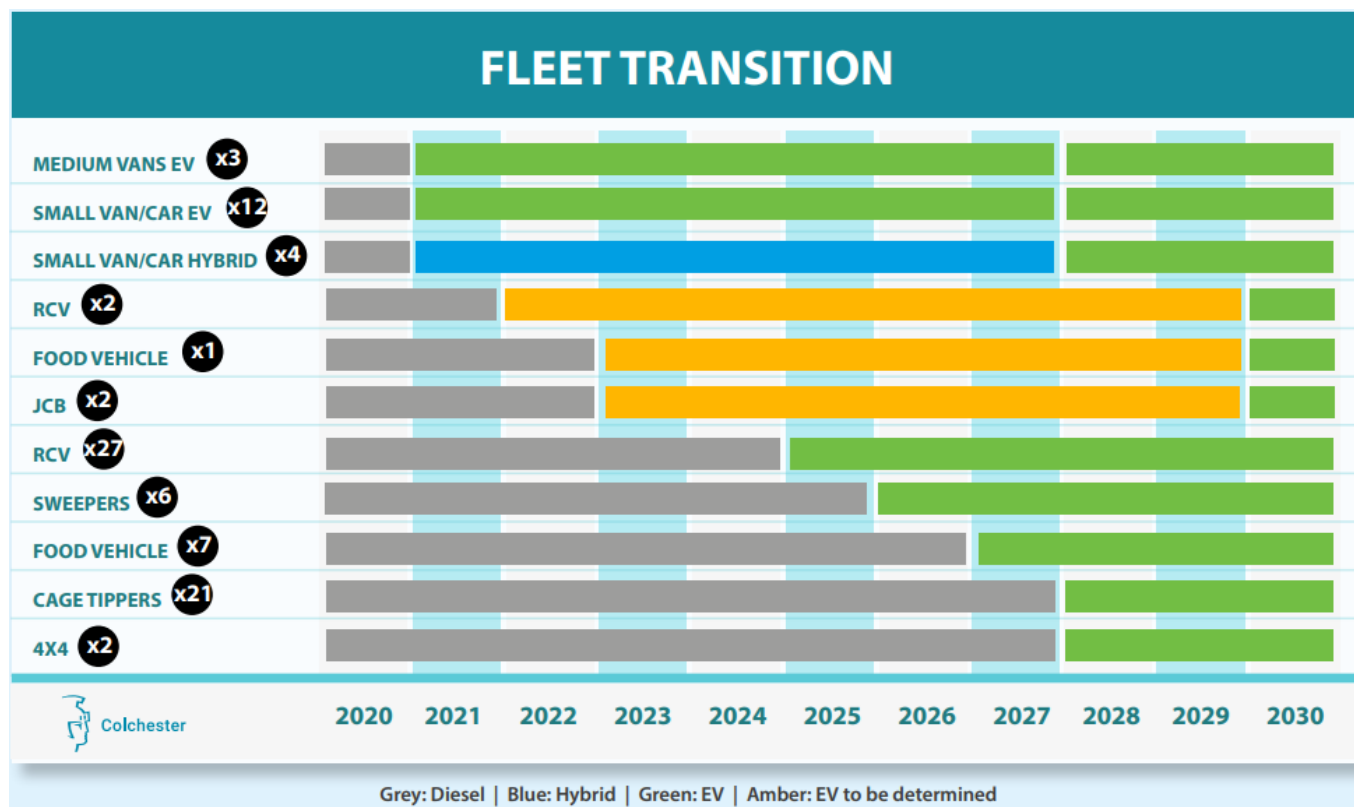
- Make effective and robust informed decisions
- Ensure efficient and effective fleet management
- Improve and future proof service delivery
- Enhance fleet performance

7.2 It is proposed that as the Council formulates its transition from diesel to greener fleet options, the following principles are agreed and considered at each stage and during the procurement process:

- Review the data systems in place to track, monitor and evaluate the fleet
- Undertake robust evaluation of operational need and financial viability
- Challenge the number and size of vehicles
- Explore both lease hire and purchasing options, considering existing budgets
- Base decisions on expert recommendations and guidance

7.3 In assessing each stage of transition, the following factors will be considered on a case by case basis to ensure an effective (operational, financial and environmental) replacement of an ICE vehicle to EV:

- typical daily journey and load – longest daily trip, maximum load
- single-charge range – ideally avoiding charging during the day
- carrying capacity – seats in cars, weight and volume in vans
- whole life cost (WLC) – cost over the operational lifetime (investment and operating the vehicle)
- grant funding available – funding to cover cost difference



