Ultra Low Emission Zone

Further consultation on Licensing Proposals
for Taxi and Private Hire Vehicles

Supplementary Information
Addendum

July 2015 v3
<table>
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<th>Version</th>
<th>Date</th>
<th>Summary of changes</th>
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<tbody>
<tr>
<td>2</td>
<td>14/07/15</td>
<td>References in Table 3 on page 14 and Table 1 of Appendix 16 to the proposed PHV two-year sunset period exemption from the ZEC requirement corrected to state ‘six or more’ passengers as opposed to ‘more than six’.</td>
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</table>
| 3       | 23/07/15  | The caption for Table 6 on page 56 corrected to state ‘Emissions impact in 2020 from the original ULEZ proposals (Package 1)’ as opposed to ‘Emissions impact in 2020 from the revised ULEZ proposals (Package 1)’.  
The caption for Table 10 in Appendix 6 corrected to state ‘Emissions impact in 2025 from the original ULEZ proposals (Package 1)’ as opposed to ‘Emissions impact in 2025 from the revised ULEZ proposals (Package 1)’.
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1. **Introduction and background**

1.1. **The ULEZ and the taxi and PHV proposals under consultation**

1.1.1. On 23 March 2015, the Mayor of London confirmed the introduction of the Ultra Low Emission Zone (ULEZ) in London\(^1\). This followed a public and stakeholder consultation on the proposal which ran from 27 October 2014 to 9 January 2015.

1.1.2. The ULEZ proposal as consulted on comprised three main elements.

- The first was a requirement for all vehicles driving in central London from September 2020 to meet new exhaust emissions standards (ULEZ standards). Those not meeting these standards would be able to drive in the zone, but would need to pay a daily non-compliance charge to do so.

- The second element was investment in the TfL bus fleet so that all double deck buses operating in central London will be hybrid and all single deck buses will be zero emission (at tailpipe) by September 2020.

- The third element was changes to the licensing requirements for taxis and PHVs to reduce emissions from these fleets by means of a reduction in the taxi age limit and the introduction of a Zero Emission Capable (ZEC)\(^2\) requirement for newly-licensed vehicles.

1.1.3. TfL set out its analysis of the consultation and its recommendations to the Mayor in a report in March 2015\(^3\).

1.1.4. The Mayor has confirmed the first two parts of the ULEZ proposal as described above. These have been implemented by means of a Scheme Order (in effect, a change or Variation Order (VO) to the existing Low Emission Zone) which was approved by the Mayor with two minor

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\(^2\) In the consultation, this was defined as a vehicle capable of zero emissions for a minimum range of 30 miles and capable of emitting a maximum 50g/km CO\(_2\).

modifications\textsuperscript{4} and by TfL approving changes to its bus procurement strategy. This means that from 7 September 2020 cars, motorcycles, vans, coaches, buses and HGVs will all be required to meet emissions standards in order to drive in the ULEZ without paying a charge. The parts of the Scheme Order pertaining to taxis and PHVs were also confirmed: that taxis would be exempt as non-chargeable vehicles with respect to driving in the ULEZ, and that PHVs would be covered by the ULEZ standards and non-compliance charges in the same way as private cars and vans. TfL is now beginning to change its bus fleet so that by 2020, only ultra low emission buses (hybrid double deckers and zero emission at tailpipe, eg electric, single deckers) will operate in the zone.

1.1.5. TfL is the licensing authority for taxis and PHVs in London. The taxi and PHV proposals put forward for consultation in October 2014 were as follows:

- A requirement that all taxis and new\textsuperscript{5} PHVs presented for licensing in London for the first time from 1 January 2018 would need to be zero emission capable\textsuperscript{6};
- A reduction in the age limit for all non zero emission capable taxis from 7 September 2020 from 15 to 10 years (irrespective of date of licensing);
- From 1 January 2018, second-hand\textsuperscript{7} PHVs presented for licensing in London for the first time must meet the ULEZ standards, which are dependent on its vehicle type (Euro 4 petrol, Euro 6 diesel).

1.1.6. With regard to these taxi and PHV proposals, TfL recommended in March 2015 that most of these should not be implemented at that time. The following issues were identified for further consideration:

- The required funding and approach to take with regard to mitigating the financial impact of the reduced taxi age limit on owners / operators;

\textsuperscript{4} These were: the addition of an exemption (in the form of a three-year sunset period) for vehicles adapted for disability needs and a change to the definition of historic vehicles. Please see the Report to Mayor which can be found at https://consultations.tfl.gov.uk/environment/ultra-low-emission-zone.
\textsuperscript{5} 18 months or younger from date of first registration
\textsuperscript{6} For both taxis and PHVs, ZEC was defined as having a minimum zero emissions range of 30 miles and maximum CO\textsubscript{2} emissions of 50g/km
\textsuperscript{7} Older than 18 months old from date of first registration
• The funding available to assist with the purchase of ZEC taxis and PHVs;
• The range of vehicle models available which satisfy the ZEC requirement for PHVs and the needs of different operators;
• The availability of rapid-charging infrastructure for ZEC taxis and PHVs.

1.1.7. The Mayor asked TfL to undertake further consultation and engagement with the taxi and PHV trades on these issues before making a final recommendation to him. This work is now complete and TfL on behalf of the Mayor is now consulting on updated proposals for taxis and PHVs. Comments on all aspects of the proposals are welcome and will be taken into account prior to a decision being made.

1.1.8. As part of the consultation, TfL is also making available additional information on how the proposals would be implemented and operate in the longer term. Subject to the outcome of this consultation, changes to licensing would be implemented by means of the Conditions of Fitness (CoF) for taxis and Vehicle Regulations for PHVs, and approved exemptions to them. These are the legal documents under which TfL licenses such vehicles.

1.2. About this document

1.2.1. This Supplementary Information document is an Addendum to the Supplementary Information provided in the previous ULEZ consultation (the original consultation), and which is still available online⁸. Information provided in that document is not repeated here: as described in the preceding section, the VO for ULEZ emissions standards has been confirmed (with two minor changes to the original proposals) and the information related to that element, and its impacts, has not changed. All the consultation documents remain online. TfL set out its analysis of the original consultation and its recommendations in a Report to the Mayor. The Mayor’s decision is set out in the Mayoral Decision Form (MD1463) dated 23 March 2015. All of these documents can be accessed online at https://consultations.tfl.gov.uk/environment/ultra-low-emission-zone.

1.2.2. With regard to taxis and PHVs, some changes are proposed to the proposals made in October 2014. These updated proposals and the

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⁸ https://consultations.tfl.gov.uk/environment/ultra-low-emission-zone
process by which they were developed are described in the following sections of this document. The likely impacts of these changes on air quality and human health have been modelled and the impacts have been independently assessed by Jacobs consultancy, and set out in an Addendum to their original Integrated Impact Assessment (IIA). The IIA Addendum will be made available during the consultation period and its findings are summarised in Section 9 and Appendix 16.

1.2.3. This document is intended to inform the public consultation on the proposals for taxis and PHVs, which runs from Wednesday 1 July to Tuesday 11 August 2015. Its main focus is therefore on the proposed changes to licensing for these vehicles and the impact on air pollution and health as a result of these proposals and other measures. Additionally it sets out more information on the aspects for which less information was available during the original consultation: financial assistance for taxi owners / operators, availability of ZEC vehicles, and TfL’s plans for rapid-charging infrastructure in London.

1.3. Air pollution and public health

1.3.1. As set out in detail in the earlier consultation, the rationale for the ULEZ proposals is the need to improve air quality in London.

1.3.2. The health impacts of the two pollutants of concern in London, a significant proportion of which come from vehicle emissions, are⁹:

- **Nitrogen dioxide (NO₂):** At high concentrations, NO₂ causes inflammation of the airways. Long-term exposure is associated with an increase in symptoms of bronchitis in asthmatic children and reduced lung function growth.

- **Particulate matter (PM):** Long term exposure to PM contributes to the risk of developing cardiovascular and respiratory diseases, as well as of lung cancer. Research shows that particles with a diameter of ten microns and smaller (PM₁₀) are likely to be inhaled deep into the respiratory tract. The health impacts of PM₂.₅ are especially significant as smaller particles can penetrate even deeper.

1.3.3. Vehicle emissions are a significant source of the air pollutants of concern and exceedence of legal limits for NO₂ concentrations in London are expected to continue beyond 2020.

1.3.4. The extent of the negative effects of air pollution on health is dependent on each person’s level of exposure and other diseases they may be vulnerable to or suffering from. Knowledge of the impacts of air quality on health is continually increasing as research in this area progresses.

1.3.5. It can be difficult to demonstrate a clear link between an individual’s health and air quality. However, there are a number of studies that try to estimate the impacts at a population level. The Committee on the Medical Effects of Air Pollution has recognised a relationship between concentration and mortality rates\(^1^0\). This demonstrated that in 2008 an equivalent of 4,300 deaths in the Capital were attributed to long-term exposure to fine particulate matter (PM\(_{2.5}\)) and a permanent reduction of 1μg/m\(^3\) would increase life expectancy equivalent to an average 3 weeks per member of the 2008 population, with the expected gains differing by age\(^1^1\).

1.3.6. In 2012, the World Health Organisation classified diesel engine exhaust as carcinogenic to humans, based on sufficient evidence that exposure is associated with an increased risk of lung cancer\(^1^2\). Due to the large number of variables that influence the health impacts of air pollution, scientific understanding of this complex relationship is continually advancing. Stronger evidence and methodologies to assess the health impacts of short and long-term exposure to NO₂ are being established which still require expert bodies to verify them.

1.4. The ULEZ

1.4.1. The ULEZ is a package of measures affecting all vehicle types. Although this document concerns the taxi and PHV proposals, it will be useful to describe the scheme and its objectives as a whole, and its two other elements covering emissions standards and TfL buses.

1.4.2. The objectives of the ULEZ are as follows:

\(^{10}\) for every 10μg/m\(^3\) increases in average PM\(_{2.5}\) concentration there is an estimated 6% increase in annual all-cause death

\(^{11}\) http://www.london.gov.uk/sites/default/files/Health_Study_%20Report.pdf

• Reduce air pollutant emissions from road transport, particularly those with greatest health impacts, to support Mayoral strategies and contribute to achieving compliance with European Union (EU) Air Quality Directive legal limits on certain air pollutants as soon as possible;
• Reduce carbon dioxide (CO₂) emissions from road transport, to support Mayoral strategies and contribute to a London-wide reduction;
• Promote sustainable travel and stimulate the low emission vehicle economy, by increasing the proportion of low emission vehicles in London.

1.4.3. The original ULEZ package contained measures related to emissions standards, TfL buses and taxi and PHV licensing. It presented information on their impacts on emissions savings and air quality as a whole package. The first two of these have been confirmed and will be implemented from 2020, although cleaner buses will be rolled out progressively before then.

1.4.4. The ULEZ emissions standards will be introduced in central London on 7 September 2020 and will require vehicles to meet specified emissions standards in order to drive in the zone without paying a non-compliance charge. These standards are set out in Table 1 below. In addition, all of TfL’s double decker buses will be required to be hybrid and all its single decker buses will be required to be zero emission at tailpipe (eg electric). This information provides context to the taxi and PHV proposals, and is also important because PHVs are included in the ULEZ emissions standards and charging scheme.

13 Principal greenhouse gas related to climate change.
<table>
<thead>
<tr>
<th>Vehicle name</th>
<th>Vehicle type approval(^{14})</th>
<th>Description</th>
<th>Emissions standard(^{15})</th>
<th>Date when manufacturers must sell new vehicles meeting the emissions standards(^{16})</th>
<th>Charge level to drive a non-compliant vehicle in the ULEZ area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycle, moped etc</td>
<td>L</td>
<td>Any motorcycle or moped, (tricycle or quadricycle).</td>
<td>Euro 3</td>
<td>From 1 July 2007</td>
<td>£12.50</td>
</tr>
<tr>
<td>Car and small van(^{17})</td>
<td>M1 N1 (i)</td>
<td>A passenger vehicle with no more than 8 seats in addition to the driver`s seat. A goods vehicle with weight when empty less than 1,205 kg.</td>
<td>Euro 4 (petrol) Euro 6 (diesel)</td>
<td>From 1 January 2006 From 1 September 2015</td>
<td>£12.50</td>
</tr>
<tr>
<td>Large van and minibus</td>
<td>N1 (ii,iii) M2</td>
<td>Goods vehicle with a gross weight of 3.5 tonnes or less. Passenger vehicle with more than 8 passenger seats &amp; gross vehicle weight of 5 tonnes or less.</td>
<td>Euro 4 (petrol) Euro 6 (diesel)</td>
<td>From 1 January 2007 From 1 September 2016</td>
<td>£12.50</td>
</tr>
<tr>
<td>HGV</td>
<td>N2, N3</td>
<td>Lorries and specialist vehicles of more than 3.5 tonnes gross vehicle weight</td>
<td>Euro VI</td>
<td>From 1 January 2014</td>
<td>£100.00</td>
</tr>
<tr>
<td>Bus/coach</td>
<td>M3</td>
<td>Passenger vehicles with more than 8 passenger seats of more than 5 tonnes gross vehicle weight</td>
<td>Euro VI</td>
<td>From 1 January 2014</td>
<td>£100.00</td>
</tr>
</tbody>
</table>


\(^{15}\) Euro standards for heavy-duty diesel engines use Roman numerals and for light-duty vehicle standards use Arabic numerals.

\(^{16}\) These are usually a year earlier for early adopters.

\(^{17}\) Car-derived van
1.5. The original and new taxi and PHV proposals

1.5.1. TfL is working to reduce the emissions impact of taxis and PHVs through its role as the body which licenses these services in London. In recognition of their total contribution to NOx (see Appendix 15, Glossary for a definition of NOx) emissions, the original ULEZ package\(^{18}\) contained proposals to make changes to taxi and private hire vehicle (PHV) licensing in order to reduce emissions from those vehicles.

1.5.2. In light of concerns raised by the taxi and PHV trade organisations during the original consultation, the Mayor asked TfL to undertake additional engagement with the taxi and PHV trade organisations and to bring forward revised licensing proposals as part of a revised package, before confirming these changes. In addition, further announcements have been made by the Government about funding for ultra low emission vehicles, both during, and subsequently to, the original consultation. These developments, together with further analysis undertaken by TfL and its consultants, have led to the proposals for taxis and PHVs being refined. This work is now complete and TfL, on behalf of the Mayor, is now consulting on updated proposals for taxis and PHVs.

1.5.3. The process of formulating these new proposals is described in detail in the following sections of this document, which includes the development of alternative options for the taxi age limit. For the reasons set out in Section 4, a voluntary decommissioning scheme is considered to be the currently preferred approach and is therefore presented as part of the new proposals set out in Table 2 below. Further information on the rationale for each of these proposal changes is outlined throughout this document.

1.5.4. In developing the original ULEZ proposals, consulted on from October 2014 to January 2015, TfL undertook extensive engagement with the taxi and PHV trades: drivers’ representative organisations; fleet owners/operators and manufacturers of ZEC vehicles. Appendix I of the Report to the Mayor lists these meetings. Since March 2015, TfL has continued to engage with these stakeholders, and the further meetings are listed in Appendix 2 of this document.

\(^{18}\) From hereon the original ULEZ package is referred to as Package 1 while the new package is referred to as Package 2, see Table 2 and Table 3 below for a summary of each.
Table 2: Original and new proposals for taxi licensing

<table>
<thead>
<tr>
<th>Original proposals consulted on October 2014 – January 2015 (ULEZ Package 1)</th>
<th>New proposals (changes and additions shown in italics) (ULEZ Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A requirement that all taxis presented for licensing for the first time need to be ZEC(^{19}) from 2018 with a petrol only range extender engine where appropriate;</td>
<td>• A requirement that all taxis presented for licensing for the first time need to be ZEC from 2018 (petrol requirement for internal combustion engines);</td>
</tr>
<tr>
<td>• A 10 year age limit for non ZEC taxis from 2020 with an associated compensation scheme for affected vehicle owners (Option A – see Section 4.1.2);</td>
<td>• Retention of a 15-year age limit for all taxis and the introduction of a voluntary decommissioning scheme for taxis older than 10 years (Option C – see Section 4.1.2);</td>
</tr>
<tr>
<td></td>
<td>• A policy review at the start of 2020 to gauge progress on the voluntary decommissioning scheme and ZEC uptake.</td>
</tr>
</tbody>
</table>

Table 3: Original and new proposals for PHV licensing

<table>
<thead>
<tr>
<th>Original proposals consulted on October 2014 – January 2015 (ULEZ Package 1)</th>
<th>New proposals (changes and additions shown in italics) (ULEZ Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A requirement that new vehicles licensed for the first time as PHVs need to be ZEC (vehicle definition as per taxis) from 2018;</td>
<td>• A requirement that new vehicles licensed for the first time as PHVs need to be ZEC from 2018(^{20}),</td>
</tr>
<tr>
<td>• A discontinuation of the introductory five year age limit rule;</td>
<td>• A two-year sunset period exemption until 2020 from the ZEC requirement for PHVs that carry six or more passengers;</td>
</tr>
<tr>
<td>• A requirement that used vehicles (older than 18 months) licensed for the first time as PHVs must be at least Euro 6 (diesel) and Euro 4 (petrol) from 2018.</td>
<td>• A discontinuation of the introductory five year age limit rule(^{21});</td>
</tr>
<tr>
<td></td>
<td>• A requirement that used vehicles (older than 18 months) licensed for the first time as PHVs must be at least Euro 6 (diesel) and Euro 4 (petrol) from 2018.</td>
</tr>
</tbody>
</table>

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\(^{19}\) A ZEC vehicle is defined as ≤50g/km CO\(_2\) with a minimum zero emission range of 30 miles. For taxis, the original consultation specified that the conventional engine must be petrol.  
\(^{20}\) For PHVs only, the criteria for a ZEC vehicle has been updated since the original consultation. See Section 5.3 below.  
\(^{21}\) In January 2015, TfL introduced an exemption to the 5 year rule – that full electric and petrol hybrid vehicles which emit less than 110g/km CO\(_2\), as defined by the manufacturer, will be exempt from the 5 year rule.
1.6. **Future taxi and PHV exemptions**

1.6.1. TfL intends to consult at a later date on possible exemptions to the proposed taxi and PHV ZEC requirement (for specialist vehicles), however these would be expected to be few in number and be led by the existing age limit exemptions.

1.6.2. Recently there has been a Taxi & Private Hire (TPH) consultation on changes to PHV regulations\(^2\) (27 March – 19 June 2015), which is not related to ULEZ. The outcome of this consultation will be made available separately on the TPH part of the TfL website.

1.7. **Additional proposed interventions**

1.7.1. The new proposals (Package 2) put forward in this consultation represent the Mayor’s preferred approach. They have been developed to reflect the current challenges facing the taxi and PHV trades while tackling London’s air quality in the most effective and sustainable way.

1.7.2. However, these new proposals do not achieve the same level of emissions reduction as would have been made if the ULEZ had been implemented in full as originally proposed (including the original taxi proposals). The difference is relatively small (as shown in Section 4.5.7), but nevertheless it is important to consider other means by which emissions savings could be realised to offset or mitigate the reduction. These interventions are listed below and are in addition to the ongoing measures which could be taken by TfL, the London boroughs, national government and the EU as set out in the Transport Emissions Roadmap (TERM)\(^3\):

- Retrofitting 400 Euro V buses in outer London to meet a Euro VI standard;
- Zero emission double-decker demonstrator project in central London;
- A Low Emission Neighbourhood (LEN) in central London.

1.7.3. These additional interventions will not result in exactly the same impacts as the original proposals. They will achieve significant NO\(_x\) emissions savings – commensurate in 2020 with the absolute savings made by the original proposal at a London wide level – but will not lead to exactly the

\(^2\) https://consultations.tfl.gov.uk/tph/private-hire-regulations-review
same reductions in exposure to NO₂ exceedence in central London or reductions in other pollutants.
2. Developing the updated licensing proposals for taxis and PHVs

2.1. Developing the updated licensing proposals for taxis and PHVs

2.1.1. TfL’s development of these updated proposals has taken account issues of concern for the PHV and taxi trades, as described in the Report to the Mayor (March 2015) and listed at Section 1.1.6 above. These were summarised in the report as follows:

‘There are uncertainties around the level of funding available and approach to take with regard to financial assistance towards mitigating the impact of the reduced taxi age limit. There is also a need to provide further clarity with regard to the funding available to assist with the purchase of ZEC taxis and PHVs. Of particular concern for the PHV industry is the range of vehicle models which will satisfy the ZEC requirement and the needs of different operators. Finally, for both taxis and PHVs there is uncertainty about the availability of appropriate rapid-charging infrastructure for ZEC vehicles.’

