OVERVIEW AND SCRUTINY COMMITTEE - 5 SEPTEMBER 2018

Tackling air quality emissions and reducing costs in the council's fleet through Ultra Low Emission Vehicle's and supporting initiatives

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Purpose

This briefing note provides an overview of the range of measures being undertaken by the Parking, Fleet and Transport Service Area (PFTS) to improve air quality and reduce operational costs by converting as many of the Councils fleet of around 500 vehicles to Ultra Low Emission Vehicles (ULEVs) and developing and delivering a range of complementary supporting projects. This was requested at the Overview and Scrutiny meeting on the 4th April 2018.

Background information

Nottingham City Council, in partnership with Nottinghamshire County Council and Derby City Council, is one of four cities in the UK to be awarded funding as a 'Go Ultra Low City' to introduce measures that will tackle air quality and encourage the uptake of ULEVs across the local area. Together the three authorities are benefiting from £6.120million of investment. Nottingham is leading the programme of measures, which will help the Council maintain its position as a leader in local integrated transport delivery and make Nottingham exemplary for ULEVs.

What is an Ultra Low Emission Vehicle?

The Council is adopting the term "Ultra Low Emission Vehicle" defined by HM Treasury as "a vehicle that emits less than 75g of carbon dioxide emissions per kilometre travelled and can drive a minimum of 10 miles in zero emission range". This includes all battery electric vehicles and some but not all hybrid vehicles. The Council has a number of Nissan Leafs and Nissan ENV200 vans, which are some of the most popular models of pure electric vehicles available on the market.

Depending on the size of the battery, the vehicles can do between 80-150 miles on a single charge. If a vehicle has a 30kW battery size (which has a range of 100-120 miles) and assuming the Council pay 11p per kW on the electricity tariff, a vehicle could be charged from as little as £3.30 (excluding standing charge).

The funding is being used to deliver a number of measures including:

- Introduction of a new public network of charging infrastructure, including provision at all park and rides and key council owned car parks
- Delivering the Workplace Travel Service; a support package to encourage businesses to take up ULEVs
- Leading by example with our own fleet and supporting public sector organisations to convert their fleet to ULEVs
- Creation of the Daleside Road bus lane giving an exemption to ULEVs (the first of its kind in the UK)

In 2017 the Government identified a number of cities where air pollution (nitrogen dioxide levels) were showing exceedance above the EU legal limits – including Nottingham. The Council was tasked with developing a local air quality plan to help bring emissions levels back within the legal thresholds in the shortest possible time, and by 2020 at the latest. The Council took advantage of DEFRA's Early Measures funding, which has successfully secured funding to support the conversion of Nottingham City Transport's bus fleet to gas and retrofitting their

remaining Euro V buses to Euro VI emissions standards; support the conversion of the Hackney Carriage fleet to ULEV; and support for the Council's own fleet transition to ULEV.

Strategy for Implementation

A Fleet Strategy is in development to promote the uptake of ULEVs and includes the following key projects:

1. ULEV Fleet Purchase

With 38 ULEVs already in the fleet and plans for a further 80 vehicles, opportunities for replacing small, medium to heavy sized vehicles are being sought, not just for the financial savings the vehicles offer, but also for the emissions benefits to the city and its citizens. The council is a Go Ultra Low Company (a national initiative supporting businesses) with an ambition of at least 5% of the fleet to be converted to ULEV by 2020.