Phase 1 - Short term plans (2020 and 2021)

7.4 The Council has, in the current financial year, followed the principles outlined above and committed to vehicle replacements, as summarised below:

Food waste vehicles

7.5 During the recent Food Waste Vehicle procurement, Officers investigated the potential of procuring low emission / electric food waste vehicles. Unfortunately, there were no electric food waste specific vehicles being manufactured at that time. Therefore, there was no operational impact assessment that could be made in relation to the use of electric food waste vehicles or their associated costs. In pursuit of the best practicable environmental option, Cabinet agreed on 11 March 2020 to the recommendation of procuring food waste replacement fleet with the latest Euro VI engines. This ensured cleaner fuel technology and reduced CO² emissions, which falls under the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles.

Caged tipping vehicles

7.6 Low emission/electric caged tipping vehicles have been considered. At the time of the report to Cabinet on 14 October 2020 the market for these vehicles in an electric format was restricted, making it operationally unviable and cost prohibitive compared to the Euro

VI diesel engine equivalent. The costs associated with EV vehicles were estimated to be 200% higher compared to a Euro VI diesel engine equivalent, resulting in a potential £95,000 annual budget pressure. The Energy Savings Trust recommended the Council undertake one more procurement of Euro VI engines for this section of fleet and at the end of that period, electric vehicle technology, cost and viability will have improved.

EV transition –Small Fleet Vehicles

- 7.7 On 23 November 2020, Cabinet agreed that it would be operationally and financially viable to initiate the first phase of transition to a low carbon fleet, by agreeing the recommendation to procure 15 EV's, 4 hybrid and 2 diesel vehicles, from a fleet of 21 small fleet vehicles. The reasons for the hybrid and diesel purchase are set out below.
- 7.8 The Helpline service, covers North East Essex (Colchester and Tendring) on a twenty-four-hour basis. It is a critical service for vulnerable members of the community. To deliver this service, the fleet needs to provide absolute reliability and certainty. Having considered usage and vehicle charging times in relation to demand and call outs, there is a risk that reliance on fully electric vehicles may jeopardise service resilience and response times. For this reason, hybrid vehicles are being recommended that better match operational need at this time and which will provide a significant improvement on the current diesel vehicles in terms of environmental performance.
- 7.9 Neighbourhood Services operate two Land Rovers supporting operations in Castle Park and Highwoods Country Park. At this time there are no viable electric or hybrid 4x4 pick-up truck alternatives and as such it is proposed to procure replacement combustion engine vehicles to the latest emission standard. Should these vehicles be purchased through the procurement process they will be subject to continual review and earmarked for replacement as the EV market for 4x4 pick-ups develops.

EV Charging Infrastructure

- 7.10 Rowan House has been identified as the best location for the installation of the infrastructure for the small fleet procurement, as the Shrub End depot requires significant electrical supply investment and infrastructure. Rowan House was pre-surveyed earlier in 2020 and it is believed that the required 20 chargers will be achievable. The works will cost £114,000 and it is anticipated that £14,000 will be secured through the Office for Low Emission Vehicles (OLEV) workplace charging grant scheme for the charging units. This is currently going through the procurement process.

Phase 2 - Medium term plans (2022 and 2025)

- 7.11 The following sets out the impact and recommendations on the transition to EV for each of the following:
- Small fleet – any 3.5tonne or smaller vehicles
 - Heavy Commercial Vehicles 7.5 tonne and above
 - Infrastructure requirements

Small fleet – any 3.5tonne or smaller vehicles

Vehicle Type	Vehicle Count	Replacement Due Date	Propose replacement to EV
JCB	2	2023	Undertake review (dependent on EV infrastructure)
Sweepers	6	2026	Undertake review

Cage tippers	21	2028	Undertake review
4x4	2	2028	Undertake review
Medium Vans EV	3	2028	Already EV
Small van/car EV	12	2028	Already EV
Small van/car Hybrid	4	2028	Undertake review

7.12 Electrification of the small fleet set out in the above table (excluding JCB and Sweepers, which are deemed as plant and referenced in paragraph 8.6) would reduce the CO₂e produced by this fleet by approximately 38%.

7.13 The following table gives an indicative comparator of the capital costs for purchasing the vehicles.

Vehicle type	EV	Diesel
3.5t van	£60,000	£28,000
Car/small van	£25,000	£13,000
Sweeper	£213,750	£66,500

7.14 The total revenue implication would be an increase of c.£101,000 a year, based on a 5-year replacement cycle model, as opposed to the Council's current 7-year replacement programme. This revenue impact would need to be further analysed at each stage of the transition.