2.1.2. At the same time as considering the issues raised by the taxi and PHV trades and some other respondents, it is also important to keep in mind the overall objectives of the ULEZ, particularly with regard to the main objective of improving air quality and health in London as soon as possible. Therefore the appraisal of alternative proposals must take account of the overall contribution of taxis and PHVs to road transport emissions, and the impact of variations on the ULEZ objectives.

2.1.3. TfL has revisited the specifics of the taxi and PHV licensing proposals and is now proposing a different approach (Package 2). A number of alternative approaches have been considered which are described below. In appraising these alternative options to the original proposal for licensing taxis and PHVs, it has been important to consider the consequences for air pollutant emissions. While NOx and PM are the main pollutants of concern for air quality, CO2 is also of interest.

2.1.4. One of the main drivers for this re-evaluation has been the views of the taxi and PHV trades associations on the impact of the original proposals raised during, and subsequently to, the original consultation. Therefore an

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24 Para 12.4.2 of RTM, March 2015
important factor for TfL in developing potential alternative approaches has been the impact on the trades, for example the costs for vehicle owners and drivers, and the availability of vehicles and appropriate infrastructure. As will be seen in this document, circumstances have moved on - particularly with regard to funding and infrastructure - even in the few months since the earlier consultation closed.

2.1.5. Critically, the need for a compulsory taxi age limit reduction in order to achieve the removal of the oldest vehicles from the fleet and stimulate the uptake of ZEC taxis remains an issue of significant concern for the taxi trade, which has argued strongly that it is not necessary if adequate financial incentives are put in place and that it has added unintended consequences of stagnating the market. However during the original consultation the majority of non-trade stakeholders supported a compulsory reduction in the age limit to reduce emissions from taxis. The updated proposal presented in this document is the result of TfL’s consideration of both points of view in this matter.

2.1.6. The requirement to change both taxi and PHV licensing requirements in order to mandate ZEC vehicles has remained largely unchanged in this updated proposal. There are a number of reasons for this as explained in the sections below. One important reason to highlight here is that of the 16,281 public responses to the original consultation, 73 per cent supported the ZEC requirement for taxis, and 72 per cent for PHVs\(^25\). In addition the majority of non-trade stakeholders were supportive of these requirements, pointing out the air quality and health benefits arising from a ZEC requirement.

2.1.7. A further important consideration here is a development since the original consultation with regard to money available for the purchase of ZEC taxis. The Government has allocated £25m for London towards purchase grants for these vehicles\(^26\).

2.1.8. As will be seen in the remainder of this document, the expected emission reduction benefits of the new ULEZ package (Package 2) being put forward differ from the original proposal. TfL has identified additional mitigation measures to ensure the London wide reduction in NO\(_x\)

\(^25\) Questions 21a and 21b. Sum of ‘support’ and ‘strongly support’

\(^26\) These grants will top-up the already existing Government plug-in car grant, currently £5k per vehicle.
emissions and inner and outer London reductions in NO$_2$ concentrations are maintained in recognition of this (see Section 8 below).
3. Proposals for Zero Emission Capable taxis

3.1. Production of ZEC taxis

3.1.1. London taxis are purpose-built to meet the specific requirements of London legislation and taxi licensing, eg all taxis must meet a range of accessibility requirements and be wheelchair-accessible. All new taxis must meet the latest relevant Euro exhaust emissions standard (refer to Appendix 15 for a glossary of terms including an explanation of Euro standards) and incorporate the most up to date passenger safety systems for newly manufactured vehicles. ZEC taxis will also have to meet these requirements, in addition to fulfilling the ZEC criteria.

3.1.2. During the development of the original ULEZ proposal, TfL worked with several manufacturers who were developing ZEC taxis. These companies included: The London Taxi Company (LTC) based in Coventry; Penso (the company developing and manufacturing the Mercedes Vito taxi) based in Coventry; Nissan and ADV, based in Coventry; Karsan, a vehicle manufacturer based in Turkey; and Frazer Nash, a design company based in Surrey. Most of the ZEC models under development will be range-extended electric vehicles (REEV)\(^{27}\), with the capability of operating in zero emissions mode as stated within the ULEZ proposal.

3.1.3. In March 2015, Geely (the parent company of LTC) announced that it would be investing £250m in a new factory to produce ZEC taxis\(^{28}\). The factory will be located in Coventry and create up to 1,000 jobs. The next generation of taxis from LTC will be ZEC and vehicles will be available to buy in the UK from the end of 2017. The factory will have the capacity to produce more than 30,000 vehicles per year.

3.1.4. Karsan is developing a REEV taxi model, working closely with the Royal College of Art and with close engagement with the London taxi trade and plan to conduct road trials in 2016/17 with a view to introducing the new taxi to London in 2017. As an established manufacturer of mainstream vehicles, Karsan will be able to produce ZEC taxis in large volumes.

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\(^{27}\) Refer to Section 11.1 of the Supplementary Information document from the original consultation for an explanation of REEVs. https://consultations.tfl.gov.uk/environment/ultra-low-emission-zone/user_uploads/ulez-supplementary-information---final-291014.pdf-1

\(^{28}\) http://london-taxis.co.uk/news/?id=1187 (26 March 2015)
3.1.5. Frazer-Nash is already operating a small number of pre-production prototype REEV Metrocabs in London on a trial basis. It has announced a £50m investment in new manufacturing facilities in Coventry and plans to start production in 2016.

3.1.6. Both Penso and Mercedes-Benz UK state that they have the low emissions technology available but have yet to make public any plans for a low emissions model of Mercedes Vito taxi. Nissan has suspended development of its pure-electric taxi until the outcome of the ULEZ consultation but there remains the opportunity for it to supply electric taxis to the London market in the future.

3.1.7. In summary, it is apparent that more than one model of ZEC taxi will be available to buy in time for the introduction of the ZEC requirement in January 2018, with increasing numbers available as time goes on. In developing the updated proposal, TfL has been mindful of the need to assure the taxi manufacturers that there will be a ready market for these vehicles and the need to smooth the introduction of the ZECs into the fleet by managing demand properly. The introduction date proposed for a ZEC requirement for taxis is considered to be timely and appropriate in this context. In the original consultation, the majority of non-trade stakeholders and the public thought it was achievable in this timescale.

3.1.8. As set out in the materials for the previous consultation, large-scale uptake of vehicles using electric power by the commercial sector (including taxis and PHVs) will need to be supported by rapid-charging infrastructure. Section 6 below outlines the work TfL is currently undertaking in this field to ensure there is sufficient support in place once these vehicles are brought to market.

3.2. Zero Emission Capable licensing requirement

3.2.1. After further consideration of the issues and in light of the additional information set out below, there is no change to the original proposal to require all taxis, presented for licensing for the first time, to meet a ZEC requirement (≤50g/km CO₂ and 30 mile zero emission range) from 1 January 2018.
3.2.2. The Mayor’s commitment to the operation of ZEC taxis in London was set out in February 2013\textsuperscript{29}, as work on the ULEZ began. It is a critical part of the proposal and recognises the influence of the iconic London taxi on the wider awareness and uptake of zero and low emission vehicles. Another important factor here is the signal which has already been sent to taxi manufacturers with regard to the Mayor’s commitment to a ZEC policy and the significant investment which has already been made, and could continue to be made, in the production of these vehicles.

3.2.3. As in the original proposal, it is proposed that, for conventional internal combustion engine (ICE) vehicles, the permitted fuel type is petrol only, in recognition of its lower NO\textsubscript{x} emissions compared to diesel. For non-ICE vehicles, other non-diesel fuel types such as fuel cell technology (for example hydrogen) or a battery electric vehicle (BEV) would be permitted. This provides greater flexibility for manufacturers in the development of these vehicles both today and in the long-term; it also means that purchasers and drivers of ZEC taxis will have more choice in the vehicle specification in future.

<table>
<thead>
<tr>
<th>Proposal 1 (taxi licensing): ZEC taxi requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1 January 2018, all vehicles licensed for the first time as taxis must be ZEC. This is defined as a vehicle that emits (at tailpipe) $\leq 50\text{g/km CO}_2$ with a minimum zero emission range of 30 miles.\textsuperscript{30} A ZEC taxi must be petrol if an ICE engine, other non-diesel fuels permissible for non-ICE.\textsuperscript{31}</td>
</tr>
</tbody>
</table>

3.3. Zero emission capable taxi purchasing grants

3.3.1. The OLEV plug-in car grant (currently set at a maximum of £5k) is available for the purchase of ultra low emission vehicles. The proposed ZEC taxi requirement means these vehicles will qualify for the grant under Category 2 (see Figure 1).

\textsuperscript{29} https://www.london.gov.uk/media/mayor-press-releases/2013/02/mayor-of-london-announces-game-changer-for-air-quality-in-the

\textsuperscript{30} Carbon dioxide emissions and range measurements shall be taken from the “official” type approval data for the vehicle as prescribed in EU Regulation 715/2007 as amended.

\textsuperscript{31} These requirements will remain under review and should suitable alternative emission vehicle technologies become available Transport for London may amend the list of permitted fuel types.
Currently, OLEV offers a plug-in car grant of up to £5k towards the purchase of an eligible low emission vehicle, and this could be used toward the purchase of a ZEC taxi. The OLEV intends for local authorities to be able to top-up the plug-in car grant when it is claimed towards the purchase of a ZEC taxi.

It is therefore a significant development for this proposal that London was recently awarded a new £25m fund by the Government in support of the ULEZ requirement. This will enable TfL to distribute top-up grants to London taxi drivers.

The OLEV is seeking State Aid clearance from the European Commission for the maximum level of support that can be provided for each purchase of a ZEC taxi. It has indicated that this threshold is likely to be £8k per vehicle, which means TfL would be able to use this new fund to provide a ‘top-up grant’ of up to £3k in addition to the national plug-in car grant. This would provide up to £8k towards the purchase of a ZEC taxi.

Some drivers would also be entitled to additional funding under the proposed taxi decommissioning scheme. However, it is not proposed to link the two schemes. Pending a decision on these proposals, we will work with the taxi trade, industry and Government to ensure the application process for purchasing grants is easy to understand and administer.
4. Options for revised taxi age limit proposals

4.1. Summary of options

4.1.1. In its response to the original consultation, the taxi trade was strongly opposed to a reduction in the current 15 year age limit because of its adverse impact on the industry and potential to stagnate the market, as described below. Most of the respondents from the trade advocated a policy of no change whatsoever to the age limit. Conversely, the majority of non-trade stakeholders (including all the London boroughs who responded) were extremely supportive of a reduction in the taxi age limit, citing the air quality and health benefits of this approach.

4.1.2. At the Mayor’s request, TfL has undertaken further engagement and work on the options available for achieving emissions savings from taxis, taking these views into consideration. This has involved comparing its original assessment of a compulsory 10 year age limit (Option A) against a potentially less impactful compulsory 12 year age limit (Option B). As well as these two options for a compulsory age limit reduction, TfL also developed a third option, without a compulsory age limit reduction. This is referred to as Option C and would introduce a financial incentive to remove the oldest taxis from the fleet – a ‘voluntary decommissioning scheme’ - with no associated reduction in the age limit.

Table 4: Summary of options for revised taxi age limit proposals

<table>
<thead>
<tr>
<th>Taxi option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>A 10 year age limit for pre-Euro 6 taxis from 2020 with an associated compensation scheme for affected vehicle owners(^{32}).</td>
</tr>
<tr>
<td>Option B</td>
<td>A 12 year age limit for pre-Euro 6 taxis from 2020 with an associated compensation scheme for affected vehicle owners(^{33}).</td>
</tr>
<tr>
<td>Option C</td>
<td>Retention of a 15-year age limit for all taxis and the introduction of a voluntary decommissioning scheme for taxis older than 10 years. Owners taking advantage of the decommissioning scheme are paid to forfeit their right to re-license the decommissioned vehicle in London.</td>
</tr>
</tbody>
</table>

\(^{32}\) Euro 6 taxis would retain a 15 year age limit.

\(^{33}\) As above.
4.2. Understanding the taxi market

4.2.1. In the original consultation, TfL set out that £40m had been identified in its Business Plan to support the delivery of the proposed changes to taxi licensing. At that time the proposal was a reduced age limit of 10 years with an associated proposal for a compensation scheme to compensate owners for the adverse impact on the residual value of the vehicle arising from the loss of five ‘licensable’ years. In early 2015, TfL commissioned an economic and financial policy consultancy, Cambridge Economic Policy Associates (CEPA) to advise TfL and develop the scheme in more detail following engagement with the taxi trade.

4.2.2. CEPA has engaged with TfL and the taxi trade associations, vehicle manufacturers, fleet owners and specialist taxi financing companies and accountants, reviewed TfL’s preliminary analysis and conducted further research and analysis. The data it has gathered has been used to test the impacts of changes to the age limit in terms of the total funding required for different taxi depreciation profiles and driver behaviour. It also takes into account the purchase costs for replacement vehicles and the benefits of those replacement vehicles. CEPA has tested scenarios with different age limits in place, with different approaches to providing financial assistance, and with various assumptions regarding driver response.

4.2.3. This work has been valuable in developing the new proposal to introduce a decommissioning scheme rather than a compensation scheme. It has provided a good evidence base for a consideration of the impacts and effects of changes to taxi licensing including the impacts on profitability. An important input has been the data and feedback made available from CEPA’s engagement with the taxi trade.

4.3. Age limit reduction options

4.3.1. Age limits (for taxis and PHVs) were first introduced in 2012 and have since resulted in more than 6,000 of the older, most polluting taxis being removed from the fleet. These rolling age limits also bring about other benefits by ensuring advances in vehicle technology, safety and efficiency, which are inherently associated with newer vehicles and are brought into the fleet over time. It is therefore established that a compulsory age limit is an effective way of removing older taxis from the fleet and leading to accelerated turnover. Because these older vehicles are typically more polluting than newer taxis, the net effect is to reduce emissions.
4.3.2. The rationale for reducing the age limit to ten years was set out in the original Supplementary Information\(^{34}\) and can be summarised as follows: a compulsory age limit reduction gives certainty and is a proven approach to emissions reduction\(^{35}\). In developing its current proposals TfL therefore considered a 12 year compulsory age limit (taxi Option B). A 12 year age limit would still provide certainty over the number of older taxis removed from the fleet by 2020 and also potentially address concerns from the trade about the financial impacts of a reduced age limit (it has less adverse impacts than a 10 year age limit).

4.3.3. In the Report to the Mayor, TfL recommended that – regardless of the outcome of further work on the age limit for taxis generally – there was a strong case to retain a 15-year age limit for Euro 6 taxis, which will be available to buy from September 2015, and have lower emissions than previous models\(^{36}\). All the options considered here (A, B and C) would retain a 15-year age limit for Euro 6 and ZEC taxis.

4.3.4. Options A and B both include a compulsory reduction in the taxi age limit, which is opposed by the taxi trade owing to its impact on owners and drivers. Under Option B, around 4,300 vehicles would be removed in 2020. This option does not achieve the same emissions savings as a 10 year limit (Option A) and so further emission reduction mitigation measures would be required to ‘close the gap’ if it were to be taken forward. However Option B has the advantage of providing certainty about the level of emissions savings it would achieve should the impact on the trade be overcome.

4.3.5. Both Option A and Option B would provide a compensation scheme for owners of affected taxis (see Appendix 13). As would be expected, the cost of this scheme is higher for Option A than for Option B: £65m compared to £40m, reflecting the higher compensation payments required per vehicle under a 10-year age limit due to the removal of more licensable years in London compared to a 12-year age limit. As set out in the original Supplementary Information, £40m was allocated in the TfL

\(^{34}\) See Table 8 on page 64 for a comparison of emissions savings from different approaches, including a 12 year age limit

\(^{35}\) The introduction of a 15 year age limit in 2012 was particularly effective in reducing PM.

\(^{36}\) This was to prevent demand for Euro 6 taxis dropping and therefore stagnating the market between 2015 and 2018 as owners / operators would likely purchase a ZEC vehicle than a Euro 6 with a 10 year age limit. Under the original proposals a compulsory 10 year age limit was proposed.
Business Plan for this proposal, so it can be surmised that, in this respect, Option B is also likely to be feasible within the original budget.

4.3.6. Option B, then, has merits in terms of its implementation cost and whilst this delivers emissions savings they are not as great as under Option A and the option still does not address the taxi trade’s concerns relating to a compulsory age limit reduction. TfL still considers that it is desirable to remove taxis over ten years old from the fleet in order to achieve emissions savings from this sector. However, the question that remains is whether this ten year age limit must be compulsory or whether a voluntary approach should be used.

4.3.7. Option C seeks to remove the oldest vehicles from the fleet by means of voluntary action by the owners of these vehicles. In order to do this effectively, the money available must be targeted at the owners of the oldest vehicles. Under this scenario, then, the approach to payments must change.

4.3.8. In comparison to a compulsory scheme where the lifespan of every pre-Euro 6 vehicle is reduced and compensation payments are offered to all affected (approximately 15,000 vehicles), a voluntary approach would involve offering a sum of money only to the older vehicles on the condition that they are not relicensed in London again. The scheme would target the oldest vehicles in the fleet – those older than 10 years old and the money offered (up to a maximum of £5k) would reduce in line with the number of times the vehicle can be relicensed (thereby reflecting the diminishing value of that vehicle). More details of this approach are set out in Appendix 14.

4.4. Summary of engagement with the trade

4.4.1. In its response to the consultation, and in subsequent discussions, the Licensed Taxi Drivers Association (LTDA) among other taxi representative organisations, stated that there was no need for a compulsory reduced age limit, and that ZEC taxis would prove attractive enough – with the right financial incentives – to achieve an accelerated uptake of these vehicles in the London fleet.

4.4.2. The LTDA suggested that many vehicle owners would choose to move to ZEC taxis at an accelerated rate and that the existing diesel taxis would be seen as an undesirable vehicle to own and operate. Therefore, without a compulsory age limit but with purchase grants, there would be a removal of diesel taxis across all age categories, and the associated emissions benefits would be compounded by the benefits of adding ZECs.
4.4.3. Historical sales data suggests that between 1,200 and 1,400 new taxis enter the London fleet each year. Based on this there would certainly be at least 4,000 ZEC taxis in the London fleet by the end of 2020. The appeal of the new ZEC taxi, including its potential to reduce fuel costs, would also increase this uptake but this is difficult to quantify in absolute terms although the funding for purchase grants will certainly be a favourable factor in supporting the uptake of 9,000 ZEC taxis.

4.4.4. However, the improved conditions for the purchase of ZEC vehicles are not likely, by itself, to result in the removal of the oldest vehicles. This is why it is considered important by TfL to also implement a measure that reduces the number of the oldest vehicles in the fleet.

4.4.5. A further point made by the taxi trade in its discussions with TfL is the current difficulties faced by the trade in a changing and challenging market. Given that the current age limit is 15 years, many owners would have had expectations of running a taxi to this age, or selling within the London market after a number of years usage. A reduction in the compulsory age limit therefore has a negative financial impact on them. This impact on profits, even with compensation being offered, was confirmed by CEPA’s analysis too.

4.4.6. By reducing the lifespan of the vehicle, owners of the oldest vehicles have to purchase a replacement vehicle early, whilst owners of younger taxis will receive a reduced re-sale value. Furthermore, as with any innovative technology, ZEC taxis can bring huge benefits but there is uncertainty about their purchase costs and there will be a period of adjustment as owners and drivers become confident with buying and using these vehicles. These points were also made in response to the original consultation.

4.5. **Alternative approach to reducing the age limit**

4.5.1. In response to engagement with the trade, an alternative option was therefore developed that would involve a financial incentive to remove the

37 The launch of the TX4 in 2007 saw a doubling of new vehicle sales. This vehicle did not benefit from the additional grants, modernisation and fuel savings that a ZEC taxi will bring.
oldest taxis from the fleet, with no associated reduction in the age limit – a ‘voluntary decommissioning scheme’ (Option C).

4.5.2. A voluntary decommissioning scheme and a ZEC purchase grant responds to the trade’s view that accelerated ZEC uptake can be achieved without major changes to the vehicle licensing requirements. By targeting the scheme at older vehicles, it also provides the mechanism to remove these vehicles from the fleet, which - combined with ZEC uptake - will lead to overall emissions savings.

