Colchester City Council

Environment and Sustainability Panel Meeting

Grand Jury Room, Town Hall, High Street, Colchester, CO1 1PJ
Thursday, 21 March 2024 at 18:00

The Environment and Sustainability Panel explores methods of conservation of natural habitats and biodiversity through adapting existing practices or creating new ecologically diverse environments. The Panel encourages renewable energy generation and carbon footprint reduction in both the public and private sectors by examining air and water quality, plastic and waste reduction and renewable energy generation. The Panel monitors

the progress and implementation of the Council's Emergency Climate Action Plan and regularly reports to Cabinet and Full Council.

Access to information and meetings

You have the right to attend all meetings of the Council, its Committees and Cabinet. You also have the right to see the agenda (the list of items to be discussed at a meeting), which is usually published five working days before the meeting, and minutes once they are published. Dates of the meetings are available here: https://colchester.cmis.uk.com/colchester/MeetingCalendar.aspx.

Most meetings take place in public. This only changes when certain issues, for instance, commercially sensitive information or details concerning an individual are considered. At this point you will be told whether there are any issues to be discussed in private, if so, you will be asked to leave the meeting.

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Access

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Environment and Sustainability Panel - Terms of Reference (but not limited to)

1. To acknowledge our “Climate Emergency” and translate aspirations into actions.

2. To explore methods of conservation of natural habitats and biodiversity, whether through adapting existing practices and places or creating new ecologically diverse environments with sustainable practices built in.

3. To engage, communicate and collaborate with strategic partners, external bodies, Parish Councils and local communities, to encourage biodiversity enhancement and sustainable practices through their work.

4. To encourage environmental stewardship focusing on carbon footprint reduction by improving air quality, water quality, plastic and waste reduction and renewable energy generation in both public and private spheres across the City.

5. To be a leading voice for environmental sustainability, promoting innovative environmental practices, having influence across the City and beyond, including public and private sector policy, at regional and national levels.

6. To promote, monitor and regularly report to Cabinet and Full Council upon progress and implementation of the Council’s Climate Emergency Action Plan and it's goal to be net carbon neutral by 2030.

COLCHESTER CITY COUNCIL
Environment and Sustainability Panel
Thursday, 21 March 2024 at 18:00

The Environment and Sustainability Panel Members are:

Councillor Steph Nissen	Chairman
Councillor Tracey Arnold	Deputy Chairman
Councillor Molly Bloomfield	
Councillor Pam Cox	
Councillor Paul Dundas	
Councillor Andrew Ellis	
Councillor Mark Goacher	
Councillor Sue Lissimore	
Councillor Venessa Moffat	
Councillor Natalie Sommers	

The Environment and Sustainability Panel Substitute Members are:
All members of the Council who are not Cabinet members or members of this Panel.

AGENDA
THE LIST OF ITEMS TO BE DISCUSSED AT THE MEETING
(Part A - open to the public)

Please note that Agenda items 1 to 6 are normally dealt with briefly.

Live Broadcast

Please follow this link to watch the meeting live on YouTube:

(107) ColchesterCBC - YouTube

1 **Welcome and Announcements**

The Chairman will welcome members of the public and Councillors and remind everyone to use microphones at all times when they are speaking. The Chairman will also explain action in the event of an emergency, mobile phones switched to silent, audio-recording of the meeting. Councillors who are members of the committee will introduce themselves.

2 **Substitutions**

Councillors will be asked to say if they are attending on behalf of a Committee member who is absent.

3 **Urgent Items**

The Chairman will announce if there is any item not on the published agenda which will be considered because it is urgent and will explain the reason for the urgency.

4 **Declarations of Interest**

Councillors will be asked to say if there are any items on the agenda about which they have a disclosable pecuniary interest which would prevent them from participating in any discussion of the item or participating in any vote upon the item, or any other registerable interest or non-registerable interest.

5 **Minutes of Previous Meeting**

The Councillors will be invited to confirm that the minutes of the meeting held on 8 February 2024 are a correct record.

Environment and Sustainability Panel draft minutes 8 February 2024 7 - 18

6 **Have Your Say! (Hybrid Council Meetings)**

Members of the public may make representations to Council meetings on any item on the agenda or any other matter relating to the business of Council. This can be made either in person at the meeting or by joining the meeting remotely and addressing the Council via Zoom. Each representation may be no more than three minutes. Members of the public wishing to address Council remotely may register their wish to address the meeting by e-mailing democratic.services@colchester.gov.uk by 12.00 noon on the working day before the meeting. In addition, a written copy of the representation should be supplied for use in the event of technical difficulties preventing participation at the meeting itself.

There is no requirement to pre-register for those attending in person.

7 **Ferry Marsh Nature Reserve Improvements** 19 - 34

The Committee are invited to review the report and recommend to Cabinet that it approve the changes to Ferry Marsh Nature Reserve as set out in the report.

8 **Air Quality Update** 35 - 40

The Committee are invited to note and support the the work being undertaken to improve air quality in Colchester, and to support staff in their negotiations with Essex County Council to obtain necessary permissions to take projects forward.

9 **Sustainable Travel Projects Update** 41 - 52

The Committee are invited to support the work of the Sustainable Travel Team in working with the County Council and partners to deliver infrastructure and projects to enable travel behaviour change. Further to this the Committee are invited to support the progress being made by the City Council in delivering the key goals and outcomes for sustainable travel in Colchester.

10 **Colchester City Council Fleet Transition Strategy** 53 - 92

The Committee are invited to review the report and recommend to Cabinet the strategy with any additional comments and changes as agreed by the panel.

11 **Work Programme 2023-2024** 93 - 96

The Committee are invited to note the contents of the work programme for 2023-2024.

Part B
(not open to the public including the press)

Environment and Sustainability Panel

8 February 2024

Present:	Councillor Steph Nissen (Chair) Councillor Tracey Arnold (Deputy Chair) Councillor Pam Cox Councillor Paul Dundas Councillor Andrew Ellis Councillor Mark Goacher Councillor Sue Lissimore Councillor Natalie Sommers
Substitutes:	Councillor Michael Lilley for Councillor Molly Bloomfield Councillor Sam McCarthy for Councillor Venessa Moffat
Also present:	

114. Minutes of the previous meeting

RESOLVED that: the minute of the meetings of 6 December 2023 be confirmed as a correct record.

The Panel noted that since the previous meeting work had been carried out to promote energy efficiency grant funding to residents. Consideration was being given to additional promotional work which could take place, and the Council's social media channels had been used to promote the Home Upgrade Grant in particular.

115. Have Your Say!

Martin Pugh attended the meeting remotely and addressed the Panel in accordance with the Council's Have Your Say! arrangements. A letter had been sent by 17 naturalist experts via email on 5 January 2024, and Panel members were urged to check whether they had received this. The letter sought to demonstrate that Middlewick Ranges had been included erroneously in the Local Plan and that the site was not only of local importance, but also of national importance. The site was home to a huge number of invertebrate species, and 167 of those were rare or threatened, and recent studies had shown that Middlewick represented 10% or more of acid grassland in Essex, and was in fact the largest open area of acid grassland in the country. Mr Pugh suggested to the Panel that in relation to the Council's Climate Emergency Action Plan, Middlewick constituted a very valuable carbon store, and the development of the site would release an astronomical amount of carbon into the atmosphere – had any consideration been given to this consequence of including the site in the Local Plan?

Mr Pugh believed that including Middlewick Ranges in the Local Plan set a dangerous precedent for other local authorities and developers by suggesting that wildlife sites were ‘fair game’ for such use. Local wildlife sites had been devalued and local and national expert opinions on them had been disregarded in favour of commercial consultants. Now that the science which had supported the inclusion of the site in the Local Plan had been debunked, would the Panel lend its support to the local campaign which sought to get Middlewick removed from the Local Plan all together?

Mel Rundle, Head of Sustainability, responded to Mr Pugh and explained that since the previous meeting of the Panel when he had requested an additional ecological report, she had spoken with colleagues in the Council’s Planning Team who had advised that the Council had engaged with the Colchester Natural History Society to recommend an indepdnednt ecologist to provide a survey. This work would commence in the spring and the ecological report would be publically available if completed.

Mr Pugh welcomed the production of such a report, but remained concerned that the science which had suggested that it was possible to move wildlife from Middlewick to another location had been discredited, and a further delay of another year or so would give developers the opportunity to purchase the site. It was suggested that a desk-based assessment of all the evidence which had already been provided was carried out, as this would allow the use of site to be re-considered much more speedily. The Chair of the Panel would make this suggestion to the Council’s Planning Team on Mr Pugh’s behalf.

Steven Vince attended the meeting and addressed the Panel in accordance with the Council’s Haye Your Say! arrangements. He was visiting the Panel to once again ask that the Council cease its unlawful practices in respect of Village Green 241 in West Mersea. He alleged that Colchester City Councillors had tried to stop him expressing his views, but he would not be silenced. There were 16 illegal parking spaces on the green, which he believed earned the Council up to £1m a year in revenue, which was unlawful. He called on the Panel, Councillors and Officers to take action to stop the unlawful practice of charging for the use of a village green and to restore the good name of the Council. He noted that he had been promised a reply to his request in September 2023, but was still waiting for this.

Responding to Mr Vince, the Chair of the Panel advised him that any concerns which he had about the conduct of Colchester City Councillors should be reported to the Council’s Monitoring Officer. She also noted that following Mr Vince’s visit to the Panel in September, Councillors and Officers had arranged to meet with him to discuss the concerns which he had raised, and a comprehensive response had been provided at this meeting.

The Head of Sustainability advised Mr Vince that a site visit had been conducted to the village green with him, and that the Council had now instructed a solicitor to provide independent advice in respect of the concerns that he had raised. The income from the car parking in question was shared with Mersea Town Council, which had agreed to share the costs of providing the legal advice to provide clarity on the situation. As soon as the legal advice had been received, this would be

shared with Mr Vince, however, it was difficult to provide a timescale for when the advice may be received. Mr Vince reiterated his statement that the Council was unlawfully taking money from the public every day that the car park remained open, and demanded that this illegal practice be stopped. The Chair of the Panel resolved to follow up on the progress of the advice which had been requested by Officers on behalf of Mr Vince.

Alan Short attended the meeting and addressed the Panel in accordance with the Council's Have Your Say! procedures. He noted that in December 2023 the Panel had decided that consideration of the ecology and biodiversity of Middlewick Ranges was appropriate to it. In the light of this, why had the Panel not commissioned the external review of the site, and set out the terms of reference for this before reporting its findings directly to the Local Plan Committee? The second issue which Mr Short wished to raise, was the provision of information to Councillors. He stated that before the decision to adopt the Local Plan had been taken in 2022 a letter had been received from Natural England, who were a statutory body, which made adverse comments on the inclusion of Middlewick Ranges in the Local Plan. According to a local newspaper, this letter had been received by Councillor Goss, who had decided in conjunction with Councillor Tim Young, that it would not be circulated to all other Councillors before the vote on the Local Plan. The Chair of the Panel resolved to raise Mr Short's concerns with Cabinet and the relevant Portfolio Holder, and considered that enhanced powers for both the Panel and the Council's Policy Panel would be appropriate, however, at the current time the Panel could only make recommendations to Cabinet. Mr Short considered that it was the remit of the Local Plan Committee to identify areas for potential housing, which was desperately needed in Colchester, however it was also necessary to ensure that the Council did not regret building on land which had a significant ecological value.

Kemal Cufoglu attended the meeting and addressed the Panel in accordance with the Council's Have Your Say! arrangements. He was speaking as the Policy Development Officer of the Colchester Green Party. He congratulated the Council's Trees for Years scheme which allowed residents to obtain free trees and shrubs, however, he asked what contribution the Panel had made to this scheme, and what contributions had the Panel made to the Council's Woodland and Biodiversity project? On the Trees for Years webpage, it was claimed that 10,000 native trees would be distributed, however, none of the shrubs being offered were native, and they did not have the benefits to wildlife that he would expect. The forsythia x intermedia plant in particular which was being offered had no known value to wildlife in the United Kingdom according to the BBC's Gardeners World. This was in contrast to information provided by the Council in respect of this shrub which claimed that it attracted bees, beneficial insects, birds and moths. The dogwood shrubs which were also being offered by the Council were also non-native, and while attractive, did not attract beneficial insects. He urged the Council to reconsider its scheme and replace non-native trees and plants with little to no value for wildlife with more appropriate native species. What action had the Panel taken to review woodland and sustainability project? It had been noted that a number of the Council's webpages concerning tree planting and related Council projects appeared to be out of date, having not been updated for a number of years. Mr Cufoglu questioned the number trees which had been planted and which had survived, noting that he had registered

to be a tree guardian in 2019, but had only received a single email since this date advising him of proposed tree planting.

The Chair of the Panel confirmed that the Panel had the power to make recommendations to Cabinet, but did not have the power to interfere in decisions which had already been taken. The level of detail which Mr Cufoglu had provided when addressing the Panel was appreciated, and he was requested to email Officers the points that he had made in order to enable the concerns that he had raised to be addressed.

A Panel member had been involved with some tree planting and believed that work had already been undertaken by the Council to review the number of trees which had survived. It was noted that the inclusion of forsythia in the Council's Trees for Years scheme had been questioned by a Panel member in the past, who had been assured that the plants were of value in the spring.

116. Housing Stock and sustainability

The Panel considered a report which outlined key initiatives, improvements, and future plans to enhance sustainability, and improvements in Colchester City Council's housing stock energy performance.

Mark Wicks, Interim Director of Assets for Colchester Borough Homes (CBH) attended the meeting to introduce the report and assist the Panel with its enquiries. The Panel was invited to consider the progress which had been made by CBH with regard to Standard Assessment Procedure (SAP) and Energy Performance Certificate (EPC) ratings. Since 2021, the average SAP rating had increased across the housing estate from 75.2 to 75.71, and the housing stock was in a very good position with 86.3% of properties with a current EPC rating of C or above compared to the benchmark standard of 72%. CO2 emissions had been reduced by an average of 55 kilograms per property and further improvements were planned through the current capital programme. Use of the Social Housing Decarbonisation Fund would lead to an upgrade of 105 properties by the summer of 2025, and an additional 25 properties would receive retrofits during 2024/2025.

Work was being undertaken to monitor the performance of properties and the improvements which had been made to them, and this monitoring was primarily through a device called a Switchee which was a smart thermostat which had the capacity to reduce energy consumption in the home by up to 15%. Monitoring how the home performed allowed any issues to be identified and addressed swiftly, and it was intended that 600 properties would receive the device.

Three wildflower areas had been created on Housing Revenue Account (HRA) land, and these areas were having a positive impact on local wildlife. 30 trees had been planted, and it was planned to plant an additional 50 trees through future schemes.

The Panel was pleased to note the higher than national average of properties with an EPC rating of C or above, and requested that the number of properties in each

EPC band be circulated to it to provide context for this figure. The Interim Director of Assets would provide this information after the meeting.

In response to an enquiry from a Panel member, the Interim Director of Assets confirmed that HRA land was generally defined as where CBH properties were situated, and would include any area, including outside areas, which was maintained as part of this portfolio of properties. The Interim Director of Assets would liaise with the Grounds Maintenance Officer of CBH, but was certain that suggestions from Councillors on the location of future wildflower sites would be most welcome.

A Panel member welcomed the fact that CBH had stopped using glyphosate herbicides to control weeds, however, sought assurance on the quality control which was implemented to stop borders becoming overrun with weeds. It was also noted that fewer visits were being paid to hard standings managed by CBH, had the loss of staff been the cause of this reduction? The Interim Director of Assets resolved to refer these questions to the Grounds Maintenance Officer of CBH and provide answers to the Panel after the meeting.

In discussion, the Panel sought further information on the operation of the Switchee devices in tenants homes, and expressed some concern that the devices could be controlled in a manner that would enable coercive control to be exerted over tenants through withholding heat in the property. The Interim Director of Assets confirmed to the Panel that generally control of the Switchee system was via the device itself which was mounted inside the CBH property, however, there was the opportunity to control the devices via an app. CBH were aware of the potential for misuse of this facility, and remote access to the device would be removed whenever a tenant left a property. With regard to the potential for the device being used for coercive control, the use of the systems was monitored via a portal which would enable any unusual or unexpected use of the devices to be flagged, enabling a quick response.

A Panel member sought clarification on the position with the maintenance of outside hard surfaces which were managed by CBH, and whether or not glyphosate herbicides were still being used, or whether their use had stopped entirely. Did CBH only carry out benchmarking against other Arms Length Management Organisations (ALMOs), or did it include other registered providers in this exercise? The Interim Director of Assets conceded that the Officer's report had been misleading and that in fact the use of glyphosate herbicides had been completely stopped. CBH did only carry out benchmarking work against other ALMOs, however, benchmarking against registered providers could be considered in the future.

Further information was provided to the Panel about the Switchee devices, and it was confirmed that they were slightly different from other smart thermostats in that they combined with sensors in the home to monitor conditions, and that this was helpful in preventing the spread of mould and damp. Although no personal data was collected by these sensors, it was possible to interact with tenants through the device through simple questionnaires. Funding had been obtained to fit 600 devices, and the installation of these had been determined based on geographical area where it was considered that people were most at risk from fuel poverty. It was felt that the devices were very useful, and it was hoped to introduce them as widely as possible.

A Panel member considered that the increase in the SAP score which had been noted in the Officer's report did not appear to be very significant. Where additional methods available to CBH to drive the figure even higher? The Interim Director of Assets explained that the SAP score was calculated across more than 6,000 properties, and the initial SAP score had already been higher than the average expected. Although the rise in SAP score did appear to be slight, when considered across the whole housing stock, the increase gained some more significance. It was the overall intention to raise all properties to a SAP score of 69, which was considered to represent a reasonable level of energy efficiency. The numbers of houses associated with each level of SAP score would be provided to the Panel.

RESOLVED that: the contents of the report be noted.

117. Colchester City Council Fleet Transition Strategy

The Panel considered a report which set out the new Colchester City Council Fleet Transition Strategy, outlining a pathway for Colchester to transition to a zero-tailpipe emission fleet. It showed the requirements needed including infrastructure, personnel, and capital investment.

Rosa Tanfield, Head of Neighbourhood Services, attended the meeting to present the report and assist the Panel with its enquiries. A detailed strategy document had been presented to the Panel, which proposed a revised Colchester City Council Strategy to transition the Council's fleet to carbon neutral status by 2030. This aligned with the Council's commitment to address the climate emergency by replacing diesel and petrol vehicles with low emission vehicles in the future. The Council recognised that its fleet accounted for approximately 25% of its total emissions, and the Panel was asked to recommend to Cabinet that the proposed Strategy was approved and adopted by the Council.

The proposed Strategy established 4 key objectives:

1. Ensuring assets were fit for purpose.
2. Promoting safety
3. Optimising asset usage.
4. Prioritising sustainability.

The Strategy set out aspirations to transition the Council's current fleet to greener lower emission vehicles by 2030, and specific objectives had been established by the Strategy to support achieving this goal. It was important to make effective and robust informed decisions on the composition of the fleet to ensure efficient and effective fleet management, future proof service delivery and enhance fleet performance. The proposed Strategy supported the Council's commitment to a systematic and data-driven approach, emphasising the importance of informed decision making, financial prudence and expert guidance.

The Officer's report recognised that the market for alternative fuel source vehicles was constantly changing and developing, and there was a need for infrastructure development to support any future move towards the use of more electric vehicles

(EVs), and the transitioning of the Council's entire fleet, including refuse trucks, to EVs would require particularly careful evaluation, with different options for charging vehicles being considered. The Strategy also considered the use of alternative fuels such as hydrotreated vegetable oil (HVO) which had the potential to significantly reduce tailpipe gas emissions, however, it was recognised that there were concerns about the use of HVO and the potential origin of used cooking oil used in its production. In terms of hydrogen fuelled vehicles, information had been provided by the Energy Savings Trust and the Officer's report addressed the suitability of these vehicles when used for refuse collection. The Officers' report outlined potential costs of refuse collection vehicles and vans dependent on the different fuel types.

The proposed Strategy set out 3 main options for the Council to consider when at the point of adding to its fleet or replacing existing vehicles:

1. The full transition to EV which would align with the Council's Climate Emergency Action Plan (CEAP) but would require significant capital investment.
2. The use of HVO as an interim measure until the Council had reached zero full tailpipe emissions.
3. To continue as running the current fleet and replacing vehicles with the latest diesel engines on renewal. Although this would be cost effective in the short term, this action would not align with the Council's CEAP.

The Panel were not being asked to confirm the option to be taken in the future, as the options were contained within the proposed Strategy and were to be considered in the future at the point when vehicle replacements were being considered, and decisions which were taken at this point would be supported by a business case before any commitment was made. The proposed Strategy emphasised the Council's commitment to reducing its carbon emissions and transitioning to a lower emission fleet, while acknowledging the ongoing development in green technology and the necessity of a measured approach being taken in the light of funding challenges. The Panel was asked to recommend the Strategy to Cabinet for approval and adoption, subject to any changes which it considered necessary.

In discussion, the Panel wondered why the phrase less 'tailpipe emissions' was no being used? A Panel member was very concerned that there was nothing in the Officer's report relating to the production and disposal of vehicles and batteries or the methods used to mine materials for batteries. A full picture was needed of the whole life cycle of vehicles. With regard to charging of EVs ,how much cost to build a substation at the Council's Shrub End depot, and what was the volume of EV ownership which would require such works to be carried out?

The Head of Neighbourhood Services explained to the Panel that the Strategy which it was being asked to consider did not commit the Council to investing in an EV fleet, but was simply setting out a framework which would guide and inform future decision making when options for replacement vehicles were being considered. It was accepted that the marketplace was evolving as a rapid pace, and any future purchases would be supported by a very detailed business case, prepared using the Strategy as a guide to ensure that the Council made an informed decision about the most appropriate way forward at that time. EVs, potentially supported by a new

substation, were not the only options being considered, and other fuel types, or different methods of connecting to EV infrastructure would also have a bearing on future decisions.

Peter Eggeman of the Energy Savings Trust, attended the meeting remotely and advised the Panel that in respect of concerns about the production and recycling of batteries used in EVs. He stated that a number of years ago there had been significant concerns around the production of rare trace minerals used in the production of batteries, particular those coming from the Democratic Republic of Congo. At the current time, however, such trace minerals were now being produced in other locations such as Chile and Australia, and motor manufacturers had taken steps to ensure that materials used in the production of their batteries were being sourced responsibly. Materials like cadmium and lithium were used in other areas, such as catalytic reduction equipment found in internal combustion engine vehicles as well as the 12 volt batters used in cars. In terms of recycling batteries from EVs which had reached the end of their useful life, the Panel heard that these could be repurposed as storage and were generally becoming more widely recyclable.

Simon Davison, Sustainability and Climate Change Manager, attended the meeting remotely and supported the comments which had been made by Peter Eggeman, noting that trace metals were commonly used in the production of a wide variety of batteries used commonly in everyday life. He explained that the use of the term tailpipe emissions served to differentiate vehicle emissions from carbon emissions, as tailpipe emissions contained harmful elements and microscopic pollutant particles. Switching to vehicles with alternate power sources would significantly reduce these emissions as well as improving local air quality.

A Panel member wondered whether consideration had been given to the carbon footprint involved in producing and disposing of vehicles used in the Council's fleet, and would vehicles only be replaced one they had reached the end of their useful life? The Head of Neighbourhood Services confirmed that the Council was in the fortunate position of owning, and not leasing, the majority of its fleet and this enabled a pragmatic approach to be taken to the lifespan of a vehicle and when it should be replaced. When considering whether or not to replace a Council vehicle, the Sustainability and Climate Change Manager considered that it would be useful to start taking whole life cycle analysis into account, noting that the lifespan of diesel road sweepers was 3 or 4 years, whereas the lifespan of a similar EV may be much longer.

In response to a question from the Panel, the Head of Neighbourhood Services confirmed that a Fleet Transition Plan had already been adopted by the Council, and it would therefore cause no issues if the Panel wished to defer a decision on the proposed Strategy until its next meeting to enable some additional information to be provided.

In discussion, the Panel offered support for the proposed Strategy, however, noted the difference between smaller and larger EVs in terms of their development and efficiency. The improvements in range and affordability of smaller vehicles had been significant over recent years, while larger heavy goods vehicles were only just entering the market and were significantly more expensive than their diesel

counterparts. A Panel member questioned whether the Council's Shrub End depot would remain suitable for the location of an all EV fleet, given the infrastructure changes which may be necessary to support this. It was noted that the report contained information about the fuel consumption of diesel and HVO vehicles, but did not contain this information for EVs, could this information be provided in terms of miles per kilowatt hour? It was also suggested that many EVs being marketed by European or American companies were actually being built in China, was this something that the Council should be aware of and give consideration to? What was the price per litre of HVO compared to normal diesel, and how was the 90% tailpipe reduction in emissions which had been mentioned actually measured?

