



LONDON FIRE BRIGADE

Decision title

Ultra Low Emission Fleet (ULEF) Programme

Recommendation by

Assistant Director, Technical and Commercial

Decision Number

LFC-0034-D

**DECISION AND REPORT: NOT PROTECTIVELY MARKED
APPENDIX 2: OFFICIAL-SENSITIVE (COMMERCIAL)**

Summary

LFC-0034 sets out the initial steps proposed to be taken to achieve the fleet targets set out by the Mayor in the London Environment Strategy and defined in the Memorandum of Understanding between the London Fire Commissioner (LFC) and Transport for London (TfL). The approach is based on the Ultra Low Emission Fleet (ULEF) plan developed specifically for the London Fire Brigade's (LFB) fleet, a summary of which is provided in Appendix 1. The report proposes that a programme board is established to provide oversight of delivery of the ULEF plan and a Programme Coordinator post to support the programme delivery. It is intended that the programme is set out in stages, whereby delivery of successive stages will depend upon successful completion of the stage prior, with approval of subsequent stages sought from the Commissioners Board. To commence delivery of the programme approval is also sought for a corporate project and corresponding funding to take forward Stage 1, phases one and two.

Decision

The London Fire Commissioner approves the budget requirement over five years as set out within the ZEPA business case in the Confidential Appendix 2 and the Grade F Programme Coordinator post are to be funded from the London Safety Plan 2017 implementation reserve.

Dany Cotton QFSM
London Fire Commissioner

Date

9/8/18

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LONDON FIRE BRIGADE

Report title

Ultra Low Emission Fleet (ULEF) Programme

Report to

London Fire Commissioner

Date

20 June 2018

Report by

Assistant Director – Technical and Commercial

Report number

LFC-0034

APPENDIX 2: OFFICIAL-SENSITIVE – COMMERCIAL

Summary

This report sets out the initial steps proposed to be taken to achieve the fleet targets set out by the Mayor in the London Environment Strategy and defined in the Memorandum of Understanding between the London Fire Commissioner (LFC) and Transport for London (TfL). The approach is based on the Ultra Low Emission Fleet (ULEF) plan developed specifically for the London Fire Brigade's (LFB) fleet, a summary of which is provided in Appendix 1. The report proposes that a programme board is established to provide oversight of delivery of the ULEF plan and a Programme Coordinator post to support the programme delivery. It is intended that the programme is set out in stages, whereby delivery of successive stages will depend upon successful completion of the stage prior, with approval of subsequent stages sought from the Commissioners Board. To commence delivery of the programme approval is also sought for a corporate project and corresponding funding to take forward Stage 1, phases one and two.

Recommendation

The London Fire Commissioner approves the budget requirement over five years as set out within the ZEPA business case in the Confidential Appendix 2 and the Grade F Programme Coordinator post are to be funded from the London Safety Plan 2017 implementation reserve.

Background

1. The Mayor's London Environment Strategy (LES) sets targets for the London Fire Brigade and the other functional bodies of the Greater London Authority to achieve zero emission fleets by 2050, with intermediate targets to achieve zero emission capable light vehicles by 2025 and zero emission capable or fossil fuel free heavy vehicles by 2030. The London Fire and Emergency Planning Authority (LFEPA) responded to the consultation on the draft strategy (FEP 2797, 03/11/17) confirming support for the policy actions set out for LFB to deliver, and committed to working towards delivery of the targets in the Memorandum of Understanding established between LFB and TfL.
2. At its meeting of 11 October 2017 the Corporate Management Board received a report regarding the LES consultation (CMB098/17) and agreed in principle to work commencing to

establish a corporate project aimed at delivering a prototype low emission heavy vehicle to support delivery of the Mayor's strategy. This report sets out the business case for that project and the associated programme of work planned to support delivery of the fleet targets.