4.5.3. There is undoubtedly less certainty in this approach than with a compulsory reduction in the age limit but it will be effective in achieving ZEC uptake if taxi owners / operators respond in the way that trade organisations have said they will and by vehicle owners voluntarily not relicensing older vehicles, so that they are taken out of the London fleet early and permanently. Some of these owners would then go on to buy ZEC vehicles, although other options such as a newer second-hand vehicle will also be open to them. However they respond, the oldest vehicles would leave the fleet, so the policy objective is met.

4.5.4. The fact that there is now a substantial pot of money for the purchase of ZEC taxis gives a much greater degree of credibility to the contention that a number of owners from all segments of the market will move to ZEC taxis, well above the natural turnover in the fleet. Under this option the desired outcomes of ZEC uptake and emissions savings can be achieved without adversely affecting the business models of the taxi owners.

4.5.5. A potential benefit of a voluntary approach such as this one is that the money identified to compensate the majority of taxi owners for a reduction in the age limit can now be focussed on the oldest taxis (those older than 10 years). TfL’s aim of both removing the oldest and most polluting vehicles from the fleet and introducing an increasing proportion of ZEC taxis would not change but the approach to achieving this aim would become more targeted.

4.5.6. Option C moves away from a compulsory age limit reduction and instead relies upon taxi owners to take vehicles over ten years old out of the London fleet voluntarily. An incentive to do this would be a payment akin to that proposed for a compulsory age limit reduction and would account for the lost residual value in the vehicle associated with decommissioning the vehicle as a taxi in London (see Appendix 14).

4.5.7. It is important to note that, whilst ZEC uptake and the voluntary decommissioning scheme are complimentary, they would remain
independent schemes as they have different primary objectives. Crucially, the later would not mandate the use of the payment once a participant is deemed eligible (ie they do not have to purchase a new vehicle).

4.6. **Impacts of changing the taxi age limit proposal**

4.6.1. The age limit discussion - particularly the need for a compulsory age reduction in order to retire these older taxis - also has to be understood in light of the compensation available for owners of taxis affected by a reduced age limit and the financial assistance available to purchase ZEC taxis. At the time of the original consultation, it was known that £40m had been allocated in the TfL Business Plan for a taxi fund to support owners affected by the proposed reduced age limit. TfL stated that it would be commissioning work on how this could best be used, and that it would be requesting money from the Government to help with the purchase of ZEC taxis.

4.6.2. A couple of months after the consultation, on 23 March 2015, when the Mayor announced his ULEZ decision, the Government made available a new £25m fund for London taxi owners, to help with the costs of upgrading to a ZEC vehicle. This is a significant development in relation to the appraisal of Option C. By allocating money for ZEC purchase grants, it provides reassurance that there will be grants available to support the level of ZEC uptake anticipated by the taxi trade.

4.6.3. It is helpful to consider the three options (A, B and C) set out in this document in summary form. Table 5 below sets out the data for each option in terms of the number of taxis affected the tonnage of emissions savings, the associated costs and other pros and cons.
Table 5: Assessment of different tax age limit options

<table>
<thead>
<tr>
<th>Taxi option</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>10 year age limit (original proposal) supported with purchasing grants and compensation</td>
<td>12 year age limit (alternative proposal) supported with purchasing grants and compensation</td>
<td>15 year age limit supported with purchasing grants and a voluntary decommissioning scheme</td>
</tr>
<tr>
<td>Estimated number of ZECs in the fleet by end 2020</td>
<td>~10,700</td>
<td>~8,300</td>
<td>~4,000 – 9,000</td>
</tr>
<tr>
<td>Number of oldest vehicles removed from the 2020 fleet on-top of natural churn</td>
<td>6,700</td>
<td>4,300</td>
<td>~2,000 – 5,000</td>
</tr>
<tr>
<td>Percentage change in road transport NOx emissions – central London, 2020</td>
<td>-51%</td>
<td>-48%</td>
<td>-44% – -49%</td>
</tr>
<tr>
<td>Percentage change in road transport NOx emissions - inner and outer London, 2020</td>
<td>-12%</td>
<td>-11%</td>
<td>-11% – -12%</td>
</tr>
<tr>
<td>As above + further mitigation</td>
<td>No mitigations required here</td>
<td>-12%</td>
<td>-12% – -13%</td>
</tr>
<tr>
<td>Required TfL fund for purchasing grants</td>
<td>£32m</td>
<td>£25m</td>
<td>£12m – £27m</td>
</tr>
<tr>
<td>Required TfL fund for compensation / decommissioning</td>
<td>c. £65m</td>
<td>c. £40m</td>
<td>up to £45m if 100% uptake</td>
</tr>
</tbody>
</table>

Mechanisms

- Age limits remove the oldest vehicles and encourage uptake of ZEC vehicles.
- Grants encourage uptake of ZEC taxis whilst a voluntary decommissioning scheme will help remove the oldest vehicles in the fleet.
- Leads to less distortion in the vehicle market
- The values of vehicles in the market are less affected because removal of the oldest vehicles is now voluntary.
- By maintaining confidence within the market those considering purchasing a ZEC taxi are more likely to do so.
- Decommissioning payments will help to encourage a buoyant second hand market, thereby encouraging those in the middle of the market to consider purchasing a ZEC vehicle.
- The grants and decommissioning scheme funding is only secured up to the end of 2020, this acts as an additional incentive for users to take up these funds ahead of 2020.

Pros

- Guarantees the removal of the oldest vehicles in the fleet.
- As a result there is additional demand for new vehicles or second-hand younger vehicles. The demand for the second-hand vehicles provides the market for people to sell their existing vehicle in order to buy a ZEC and therefore boosting sales indirectly.
- The age limit is rolling and therefore the oldest age group of vehicles is removed from the fleet each year.

38 Assessment includes the impact of the remaining ULEZ package
39 Figures form the lower and upper emissions estimates. The 9,000 uptake figure is used within the formal assessment of Package 2 as it is the aim of the package to achieve this uptake
40 Mid-point of 3,500 used in the emissions estimates and formal assessment. See Appendix 14 for an explanation of the decommissioning scheme.
41 See Section 8. TfL would retrofit an additional 400 Euro V buses on routes that operate outside central London
42 Assumes TfL will need to provide £3k grant per ZEC taxi
43 100% uptake is the equivalent of around 11,000 vehicles removed from the fleet early between 2017 and 2020 inclusive
<table>
<thead>
<tr>
<th>Cons</th>
<th>Vehicles older than 10 years will start to be decommissioned as soon as the scheme starts rather than waiting until 2020 (when the age limit would have come into force).</th>
</tr>
</thead>
</table>
| Cons | **Whilst there are guarantees around the removal of the oldest vehicles there is uncertainty as to how individual businesses will be able to absorb initial shocks to profits.**  
**Reduced age limits reduce the value of all vehicles immediately from the point of announcement (not just of those retired in 2020).**  
**Even with compensation being offered for the lost residual value of the vehicles those affected in the early years of the scheme are likely to see a reduction in short-term profits.**  
**The trade argue that given the reduction in profits and increased uncertainty in the market, sales of new vehicles to those in the middle of the market will drop and ZEC uptake will actually be stagnated in the first few years.**  
**It often makes financial sense to replace a vehicle at the last possible moment (ie after the introduction of the reduced age limit in 2020) so there may be limited pre-compliance benefits.** |
| Cons | **There is uncertainty as to how the trade will respond.**  
**Given the available grants and attractiveness of the ZEC vehicles LTDA estimate 9,000 ZEC taxis by the end of 2020. Should normal sales levels prevail it could be less than half this figure.**  
**Example scenarios of the decommissioning scheme suggest an uptake of around 3,500 above natural churn of the oldest vehicles in 2020 being removed early but this is subject to uncertainty too.**  
**The funding for the decommissioning scheme is only secured up to the end of 2020 so there is potential for the average age of the fleet to begin increasing again after this point.** |
4.6.4. As can be seen, Option C, which is in effect a voluntary age limit reduction, results in uncertainty around the number of older taxis removed from the fleet by 2020. Indicative scenario modelling by CEPA has estimated 2,800 to 7,000 vehicles may leave the fleet early over the lifespan of the scheme. When factoring in those vehicles that would have left the fleet anyway by 2020 (as a result of the 15 year age limit) the impact on the 2020 fleet would be in the region of 2,000 to 5,000 vehicles removed. This compares to the 6,700 removed under a compulsory 10-year age limit and 4,300 under a 12-year age limit.

4.6.5. As previously discussed the LTDA has suggested that without any adjustment to the age limit around 9,000 ZEC vehicles could be on London’s roads by the end of 2020. Due to the uncertainty a lower range starting at 4,000 vehicles (based on natural churn) has also been presented. This figure should be seen as a pessimistic minimum estimate given the enthusiasm for these new vehicles and the grant support available.

4.6.6. Given these uncertainties in ZEC uptake and assuming a mid point of 3,500 oldest vehicles removed by 2020 as a result of the decommissioning scheme, the emissions savings associated with Option C could be lower than that of Option B if the more pessimistic uptake scenario is realised. However, under an optimistic ZEC uptake scenario (9,000 vehicles) the emissions savings could sit someway between Options A and B. This does not take account of additional mitigation measures that could be adopted, and which are set out in Section 8. With these in place, the gap in savings of NOx in 2020 in inner and outer London between options C and A can be closed (in fact, the saving could even be slightly greater). The figures shown in Table 5 and discussed here represent savings across road transport as a whole and all three options (A, B and C) include the ULEZ proposals signed off in March. This gives an indication of the effect of the options on the overall ULEZ package.

4.6.7. As already discussed a compulsory age limit has the advantage of providing certainty as to the removal of the oldest vehicles. However a potential disadvantage not yet discussed is the potential impact on the overall taxi market, especially second-hand sales. The work undertaken by CEPA has identified that the taxi market is varied, comprising both owner / drivers and fleets and a range of purchasing behaviours. Some owners will generally run a vehicle right to the end of its life, others move between ‘middle-aged’ second-hand vehicles and others work within the warranty.
4.6.8. The influence of ZECs is, to some extent, an unknown factor for this market. Certainly there is likely to be enthusiasm from some purchasers, especially those who like to buy new vehicles. As we have set out, the option of buying younger second-hand vehicles would remain the natural choice for some drivers. It is important to consider the wider effects of ZECs on the market as a whole. With a compulsory reduction in the age limit, there is a fear that the negative impact of profitability might serve to stagnate uptake of ZEC vehicles from taxi owners who operate in the middle of the market. Option C mitigates the industry-wide impacts and instead is more targeted at helping those who want to decommission older vehicles and separately at those who want to buy a ZEC. It therefore leads to less distortion in the vehicle market.

4.6.9. The funding associated with Option C is secured up until 2020 (or sooner if the funding is exhausted before then) and therefore vehicles older than 10 years will be voluntarily decommissioned up to and including this date. A compulsory age limit would have begun in 2020 and had a rolling effect until all pre-Euro 6 vehicles are removed. Therefore, unless the decommissioning scheme continues post 2020, the average age of the taxi fleet will begin to increase after 2020 as no further vehicles are decommissioned early.

4.6.10. Whilst Option C may not have longevity of Options A and B it does bring about upfront benefits. Under Options A and B, assuming suitable replacements are in good supply, it often makes financial sense to only replace a vehicle at the last possible moment, ie after the introduction of the reduced age limit in 2020. Option C will make funds available for decommissioning from sometime in 2017. The sooner a vehicle owner takes up the scheme the higher the payment they will receive (because it diminishes as the vehicle ages). Therefore, there are likely to be benefits ahead of 2020 with Option C.

4.6.11. Whilst the discussion of emissions benefits here has focused on NOx emissions Appendix 5 shows a comparison of the options in terms of their PM and CO2 emissions.

4.7. Preferred approach

4.7.1. The detail of the taxi decommissioning payments scheme and the ‘taxi top-up’ grant have been developed with inputs from the taxi trade, manufacturers and the expertise of CEPA and TfL. However it is also important to bear in mind the wider context of TfL’s duty as a public authority to achieve value for money. It is understood that these are challenging times for the taxi trade and its concerns have been
addressed; but it is a difficult time for many other businesses and individuals who will also have to comply with the ULEZ requirements, albeit in different ways.

4.7.2. Both the decommissioning scheme and the ‘taxi top-up’ grant proposal have been designed to achieve the desired effect in terms of emission savings and the uptake of ZEC taxis, while managing the impacts on taxi owners. Another consideration has been the expectations and capacity of manufacturers who have invested heavily in the development of ZEC taxis. In the original consultation, there was strong public and stakeholder support for a compulsory reduced age limit and although this is no longer the preferred option, the voluntary decommissioning scheme and the ‘taxi top-up’ grant could, when combined with suitable mitigation measures (see Section 8), lead to similar savings of NOx emissions at a London-wide level in 2020.

4.7.3. Option C has been designed to allow owners of older vehicles to respond in their chosen way: some will replace a mid-range vehicle with a ZEC taxi, some will decommission an old taxi and buy a ZEC taxi; some will choose to simply take the decommissioning payment and leave the industry or buy a younger second-hand vehicle. Furthermore, owners who choose not to participate should be aware that when they come to replace their existing vehicle after 2020 there is no guarantee of financial support. The proposed 31 December 2020 time limit on the scheme is in part driven by the amount of money available: the current funding package totals £65m, which is a considerable sum, but is nevertheless a limited sum. There is no ongoing allocation of funding from neither TfL nor the Government for either scheme and there is no commitment to continue these funds beyond 2020. It is TfL’s duty to ensure that it is disbursed in the most effective way and the current proposal represents this.

4.7.4. It is proposed that Option C – a voluntary decommissioning scheme for taxis older than 10 years old and a ZEC purchase grant – is taken forward as a preferred approach. The updated proposal set out here reflects further consideration of the means by which the desired outcomes can be achieved, informed by discussions with the taxi trade, further analysis by TfL and CEPA and also recent developments around the ways to fund both this approach and the purchase of ZECs.
Proposal 2 (taxi licensing): Package 2 taxi policy (Option C)

Instead of a reduced age limit, a voluntary decommissioning scheme is put in place by TfL for taxis over 10 years old to speed their removal from London’s taxi fleet. There will also be grants for the purchase of ZEC taxis.

4.8. Continued stakeholder engagement and progress review

4.8.1. The taxi trade suggested that given the available grants, 9,000 ZEC taxis could be in the fleet by the end of 2020. In its assessment of the impact of taking forward its preferred approach, TfL has taken this assumption into account and is willing to work with the trade to ensure this is achieved. Although it remains unclear what the combined effect of purchasing grants and decommissioning will be achieved at a market level, by working in collaboration with the trade, TfL believes the benefits of this policy will start to be realised before 2020 because the removal of the oldest vehicles and the allocation of grants will have been smoothed over a number of years.

4.8.2. Critical to the success of this approach will be the continued commitment of the taxi trade organisations and their demonstrated promotion and support. They are an important influence on the success of the decommissioning scheme and the take-up of ZEC taxis. Given that there would no longer be an element of compulsion in retiring taxis over ten years, it will be important for the trade to ‘sell’ the benefits of the decommissioning scheme and the purchasing grants to its members.

4.8.3. For ZEC taxis, it is understood that this is an innovative technology and some potential owners may be wary of the financial investment required; the trade bodies as well as TfL can play an important role in providing support and information to make this policy work. This approach was put forward by the taxi trade organisations and has been accepted by the Mayor on the basis that the necessary financial support package is in place to support its delivery, but it will be kept under review and the trade organisations should be aware of their responsibility in ensuring its success.

4.8.4. Likewise, it is important TfL ensures both financing schemes (ie decommissioning payments and purchase grants) are developed so that it is easy to understand and administer and that taxi drivers can carry on using their vehicle during the application procedure. It is also fundamental that a supporting rapid charging network is put in place to enable owners
of ZEC taxis to operate these vehicles with the upmost efficiency (and hence capture the associated monetary fuel savings).

4.8.5. As taxis make a significant contribution to poor air quality in central London, progress on the voluntary decommissioning scheme and ZEC uptake would be monitored annually. If this approach was to be adopted we would commit that the policy would be reviewed in early 2020, or sooner if necessary. Depending on its success, this would provide an opportunity to seek further financial support from the Government to continue the scheme beyond this point in time. However, if it is apparent there has been insufficient progress, and that further urgent measures from the taxi fleet are required to address air quality in London, then a reduction in the mandatory age limit (for example to 10 years) could be necessary, subject to further consultation at the time.
5. Proposals for Zero Emission Capable and low emission PHVs

5.1. PHV context

5.1.1. It may be useful to start with some context on the more general approach to PHV licensing, which is not part of the current consultation. PHVs have an age limit of ten years, which was introduced in 2012, at the same time as the 15-year age limit for taxis. In addition, those new to licensing must be Euro 4. At that time an introductory five year age limit was introduced for vehicles licensed for the first time as PHVs, however this was discontinued from January 2015 for petrol vehicles that emit <110g/km CO₂ (ie hybrids). If the proposed changes to PHV licensing set out here are implemented, the introductory five year age limit will be discontinued for all PHVs. For clarity, there is no proposal to change the PHV age limit from ten years, nor was there in the original consultation.

5.1.2. Before the PHV and taxi age limits were introduced in 2012, TfL consulted on potential exemptions (which were in effect 5-year extension periods) for certain types of PHV and taxi vehicles. These were available for certain Liquefied Petroleum Gas (LPG) conversions and for PHVs only, wheelchair-accessible vehicles, historic/niche vehicles, special needs transport (SNT) and vehicles covered by the London Low Emission Zone (LEZ) requirements.

5.2. Revised zero emission capable PHV proposals

5.2.1. After further consideration of the issues, and in light of the additional information set out below, there is no change to the original proposal to require new vehicles licensed for the first time as PHVs to meet a ZEC requirement from 1 January 2018.

5.2.2. For PHVs, it should be noted that the ZEC requirement would still only apply to new vehicles, defined as up to 18 months old (inclusive) from the date of registration with the DVLA. Therefore, operators and individuals could license used vehicles for the first time\(^4^4\) that are not ZEC provided they meet other emission requirements (see Proposal 6 below).

\(^{44}\) A used vehicle is considered to be not less than 18 months old as determined by date of first registration with the Driver and Vehicle Licensing Agency (DVLA) or date of vehicle manufacture.
5.2.3. By making this distinction between new and used vehicles and discontinuing the five year introductory rule (thereby allowing older, cleaner petrol vehicles), the availability of vehicles and range of models that can be licensed as PHVs for the first time is greatly increased.

5.2.4. The ZEC requirement is a critical part of the ULEZ scheme. As well as achieving the two emissions reduction objectives (for air quality and CO₂ emissions), it would directly help to achieve the third objective of stimulating the low emission vehicle market. Every year there are approximately 14,000 vehicles licensed for the first time as PHVs in London (of which 35% are new vehicles).

5.2.5. It should be noted that there is a new proposal (see Section 5.4 below) for a two-year sunset period exemption for certain PHVs, which reflects the trade’s concern that insufficient models are available to satisfy all aspects of the PHV market.

5.2.6. An additional factor is the strong support for the 2018 ZEC PHV proposal identified in the previous consultation with the majority of non-trade stakeholders supporting the proposal with 72 per cent of the total 16,281 public respondents either supporting or strongly supporting the proposal.

Proposal 3 (PHV licensing): new vehicles

From 1 January 2018, new vehicles (defined as up to 18 months old (inclusive) from the date of registration with the DVLA) licensed for the first time as PHVs must meet the approved ZEC requirement (this is unchanged from the original ULEZ proposals).

5.3. Criteria for ZEC PHVs

5.3.1. In the original consultation, it was proposed that the criteria for ZEC PHVs and ZEC taxis would be the same:

- Utilise plug-in / battery electric technology or equivalent to achieve a maximum output of 50g/km CO₂;
- Achieve a minimum zero emission range of 30 miles to ensure capability of operating in the ULEZ for extended periods whilst in zero emission mode.
5.3.2. The OLEV recently announced new criteria for ULEVs (ie Ultra Low Emission Vehicles, refer to Appendix 15, Glossary for a definition) eligible for the plug-in car grant (currently set at £5k), which takes effect from April 2015\(^45\). Under these changes there are three categories of vehicles eligible for the grant (see Figure 2).