The Head of Neighbourhood Services confirmed that the 90 reduction in tailpipe emissions was in terms of CO2, but care had to be taken when sourcing HVO to ensure that I had the correct certification. Lots of other local authorities had been utilising HVO, and it was possible to mix this fuel with diesel in a fuel tank. There were 2 fuel tanks at the Shrub End depot, and one had been filled with HVO as part of a trial to assess the impact on the fleet of using this fuel type, and the Council did monitor the costs of both diesel and HVO. The Council was actively considering working with other authorities in Essex to see of the costs of HVO could be brought down by a potential procurement framework. In terms of residual value of vehicles which had reached the end of their life, the Council used its vehicles for as long as possible, and so any residual value was likely to be very small.

A Panel member requested that further consideration be given to the equality and diversity and human rights implications of the Officer's report, considering that more detail was required. He understood that the Council had a number of social value indicators and wised to see more information provided on what could, or could not be done to support these. The Head of Neighbourhood Services would contact colleagues in the Council's Procurement Team to see if further detail could be provided to the Panel.

The Panel noted the significant emission savings that were achievable through the use of HVO, and wondered whether there was an opportunity to sell HVO to the general public, if the Council was procuring this in bulk. Was the Council aware of the emissions associated with generating or procuring HVO or electricity consumed by the fleet?

A Panel member acknowledged the discussion which had taken place in respect of the proposed strategy. Although she appreciated the questions which had been asked, she reminded the Panel that 25% of the Council's overall emissions were generated by its fleet, and it was therefore of paramount importance to address this at the earliest opportunity. She suggested that the Panel recommend the proposed Strategy which was before it to Cabinet, with the suggestion that Cabinet seek the additional information which had been referenced by the Panel.

In the light of the discussions which had taken place on the item, the Panel voted on whether to commend the proposed Strategy to Cabinet, or defer the final decision until the next meeting of the Panel.

RESOLVED that: the decision on whether or not to recommend the proposed Fleet Transition Strategy be deferred until the next meeting of the Panel in order to allow additional information to be presented to it.

118. Climate Emergency Action Plan Update.

The Panel considered a report which detailed key progress and updates from actions in the Climate Emergency Action Plan (CEAP) and other relevant updates since its last meeting in December 2023.

Ben Plummer, Climate Emergency Project Officer, attended the meeting to present the report and assist the Panel with its enquiries. The attention of the Panel was drawn to a scheme managed by Essex County Council called Solar Together, which provided cheaper access to solar panels or battery storage for residents. The deadline for registering for the scheme was 23 February 2024, and this simply constituted a register of interest and did not commit the resident to any future purchase.

A Panel member noted the intention to consider the removal of Air Quality Management Areas (AQMA) in Colchester, and expressed some reservations about this proposal. Although significant work had been carried out which had been very successful in improving air quality in Colchester, it was felt that the problem had been so serious that very careful consideration had to be given to the removal of any AQMA. The Climate Emergency Project Officer could not comment on the reasoning behind the consideration of the removal of AQMAs, but advised the Panel that it would receive an update on air quality at its next meeting which would provide further data in relation to this.

In discussion, the Panel considered the Green Events Code which had been referenced in the Officer's report, and was noted that damage had been caused to Castle Park following an event on October 2023. Although it was desirable to hold events in the Council's parks, care had to be taken to ensure that the space remained fit for use by others following them. Mel Rundle, Head of Sustainability, advised the Panel that concerns had been raised about the condition that Castle Park had been left in following some events, and the Parks and Countryside Team were working closely with the Events Team to mitigate against any future issues. The time of year in which events were held, together with the weather, was an important factor in determining the potential extent of any damage, and this would be considered in the future.

The Climate Emergency Project Officer was asked whether there was a rationale for selecting items from the CEAP to update the Panel on, noting that the action plan had been written to end in 2023. Given the importance of the Plan, was it intended to update the CEAP, and could full updates from the Plan be provided as part of the next update report at the next Panel meeting? The Head of Sustainability advised the Panel that a very wide range of Officers worked on different areas of the CEAP,

and it may well not be possible to obtain updates from them all, however, any updates which were available could be brought back to the Panel.

Panel members were interested in the Vision 2025 project, designed to make outdoor events more environmentally friendly. It was accepted that this constituted a very wide piece of work, but was it possible to provide the Panel with an overview of this? The Panel were advised that the Colchester City Council Events Policy had been adopted in 2020 and contained no references to sustainability. It was proposed that the Events Policy would be re-considered with the support of sustainability experts from Vision 2025 to explore what it was realistic to mandate to outdoor events promoters. Officers were keen to work with the Council's Events Team, and were considering introducing an environmental impact assessment element to the Policy. It was not anticipated that any changes would be made in the forthcoming year, but work would be ongoing.

The Panel expressed its admiration for the climate communications email which the Climate Emergency Project Officer circulated to all Councillors, which it considered was excellent, and of real benefit when raising awareness of funding which was available. Was it possible to disseminate the information contained in the email to a much wider audience so that everyone in Colchester could benefit? The Climate Emergency Project Officer explained that his update email was also circulated to all Parish Councils, and had recently been sent to the Council's Communities Team who also circulated their own newsletter which drew on information contained in the update. Consideration would be given to locating the information contained in the climate communications email on the Council's website.

RESOLVED that: the contents of the report be noted.

119. Work Programme 2023/2024

The Panel considered a report outlining its work programme for the current municipal year.

Mathew Evans, Democratic Services Officer, attended the meeting to present the report and assist the Panel with its enquiries.

The Panel noted the deferment of the Fleet Transition Straregy to its next meeting in March 2023, and the removal of the item presenting the Carbon Management Plan which would be presented to the Pael in the new municipal year.

RESOLVED that: the contents of the report be noted.

Environment and Sustainability Panel

Item **7**

05 March 2024

Report of	**Head of Sustainability**	**Author**	**Fiona Shipp** ☎ **01206 589250**
Title	Ferry Marsh Nature Reserve improvements		
Wards affected	Wivenhoe		

1. Executive Summary

1.1 Ferry Marsh Nature Reserve in Wivenhoe is managed by the Council's Countryside Team and in recent years, there has been a change of habitat with a significant increase in biodiversity due to the site having wetter conditions and reduced human access. As responsible landowners of the site, in the context of the Climate Emergency, and following public consultation, agreement is sought to protect the increase in biodiversity as a result of these changes.

1.2 In partnership with Natural England, Essex Wildlife Trust and Wivenhoe Town Council, the Council would like to introduce a system to control the water levels to an acceptable level that encourages the new wildlife to flourish, whilst minimizing the disruption to existing wildlife and still enabling the Rangers and Volunteers to maintain the site as per the management plan. This will help protect the biodiversity to continue to flourish at this site.

1.3 This revised paper contains key changes under 6.6, 10.1, 13.3 and appendices B,C,and D.

2. Recommended Decision

2.1 To recommend to Cabinet that it approve of the changes to Ferry Marsh Nature Reserve as set out in the report.

3. Reason for Recommended Decision

3.1 To control the water levels to an acceptable level that encourages the new wildlife to flourish, whilst minimizing the disruption to existing wildlife and still enabling the Rangers and volunteers to maintain the site as per the management plan. This is aligned to feedback received from public consultation and supports objectives set out in the Council's Climate Emergency Action Plan and in its Strategic Plan.

4. Alternative Options

4.1 If no further work is carried out to manage water levels, then we will not be able to maintain optimal water level for biodiversity, and benefits gained during recent flooding may be permanently lost. It will not be possible to fully deliver the sites management plan which recommends wetness of the site maintained for marsh and ditch assemblages. It may also not be possible to improve the Site of Special Scientific Interest condition to 'favourable'. If access is reinstated to the closed path, then disturbance by people and

dogs will increase, which is likely to affect sensitive bird life. More dogs accessing the water is likely to affect water quality and invertebrate life because of the effects of flea medications on dogs.

5. Background Information

5.1 Ferry Marsh (part of Colne Local Nature Reserve) in Wivenhoe is managed by the Council's Countryside Team and in recent years, there has been a change of habitat with a significant increase in biodiversity due to the site having wetter conditions and reduced human access.

5.2 In light of the current climate and biodiversity emergency faced by Colchester, the Council have been encouraged by the increase in biodiversity at this site, and as responsible landowners would seek to protect this.

5.3 In 1999, Colchester Borough Council took over the management of Ferry Marsh which is designated as a Local Nature Reserve and a Site of Special Scientific Importance (SSSI) These designations both place priority on the wildlife of the site and although managed by the Countryside Team, the site has never been designated a 'Country Park' where human activities should have greater priority.

5.4 From 2002 – 2017, the site largely remained a dry marsh gradually improving in quality due to the management by CBC, especially after 2010 when a section was placed off limits to people and dogs by the creation of ditch habitats for Water Voles under the guidance of Essex Wildlife Trust (EWT).

5.5 During this drier period however there is evidence that the site was becoming wetter with the Environment Agency unblocking the sluice three times during flooding events. Evidence from notes in previous management plans indicates that there had at times been limited access to the site due to its wet nature. There were resulting changes in the wildlife: Water Voles increased; Sea Barley arrived bringing another 'yellow' Nationally Scarce plant into the site.

5.6 In 2018, the sluice onsite blocked, water levels started to rise and access across the marsh was restricted by flooding. The sluice was no longer the original Environment Agency (EA) installed sluice, but a replacement installed by a developer that had now liquidated. The EA no longer unblocked the sluice, which thus remained blocked.

5.7 In 2020, the higher levels of water had greatly enlarged the areas of reedbed and by 2022 this had started to be broken up by natural pools forming in the centre, ideal for wildlife especially birds. In the summer of 2020, 40 pairs of Reed Warblers were spotted, 2 pairs of Reed Buntings, new species including 5 singing Cetti's Warbler, 4 pairs of Little Grebes together with Cuckoos. (Dr. Chris Gibson 2020 - bird survey records)

5.8 In 2022, all the Nationally Scarce qualifying plants still remained, and further species have also been discovered such as Divided Sedge. The other components of the Site of Special Scientific Interest are changing too, with Barrier Marsh having a thriving population of National Scarce Mousetail. The Outfall was cleared resulting in a significant change to the biodiversity on site which had built up over the years. Breeding bird numbers dropped instantly as the habitat changed and disturbance and predation factors such as foxes, dogs and cats moved in.

5.9 Fortunately, Cetti's Warblers remained and as Schedule 1 breeding birds this necessitated the closure of the cross-marsh path by CBC.

5.10 In 2023, in partnership with Essex Wildlife Trust, the ditch network was checked to monitor the water vole population. Although this was not a full survey due to not wishing to disturb nesting birds, it found water voles exploiting all the ditches, which was an expansion on their previous distribution, and reassurance that the population survived well through the flooded period. This shows there is scope for a controlled higher water level without adversely affecting the water vole population.

5.11 In partnership with Natural England, Essex Wildlife Trust and Wivenhoe Town Council, proposals were discussed to introduce a system to control the water levels to an acceptable level that encourages the new wildlife to flourish, whilst minimizing the disruption to existing wildlife and still enabling the Rangers and Volunteers access to maintain the site as per the management plan, to help protect the biodiversity to continue to flourish at this site.

5.12 A public consultation was designed to allow users and local residents to give feedback to our proposals which included:

- Adapt the external sluice to minimise future maintenance and remove the need to unblock to prevent flooding.
- Introduce an internal system to control the water levels to an acceptable level that encourages the new wildlife to flourish, whilst minimizing the disruption to existing wildlife and still enabling the Rangers and Volunteers access to maintain the site as per the management plan.
- An internal water level control system could be in the form of a sluice or system of sluices that would allow the Rangers to regulate the water levels on site.
- Water level to be established which optimises the wetland habitat and not compromising the banks already engineered for Water Voles
- Creation of a reliable system which avoids flooding beyond the set level and reduces the risk of flooding burrows significantly.
- Modifying the access to the site by creating a short loop to enable users to walk through a small section of reedbed.
- Improving the surface of the sea wall to provide easier access.
- Installing a viewing platform / screen along Rowhedge Ferry Road
- Expanding the Nature Reserve by acquiring and managing the Crown Estate owned land adjacent to Ferry Marsh

5.13 In December 2023, Colchester City Council carried out the consultation asking local residents their thoughts and opinions on the following options (Results in Section 6.3 - 6.5) and Visual Summary in Appendix A):

- How do you currently access and enjoy Ferry Marsh? *Options: A walkthrough route to Wivenhoe Trail, watching local wildlife, Dog Walking, exercise, peace and tranquillity, photography, cycle route, taking children/family, Other*
- What improvements would you like to see made to Ferry Marsh? *Please rank the below in order of priority – Management of water Levels in order to prevent flooding, Management of water levels to increase wildlife and diversity and abundance,*

improve surfacing along the sea wall path, Installation of bird hide/screen, Seasonal access to marsh, management to decrease level of disturbance, more benches

- The marsh does not currently include land adjacent to Old Ferry Road, it is own by Crown Estate. Would you support Colchester City Council expanding the nature reserve to include the Crown Estate land? *Yes/No/No Preference*

- Would you support Colchester City Council in introducing further methods to manage the water levels on site? *Yes/No/No Preference*

- Would you support Colchester *City Council in protecting the biodiversity through modified access to the marsh? Yes/No/other*

- Any other comments

5.14 A working group which comprised of Council officers, local Councillors for Wivenhoe Town Council, Ward Councillors for Wivenhoe and representatives from Essex Wildlife Trust and Natural England met in March 2023 to review the results of the consultation. All parties were supportive to proceed with all options listed above including keeping the main path in the Marsh closed to the general public, introducing a short circular walk so that people can still enjoy 'entering' the Marsh but with minimal disturbance to the wildlife and progressing the site improvements such as a viewing screen.

5.15 Colleagues in Natural England and Essex Wildlife Trust are satisfied that the above actions do not put at risk the Site of Special Scientific Interest designation for the site and in introducing a water control system, the Site of Special Scientific Interest status will be in a better position to achieve a more favourable condition.

5.16 Should agreement be given to this proposal, then the next steps include the following:

- Understanding the water levels and what they should be within the Marsh and carrying out a formal level survey and installing datum points.

- Work with Essex Wildlife Trust as they have experience of installing a water control system on the River Stort.

- Work with Essex Wildlife Trust to undertake a Water Vole survey.

- Create the short loop at the northern part of the site – ensure that dogs can't breach the loop and jump into the Marsh.

- Create bird screens - one near the Old Rowhedge Ferry Road track and one off of the short loop walk.

- Seek formal Natural England Ascent for any works, allowing for 28 days' notice.

- Determine exactly what the land ownership boundaries are for the houses and the Crown Estate Land and start a dialogue around potentially managing the Crown Estate owned land and what liabilities would come with managing the land.

5.17 It might not be possible to achieve all the above simultaneously, however having a commitment to deliver them would mean including them into the Ranger's Site Action Plan for the coming year.

6. Consultation

6.1 In December 2023, Colchester City Council carried out a consultation asking local residents their thoughts and opinions around the options above. There were 4 drop-in sessions organised in Wivenhoe (Tuesday 13th December; Saturday 17th December; Tuesday 10th January; Saturday 14th January 2023). A total of 217 people attended the four in-person sessions whereby they were able to view information boards, engage with Council officers, ask questions to the Natural England representative, and generally find out more.

6.2 There was also an online consultation which ran for 6 weeks, and a total of 175 people responded to the online consultation.

See Appendix A for a visual summary of the results.

6.3 Over 70% of the respondents supported protecting the biodiversity of the site through modified access to the Marsh. This question is the main point of the consultation as in essence, either the Council re-allows access through the marsh which will have an adverse effect on the biodiversity of the site, or the Council continues to restrict access (modify in this case by providing an alternative) which some local residents were against.

6.4 There was over 65% support in introducing further measures to control the water levels on site and over 80% support for the Council to expand the land management of the marsh to include the Crown Estate section.

6.5 Interestingly, responses indicated that it was a greater priority to manage the water levels to increase wildlife and biodiversity closely followed by management of water levels to prevent flooding. Management to decrease / limit disturbance to wildlife in the marsh was the third highest priority.

6.6 There was some concern raised at the previous Environment & Sustainability Panel in September 2023 that the consultation wording was confusing causing people to potentially answer incorrectly, and that people weren't asked directly about the path removal. However, reassurance has been receivedfrom the team that ran and attended the sessions that they tried to speak to all people who attended to explain the questions and what was being asked and what the impact of this would be.

7. Equality, Diversity and Human Rights implications

7.1 An Equality Impact Assessment (EIA) has been completed.

7.2 It is considered that the proposals do not breach human rights as a service will continue to be offered.

8. Strategic Plan References

8.1 The proposal directly links to the vision, themes and objectives of the Strategic Plan 2023-26, specifically 'Respond to the Climate Emergency', particularly 'Conserve and enhance our biodiversity'.

9. Publicity Considerations

9.1 The decision will be published in a press release and available on the Council's website. The working group referenced earlier in this report will also be advised of the decision.

10. Financial implications

10.1 Implementation of the above next steps will rely on budget being available part of which will be funded through the Countryside Team's site budget and installed by the Ranger Team and volunteers.

Creation of simple bird screen and fencing around short loop path.

- £2,000 Total for Chestnut paling fencing and field gate for short loop path
- £500/bird screen for timber.

The following will need to be funded separately and preferably from external grant funding.

- GPS Site survey and installation of datum points £1,600+VAT - Contractor
- Creation of an internal water control system. £6,082.85/Drop board sluice UNIT (max 2) Plus installation of drop board sluice and pipe under grass path x 1 £3,963.17 Plus mobilisation £650 = £16,778.87 - Contractor

Item	Cost (ex VAT	Funding Source
Fencing & Field gate	£2,000	Existing Site Revenue Budget
Bird Screen	£500/screen x2	Existing Site Revenue Budget
GPS Survey	£1,600	External Grant Funding
Drop Board Sluices Contractor Mobilisation	£6,082.85/Drop board sluice x 2 £3,963.17/Drop Board Sluice & Pipe under path x1 £650x1	External Grant Funding
Total for all Proposed Works	**£21, 378.87**	
Total for Grant Funding	**£18, 378.87**	

10.2 No additional funding has been identified for taking on management of Crown Estate land and this would need to be sourced before agreeing to taking this on and would form a separate paper.

11. Health, Wellbeing and Community Safety Implications

11.1 The provision of rich green open spaces for communities is incredibly important in supporting the health and wellbeing of our communities. The provision and protection of this site ensure the Council continues its responsibilities in this regard, and to promote

the positive health benefits to our residents of our countryside site, parks and open spaces.

11.2 Ensuring that the site is well managed and maintained will help support creating safe, clean and green neighbourhood, which can help to reduce the fear of crime in local areas.

11.3 This site has particularly high-quality visual landscape benefits for the local community and visitors with sweeping views over the marsh and across the River Colne.

12. Health and Safety Implications

12.1 The Ferry Marsh, marshland and ditches is part of the Council Water Safety review programme. Any actions recommended through the review will be actioned as appropriate.

13. Risk Management Implications

13.1 There is a risk that should the decision not be supported then;

- There would be continued expenditure for clearing out the sluice pipe on a more regular basis.
- There would be potential to be unable to control flooding to the site and Wivenhoe Trail.
- Continuation of repeating the cycle of flooding and sudden loss of water when the sluice pipe is unblocked, with potential cycle of boom and bust for aquatic biodiversity.
- The status of the Site of Special Scientific Interest compartment is unlikely to be ever improved to ‘favourable’ condition.
- Inability to fully fulfil recommendations in management plan and make the proposed biodiversity gains.
- If the central path remains open, preventing disturbance to wildlife will be virtually impossible, potentially impacting biodiversity, and reducing breeding activity, with increased effects of dog flea treatments on aquatic life.
- An open central path would also likely be frequently wet and impassable. Installation of a boardwalk to make it more accessible would then be high cost, with high on-going maintenance costs and make site maintenance in general more difficult.

13.2 In proceeding with the recommendations there is a risk that;

- We are unable to fulfil all the suggested mitigation for closing the path due to budget/funding (bird screen, resurfaced paths, internal water level management etc).
- As there will be reduced public access to the site, with access limited to the perimeter and short loop path, this may cause complaints despite the consultation.
- Finding ideal water levels may take time and require further level surveys which may have cost implications.
- The Bird Screens may attract anti-social behaviour.

- There will be ongoing maintenance costs of the fences and bird screens.

- We do not find funding to take on the maintenance of the Crown Estate land and are unable to manage this as a contiguous part of the site.

13.3 Concerns have been raised that the site has a covenant on it with a designation of Public Open Space and that this prevents any restriction on use of existing paths within the site. This could be classed as a risk to the Council if they breached a Covenant, and research has been undertaken to understand the nature of such designations.

The Transfer of the land in the title is dated 29 November 1999 and it was made between (1) Wivenhoe Quay Limited (Transferor) and (2) Colchester Borough Council (Council) and it contains the following covenants:-

"The Council hereby covenants with the Transferors for the benefit of the remainder of the Retained Land as follows:
5.1 not to use the Property otherwise than for public open space
5.2 to keep the Property in a clean and tidy state and condition and to maintain the same to an appropriate standard"

Under those terms the Covenant is still capable of being enforced.

When the site was transferred it already held the status of Site of Special Scientific Interest (SSSI) which it was designated in 1992.

As access is not specifically covered in the covenant and the path in question is not a Public Right of Way. The Council could make a decision to restrict access for the purposes of protecting wildlife as part of its legal obligation to manage the site effectively and appropriately to conserve the special features of the site as required by its SSSI status.

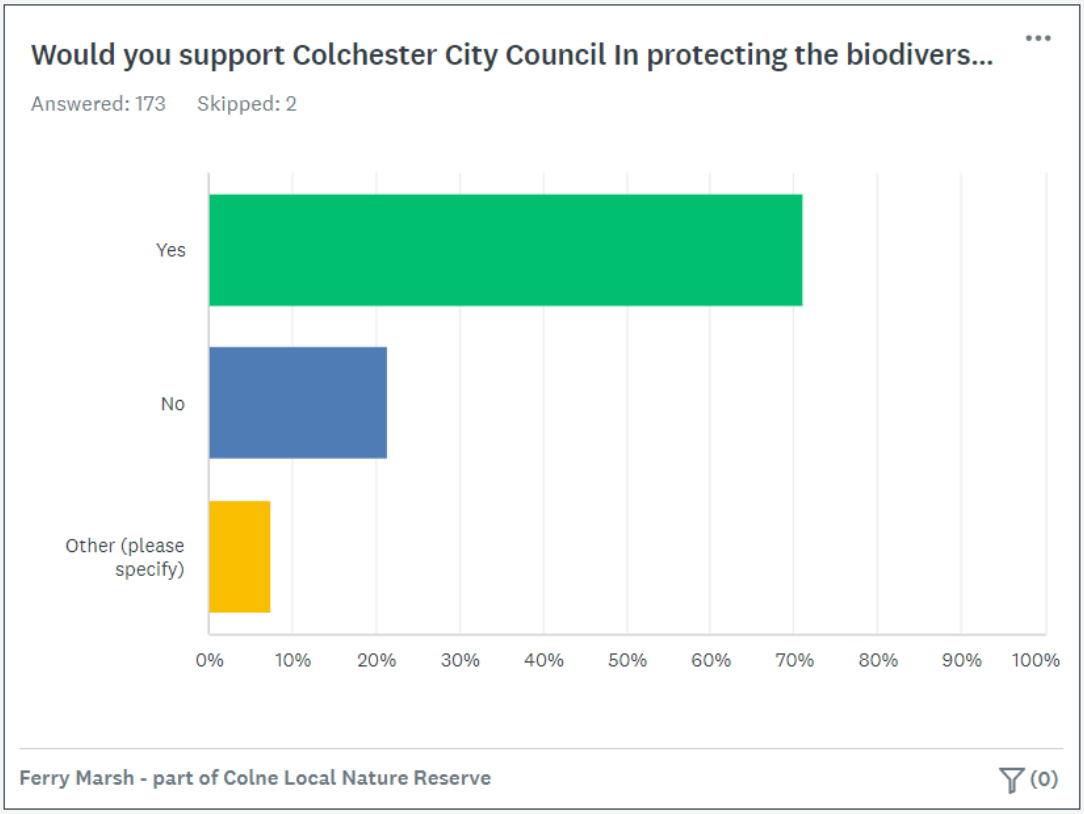
14. Environmental and Sustainability Implications

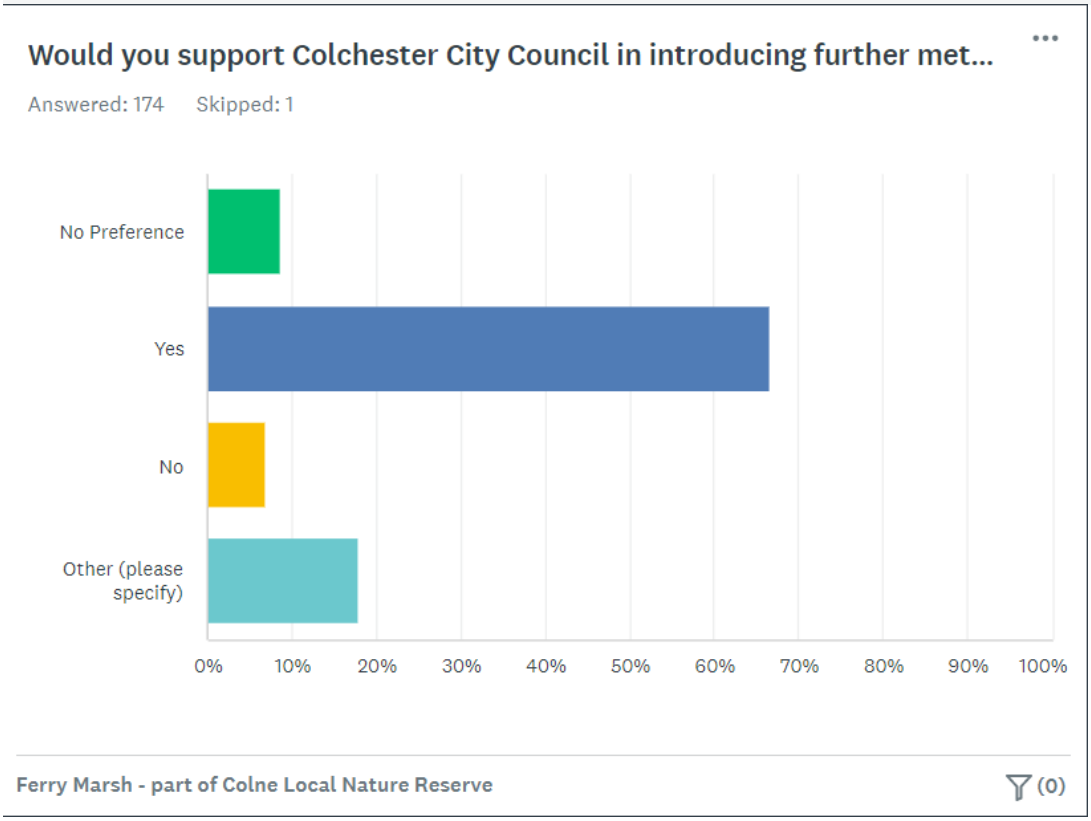
14.1 The consideration of environmental and sustainability implications of the decision being taken is set out in the table below:

Sustainability theme	**Positive environmental impact**	**Neutral impact/ Not applicable**	**Negative environmental impact**	**What are the positive and negative impacts on carbon reduction / environment?**	**How will positive impacts be enhanced/ encouraged? And negative impacts minimized or eliminated**
Energy		✓		n/a	n/a
Waste		✓		n/a	n/a
Procurement		✓		n/a	n/a
Biodiversity and green spaces	✓			Measures proposed encourages the new wildlife to flourish, minimize the disruption to existing wildlife whilst still enabling the	

				Rangers and Volunteers to maintain the site as per the management plan, to help protect the biodiversity to continue to flourish at this site.	
Transport		✓		n/a	n/a
Adaption		✓		n/a	n/a
Water	✓			Maintaining the wetness of the site, whilst avoiding uncontrolled flooding will provide valuable fresh and brackish water habitats particularly in times of drought. Preventing dogs accessing ditches will reduce the negative effects of flea treatments on aquatic invertebrates and disturbance to waterfowl.	
Digital		✓		n/a	n/a
Community	✓			The site continues to be publicly accessible but with enhancements to the wildlife and biodiversity that the public can experience	n/a
Housing/ Development		✓		n/a	n/a
Carbon Emissions saving	✓			A wet site provides good carbon sequestration.	Rotational dredging of ditches will release carbon but very infrequently in small amounts and is outweighed by other biodiversity gains.