7.15 In terms of maintenance, EVs have many fewer moving parts and as a result, service costs are lower (experience to date in car and van fleets suggests at least 30% to 40% lower) and reliability is higher.

7.16 EVs have lower energy (fuel) costs; a typical electric car or small van, charged overnight on a standard tariff, costs no more than £0.04/mile or about one third the comparable ICE cost. Using off-peak tariffs EV energy costs can be as low as £0.02/mile.

7.17 Whilst replacing the fleet now would generate a reduction in CO₂e emissions, by 2030 the grid will be considerably cleaner than it is today and so it is estimated emissions from a fully electric fleet charged by the grid by 2030 would be nearer to 90%.

7.18 Small and medium EV vans (up to two tonnes) offer a lifetime cost-saving alternative to ICE equivalents. But 3.5 tonne electric vans are currently expensive, have a limited range and a limited carrying capacity.

7.19 Between 2022 and 2025 it is expected that 3.5 tonne vans will become available with a single-charge range of at least 150 miles under full load and with a good towing capacity. They will have a whole life costs comparable to or better than ICE models.

7.20 RECOMMENDATION: Replacement of these vehicles to EV will not be undertaken until after 2022 at least and is dependent on EV infrastructure discussed further below.

Heavy Commercial Vehicles 7.5 tonne and above

Vehicle Type	Vehicle Count	Replacement Due Date	Proposed replacement to EV
Refuse Collection Vehicle	2	2022 (to be replaced?)	If it can be supported by infrastructure

Food Waste Vehicle	1	2023	If it can be supported by infrastructure
Refuse Collection Vehicle	27	2025	Undertake review
Food Waste Vehicle	7	2027	Undertake review

7.21 27 Refuse Collection Vehicles have been replaced by the Council within the last 2 years, meaning that the fleet is very modern and only the five “back-up” vehicles do not comply with the latest Euro VI (trucks) emission standards.

7.22 The following table gives an indicative comparator of the capital costs for purchasing the vehicles.

Vehicle type	EV	Diesel
Refuse Collection Vehicle	£380,000	£170,000
Food Waste Vehicle	£135,000	£70,000

7.23 Based on the data available it is estimated a 27 electric fleet would provide a revenue saving of £612,377 over a ten year period (£61,237 per year) but this estimation is very sensitive to factors such as the diesel price, introduction of a carbon tax, road pricing, diesel Euro VI CAZ charges and significant reductions in the off-peak cost of electricity including occasional negative pricing and local private-wire generation. However, the diesel vehicles still cost nearly £200,000 less to procure than the electric vehicles. In addition, the key dependency to delivering an effective transition to EV is establishing the available power supply and current baseline usage at each site where change is planned. This is discussed further below.

7.24 As with the sub 3.5t fleet the same typically applies to electric RCVs (eRCV) that when the operational life is optimised, they are usually no more expensive to buy and operate than diesel vans, when assessed from a WLC perspective.

7.25 Most of the fleet is not due for replacement until 2025/26 at which time the whole fleet could be switched to EV, which should reduce CO₂ emissions of the fleet by at least 80% (570 tonnes per year) depending on the UK grid carbon intensity at that time.

7.26 RECOMMENDATION: From 2022 replacement of 7.5 tonne and all other HCV's should proceed as models become available, and dependent on EV infrastructure discussed further below.

EV Infrastructure requirements

7.27 A key determinate of the success of the strategy is the provision of electricity. Whilst under Phase 1 a solution is in place and electricity will be provided at Rowan House, if the entire fleet (small fleet and heavy commercial vehicles) is moved to EV, the capacity required will not be sufficient at Shrub End Depot.

7.28 Investment is set aside under the capital works programme to improve the Shrub End Depot site. This includes initial ‘future proofing’ site works which will include installing trunking beneath the car park resurface in preparation for installation of infrastructure for EV charging points. The charging points will be required for 2024 in advance of the next RCV procurement for 2025. CBH are project managing the Shrub End Redevelopment Programme and are currently scoping the power supply capacity and associated costs for the required infrastructure. The cost implications and timeframe for the installation of the

infrastructure required are being explored and researched with UK Power Networks. It is currently indicated that to access a power supply with capacity to charge the entire fleet, a separate substation will be required. Early market testing indicates the estimated cost at this stage to be at least £500,000. Other alternatives and options that will be considered, include:

- Installing onsite battery storage
- Charging some of the fleet at other council sites
- Smaller vehicles charged at employee homes, if practicable
- Power Purchase agreement (e.g. By installing an EV Canopy over the Depot, the Council would be able to wrap the cost of the proposed substation into a long term (25 year) Power Purchase Agreement and any excess power would be utilised by the contractor and exported to local green energy customers (both Domestic and Commercial). The contractor will have an investment grade proposition ready to go and could make the site a local renewable generation facility without impacting normal site operations.