![Figure 2: Eligibility criteria for the OLEV plug-in car grant](image)

5.3.3. TfL identified in its Report to the Mayor (March 2015) that it would consider aligning the PHV ZEC criteria to align with those used by OLEV. By aligning the definitions the proposal is easier to understand, is consistent with the grant eligibility criteria and crucially, it allows plug-in hybrid variants of popular models used by the trade to become eligible for licensing (eg Toyota Prius and Mercedes Benz S-class). This addresses concerns raised by the PHV trade in the previous consultation. In addition to vehicles available on the market today, the OLEV has stated there is likely to be a further 40 models forthcoming over the next three years that would meet this criteria. Therefore it is proposed that these criteria become the requirements for ZEC PHV licensing.

5.3.4. Appendix 1 is a list of vehicle models which meet the requirements and which could be used as PHVs meeting the revised ZEC specification. The vehicle market is continuing to evolve and TfL will continue to monitor its development in order to support the introduction of ZEC PHVs. Nevertheless it is apparent that the range of models available is

increasing and that as demand begins to grow (facilitated in part by the ULEZ) the price is likely to fall.

**Proposal 4 (PHV licensing): definition of ZEC**

For PHVs, any vehicle meeting the criteria set out in categories 1, 2 or 3 of the OLEV plug-in car grant eligibility criteria will be regarded by TfL as ZEC.

### 5.4. PHVs carrying six or more passengers

#### 5.4.1. A PHV can be licensed to carry up to eight passengers. The original proposal did not distinguish between types of vehicle, and there are a range of vehicle sizes and types ranging from a typical 5-seat family saloon to a minibus converted to carry wheelchairs, for example. During the previous consultation, and continued engagement with the PHV trade bodies, an issue was identified regarding a lack of suitable vehicles that carry six or more passengers and meet the ZEC requirement (even taking into account the revised proposal given above).

#### 5.4.2. Despite the continued expansion of the ZEC vehicle market, there are currently no suitable vehicles which can carry six or more passengers (in addition to the driver’s seat). For example, the popular Ford Galaxy and certain minibuses which can be licensed as PHVs and are often for community or other specialist transport. Seven-seaters comprise almost a third of the PHV fleet and minibuses are around 5 per cent of the PHV fleet. Under these circumstances, a requirement that these larger PHVs meet the same ZEC requirements from January 2018 as other PHVs could place a significant restriction on the operation of some fleets (there are only full battery electric vehicles available on the market).

#### 5.4.3. Given the current limitation in model availability, and PHVs’ relatively small contribution to emissions, it is therefore considered reasonable to propose a ‘sunset period’ exemption from the 2018 ZEC licensing requirement for these vehicles (ie PHVs carrying six or more passengers). Instead, they would need to be at least Euro 6 from 1 January 2018 and ZEC from 1 January 2020. By 2020 it is expected that appropriate models will be more widely available (the current 10 year vehicle age limit will remain unchanged).

#### 5.4.4. This change to the original proposal for the ZEC requirement for PHVs is in response to issues raised by the PHV trade and TfL’s further analysis of the vehicle market. They are considered to be proportionate to the impact of the proposals on the trade. Overall, PHVs contribute only 4 per cent of
NOx from road transport in 2020, meaning that these time-limited exemptions will not have a material impact on the emissions reduction objective of the ULEZ.

5.4.5. However given that one of the objectives of the ULEZ is to stimulate the development of the low emission vehicle market, it is not considered appropriate to completely exempt PHVs carrying six or more passengers. The inclusion of a requirement for these vehicles in the future will in itself help to stimulate their production by reassuring manufacturers about a ready market. It will also help to limit the likelihood that some PHV operators will procure larger vehicles to circumvent the ZEC requirement from 2018. However, TfL will monitor developments in this area and if suitable models are not available, may consider changing the policy in future, subject to consultation.

**Proposal 5 (PHV licensing): ZEC requirement two-year ‘sunset period’ exemption**

Vehicles with 6+ seats in addition to the driver’s seat that are licensed for the first time as PHVs would not be required to meet the approved ZEC requirement until 1 January 2020. Until this time and from 1 January 2018, they would need to be at least Euro 6 to be licensed as a PHV.

5.5. **Licensing requirements for older or used PHVs**

5.5.1. In line with the original proposal, it is proposed to maintain a distinction in the licensing requirements for new and older or used PHVs licensed for the first time. This will provide flexibility for drivers and owners and recognises that there are many PHV drivers who use a vehicle they already own and may work only occasionally or for short periods in this sector. Currently PHVs are required to meet a ten-year age limit as a requirement for licensing and there is no proposal to change that.

5.5.2. The emissions standards for private cars to drive in the ULEZ area without paying a daily non-compliance charge have been confirmed by the Mayor as Euro 4 petrol and Euro 6 diesel as from 7 September 2020. It is reasonable therefore that used PHVs, which the vast majority of are cars, are required to meet the same standard when first licensed. At the same time, it is proposed that the introductory five year age limit is removed. The licensing requirements apply London wide and, in alignment with the other proposals for taxis and PHVs, would commence from 1 January 2018 (older or used vehicles that are not cars may apply to TfL for an appropriate exemption on an ad hoc basis).
Proposal 6 (PHV licensing): used vehicles

From 1 January 2018, used vehicles (defined as more than 18 months old from the date of registration with the DVLA) licensed for the first time as PHVs must meet a minimum Euro 4 petrol or Euro 6 diesel standard.

5.6. Purchasing a vehicle suitable for use as a ZEC PHV

5.6.1. In the previous consultation, the PHV trade expressed concern about the financial impact of the ZEC requirement from 2018. For taxi owners, a compensation scheme (in relation to a reduced age limit) was put forward, TfL stated that it would work with OLEV to ensure taxi and PHV owners could benefit from its Ultra Low Emission Vehicle scheme. No specific financial assistance was put forward for PHV owners, in recognition of the different financial impacts and the choice available to PHV owners to license emissions standard compliant non-ZEC vehicles rather than ZECs. OLEV has stated in its guidance that it will not be providing assistance to PHVs beyond the plug-in car grant (see below). TfL has now considered these issues further.

5.6.2. PHVs are essentially the same as the mainstream car market, with a wide range of models available to choose from. This differentiates PHVs from taxis, for which there are only a handful of approved models meeting specific requirements, including wheelchair accessibility. The exception to this is the large-vehicle sector. It should also be reiterated that a ZEC PHV by no means requires the purchase of a full electric vehicle.

5.6.3. Indeed, there has already been significant uptake of ultra low emission cars in the PHV sector, especially of the Toyota Prius (around 17 per cent of the PHV fleet in London is hybrid, and almost all of these are the Prius model). Hybrid vehicles offer cost savings on fuel which to some extent offsets the premium on purchase price. As more of these vehicles are bought and the technology develops, it is reasonable to expect the price of a ZEC equivalent model to fall further. Fleets also have opportunity to negotiate discounts for bulk purchase.

5.6.4. PHV owners are able to take advantage of the Government’s plug-in car grant (up to £5k towards the cost of an eligible vehicle, administered by OLEV) to enable them to buy ZEC vehicles. OLEV has stated that there would be £200m available for the grant between 2015 and 2020. Uptake of the grant accelerated considerably in 2013/14 and since it is a finite pot,
this has implications for its future. OLEV is currently undertaking a review of the scheme and is expected to publish its findings in summer 2015.46

5.6.5. Although there is currently a premium on the purchase price of ZEC PHVs, it is considered that the OLEV grant, together with the fuel cost savings available from these vehicles, will ensure they are an attractive and affordable option. As demand increases, the range of vehicles is expected to grow and the price to fall. As already noted, hybrid vehicles are becoming much more mainstream and popular; this proposal is continuing and accelerating this trend.

5.6.6. In its response to the previous consultation47, the Society of Motor Manufacturers and Traders (SMMT), endorsed the proposed ZEC requirement as an ‘ambitious but realistic’ approach, noting the low emission vehicle market was still developing as well as the need to support uptake with appropriate infrastructure. As described in Section 6, progress has been made in this respect, and a plan for rapid-charging infrastructure is being developed, alongside intensifying existing slow and fast charging infrastructure.

5.6.7. Unlike taxis, there is a choice other than the purchase of a ZEC for PHV owners, which is to license a used vehicle compliant with the ULEZ emissions standards (Euro 4 for petrol and Euro 6 for diesel). Given the existing ten year age limit for PHVs, which is not proposed to change, this is not considered to be an onerous requirement. In this context, it is not proposed that TfL offer any further financial assistance to this sector with the OLEV plug-in car grant and anticipated fuel savings, being considered sufficient.

47 Consultation response dated 22 December 2014
6. Electric vehicle charging infrastructure

6.1. Plug-in electric or hybrid electric vehicles can be charged at home or at a public charging point (on-street or in a supermarket or motorway car park, for example). For most non-commercial vehicles, charging is done at home on a ‘slow’ overnight charge using the domestic power network, taking several hours, and may be ‘topped-up’ during the day at public charge points. This technology will continue to be important for the non-commercial vehicles and some commercial vehicles – many of which are already being used successfully in London – including PHVs and light vans. However, the emergence of purpose-built ZEC taxis and heavier commercial vehicles will mean that further charging provision, including provision for ‘rapid charging’ is required. It should be noted here that many cars are, at present, built to be compatible with ‘slow’ charging points only. This section describes TfL’s approach to both ‘slow’ and ‘rapid’ charging in the context of the ULEZ proposals for taxis and PHVs.

6.2. In 2011 TfL established the Source London electric vehicle charging network. The Source London scheme consists of publically accessible electric vehicle charge points which are conveniently located across the capital and accessed using a single membership card. The majority of charge points within the scheme are not rapid charge points and are either standard (3kW) or fast (7kW) charging. A live web map48 showing locations of charge points in London is available.

6.3. This network, which by 2014 had expanded to 1,400 charge points (see Figure 3 below), provides electric vehicle drivers with the confidence that they are never far from their nearest charge point. By reducing the perception of ‘range anxiety’ the Source London network was able to remove a significant barrier to the adoption of electric vehicles.

6.4. In 2014, following a competitive tender process, TfL transitioned Source London to a private operator, BluePoint London, a subsidiary of Bollore, who run Paris charge points. This means the Source London network can expand without further public subsidy. BluePoint London plan to expand the network to 6,000 charge points by 2018 (mostly 7kW) and improve service for customers (see Figure 4).

48 https://www.zap-map.com/live/#y=51.3795/x=-0.27947/z=10
Figure 3: 2014 – Existing 1,400 charging stations (mostly 7kW)

Figure 4: 2018: 6,000 charging stations (mostly 7kW)

This is an indicative map showing possible locations for additional points. Engagement is currently underway.
6.5. This expansion will benefit PHV drivers looking to invest in plug-in hybrid electric vehicles, many of which are not yet compatible with fast or rapid-charging. The network will complement any domestic charging available to individual drivers. In the original consultation, respondents drew attention to the fact that many PHV owners may not have access to charging at home because of not having access to a garage, living in a flat, or other reasons, and this is understood. It should be reiterated that the requirement for ZEC PHVs (which applies only to new vehicles) is that vehicles have a minimum range of 10 - 20 miles in zero emission mode – there is currently no expectation that vehicles operate in this mode at all times, rather the conventional engine would continue to be used when necessary. TfL has considered the concerns of the PHV trade with regard to charging but given the requirement that is currently proposed, and the continued expansion of the public network, it is not considered necessary to justify a change to the proposal. However, TfL will of course consider further evidence related to this issue during the consultation process.

6.6. The high mileage and intensive duty cycles of commercial electric vehicles, such as taxis, means that their charging requirements are distinct from the drivers who use the Source London network. As set out in the materials for the previous consultation, large-scale uptake of vehicles using electric power by the commercial sector (including taxis and PHVs) will need to be supported by rapid-charging infrastructure. Rapid 43kW or 50kW charge points can provide full charge in approximately 30 minutes. A 15 minute charge from a rapid-charge point could provide ~40 miles range.

6.7. While ZEC taxis and PHVs, except for pure electric PHVs, would not operate in electric mode continually (there are minimum requirements specified), it is important to maximise the usage of this mode, and minimise the use of the conventional engine\(^50\). This optimises the air quality benefits of the ZEC vehicle. The provision of suitable charging infrastructure will enable this to take place.

6.8. TfL has secured £10m from the Government’s National Infrastructure Plan to deliver rapid charging infrastructure in London. In addition, TfL is bidding for funding for additional charging infrastructure, including rapid

\(^50\) In addition to the battery, ZEC taxis will have a petrol engine; ZEC PHVs can have a petrol or diesel engine.
charging for commercial fleets and residential charging for drivers without access to off-street parking, through OLEV’s £500m package to support ultra low emission vehicle uptake across the UK.

6.9. TfL has recently issued a Prior Information Notice (PIN) for its planned network. The PIN seeks views and information from a broad range of charge point manufacturers, installers, maintainers, network operators and the wider electric vehicle industry to understand the current market and explore opportunities. The scope of this market engagement covers all aspects of how new charging infrastructure for electric taxis, private hire vehicles and other commercial fleets could be installed and operated. This includes: the supply of charge point infrastructure, including technical standards, connector standards and communication protocols; installation, including hosting agreements and power supply issues; operation, including back office software and systems, secure payment solutions and customer assistance; and maintenance, including remote diagnostics and repair.

6.10. TfL will use this information to inform proposals for future charging infrastructure in London, including a rapid charge network for taxis, private hire and other commercial fleets to support the ULEZ proposals. TfL is examining all funding options, including using public money to fund the scheme, securing investment from the private sector or a combination of both.

6.11. Based on initial assessment work, it is anticipated that 90 rapid charge points will be needed for ZEC taxis in 2018 with a further 60 for ZEC private hire vehicles and other commercial vehicles. It is therefore expected that a charge point installation programme would need to begin by early 2017. TfL expects this network to increase over time as more electric taxis, private hire and commercial fleet vehicles enter service. This new network would be primarily for the use of commercial vehicles including taxis and PHVs. Source London would continue to be the main network for the on-street charging of private vehicles in London.

7. Summary of taxi and PHV proposals

7.1. TfL has undertaken the further work on options development for taxi licensing as requested by the Mayor and has considered three options for the taxi age limit. This consultation is an opportunity for stakeholders and the public to consider the options presented and provide comments on them.

7.2. With the exception of the new taxi voluntary decommissioning scheme (in place of a reduced age limit), the updated proposals outlined here are not expected to materially affect the emissions savings of ULEZ, although the reductions from the taxi fleet are noticeably lower. PHVs are a small contributor to air pollutant emissions and the changes proposed here, while important for the vehicle owners most affected, would not have a significant effect on emissions. For clarity, the updated proposals for taxis and PHVs will now be discussed separately in turn.

7.3. For taxis, TfL has considered options for a compulsory reduced age limit (to 10 or 12 years) with compensation and a voluntary 10 year age limit with a decommissioning scheme. All three options are presented for consultation. The preferred approach is the voluntary approach, taxi Option C, for the reasons set out in Section 4 above. This reflects that TfL and the Mayor have listened to the views of the taxi trade on how the stated intention of both the introduction of ZEC taxis and the removal of the oldest and most polluting vehicles from the fleet can be achieved. Although the approach has been changed, the objective, and measures of success, for that proposal remain the same.

7.4. A voluntary decommissioning scheme (taxi Option C described in Section 4.5 above) rather than a compulsory age limit reduction could be successful in removing the oldest and most polluting taxis from London’s roads. This has been designed to provide enough of an incentive for this to happen through the voluntary action of taxi owners, supported by the efforts of their trade organisations. It is not assumed that all owners of retiring taxis will go on to purchase a ZEC: the market does not behave like that. However the decommissioning scheme will also help to create market capacity in the taxi vehicle market. Some sellers of older taxis will go on to purchase second-hand taxis under ten years old, thus creating more of a market for those vehicles. In turn, this will encourage some owners to sell taxis earlier in order to move to ZECs.

7.5. Separate to the decommissioning scheme, but a critical part of the overall approach, is the ZEC taxi purchase grant. These two approaches together
are intended to achieve the comparable emissions savings from the taxi fleet by the end of 2020, when considered against the original proposals.

7.6. The taxi trade has shown enthusiasm for ZEC taxis and the Mayor is committed to their introduction as a means to achieve the objectives of the ULEZ with regard to air quality improvement and impetus to the low emission vehicle market in the UK. As well as improved emissions, the emerging models are promising in terms of fuel cost savings and, as a new technology, will be attractive to both drivers and passengers. The proposed ZEC purchase grant will help to offset the higher purchase cost of these models (compared with diesel taxis). It will be important here that the trade organisations and the ZEC taxi manufacturers which have strongly advocated the approach now proposed continue to support and encourage taxi owners and drivers in the transition to ZEC taxis.

7.7. Despite this appeal, there is inevitably some uncertainty about the scale of the actual uptake of ZEC taxi vehicles. The approach taken here responds to the views of the taxi trade as expressed in the original consultation and in TfL’s continued engagement with them. It lacks the certainty of a reduction in the age limit and so is not without risk as a strategy for achieving the ULEZ objectives.

7.8. If this approach was to be adopted TfL would commit that the policy would be reviewed in early 2020, or sooner if necessary. Depending on its success, this would provide an opportunity to seek further financial support from the Government to continue the scheme beyond this point in time. However, if it is apparent there has been insufficient progress, and that further urgent measures from the taxi fleet are required to address air quality in London, then a reduction in the mandatory age limit (for example to 10 years) could be necessary, subject to further consultation at the time.

7.9. Because taxis are responsible for a significant proportion of NOx emissions in London, it has been important to appraise the impacts of the original ULEZ package (Package 1 – with its compulsory 10-year age limit) and the updated ULEZ package (Package 2 – with a voluntary decommissioning scheme for taxis older than ten years). As would be expected, there is a difference, especially in central London but less so in London as a whole. This approach would, in the absence of suitable compensatory measures, lead to a reduction in the overall air quality and health impacts of the ULEZ. For this reason TfL has identified a number of actions to close the gap, set out in Section 8 below. These must be considered as an inherent part of Package 2.
7.10. For PHVs, the updated proposals also reflect the views of PHV trade organisations with regard to the limitation of the ZEC models available for vehicles with more than 6 seats. It should be remembered that there was never any proposal to reduce the PHV age limit (it remains at 10 years, as has been the case since 2012). The introductory 5-year age limit for new vehicles would however be removed under the current revised proposals.

7.11. The requirements for PHVs in general are less onerous than those for taxis – a PHV is essentially a ‘normal’ car. It is also recognised that the PHV market is more fluid, and drivers may work only for short periods in this sector and use a car they already own. It is also the case that PHVs make a relatively small contribution to road transport emissions. For these reasons the updated proposals maintain the different approach for new and older PHVs as set out in the original consultation.

7.12. For older PHVs, it is considered reasonable that the same emissions standards as for the ULEZ should apply – Euro 6 for diesel and Euro 4 for petrol. However for new vehicles it is important to encourage the introduction of ZEC vehicles and this will help to stimulate the development and uptake of low emissions vehicles more generally (which is an important objective of the ULEZ and ZEC PHVs will help to influence the wider car market). In these updated proposals additionally there would be a two-year sunset period exemption (to 2020) for the ZEC requirement introduced for PHVs with 6+ seats and the ZEC criteria aligned to meet the refreshed OLEV criteria.
8. **Mitigation measures**

8.1. **ULEZ contribution to emission savings**

8.1.1. The proposed changes to taxi and PHV licensing set out in this document, as part of the overall ULEZ package, would contribute to a reduction in air quality pollutant emissions. However, these changes do not achieve the same level of emissions reduction as would have been made if the ULEZ had been implemented in full as originally proposed including the original taxi proposals. The difference in the taxi options is relatively small (as shown in Section 4), but nevertheless it is important to consider other means by which emissions savings could be realised to offset or mitigate the reduction. These are set out below and are in addition to the ongoing measures which could be taken by TfL, the London boroughs, national government and the EU as set out in TERM.

8.1.2. These additional interventions will not result in exactly the same impacts as the original proposal. They will achieve significant NOx emissions savings – commensurate with the absolute savings made by the original proposal at a London wide level in 2020 – but will not lead to exactly the same reductions in exposure to NO2 exceedence. This is especially the case in central London. In principle it would be possible to propose a transport intervention (for example reducing HGV vehicle kilometres by 40 per cent) that would replicate the impact of the original proposal (particularly the 10 year taxi age limit), but any such intervention would have significant adverse social and economic impacts which would considerably outweigh the air quality benefits.