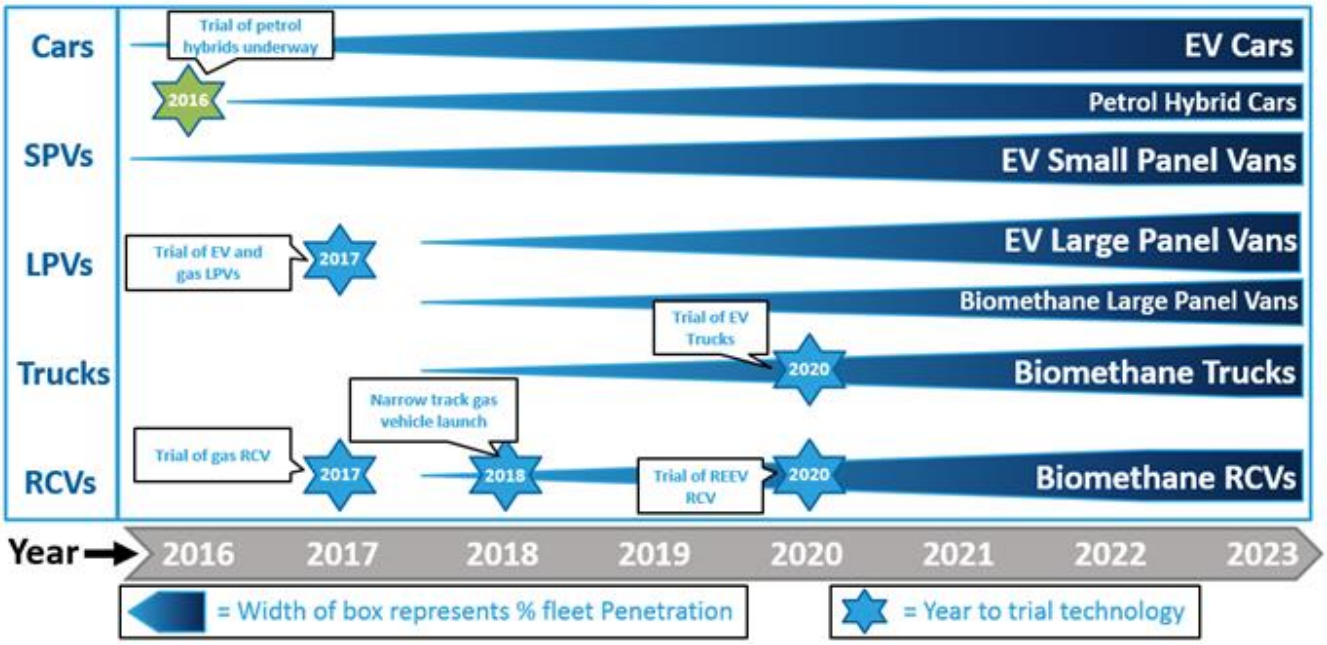
In 2016, the Council commissioned an independent fleet review of the Councils 500 fleet vehicles across all types to understand the opportunities for adopting ULEVs into the fleet. The council's fleet composition is set out in Table 1:

Table 1: Emissions from Nottingham City Council fleet

Vehicle Type	Number of vehicles	% of fleet	Total Annual NOx Emissions (kg)	% Contribution to NOx emissions	Total Annual PM Emissions (kg)	% Contribution to PM emissions
Car	50	10%	300	4%	3.4	6%
Small Van (<2.5t)	100	21%	611	9%	8.4	14%
Large Van (>2.5t)	198	41%	1442	20%	13.8	23%
Compact sweeper	27	6%	NA	NA	NA	NA
Truck (7.5t)	17	3%	239	3%	3.4	6%
Truck (12-18t)	7	1%	244	3%	1.7	3%
Truck (>18t)	30	6%	1527	22%	9.7	17%
RCV	58	12%	2737	39%	18.6	32%
Total	**487**	**100%**	**7100**	**100%**	**59**	**100%**

The review concluded that there was a financial case for switching cars and small vans to ULEV and proposed the following roadmap for transition:

Figure 1: Road map for Nottingham City Council fleet transition alternative fuels (2016)