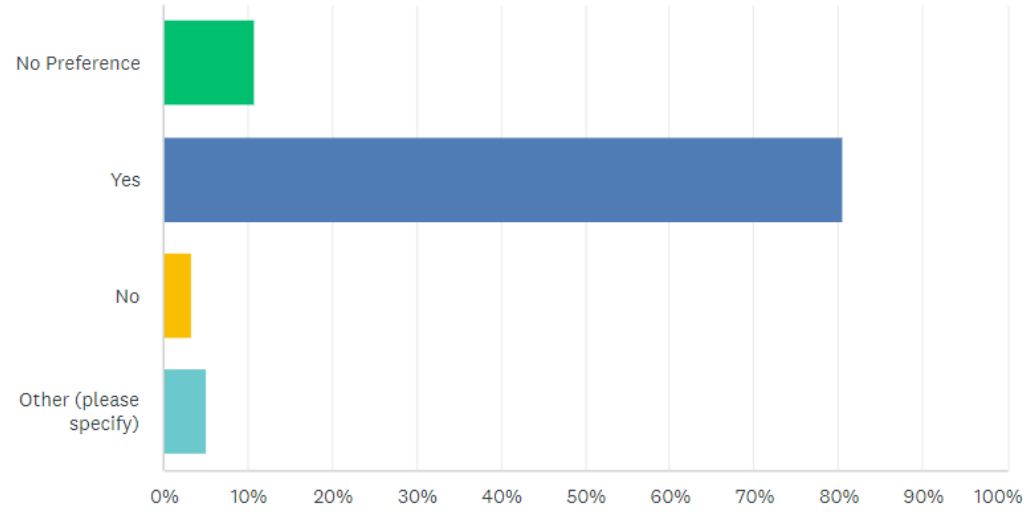
Appendix A – Results of consultation





The marsh does not currently include the land adjacent to Old Ferry R...

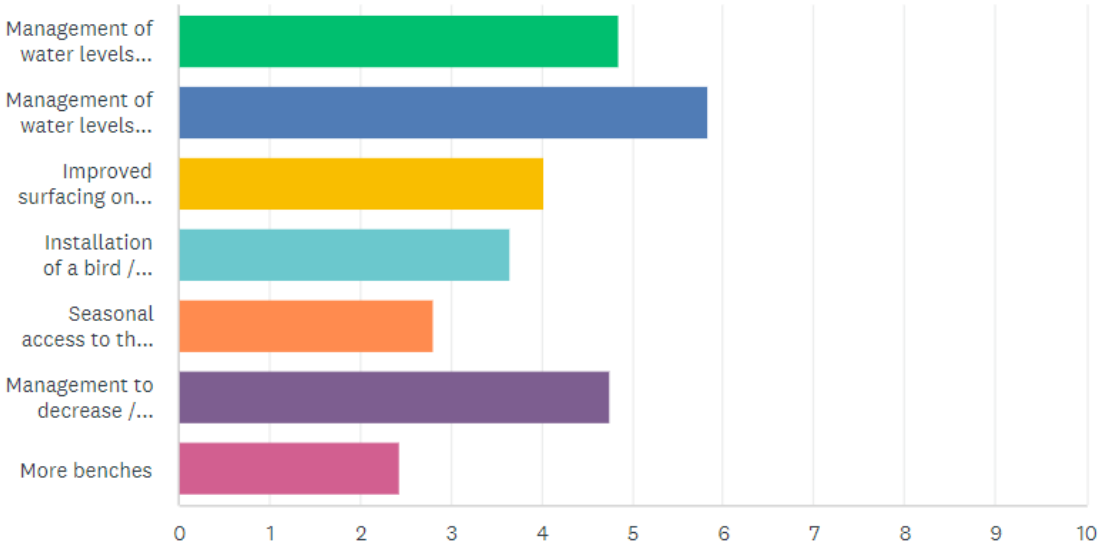
Answered: 175 Skipped: 0



Ferry Marsh - part of Colne Local Nature Reserve (0)

What improvements would you like to see made at Ferry Marsh? Pleas...

Answered: 175 Skipped: 0



Appendix B – Site Plan Showing Proposed Path Closure & Photo Locations

Appendix C – Site Photos

Top Left: Looking in to Ferry Marsh from Wivenhoe Trail

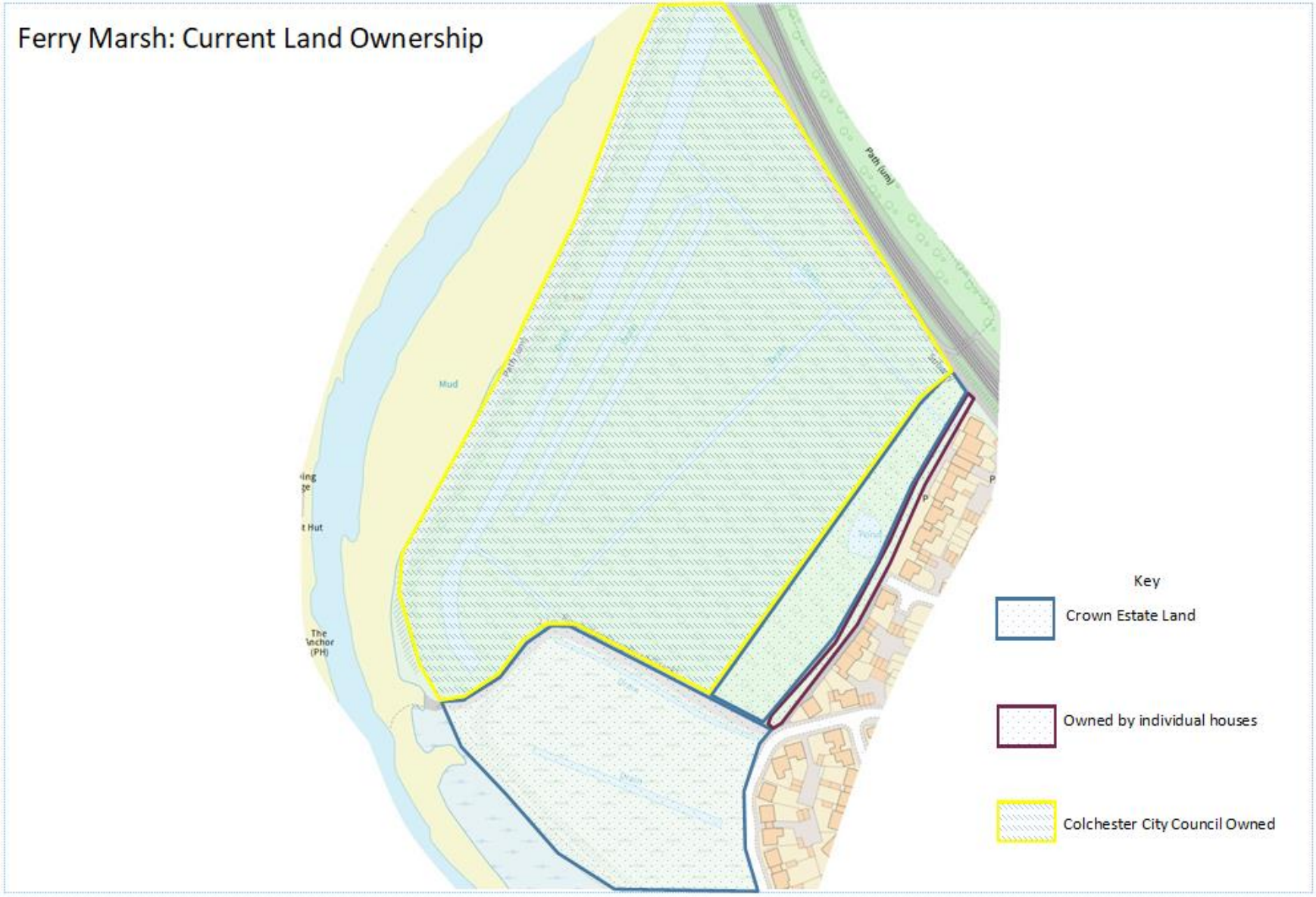
Top Right: Looking across Ferry Marsh from the river wall path

Bottom Left: Looking down Old Ferry Road Track from River Wall

Top Left: Looking in to Ferry Marsh from Old Ferry Road Track

Bottom Right: Looking along Old Ferry Road Track towards road

Appendix D – Current Land Ownership



Environment and Sustainability Panel

Item **8**

21 March 2024

Report of	**The Head of Public Protection & The Head of Sustainabilty**	**Author Emily Harrup**
Title	**Air Quality update**	
Wards affected	**Castle and Stanway**	

Please note that since the publication of this agenda, factual errors were noted in paragraph 5.3 of this report relating to the reporting of tonnes and not kilograms, and a corrected report has been published as a supplementary agenda document to this meeting.

1. Executive Summary

1.1 In 2023 a recommendation was put forward to the Portfolio holder and approved, to revoke AQMA 2 and 4 and to amend AQMA 1 to include only those areas which do not comply with the DEFRA guidance.

1.2 The amended AQMA 1 is Brook Street, Osborne Street and St Johns Street, Mersea Road.

1.3 This was following the submission of the 2023 Colchester Annual Status Report to; and approval by DEFRA ,where it was concluded it would be appropriate to examine revocation and amendments to the cities AQMA's due to the improvement of air quality.

1.4 This was due to the ongoing and consistent improvement of air quality over the last few years which met DEFRA's criteria for revocation. This is really positive and reflects the positive impact of the Council's projects to mitigate air pollution alongside improvements in vehicle technology.

1.5 All of the projects undertaken by the Transport and Sustainability team, given the focus on changing travel habits will have a positive impact on air quality. However since 2018, the team have been delivering projects, funded through 5 successful bids to DEFRA specifically aimed at tackling air pollution. These projects include the award winning CAReless Pollution campaign, and the delivery of a number of new services to support the uptake of eCargo Bikes, alongside general promotion and awareness raising of different ways to travel. As usage of these services grow they will continue to have a positive impact on air quality. This report outlines the impact of some of those projects.

1.6 The current DEFRA project being delivered is focused on providing further resources to support a change in travel habits and engagement to promote an uptake of services available both offered by the council and the local community.

1.7 Essex County Council with funding from DEFRA have created a new Essex Air website. Several of the Transport and Sustainability team's final reports on DEFRA projects have been shared on the site as well as the CAReless Pollution resources, some of which have made generic so they can be used by other local district, town and parish councils.

1.8 A new Air Quality Action Plan (AQAP) is due to be written which will focus on tackling air pollution in the amended AQMA 1. A steering group including officers from Essex County Council is due to be convened to work on the new AQAP. This will review actions and progress from the old AQAP, and potential physical interventions including any proposed in Essex County Council's draft Air Quality Strategy as well as the ongoing work by the Transport and Sustainably team to encourage and support people to try different ways of travelling.

2. Recommended Decision

2.1 To support:

- the work being undertaken to improve air quality in Colchester.
- staff in their negotiations with Essex County Council to obtain necessary permissions to take projects forward.

3. Reason for Recommended Decision

3.1 To ensure that the Panel is content with the progress made to date and has the chance to feedback on ongoing work.

4. Alternative Options

4.1 There are no alternative options. It is the Council's statutory duty to tackle air pollution in the AQMA's and have an AQAP in place.

5. Background Information and projects contributing to air quality improvements

5.1 Background information

5.1.1 Air quality is a measurement of the type and quantity of pollutants contained within it. Poor air quality can affect health, particularly that of the young and the elderly. It can irritate the lungs, lower resistance to respiratory infections such as influenza, and exacerbate existing respiratory conditions.

5.1.1 Since 2012 Colchester has had four declared Air Quality Management Areas. In 2018 AQMA 3 St Andrews Avenue and Harwich Road was revoked.

In 2023 Portfolio holder approval was given to:

- Revoke AQMA 2 - East Street and Ipswich Road
- Revoke AQMA 4 - Lucy Lane North, Stanway
- Amend AQMA 1 to include only those areas which do not comply with the DEFRA guidance these are Brook Street, Osborne Street and St Johns Street, Mersea Road

5.1.2 Next steps are to update our web pages to reflect the changes in AQMA's, notify DEFRA and provide DEFRA with updated information to reflect on their records and information in the public domain.

5.2 Funded air quality projects

The Council has taken many actions and secured funding to improve air quality and achieve air quality reductions. These are summarised below.

- 2012 – Successful Defra bid to launch a 'Love your car' campaign to promote car sharing and eco driving - **£35,000**
- 2015 Clean Vehicle Technology Fund - **£194,000**. This funding enabled the retrofit of 10 commercially operated buses with pollution reducing technology.
- 2016 Adoption of a Low Emission Strategy following receipt of a **£50,000** grant from DEFRA.
- 2017, the Council submitted a **£1.25m** joint bid with ECC, Rochford District Council and Southend-on-Sea Borough Council to the Defra operated Clean Bus Technology Fund to enable further retrofitting of older polluting buses enabling a further 32 commercial buses to be retrofitted.
- 2018 - Successful bid to Defra to develop a community led CAReless Pollution campaign to encourage reduction in engine idling and raise awareness of air pollution - **£249,100**
- 2019 – Successful bid to Defra for a roadside signage study to test the effectiveness of psychological messages to discourage engine idling plus a traffic light count down feasibility study **£59,785**
- 2020 - Successful bid to Energy Saving Trust/Dft for fleet of ecargo bikes for business use - **£137,453**
- 2020 - Successful bid to Defra for funding for Phase 2 of Careless Pollution and to set up shared transport schemes including an electric car club and 2 ebike/ecargo bike shared hubs **£248,700**
- 2021 - Successful bid to Defra to fund the setting up of a ecargo bike concierge service to transport shopping to shoppers' homes of lockers in outlying car parks to leave them free to spend time in the city centre and travel sustainably into the centre or park outside the AQMA and walk in. **£188,587**
- 2022 - Successful bid to Defra for CAReless Pollution phase 3 including integration of walking and cycling into school tool kit, development of air quality related e-learning module for businesses, 2 dedicated engagement officers, new Cycle Colchester website, new Cycle Colchester map and ebike/ecargo bike short term hire scheme for residents. - **£310,770**

5.3 Impact of projects

5.3.1 All of the Transport and Sustainability teams' projects contribute to improving air quality through encouraging and supporting the community to try other forms of transport for some journeys and reduce their use of cars. However it is difficult to quantify the air quality impact of individual projects, as the sum of the whole has contributed to the improvements. We can highlight some data that we have collected in recent years and translated into savings in NOx (Nitrogen Oxide and Nitrogen Dioxide, key air pollutants which in Colchester come from tailpipe emissions) compared to if these journeys had been undertaken by an Internal Combustion Engine (ICE) vehicle. Also included are results from evaluation we have undertaken

5.3.2 Colchester's eCargo Bike fleet funded through the Energy Savings Trust and DEFRA have ridden 64,000 miles since launching in 2021 with 34,000 of these miles ridden in 2023. In air quality terms this equates to a saving of 12.8 tonnes of NOx overall and 6.8 tonnes of NOx in 2023.

5.3.3 The 2023 Christmas trial of the eCargo Bike city centre to home concierge service replaced 516 miles of van deliveries with electric cargo bikes, equating to at least 103g of NOx saved and fewer vehicles congesting the city centre. It is also important to note that the eCargo Bike depot is based at Hills which is in Brook Street, so all of the activity

being delivered by eCargo Bikes instead of ICE vehicles is positively impacting on air quality in Brook Street.

5.3.4 In July 2023 Tier introduced on street eBike hire into Colchester. Since then 22,000 journeys have been made by eBike covering 38,129 miles equating to a NOx saving of 7.6 tonnes. The eScooters have ridden 562,392 since their inception equating to a NOx saving of 112 tonnes.

5.3.5 The electric car club car has driven 12,951 over the last year equating to a reduction of NOx of 2.6 tonnes.

5.3.6 Phase 2 of the CAReless Pollution campaign encouraging the community to switch off their engine every time they wait was evaluated in May 2023. From street surveys, roaming questions and school gate surveys the following results were gathered

- 34% - 44% of people spoken to were switching off their engine either ‘always’ or ‘most of the time’ when stationary.
- 31%-34% of people spoken to had automatic stop/start engines or an electric car
- Combining the two sets of statistics meant that around two-thirds of vehicle drivers are taking positive action to reduce air pollution on a regular basis.
- Within schools encouragingly 60% of people spoken to were aware of the CAReless Pollution campaign, and 39% on street, demonstrating high brand awareness

5.3.7 The signage study in Brook St and Eastgates that ended in September 2022 and collected data from150,705 vehicles tested the impact of different psychologically framed motivating messages to encourage switching off engines. The study showed a peak average switch off rate of 26% - an increase of 11% of drivers switching off their engines. We continue to work with Essex County Council to obtain permission to put the signs up permanently. Essex County Council have raised concerns about the signs that were not issues when the signs were up during the study. We feel this issue is important to resolve especially as Essex County Council are already using the results from the study for example on the new Essex Air website.

5.4 What’s next?

5.4.1 Work will start on the new Air Quality Action plan by an Air Quality Steering Group with a draft submitted to DEFRA in six months time.

5.4.2 The Transport and Sustainability team are working on an overarching strapline and set of key messages to better frame the work of the team, to help describe what we are trying to do and ensure that we can connect and resonate with the public. With so many different elements to the work of the Transport and Sustainability team, we have identified this as a need and are undertaking a strategic messaging exercise facilitated by our communication partner Meadows. Following a workshop with key stakeholders, early thoughts include a strong sense that language should focus on health, positivity and the individual and not climate change and negative outcomes, this also fits in closely with our work around Air Quality where health has always been seen as the key motivator for action.

5.4.3 2024 will be focused on delivering our 5th successful DEFRA project, which includes community led CAReless Pollution phase 3, a new Cycle Colchester map and website, short term hire ebike/ecargo bike scheme for residents and extensive community and business engagement.

5.4.4 The Transport and Sustainability team will also continue to deliver all of the projects outlined in the Transport and Sustainability update.

5.4.5 The Transport and Sustainability team will continue to work closely with Essex County Council to attract investment into and keep a focus on Colchester so that further infrastructure projects can be delivered to continue to support further air quality improvements.

6. Equality, Diversity and Human Rights implications

6.1 An Equality impact assessment was completed as part of the recommendations to revoke the AQMA's and reduce AQMA 1.

7. Strategic Plan References

7.1 Strategic Plan 2020-23. Tackling the climate challenge leading sustainability and improvements in air quality are strategic priorities to Colchester City Council.

8. Consultation

8.1 There are no consultation considerations for this paper, although many of the projects referenced have community engagement elements within them and success in promoting sustainable travel will involve engagement and education of others to influence behaviour change more widely.

9. Publicity Considerations

9.1 There are no specific publicity considerations

10. Financial implications

10.1 None

11. Health, Wellbeing and Community Safety Implications

11.1 Improvements in air quality will have health benefits, particularly to those who are young, elderly or with respiratory conditions.

12. Health and Safety Implications

12.1 There are no Health and Safety Implications.

13. Risk Management Implications

13.1 There are no identified risks

14. Environmental and Sustainability Implications

14.1 The report demonstrates improvements in Air Quality

Appendices

Environment and Sustainability Panel

Item 9

21 March 2024

Report of	**Head of Sustainability**	**Author**	**Emily Harrup** **Jane Thompson** **Mike Polom**
Title	**Sustainable Travel Projects Update**		
Wards affected	**All**		

1. Executive Summary

1.1 This report updates on the City Council's sustainable travel projects and sets out key progress made since the development of "Sustainable Travel – Our Approach". This document outlines two key goals and ten outcomes which were informed by the Strategic Plan objectives, Sustainable Travel policies, the Climate Emergency Action Plan (CEAP), community engagement feedback and other national and local guidance. The two goals are to:

- Increase the proportion of short trips made via sustainable transport
- Reduce air pollutants in the Air Quality Management areas translating into better health

1.2 This report shows that there has been great work undertaken with some significant achievements that are set out below. Amongst the highlights are the lowering of pollution levels in Air Quality Management Areas resulting in proposals to revoke two of the AQMA's and shrink the third, and successes include the opening of the new Secure Bike Park, refreshed Bikewise campaign, and the ongoing and expanding e-Cargo bike projects, including the opening of the first Pay As You Go shared bike hub based in the Secure Bike Park.

1.3 Another significant piece of work is the adoption of the Active Travel Supplementary Planning Document, which will support Essex County Council (as highway authority) in their bids for Government funding for Colchester infrastructure projects, as well as enable Colchester City Council (as planning authority) to require developers to contribute towards the strategically aligned and planned infrastructure and facility improvements.

1.4 A key finding from the community engagement undertaken over the past three years has continued to show that residents are willing to travel sustainably if they are given the right infrastructure and support.

2. Recommended Decision

2.1 To help the community in their desire to travel sustainably by supporting the work of the Sustainable Travel team in working with the County Council and partners to deliver infrastructure and projects to enable travel behaviour change.

2.2 Support the progress being made by the City Council in delivering the key goals and outcomes for sustainable travel in Colchester.