8.1.3. The explanation for this difficulty lies in part in the success of interventions so far and the further reductions which will be achieved by the ULEZ - as road transport emissions are successfully reduced, the measures required to achieve further significant reductions become increasingly drastic, with diminishing returns and potential for other adverse impacts.

8.2. **Additional interventions**

8.2.1. TfL has developed further additional measures, which will address emissions in both central and outer London:

- Retrofitting of Euro V buses in outer London to meet a Euro VI standard;
- Zero emission double-decker bus trial in central London;
- A Low Emission Neighbourhood (LEN) in central London.
8.2.2. Each of these interventions is described in more detail in the following sections. It should also be noted that TfL already has in place several ongoing programmes that have benefits in reducing road transport emissions. The Tube upgrades, Crossrail and the Mayor's cycling vision all help to support alternatives to private vehicle usage, which leads to reduced emissions.

8.2.3. In addition, the TERM proposes several measures to reduce transport emissions including:

- Tightening the standards for the London wide LEZ;
- Introducing a system of pay as you drive road user charging;
- Accelerating the London-wide uptake of low emission vehicles; and
- Introducing LENs.

8.2.4. TfL is working with stakeholders to develop a freight strategy that will include measures to reduce freight emissions. A Delivery Plan for ULEVs is currently being developed that will outline how TfL will encourage the uptake of alternatively fuelled low emission vehicles in the near future.

8.2.5. Finally, the second round of the Mayor's air quality fund has set aside £6m for boroughs to bid for up to £400k for projects to tackle air pollution in local hotspot areas, and £2m to implement two LENs.

8.3. Bus retrofit

8.3.1. Many of the respondents to the previous consultation were concerned that the improvements to the central London bus fleet would lead to a relative deterioration of the fleet in the rest of the Capital. This is not the case: while the ULEZ charging scheme and bus standards will apply only in the central London zone, the benefits will be spread beyond this zone as cleaner vehicles (ie hybrid and electric buses), will be used for journeys that start or end outside this zone. In addition, regardless of the ULEZ, TfL already has in place a comprehensive programme to upgrade the bus fleet: by 2016, 20 per cent of the TfL fleet will be hybrid. By 2020, almost 40 per cent of the TfL bus fleet will be hybrid. That said, there is still potential for further improvements to the fleet, and these have been considered in developing the ULEZ.

8.3.2. As part of the present consultation, it is now planned that an additional 400 Euro V buses in the TfL fleet are fitted with equipment to bring them up to the Euro VI emission standard. With ULEZ in place buses in central London will already have the lowest possible emissions so this retrofit will
be applied to buses used in inner and outer London. Routes will be selected that pass through areas of high NO₂ concentrations and where buses contribute substantially to road transport emissions (eg local high streets). The cost to TfL is £8.8m in total.

8.3.3. At a London-wide level, this intervention means that the updated proposal achieves emissions savings which in many instances are the same as the original proposal (but this is not the case for PM exhaust emissions). It does not, however, specifically improve central London’s air quality. The following two interventions will directly address central London.

8.4. Zero emission double-decker bus trial

8.4.1. One of the objectives of the ULEZ is to stimulate the low and zero emission vehicle market and encourage the development of new technologies. TfL is proposing to run a demonstrator project to test the feasibility of using zero emission double-decker buses on frequent stopping routes in central London, such as those operated by privately operated sightseeing bus tours. Sightseeing buses operate between 80-100 miles per day which should be within the range of a zero emission double-decker vehicle.

8.4.2. Sightseeing buses are licensed by TfL under the London Service Permit scheme. TfL proposes to work with London Service Permit holders operating double-decker buses in the ULEZ to scope and implement the trials of zero emission double decker buses to cover the price premium between a Euro VI and zero emission vehicle. The demonstrator project would show whether it is feasible to operate zero emission double-decker buses on frequent stopping routes in central London traffic conditions. It would also identify cost savings for operators over diesel vehicles and the customer experience of using zero emission vehicles.

8.4.3. Under the ULEZ, non-TfL buses operating in central London will be required to meet the Euro VI standard to drive in the zone without charge from September 2020. This does not in itself mean that buses would have to be hybrid or electric-powered, although that is an acceptable option. Double-deck electric vehicles are not yet widely available and single-decks have a price premium and require supporting infrastructure such as appropriate charging points. However in proposing the ULEZ, the Mayor set out a vision for a zero emission capable future in London and the
consultation invited views on the future of ULEZ. There was support for this in principle, and in any case it is important to drive continual improvement to bring air quality and health benefits to London. It is also important that all sectors are encouraged and enabled to use the lowest emission vehicles.

8.5. **Low Emission Neighbourhood (LEN)**

8.5.1. A LEN is an area-based scheme that includes a package of measures focused on reducing emissions, delivered with support from TfL, GLA and the local community. TfL has up to £3m funding available for a LEN in central London.

8.5.2. One of the key elements of central London LENs would be the reduction in delivery and servicing trips through freight consolidation. This would help to mitigate the ULEZ emissions gap by reducing HGV / LGV vehicle kilometres and also upgrading vehicles to those with zero tailpipe emissions or, if appropriate, cycle freight. Further work would be required to design and quantify the emissions benefits of LENs. However, commitment to developing a flagship LEN in a high profile central London area could encourage a step change in behaviour and persuade other areas of London to follow suit.

8.5.3. Further information regarding LENs can be found in TfL’s LENs Guidance Note.

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52 This would require further statutory consultation prior to implementation
9. Impact assessment of original Package 1 and proposed new Package 2

9.1. Impact on air pollutant emissions and exposure

9.1.1. This section summarises the impacts of Package 1 and Package 2. Package 1 was consulted on in October (10 year taxi age limit) and Package 2 includes the amended taxi and PHV policies (grants and a voluntary decommissioning scheme for taxis and slight adjustment to the ZEC criteria to the requirements for PHVs) as well as the mitigation measures described in Section 8.

9.1.2. As Table 6 below shows, the original ULEZ proposals (Package 1) reduce vehicle exhaust emissions of NO\textsubscript{x}, NO\textsubscript{2}, PM\textsubscript{10} and PM\textsubscript{2.5} by at least a half in central London, with smaller reductions in inner and outer London. As a consequence, the proportion of people living in areas in NO\textsubscript{2} exceedence (Table 7) falls significantly from 63 per cent to 16 per cent in central London.

Table 6: Emissions impact in 2020 from the original ULEZ proposals (Package 1)

<table>
<thead>
<tr>
<th>Emission</th>
<th>ULEZ</th>
<th>Inner London</th>
<th>Outer London</th>
<th>London-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO\textsubscript{2}</td>
<td>-15%</td>
<td>-3%</td>
<td>-1%</td>
<td>-2%</td>
</tr>
<tr>
<td>NO\textsubscript{2}</td>
<td>-50%</td>
<td>-18%</td>
<td>-10%</td>
<td>-14%</td>
</tr>
<tr>
<td>NO\textsubscript{x}</td>
<td>-51%</td>
<td>-17%</td>
<td>-10%</td>
<td>-14%</td>
</tr>
<tr>
<td>PM\textsubscript{10} (exhaust)</td>
<td>-64%</td>
<td>-19%</td>
<td>-4%</td>
<td>-13%</td>
</tr>
<tr>
<td>PM\textsubscript{2.5} (exhaust)</td>
<td>-64%</td>
<td>-20%</td>
<td>-4%</td>
<td>-13%</td>
</tr>
<tr>
<td>PM\textsubscript{10} (total)</td>
<td>-14%</td>
<td>-2%</td>
<td>-0.3%</td>
<td>-1%</td>
</tr>
<tr>
<td>PM\textsubscript{2.5} (total)</td>
<td>-21%</td>
<td>-4%</td>
<td>-1%</td>
<td>-2%</td>
</tr>
</tbody>
</table>

Table 7: Proportion of population living in areas of NO\textsubscript{2} exceedence in 2020 (Package 1)

<table>
<thead>
<tr>
<th>Area</th>
<th>Estimated population in 2020</th>
<th>Proportion of population living in areas of NO\textsubscript{2} exceedence in 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without ULEZ</td>
<td>With ULEZ</td>
</tr>
<tr>
<td>ULEZ</td>
<td>200,000</td>
<td>63%</td>
</tr>
<tr>
<td>Inner London</td>
<td>3,400,000</td>
<td>13%</td>
</tr>
<tr>
<td>Outer London</td>
<td>5,500,000</td>
<td>2%</td>
</tr>
<tr>
<td>London-wide</td>
<td>9,100,000</td>
<td>7%</td>
</tr>
</tbody>
</table>
9.1.3. If Package 2 is taken forward, the figures change as shown in Table 8 and Table 9 below.

Table 8: Emissions impact in 2020 from the revised ULEZ proposals (Package 2)

<table>
<thead>
<tr>
<th>Emission</th>
<th>ULEZ</th>
<th>Inner London</th>
<th>Outer London</th>
<th>London-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>-14%</td>
<td>-3%</td>
<td>-0.5%</td>
<td>-2%</td>
</tr>
<tr>
<td>NO₂</td>
<td>-47%</td>
<td>-18%</td>
<td>-10%</td>
<td>-14%</td>
</tr>
<tr>
<td>NOₓ</td>
<td>-49%</td>
<td>-18%</td>
<td>-10%</td>
<td>-14%</td>
</tr>
<tr>
<td>PM₁₀ (exhaust)</td>
<td>-47%</td>
<td>-13%</td>
<td>-1%</td>
<td>-8%</td>
</tr>
<tr>
<td>PM₂.₅ (exhaust)</td>
<td>-48%</td>
<td>-13%</td>
<td>-2%</td>
<td>-8%</td>
</tr>
<tr>
<td>PM₁₀ (total)</td>
<td>-11%</td>
<td>-2%</td>
<td>-0.1%</td>
<td>-1%</td>
</tr>
<tr>
<td>PM₂.₅ (total)</td>
<td>-16%</td>
<td>-3%</td>
<td>-0.2%</td>
<td>-1%</td>
</tr>
</tbody>
</table>

Table 9: Proportion of population living in areas of NO₂ exceedence in 2020 (Package 2)

<table>
<thead>
<tr>
<th>Area</th>
<th>Estimated population in 2020</th>
<th>Proportion of population living in areas of NO₂ exceedence in 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without ULEZ</td>
<td>With ULEZ</td>
</tr>
<tr>
<td>ULEZ</td>
<td>200,000</td>
<td>63%</td>
</tr>
<tr>
<td>Inner London</td>
<td>3,400,000</td>
<td>13%</td>
</tr>
<tr>
<td>Outer London</td>
<td>5,500,000</td>
<td>2%</td>
</tr>
<tr>
<td>London-wide</td>
<td>9,100,000</td>
<td>7%</td>
</tr>
</tbody>
</table>

9.1.4. It is important to consider the impacts of the Package 2 proposals both in terms of absolute emissions savings and in the resulting proportion of the population living in areas of NO₂ exceedence. It is also important to look at the different effects in the ULEZ, inner and outer London and in London as a whole. Because of the different fleet composition and activity in these areas, the impacts would be expected to differ, and the data bears this out.

9.1.5. In the emissions tables (Table 6 and Table 8) the data for PM emissions has been shown both by particulate size (PM₂.₅ and PM₁₀) and by origin, exhaust or total exhaust and tyre and brake wear. The ULEZ proposal – both in its original form and updated Package 2 proposals – is intended to reduce exhaust emissions from vehicles, because these can be directly addressed by setting emissions standards. Although the ULEZ does not seek directly to reduce emissions from tyre and brake wear (there are no
advances in technology to make this an attractive approach), total PM is presented here in order to give a more rounded picture.

9.1.6. In considering emissions savings, it can be seen that within the ULEZ, there is a reduced saving for all emissions with the new package (Package 2) compared to the original proposal. This reduction is relatively small for CO₂, NO₂ and NOₓ: for example for NOₓ it is 49% rather than 51%. However the difference is more marked for both PM₁₀ and PM₂.₅ exhaust emissions, with a 17 percentage point difference for the former and a 16 percentage point difference for the latter. This can be attributed to the relatively high levels of this pollutant emitted by older taxis, which are prevalent and active in the ULEZ area and the fewer older taxis estimated to be removed under Option C (3,500) compared to Option A (6,700).

9.1.7. Moving away from the ULEZ area and to inner and outer London, the pattern is similar but less marked for Package 2. The reductions in emissions savings from the updated proposal are smaller. Although the taxi and PHV licensing proposals apply London wide in both the original and updated proposals, the effect of the taxi policies in particular (PHVs are estimated to contribute only 4% to road transport NOₓ emissions in central London), is more marked in central London, where taxis are estimated to emit 18% of road transport NOₓ. Also important here is the further improvement to buses in inner and outer London contained within the updated proposal, which will achieve emissions savings which to some extent balance the losses incurred by other changes.

9.1.8. In some instances there is no change from the original proposal under Package 2. In inner London the emissions savings for CO₂ and NO₂ are unchanged, and there is a small increase in NOₓ savings. A similar pattern is observed in outer London. It should be reiterated here that the savings in both inner and outer London were considerably smaller than for the ULEZ zone even with the original proposal: the context is that there is ‘less to lose’ in terms of emissions.

9.1.9. Finally, at a London-wide level, there is much less difference in emissions savings when the original and updated proposals are compared. For several emissions – CO₂, NO₂, NOₓ and total PM₁₀ – there is no difference at all.

9.1.10. In terms of population living in areas of exceedence the results for the Package 2 are very similar to Package 1. There is no change at the inner, outer and London wide level however as a result of Package 2 there is one percentage point fewer people taken out of areas of exceedence.
within ULEZ. The similar impacts resulting from the two packages can be attributed to the inclusion of ‘replacement’ measures for the small amount of lost savings from Package 2 in the form of further bus retrofits in inner and outer London.

9.1.11. The impacts on emissions and exposure in 2025 are summarised in Appendix 6.

9.2. ULEZ and the EU limit values

9.2.1. London is currently compliant with all EU legal air quality requirements (called ‘limit values’) except NO₂. However, while formal compliance has been achieved for particulate matter (PM₁₀) there are no ‘safe’ levels, as even low concentrations have an impact on human health and it is important to continue delivering further reductions in PM concentrations.

9.2.2. Although the date for compliance with EU air quality limits was 1 January 2010, member states were allowed to apply for a time extension of five years if they submitted air quality plans to show what measures were being taken to achieve compliance by that date. In September 2011, Defra and the Scottish, Welsh and Northern Ireland devolved administrations submitted updated air quality plans for the achievement of the NO₂ limits in the UK as soon as possible. The air quality plan for London took account of past, present and future measures, including those published in the current Mayor’s Air Quality Strategy (2010).

9.2.3. These air quality plans formed the basis of Defra’s projections for compliance with EU NO₂ limit values, which have recently been updated. These latest projections show that 5 of 43 zones will be compliant by 2015, 15 zones by 2020, 38 by 2025 and 40 out of 43 by 2030. London, Birmingham and Leeds are the three locations that are not expected to be compliant until after 2030, at least twenty years after the EU deadline for compliance (1 January 2010).

9.2.4. Defra’s projections did not take account of any possible uncommitted actions (at the time of modelling), such as the ULEZ (for clarity: neither the confirmed emissions standards nor the taxi and PHV proposals in their original or present form are included). Defra’s updated modelling is expected to be available later this year. Given enough time, the UK would be expected to become compliant due to the ‘natural’ turnover of the vehicle fleet, as older cars are replaced by newer and cleaner cars, assuming that air pollution from other sources continues to reduce, such as from domestic heating.
9.2.5. The ULEZ is considered to be essential to bringing forward the date of London’s compliance so as to help minimise the public health impacts of high NO₂ and PM levels and as a step change towards ensuring the Capital complies with limit values under the Air Quality Directives as soon and as effectively as possible. It is also an important step to ensure London is taking action to mitigate the impact of climate change.

9.2.6. A member state which is in breach of the EU air quality directives can be infracted by the European Commission resulting in fines ultimately being imposed by the European Court of Justice if effective remedial action is not taken. These fines can be substantial, potentially in the order of hundreds of millions of pounds, although the actual figure is not currently known.

9.2.7. The UK’s non-compliance with NO₂ limit values was the subject of a case heard by the Supreme Court in 2013\textsuperscript{54}. The court concluded that the UK was in breach of the Air Quality Directives in relation to NO₂. Although most EU territories are not compliant, the European Commission commenced infraction proceedings against the UK in February 2014 when it issued a Letter of Formal Notice to the UK Government. These legal proceedings are likely to take several years to come to a conclusion.

9.2.8. In a follow-up ruling, the Supreme Court ordered the Government to submit an air quality action plan to the European Commission by the end of this year (ie 2015). The London ULEZ, including the proposed measures for taxi and private hire vehicles, will form an important part of that plan. The Court’s judgement underscores the importance of addressing London’s air quality and bringing it within limit values as soon as possible.

9.2.9. It is important to re-state that neither the original ULEZ package (with its proposals for changes to taxi and PHV licensing) nor any of the alternative options set out here would, on their own, achieve compliance with the EU limit values. This was never the intention of the ULEZ, as no single intervention from the Mayor can achieve that effect. However, even with the changes set out here, the ULEZ is an important single intervention which must be understood in the context of other actions that can be taken. TERM, published in September 2014, sets out a range of possible additional measures that the Mayor, TfL, the London boroughs, the

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\textsuperscript{54} Client Earth v Secretary of State for Environment Food and Rural Affairs.
Government, EU and other parties should consider in order to help meet the challenge of reducing air pollutants and CO₂ emissions in London.

9.2.10. The ULEZ as originally proposed in Package 1 would take London a significant step closer towards complying with the NO₂ limit values in 2020, going from 47 per cent of central London being compliant to 83 per cent. With Package 2, including the revised proposals for a voluntary decommissioning scheme and mitigation measures presented in this document, 82 per cent of central London is estimated to have an NO₂ annual mean concentration below 40µg/m³. A difference of just one percentage point. In addition, the overall impact of the ULEZ on London wide NOₓ emissions would not be reduced owing to additional measures forming part of that proposal.

9.3. Integrated Impact Assessment

9.3.1. In the original ULEZ consultation, TfL commissioned Jacobs to produce an IIA of the ULEZ, which comprised the following:

- Equalities Impact Assessment (EqIA)
- Health Impact Assessment (HIA)
- Environmental Impact Assessment (EIA)
- Economic and Business Impact Assessment (EBIA)

9.3.2. Because two minor changes were recommended following TfL’s consideration of the consultation responses, a further Addendum to the IIA was also produced and published alongside the Report to the Mayor in March this year.

9.3.3. In the light of the amended proposals for taxis and PHVs now being put forward, a second addendum has been produced by Jacobs. This contains an assessment of the changes now proposed to the taxi and PHV proposals. In an initial screening, it was determined that there was no further material impact on equalities and economic / business from the latest proposed changes. The second addendum will therefore cover HIA and EqIA.

55 These were: the addition of an exemption (in the form of a three-year sunset period) for vehicles adapted for disability needs and a change to the definition of historic vehicles. Please see the Report to Mayor.
9.3.4. This further HIA and EqIA addendum will be published in full in mid July.
An assessment has been carried out of the extent and scale of health and equalities impacts, and is summarised below.

9.4. **Summary of changes to impacts**

9.4.1. Jacobs undertook assessments of the following updates to the proposals: the retention of the 15-year age limit for taxis and a decommissioning scheme (the preferred approach) and the change to the definition of a ZEC PHV. Taxi Option A was the subject of the original consultation and IIA so is not re-assessed. Option B was not taken forward for assessment by Jacobs because TfL had identified a preferred approach in Option C.

9.4.2. No assessment was undertaken of the two-year sunset period exemption for 6+ seater PHVs as no assessment was previously undertaken on this particular sector and so no specific impacts were identified. There was no further assessment of the unchanged proposals. Their assessment should be understood as covering the whole updated ULEZ, albeit the impacts of the updated proposals are identified separately.

9.4.3. Appendix 16 is a summary of the IIA addendum produced for this consultation. In short, there are no changes to the nature and scale of impacts with regard to environmental impacts. As set out above, the result of health and equality impact assessments will be made available in mid-July and will inform impacts in these areas and also one of the economic impacts already identified. However it can already be said that, with the preferred approach, two of the minor negative equality impacts of the compulsory age limit reduction would be removed, and there is no change to the scale of the impact for two of the minor negative economic impacts identified.
10 Conclusion and next steps

10.1. Conclusion

10.1.1. The primary objective of the ULEZ is to improve air quality and health in London as soon as possible by supporting compliance with EU legal limits on harmful air pollutants, particularly NO₂ and PM, given that London and large parts of the UK are currently in breach of them.