Ultra Low Emission Fleet Programme

3. The Ultra Low Emission Fleet (ULEF) Plan (summarised at Appendix 1) sets out London Fire Brigade's plan to achieve an Ultra Low Emission Fleet in line with the Mayor's LES targets. It profiles the current fleet and planned replacement schedules, as well as emissions reduction measures taken to date. The plan proposes a process for managing the further actions which will be needed to deliver the ULEF Programme. This includes prioritising vehicles and defining the operational performance requirements for frontline vehicles which will affect choice of future vehicle technology.
4. Whilst cars, buses and vans have relatively well-defined pathways to zero emissions, the trajectory for heavy vehicles (HGVs) is less clear because availability of affordable zero emission capable (ZEC) technology will be limited in the 2020s. Moreover heavy frontline vehicles such as pumping appliances have more complex and extensive power requirements than other vehicles which in turn presents additional technical challenges during the design and build process.
5. In consideration of these complexities alongside the long lifespan of HGVs (typically 12 years), action is required now to develop solutions to ensure that suitable vehicles are available in time for the next wave of fleet replacements, scheduled for 2029.
6. In order to achieve the ULEF plan a number of work streams will be required, initiated by the Zero Emission Pumping Appliance (ZEPA) Project (paragraphs 25 – 28; Confidential Appendix 2) and developed further by other projects as and when appropriate. A programme approach will ensure knowledge and learning from ZEPA will be embedded into other work streams to ensure the rollout of zero emission vehicles in the fleet will be as efficient as possible. As a result, the rollout of zero emission capable vehicles could be incorporated into the fleet replacement programme rather than creating the need for additional corporate projects, by:
 - identifying new technology and suppliers;
 - assess the feasibility and benefits of deploying zero emission technology (both the vehicles and the supporting infrastructure) currently available;
 - ensuring vehicles meet LFB requirements;
 - establishing adequate recharging and/or refuelling infrastructure; and
 - solutions applied to ZEPA are applied to other HGVs in the fleet, potentially negating the need for extensive prototype development and testing.

Technology being considered

7. The 2050 target sets the requirements for Zero emission vehicles, which is defined in the Mayor's Transport Strategy as a vehicle that produces zero harmful exhaust emissions, including PM, NO_x, NO₂, CO and CO₂. These include:
 - i) Battery Electric Vehicles (BEVs)
 - ii) Hydrogen powered Fuel Cell Electric Vehicles (FCEVs)
 - iii) BEVs with hydrogen powered fuel cell range extender.
8. Zero emission capable (ZEC) vehicles as per the 2030 target are vehicles that are constructed to be capable of operating in zero emission mode for at least part of their operating cycle. The zero

emission mode may be augmented by an internal combustion engine configured to extend the driving range of the vehicle, either by propelling the driven wheels or by powering an on-board generator. In basic terms a plug-in hybrid electric, diesel engine could meet the requirements.

9. The ULEF Programme will assess the viability of other Ultra Low Emission Vehicles and alternative fuel solutions that could meet the 2030 requirement as an interim solution (including meeting the "non fossil fuel free" target for all vehicles in 2030). These include:
 - Hydrogen combustion – currently Dual Fuel hydrogen-diesel vehicles are in operation however R&D projects are looking at the viability of pure hydrogen combustion;
 - Drop in fuels such as HVO (Hydrotreated Vegetable Oil) and Biodiesel FAME (Fatty Acid Methyl Esters); and
 - Biomethane.
10. The programme will also be underpinned by ongoing work to strategically develop LFB's refuelling/recharging infrastructure; review operational and performance requirements against zero emission technology; stakeholder engagement (internal and external).

ULEF Programme Board

11. The ULEF Programme Board will be established and tasked with the following responsibilities:
 - i) To steer the direction of the programme.
 - ii) To ensure LFB's fleet meets national resilience capabilities.
 - iii) To ensure LFB meets its commitments outlined in the MOU on ULEZ and the London Environment Strategy with TfL.
 - iv) To steer the direction of the ZEPA project.
 - v) To provide oversight on strategic matters and developments (aligning to operational delivery models, asset replacement schedules, property assets, resilience and contingency planning).
 - vi) To propose where further projects to achieve the targets should be corporately led or form part of standard fleet replacement engineering work streams.
 - vii) To take a strategic review of opportunities for external funding to support key projects, whereby application to one funding call may limit opportunities for success in further funding calls.
12. The Director of Corporate Services will act as the Project Sponsor and representation from appropriate departments will be sought by their respective Assistant Directors and Assistant Commissioners. It is envisaged that this will include the following Departments in the first instance:
 - Operational Policy
 - Central Operations
 - Strategy & Risk
 - Procurement
 - Health & Safety
 - Technical and Service Support
 - Development and Training
 - General Counsel
 - Finance