7.29 RECOMMENDATION: Planning for the infrastructure requirements are initiated immediately with all options properly explored and considered.

Development of the Strategy

7.30 The EV sector, technology, learning, research and development is moving at a fast pace and is ever evolving. This requires officers to keep well informed and as such it is the intention to remain engaged with the Energy Savings Trust to inform, advise and provide expert guidance and recommendations. As a result, this strategy will need to be reviewed and adapted to ensure that Council maintains a relevant fleet strategy.

7.31 In order to ensure the strategy is underpinned by well informed decisions, it is proposed that the following is undertaken:

- Careful monitoring of new electric vehicles as they join the fleet
This will allow the estimate of future demand to be refined and a strategy developed long before the whole fleet has switched to electric power. All Council EVs should all be equipped with on-board telemetry that is “EV-aware” and can report battery state of charge as well as total kWh received from charge points and distance travelled. This data needs to be linked to good fleet data management systems.
- Purchasing of a fleet data management system
The energy consumption and energy efficiency data captured and used as a basis for review and validation.

7.32 The Council will also continue to invest and action other measures to mitigate environmental impact across its fleet operations and bring more certain carbon saving through the use of its fleet. These include:

- Plan more efficient routes to reduce emissions from fleet
- Driver training for fuel efficiency
- Closer monitoring of driver performance indicators (safety and fuel efficiency)
- Better use of fleet telematics to improve driving efficiencies (e.g. reducing idling)
- Closer monitoring of fuel consumption performance
- Better use of E-cargo bikes
- Sourcing grant funding opportunities for all activities

8 Summary of EST recommendations

- 8.1 The following sets out a summary of the recommendations from the Energy Savings Trust as described above, in this strategy.
- 8.2 The Council should actively pursue the option to implement an electric refuse fleet when the current fleet is due for replacement. The whole fleet should then be changed using a phased introduction, which should ensure a smooth transition to zero emission operation. This has significant implications for the charging infrastructure at CBC's properties.
- 8.3 We have assumed in making this recommendation that any potential issues in power supply are resolved by 2026. If it cannot, CBC should explore its options such as adding additional sites and capacity or even consider allowing appropriate (smaller) vehicles to be taken home, in order to free up capacity at its own sites for the larger vehicles. We also recommend CBC revisit the modelling nearer the point they wish to replace the fleet, to take into account any developments in the market. Based on the data made available, it is expected that by 2025 and at the latest 2027, a viable, cost-neutral or cost-saving EV option will be available for all of the vehicle types currently in use at CBC.
- 8.4 An electric RCV (eRCV) costs about £380,000 while an electric 3.5t van currently costs about £60,000 and a car about £25,000 so five electric 3.5t vans or nine cars would cost £300,000 and £325,000 respectively – so on balance, CBC can achieve a slightly better return on investment by replacing more of the smaller vehicles for less overall expenditure for the same carbon saving.
- 8.5 However, given the total CO₂e produced by the RCV fleet, unless CBC does tackle the RCV fleet it is only taking account of 40% of its transport emissions. So, we would suggest that CBC (if replacement cycles allow,) target the smaller vehicles for replacement first and then once these have been successfully electrified, target the larger fleet beginning with RCVs. We would suggest that planning for the RCV to be replaced by eRCVs begins now, as electrifying the whole fleet will have significant impact on the electricity supply needed, and how/where it is supplied.
- 8.6 CBC should actively pursue the option to implement electric vehicles across the rest of the fleet before attempting to adopt electric items of plant such as sweepers, unless they are able to obtain grant funding offset the addition cost. For the smaller items of plant, CBC needs to begin to collect mileage and fuel data, so that a whole life cost analysis can be performed on the electric alternatives.
- 8.7 Electric vehicles are significantly more energy efficient than internal combustion engine (ICE) vehicles and we estimate that the energy use (MWh) of an all-electric fleet will be at least 75% less than the equivalent ICE fleet. An all-electric CBC fleet charged from the UK Grid in 2030 will reduce CBC transport energy use by 75%, energy costs by 73% and GHG emissions by 91%.