10.1.2. Road transport is a significant contributor to overall NOₓ and PM₁₀ emissions in London but the majority of emissions come from other sources: principally non-domestic gas use for NOₓ and resuspension⁵⁶ for PM₁₀. Road transport is a relatively small contributor to overall CO₂ emissions, the bulk of which come from domestic and commercial energy use. This means that the ULEZ cannot by itself be the solution for London’s air quality challenge. Even with the ULEZ proposals implemented in full as originally proposed, levels of NO₂ will continue to exceed legal limits in some areas of London. Nevertheless the ULEZ is an important part of the solution and the Mayor has already confirmed the implementation of the bus and vehicle emissions standard in the ULEZ zone in central London from September 2020.

10.1.3. The proposals set out here reflect the information shared by the taxi and PHV trades with TfL in the original consultation and in continued engagement and TfL’s further analysis of the impacts of the proposals. They also reflect developments with regard to the funding available for taxis (in particular the £25m from Government) and TfL’s strategy for the implementation of rapid-charging infrastructure. Some of the proposals remain as originally proposed; others, most notably the move from a reduction in the taxi age limit to a voluntary decommissioning scheme, have been updated.

10.1.4. Work from CEPA, also informed by the taxi trade, has been critical in shaping a voluntary taxi decommissioning scheme which, together with the ZEC purchase grant, could achieve similar level of ZEC take-up as the reduction in the age limit to 12 years.

10.1.5. The need to tackle air pollutant emissions remains a pressing issue in London and the original consultation showed that there was considerable

⁵⁶ Settled PM that becomes airborne through wind or turbulence caused by vehicle movements
support for the Mayor to make changes to taxi and PHV licensing in order to help achieve emissions savings. Set out here is an updated proposal (Package 2, which includes taxi Option C) which could achieve these savings through a combination of a voluntary decommissioning scheme for taxis older than ten years and a purchase grant for ZEC taxis (leading to 9,000 taxis in the fleet by the end of 2020). This is TfL’s and the Mayor’s current preferred approach to taxi licensing.

10.1.6. If this approach was to be adopted TfL would commit that the policy would be reviewed in early 2020, or sooner if necessary. Depending on its success, this would provide an opportunity to seek further financial support from the Government to continue the scheme beyond this point in time. However, if it is apparent there has been insufficient progress, and that further urgent measures from the taxi fleet are required to address air quality in London, then a reduction in the mandatory age limit (for example to 10 years) could be necessary, subject to further consultation at the time.

10.1.7. Given the significant contribution of taxis (PHVs make a much smaller contribution) to road transport emissions, changes to the approach will necessarily reduce the emissions savings, set out in Section 9. For this reason TfL has developed further bus interventions which will to some extent, compensate for the difference. This is more successful at a London-wide level: here the emissions savings are the same for CO₂, NO₂ and NOₓ. Exhaust emission savings of PM₂.₅ and PM₁₀ are less than in the original proposal, although the overall emissions of these pollutants (exhaust and tyre and brake wear), are the same as in the original proposal at the London-wide level (see Section 9 for more details).

10.1.8. In central London, the compensatory action of additional measures is less effective in terms of maintaining emissions savings. In terms of population living in areas of NO₂ exceedence there is one percentage point fewer people taken out of areas of exceedence within ULEZ in Package 2.

10.1.9. This is not surprising and can be explained both by the prevalence of taxis in the ULEZ zone and the fact that, owing to confirmation of the bus proposals in the original proposals, there is now very little scope to increase emissions savings from buses at this location, as there is in the rest of London. However, to address this, TfL is proposing to develop trials of zero emission double decker buses in the ULEZ, and develop a LEN in central London. The effect of these two measures has not been quantified but would reasonably be expected to have a positive impact in central London.
10.2. **Next steps**

10.2.1. The taxi and PHV trades, stakeholders and public are invited to respond to this consultation. Although the revised ULEZ package includes the current preferred taxi age limit proposal (Option C), other options (presented in Section 4) are available for consultation and for respondents to indicate their views.

10.2.2. At the end of this consultation TfL will analyse the responses received and prepare a report to the Mayor and Commissioner for Transport containing its recommendations. This will be considered alongside the report prepared on the original consultation and both will inform the decision made.

10.2.3. Changes to taxi and PHV licensing would be made by the issuing of updated Conditions of Fitness and PHV Vehicle Regulations and/or approved exemptions respectively. These would be issued by TPH in the usual way.
Appendix 1: ZEC models list (for PHVs)\textsuperscript{57}

‘5 seat Saloons’ (Hatchback, family and SUV suitable as PHV ‘Saloon’) - £25k to £35k

<table>
<thead>
<tr>
<th>Make / Model</th>
<th>Official CO\textsubscript{2} emissions</th>
<th>Zero emission range (miles)</th>
<th>Seats</th>
<th>Available</th>
<th>Price (with £5k grant)</th>
<th>Rapid Charge compatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>NISSAN Leaf Visia 80kW Auto</td>
<td>0 g/km</td>
<td>124</td>
<td>5</td>
<td>Yes</td>
<td>£23k</td>
<td>yes</td>
</tr>
<tr>
<td>FORD Focus Electric Car 107kW Auto</td>
<td>0 g/km</td>
<td>100</td>
<td>5</td>
<td>Yes</td>
<td>£28k</td>
<td>no</td>
</tr>
<tr>
<td>VOLKSWAGEN e-Golf Electric Car 85kW Auto</td>
<td>0 g/km</td>
<td>118</td>
<td>5</td>
<td>Yes</td>
<td>£26k</td>
<td>yes</td>
</tr>
<tr>
<td>VOLKSWAGEN Golf GTE Hybrid</td>
<td>37g/km</td>
<td>31</td>
<td>5</td>
<td>Yes</td>
<td>£28k</td>
<td>no</td>
</tr>
<tr>
<td>BYD e6</td>
<td>0 g/km</td>
<td>186</td>
<td>5</td>
<td>Yes</td>
<td>£25k</td>
<td>yes</td>
</tr>
<tr>
<td>VOLKSWAGEN Passat GTE Hybrid (There is also an estate version)</td>
<td>40-42g/km</td>
<td>31</td>
<td>5</td>
<td>Late 2015</td>
<td>?</td>
<td>no</td>
</tr>
<tr>
<td>MITSUBISHI Outlander PHEV 2.0 GX3h Auto</td>
<td>44g/km</td>
<td>33</td>
<td>5</td>
<td>Yes</td>
<td>£35k</td>
<td>yes</td>
</tr>
<tr>
<td>TESLA Model X (2015/16)</td>
<td>0 g/km</td>
<td>240</td>
<td>5</td>
<td>Late 2015</td>
<td>?</td>
<td>yes</td>
</tr>
<tr>
<td>TOYOTA Prius PHEV</td>
<td>49g/km</td>
<td>16</td>
<td>5</td>
<td>Yes</td>
<td>£28k</td>
<td>no</td>
</tr>
</tbody>
</table>

\textsuperscript{57} As at April 2015
### People carrier (‘7 Seater’) – £23k – £27k

<table>
<thead>
<tr>
<th>Make / Model</th>
<th>Official CO₂ emissions</th>
<th>Zero emission range (miles)</th>
<th>Seats</th>
<th>Available</th>
<th>Price (with £5k grant)</th>
<th>Rapid Charge compatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITROEN Berlingo (7 seater conversion)</td>
<td>0 g/km</td>
<td>106</td>
<td>7</td>
<td>2015</td>
<td>£27k</td>
<td>Yes</td>
</tr>
<tr>
<td>Nissan E-NV200 (7 seater conversion)</td>
<td>0 g/km</td>
<td>106</td>
<td>7</td>
<td>TBC</td>
<td>£23k</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### ‘Luxury / Exec’ – £50k to £88k

<table>
<thead>
<tr>
<th>Make / Model</th>
<th>Official CO₂ emissions</th>
<th>Zero emission range (miles)</th>
<th>Seats</th>
<th>Available</th>
<th>Price (with £5k grant)</th>
<th>Rapid Charge compatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESLA Model S</td>
<td>0 g/km</td>
<td>240</td>
<td>5</td>
<td>2015</td>
<td>£50k</td>
<td>yes</td>
</tr>
<tr>
<td>VOLVO V60</td>
<td>48g/km</td>
<td>50</td>
<td>5</td>
<td>2015</td>
<td>£50k</td>
<td>No</td>
</tr>
<tr>
<td>AUDI A6/A8 (2015)</td>
<td>35 g/km</td>
<td>50</td>
<td>5</td>
<td>Late 2015</td>
<td>N/A</td>
<td>?</td>
</tr>
<tr>
<td>MERCEDES E-Class</td>
<td>?</td>
<td>?</td>
<td>5</td>
<td>2017</td>
<td>N/A</td>
<td>?</td>
</tr>
<tr>
<td>MERCEDES S500</td>
<td>65g/km</td>
<td>20</td>
<td>5</td>
<td>Late 2015</td>
<td>£88k</td>
<td>No</td>
</tr>
</tbody>
</table>
## ‘Non-car’ (Van and convert to accessible) - £17k to £27k

<table>
<thead>
<tr>
<th>Make / Model</th>
<th>Official CO₂ emissions</th>
<th>Zero emission range (miles)</th>
<th>Seats</th>
<th>Available</th>
<th>Price (with £5k grant)</th>
<th>Rapid Charge compatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENAULT Kangoo Electric</td>
<td>0 g/km</td>
<td>110</td>
<td>2</td>
<td>2015</td>
<td>£17k</td>
<td>No</td>
</tr>
<tr>
<td>PEUGEOT Partner Electric</td>
<td>0 g/km</td>
<td>106</td>
<td>3</td>
<td>2015</td>
<td>£21k</td>
<td>yes</td>
</tr>
<tr>
<td>CITROEN Berlingo Electric Van</td>
<td>0 g/km</td>
<td>106</td>
<td>3</td>
<td>2015</td>
<td>£27k</td>
<td>yes</td>
</tr>
<tr>
<td>NISSAN e-NV200 Combi Electric 80kW Acenta</td>
<td>0 g/km</td>
<td>106</td>
<td>2</td>
<td>2015</td>
<td>£23k</td>
<td>yes</td>
</tr>
</tbody>
</table>
Appendix 2: Meetings with taxi and PHV trades update (April-June 2015)

a) Taxi trade engagement:

- **27 April 2015** – Meeting with the taxi trade on charging infrastructure including the number of charge points needed; locations and potential delivery mechanisms and financing.

- **11 May 2015** - Meeting with the taxi and Private Hire trades to provide an update on the proposed policy including financing and to provide notice of the public consultation.

- **21 May 2015** – Meeting with Karsan to discuss manufacturer provisions including rapid charging capable.

- **21 May 2015** - Meeting with Frazer Nash to discuss manufacturer provisions including rapid charging capable.

- **28 May 2015** – Meeting with Mercedes Benz to discuss manufacturer provisions including rapid charging capable.

- **28 May 2015** - Meeting with LTC to discuss manufacturer provisions including rapid charging capable.

- **25 June 2015** – Meeting with the taxi trade to provide an update on proposed financial support for ZEC and older taxis, as well as an update on rapid charging and the consultation proposals.

b) Private Hire engagement

- **15 April 2015** – Meeting with the Private Hire trade on charging infrastructure including the number of charge points needed; locations and potential delivery mechanisms and ZEC vehicle availability and financing update on discussions with the OLEV and manufacturers about the availability and affordability of zero emission capable vehicles that could be used as PHVs from 2018, fleet replacement cycle and procurement lead in times.

- **7 May 2015** - Meeting with the Private Hire trade to provide an update on the proposed policy and to provide notice of the public consultation.

- **11 May 2015** - Meeting with the taxi and Private Hire trades to provide an update on the proposed policy including financing and to provide notice of the public consultation.
• **15 June 2015** – Discussion with various PHV company reps including Addison Lee, Carey International and Tristar to look at affordability and availability of luxury ZEC PHVs in 2018.

• **18 June 2015** – Meeting with the PHV trade to provide an update on the forthcoming consultation as well as the affordability of ZEC chauffeur and executive vehicles and an update on rapid charging.
Appendix 3: Proposed requirements for taxis licensed for the first time in London from 1 January 2018

From 1 January 2018:

All taxis licensed for the first time in London must be ZEC. It is proposed a ZEC taxi must be:

1. Capable of emitting maximum 50g/km CO₂.  
   - Manufacturers that have registered an interest or are already developing ZEC taxis have indicated to TfL they will achieve this requirement and it may actually be exceeded.

2. Capable of zero emissions for a minimum range of 30 miles (48km).  
   - With the bulk of licensed taxi work operating predominantly within a potential zero emission zone/s they must be capable of operating within this area for extended periods whilst in pure electric vehicle mode.

3. Petrol-electric plug-in hybrid if the vehicle is a conventional internal combustion engine (ICE). For non-ICE vehicles, other fuel types such as fuel cell (eg hydrogen) or battery electric vehicle is permitted.

There is no change to the 15 year age limit for taxis.

Any transmission system is permitted.

Carbon dioxide emissions and range measurements shall be taken from the ‘official’ type approval data for the vehicle as prescribed in EU Regulation 715/2007 as amended.

These requirements will remain under review and should suitable alternative emission vehicle technologies become available Transport for London may amend the list of permitted fuel types.
Appendix 4: Proposed requirements for vehicles licensed for the first time as Private Hire Vehicles (PHVs) in London from 1 January 2018

From 1 January 2018:

The requirements for vehicles licensed for the first time as PHVs will vary according to the age of the vehicle when presented for licensing. This will replace the current five year introductory age limit. The ten year age limit would remain in place and all other vehicle requirements would remain unaffected.

<table>
<thead>
<tr>
<th>Age of vehicle when presented for licensing</th>
<th>Requirement from 1 January 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. New PHVs</strong></td>
<td></td>
</tr>
<tr>
<td>Not more than 18 months old as determined by date of first registration with the DVLA</td>
<td>Capable of zero emissions for a minimum range of 10 miles with maximum 50g/km CO₂ or a minimum range of 20 miles with maximum 75g/km CO₂</td>
</tr>
<tr>
<td><strong>2. Used PHVs</strong></td>
<td></td>
</tr>
<tr>
<td>Not less than 18 months old as determined by date of first registration with the DVLA</td>
<td>Compliant with the ULEZ emissions standards (Euro 6 diesel and Euro 4 petrol)</td>
</tr>
</tbody>
</table>

1. **New PHVs**

The ZEC requirement only applies to new vehicles. A new vehicle is considered to be not more than 18 months old as determined by date of first registration with the Driver and Vehicle Licensing Agency (DVLA) or date of vehicle manufacture.

A ZEC PHV must be capable of zero emissions for a minimum range of 10 miles with maximum 50g/km CO₂ or, capable of zero emissions for a minimum range of 20 miles with maximum 75g/km CO₂.

- For example, the use of plug-in hybrid technology (PHEV) battery electric technology (BEV) or equivalent.
- Certain makes and models of vehicles popular within the private hire industry are already available on the market. By 2018 it is expected even
more vehicle models will meet this requirement, including vehicles for the chauffeur and executive services market.

- These ranges are considered appropriate to allow PHVs to pick up and drop off within a potential zero emission only zone/s as many PHVs spend considerable amounts of time outside the central London area. In addition, as all private hire journeys must be pre-booked through a licensed private hire operator there will be opportunity to plan journeys and factor in time, between bookings, to charge vehicles.

There is a two year time limited exemption to this requirement: a PHV licensed for the first time in London to carry six or more passengers must meet a minimum Euro 6 standard from January 2018 and meet the ZEC requirement from January 2020 if licensed as a PHV for the first time.

2. Older or used PHVs

The following requirement only applies to older or used vehicles. An older or used vehicle is considered to be not less than 18 months old as determined by date of first registration with the Driver and Vehicle Licensing Agency (DVLA) or date of vehicle manufacture (unless they meet the ZEC criteria above). To be licensed as a PHV for the first time these must be:

- Euro 6 diesel or Euro 4 petrol and so compliant with the ULEZ emissions standards. This is instead of the existing five year introductory age limit, which would be discontinued from 2018.
## Appendix 5: Further impacts of taxi options

<table>
<thead>
<tr>
<th>Taxi option</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>10 year age limit (original proposal) supported with purchasing grants and compensation</td>
<td>12 year age limit (alternative proposal) supported with purchasing grants and compensation</td>
<td>15 year age limit supported with purchasing grants and a voluntary decommissioning scheme</td>
</tr>
<tr>
<td>Percentage reduction in road transport CO₂ emissions – central London, 2020</td>
<td>15%</td>
<td>13%</td>
<td>10% - 14%</td>
</tr>
<tr>
<td>Percentage reduction in road transport CO₂ emissions - inner and outer London, 2020</td>
<td>1.4%</td>
<td>1.1%</td>
<td>0.6% - 1.2%</td>
</tr>
<tr>
<td>Percentage reduction in road transport PM₁₀ exhaust emissions – central London, 2020</td>
<td>64%</td>
<td>54%</td>
<td>37% - 47%</td>
</tr>
<tr>
<td>Percentage reduction in road transport PM₁₀ exhaust emissions - inner and outer London, 2020</td>
<td>9%</td>
<td>6%</td>
<td>2% - 4%</td>
</tr>
</tbody>
</table>
The percentage savings shown are for road transport emissions and include the impact of ULEZ policies signed off in March. The inclusion of Option A, with its higher ZEC uptake and removal of the oldest vehicles saves the most CO\textsubscript{2} and PM\textsubscript{10} exhaust emissions across London. Including Option C in the ULEZ package could achieve similar CO\textsubscript{2} impacts as Option A but for PM\textsubscript{10} exhaust the impacts are considerably reduced (around half to three quarters of the impact in central London). PM\textsubscript{10} exhaust however only contributes 34 per cent of total PM\textsubscript{10} from the taxis in London.
Appendix 6: Further impacts of Packages 1 and 2

Table 10: Emissions impact in 2025 from the original ULEZ proposals (Package 1)

<table>
<thead>
<tr>
<th></th>
<th>ULEZ</th>
<th>Inner London</th>
<th>Outer London</th>
<th>London-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>-16%</td>
<td>-4%</td>
<td>-1%</td>
<td>-3%</td>
</tr>
<tr>
<td>NO₂</td>
<td>-43%</td>
<td>-12%</td>
<td>-4%</td>
<td>-8%</td>
</tr>
<tr>
<td>NOₓ</td>
<td>-35%</td>
<td>-9%</td>
<td>-4%</td>
<td>-7%</td>
</tr>
<tr>
<td>PM₁₀ (exhaust)</td>
<td>-46%</td>
<td>-10%</td>
<td>0%</td>
<td>-6%</td>
</tr>
<tr>
<td>PM₂₅ (exhaust)</td>
<td>-47%</td>
<td>-10%</td>
<td>-1%</td>
<td>-6%</td>
</tr>
<tr>
<td>PM₁₀ (total)</td>
<td>-4%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>PM₂₅ (total)</td>
<td>-7%</td>
<td>-1%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 11: Proportion of population living in areas of NO₂ exceedence in 2025 (Package 1)

<table>
<thead>
<tr>
<th>Area</th>
<th>Estimated population in 2020</th>
<th>Proportion of population living in areas of NO₂ exceedence in 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without ULEZ</td>
<td>With Package 1</td>
</tr>
<tr>
<td>ULEZ</td>
<td>200,000</td>
<td>17%</td>
</tr>
<tr>
<td>Inner London</td>
<td>3,500,000</td>
<td>2%</td>
</tr>
<tr>
<td>Outer London</td>
<td>5,800,000</td>
<td>0%</td>
</tr>
<tr>
<td>Greater London</td>
<td>9,500,000</td>
<td>1%</td>
</tr>
</tbody>
</table>
### Table 12: Emissions impact in 2025 from the revised ULEZ proposals (Package 2)

<table>
<thead>
<tr>
<th></th>
<th>ULEZ</th>
<th>Inner London</th>
<th>Outer London</th>
<th>London-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>-15%</td>
<td>-3%</td>
<td>-1%</td>
<td>-2%</td>
</tr>
<tr>
<td>NO₂</td>
<td>-32%</td>
<td>-9%</td>
<td>-3%</td>
<td>-6%</td>
</tr>
<tr>
<td>NOₓ</td>
<td>-29%</td>
<td>-8%</td>
<td>-3%</td>
<td>-6%</td>
</tr>
<tr>
<td>PM₁₀ (exhaust)</td>
<td>-26%</td>
<td>-3%</td>
<td>0%&lt;sup&gt;58&lt;/sup&gt;</td>
<td>-1%</td>
</tr>
<tr>
<td>PM₂.₅ (exhaust)</td>
<td>-27%</td>
<td>-4%</td>
<td>0%</td>
<td>-2%</td>
</tr>
<tr>
<td>PM₁₀ (total)</td>
<td>-3%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>PM₂.₅ (total)</td>
<td>-4%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Table 13: Proportion of population living in areas of NO₂ exceedence in 2025 (Package 2)

<table>
<thead>
<tr>
<th>Area</th>
<th>Estimated population in 2020</th>
<th>Proportion of population living in areas of NO₂ exceedence in 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without ULEZ</td>
<td>With Package 2</td>
</tr>
<tr>
<td>ULEZ</td>
<td>200,000</td>
<td>17%</td>
</tr>
<tr>
<td>Inner London</td>
<td>3,500,000</td>
<td>2%</td>
</tr>
</tbody>
</table>

<sup>58</sup> In the modelling the PM₁₀ and PM₂.₅ exhaust emissions are seen to increase in outer London by two per cent compared to baseline. This is a feature of the COPERT emissions functions which suggest that particulate exhaust emissions from newer diesel cars are lower than for petrol cars. This may be a feature of driving conditions outside of London but London test data does not necessarily support this view. Therefore the overall change in exhaust emissions is considered to be negligible.
The impact of the packages in 2025 is less than in 2020 due to the improvements from the natural turnover in the fleet within the 2025 baseline. Despite this, savings of exhaust emissions within central London are still high with Package 1 seeing a 16 per cent reduction in CO₂, 35 per cent reduction in NOₓ and 46 per cent reduction in PM₁₀ as set out in Table 10. Package 2 sees a lesser impact on all pollutants with NOₓ savings in central London reducing by six percentage points. The PM exhaust emissions are reduced by 20 percentage points reflecting the significance of the older taxis for this pollutant. In spite of this PM₁₀ and PM₂.₅ are still reduced by more than a quarter in 2025 in central London. The 2025 package is modelled assuming that no additional funding for ZEC taxis or voluntary vehicle decommissioning is secured beyond 2020. Should these schemes prove successful, and the need to seek further reductions from the taxi industry then there may be cause to continue these funds and further reduce pollution in 2025.