3. Reason for Recommended Decision

3.1 To ensure that the Panel is content with the progress made to date and has the chance to feedback on ongoing work.

4. Alternative Options

4.1 Not Applicable

5.0 Sustainable Travel Progress/Updates

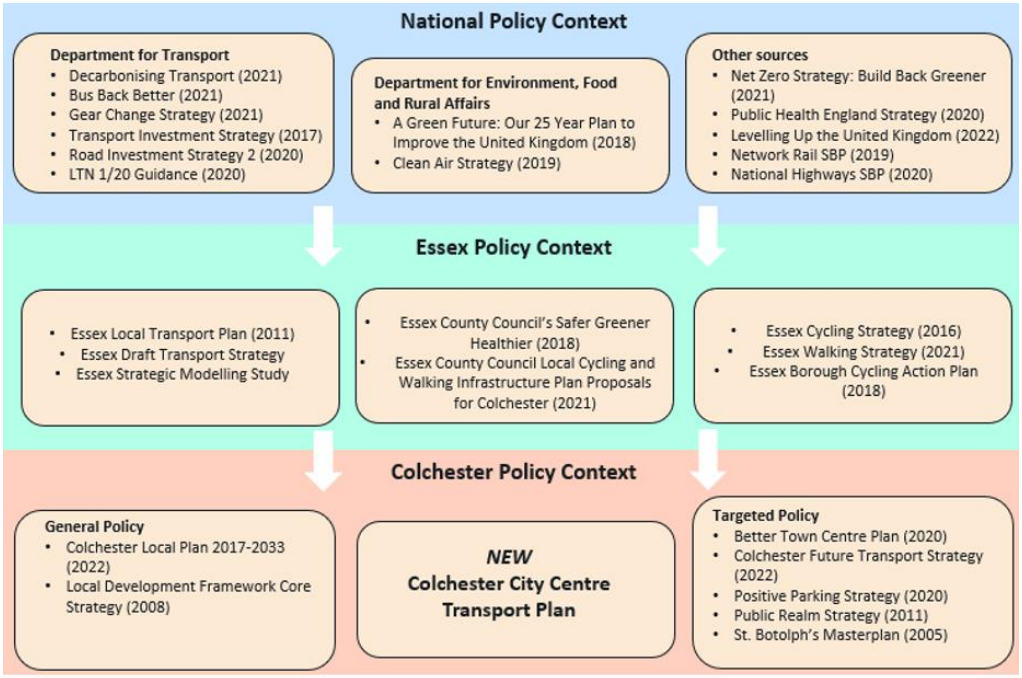
5.1 Background

5.1.1 Essex County Council (ECC), as the Highway and Transport Authority, are responsible for developing sustainable travel infrastructure to support an increase in walking, cycling and public transport use. The County Council works with Government bodies to develop policies to ensure infrastructure is provided, and is the responsible authority to make funding bids, for example the Active Travel Fund administered by Active Travel England.

5.1.2 ECC translate this requirement to the city, borough and district councils in Essex to develop sustainable travel infrastructure at the local level. In Colchester this is outlined in their Colchester Future Transport Strategy. However, the Council (and our Sustainable Travel team's work) influences, complements, supports and builds on the work of ECC and we work in close collaboration with them. Our own projects go beyond physical highway infrastructure changes to also provide facilities, support and services to enable behaviour change locally. The aligned work, and close partnership approach, has resulted in Colchester successfully achieving a high level of investment, delivering more schemes and being a front runner with innovations and momentum in sustainable travel compared to other towns or cities in Essex.

5.1.3 Our Sustainable Travel team have regular meetings and dialogue with ECC and other partners to ensure Government, regional, county and local policies and aspirations are reflected in the work we do, to ensure policies are joined-up and projects are carried out which make the best use of our and our partners' resources.

5.1.4 The policy context therefore flows down from national level, through County level, to City Council and the localised level as follows:



5.2 How we meet our goals

5.2.1 In order to meet our goals, we work to develop, secure and deliver a number of developer and externally funded infrastructure and behaviour change projects. We also work closely with the County Council and other partners to lobby for investment in Colchester and influence and input into proposed plans and strategies.

5.2.2 The current projects we are delivering are being funded by £1.19m grants successfully secured since 2018 from government departments such as Defra, £1.7m secured through s106 agreements for projects in east Colchester, £120k from partners involved in Fixing the Link, £90k from partners involved in delivering the Secure Bike Park project and approximately £25k per annum in local business and organisation contributions to host the Colchester Travel Plan Club.

5.2.3 The below outlines the projects and progress we have made during 2023 towards achieving our two goals and associated ten outcomes. These all contribute to meeting the needs of the community identified through our engagement over the past three years as well as the Council's strategic priorities.

5.3 Community Engagement and Partnership Working

5.3.1 Since 2020 we have carried out community engagement to help inform the development of our projects, our aim is to attend at least ten public events per year. We continually use the feedback from engagement to "sense check" the direction of our work and provide an evidence base for what the community tell us they want; and identify how we need to support them to use active travel.

5.3.2 We follow an Asset Based Community Development (ABCD) approach to our work, being led by what the community tell us they want and need, co-producing solutions and letting the community lead where possible. We work with many different partners some (not all) of which are listed below:

- ECC Sustainable Travel team, Highways (Infrastructure) and Passenger Transport (Bus, P&R)
- City Centre BID
- Transport East
- University of Essex
- Clean Air Colchester
- Colchester, New Town and Wivenhoe Bike Kitchens
- Colchester Cycle Campaign
- Colchester eCargo
- Colchester Institute
- Destination Colchester
- Enform
- Enterprise car club
- ESNEFT
- Essex Pedal Power
- GO4 Café/New Town Community Bike Hub
- NHS Suffolk and North East Essex Integrated Care Board (ICB)NHS and patient participation groups
- Residents' Associations
- Tier the e-scooter and e-bike provider
- Town and parish Councils
- Civic Society
- Walk Colchester

5.3.3 During 2023 we attended 13 community events, talking to over 500 local residents with many of them trying an eCargo Bike.

5.3.4 Of the top three concerns highlighted in relation to cycling, the overwhelming message from the community for the third year running was:

- Not feeling safe cycling on the roads

- Lack of signage and disjointed cycling networks and
- Bike security and theft

The top concern continues to be the lack of segregated and joined up infrastructure which reflects trends elsewhere and remains the main barrier stopping people from cycling in Colchester. This needs to be tackled if genuine travel choice is to be provided and highlights the importance in delivering the Active Travel Fund, Town Deal and Local Cycling and Walking Investment Plan (LCWIP) cycle routes to enable people who don't currently cycle to have the confidence to try it.

5.3.5 In 2023 we asked the public to place stickers on a map indicating where they currently ride and where they would like to, but don't due to lack of safe infrastructure. This complements the previous two years, map of barriers to cycling which highlighted lack of cycle paths, lack of parking, lighting, physical obstacles etc. The 2023 map can be viewed here. This is shared with ECC and partners to contribute to the evidence base to help support funding for new and improved infrastructure.

5.3.6 In terms of future infrastructure, ECC has produced an LCWIP which includes a number of strategic priority routes for investment in Colchester. The first route to be implemented is improving the links from the east to west and north to south via the city centre, as part of the County Council's Active Travel Fund. This scheme is to be followed by the East Hill to University and Greenstead route, which is also supported by the City Council's Town Deal. The Town Deal project includes other investment in the city centre to improve the walking and cycling environment.

5.4 Colchester Projects Related to Goal 1:

Increase the proportion of short trips made via sustainable transport

5.4.1 Strategic Influencing

- Lobbying for investment in sustainable transport infrastructure including
    - ECC's Colchester Future Transport Strategy,
    - Local Transport Plan,
    - Evolving Place and Movement study,
    - Local Cycling and Walking Investment Plan (LCWIP),
    - Essex and South Suffolk Community Rail Partnership,
    - Town Deal, Levelling Up Fund and City Centre Master Planning etc.
- Responding to ECC's consultations such as Park and Ride service and Bus Service Improvement Plan
- Working with ECC and bus operators on the Colchester Bus Blueprint
- Assisting with the production of the Colchester Future Transport Strategy.
- Working with Transport East in the development of the Strategic Investment Programme and other policies.
- Worked with Planning colleagues in developing and successful adoption of the Active Travel SPD which will require developers to contribute towards active travel infrastructure and measures.

5.4.2 Outcome 1: More uptake of walking and cycling for short journeys such as for work, shopping, school drop-off.

- Reviewed and made recommendations to ECC on the updated Local Cycling and Walking Infrastructure Plans to help better reflect where investment is needed.

- Worked with ECC in designing and delivering the Active Travel Fund routes for example comments on design of the Greenstead to Severalls LCWIP7 route.
- Identified funding opportunities and worked with others in helping to implement Town Deal LCWIP4 route which joins the east-west route at East Hill and travels to the University and Greenstead.
- Identified student development S106 contributions for projects to help walking and cycling in east Colchester and planning the projects' delivery. For example, the Walking with Words wayfinding project delivering an innovative experience and encouraging more people to walk the route from the University and the student accommodations to the city centre and including a link from the University to Greenstead.
- Developed Fixing the Link phase 2, encouraging walking between the main railway station and the city centre, which following the successful installation of trees in North Station Road, include a drought planting scheme on the Albert roundabout.
- Working with colleagues at CBH to identify the opportunity for residential secure cycle parking to be provided in Greenstead, serving residents of the flats which don't have secure bike parking.

5.4.3 Outcome 2: More businesses trialling eCargo bikes and opting for sustainable transport options.

Cargo Bike city centre to home delivery service

- The City Centre eCargo Bike delivery service is part of a £188k funded Defra project to support residents to walk, cycle or use public transport to get into town or to park in outlying car parks. This will reduce driving through the AQMA as well as support economic growth in the City Centre as shoppers can purchase bulky items with the confidence, they can be delivered home, as well as staying in Colchester for longer to make use of leisure and entertainment facilities. The project includes developing logistics software that will interface with parcel lockers in Napier Road car park and at the park and ride, allowing shoppers to choose multi-modal active travel journeys.
- Currently reviewing project against a number of challenges faced, particularly around lockers.
- Ran a second Christmas Delivery Service trial in the weeks leading up to Christmas 2023, this time offering the service for free. Shoppers were able to use an online service to book their shopping to be collected either directly from them or from a shop, and delivered to their home for free.
    - We worked closely with the City Centre BID to promote and market the trial alongside their Christmas promotions.
    - The focus of the trial was to test logistics software, route optimisation, and speak to businesses and the public to understand and overcome barriers to use.
    - Public and businesses were very positive about the service, especially running it for free, and understood the benefit. Direct pickup from the shops and/or members of the public was very well received compared to the use of a drop-off hub.
    - Featured on BBC news over Christmas which has raised the profile of our work with other local authorities and led to knowledge sharing opportunities.

Colchester eCargo Bike Library

Our ten champion eCargo Bike businesses continue to use their ecargo bikes and promote them to other businesses, 4 businesses have taken a short-term hire in 2023.

Colchester Travel Plan Club - Travel Plan work

The Colchester Travel Plan Club continued to work closely with over 15 local businesses and organisations as paying Travel Plan Club Members (and 100 associate members) to develop and implement workplace travel plans. This has included a new site-wide travel

plan for the University of Essex and Northern Gateway as well as developing a new travel plan for Colchester City Council.
Key achievements include:

- Advised planning colleagues on planning applications where a travel plan is appropriate, including engaging directly with the applicants to ensure their developments have active and sustainable travel at their core.
- Continued to work with bus operators to negotiate and implement discounts for Travel Plan Club members, especially in a world of more flexible working. This has included reinstating a bus route from Greenstead to the University of Essex after concerns were raised by a student accommodation provider at the lack of provision.

Colchester City Council Travel Plan

- Created a pool ebike/ecargo bike booking system for staff for the return to Rowan House as well as supporting Shrub End and Highwoods Country Park with move to ebikes/cargo bikes.
- Working towards achieving Modeshift STARS Good/Very Good business travel plan accreditation for Colchester City Council.
- Recruited a new Travel Plan Club Coordinator to implement and administer the Colchester City Council travel plan.
- Coordinated a site travel survey in October 2023 including all tenants of Rowan House to better understand travel to work habits now the office has reopened.
- Developed and implemented needs-based parking permit system to manage parking sustainably at Rowan House and prioritise those with accessibility and/or business need.

5.4.4 Outcome 3: People are aware of the walking and cycling network leading to greater use of them

Requests for an up-to-date cycle map is a common request received through our community engagement. Based on this feedback the team bid to DEFRA for funding to develop a new Colchester cycling map to replace the 2016 map produced by ECC. This was successful and will be delivered in 2024. In addition funding was granted to create a new Cycle Colchester website which will also host the new cycle network map. Both projects will be community led based on feedback from 2022 and 2023 events and direct engagement with community groups that will take place during 2024.

5.4.5 Outcome 4: People feel confident about locking up their bikes safely in the town centre, so feel more willing to cycle into town.

To meet this objective which was also one of the top three themes coming out of our engagement over the last three years, in 2023 the team have :

- Opened the new Colchester Secure Bike Park in April which is operated by Spokesafe offering pay as you go secure parking and season tickets as well. Based in Portal Precinct the hub also hosts the Colchester Bike Kitchen, a DIY community bike repair workshop and the Colchester e-Cargo Bike Library hire scheme. Around £90,000 funding was secured to deliver this project. The SBP is proving popular and we are currently helping to promote it via the Bikewise campaign.
- Refreshed the Bikewise campaign, working with Colchester Police, the Safer Colchester Partnership, Spokesafe and the Colchester Travel Plan Club to educate those parking their bikes to consider how and where they park and to use a quality lock.
- Review will be carried out of the existing on-street parking provision to make cycle parking safer and more convenient for all of the city's shoppers and visitors.

5.4.6 Outcome 5: Widespread take up and recognition of the benefits of cycle training to build confidence, safer cycling practices.

- Over 179 adults have received a free Cycle Training session funded by our DEFRA funding, this includes Learn to Ride, Cycle Confidence and Advanced cycle training. We still have a further 221 free spaces available and the training will continue to be promoted during 2024.
- To further improve the likelihood of children cycling independently following the year 5 and 6 Bikeability training, we are trialling a new package called Bikeability Boost funded by DEFRA and in partnership with ECC. The package has been developed following 227 parent/child survey responses and focus groups with 96 children. It is being trialled in 6 primary schools in the city centre. In addition to the Bikeability training, it includes a pre Bikeability assembly for children and parents, a transitions session in the summer term prior to starting at secondary school, opportunities to do level 3 in the summer holiday, help and support for basic maintenance and information on local support services to parents. Evaluation is taking part at all stages. To date all six schools have received an assembly and 109 pre Bikeability parent surveys have been received. The assemblies have been such a success that ECC have bid for funding to deliver these to more schools.

5.5 Colchester Projects Related to Goal 2:

Reduce air pollutants in the Air Quality Management areas translating into better health

5.5.1 Outcome 6: Residents and businesses use range of sustainable shared transport options on a pay as you go basis

To increase access to a variety of transport choices the council has set up a number of services giving access to a range of different vehicles on a pay as you go basis or as a short term hire giving the opportunity to try before you buy.

Tier eBikes
Tier launched on street pay as you go eBikes in July 2023. Since July 22,000 journeys have been undertaken. More eBikes are due to be rolled out in the coming months.

eBikes and eCargo bikes
Colchester's eCargo Bike Library now has 32 eCargo Bikes, 3 longtail eCargo Bikes, 5 eTrailers and 6 standard eBikes purchased using funding from the Energy Savings Trust and DEFRA. These bikes are distributed across the following projects.

1) Ten businesses championing eCargo bikes – launched 2021
2) Short term hire scheme for businesses – launched in 2021
3) Colchester City Centre pay as you go shared bike hub – launched October 2023
4) Short term hire scheme for residents – due to launch March 2024
5) New Town Community pay as you go shared bike hub – due to launch April 2024
6) Colchester eCargo city centre to home delivery service
7) Colchester City Council pool bike scheme for staff

- 15 members have joined the City Centre cargo bike pay as you go service since it launched in October. Most popular uses to date are for Leisure and shopping. Most of these journeys would either not have been made or would have been made by car if the eCargo bike service hadn't been available. The service will be heavily promoted over the summer via the events we attend.

- The New Town community shared hub is almost ready to launch. The storage shed has been built and soft testing is about to commence. Once launched a community guide will be developed to support other communities to set their own hubs up. We are currently working with Wivenhoe Transition Town and Town Council to submit a bid for funding to set up a shared bike hub.
- Our most recent successful Defra bid is funding a short-term hire scheme for residents to borrow an ebike or ecargo bike for up to one month. This is due to launch this month.

Wider impact of our eCargo bike work

With the increased presence of eCargo Bikes on Colchester's streets, opportunities for residents and businesses to try them out and the promotional work of our Champions, this has really kick started an interest in eCargo Bikes. We are aware of at least an additional 20 longtails and eCargo bikes in Colchester that are privately owned, and Colchester eCargo has 10 eCargo Bikes and 6 longtails in addition to the eCargo Bikes loaned by the council.

Since the commencement of our Colchester led projects in 2020 when we were aware of only one eCargo Bike user in Colchester, there are now just under 80 eCargo bikes, longtails and etrailers riding the streets of Colchester and with 2024 the year we focus on engagement and promotion of our services, this is only going to increase.

Colchester eCargo one of our eCargo Bike champions who started off with just one of our eCargo bikes, now provides employment to 12 people covering pickups, deliveries, the city centre to home delivery service and their contract with Tier to maintain and manage the on street escooters and ebikes.

Colchester electric car club

Colchester's electric car club car based in Priory Street has driven 12,951 miles since launched. A decision is awaited regarding basing the second car at Rowan house until a more permanent location is available in St Peters Street at the Ryegate House development. A car club has been built into a number of developments. We continue to request car clubs in new developments through Development team and have talked to a number of businesses and organisations regarding hosting car club vehicles.

5.5.2 Outcome 7: More people switching off their engines when stationary

- CAReless Pollution phase 2 completed in May 2023 when evaluation took place. Results are outlined in the Air Quality report.
- Phase 2 activities have included development of a film showcasing how the 'Take Care of your Air' resources can be used, school assemblies and activity, attendance at events; talks and presentations to businesses, social media, ambient advertising, and workshops and the sharing of resources with community volunteers.
- In 2023 we also completed three legacy projects working with Meadows and Adrien LeRoy a local artist to create bold and colourful murals to remind people of the importance of clean air, promote sustainable transport and encourage engine switch offs. These can be found in Queen St and St John's and St Mary's car parks.
- We continue to work with Essex County Council to obtain permission to reinstall the psychological based 'no idling' signs in Brook St and Eastgates on a permanent basis. However, Essex County Council have raised concerns about the signs that were not raised when the signs were up during the study. We feel this issue is important to resolve especially as Essex County Council are already using the results from the study as content on the new Essex Air website

5.5.2 Outcome 8: Understanding within CCC and ECC as to how the EV transition should be promoted in Colchester

- Continued to liaise with ECC and attend ECC stakeholder workshops
- Commented on ECC's draft EV strategy
- Working with ECC on potential locations for EV charging in Colchester for a LEVI bid with a focus on areas where commercial providers would not operate in line with ECC's strategy

5.5.2 Outcome 9: Residents understand and feel more supported and confident about transitioning to use an electric vehicle in Colchester.

- Promoted the car club at events as this is an easy way for residents to try out an electric car without the cost of purchase.

5.5.3 Outcome 10: Shared transport choices are accessible to all sections of our community regardless of income

- Prices for the city centre bike hub and car club have been carefully established to balance affordability with the necessity for the services to be financially viable.
- By providing pay as you go as well as try before you buy we are offering a suite of services to suit all circumstances and financial positions.
- We are working with community groups that work with underserved areas of our community on flexible ways to access our eCargo bikes to assist them with their work.

5.6 Raising Colchester's profile locally and nationally.

The evolution of our projects and the lessons we have learnt means we are seen as a regional expert on eCargo Bikes, Car Clubs and No Idling campaigns and our knowledge and experience is often sought out by others.

In 2023 we:

- Presented at the National eCargo Bike Summit in March 2023
- Presented at the Cycle City Active City national conference in Oxford in July 2023
- Presented at DEFRA's first Air Quality symposium in September 2023
- Shared knowledge with 11 other councils who asked to talk to us about our projects
- Presented to Active Essex , ECC, NECCG and other local stakeholders

5.7 Next Steps

This year we will continue to lobby and work closely with ECC and partners for ongoing investment in and delivery of sustainable transport infrastructure and projects in Colchester. We will continue to influence policy and project design for example

- Local Transport Plan,
- Evolving Place and Movement study,
- Local Cycling and Walking Investment Plan (LCWIP),
- Town Deal, Levelling Up Fund and City Centre Master Planning etc.

In 2024 we will:

- Work with ECC in designing and delivering the Active Travel Fund routes for example refining the Greenstead to Severalls LCWIP7 route.
- Continue to identify S106 contributions for projects to help walking and cycling in Colchester and planning the projects' delivery.

- Deliver University to City Centre and Greenstead Walk with Words wayfinding project
- Deliver Fixing the Link phase 2, Albert roundabout drought planting scheme.
- Continue to work on delivering a residential secure bike parking project in Greenstead.
- Deliver our first community led Shared Bike Hub.
- Deliver our 5th DEFRA successful bid, this includes funding for two additional officers one focused on community the other on businesses. The community focused officer started in January 2024 the business officer is still to be recruited. The project includes:
  - Phase 3 of the CAReless Pollution campaign to further cement the legacy and expand the offer to include active travel through:
  - Expansion of the school toolkit to include Active Travel, and working with schools to promote it and embed it into the curriculum.
  - Development of a free business eLearning module tapping into Environmental, Social Governance and the Corporate Social Responsibility agenda
  - Closer working with heath groups and stakeholders
  - Ongoing promotion to the community and recruitment and support of volunteers
  - New Cycle Colchester map
  - New Cycle Colchester website
  - New resident eBike/eCargo bike short term hire scheme
  - Extensive school, community and business engagement
  - Attend at least 10 community events to promote our services and signpost to local support.

With so many different elements to our work we have identified a need to better frame what we do and find language that will resonate with the public. Therefore, we are undertaking a strategic messaging exercise facilitated by our communication partner Meadows. We brought together key stakeholders for an interactive workshop. Early thoughts include a strong sense that language should focus on health, positivity and the individual and not climate change and negative outcomes. Out of this work we are hoping to achieve an overarching strapline and set of key messages, that we and partners (if they want to) can adopt.

6. Equality, Diversity and Human Rights implications

6.1 This report has no specific equality, diversity and human rights implications, however sustainable travel can help support families and people on low income by enabling options to travel to work, education or services without the need to own and run a private car. Examples include the Get Monkwick Moving project.

7. Strategic Plan References

7.1 The projects outlined in this report contribute to the Strategic Plan 2023-2026 themes-

- Respond to the climate emergency
- Deliver modern services for a modern city
- Improve health, wellbeing and happiness
- Grow our economy so everyone benefits

8. Consultation

8.1 There are no consultation considerations for this paper, although many of the projects referenced have community engagement elements within them and success in promoting sustainable travel will involve engagement and education of others to influence behaviour change more widely.

9. Publicity Considerations

9.1 There are no specific publicity considerations.

10. Financial implications

10.1 There are no specific financial implications from this paper, however the projects have attracted significant investment, for example

- Over £4.5m for the Active Travel/ Town Deal LCWIP4 route from East Hill to University/ Greenstead
- Around £2.5m Active Travel route from Lexden Road to East Hill
- £1.7m s106 funds mainly from student accommodation providers in east Colchester enabling a number of projects to be implemented for example Walking with Words and Animating King Edward Quay
- £1.19 million for a number of Defra funded Clean Air projects
- £120k fixing the Link phase 2 project
- £90k Secure Bike Park in city centre
- £30k per annum to host and coordinate the Colchester Travel Plan Club
- Additionally Town Deal projects including those improving public realm encouraging more walking and cycling.

11. Community Safety Implications

11.1 There are no specific community safety implications from this paper.

12. Health and Safety Implications

12.1 There are no health and safety implications from this paper, however sustainable and active travel helps increase activity and access to work, education and leisure meaning a benefit to physical and mental health. Also, cleaner air will help reduce the 1 in 20 deaths currently attributed to poor air quality in the city. (Public Health England)

13. Risk Management Implications

13.1 There are no risk management implications from this paper.

14. Environmental and Sustainability Implications

14.1 The projects and initiatives outlined in this report are all relevant to tackling climate change and/or improving the environment as well as increasing the level of sustainable transport, allowing people to reduce their car use. Actions and projects highlighted in the report all have co-benefits outside of environmental improvements for residents.

Background Papers
Sustainable Transport – Our Approach
Colchester Future Transport Strategy

Environment and Sustainability Panel

Item 10

21st March 2024

Report of	**Head of Neighbourhood Services**	**Author**	**Robert Doran 01206 282612**
Title	**Colchester City Council Fleet Transition Strategy**		
Wards affected	**All wards**		

1. Executive Summary

1.1 This report is presented in response to proposals and questions asked by the Environment & Sustainability Panel at its meeting of February 2024. It sets out to address questions and points of concern, in order to give confidence to the Panel to take forward the recommended decision. Topics include: the recycling and reuse of batteries, emissions from manufacturing, the point needed for investment in infrastructure, and cost comparisons of different fuel types.

2. Recommended Decision

2.1 Further to a discussion on the additional information provided, make recommendations to Cabinet to implement the Strategy with or without changes as agreed by the Panel.

3. Reason for Recommended Decision

3.1 One of the key priorities of the Strategic Plan for 2023 – 2026 is “responding to the climate emergency” and “delivering modern services for a modern city”. A key element is to reduce the carbon footprint and to remain on track for the Council to be net zero by 2030. The Strategy will enable the Council to make an informed decision on the investment in its fleet.