9. Environmental and Sustainability Implications

- 9.1 Keeping EVs for longer does not have a negative impact on either Green House Gas emissions or air quality, which is the opposite of what occurs with older, internal combustion engine vehicles. Research suggests that electric vehicles are also more reliable and enjoy fewer maintenance issues.

- 9.2 The fleet contract will include obligations on the contractor to ensure that the Council is kept informed about the latest environmental technology innovations.
- 9.3 The Council will constantly investigate and identify alternative options to improve the environmental impacts of the Council's fleet and will seek opportunities to trial new technology in line with the net-zero Carbon target.
- 9.4 Any replacement diesel Heavy Goods Vehicles (vehicles over 3.5 tonne) will have the latest Euro VI engines. This will ensure cleaner fuel technology and therefore this will reduce CO² emissions, which falls under the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles.

10. Financial implications

- 10.1 The EV sector is developing fast. By 2025 EVs could be less expensive to buy than their ICE equivalent because the EV will not need expensive emission and "light-weighting" technology to meet challenging new emission targets. Over this time the cost of batteries will continue to fall, and their energy density will increase. Affordable battery cars and small vans with a single-charge range of 250 miles or more will become the norm.
- 10.2 If vehicles are purchased rather than leased, they can be sold to make way for the EV's as soon an operationally viable model becomes available. Alternatively, deferring purchases or entering into short term leases may allow the switch to electric to be made earlier when vehicles become available later in the decade.
- 10.3 The EV charging infrastructure at Rowan House is subject to a separate Capital Investment Programme bid and there will be associated revenue impact for the hosting, back-office support and on-going maintenance of the charging units. These costs are estimated at £10,400 per year but vary per supplier and will be identified and costed fully during the procurement process.
- 10.4 The full costs associated with the infrastructure required for the Shrub End Depot EV Charging points are currently unknown but indicative costs are at least £500,000. The costs and power capacity are currently being explored and researched.
- 10.5 To support the recommendations in this report additional revenue costs are to be explored for the installation of a telematics and fleet management system. It is estimated that a telematics/tracking system will cost in the region of £10-15,000 per year and a fleet management system will cost in the region of £20-30,000 dependent on the specification.

11. Equality, Diversity and Human Rights implications

- 11.1 The relevant Equality Impact Assessment for the Council's Procurement Strategy can be found [HERE](#)
- 11.2 Through the Council's procurement strategy, officers will ensure that all procurement and purchasing documentation recognises, understands, and supports the Council's policies with regards to equal opportunities, diversity and human rights.

12. Strategic Plan References

- 12.1 Fleet operations are a key element of the way the Council delivers its services to residents and businesses and therefore underpins much of the activity that will deliver against the strategic priorities. Fleet operations within the context of the Council's 'Climate Challenge and Sustainability' Strategic Priority are considered within section 9 of this report.

13. Consultation

- 13.1 Frontline staff and service managers involved in the operational management of core services that require fleet vehicles have been consulted and will continue to be involved at all stages of the procurement and selection process to ensure that vehicles are fit for purpose and appropriate.
- 13.2 Demonstration EVs have been tested with teams and the feedback received was extremely positive. Drivers will experience a calmer driving experience in new quieter vehicles with less vehicle downtime due to the reduction in engine components.

14. Publicity Considerations

- 14.1 The introduction of EV and hybrid fleet vehicles is a demonstration of the Council's commitment to tackling the Climate Emergency and demonstrates positive progress on the journey to being net zero carbon for Council operations by 2030.
- 14.2 The vehicle fleet underpins many of the Council's core frontline teams and is a highly visible asset out in communities supporting services that benefit residents, local businesses and visitors to Colchester.

15. Health, Wellbeing and Community Safety Implications

- 15.1 These new vehicles should contribute to staff wellbeing as the vehicles will be more reliable meaning less downtime in fulfilling daily duties. They are also quieter which creates a more comfortable and relaxing driving experience.
- 15.2 Most of the small fleet will be electric with additional hybrids reducing the Council's carbon footprint. This will improve air quality and reduces air pollution leading to better health of workers and residents supporting improved wellbeing outcomes.

16. Health and Safety Implications

- 16.1 The Council has a corporate responsibility to ensure that all fleet and transport operations comply with national standards.

17. Risk Management Implications

- 17.1 The Council will seek to mitigate against any potential risks by following the compliant procurement process and ensure contingency plans are in place for any failure of vehicles that may impact on core services.
- 17.2 Without these vehicles it would make it difficult for the Council to undertake its duties under the Environmental Protection Act 1990 and the Clean Neighbourhoods and Environment Act 2005.