The council has introduced 38 cars and small vans into the fleet thus far, which have resulted in a £25,000 fuel saving in the last financial year alone. With large increases in Inflation costs for equipment and diesel will cost the PFTS an additional £295,000 in inflation this year (£220k is in fuel alone) so the cost savings for ULEV fleets is significant when the programme is scaled up. Electric vehicles have less moving parts than their internal combustion engine counterparts and so maintenance requirements and costs are reduced, as is the downtime when vehicles are in for repair. Therefore, ULEVs has less disruption on customer services. The vehicles can also be kept longer – so many vehicles are currently replaced after 7 years, however the ULEVs will be kept on for 10 years. With the Government's Road to Zero Strategy target of no new diesel or petrol vehicles to be sold from 2040, the residual value of diesels is already being affected. This means the residual value of the electric vehicles will likely rise. However, whilst ULEVs offer the Council savings over the lifetime of the vehicle there is still a premium upfront cost to purchasing the vehicles themselves. Following the fleet review, the Council has been able to utilise Go Ultra Low funding to support the price differential between conventional diesel and ULEVs (in some cases £3k to £8k more costly). In addition to the 38 vehicles already introduced, a further 82 vehicles have been prioritised for replacement with ULEVs which will result in 22% of the fleet (mainly light vehicles) being ULEV in the period to 2020.

In March 2018, the Council was successful in securing a further DEFRA Early Measures £1.5m grant to contribute to a £2.8m project to enable the Council to pilot the conversion of a number of its heavy fleet vehicles from diesel to ULEV, which are the main contributors to local pollution. The specialist vehicles proposed for replacement with ULEVs include vehicles, which operate in the city centre area and along the ring road:

- Electric Sweepers
- Electric Cage Tippers/mini buses
- Converting up to 3 x 18t Refuse Collection Vehicles to electric
- Purchasing an electric 26t Refuse Collection Vehicle

As with the Go Ultra Low City funding, the DEFRA grant is being used to bridge the gap in the initial purchase price between the conventional diesel vehicle and their ULEV alternatives (in some cases £15k to £180k more costly). Funding is also being used to recruit additional specialist resources within the Parking Fleet and

Transport team to 31 March 2020 to assist in the rapid and successful implementation and ongoing management of the ULEV programme and the essential data analysis and monitoring requirements to DEFRA.

There are currently less alternative vehicles available for the more specialist fleet vehicles and this project will allow the Council to trial these in advance of them being universally available. This will provide valuable insight to understand how ULEVs can be incorporated into the medium/heavy fleet, and will help deliver the business case for future investment. In addition, the project outputs can be shared with other local authorities, healthcare providers and public sector organisations to help deliver the Go Ultra Low objectives by encouraging these key organisations to follow the Council's lead.

2. ULEV Centre

The council currently employs fleet technicians who undertake a wide range of service maintenance and repair activities on the fleet.

A number of technicians have attended externally accredited training and possess the relevant electrical certifications to carry out tests and repairs of the ULEV vehicles. PFTS are preparing plans to utilise Go Ultra Low funding to invest in the creation of a fully equipped ULEV service maintenance and repair centre. This facility based behind the Tamar Building at Eastcroft Depot will support the maintenance of all of the council's ULEV fleet vehicles, without the need to send the ULEV vehicles externally for repairs, therefore saving the council money in the ongoing upkeep of the vehicles.

The ULEV Centre also presents a further commercial opportunity for ULEVs to the Council. Currently there are no independent service maintenance and repair facilities for public sector and commercial fleets. ULEVs have to be returned to the Manufacturers/Dealerships for maintenance, which is a costly approach. Establishing an ULEV Centre for the council's own fleet vehicles will provide the opportunity to offer the services to external public sector organisations e.g. other local authorities, Nottingham City Homes, Nottinghamshire Fire and Rescue and other clients e.g. local taxi drivers.

The initiative presents a unique opportunity to take on Apprentices and offer skills and training opportunities for an emerging sector.