4. Alternative Options

4.1 Options are set out within the Colchester City Council Fleet Transition Strategy that consider the commitment to transition the fleet to fully electric vehicles, the use of Hydrotreated Vegetable Oil (HVO) as a drop in fuel or continuing with the replacement of vehicles with the latest Euro engine diesel vehicles.

5. Background Information

5.1 The Environment and Sustainability Panel at their meeting of February 2024 were presented with proposals for a new Fleet Transition Plan. Numerous questions were posed to Officers, and this report aims to address these points, with the aim to provide confidence to the Panel that they can make the recommended decision as set out.

Question: An explanation of the 'tipping point' beyond which our used of electric vehicles would require us to install a sub-station at Shrub End

5.2 The Energy Savings Trust in July 2020 prepared a report (Appendix A) for Colchester City Council to assess the efficiency of its fleet in terms of greenhouse gas emissions, energy consumption and operating costs. Within this report, it sets out that the Council would need a 526kVA[1] supply at the Shrub End depot to service an all-electric fleet. Using the model within the report it determined the capacity required from four possible charging strategies:

1. The first is the capacity required for all the chargers to operate simultaneously at full power – this is the simplest option, and many vehicles will be fully charged in less than eight hours leaving unused capacity throughout the rest of evening.

2. The second strategy considered assumes that all the vehicles return with 10% battery capacity and there is a charge management system in place to spread charging over the whole overnight period by restricting the capacity available to the chargers.

3. The third strategy uses the tracking data, considers the mileage driven by the vehicles during the day and determines the electricity (kWh) required to return the vehicles to a fully charged state.

4. The fourth and final strategy is much riskier. It allows the vehicle to run down throughout the week by ensuring that each vehicle has enough power to complete the next day's workload and is only fully recharged over the weekend. This final strategy only works with a very predictable daily workload and does not accommodate changes made at short notice. It is a high-risk strategy and should only be considered if the site capacity is severely constrained, upgrade is very expensive, and the vehicles have a very predictable work pattern.

Table 1: Site capacity required by different charging strategies

Strategy	Description	kW	Notes
1	Simple maximum capacity – all 100% charged	1,040	Very expensive
2	Smart - worst case – all 100% charged	533	Expensive as over 400 kVA
3	**All departures 100% charged**	498	**Optimal**
4	No unnecessary off-site charging, not all 100%.	351	High risk

5.3 It may be difficult to create the 500kW of headroom predicted to be needed to fully charge the electric Refuse Collection Vehicles (eRCVs) overnight. It is believed that this

[1] kVA – kilo volt-amperes. A unit of apparent power, which is the product of Root Mean Square (RMS) values of voltage and current (i.e. the amount of power being used by a system).
KW – actual power

may be a worse case estimate but only a long-term detailed on-site evaluation of an eRCV across all the Council's routes will determine that.

Question: Explanation about the whole life cycle of batteries and vehicles

5.4 In recent years, motor vehicle manufacturers, have shown a vested interest in distancing themselves from any involvement in illegal or unsustainable methods of vehicle manufacture. While past allegations suggested the use of child labour for electric vehicle battery production, it is apparent that production methods have since evolved, with rare trace minerals and materials now being responsibly sourced from various global locations. Notably, graphite extraction for battery production has recently been licensed in Canada, with minerals also being extracted from Australia and Chile, among other regions.

5.5 Insights from a report by Forbes in 2022 underscored the longevity of electric car batteries, with UK Marketing Director for Nissan, Nic Thomas, noting that the vast majority of electric car batteries produced by Nissan over the past twelve years remain in active use, delaying recycling programs.

5.6 At the end-of-life stage for electric vehicles, batteries are being repurposed for electricity storage or recycled, with raw materials such as lithium and nickel being reclaimed for use in new battery production. Advances in battery technology, particularly in battery management systems and cooling mechanisms, have led to substantial improvements in efficiency and cost-effectiveness without added weight or expense. These enhancements, such as the adoption of liquid cooling systems, suggest a potential lifespan of over twenty years for modern batteries.

5.7 Moreover, efforts to address the approximately one million electric vehicles already on UK roads are underway. Nottingham City Council (NCC) for example, has explored various strategies, including battery repair, reuse, and replacement. Utilising battery refurbishment tools, NCC has successfully restored older batteries to nearly double their original range. Additionally, containers filled with batteries reclaimed from vehicles at the end of their lifespan are being repurposed for alternative energy storage purposes. Collaborating with a Scottish company, NCC is also investigating innovative methods for replacing outdated batteries with newer, technologically advanced alternatives, potentially extending the lifespan of electric vehicles beyond their original specifications.

Question: Check the current cost of HVO and diesel and cost per mile for fuel types

5.8 Table 2 illustrates the pence-per-mile (PPM) cost of a 26-tonne Refuse Collection vehicle achieving 4 miles per gallon, based on the Council's figures for diesel and electricity. The report from Energy Savings Trust July 2020 report (Appendix A), reported that Colchester City Council's waste fleet averaged 3.4mpg, with a 2.0 – 4.7 mpg range.

Table 2: fuel cost comparisons

Fuel / energy	Unit	Price uplift for HVO	Price (excl VAT)	Fuel consumption (mpg)	Battery Electric Vehcile kWh per mile	Price per mile
Diesel (average biofuel blend)	litre	n/a	£1.25	4.0	n/a	**£0.31**
Biodiesel HVO	litre	25%	£1.56	4.0	n/a	**£0.39**

Electricity	kWh	n/a	£0.23	n/a	3.13	**£0.72**

Questions: Provide more detail in the Equality Impact Assessment in relation to the Council's procurement social value indicators

5.9 The Council is committed to ensuring equality in its procurement processes. As part of this commitment. The Social Value Portal is utilised for relevant contracts, enabling bidders to propose targets that align with the Colchester Themes, Outcomes, and Measures (TOMs) framework. This framework is a comprehensive set of measures designed to assess the social value of a contract.

5.10 The Social Value Portal is an online platform that facilitates the integration of social value into the procurement process. Bidders interested in participating in the Council's projects are required to register on the Social Value Portal. Detailed guidance on how to navigate the portal and how to align bids with the Colchester TOMs framework is provided in the tender pack for each project.

5.11 Once a bidder is successful, their social value offer becomes an integral part of the contract. This means that the commitments they have made regarding social value are contractually binding. The Social Value Portal plays a crucial role in this stage as well. It provides a robust monitoring system that tracks the successful bidder's performance against their social value commitments throughout the contract's duration.

Question: Are we aware of the emissions associated with generating/procuring both Hydrotreated Vegetable Oil (HVO) and electricity consumed by the fleet

5.12 From the Digest of UK Energy Statistics (DUKES) 2022 produced by the Department for Business, Energy & Industrial Strategy, renewables accounted for 135/325 terawatt-hours (TWh[2]) (42%) of total UK electricity generation, fossil fuels accounted for 133/325 TWh (41%) and the remaining 17% came from nuclear production, or was imported from Europe (usually France, Eire, Belgium and Netherlands).

5.13 Powering the battery electric version of a fossil-fuelled vehicle will see a 75-80% reduction in greenhouse gases and powering it by HVO will see a 90% greenhouse gas reduction but see Section 5. 'Alternative Fuels' in the Fleet Transition Plan (pages 15 and 16).

Question: How many miles is it anticipated that each vehicle would do?

5.14 Vehicle use varies over time. Table 3, sets out the average annual mileage for the Recycling Collection Vehicles in the Council's fleet portfolio:

Table 3: Average annual mileage

Openback	11,728
Trade lift	13,101
Twin lift	8,814
Triple lift	8,265
50/50	6,179

6. Equality, Diversity and Human Rights implications

[2] The amount of electricity generated from renewable sources over a certain period

6.1 There are no further updates to the equality diversity and human rights implications from the report of the Environment & Sustainability Panel of February 2024.

7. Strategic Plan References

7.1 There are no further updates to the strategic plan references from the report of the Environment & Sustainability Panel of February 2024.

8. Consultation

8.1 There are no further updates to the approach to consultation from the report of the Environment & Sustainability Panel of February 2024

9. Publicity Considerations

9.1 There are no further updates to the publicity considerations from the report of the Environment & Sustainability Panel of February 2024

10. Financial implications

10.1 There are no further updates to the financial implications from the report of the Environment & Sustainability Panel of February 2024

11. Health, Wellbeing and Community Safety Implications

11.1 There are no further updates to the health, wellbeing and community safety implications from the report of the Environment & Sustainability Panel of February 2024

12. Health and Safety Implications

12.1 There are no further updates to the health and safety implications from the report of the Environment & Sustainability Panel of February 2024

13. Risk Management Implications

13.1 There are no further updates to the risk management implications from the report of the Environment & Sustainability Panel of February 2024

14. Environmental and Sustainability Implications

14.1 There are no further updates to the environment and sustainability implications from the report of the Environment & Sustainability Panel of February 2024

Appendix A
Energy Savings Trust Report – July 2020

Department for Transport

Fleet Report

energy saving trust

Colchester Borough Council

Lead Author – Steve Williams
Peer Reviewed by – Peter Eggeman
24th July 2020

Contents

Glossary of Terms

Abbreviation	Meaning
BEV	Battery-electric Vehicle
CAZ	Clean Air Zone (England and Wales, excluding London)
CCC	UK Committee on Climate Change
CNG	Compressed Natural Gas - methane (CH_4)
DBEIS/BEIS	(Department for) Business, Energy and Industrial Strategy
DVLA	Driver and Vehicle Licencing Agency
EV	Electric Vehicle - usually battery-powered (BEV)
EVCI	Electric Vehicle Charging Infrastructure
GHG	Greenhouse Gas, CO_2e, in transport usually CO_2, CH_4 and N_2O
GVW	Gross Vehicle Weight – Replace by MAM
GWP	Global Warming Potential
HCV	Heavy Commercial Vehicle – also known as HGV – over 3.5t MAM
HGV	Heavy Goods Vehicle – also known as HCV – over 3.5t MAM
ICE	Internal Combustion Engine – Petrol/Diesel/Gas
LCV	Light Commercial Vehicle – Van – up to 3.5t MAM
MAM	Maximum Authorised Mass – replaces GVW Gross Vehicle Weight.
NAEI	National Atmospheric Emissions Inventory – Transport Factors
NPV	Net Present Value
OEM	Original Equipment Manufacturer, e.g. Ford, Nissan, Toyota etc.
OLEV	Office of Low Emission Vehicles
PHEV	Plug-in Hybrid Electric Vehicle
PM	Particulate Matter – associated with wide range of human illness
RCV	Refuse Collection Vehicle (eRCV - electric RCV)
REEV	Range Extended Electric Vehicle
SoC	State of Charge – how much charge is left in the battery.
TTW	Tank to Wheel
ULEV	Ultra-Low Emission Vehicle
VED	Vehicle Excise Duty – also called Vehicle Tax.
VRM	Vehicle Registration Mark – also VRN - Number
WLC	Whole Life Cost
WTT	Well to Tank
WTW	Well to Wheel

1. Executive summary

Colchester Borough Council (CBC) has sought this report to assess the efficiency of its vehicle fleets in terms of greenhouse gas (GHG) emissions, energy consumption and operating cost. The analysis was undertaken by the Energy Saving Trust (EST) using CBC data.

The report identifies any of CBC's heavy commercial vehicles (HCVs) that could be replaced by zero or ultra-low emission models. A separate report covering vehicles of 3.5t MAM or less has already been provided to CBC in June 2020. In July 2019, CBC declared a climate emergency and set the target of Colchester being carbon-neutral by 2030. In its Climate Emergency Action Plan, it identifies its own vehicle fleet as accounting for 1,383 tonnes of Scope 1 emissions in 2018/19 which was 22% of its total emissions for that year.

During the 12 months ending 31st March 2020 CBC operated 51 HCVs and items of plant, including 31 refuse collection vehicles (RCVs). Based on the data sets that CBC have supplied, we estimated these HCVs/items of plant:

- drove at least 289k miles,
- produced an estimated 920 tonnes of greenhouse gases - carbon dioxide equivalent (CO_2e)
- consumed an estimated 3,746-megawatt hours of energy,
- emitted up to 843 kgs of nitrogen oxides (NO_X),
- emitted up to 8.8 kg of particulate matter (PM),
- was 65% clean air zone compliant.

Added to the sub 3.5t fleet - profiled in an earlier report the overall summary for the CBC fleet is that it

- drove at least 859k miles,
- produced an estimated 1,167 tonnes of greenhouse gases - carbon dioxide equivalent (CO_2e)
- consumed an estimated 4,758-megawatt hours of energy,
- emitted up to 1,555 kgs of nitrogen oxides (NO_X),
- emitted up to 17.74 kg of particulate matter (PM),
- was 37% clean air zone compliant.

This report focuses on the opportunities to introduce Ultra Low Emission Vehicles (ULEVs) in the HCV fleets. In the period reviewed, the HCV fleet consisted of 32 RCVs, 11 large trucks mostly operated by the Waste and Recycling department and nine items of plant (mostly sweepers).

Of the 32 RCVs, five were listed as "back-up" vehicles and one of these returned no mileage or fuel use data. 27 of the 32 CBC RCVs have been replaced within the last 18 months, meaning that the RCV fleet is a very modern fleet and only the five "back-up" vehicles do not comply with the latest Euro VI (trucks) emission standards. This is reflected in the high level of clean air zone (CAZ) compliance, with 87% of the fleet passing the CAZ standard, which is a very high percentage for a council fleet not operating in an active Clean Air Zone. As a result, most of the RCV fleet is not due for replacement until 2026/27, at which time the whole fleet could be switched to battery electric power, which should reduce GHG emissions of the RCV fleet by at least 80% (570 tonnes per year) depending on the UK grid carbon intensity at that time.

The 11 large trucks (with a MAM of 7.5t) are older and consequently likely to be replaced in the next 12 months or so. Whilst we are not currently aware of any OEM 7.5t trucks, we believe the Mitsubishi Canter will be available from 2021 and there are third party REEV conversions of OEM chassis available from companies such as Tevva and Paneltex. Based on the data provided, it is feasible that vehicles could be switched to battery electric power, which should reduce GHG emissions of the LCV fleet by at least 68% (95 tonnes/year) upon adoption, with savings increasing as the grid decarbonises, to at least 109 tonnes by 2030. However, detailed daily mileages (from tracking data) were not available and CBC should compile this data and analyse this data to ensure a conversion to electric is possible in all cases, or if a mix of pure electric, and REEVs or diesels will be necessary.

CBC also operate nine items designated as Plant and these include 7 Sweepers (four compacts and three mediums) and two waste loaders. Electric sweepers are now available from several manufacturers, for example, Johnson, Boschung and Schmidt have offerings which between them cover sub compact, compact, medium and large sweepers sectors. Adopting electric sweepers will cut emissions from that section of the fleet by approximately 80% but those organisations who have already adopted them have received grant funding to offset the higher initial purchase costs.

When assessing the operation of ULEVs we use a whole life cost (WLC) model which includes the cost of funding and operating the vehicle. ULEVs are more expensive to buy but cheaper to fuel and maintain and so a WLC model is the most accurate way to compare them with their diesel equivalents.

As our previous report on the sub 3.5t fleet has demonstrated, as at June 2020, small and medium electric vans are usually no more expensive to buy and operate than diesel vans, when assessed from a WLC perspective, and the same typically applies to electric RCVs (eRCV) when the operational life is optimised. It is more difficult to replace, larger commercial vehicles (excluding RCVs) with a MAM of between 3.5 tonnes and 26 tonnes with ULEV in the present market however that will change over the next five years.

There are now viable eRCVs in a range of size options from both Electra/Mercedes and Dennis Eagle. The manufacturers of these vehicles promote the mechanical simplicity and long operating life of the electric version. With a small fraction of the moving parts in the electric drive train, both Electra and Dennis Eagle suggest their eRCVs can have an operational life of ten years whereas most diesel RCVs, often supplied by the same companies (Electra has a partner leasing company) are written off after seven years.

The eRCVs on order for the City of London (Electra) Manchester City Council (Electra) and Nottingham City Council (Dennis Eagle) have all been costed on a ten year model and the cost includes a residual value for the battery which can have a long second-life as a static battery in an energy storage array. The large batteries are modular in design and can be refurbished. No residual value is assigned to the chassis and rig but that may be unduly pessimistic when the long lifecycle of electric drive components is considered.

We have modelled the WLC of eRCVs on a ten-year lifecycle and compared that with a seven plus three-year lifecycle for the diesel RCVs. Based on the 27 newer vehicles (all supplied with Dennis Eagle telematics) CBCs waste fleet is essentially split between two mini fleets. The first comprises of twelve 26t Twinpack Dustcarts driving low mileage (c.4,600 average) and achieving average mpgs of c2.6 mpg, and the second comprising of fifteen 26t Dustcarts with various different backs multiple averaging c.11,500 miles and achieving just over 4mpg.

If all 27 vehicles were converted to eRCV and using best estimates for the cost of fuel and energy for the next ten years, we believe the eRCVs would save at least £612k and reduce carbon emission by up to 6,360 tonnes (80%) over their lifetime. By 2030 the eRCV GHG emissions will be 90% less than an equivalent diesel, as carbon produced from the generation of electricity to charge the vehicles reduces.

We have input the results from the eRCV model into the HM Treasury Green Book tool for assessing the net present value (NPV) of projects in terms of GHG reduction, energy reduction and air quality improvement. The results of this suggest that the overall benefit to society of introducing eRCV over its lifetime could be £700k. When combined with a cost saving of between £612k the overall lifetime benefit is significant and could be up to £1.3m.

Electric Vehicle Charging Infrastructure (EVCI) at the depot (or other sites where charging may occur) and the site's power supply capacity is critical to the ability to charge such a large fleet of vehicles equipped with 300 kWh batteries. Using RCV tracking data we believe it will be possible to charge the RCV fleet at one site if the capacity of that site is at least 526 Kilo-volt-amperes (kVA). An accurate assessment can only be made once the first electric RCVs are on site and in regular use – they will need to be closely monitored.

The bulk of the RCV fleet has recently (2019 and 2020) been renewed and so there is time to resolve EVCI issues and build towards an all-electric fleet when the next cycle of replacement occurs in 2026/27.

In the future, managing the fleet will involve playing a role in the management of the site electricity supply and possibly even the local grid. Systems that predict when it will be best to charge EVs, based on surplus renewable generation, and provide a financial incentive for doing so, are already being piloted in the consumer market (e.g. Octopus Agile tariff). On a few occasions in 2019, consumers have been paid to charge their vehicles because it costs less than paying wind farms to curtail generation. Well-integrated data systems, fully integrated into the operation of electric vehicles and that are able to fully report on charging and battery data, will be critical to running a low-cost, low-emission electric vehicle fleet

The whole CBC fleet could be well placed to take advantage of the emerging market in electric cars vans and heavy vehicles providing it can ensure a good power supply at its main depot and other sites it wishes to charge at. 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. From 2026, we would expect all replacement vehicles in all but the most specialist sectors to be battery electric powered.

2. Summary of recommendations

Item	Recommendation	Difficulty	Risk	Estimated % CO_2e reduction	Estimated annual £ saving (cost)	Estimated annual emission reductions[1]		
						CO_2e (tonnes)	NO_X (kg)	PM_{10} kg)
1	Establish available power supply and current baseline usage on a half hourly basis at each site where charging is planned	Low	Low					
2	Replacement of diesel RCVs with electric RCVs at next replacement cycle. Monitor energy consumption and charge times.	Moderate	Moderate	70% to 90%	Full fleet £61.2K	Full fleet 636t	COPERT 5[2] 2,681 kg NO_X 5.45 kg PM	
3	From 2022: Replacement of 7.5 tonne and all other HCVs as models become available. GHG reduction increase over time as grid decarbonises.	Moderate	Moderate	70% to 90%	Full Fleet Cost Neutral	Full Fleet 110t		

[1] CO_2 Carbon dioxide, NO_X Nitrogen oxides, PM_{10} Particulate matter under 10 microns. Air quality emissions are based on performance of average vehicle in an urban area and are indicative only.

[2] COPERT is the EU standard vehicle emissions calculator, developed for the calculation of road transport emissions. It has been used for the RCV fleet emissions analysis. https://www.emisia.com/utilities/copert/

3. Emissions and energy use

The carbon dioxide (CO_2e) footprint (often shortened to carbon footprint) details the tonnage of carbon dioxide that Colchester Borough Council (CBC) road transport has emitted during 2019. The 'e' in CO_2e stands for 'equivalent' and indicates that the estimate includes the other reportable greenhouse gases (GHG) emitted by the fleet (methane and nitrous oxide) expressed in terms of their carbon dioxide equivalence. For example, one tonne of nitrous oxide (N_2O) has a global warming potential (GWP) 265 times that of carbon dioxide and is therefore equivalent to 265 tonnes of CO_2. The GWP of methane (CH_4) is 28 (GHG Protocol, GWP Values).

The CO_2e estimate is based on tank to wheel (TTW) factors. This means that it does not include CO_2e emissions relating to the extraction, refining and distribution of the fuels, known as well to tank (WTT) factors, nor does it include the manufacture and disposal of the vehicles. No matter what type of vehicle, or engine technology is used the carbon emissions from burning a litre of diesel (for example) will always be the same. WTT and TTW factors can be combined to give well to wheel (WTW) values.

The footprint for the fleets (Table 3-1) is based on the fuel and mileage data CBC have provided. We have calculated this footprint using the 2019 GHG conversion factors published by the Department for Business, Energy & Industrial Strategy (DBEIS). The methodology complies with international GHG reporting standards. The average gCO_2e/km has been omitted for fleets where mileage and fuel or kWh data was missing.

Table 3-1: *GHG reporting: scope, fleet size, mileage, CO_2e emissions and energy consumption*

Vehicle Fleet	GHG Scope	Fleet size	Annual mileage	CO_2e (tonnes)	Energy (MWh)	Average gCO_2e /km
RCV – Refuse vehicles	1	31	217,014	715	2,911	2,443.8
HCV ≤ 7.5 tonne	1	11	69,515	139	564	1,176.8
Plant – Sweepers / Tractors etc	1	9	2,813	66	271	-
Totals		**51**	**289,342**	**920**	**3,746**	**1,810.3**

Table 3-2 shows the methodology we have used to determine the carbon dioxide emissions and energy used. This is an indicator of the quality of the data: Method 1 is the most accurate and Method 5 the least accurate. A full description of GHG Reporting and the EST Transport Methodology is available on request.

Table 3-2: *Method used for calculating the carbon footprint as a percentage of fleet size*

Vehicle Fleet	Method 1	Method 2	Method 3	Method 4	Method 5	No Data
RCV – Refuse vehicles	100%	0%	0%	0%	0%	0%
HCV ≤ 7.5 tonne	100%	0%	0%	0%	0%	0%
Plant – Sweepers / Tractors etc	100%	0%	0%	0%	0%	0%

A full description of the EST GHG emissions and energy use calculation methodology is available on request.

The expectation is that the analysis of all directly operated fleets including trucks, vans and fleet cars is based on fuel burnt (Method 1).

Air quality

Every litre of fuel burnt or mile driven is also associated with emissions of nitrogen oxides and particulates. These are much harder to measure as they depend on the vehicles average speed, load, its usage cycle, its fuel type, the Euro emission category, the engine technology, and the effectiveness of the exhaust clean-up system.

We have determined the data in Table 3-3 using the average emissions of a 2018 UK car, LCV (van) or HCV (including the RCVs) adjusted for the area of operation (urban) as published by the National Atmospheric Emissions Inventory. This analysis is based on fleet mileage and cannot be determined from fuel data.

Table 3-3: *Estimated annual emissions of nitrogen oxides (NO_X) and particulate matter (PM)*

Vehicle Fleet	NO_X (kg)	PM (kg)
RCV – Refuse vehicles	644.4	6.68
HCV ≤ 7.5 tonne	191.2	2.04
Plant – Sweepers etc	8.4	0.09
Total	**843.9**	**8.81**

A more accurate assessment of the air quality impact would require the use of the COPERT V5 model and much more detailed usage data. Specific fleets such as the RCVs will have very high emissions due to their slow operating speed, low engine temperatures and stop/start operation; this is not reflected in the above figures. The data also assumes an average fleet profile and the CBC fleet is much newer than the UK fleet average with far more Euro 6/VI vehicles in the van and heavy good fleets so, with the exception of the RCVs, it is likely the rest of the fleet will have lower emissions than estimated above.

Overview of the Emissions and replacement strategy for the whole fleet

Whilst this report focuses on the heavier vehicles and items of plant operated by CBC and a separate report detailing the emissions of the sub 3.5 tonne fleet has already been issued, it is we believe useful for CBC to have a view of the fleet where both sections of the fleet are summarised together.