In terms of population exposure Package 1 saw a dramatic reduction from 17 per cent of the population to three per cent in central London. This is slightly lower for Package 2 with five per cent of the population living in areas with NO₂ concentrations above 40μg/m³. Changes in inner and outer London are comparable in both packages with very few background locations expected to be above the limit value come 2025.
Appendix 7: Air quality impacts of ULEZ – NO₂ annual mean 2020 (µgm⁻³)

Without ULEZ

Package 1

Package 2
Appendix 8: Air quality impacts of ULEZ – PM$_{10}$ annual mean 2020 (µg m$^{-3}$)
Appendix 9: Air quality impacts of ULEZ – PM$_{2.5}$ annual mean 2020 (µgm$^{-3}$)
Appendix 10: Air quality impacts of ULEZ – NO$_2$ annual mean 2025 (µgm$^{-3}$)

Without ULEZ

Package 1

Package 2
Appendix 11: Air quality impacts of ULEZ – PM$_{10}$ annual mean 2025 ($\mu$gm$^{-3}$)

Without ULEZ

Package 1

Package 2
Appendix 12: Air quality impacts of ULEZ – PM$_{2.5}$ annual mean 2025 (μgm$^{-3}$)
Appendix 13: Basis for a compensation scheme under taxi age limits

A reduced age limit policy will reduce the economic life of those diesel taxis to below their expected life at the time of purchase. A compensation scheme has been designed which aims to:

- Compensate the owner / operators for the loss in value so that they can afford to delicense their taxi; and
- Structure the eligibility and amounts in order to smooth out the impact.

The compensation has been based on the change in residual values resulting from a reduced age limit. Cambridge Economics Policy Associates (CEPA) has worked with TfL and key stakeholders to estimate what this loss in residual value will be at different ages.

CEPA estimated the depreciation profile under a reduced age limit and compared this to the estimated depreciation profile under a 15 year age limit; these were determined after consulting with the trade. The compensation values have been based on the difference between the different depreciation profiles over the lifetime of the taxi (ie the immediate change in value upon announcement of the policy and any further changes in future years that are the result of the age limit policy).

The compensation scheme has been designed to compensate all taxis directly impacted by the reduced age limit at policy announcement, ie if a 10 year age limit is announced in September 2015, compensation will be available if a taxi is 5-15 years old in 2020.

The following compensation values have been estimated for taxis claiming in 2020:

<table>
<thead>
<tr>
<th>Age of taxi in 2020 (years)</th>
<th>Compensation amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-11</td>
<td>£5,000</td>
</tr>
<tr>
<td>12</td>
<td>£3,800</td>
</tr>
<tr>
<td>13</td>
<td>£2,800</td>
</tr>
<tr>
<td>14</td>
<td>£1,900</td>
</tr>
<tr>
<td>15</td>
<td>£1,200</td>
</tr>
</tbody>
</table>

In order to smooth the impact of the age limit and encourage early emission savings, the compensation scheme will operate from 2016, and therefore give the option to owner / operators to de-license their taxi in advance of the age limit. The table below sets out the compensation amounts based on the different points at which it could be claimed.
There are two components of the compensation:

- ‘Base compensation’: Amount reflecting the loss in the taxi’s value from a reduced asset life if it continues to be licensed until 2020, at which point it must be de-licensed if it is over the new age limit.
- ‘Incentive compensation’: The additional compensation given to incentivise de-licensing earlier than 2020, ie early take-up.

The total estimated cost of this scheme using the high depreciation curve estimate is £40m under a 12 year age limit and £68m under a 10 year age limit. The total scheme cost would vary slightly depending on the proportion of taxis that choose ‘early take-up’, as opposed to waiting until 2020.
| Vehicle age | 10 year age limit compensation if claimed in... |  |  |  |  |  |  |  |  |  | Purchasing grant if buying a ZEC taxi |
|-------------|-----------------------------------|---|---|---|---|---|---|---|---|---------------------------|
| 0 | 5 |  |  |  |  |  |  |  |  |  |  |
| 1 | 6 |  |  |  |  |  |  |  |  |  |  |
| 2 | 7 |  |  |  |  |  |  |  |  |  |  |
| 3 | 8 |  |  |  |  |  |  |  |  |  |  |
| 4 | 9 |  |  |  |  |  |  |  |  |  |  |
| 5 | 10 |  |  |  |  |  |  |  |  |  |  |
| 6 | 11 |  |  |  |  |  |  |  |  |  |  |
| 7 | 12 | £5,000* |  |  |  |  |  |  |  |  |  |
| 8 | 13 | £5,000* | £5,000* |  |  |  |  |  |  |  |  |
| 9 | 14 | £5,000* | £5,000* | £3,800* |  |  |  |  |  |  |  |
| 10 | 15 | £5,000* | £3,800* | £2,800* | £1,900* | £1,200 | £2,700* | £2,700* | £2,700* | £1,800* | £1,200 |

*to claim this amount the taxi must be de-licensed earlier than 2020 (i.e. incentive payment included)

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59 Current grant is £5k but the OLEV expects this to diminish over time.
Appendix 14: Voluntary decommissioning payment scheme

The original proposal posited a compensation scheme for owners of older taxis which would be removed from the fleet under a mandatory 10-year age limit, and £40m was allocated for this in TfL’s Business Plan. Because the updated proposal (Taxi Option C) is shaped to achieve a voluntary removal of these older taxis, the compensation scheme as originally envisaged is no longer the most appropriate approach. Instead it is proposed to offer a decommissioning scheme for older taxis, under which owners receive a payment in return for no longer being able to re-license their taxi in London, ie they are ‘decommissioned’ as London taxis.

At the outset it is important to state that taxi decommissioning payment would not be linked to purchase of a ZEC taxi. There are two main reasons for this. Firstly, the decommissioning scheme by itself is a critical approach to achieving the ULEZ objective of reduced air pollutant emissions. Older taxis are more polluting than newer vehicles and so removing taxis over ten years old from the fleet brings significant emissions savings. The second reason for this is to allow flexibility in driver / owner response and help achieve the optimum uptake not just of ZEC taxis, but of replacement of older taxis with vehicles under ten years old.

It is proposed that taxis over ten years old at the point of making the claim would be eligible for a decommissioning payment. Focusing on these older vehicles is most effective in terms of securing the emissions savings which ULEZ is intended to achieve and uses the money available most effectively. Once the claim has been made, the vehicle cannot be relicensed as a taxi in London. This completely removes older and more polluting taxis from the London fleet, which helps to achieve the ULEZ objectives and is in line with the previous proposal. It also ensures that a decommissioning payment cannot be made more than once for the same taxi.

A decommissioned taxi could be scrapped, sold for private use or (subject to local licensing) be used as a taxi or PHV outside London. TfL does not propose to mandate any use for these decommissioned taxi vehicles. Nor is it assumed that the recipient automatically goes on to buy a ZEC taxi. As shown in Figure 6 below, there are a number of options available including the purchase of a second-hand taxi under ten years old. In this way the effect of the scheme is to create additional market capacity in the vehicle market by creating opportunities to buy and sell a range of taxis, including ZECs and second-hand vehicles.

---

60 Taxis are re-licensed on an annual basis
The decommissioning payments scheme would operate once ZEC taxis are available on the market (anticipated mid 2017) until the end of 2020. This coincides with the proposed mandatory ZEC requirement for newly-licensed taxis from 2018 and, in running for over three years, helps to support the introduction of these vehicles into the fleet.

There is a balance to be struck between making sure the payments are high enough to act as an incentive and spreading the cost so that the scheme can run for an adequate period. The individual payment for decommissioning would be on a sliding scale related to the vehicle’s age and, most importantly here, the number of times it could have been re-licensed were it not to be decommissioned. In the trade this is known as the remaining ‘number of plates’ a vehicle has.

It is worth expanding here on the way that taxi re-licensing works in relation to vehicle age, because it is an important factor in calculating the decommissioning amount payable. Taxis are re-licensed on an annual basis but the date of relicensing will of course vary between vehicles. An eleven year-old taxi may, depending on its date of relicensing, have 4 or 5 re-licenses (years of service) left before it breaches the 15-year age limit and cannot be relicensed.

This is demonstrated in the example given in Figure 5, where a taxi has its licence renewed annually on 1 June.

![Diagram](image)

**Figure 5: Taxi relicensing and interaction with decommissioning scheme**

In considering whether to take the decommissioning payment, the owner would consider the number of plates remaining (ie years of service left in the vehicle). Proposed decommissioning payments are shown in Table 14 below.

<table>
<thead>
<tr>
<th>Number of plates remaining</th>
<th>Payment amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 5</td>
<td>£5,000</td>
</tr>
<tr>
<td>4 3</td>
<td>£3,800</td>
</tr>
<tr>
<td>2 2</td>
<td>£1,900</td>
</tr>
<tr>
<td>1 1</td>
<td>£1,200</td>
</tr>
</tbody>
</table>

Table 14: Proposed decommissioning payments by vehicle plates remaining
In calculating these amounts, CEPA has taken into account both second hand market taxi values and the effect of the scheme on profitability (for the owner) in future years. It is not expected that everyone who is eligible for the decommissioning grant would apply for it. Some owners will sell their vehicle (potentially earlier than planned) and either buy a newer second hand vehicle (with lower maintenance costs), buy a ZEC taxi or exit the market. This is shown in summary in Figure 6. The process has been shaped so that it works with this range of responses and gives appropriate flexibility to owners. It is not the intention of this policy that the overall number of licenses will decrease, nor is it expected to produce this result.

![Figure 6: Possible scenarios for taxi owners 2017-2020](image)

More information on how the decommissioning payment may be claimed will be made available following a decision on whether to proceed with these proposals. The process will be developed so that it is easy to understand and administer; taxi drivers could carry on using their vehicle during the application procedure.

Uptake forecasts are uncertain because decision-making by taxi owners depends on a range of financial and non-financial factors. CEPA has utilised economic theories and scenario modelling to provide some high-level uptake estimates. The results indicate uptake could be in the range 25 per cent to 65 per cent of eligible vehicles over the duration of the scheme, which would correspond to costs broadly in the range £10m to £25m. Although these estimates are uncertain, they indicate that the allocated £40m would likely suffice to assist taxi vehicle owners if it is allocated towards a voluntary decommissioning payment scheme. Within the assessment work a mid-point of 3,500 vehicles removed in addition to natural turnover was used. The work undertaken by CEPA shows it is appropriate there are eligibility requirements and time constraints on the scheme.

Given it is proposed to no longer reduce the age limit, it will be important for the trade to 'sell' the benefits of the decommissioning scheme (and purchasing grants) to
its members. Subject to the outcome of the consultation, we will continue our engagement with the trade to ensure whichever proposal is taken forward is easy to understand and administer to drivers.
Appendix 15: Glossary

**Air pollutants**
Generic term for substances emitted that have adverse effects on humans and the ecosystem.

**Conditions of Fitness (CoF)**
Taxi licensing requirements.

**Carbon Dioxide (CO₂)**
Principal greenhouse gas related to climate change.

**Department for Environment, Food and Rural Affairs (Defra)**
UK Government department responsible for policy and regulations on environmental, food and rural issues.

**Driver and Vehicle Licensing Agency (DVLA)**
The organisation of the UK government responsible for maintaining a database of drivers in Great Britain and a database of vehicles for the entire United Kingdom.

**Early adopters**
Vehicles which comply with the Euro standards specified in the ULEZ before that Euro standard becomes mandatory.

**Electric vehicle (EV)**
Also referred to as an electric drive vehicle, uses one or more electric motors or traction motors for propulsion. An electric vehicle may be powered through a collector system by electricity from off-vehicle sources, or may be self-contained with a battery or generator to convert fuel to electricity.

**Euro standards**
The European emissions standards, or Euro standards, are a range of successive exhaust emissions standards for petrol, gas and diesel engines, identified as Euro 4, Euro 5, Euro 6, Euro VI etc (Euro standards for heavy-duty diesel engines use Roman numerals and for light-duty vehicle standards use Arabic numerals). New vehicles are tested to ensure they meet the emissions standards during the type approval process. These standards are used by the existing London LEZ to ensure consistency across Europe.

**Heavy Goods Vehicle (HGV)**
Type of truck weighing >3.5t.

**Hybrid vehicle**
A vehicle that uses two or more distinct power sources to move the vehicle. The term most commonly refers to hybrid electric vehicles (HEVs), which combine an internal combustion engine and one or more electric motors.
**Integrated Impact Assessment (IIA)**
A method of estimating the possible implications, intended and unintended, of policies, plans, strategies, projects or initiatives. It examines how the proposal may affect communities and how these effects may be distributed amongst different groups within the community. The aim of IIA is to make recommendations to enhance potential positive outcomes and minimise negative impacts of a proposal.

**Late adopters**
Refers to vehicles which a number of manufacturers, usually of smaller and/or specialist vehicles, have been permitted to produce which meet a certain Euro standard past the mandatory date of the next Euro standard.

**Legal limits**
The European Union (EU) Ambient Air Quality Directive (2008/50/EC) and Directive 2004/107/EC set limits for concentrations of pollutants in outdoor air, which have been transposed into English law by the Air Quality (Standards) Regulations 2010. Also known as ‘limit values’.

**Low Emission Neighbourhood (LEN)**
An area-based scheme that includes a package of measures focused on reducing emissions, delivered with support from TfL, GLA and the local community.

**Low Emission Zone (LEZ)**
The Low Emission Zone (LEZ) operates to encourage the most polluting heavy vehicles driving in London to become cleaner. The LEZ covers most of Greater London and is in operation 24 hours a day, 365 days of the year.

**LPG vehicles**
These vehicles are converted to run on liquefied petroleum gas (LPG). They are usually spark ignition (petrol) powered vehicles that have undergone an aftermarket conversion to run on a combination of petrol and LPG (Bi-fuel). This conversion does not change the type approval status of the base vehicle.

**Mayor’s Air Quality Strategy (MAQS)**
Sets out actions to improving London’s air quality and includes measures aimed at reducing emissions from transport, homes, workplaces and new developments.

**Nitrogen dioxide (NO₂)**
An air pollutant that can affect lung function and can cause respiratory symptoms. There is a legal limit in place for NO₂.

**Nitrogen oxide (NOₓ)**
Refers to total vehicle emissions (both those directly emitted and those formed by chemical reactions). Vehicle emissions standards refer to total NOₓ emissions but EU air quality limit values refer to ambient concentrations and are set for NO₂ as this is the harmful component of the emissions.
Office for Low Emission Vehicles (OLEV)
A team working across government to support the early market for ultra-low emission vehicles (ULEV).

Particulate Matter (PM)
Airborne particulate matter is made up of a collection of solid and/or liquid materials of various sizes. PM contains a range of chemical compounds and can adversely affect our health. There are legal limits in place for both PM$_{10}$ and PM$_{2.5}$.

PM$_{10}$
Particulate matter with particle size less than 10 micrometres in diameter and which are so small that they can get into the lungs, potentially causing serious health problems.

PM$_{2.5}$
Particulate matter with particle size less than 2.5 micrometres in diameter (fine particles) and which are so small they can be detected only with an electron microscope. Sources of fine particles include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes.

Plug-in hybrid electric vehicle (PHEVs)
PHEVs can operate in ZEC mode for longer than a pure electric (battery-only) vehicle. PHEVs have a (lithium-ion) battery that can be recharged overnight (and top-up, using fast-charge technology), to provide zero emission driving for up to circa 80km, after which the conventional engine is used.

Private Hire Vehicle (PHV)
Any vehicle that seats up to eight passengers and is available for hire with a driver requires a PHV licence (eg minicab). It is the responsibility of the vehicle owner to apply for a licence.

Rapid charging
A high power supply which can typically charge an electric vehicle in less than 30 minutes, as opposed to slow charging which is the most common method of charging electric vehicles with a full charge typically taking 6 to 8 hours.

Retrofit
Retrofit technology, such as the fitting of a filter, can be used to enable older vehicles to meet Euro standards that were mandatory for newer vehicles.

Small and medium-sized enterprises (SMEs)
As defined in EU law, the main factors determining whether a company is an SME are: number of employees and either turnover or balance sheet total.

Taxi (black cab)
A specialist vehicle licensed by TfL to ply for hire in London. Most taxis are licensed to carry five passengers although some are licensed to carry six.
**Taxi and Private Hire (TPH)**
The office within TfL responsible for taxi and PHV licensing.

**Transport Emissions Roadmap (TERM)**
TERM looks at how to reduce emissions from transport in London. It reports on what we have already done and what we may do in the future. It provides a range of possible new measures that the Mayor, TfL, the London boroughs, the Government, EU and other parties should consider to help meet the challenge of reducing air pollutants and CO₂ emissions in London. More information on TERM and TfL’s work to reduce the environmental impact of transport can be found at:

**Ultra Low Emission Vehicle (ULEV)**
The Department for Transport uses the term ‘ultra-low emission vehicles’ to refer to vehicles with significantly lower levels of tailpipe emissions than conventional vehicles. In practice, the term currently refers to electric, plug-in hybrid and hydrogen fuel-cell vehicles. Vehicles that use non-fossil fuel propulsion have zero tailpipe emissions. For other propulsion types, only vehicles with tailpipe emissions below 75 grams of CO₂ per kilometre are included.

**Ultra Low Emission Zone (ULEZ)**
Emissions standards which will be introduced in central London in September 2020 to encourage the most polluting vehicles driving in London to become cleaner. The ULEZ will cover the same area as the CCZ and will operate 24 hours a day, 365 days of the year.

**ULEZ exhaust emissions standards (the ULEZ standards)**
The ULEZ standards differ by vehicle type. Each vehicle must conform to the relevant Euro standard in order to drive in the ULEZ without paying the daily non-compliance charge.

**Variation Order (VO)**
An amendment to a Scheme Order, which is used to implement road user charging schemes in London (such as LEZ and ULEZ).

**Zero emission bus**
A bus with zero tailpipe emissions (eg electric or hydrogen).

**Zero emission capable (ZEC) PHV**
The following criteria was originally consulted on:

A pure electric or hybrid vehicle capable of running in zero emission (at the tailpipe) mode or for all or part of the time (maximum 50g/km CO₂, minimum range 30 miles).