13. It is proposed that a ULEF Programme Coordinator post at Grade F is created to deliver this programme of work. Key tasks of the role include:
- Develop, co-ordinate, manage and monitor the performance of Ultra Low Emission Fleet Programme, supporting the Programme Board;
 - Manage the ZEPA project;
 - Manage and coordinate a national working group to develop a common specification for the pump and other collaboration activities;
 - Identify sources of external funding for low emission vehicles as part of fleet replacement and testing of prototypes and lead on funding applications; and
 - Establish a supply chain network with Babcock to identify opportunities to support this work such as influencing R&D activity to lightweight equipment.

Zero Emission Pumping Appliance (ZEPA) Project

14. The Business Case for the project is set out in the Confidential Appendix 2 and includes the request for funding for the project. The objective is to establish a project to develop a zero emission capable frontline pumping appliance that will meet requirements for LFB (and other fire services in the UK if possible).
15. The London Safety Plan identifies the need to explore the use of electric vehicles and for LFB's sustainability strategy to support the Mayor's priority to restore London's air quality to legal and safe levels (London Safety Plan 2017, pages 54 and 60). It is therefore proposed that the programme coordinator post and the project costs as set out in the Confidential Appendix 2 (Commercial are funded from the LSP 2017, to which delivery of this project is aligned).
16. The ZEPA project will help to stimulate a market for zero emission HGVs in the fire service and provide a high-profile example to encourage other organisations and businesses in London to plan and deliver zero emission vehicles – as well as Londoners in general. As such there are early indications that external grant funding opportunities may be available to support the project. The supply market may also be interested in providing a level of investment into the R&D required, however the potential for grant funding and supplier investment are speculative only at present and they have not been factored into the project budget.
17. The ZEPA Project has been allocated as the first corporate project within the ULEF Programme for the following challenges:
- As outlined above, there is currently a lack of availability on the market (both UK and globally) for zero emission capable HGVs;
 - Pumping appliances have more complex and extensive power requirements than other vehicles which presents additional technical challenges;
 - Pumping appliances account for a high proportion of LFB's fleet; and
 - Pumping appliances have a lifespan of 12 years and the next wave of replacements are planned for 2029.
18. Early market engagement with vehicle suppliers has clarified the need for LFB to act now to catalyse the market and drive the necessary solutions to meet the timeframes set out by the Mayoral targets.
19. The innovative nature of the programme will showcase the following commitment for collaboration outlined in the London Safety Plan: *to identify further opportunities that maximise*

learning and best practice from across the country and internationally, working towards the combined vision to make London 'the safest global city' through a commitment to partnership, collaboration, innovation and co-operation.

20. LFB's contract for the provision of fleet vehicles and operational equipment, maintenance and management services with Babcock Critical Services runs through to 2035, covering the period of the first target dates and next generation fleet replacement, following the Series 3 pump replacement. Babcock Critical Services as the responsible party for procurement and deployment of new vehicles, as well as disposal of retired vehicles will be an integral part of the ZEPA Project and has been closely involved in the development of the project thus far. The ZEPA project will provide LFB and Babcock with a blueprint for working in partnership to transform the entire fleet to zero emission capable vehicles. The procurement of supporting infrastructure falls outside the scope of the vehicle contract, however a partnership approach to determining the appropriate infrastructure will be necessary to develop the most efficient and cost effective solutions.