Table 3-4: *GHG reporting: scope, fleet size, mileage, CO_2e emissions and energy consumption*

Vehicle Fleet	GHG Scope	Fleet size	Annual mileage	CO_2e (tonnes)	Energy (MWh)	Average gCO_2e /km
RCV – Refuse vehicles	1	31	217,014	715	2,911	2,443.8
HCV ≤ 7.5 tonne	1	11	69,515	139	564	1,176.8
Plant – Sweepers / Tractors etc	1	9	2,813	66	271	-
LCV - Large	1	30	238,174	139	567	377.1
LCV - Medium	1	11	65,480	21	87	210.4
LCV - Small	1	7	35,292	12	51	150.1
Car	1	29	231,571	75	307	213.5
Totals		**128**	**859.859**	**1,167**	**4,758**	**1,666.4**

If a local authority has responsibility for refuse collection, the RCV fleet is usually a significant source of transport GHG emissions. Typically, it is between 30% and 40% of the fleet total, with the remaining two thirds split equally between the grey fleet and the rest of the council's fleet. We have not been given the data on the grey fleet so this has not been included in the Table 3-4 above or in figure 3-1 (overleaf). Based on the data supplied by CBC the split between RCV and the rest of the council's fleet is approximately 60/40, but CBC should consider the grey fleet when looking at its transport emissions to understand the whole picture.

Table 3-4 shows that the RCV fleet emits five times as much CO_2e as either the large van or HCV ≤ 7.5 tonne and nine times as much as the car fleet. Clearly, the RCVs need to be addressed if CBC wishes to make real progress towards a zero emissions fleet. Figure 3-1 (overleaf) shows this gap graphically.

Figure 3-1: *Carbon dioxide emissions (tonnes) (Scope 1)*

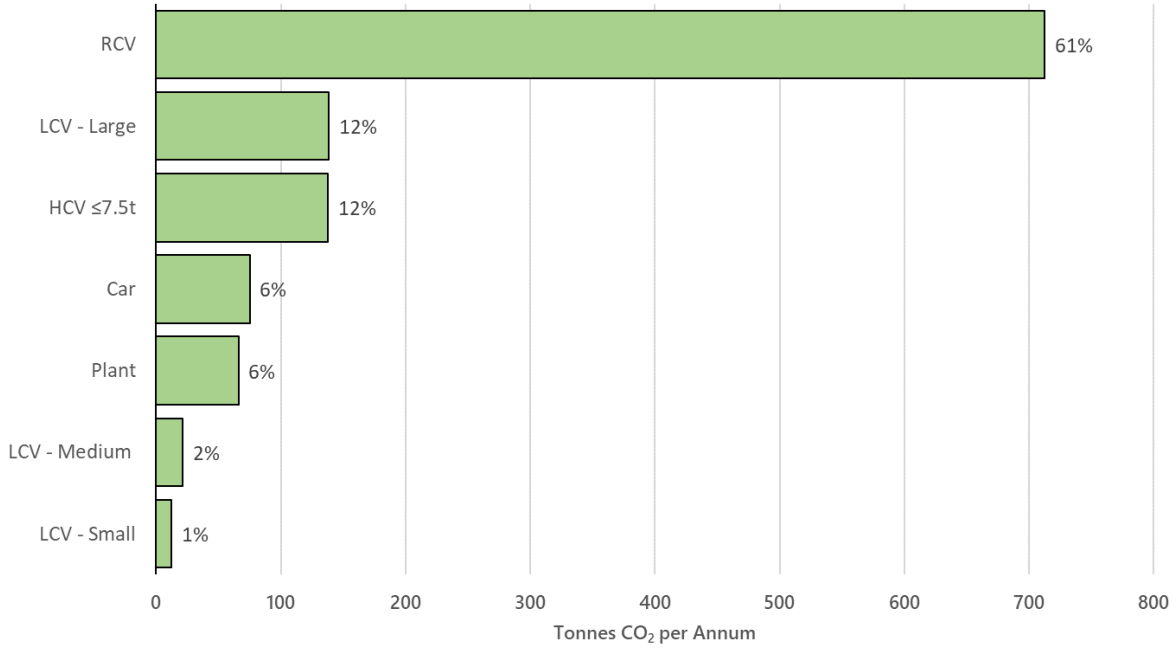


Table 3-5: *Analysis of fleet size, mileage, carbon emissions and energy use.*

Vehicle Fleet	% Size	% Mileage	% Carbon	% kWh
RCV	24.2%	25.2%	61.3%	61.2%
HCV ≤7.5t	8.6%	8.1%	11.9%	11.9%
LCV - Large	23.4%	27.7%	11.9%	11.9%
Car	22.7%	26.9%	6.4%	6.5%
Plant	7.0%	0.3%	5.7%	5.7%
LCV - Medium	8.6%	7.6%	1.8%	1.8%
LCV - Small	5.5%	4.1%	1.1%	1.1%

The biggest environmental impact is from the RCV fleet, which whilst only 24% by number, accounts for 61% of GHG emissions. The sub-fleets with the next largest impact are the HCV ≤7.5t and the Heavy LCV fleet, both of which emit 139 tonnes but the HCV ≤7.5t travels only a third of the distance the Heavy LCV fleet does.

***Figure 3-2**: Targeting fleets for GHG reduction – Average annual GHG emissions per vehicle.*

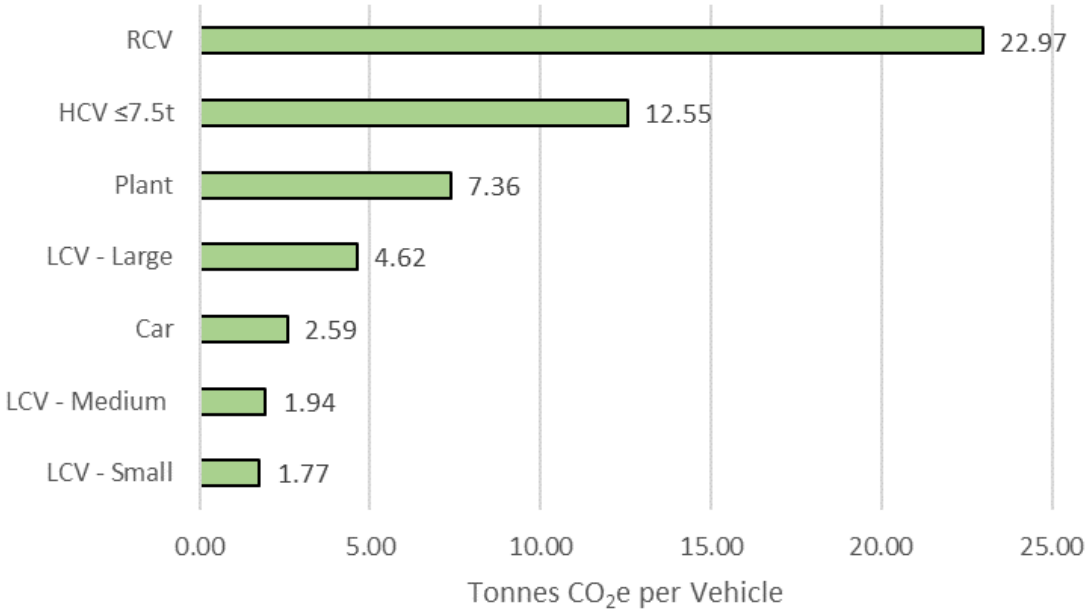


Figure 3-2 shows the average annual emissions of a vehicle in each category and therefore illustrates the annual GHG reduction associated with replacing one vehicle with a zero-emission alternative. Replacing one RCV is equivalent to replacing over five large vans or nine cars. An electric RCV (eRCV) 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. However, given the total CO_2e 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.

4. Achieving Net Zero Transport by 2030

CBC declared a Climate Emergency (CE) in July 2019 and has set itself the objective of being a "net zero" borough by 2030.

DBEIS data (Appendix B) shows that since 2014, UK electricity grid GHG intensity has fallen from 494 gCO_2e per kWh to 233 gCO_2e per kWh, a reduction of 53% and it is expected to fall much further. The Committee for Climate Change (CCC) and DBEIS suggest that by 2030 the grid GHG intensity could be as low as 100 gCO_2e/kWh and the move to renewables will reduce other generation emissions such as SO_X, NO_X and PM.

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. Table 4-1 shows that an all-electric CBC fleet (excludes the grey fleet and plant) charged from the UK Grid in 2030 will reduce CBC transport energy use by 75%, energy costs by 73% and GHG emissions by 91%.

Table 4-1 shows the estimated effect of the electrification of the vehicles under review in this report.

***Table 4-1**: Impact of electrification of the CBC Heavy fleet on GHG emissions and energy use (2020 prices).*

Factor	ICE - 2019	BEV - 2030	Change	Reduction
Energy (MWh)	3,746.3	749.3	-2,997.0	-75%
Energy Cost (£)	£367,398	£98,272	-£269,125	-73%
GHG Emissions (t)	916.4	82.4	834.0	-91%

The effect of electrification on the whole fleet, including the sub 3.5t vehicles examined in a previous report would be is shown in table 4-2.

***Table 4-2:** Impact of electrification of the whole CBC fleet on GHG emissions and energy use (2020 prices).*

Factor	ICE - 2019	BEV - 2030	Change	Reduction
Energy (MWh)	4,757.8	951.6	-3,806.3	-75%
Energy Cost (£)	£466,564	£124,807	-£341,756	-73%
GHG Emissions (t)	1,163.8	104.7	1,059.1	-91%

If charged from the UK Grid, the fleet will still be associated with about 83 tonnes of GHG emissions for just the heavy fleet and 105 t for the whole fleet, but over the next ten years CBC should evaluate investing in its own "private wire" renewable photovoltaic or wind generation capacity, as well as on-site storage so that the fleet can achieve net zero in 2030.

We believe it should be possible for the whole vehicle fleet to be zero emission by 2030 and a large part of the fleet could move to zero emission by 2025 (see previous report on the sub 3.5t fleet.)

The urban heavy commercial vehicle (HCV or HGV) market has developed more rapidly. By the end of 2020 it is possible that at least two and possibly three UK local authorities will be collecting domestic waste with fleets of 18/19-tonne and 26/27-tonne battery electric RCVs. Indications are that over a 10-year lifespan they are cost neutral and in clean air zones, where Euro VI diesels may incur access charges later in the decade, electric RCVs can make significant savings.

Specialist electric vehicles like gritters, road sweepers, welfare buses and fire tenders are also available or being developed and at least three electric fire engines will be trialled in Europe in 2020. Thousands of single and double deck electric buses are already in use in the UK, Europe and around the world.

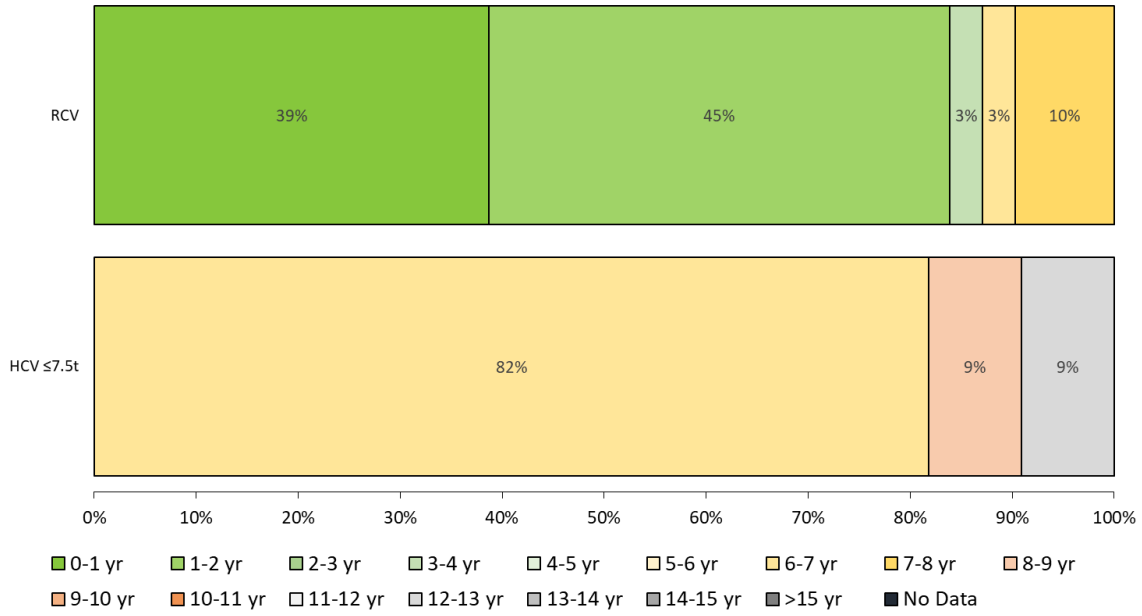
CBC should plan on having an all-electric fleet by 2030 and this has significant implications for the charging infrastructure at depots, offices and at employees' homes where vans may be parked overnight.

5. HCV Fleet profile

This section focuses on CBC heavy fleet (which is comprised of the HCV ≤7.5t fleet and the RCV Fleet. It excludes all vehicles on the CBC fleet under 3.5 t, (details of which may be found in our previous report of June 2020,) and items of plant, as the DVLA does not record the necessary data for us to undertake profiling.

5.1 Age distribution

Figure 5-1: *Age Distribution of CBC heavy fleet*



Vehicle age matters because it impacts adversely on:

- fuel consumption – old engines are less efficient,
- air quality – old engines are significantly more polluting,
- safety – not equipped with modern accident avoidance technology,
- reliability – much more likely to break down,
- service delivery – when they break down it can be very disruptive.

Table 5-1: *Table to show age distribution of CBC Fleet*

Fleet	Fleet size	Newest	Average	Oldest
RCV	31	0.2	1.8	7.4
HCV ≤7.5t	11	6.4	7.2	12.6

CBC operates its vehicles on a 7-year replacement cycle and clearly it also largely replaces different sections of the fleet in one transaction. The bulk of the RCV fleet has been replaced over the last 18 months and that the bulk of the HCV ≤7.5t fleet is due for replacement shortly. However, until they are replaced, this older section of the fleet is a concern for the reasons listed above.

5.2 Fuel types

Fuel type, in conjunction with the Euro emission standard, affects the emissions of two key pollutants: nitrogen oxides (NO_X) and particulate matter (PM). Both have a negative impact on air quality and public health.

The CBC RCV and HCV fleet is all diesel and this fuel type is usually the lower carbon, more energy efficient option, when compared to petrol, but for many years there have been significant concerns regarding the NO_X and PM emissions of diesel vehicles especially when they are used at low speeds in urban areas. The failure of the Euro 6/VI standard to reliably address those concerns means that in urban areas diesel is not the fuel of choice, especially if a zero-emission option is available. Across Europe city administrations are considering or planning diesel bans and, in the UK, Bristol (amongst others) has announced a ban on diesel cars. These restrictions will ultimately impact on all diesel vehicles including those complying with the Euro 6/VI standard and may adversely affect their residual value.

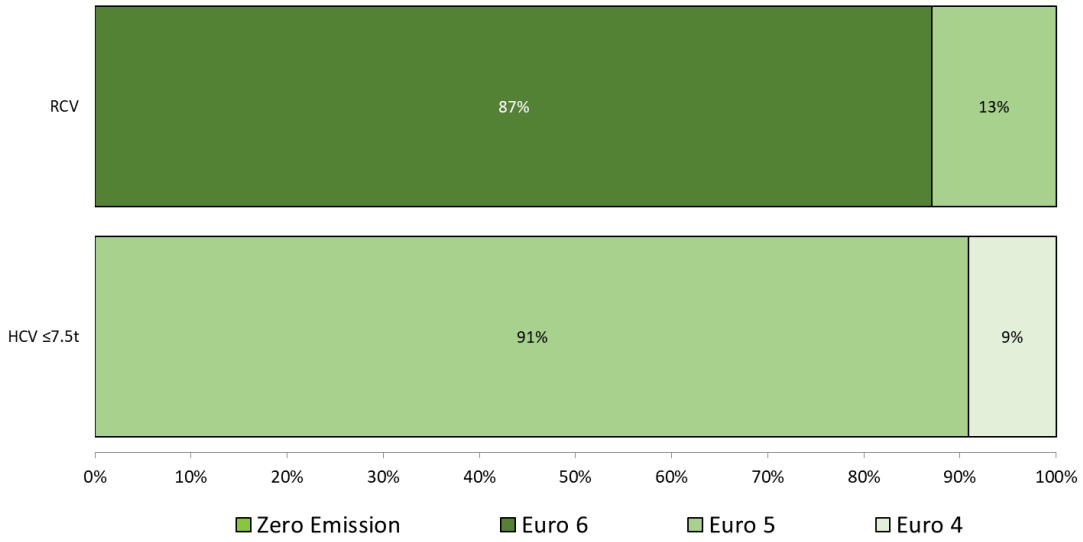
A range of "alternative" commercial vehicle energy sources are now available including battery electric, compressed natural gas, liquid natural gas, natural gas-diesel dual fuel, liquid petroleum gas, gas to liquid diesel, hydrogen-diesel dual fuel, hydrogen ICE and hydrogen fuel cell.

All have their strengths and weaknesses and very careful consideration must be given to all the environmental impacts, independently assessed "well-to-tank" GHG footprint, real world carbon intensity, indirect land use change, energy efficiency and cost associated with each fuel source before making a switch.

Whilst all of the vehicles profiled in this report are currently diesel, in the medium to long term, the heavy fleet could all be transitioned to battery electric vehicles, in some cases achieving cost savings as well as emission reductions.

5.3 Euro emission standard

Figure 5-2: *Euro Emissions distribution of CBC heavy fleet*



The Euro standard is a measure of the air pollution emissions from a vehicle; the Euro standard scheme does not regulate the GHG emissions. From a public health perspective, the two key vehicle pollutants are NO_X and PM but emissions of carbon monoxide (CO) and volatile organic compounds (VOC) are also regulated and these can have a significant impact on health if used in confined spaces, carbon monoxide can be fatal.

There are different Euro standards for petrol and diesel engines with diesel engines consistently permitted to be more polluting. As a result, a 2006 Euro 4 petrol car meets the same emission standard as a new (2020) Euro 6 diesel. Standards for cars and LCVs are numbered Euro 1 to 6 and emissions are measured in milligrams per kilometre driven, standards for HCVs are numbered Euro I to VI and the emissions are measured in milligrams per kWh of engine output because of the different vehicle configurations available.

LCVs (vans) were the last market sector to be required by regulation to meet the Euro 6 standard in September 2016 so this is the sector which often has the lowest proportion of Euro 6 vehicles.

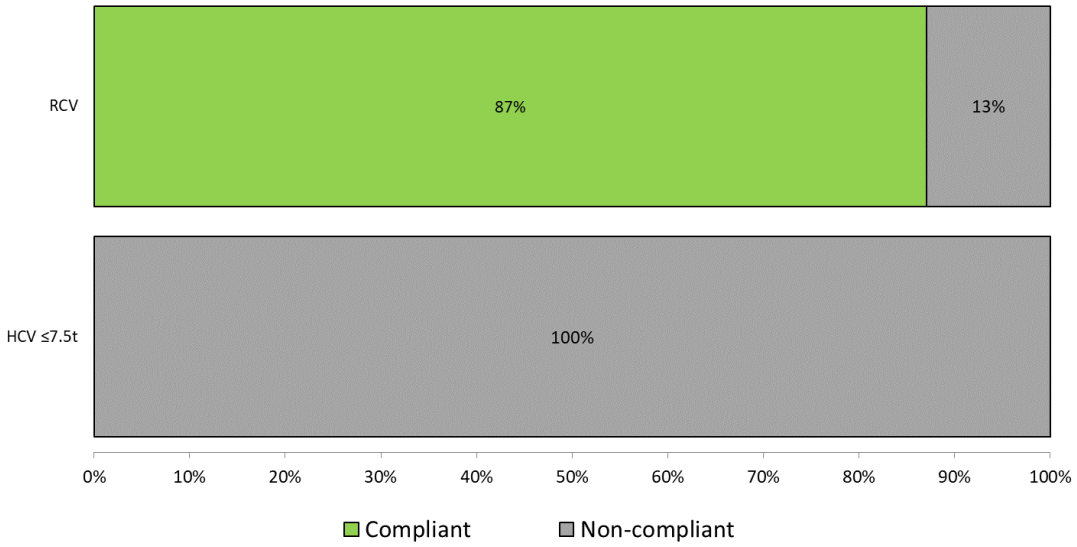
Battery electric vehicles are zero emission (DVLA still records them as Euro 6/VI but we show them separately as ZE) however, like all vehicles, they will produce particulates from both tyres and brakes as well as recirculated road surface debris. Brake dust production may be reduced by regenerative braking, but this could be offset by the greater weight of the BEV's batteries increasing tyre wear. In the future the expectation is that non-exhaust emissions will become the main source of air pollution in urban areas.

The CBC RCV fleet has a very "clean" fleet by ICE standards with only 4 vehicles out of 31 not meeting the Euro VI emission standard. The next step is to transition the fleet from fossil fuel internal combustion engines to zero tailpipe emission electric vehicles which should be achievable over the next five to seven years as the vehicles in the current fleet come to the end of their operational life with CBC.

Though smaller than the CBC RCV fleet, its HCV ≤7.5t is not as "clean" with none of the 11 vehicles currently meeting the fleet the Euro VI emission standard. The next step is (at the very least) to meet the Euro VI emission standards, by the procurement of the latest ICE vehicles, or even to exceed them by either transition of the fleet from fossil fuel ICEs to zero tailpipe emission electric vehicles.

5.4 Low emission/clean air zone compliance

Figure 5-3: Notional Clean Air Compliance of CBC heavy fleet



Across the UK, local authorities have implemented or are considering implementing low emission zones (Scotland), clean air zones (England and Wales) or an ultra-low emission zone (London).

To avoid paying a charge to enter these zones, vehicles must meet these minimum emission standards:

- Petrol engine: Euro 4 (Euro IV HCVs),
- Diesel engine: Euro 6 (Euro VI HCVs),
- Battery Electric or Hydrogen Fuel Cell (zero emission).

According to Public Health England there are 75 premature deaths each year in the CBC area attributable to particulate (PM) pollution with 811 life years lost.

Colchester has also three current air quality management areas all as a result of NOx emissions.

Whilst we acknowledge CBC is not considering introducing a CAZ, the emission standards used in a CAZ are, nevertheless, a useful guide as to what can be considered a clean fleet. CBC compliance in the fleet profiled in this report (RCVs and HCVs) is 65%, whilst CBCs overall compliance (including the sub 3.5 T fleet) is 57%.

6. Fleet data management

Central to any well-managed fleet is good data management. Fleet operators and service managers must have up-to-date, comprehensive, accurate, and accessible data on all the vehicles in use by an organisation, their drivers, their energy (litres or kWh) consumption and the business mileage driven. This applies regardless of the ownership of the vehicles (purchase, lease, spot hire, contracted, private) or the period of use.

Where commercial vehicles are involved, it is also important to have information about the work done (e.g. load carried, waste collected, bins emptied, households serviced, repairs completed, passengers carried) so that the performance of a fleet and its environmental impact can be linked directly to the level of service it has delivered.

Systems have been widely available for some time to monitor bulk fuel tanks, track off-site fuel purchase with fuel cards, manage fleet workshops, manage the fleet itself, and track all vehicle operations. The quality of these systems is variable, some have not kept pace with developments in vehicle technology, and there is often a failure to fully integrate the data from all these different sources. As a result, fleet managers – who are usually not IT specialists – are often "data rich but information poor". Microsoft's Excel is often the tool in which all the information from all these systems is collated and integrated and that can be time consuming, lead to inaccuracies and is dependent on the Excel skills of the user.

In local authorities there is a further level of complication in that the data from fuel card purchase or vehicle tracking may be held by central finance or by the operating department and not the fleet management team and so no one management team has a real-time overview of the fleet, its energy consumption, energy efficiency and GHG emissions.

All the information required for this review should be readily available to the fleet manager, the service delivery manager and, with electrification of the fleet, the energy manager.

The National Gird Electricity System Operator (ESO), working with partners, has already developed and published an open system called the "Carbon Intensity API" which publishes the predicted carbon intensity of the grid up to two days in advance in half hour periods. In the future a forecast like this may be used to adjust the price paid for electricity by lowering the cost when renewable generation is high and increasing the cost when fossil fuel generation is high. This has the aim of modifying consumer behaviour as well as the activity of "smart" appliances and vehicle charging systems. Accurate real-time data will be essential to efficient, low cost, low emission operation of an all-electric fleet.

6.1 Quality of data set at CBC

The fleet team was able to supply both fuel and odometer mileage data for almost all the Heavy fleet and it has been used to determine energy efficiency (miles per gallon or miles per kWh). Where we had concerns over the accuracy of the mileage data (especially in respect to plant) these issues have not impacted on the accuracy of this report in terms of GHG emissions as fuel data was available on which to base the GHG calculations.

CBC was unable to provide telemetry data for either the plant or the HCV ≤7.5t fleets but was able to provide it for the RCV Fleet. This allowed the routes to be mapped and out-of-area journeys to be identified. The council however was unable to supply half-hour electricity consumption data for the depot which, when combined with tracking data, allows an estimate of the required capacity for charging a future all-electric fleet to be made. We recommend that CBC urgently redresses this and begins to monitor it electricity consumption data.