3. Vehicle to Grid

In 2017, the Council successfully secured Interreg NWE and Innovate UK funding to trial a new technology at Eastcroft Depot through a project called CleanMobilEnergy. "Vehicle2Grid" (V2G) technology allows electric vehicles to be charged as usual, but also to feed electricity stored within their batteries back to the grid or adjacent buildings when they are not needed, thereby facilitating a smart, bi-directional flow of energy which meets local energy demands and reduces strain on the electricity supply grid.

The system will be trialled at Eastcroft Depot, which will integrate renewable energy from solar panels, 40 ULEVs (mainly vans for our maintenance, energy deliver and highways teams), 40 vehicle to grid chargers and a large stationary battery to store and redistribute renewable energy.

The aims of the project are to:

- Maximise use of renewable energy in the buildings at Eastcroft and when charging the new ULEVs
- Reduce energy costs to the council by managing energy in a smart way and reducing peak tariffs, and
- Generate revenue by offering grid balancing services.

The funding will allow for a large-scale demonstration of V2G technology to share learning with other European partners and local authorities across the country. Nottingham is participating alongside London (TfL) as well as other cities from across North West Europe in a project led by the City of Arnhem, The Netherlands. Nottingham is also working alongside sub-partner Leicester City Council in order to share knowledge and develop a plan for wider implementation of project objectives in the long term.

The project will help to prove the business case and inform operational delivery, which could then be expanded to other sites to deliver further savings to the council.

4. Fleet Charge Point Infrastructure Strategy

The vehicle to grid project will support 40 ULEV fleet vehicles, however as more ULEV vehicles are incorporated into the council's fleet, a sophisticated charging arrangement will need to be explored to ensure operational areas can access charge points as they need them and the energy demands placed on sites is managed sensibly. Vehicles have a range of 150 miles and some only do 50 miles a week and could suffice with one slow overnight charge on a set workday. The PFTS are exploring the development of a charging strategy whereby operational areas are allocated a number of chargers for their allocation of ULEV fleet vehicles and will be supported to manage the charging amongst themselves. The system will also need to consider how the electricity costs are recharged too.

A piece of work is currently being scoped to investigate the number and types of chargers required at the various Council sites.

PFTS are also looking at piloting home charging options as many companies such as British Gas and BT allow employees the ability to take vehicles home overnight to minimise demands placed on depots and downtime in operations. This pilot will look into the possibilities for select operational areas.

5. Other initiatives

There is a much wider set of supporting initiatives being undertaken by PFTS which will be key to the successful and ongoing conversion of the council's fleet which form a key part of the Council's Go Ultra Low status. These include:

- Continued reprioritisation of the existing fleet Vehicle Replacement Programme (£3m pa) to target ULEV and Euro 6 minimum fleet standards
- Investment and rollout of new telematics systems across the entire Council's fleet to measure and monitor driver behaviours and emission impacts (positively/negatively) and maximise fleet utilisation
- Engagement with other surrounding Local Authorities to support and partner in the ULEV conversion and contribute to the air quality objectives
- Training guides (how to get started in an ULEV and get the most from the vehicles etc) and support for operational areas as they trial and embrace new ULEV technologies
- Investment in charge points at workplaces for staff who commute to work and pay the Workplace Parking Charge to park at Council workplaces
- Leading the procurement of a new ULEV light vehicle framework, which all UK local authorities will be able to access – currently no ULEV vehicle frameworks exist either on CCS or ESPO. The framework will charge a 1% rebate offering new income opportunities for the Council.

Next steps

There are a range of supporting initiatives that PFTS and its partners in Transport Strategy and Energy Services are also delivering, which not only support the successful delivery of the ULEV conversion programme, but also deliver the necessary change and infrastructure to ensure that this conversion is sustainable and the transition is future proofed. This will be the key to maximising the early delivery of air quality benefits, alongside the priority to maintain operational effectiveness of the council's core services that rely heavily upon this fleet during this major transition.

A presentation at the meeting on the 5 September will provide further information on the wider ULEV programme of works and the risks and opportunities that this is creating for the Council and allow more in-depth Q and A of these wide-ranging initiatives.