National Working Group

21. Air pollution in many cities throughout Britain continues to exceed the World Health Organisation limits and has been linked to some 40,000 deaths per year in the UK (*ref. Royal Colleges of Physicians and of Paediatrics and Child Health report*). Consequently, low emission zones for vehicles are being introduced in cities, and, whilst these zones (outside of London) only affect local buses, it is expected that cities will introduce more strenuous zones – such as the proposed introduction of Oxford's zero emission zone. Therefore, whilst LFB is now facing the challenge to transition to a zero emission fleet, it is likely that fire services in other UK cities will face similar targets in due course.
22. Fire Services operate a comparatively small number of heavy goods vehicles within a much larger UK market, with very specialist requirements. As a result, it is essential that fire services work together to ensure suitable zero emission capable solutions are developed for pumping appliances and other heavy vehicles.
23. A national working group will be established with appropriate subject matter leads of the National Fire Chiefs Council (NFCC) including Research and Development, Air Quality and the UK Fleet Managers groups to:
 - i) Raise awareness about the impacts of tackling air quality across the UK and the challenge this creates for national fire services in transitioning to a zero emission vehicles (particularly HGVs).
 - ii) Develop a common framework towards understanding and addressing key challenges facing UK fire services in transitioning to a zero emission fleet.
 - iii) Develop a common (or aligned) specification for zero emission capable pumping appliances (and other HGVs in due course) used by UK fire services – establishing an market large enough to be attractive for suppliers.
 - iv) Provide advice and expertise to LFB's ZEPA Project and ULEF Programme.
 - v) Gain investment – expertise and potentially financial support – for work that could have real benefits for other fire services (e.g. development of common specifications,

d) Appendix 4: Finance comments to this report – OFFICIAL-SENSITIVE – COMMERCIAL

assessment of alternative fuels and the development of a real life duty cycle for pumping appliances).

24. The intention to establish a national working group on this subject was raised at the Local Government Association Fire Conference plenary session 'Fire and Rescue Service Fleets: the environmental challenge' in March 2018. Subsequently a letter was sent to Chiefs and Chairs of each fire and rescue service in Britain from the Commissioner to gauge interest. To date, five services have responded (Tyne and Wear; Hereford and Worcester; Avon; Staffordshire; and East Sussex), with further follow up of other services planned.
25. A roundtable workshop with the group is being planned for September 2018 to gain buy and discuss the immediate issue of common requirements for pumping appliances. The workshop and its aims will be promoted at conferences (Fire Fleet and Equipment Conference 2018) and through industry specific media (including an article in Emergency Services Times).
26. Wider stakeholder engagement will also be an important element of the ULEF Programme in order to share experiences from zero emission transformation programmes taking place. As part of the GLA Family Fleet Group, LFB collaborates with the GLA, Transport for London and the Metropolitan Police Service as well as the London Ambulance Service, British Transport Police and City of London Police. LFB will look for opportunities to collaborate with members of this group as well as other blue light services.

Finance

27. Finance comments to this report are set out in the Confidential Appendix 4.

Workforce comments

28. Consultations will be undertaken as part of the development of any output based specifications for each vehicle and equipment modification or replacement.

Legal comments

29. The proposed responses in this report align with the Commissioner's duties under Section 3 of the Local Government Act 1999 to "secure continuous improvement in the way in which its functions are exercised having regard to a combination of economy, efficiency and effectiveness".

Sustainability implications

30. The Ultra Low Emission Fleet Programme and its associated projects (including the ZEPA Project) will contribute towards the action in the Sustainable Development Strategy, 2016-2020, to Investigate options for a low emission frontline vehicle.
31. This work also supports the improvement of air quality and reduction of CO₂ emissions as identified in PN897 Sustainable Development and aims to deliver on targets set out in the Mayor of London's Environment Strategy.

Equalities implications

32. These will be identified through the development of output based specifications for each vehicle and equipment modification or replacement.

List of Appendices to this report:

- a) Appendix 1: Ultra Low Emission Fleet Plan – Summary Version
- b) Appendix 2: ZEPA Business Case – OFFICIAL-SENSITIVE – COMMERCIAL
- c) Appendix 3: Zero Emission Pumping Appliance Project Structure

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