6.2 Fleet energy and mileage data management

Overall CBC has good fleet data systems in place, but consideration should be given to better integration of fleet management, departmental fleet management (e.g. waste vehicle tracking) and energy management systems. This should allow all the key management teams involved: fleet operations, service delivery and council energy management to have a complete overview of transport operations without excessive manual data processing. It is important they can all quickly generate the reports they need to ensure efficient operation of the fleet, reliable service delivery and optimum energy use with minimum cost.

The move to an all-electric fleet will require new monitoring systems such as charge management software and these new systems should be able to exchange data and make reporting on fleet performance a straightforward process providing quick access to management information.

During periods of very high renewable generation and low demand some energy suppliers whose consumers have the required smart metering have offered a negative electricity cost because it is more cost effective to pay consumers to use electricity than to pay wind or solar generators to curtail generation. The electric vehicle charging system must be able to respond to this information so that periods of low carbon intensity that occur outside the normal charging hours can be utilized if the vehicle is parked and plugged in.

A large fleet of electric vehicles, some with 300 kWh batteries, is a large “sink” for surplus renewable generation and could play an important part in balancing the UK’s electricity system as well as absorbing any excess capacity from on-site generation. However, this will only work with good data systems providing accurate real-time data about the fleet and its current “status”.

6.3 Information management review – Recommendation

CBC, like many councils, would benefit from a comprehensive review of all the data systems in place to track and monitor the fleet including bulk fuel tank software, integration of any fuel cards, fleet workshop and fleet management software, EV charging infrastructure, on-board tracking systems and service delivery systems. The review should consider both the operational needs of today’s ICE fleet as well as the future requirements of a ULEV fleet – assumed to be mostly, if not entirely, electric.

7. HCV and RCV fleets

7.1 The RCV Fleet - Electrification

The refuse collection vehicle (RCV) fleet consist of 31 vehicles which average 8,513 miles per annum and achieve 3.4 miles to the gallon with a range from 2.0 to 4.7 mpg. With a gallon costing about £4.72 this means these vehicles cost about £1.39 per mile for fuel alone. Electric RCVs are available and their use is considered in full in this section.

Until very recently the only practical alternative to a Euro VI diesel RCV was a Euro VI compressed natural gas (CNG) vehicle. While natural gas vehicles can achieve GHG reductions (over 80% if fuelled with locally sourced "private" biomethane) and might improve air quality (the published scientific evidence for this is ambiguous) the refuelling infrastructure is expensive and from 2019/20 biomethane drawn from the UK gas grid cannot be counted as low carbon for GHG reporting purposes even if it is supported by Renewable Transport Fuel Obligation certificates (see notes on REGO and RTFO certificates). The same restriction applies to green electricity drawn from the UK electricity grid. In both cases the benefit of the renewable gas or electricity has already been accounted for in the calculation of the UK gas or electricity grid emission factor and it cannot be counted and claimed twice.

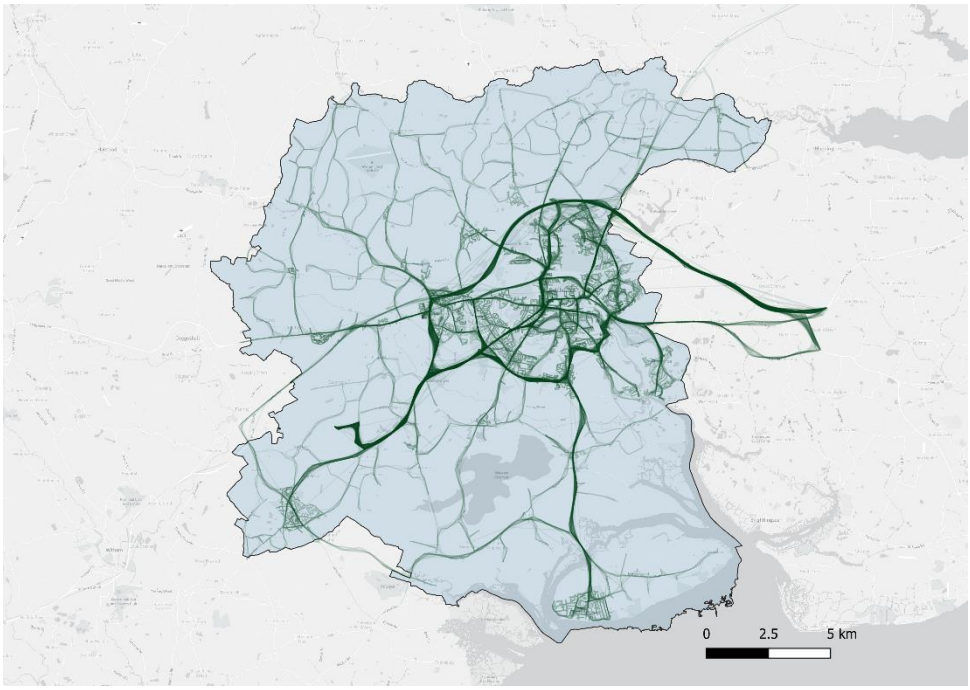
In 2018/19 Electra introduced a prototype all-electric eRCV based on a 26 tonne, three-axle Mercedes Econic chassis. During 2019 the chassis and rig was widely trialled around the UK in several cities. In Manchester it was operated by Biffa on the City Council domestic contract for over six months. There, the Electra eRCV was used for the collection of all domestic waste streams including Garden & Food Waste, Recyclables (plastic, glass, paper, cardboard) and Residuals (anything that cannot be recycled) and all the data was made available to EST. The 200-kWh battery of the prototype completed all the Manchester rounds, but had less than 10% charge left when used on the garden waste collection because of a 20 mile run to the composting centre. The vehicle is now available with a range of battery packs up to 300 kWh and can be supplied on 18 tonne and 26 tonne chassis. It is fully supported by Mercedes who provide a glider chassis pre-prepared for the electric power train direct from the factory in Germany.

Also available is the Dennis Eagle eCollect, which is a 300-kWh battery electric version of the company's popular 26 tonne "Narrow" model. It has been extensively tested with local authorities by Dennis Eagle and will go into limited production in 2020 and full production in 2021. Its capital cost and operating costs are very similar to the Electra model. Two eCollect will go into service with Nottingham City Council in 2020.

The City of London (Veolia) and Manchester City Council (Biffa) are planning to use substantial fleets of the Electra eRCV in its 18 tonne (2-axle) and 26 tonne (3-axle) versions from late 2020 onwards. In the analysis of both business cases there was considerable uncertainty about the future cost of diesel, carbon taxation of diesel, the introduction of road pricing and whether Euro VI diesel vehicles would still be permitted to enter a clean air zone without charge beyond 2025 (London) or 2027 (Manchester).

The reduction in GHG emissions from using e-RCVs is substantial even when charged from the UK grid. In the first year (2020) it should be at least 70% but by 2029/30 the decarbonisation of the UK grid is expected to have increased the annual reduction in GHG emissions to at least 90%.

***Figure 7-3**: Tracking of RCV operations*



The tracking data for the RVs show that they mostly stay within the CBC boundaries, only travel out of area to visit specialist repair centres. The exception to this is traveling along the A120, apparently to visit Ardleigh South Services.

Because they have a compact area of operations, we have modelled the replacement of all RCVs in use at CBC. These vehicles average 8,500 miles per annum and achieved an average of 3.4mpg. Poor mpg in a RCV fleet is not unusual and 3.4 mpg is in the "normal" range.

After discussion with Dennis Eagle, Electra and the three authorities planning to operate eRCVs in 2020 we now model all electric RCVs on a 10 year life cycle as experience with a range of BEVs suggests they will be significantly more reliable than the diesel vehicles which are usually operated over a seven year lifecycle. The data shown below is based on 10 years of an eRCV fleet and 7 years of a diesel RCV fleet plus another 3 years – so the first three years of average annual costs associated with the next new diesel fleet are added to the seven years. In the attached Appendix C we have also included models of both fleets with a 7 year lifecycle and with a 10 year lifecycle.

***Table 7-1:** eRCV – factors used in cost model*

RCV Factor	Electric	Diesel	Notes/Units
Year of Introduction	2021		
Operational (4.5 days per week)	260		Days per annum
Number of eRCV vehicles	27	27	Vehicles
Anticipated lifecycle	10	7+3	Years
Average annual mileage (eRCV)	8,513	8,513	Miles
Cost of energy in year one	£0.13116	£1.06	£/kWh, £/Litre
Fuel price inflation	3.24%	1.79%	From DBEIS
Residual value of the batteries	10%	-	EST Estimate

All data comes from Electra, Dennis Eagle, DBEIS or DfT national data sets. The eRCV has a significantly higher capital cost but that premium is expected to fall in line with falling battery prices. The batteries make up about £150,000 of the additional cost but Electra claim they will have a 30% residual value at the end of the vehicle's life if used in commercial battery storage arrays, we have used a more cautious 10% residual value.

***Table 7-2**: Capital costs of a fleet of electric refuse collection vehicles*

Capital Costs	Electric	Diesel	EV Cost (-Saving)	Notes
Vehicle Capital Cost	£380,000	£180,000	£200,000	Dennis Eagle
Residual Value (Chassis)	£0	£0	£0	BEV 0%, ICE 0%
ULEV Grant Funding	-£8,000		-£8,000	OLEV £8,000
Residual Value (Battery)	-£15,000		-£15,000	Estimated as 10%
Total Vehicle Cost	£357,000	£180,000	£177,000	
Over 10 year Project	£357,000	£257,143	£99,857	Diesels are 7+3
Fleet Capital Cost	£9,639,000	£6,942,857	£2,696,143	

[1]The OLEV grant for the first 200 ultra-low emission HCVs is £20,000 per vehicle. This then falls to £8,000.

The diesel vehicles using a 7+3 lifecycle still cost nearly £100,000 less to procure than the electric vehicles. The residual value of the battery may be a significant under-estimate as a 300 kWh battery in 2030 will still have a use for energy storage and the modular nature of the battery means it can be fully refurbished and reused on site. Electra has built a 30% residual value into its leasing model and that would reduce the cost of the BEV by a further £30,000. The ULEV grant of £20,000 for the first 200 vehicles over 3.5t is assumed to have been fully utilized by the time a purchasing decision is made and has therefore not been considered.

In Table 8-4, we have summarised the key elements of the WLC calculation. Whilst the initial capital cost of eRCVs is higher, once operating costs are taken into account, they can become more cost effective than diesel RCVs and even if refurbishment work on the waste collection rig is required at seven years there is headroom in the savings being made to fund this.

***Table 7-3**: Comparative whole life costs of an eRCV fleet (10 years eRCV, 7+3 diesel RCV)*

Cost Summary	Electric	Diesel	EV Cost (-Saving)	%
Total Vehicle Cost	£9,639,000	£6,942,857	£2,696,143	39%
Total Energy Cost	£1,323,505	£3,599,845	-£2,276,341	-63%
AdBlue Cost	£0	£56,129	-£56,129	-100%
SMR Cost	£1,215,000	£2,025,000	-£810,000	-40%
VED + Road User Levy	£0	£166,050	-£166,050	-100%
Total Cost	£12,177,505	£12,789,882	-£612,377	-5%
Charging Infrastructure	£324,000		£324,000	

Based on the data available we estimate a 27 vehicle eRCV fleet would save CBC £612,377 over a ten year period (£61,237 per vehicle per year) but this 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. The charging infrastructure is shown as a below-the-line cost because the expectation is that it will have a longer lifespan than the fleet and the cost of the diesel refuelling infrastructure is not included in the model.

***Table 7-4**: Energy Use and GHG Emissions of an ICE RCV and eRCV fleet over ten years*

Energy Use & GHG	Electric	Diesel	EV Cost (-Benefit)	%
Energy consumption (kWh)	8,169,148	32,676,591	-24,507,443	-75%
Scope 1 kg CO_2e	0	7,993,348	-7,993,348	-100%
Scope 1 AdBlue kg CO_2e	0	34,920	-34,920	-100%
Scope 2 kg CO_2e	1,535,426	0	1,535,426	100%
Scope 3 T&D kg CO_2e	132,046	0	132,046	100%
Total GHG Emissions	1,667,472	8,028,268	-6,360,796	-79%

Over the ten-year lifetime of the fleet using eRCVs carbon emissions will reduce by 6,360 tonnes and in the final year this reduction will be 90%. The eRCVs have no Scope 1 emissions from burning fuel and all the GHG emissions are Scope 2 from the generation of electricity and Scope 3 from transmission and distribution (T&D) losses

When the increased electricity usage and reductions in diesel consumption are input to the HM Treasury Green Book model for assessing the net present value (NPV) of the project in terms of GHG reduction, energy reduction and improved air quality, the total social benefit is valued at just under £0.7 million. With a potential c.£612k saving and a c.£700k social benefit adoption of eRCVs represents very good value for money.

7.2 Air quality improvements

The diesel RCV engine has significant emissions of both nitrogen oxides (NO_X) and particulate matter (PM) and these must be controlled using a selective catalytic reduction system (SCR) for the NO_X and a particulate trap for the PM. Both these technologies struggle to work well at the low exhaust temperatures associated with low speeds and with intensive stop/start operations. Table 7-5 below has been determined using the COPERT5 model for a Euro VI diesel operating at an average speed of 5 km per hour. This is a vehicle specific model and very different to the "Average UK HCV" values presented in Table 3-3.

Table 7-5: *Air Quality: Emission reduction over the operational life (10 years) of the ICE and BEV RCV fleets*

Factor	Electric	Diesel	EV Cost (-Saving)	Notes
NO_X kg/lifetime	0	26,811	-26,811	NAEI COPERT5
PM kg/lifetime	0	54.5	-54.5	NAEI COPERT5

7.3 eRCV Fleet Recommendation

CBC 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. We have assumed in making this recommendation that any potential issues in power supply are resolved by 2026. However, 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.

7.4 The HCV fleet – opportunities for ULEVs

The rest of the heavy fleet (everything over 3.5t tonnes that is not a refuse vehicle) is very varied but includes eight 7.5 tonne Mitsubishi Fuso Canters with plastic tipper bodies operated by Waste and Recycling, three other assorted 7.5t trucks (one of which is used as a gritter) also operated by Waste and Recycling and Hall Keepers.

Mercedes Fuso did have a functional and practical battery electric version of the 7.5 tonne Canter known as the eCanter that worked well in extensive end-user trials offering a 62-mile range. But, in a classic example of "perfectionism is the enemy of progress", the Fuso eCanter is not currently available to order because it is being re-engineered to remove the conventional drive shaft and the rear axle and replaced with in-wheel motors. While this configuration reduces weight, improves efficiency, increases range and creates capacity for more batteries or greater load, it does mean that the vehicle will not be available until 2021 at the earliest and the opportunity to significantly reduce the GHG and air quality impact of the urban 7.5t fleet in 2020 has been delayed by a year. Various other OEMs have plans for launching electric vehicles within this size beyond this timescale.

Whilst there are currently no fully electric OEM models generally available, some small manufacturers currently produce 7.5t to 12t EV chassis that could be adapted to CBC needs. ULEV products exist from companies such as Paneltex and Tevva, that are available now to purchase or lease.

Mileages vary significantly between the HCV ≤7.5t fleet between circa 3,300 and 16,500 miles a year, giving an average across the fleet of 6,951. This is an average of 27 miles per working day, based on a 250-day working year. However, because we do not have telematics data or an accurate daily mileage pattern, we have chosen to model the (range-extended) Tevva REEV, rather than the Tevva EV.

The Tevva Motors Range Extender (REEV) has an OEM stated typical electric range of 93 miles, mated to a diesel engine, in case the vehicle runs out of electric charge. The vehicle can be fitted with any body type that a similar sized diesel chassis could be, with no payload penalty. This means that a box truck, drop-side, or tipper could all be specified. However, EST has seen no independent verification of the stated range, or of the stated power consumption figures supplied by Tevva and so we advise that if this option is explored by CBC, that CBC should test the vehicle thoroughly before any purchase. Similarly, CBC should be aware that the diesel generator (used to extend the range) is not subject to the same emission standards a diesel engine is subject to and so it is possible that it may produce considerably more NOx and PM than a Euro 6 diesel engine for the same amount of fuel burnt. This of course could be avoided by purchasing the EV (only) vehicle, and analysis of the CBC HCV ≤7.5t daily mileage will reveal if this is an option, or what the mix between full EV and REEV vehicles should be.

Whilst not a typical OEM product, this option warrants further investigation and discussion with the manufacturer, based on the following assumptions and table 7-6 shows a broad estimate of variable costs.

- VED is constant between vehicles and excluded from table
- Body costs are constant between vehicles and excluded from table
- Vehicles are operated for 10 years, but diesel vehicles are currently replaced after 7 years.
- Zero retained value after 10 years on the EV and 7 years on the diesel.
- Average diesel cost is £1.04/litre.
- Average electricity cost is £0.13116 p/kWh and REEV vehicle runs on battery power 80% of the time.
- Mileage is 7,000 per year, diesel fuel consumption is 5.9 mpg (CBC average)
- Electricity consumption for range extender in EV mode is estimated at 1.6 kWh / mile
- Assumed that 10% of Tevva's mileage is driven on diesel extender for purposes of maintaining the engine
- We have excluded maintenance from the table below, and whilst maintenance on a full EV is usually lower on a REEV, (based on our experience of REEVs in the sub 3.5t market) we have chosen to be conservative, assumed to be constant between the vehicles and have not shown it.

***Table 7-6**: Approximate cost comparison for 7.5t chassis (one vehicle)*

	Range Extender Chassis	**Diesel Chassis**	EV Cost (-Benefit)	**%**
Term	10	7+3		
Approximate Capital Costs (Chassis Only)	£80,000	£64,285	£15,715	19.6%
Est. Diesel Costs (10years)	£5,609	£56,093	-£50,484	-900%
Est. Electricity Costs (10 Years)	£13,218	£0	£13,218	100%
Est. Total Costs (10 years)	£98,828	£103,551	-£4,723	-4,8%
Annual Fuel / Depreciation Costs	£9,883	£10,355	-£472	-4.8%
Annual CO_2e emissions	4t	14t	-10t	-251.5%

Based on these broad assumptions, the use of a ULEV range extender appears to be slightly cheaper than using a diesel vehicle over a 10-year life span, at approximately £472 per year. However, this is very sensitive to changes in the cost of fuel or in diesel consumption. If the 7.5t diesel chassis was operating at the best mpg on the CBC fleet, it would be cheaper than the range extender over its lifetime by around £6,500 (£650 a year).

Based on these assumptions. CO_2e emissions could reduce by 10.0t per vehicle per year, but until we have more information about the diesel generator, we are unable to predict the impact on air quality emissions.

Tevva offer a short 3-6 month lease option to help prospective buyers evaluate the use of these vehicles in service. CBC could investigate this option and if possible, undertake a trial to better understand any operational issues and true running costs.

In the long term, increasing numbers of HCVs will be suited to replacement with EVs, from OEMs, especially where mileage profiles are not excessive and where vehicles return to a depot each night. Prices are expected to fall as products become more mainstream. Battery energy density and vehicle range is also expected to increase in the coming years.

7.5 HCV Fleet Recommendation

Subject to establishing that sufficient power is available, CBC should actively pursue the option to implement an electric HCV ≤7.5t fleet when the current fleet is due for replacement. CBC may choose to wait until the launch of OEM vehicles in 2022, but from that date the whole fleet should then be changed using a phased introduction should ensure a smooth transition to zero emission operation.

7.6 Plant

The CBC fleet includes one Schmidt Cityjet compact sweeper, three Johnson 201 compact sweepers and three medium Johnson 401 sweepers. There are also two waste loaders and two John Deere Gators (a small 4x4 quadbike style vehicle). The gators were not included in the Carbon Footprint, as neither mileage nor fuel data was supplied for them.

Whilst battery electric replacements for most of these vehicle types have become available, they are yet to become cost effective. Nottingham City Council operates a fleet of eight compact Boschung sweepers and Oxford Direct Services have just taken delivery of one. In both cases, the increased purchase costs of the electric sweepers (compared to the diesel models) were covered by grant funding. We have modelled the pricing below without any grant funding. We understand that because of the nature and use of the vehicle, it is usual for a council to operate them for a maximum of 5 years. CBC provided its utilisation figures in miles but it is usual for Sweepers to be assessed in operational hours. We have therefore modelled using hours.

- VED is constant between vehicles and excluded from table
- Retained value after 5 years is 5%.
- Average diesel cost is £1.04/litre.
- Average electricity cost is £0.13116 p/kWh
- Fuel use is 5.0 litres per hour for diesel and energy use is 10 kWh/hour for the electric version.
- Annual operational hours per year are 7,000 over the 5-year lifetime (5.6 hours a day for 250 days a year)
- Schmidt estimate the maintenance costs of an electric model being between 60% to 80% less than the equivalent diesel. We have estimated maintenance figures using the maintenance figure supplied for a compact sweeper by CBC for their diesel and reducing that by 60%.

***Table 7-7** - Approximate cost comparison for a Compact Sweeper (one vehicle)*

	Electric Compact	**Diesel Compact**	EV Cost (-Benefit)	**% Increase**
Term	5	5		
Approximate Capital Costs	£213,750	£66,500	£147,250	221%
Estimated Maintenance costs (5 years)	£14,640	£36,600	-£22,000	-60%
Est. Diesel Costs (5 years)	n/a	£36,400	-£36,400	
Est. Electricity Costs (5 Years)	£9,181	N/A	£9,181	
Est. Total Costs (5 years)	£237,571	£139,500	£98,071	70%
Annual Fuel / Depreciation Costs	£47,514	£27,900	£19,614	70%
Annual CO_2e emissions	3.58t	18.15t	-14.57t	-80%

John Deere produce an electric version of the Gator and details can be found here.

7.7 Plant Recommendation

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 to

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.

7.8 Maintenance training

For organisations with their own workshops, the Institute of the Motor Industry (IMI) provides an EV technician training programme. A full series of eLearning across two-day courses cover the key elements and the total cost is about £1,800 (less a discount for IMI members):

More information on EV technical training: Institute of the Motor Industry

8. Electric Vehicle Charging Infrastructure (EVCI)

8.1 Charging electric vehicles

On many sites, small-scale “fast” charging (7.4 kW) can use spare overnight site capacity to charge small fleets of battery electric cars and vans without the need for complex charge management systems. The use of in-vehicle timers, where fitted, can ensure that the local grid connection is not overloaded, and full advantage can be taken of lower, off-peak tariffs.

Ideally, vehicles should be charged overnight from 20:00 to 08:00 hrs, to avoid a negative impact on the local and national grid by charging during periods of peak use. It is therefore important that CBC negotiates low overnight and weekend off-peak tariffs for electricity at all sites, where electric vehicles may be based. It is also important to avoid charging weekdays during the 16:00 to 19:00 hrs peak period, when grid demand is at its maximum, grid GHG emission intensity is high, due to the use of gas generation, and the unit cost per kWh is also at its peak. However, if there is on-site generation for photovoltaic, that should be used if available.

With several battery electric vehicles on the fleet, the infrastructure cost can be spread, and it is very likely that large parts of the charging infrastructure will outlive the vehicles, especially the expensive cabling and groundworks. It is unusual for ICE vehicle whole life cost models to include the cost of onsite bulk tanks, the dispensing systems, the monitoring software, and their annual maintenance.

There are over thirty suppliers of charging infrastructure; ESPO offer a framework but it has a limited number of suppliers, Crown Commercial Service (CCS) have also released a framework https://www.crowncommercial.gov.uk/agreements/RM6213 and Nottingham City Council is also believed to be entering the market, based on its considerable experience of EV charging and vehicle operation.

A simple 7.4kW AC charger can be purchased for under £400 but the most sophisticated charge points with card scanner, 3G network connection, management software and full barrier protection cost about £1,800 for a two-port pillar. To this should be (typically) added a further £1,000 for installation, management software, billing systems and on-site support with about £250 of that cost being an annual expense.

Cars and vans up to 60 kWh battery size can be charged overnight in less than 12 hours with 7.4 kW AC chargers but eRCVs will require more expensive 40 kW DC chargers, or 3-Phase AC supplies for on-board AC chargers.

See the EST Guide to chargepoint infrastructure for more detailed information on EV charging systems.

8.2 Meeting the demand for EV charging – tracking data

Using the tracking data from the CBC fleet, we have been able to estimate the charging capacity needed to meet peak demand. That peak occurs when several vehicles return with a low State of Charge (SoC) which will happen on the longer trips, or trips with high energy use due to a large load (tonnes collected) or a large number of hydraulic movements (bin lifts and compactions).

***Figure 8-1**: Profile of RCV journeys*

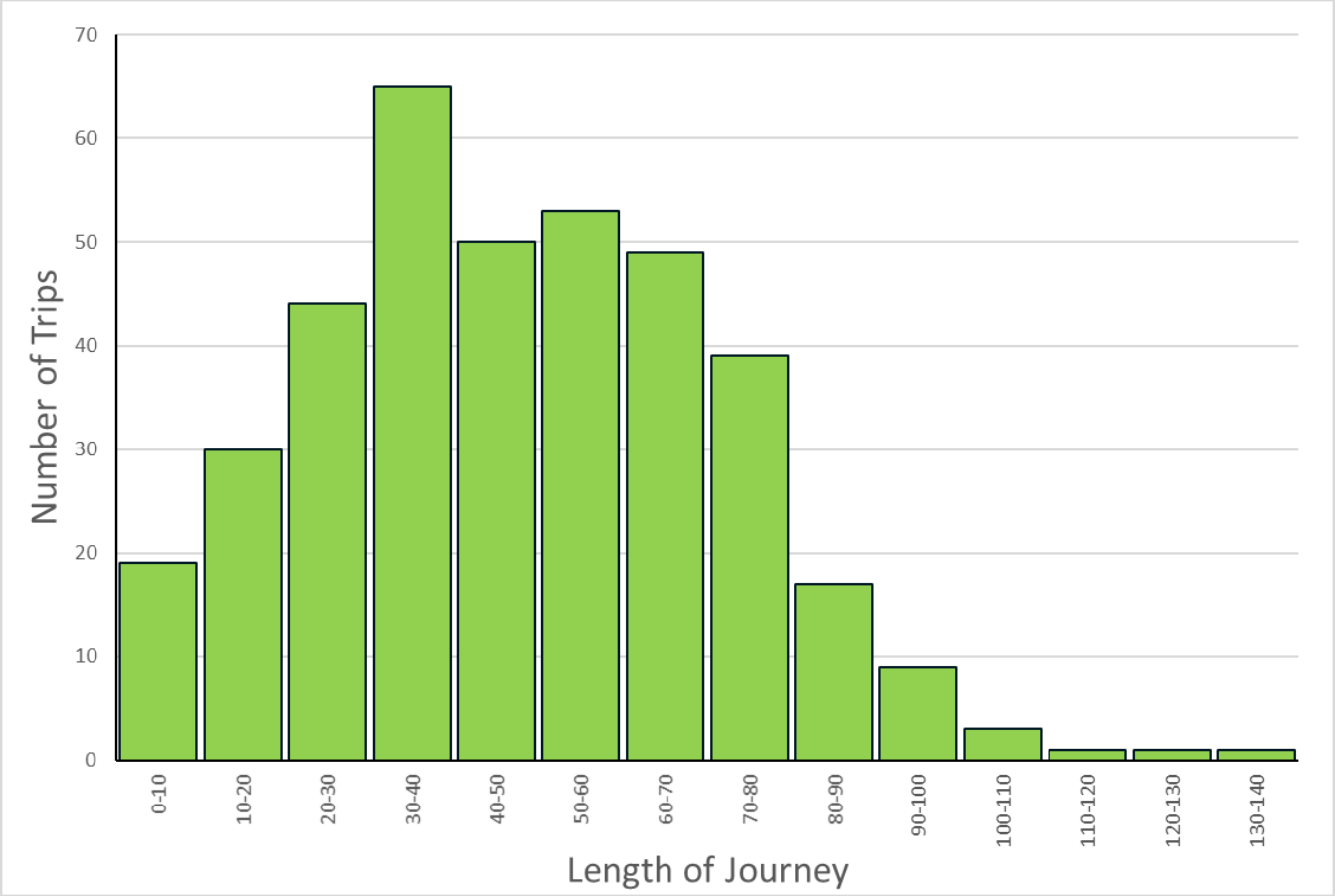
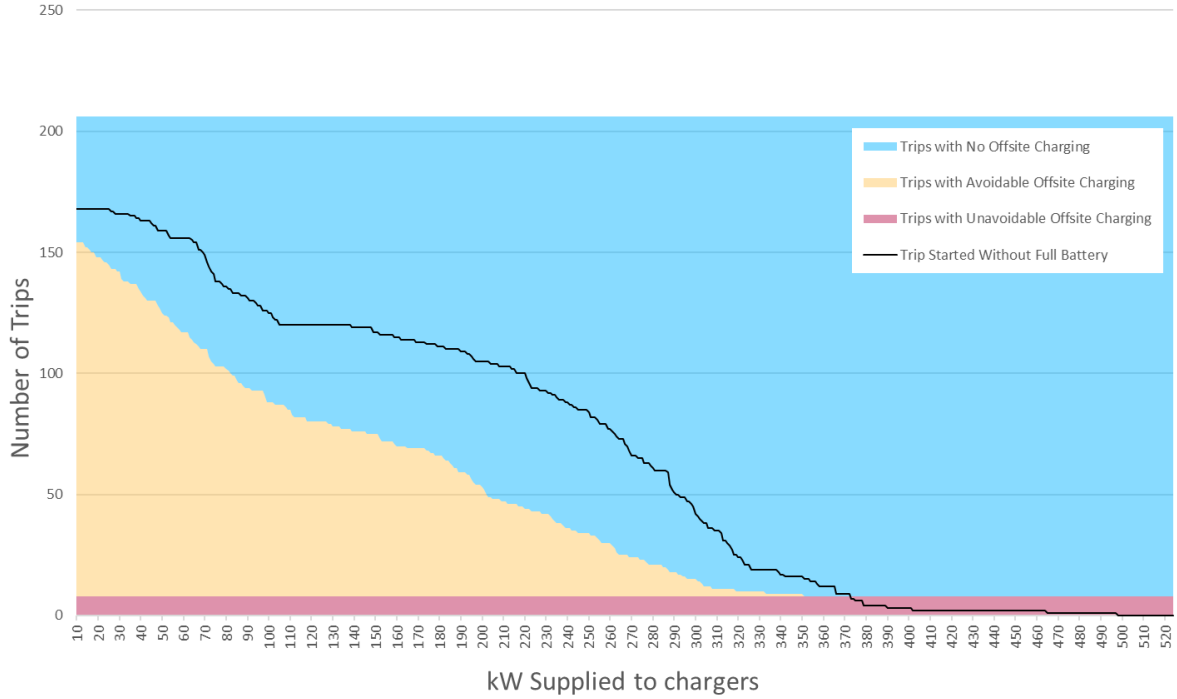


Figure 8-1 shows that there are a small number of trips that may be too long for a 300 kWh eRCV: including some by vehicle VX69YGG, which appeared to spend a long time at the Dennis Eagle factory, so it's trips may not be representative of normal use. These longer trips can be seen in Figure 8-2 which has a small number of "Trips with unavoidable off-site charging". These long-distance routes will require further investigation and it may be that with fewer stop/start operations, energy consumption would have been less than when making door-to-door street collections.

Figure 8-2: *Meeting the charge requirements by increasing the kW capacity of the site supply*



In the model vehicles were not permitted to charge between 16:00 and 20:00 weekdays but if they returned to the depot in the afternoon before 16:00 could charge up until that time. In the summer, if PV was available, there would be no reason not to allow vehicles to continue charging providing the capacity was coming from the PV – this will require a very smart management system and we have not tried to model this scenario.

There are several options for charging EVs. The simplest is to build sufficient site capacity (kW or kVA) to meet the simultaneous maximum demand for charging all the EVs from the grid connection at the full rate, supported by the charger regardless of the local "domestic" site load. This can be expensive, especially if it requires significant upgrades to the local grid infrastructure.

The alternative is to use some method of moderating the supply available to the chargers. This could be achieved by simply restricting the time when banks of chargers are operational or, with more sophisticated controls, limiting the power available to each charger and reallocating that capacity as vehicles are fully charged.

The issue with timed charging, which must be based on predicted need, is it that there is a higher risk of some vehicles not having an adequate charge to complete the follow day's workload if they return with a much lower than anticipated SoC.

It is also possible to link the management of the energy available for charging EVs to the site's "domestic" load so that the charging control system can maximise the current it draws as the load from the rest of the site falls. Each step-up in charger management requires more investment in the charging system but should avoid even more expensive capacity upgrades in the local grid and gives the fleet team greater visibility around demand and driver behaviour.

Using the model, we have determined the capacity required from four possible charging strategies. The first is the capacity required for all the chargers to operate simultaneously at full power – this is the simplest option and many vehicles will be fully charged in less than eight hours leaving unused capacity throughout the rest of evening. The second strategy considered assumes that all the vehicles return with 10% battery capacity and there is a charge management system in place to spread charging over the whole overnight period by restricting the capacity available to the chargers.

The third strategy uses the tracking data, considers the mileage driven by the vehicles during the day and determines the electricity (kWh) required to return the vehicles to a fully charged state. The fourth and final strategy is much riskier. It allows the vehicle to run down throughout the week by ensuring that each vehicle has enough power to complete the next day's workload and is only fully recharged over the weekend. This final strategy only works with a very predictable daily workload and does not accommodate changes made at

short notice. It is a high-risk strategy and should only be considered if the site capacity is severely constrained, upgrade is very expensive, and the vehicles have a very predictable work pattern.

***Table 8-1**: Site capacity required by different charging strategies*

Strategy	Description	kW	Notes
1	Simple maximum capacity – all 100% charged	1,040	Very expensive
2	Smart - worst case – all 100% charged	533	Expensive as over 400 kVA
3	**All departures 100% charged**	498	**Optimal**
4	No unnecessary off-site charging, not all 100%.	351	High risk

It may be difficult to create the 500 kW of headroom predicted to be needed to fully charge the eRCVs overnight. We believe this may be a worse case estimate but only a long-term detailed on-site evaluation of an eRCV across all the CBC routes will determine that. Dennis Eagle have a policy of limiting the initial number of eRCV to two and these will provide all the data needed to confirm the impact of an eRCV fleet.

8.3 EVCI Recommendation

CBC will need at least 526 kVA capacity to charge a large fleet of electric RCVs (assuming a power factor of 0.95).

If the entire fleet (including the smaller vehicles covered in our earlier report) is moved to electric power, then even that capacity may not be sufficient and consideration should be given to other options like installing on-site battery storage or charging some of the fleet at other council sites, or, (for the smaller vehicles at least,) whether charging at employee homes is practicable and finally - probably as an option of last resort - a further upgrade of the site capacity which will be expensive.

Careful monitoring of new electric vehicles as they join the fleet 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 CBC 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.

Appendix A: Renewable electricity and gas

Electricity Renewable Energy Guarantees of Origin (REGO) and Gas Renewable Transport Fuel Obligation (RTFO) certificates.

Many organisations have opted to have their grid electricity supplied from renewable sources backed by REGO certificates or grid biomethane backed by RTFO certificates.

The GHG emissions of the electricity or gas can be reported in line with the "market-based" (consumer) value calculated by the supplier (e.g. Zero gCO_2e/kWh if 100% renewable electricity) but it should be reported alongside the "location-based" (national) figure which is the actual GHG impact of the energy used.

This is because the zero-carbon benefit of the electricity or gas has already been accounted for in the national UK grid figure. The benefit cannot be taken twice as the grid carbon factor for other consumers would need to be adjusted upwards to compensate.

The requirement to do this is fully documented in:

HM Government: Environmental Reporting Guidelines (ERG): Including streamlined energy and carbon reporting guidance. March 2019, pages 48-49

"Where organisations have entered into contractual arrangements for renewable electricity, e.g. through Power Purchase Agreements or the separate purchase of Renewable Energy Guarantees of Origin (REGOs), or consumed renewable heat or transport certified through a Government Scheme and wish to reflect a reduced emission figure based on its purchase, this can be presented in the relevant report using a "market-based" reporting approach. ***It is recommended that this is presented alongside the "location-based" grid-average figures*** *and in doing so, you should also look to specify whether the renewable energy is additional, subsidised and supplied directly, including on-site generation, or through a third party.* ***A similar "dual reporting" approach should be taken for biogas and biomethane (including "green gas")."***

GHG Protocol, Scope 2 Guidance, Corporate Standard, Section 1.5.1, page 8

"Companies with any operations in markets providing product or supplier-specific data in the form of contractual instruments shall report scope 2 emissions in two ways and label each result according to the method: one based on the location-based method, and one based on the market-based method. This is also termed "dual reporting."

What is permitted is time specific emission factors. The HM Government ERG state:

"Where available, time specific (e.g. hour-by hour) grid average emission factors should be used in order to accurately reflect the timing of consumption and the carbon-intensity of the grid."

The carbon intensity of the grid varies throughout the day and the year. The grid data is publicly available in half hourly intervals, but organisations may have difficulty calculating this.

Where a company generates its own renewables on-site or locally, for example by using photovoltaic, wind with "private wire" or an on-site anaerobic digester and does not supply the grid it can be accounted for as a zero or low carbon supply.

Appendix B: UK Grid carbon intensity 2020-2030

There are several organisations attempting to predict future carbon intensity of the grid and these are often updated every year to reflect changes in policy of performance.

Table B-1 shows:

- The DBEIS emission reporting factor for the year, which is about two years behind real-time emissions because of the verification process.
- The real time performance of the grid in year (or year to date) as calculated from the Elexon data set.
- The Committee on Climate Change (CCC) and DBEIS projections from 2018.
- The average of the CCC and DBEIS data sets.

***Table B-1**: UK Grid future carbon intensity – DBEIS Factors, Actual (Elexon), CCC and DBEIS Predictions*

Year	DBEIS GHG Scope 2 Factor	Year on Year Change	Actual in year from Elexon Portal	CCC cost-effective path projection	DBEIS Energy and Emissions Projections	CCC - DBEIS Average
2014	494.26		415.7			
2015	462.19	-6%	364.2			
2016	412.04	-11%	277.1			
2017	351.56	-15%	247.1			
2018	283.07	-19%	227.8			
2019	255.60	-10%	204.3	218.8	201.5	210
2020	**233.14**	**-9%**	**161.3***	**210.8**	**189.1**	**200**
2021	*211.58*	*-9%*		199.5	184.3	192
2022	*192.51*	*-9%*		188.3	179.5	184
2023	*174.93*	*-9%*		177.1	174.7	176
2024	*159.06*	*-9%*		165.9	170.0	168
2025	*144.58*	*-9%*		154.6	165.2	160
2026	*131.44*	*-9%*		142.5	153.5	148
2027	*119.48*	*-9%*		130.3	141.8	136
2028	*108.62*	*-9%*		118.2	130.2	124
2029	*98.74*	*-9%*		106.1	118.5	112
2030	*89.77*	*-9%*		**93.9**	**106.8**	**100**

*January-June 2020 (includes impact of COVID-19). *211.58 = Projected future emission factors.*

When calculating the future emissions of an EV fleet it is important to use these predictions to ensure the potential carbon saving is fully assessed.

Appendix C: eRCV Lifecycle options

Table C-1 *-- Seven-year life cycle*

BASE DATA (from Model)	Electric	Diesel	Units	Notes
Annual Mileage (Fleet)	229,838		miles	From Fleet Data
Project Life	7		years	Lifespan of BEV - Max 10
Vehicle Lifespan	7	7	years	OEM Advice & Fleet policy
Fleet Size	27	27	vehicles	Fleet data
Annual Mileage/Vehicle	8,513	8,513	miles per annum	Fleet data
Energy Efficency	3.55	3.39	kWh/mile, mpg	EV derived from diesel kWh
Cost of energy/fuel	£0.131	£1.040	£/kWh, £/litre	Cost in 2020 (ex VAT)
Annual Inflation to 2030	3.24%	1.79%	Per annum	Based on DBEIS 2009-19

CAPITAL COSTS	Electric	Diesel	EV Cost (-Saving)		Notes
Vehicle Capital Cost	£380,000	£180,000	**£200,000**	**111%**	Electra/DE/Client
Residual Value (Chassis)	£0	£0	**£0**		BEV 0%, ICE 0%
ULEV Grant Funding	-£8,000		**-£8,000**		OLEV £8000
Residual Value (Battery)	-£15,000		**-£15,000**		Estimated as 10%
Total Vehicle Cost	**£357,000**	**£180,000**	**£177,000**	**98%**	
Over 7 year Project	£357,000	£180,000	**£177,000**	**98%**	From Lifespan
Fleet Capital Cost	**£9,639,000**	**£4,860,000**	**£4,779,000**	**98%**	

WHOLE LIFE COST MODEL	Electric	Diesel	EV Cost -Saving		Notes
Fleet Capital Cost	£9,639,000	£4,860,000	**£4,779,000**	**98%**	From Capital Costs
Fleet Energy Cost	£881,322	£2,452,259	**-£1,570,936**	**-64%**	Includes inflation
Diesel Fleet AdBlue Cost	£0	£39,291	**-£39,291**	**-100%**	No inflation applied
SMR (ex Tyres) Cost	£850,500	£1,417,500	**-£567,000**	**-40%**	OEM -40% to -60%
VED + Road User Levy	£0	£116,235	**-£116,235**		DVLA V149/1
Diesel Euro VI CAZ Levy	£0	£0	**£0**		Local CAZ Policy
Whole Life Cost	**£11,370,822**	**£8,885,284**	**£2,485,538**	**28%**	**£13,151**
Charging Infastructure	**£324,000**		**£324,000**		**Estimated**

ENERGY AND GHG	Electric	Diesel	EV Cost -Saving	%	Notes
Energy consumption (kWh)	5,718,403	22,873,614	**-17,155,210**	**-75%**	Model
Scope 1 kg CO_2e	0	5,595,343	**-5,595,343**	**-100%**	DBEIS Factors
Scope 1 AdBlue kg CO_2e	0	24,444	**-24,444**	**-100%**	DBEIS Factors
Scope 2 kg CO_2e	1,177,396	0	**1,177,396**	**100%**	DBEIS Factors
Scope 3 T&D kg CO_2e	101,256	0	**101,256**	**100%**	DBEIS Factors
Total GHG Emissions	**1,278,652**	**5,619,788**	**-4,341,136**	**-77%**	

AIR QUALITY	Electric	Diesel	EV Cost (-Saving)	Speed km/hr	Notes
NO_x kg/annum	0	18,767	**-18,767**	**5**	NAEI COPERT5
PM kg/annum	0	38.2	**-38.2**	**5**	NAEI COPERT5

Table C-2 – *Ten-year life cycle*

BASE DATA (from Model)	Electric	Diesel	Units	Notes
Annual Mileage (Fleet)	229,838		miles	From Fleet Data
Project Life	10		years	Lifespan of BEV - Max 10
Vehicle Lifespan	10	10	years	OEM Advice & Fleet policy
Fleet Size	27	27	vehicles	Fleet data
Annual Mileage/Vehicle	8,513	8,513	miles per annum	Fleet data
Energy Efficency	3.55	3.39	kWh/mile, mpg	EV derived from diesel kWh
Cost of energy/fuel	£0.131	£1.040	£/kWh, £/litre	Cost in 2020 (ex VAT)
Annual Inflation to 2030	3.24%	1.79%	Per annum	Based on DBEIS 2009-19

CAPITAL COSTS	Electric	Diesel	EV Cost (-Saving)		Notes
Vehicle Capital Cost	£380,000	£180,000	**£200,000**	**111%**	Electra/DE/Client
Residual Value (Chassis)	£0	£0	**£0**		BEV 0%, ICE 0%
ULEV Grant Funding	-£8,000		**-£8,000**		OLEV £8000
Residual Value (Battery)	-£15,000		**-£15,000**		Estimated as 10%
Total Vehicle Cost	**£357,000**	**£180,000**	**£177,000**	**98%**	
Over 10 year Project	£357,000	£180,000	**£177,000**	**98%**	From Lifespan
Fleet Capital Cost	**£9,639,000**	**£4,860,000**	**£4,779,000**	**98%**	

WHOLE LIFE COST MODEL	Electric	Diesel	EV Cost -Saving		Notes
Fleet Capital Cost	£9,639,000	£4,860,000	**£4,779,000**	**98%**	From Capital Costs
Fleet Energy Cost	£1,323,505	£3,599,845	**-£2,276,341**	**-63%**	Includes inflation
Diesel Fleet AdBlue Cost	£0	£56,129	**-£56,129**	**-100%**	No inflation applied
SMR (ex Tyres) Cost	£1,215,000	£2,025,000	**-£810,000**	**-40%**	OEM -40% to -60%
VED + Road User Levy	£0	£166,050	**-£166,050**		DVLA V149/1
Diesel Euro VI CAZ Levy	£0	£0	**£0**		Local CAZ Policy
Whole Life Cost	**£12,177,505**	**£10,707,025**	**£1,470,480**	**14%**	**£5,446**
Charging Infastructure	**£324,000**		**£324,000**		**Estimated**

ENERGY AND GHG	Electric	Diesel	EV Cost -Saving	%	Notes
Energy consumption (kWh)	8,169,148	32,676,591	**-24,507,443**	**-75%**	Model
Scope 1 kg CO_2e	0	7,993,348	**-7,993,348**	**-100%**	DBEIS Factors
Scope 1 AdBlue kg CO_2e	0	34,920	**-34,920**	**-100%**	DBEIS Factors
Scope 2 kg CO_2e	1,535,426	0	**1,535,426**	**100%**	DBEIS Factors
Scope 3 T&D kg CO_2e	132,046	0	**132,046**	**100%**	DBEIS Factors
Total GHG Emissions	**1,667,472**	**8,028,268**	**-6,360,796**	**-79%**	

AIR QUALITY	Electric	Diesel	EV Cost (-Saving)	Speed km/hr	Notes
NO_x kg/annum	0	26,811	**-26,811**	**5**	NAEI COPERT5
PM kg/annum	0	54.5	**-54.5**	**5**	NAEI COPERT5

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Environment and Sustainability Panel

Item **11**

21 March 2024

Report of	**Head of Sustainability**	**Author**	**Matthew Evans** ☎ **ext. 8006**
Title	**Work Programme 2023-2024**		
Wards affected	Not applicable		

1. Executive Summary

1.1 This report sets out the current Work Programme 2023-2024 for the Environment and Sustainability Panel. This provides details of the reports that are scheduled for each meeting during the municipal year.

2. Recommended Decision

2.1 The Panel is asked to note the contents of the Work Programme for 2023-2024.

2.2 The attention of the Panel is drawn to the deferment of both the Carbon Management Plan, and the Waste and Recycling Strategy reports from this meeting to the next municipal year.

3. Reason for Recommended Decision

3.1 The Work Programme of this Panel is kept under review throughout the municipal year to ensure that business is progressed and Members have the opportunity to review upcoming agenda items.

4. Alternative Options

4.1 This function forms part of the Panel's Terms of Reference and, as such, no alternative options are presented.

5. Background Information

5.1 The Environment and Sustainability Panel deals with existing and emerging environmental issues, and will focus on carbon footprint reduction and monitoring and supporting the Council's Climate Emergency Action Plan.

5.2 The Panel's Work Programme will evolve as the Municipal Year progresses and items of business are commenced and concluded. At each meeting the opportunity is taken for the Work Programme to be reviewed and, if necessary, amended according to current circumstances.

6. Equality, Diversity and Human Rights implications

6.1 This report has no equality, diversity and human rights implications.

7. Strategic Plan References

7.1 Environmental Sustainability is integral to the delivery of the Strategic Plan's priorities and direction for the Borough as set out under the four themes of growth, responsibility, opportunity and wellbeing.

8. Consultation

8.1 There are no consultation considerations for this report.

9. Publicity Considerations

9.1 There are no specific publicity considerations.

10. Financial implications

10.1 There are no specific financial implications from this report.

11. Health, Wellbeing and Community Safety Implications

11.1 With the actions provided in the updates, the Council is trying to improve health and wellbeing through the actions it is taking to improve environmental outcomes. The 'co-benefits' of environmental action are well documented. For example, improving the management of our green spaces for biodiversity can bring enjoyment and mental health benefits for residents, supporting residents to cycle more improves both their physical and mental health and increasing the energy efficiency of homes helps to improve thermal comfort and physical health.

11.2 There are no community safety implications from this report.

12. Health and Safety Implications

12.1 There are no health and safety implications from this report.

13. Risk Management Implications

13.1 There are no risk management implications from this report.

14. Environmental and Sustainability Implications

14.1 There are no specific environmental and sustainability implications arising directly from this report.

WORK PROGRAMME 2023-24

Environment and Sustainability Panel
Meeting date / Agenda items -
Environment and Sustainability Panel - **22 June 2023**
1. Overview/Introduction of Climate Emergency Action Plan and key progress. 2. Climate Emergency Action Plan – progress update.
Environment and Sustainability Panel – **20 July 2023**
1. Climate Emergency Action Plan – Progress Update
Environment and Sustainability Panel – **21 September 2023**
1. Ferry Marsh Nature Reserve Improvements 2. Woodland and Biodiversity update 3. Greenhouse gas report review 4. Climate Emergency Action Plan update
Environment and Sustainability Panel – **06 December 2023**
1. Essex Climate Action Commission update 2. Domestic Energy Efficiency Funding and Support 3. Climate Change Scorecards 4. Climate Emergency Action Plan update

Environment and Sustainability Panel – **08 February 2024**
1. Housing and Sustainability 2. Review of fleet transition – moved from December 2023 meeting 3. Climate Emergency Action Plan update
Environment and Sustainability Panel – **21 March 2024**
1. Air Quality Projects update 2. Active and Sustainable Travel projects update 3. Draft Recycling and Waste Strategy – moved from December 2023 meeting 4. Ferry Marsh Update 5. Carbon Management Plan