This has been revised to the following for this consultation:
A pure electric or hybrid vehicle capable of running in zero emission (at the tailpipe) mode or for all or part of the time, with either:

- ≤50g/km CO₂ and minimum zero emission range of 10 miles or
- >50g/km CO₂ and <75g/km zero emission range of 20 miles

**Zero emission capable (ZEC) taxi**

A pure electric or hybrid vehicle capable of running in zero emission (at the tailpipe) mode or for all or part of the time (maximum 50g/km CO₂, minimum range 30 miles). If the vehicle utilises an internal combustion engine, it must be petrol fuelled.
Appendix 16: Summary of changes to the impacts identified in the IIA (October 2014)
The ULEZ (as updated):

Summary of changes to the impacts identified in the IIA (October 2014)

i. Updates to the ULEZ

1.1.1 TfL is proposing updates to the requirements of the ULEZ (as previously consulted) which relate to vehicle licensing requirements for taxis and PHVs. Details on the requirements of the ULEZ (as previously consulted), together with details on the requirements of the ULEZ (as updated), are set out in Table 1. The proposed updates are highlighted in bold.

1.1.2 In relation to update 1, TfL will monitor progress and undertake a review at the start of 2020 (or sooner) of ZEC taxi uptake, and the removal of older vehicles from the fleet. If there is insufficient progress then a reduction in the age limit could be considered as a necessary alternative, subject to further consultation.

1.1.3 TfL are also proposing to retrofit 400 non-CCZ Euro V buses to make them Euro VI.

1.1.4 Relevant updates have been built into the atmospheric emissions modelling of which the results have been used for this assessment i.e. to assess the difference between the ULEZ (as previously consulted) and the ULEZ (as updated). The differences between the inputs to the atmospheric emissions modelling between the ULEZ (as previously consulted) and the ULEZ (as updated) are identified in Table 2.

Table 1: Proposed updates to the ULEZ requirements

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>ULEZ requirements (as previously consulted) – original proposal (Package 1)</th>
<th>ULEZ requirements (as updated) – current preferred approach (Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi</td>
<td>A requirement that all taxis presented for licensing for the first time need to be zero emission capable (ZEC)¹ from 2018 with a petrol only range extender engine where appropriate; A 10 year age limit for non ZEC taxis from 2020 with an associated compensation scheme for affected vehicle owners.</td>
<td>A requirement that all taxis presented for licensing for the first time need to be zero emission capable (ZEC) from 2018 (with no specific fuel requirement); Retention of a 15-year age limit for all taxis and the introduction of a voluntary decommissioning scheme for taxis older than 10 years that are de-licensed before reaching 15 years (update 1); A policy review at the start of 2020 to gauge progress on the voluntary decommissioning scheme and ZEC uptake.</td>
</tr>
</tbody>
</table>
Changes to the IIA (October 2014) – Summary

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>ULEZ requirements (as previously consulted) – original proposal (Package 1)</th>
<th>ULEZ requirements (as updated) – current preferred approach (Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHV</td>
<td>A requirement that new vehicles licensed for the first time as PHVs need to be ZEC (vehicle definition as per taxis) from 2018; A discontinuation of the introductory five year age limit rule; A requirement that used vehicles (older than 18 months) licensed for the first time as PHVs must be at least Euro 6 (diesel) and Euro 4 (petrol) from 2018. A ZEC PHV is defined as: minimum zero emission range 30 miles; and maximum 50 g/km CO₂</td>
<td>A requirement that new vehicles licensed for the first time as PHVs need to be ZEC from 2018²; A two-year sunset period exemption until 2020 from the ZEC requirement for PHVs that carry six or more passengers (update 2); A discontinuation of the introductory five year age limit rule; A requirement that used vehicles (older than 18 months) licensed for the first time as PHVs must be at least Euro 6 (diesel) and Euro 4 (petrol) from 2018. A ZEC PHV is defined as: ≤50g/km CO₂ and minimum zero emission range of 10 miles; or &gt;50g/km and &lt;75g/km CO₂ and minimum zero emission range of 20 miles (update 3)</td>
</tr>
</tbody>
</table>

¹ A ZEC vehicle is defined as ≤50g/km CO₂ with a minimum zero emission range of 30 miles. For taxis, the original consultation specified that the conventional engine must be petrol.

² For PHVs only, the criteria for a ZEC vehicle has been updated since the original consultation.

Table 2: Data input into atmospheric emissions model used for assessment

<table>
<thead>
<tr>
<th>The ULEZ (as previously consulted)</th>
<th>The ULEZ (as updated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In CCZ:</td>
<td></td>
</tr>
<tr>
<td>Euro 4/6 petrol/diesel for LGV and Car ULEZ standard</td>
<td>Euro 4/6 petrol/diesel for LGV and Car ULEZ standard</td>
</tr>
<tr>
<td>Euro VI HGV and Coach and non-TfL buses ULEZ standard</td>
<td>Euro VI HGV and Coach and non-TfL buses ULEZ standard</td>
</tr>
<tr>
<td>All double-decker buses Euro VI hybrid, except for new Routemaster Euro V; all single-decker electric</td>
<td>All double-decker buses Euro VI hybrid, except for new Routemaster Euro V; all single-decker electric</td>
</tr>
<tr>
<td>10 year age taxi limit</td>
<td>15 year age taxi limit with a voluntary decommissioning scheme. This is assumed in the modelling to remove 3,500 taxis older than 10 years in 2020</td>
</tr>
<tr>
<td>Grants for the purchase of ZEC taxis. It is assumed in the modelling that there will be 9,000 ZEC taxis by the end of 2020</td>
<td></td>
</tr>
</tbody>
</table>

Outside CCZ:
### Changes to the IIA (October 2014) – Summary

#### The ULEZ (as previously consulted)

- Knock on impact from car, LGV, HGV and coach ULEZ standards
- Buses incorporated into a London wide average fleet composition
- 10 year taxi age limit

#### The ULEZ (as updated)

- Knock on impact from car, LGV, HGV and coach ULEZ standards
- Central London Buses incorporated into a London wide average fleet composition + 400 non-CCZ Euro V buses are retrofitted to make them Euro VI
- 15 year taxi age limit with a voluntary decommissioning scheme. This is assumed in the modelling to remove 3,500 taxis older than 10 years in 2020
- Grants for the purchase of ZEC taxis. It is assumed in the modelling that there will be 9,000 ZEC taxis by the end of 2020

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### ii. Findings of assessment

1.2.1 Changes to impacts identified in the IIA (October 2014) can be identified for update 1 (maintaining 15 year age limit for taxis) and update 3 (change to definition of ZEC PHV). Changes to impacts in the IIA (October 2014) have not been identified for update 2 (transition period for 7 seater PHVs) because Jacobs did not previously undertake an assessment for this sub-sector of the PHV market and therefore no impacts on air quality, health, equality groups or London's economy and SMEs were identified specifically for this sector. Given that PHVs do not contribute significantly to emissions in central London i.e. total contribution of four per cent NOx from road transport in 2020 in central London it is unlikely that this updated proposal would result in a change to the benefits and impacts identified within the IIA (October 2014).

1.2.2 Certain Impacts related to air quality and health are still being assessed and will be presented in a refreshed Addendum in mid-July 2015. This will be available on TfL’s website.

1.2.3 The result of the updates is summarised in the list below, with changes to impacts shown in bold. From update 1 the changes are:

- a slight worsening on average in annual NO₂ concentrations in the CCZ in both 2020 (i.e. an improvement by 4.6 µg/m³ drops to 4.5 µg/m³) and 2025 (i.e. an improvement by 2.3 µg/m³ drops to 1.8 µg/m³);
- a slight worsening on average in annual mean NO₂ concentrations towards the outer zone in 2025 (i.e. an improvement by 0.3 µg/m³ drops to 0.2 µg/m³);
- a slight worsening on average in annual mean PM₁₀ concentrations in the CCZ in 2020 (i.e. an improvement of 0.2 µg/m³ falls to 0.1 µg/m³);
- an overall improvement in the number of receptors no longer located in areas exceeding NO AQO’s in 2020. Specifically in 2020, an additional 151 receptors would no longer be located in areas exceeding NO₂ AQO’s;
- fewer receptors (i.e. 291) would no longer be located in areas exceeding NO AQO’s in 2025;
- a slight worsening in the tonnage of CO₂ emissions across London in 2020 – i.e. an increase of 13,860 tonnes;
- a slight worsening in the tonnage of CO₂ emissions across London in 2025 – i.e. an increase of 13,860 tonnes;
a slight worsening to the reduced risk of degradation of cultural heritage assets as a result of PM$_{10}$ emissions. Specifically in 2020 the risk would increase by 15% (compared to the ULEZ (as previously consulted)) and in 2025 the risk would increase by 17% (compared to the ULEZ (as previously consulted));

removal of the disproportionate impact on the third of licensed taxi drivers who are older (60+) and may choose to retire early rather than upgrade to a ULEZ compliant vehicle.

removal of the differential effect on women and the Lesbian, Gay, Bisexual and Transgender (LGBT) community arising from increased fear for personal safety in central London and other town centres in Greater London at night as a result of a potential decrease of available taxis.

a slight reduction in the loss to the night time economy and the tourist sector;

Other impacts to be published in mid-July 2015

1.2.4 The ULEZ (as updated) would not result in any change to impacts identified in the IIA (October 2014) in relation to:
annual NO$_2$ concentrations towards the outer zone in 2020;
annual PM$_{10}$ concentrations towards the outer zone in 2025; and
PM$_{2.5}$ emissions.

1.2.5 The changes to impacts from update 3 include:
a slight reduction to the potential disproportionate impact on Black and Minority Ethnic (BAME) people who are PHV drivers;
a slight reduction to the total costs of businesses of either complying with the ULEZ;

Other health and air quality related impacts and changes to be updated in mid-July

1.2.6 More details on changes to the impacts identified in the IIA (October 2014) as a result of the ULEZ (as updated) is provided in Table 3.
### Table 3: Summary of changes to the IIA (October 2014) as a result of the ULEZ (as updated)

<table>
<thead>
<tr>
<th>Relevant impacts identified in IIA (October 2014) – for ULEZ (as previously consulted – Package 1)</th>
<th>Scale of impact for ULEZ (as previously consulted – Package 1)</th>
<th>Relevant update assessed</th>
<th>New impact – for ULEZ (as updated)</th>
<th>Change to impact in IIA (October 2014)</th>
<th>Scale of impact for ULEZ (as updated – Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental impacts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in an improvement in annual average mean NO$_2$ concentration of 4.6 µg/m$^3$ in 2020 and a further 2.3 µg/m$^3$ in 2025 in the CCZ with a reduction towards the Outer Zone of 0.9 µg/m$^3$ in 2020 and a further 0.3 µg/m$^3$ in 2025.</td>
<td><strong>Major positive long term</strong> Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would result in an improvement in annual average mean NO$_2$ concentration of 4.5 µg/m$^3$ in 2020 and a further 1.8 µg/m$^3$ in 2025 in the CCZ with a reduction towards the Outer Zone of 0.9 µg/m$^3$ in 2020 and a further 0.2 µg/m$^3$ in 2025.</td>
<td>ULEZ (as updated) would result in a slightly reduced benefit than the ULEZ (as previously consulted)</td>
<td>No change in scale of impact</td>
<td></td>
</tr>
</tbody>
</table>

In 2020 ULEZ (as previously consulted) would result in over 18,000 receptors across London no longer being exposed to concentrations exceeding the annual mean NO$_2$ Air Quality Objectives and a further 1,892 receptors no longer being exposed by 2025. The largest percentage reduction in receptors exceeding the Air Quality Objectives in 2020 would be in central London (approx. 4,500 or 86%), followed by Inner Zone (approx. 10,500 or 52%) and Outer Zone (approx. 2,800 or 33%). | **Major positive long term** Update 1 - maintaining 15 year age limit for taxis | In 2020 ULEZ (as updated) would result in 18,174 receptors across London no longer being exposed to concentrations exceeding the annual mean NO$_2$ Air Quality Objectives and a further 1,601 receptors no longer being exposed by 2025. | In 2020, ULEZ (as updated) would result in an overall increase in the number of receptors across London that would no longer be exposed to concentrations exceeding the annual mean NO$_2$ Air Quality Objectives. | No change in scale of impact |

This improvement occurs in the Inner and Outer Zones and is as a result of TfL adopting alternative measures to meet a London wide NO$_x$ emissions gap as a result of maintaining the 15 year age limit for taxis. Specifically, TfL are proposing to retrofit additional Euro V buses outside of central London to meet the Euro VI standard.
## Changes to the IIA (October 2014) – Summary

<table>
<thead>
<tr>
<th>Relevant impacts identified in IIA (October 2014) – for ULEZ (as previously consulted – Package 1)</th>
<th>Scale of impact for ULEZ (as previously consulted – Package 1)</th>
<th>Relevant update assessed</th>
<th>New impact – for ULEZ (as updated)</th>
<th>Change to impact in IIA (October 2014)</th>
<th>Scale of impact for ULEZ (as updated – Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULEZ (as previously consulted) would result in air quality improvements in PM$<em>{2.5}$ concentrations and PM$</em>{10}$ emissions in 2020 and 2025</td>
<td>Minor positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would result in air quality improvements in PM$<em>{2.5}$ concentrations and PM$</em>{10}$ emissions in 2020 and 2025</td>
<td>ULEZ (as updated) would not result in any change in the level of improvements in PM$_{2.5}$ concentrations.</td>
<td>No change in scale of impact</td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in a total reduction in CO$_{2}$ emissions across London by 123,000 tonnes per annum in 2020 and 169,000 tonnes in 2025 in central London for which taxis account for 82,232 tonnes or 66.8 per cent in 2020 and 108,235 tonnes per annum or 64 per cent in 2025</td>
<td>Minor positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would result in a total reduction in CO$_{2}$ emissions across London of 109,140 tonnes per annum for 2020 and 147,139 tonnes per annum for 2025 of which taxis account for 68,746 tonnes of 63 per cent in 2020 and 112,325 tonnes or 76.3 per cent in 2025</td>
<td>ULEZ (as updated) would result in a slightly reduced benefit that the ULEZ (as previously consulted)</td>
<td>No change in scale of impact</td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in a reduced risk of degradation of cultural heritage assets as a result of PM$_{10}$ emissions. Most significant in CCZ (9% or 10tpa in 2020 and 3% or 3tpa in 2025)</td>
<td>Minor positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would result in a reduced risk of degradation of cultural heritage assets as a result of PM$_{10}$ emissions. Most significant in CCZ (11.1% or 12tpa in 2020 and 5.8% or 6tpa in 2025)</td>
<td>Update 1 would provide for a less positive result that the ULEZ (as previously consulted). The reduction in the risk of degradation of cultural heritage assets is higher than that of the ULEZ (as consulted) but still lower than without ULEZ.</td>
<td>No change in scale of impact</td>
</tr>
</tbody>
</table>

### Health impacts
### Changes to the IIA (October 2014) – Summary

<table>
<thead>
<tr>
<th>Relevant impacts identified in IIA (October 2014) – for ULEZ (as previously consulted – Package 1)</th>
<th>Scale of impact for ULEZ (as previously consulted – Package 1)</th>
<th>Relevant update assessed</th>
<th>New impact – for ULEZ (as updated)</th>
<th>Change to impact in IIA (October 2014)</th>
<th>Scale of impact for ULEZ (as updated – Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULEZ (as previously consulted) would result in reduction in the number of people living in areas above NO₂ annual limit value in 2020 and 2025</td>
<td>Major positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in reduction in the number of care homes, hospitals and schools in areas exceeding the NO₂ Air Quality Objectives (AQOs) across London (greatest in central London)</td>
<td>Major positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in reductions of 4,123 life-years lost across Greater London, however this reduces in 2025</td>
<td>Moderate positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULEZ (as previously consulted) would result in improved health outcomes estimated to have a total monetised benefit of £101m in 2020 and £32m in 2025</td>
<td>Moderate positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Equality impacts**
## Relevant impacts identified in IIA (October 2014) – for ULEZ (as previously consulted – Package 1)

<table>
<thead>
<tr>
<th>Relevant impact</th>
<th>Scale of impact for ULEZ (as previously consulted – Package 1)</th>
<th>Relevant update assessed</th>
<th>New impact – for ULEZ (as updated)</th>
<th>Change to impact in IIA (October 2014)</th>
<th>Scale of impact for ULEZ (as updated – Package 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULEZ (as previously consulted) would have a positive differential impact on school age children, older people and pregnant women. This is as a result of the reduction of sensitive receptors (schools, care homes and hospitals) that would be in areas which experience exceedences in NO₂ emissions.</td>
<td>Moderate positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowering the taxi age limit may have a disproportionate effect on the third of licensed taxi drivers who are older (60+) who may choose to retire early rather than upgrade to a ULEZ compliant vehicle</td>
<td>Minor negative short-medium term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would not change the current licensing requirements and therefore the ULEZ would not result in any disproportionate effect on the third of licenses taxi drivers who are older (60+)</td>
<td>Impact would be removed as a result of update 1</td>
<td>Removed</td>
</tr>
<tr>
<td>ULEZ (as previously consulted) may have a differential effect on women and the Lesbian, Gay, Bisexual and Transgender (LGBT) community arising from increased fear for personal safety in central London and other town centres in Greater London at night as a result of a potential decrease of available taxis</td>
<td>Minor negative short-medium term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would not change the current licensing requirements and therefore the ULEZ would not result in any disproportionate effect on the third of licenses taxi drivers who are older (60+). Therefore the ULEZ (as updated) would also not have a differential effect on women and the LGBT community</td>
<td>Impact would be removed as a result of update 1</td>
<td>Removed</td>
</tr>
</tbody>
</table>
## Changes to the IIA (October 2014) – Summary

<table>
<thead>
<tr>
<th>Relevant impacts identified in IIA (October 2014) – for ULEZ (as previously consulted – Package 1)</th>
<th>Scale of impact for ULEZ (as previously consulted – Package 1)</th>
<th>Relevant update assessed</th>
<th>New impact – for ULEZ (as updated)</th>
<th>Change to impact in IIA (October 2014)</th>
<th>Scale of impact for ULEZ (as updated – Package 2)</th>
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<tr>
<td>Black and Minority Ethnic (BAME) people are disproportionately represented as PHV drivers and therefore any additional costs from the ULEZ (as previously consulted) may potentially impact upon this group disproportionately</td>
<td>Minor negative short-term</td>
<td>Update 3 – change to definition of ZEC PHV</td>
<td>ULEZ (as updated) would result in a greater range of vehicles being able to be purchased and licensed. Therefore it may assist with providing more market competition and affordable options for complying with the ULEZ ZEC 2018 licensing requirement and additional costs that may potentially fall disproportionately on BAME people (because they make up 53% of PHV drivers) may lessen.</td>
<td>ULEZ (as updated) may have lessened disproportionate impacts on BAME people who are PHV drivers, however the impact would not be removed</td>
<td>No change to scale of impact</td>
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<tr>
<td>Economic impacts</td>
<td>Moderate positive long term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>To be published mid-July</td>
<td></td>
<td></td>
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<td>The improved health outcomes arising from the reduction in NOX, PM\textsubscript{10} and PM\textsubscript{2.5} under the ULEZ (as previously consulted) for the Greater London Authority area are estimated to have a total monetised benefit of £101m in 2020 and £32m in 2025</td>
<td>Minor negative short-medium term</td>
<td>Update 1 - maintaining 15 year age limit for taxis</td>
<td>ULEZ (as updated) would not change the current licensing requirements and therefore the ULEZ would not result in such a loss to the night time economy or tourist sector (as the impact from taxis would be removed).</td>
<td>ULEZ (as updated) would lessen this impact but not remove it</td>
<td>No change to scale of impact</td>
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<td>ULEZ (as previously consulted) would result in a 1-2% loss to the night time economy and 0.2% loss to the tourist sector (of which taxis fall within) and an overall loss of 0.03-0.08%</td>
<td></td>
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<td>The total costs to businesses of either complying with the ULEZ or paying the charge is expected to be around £120-250m in the first year which will fall potentially disproportionately on SMEs but will diminish over time as the proportion of vehicles becoming compliant increases</td>
<td>Minor negative short-medium term</td>
<td>Update 3 – change to definition of ZEC PHV</td>
<td>The ULEZ (as updated) would increase the range of ZEC vehicles suited to the PHV market that would be available to purchase and be eligible for the £5,000 OLEV plug-in car grant. The eligibility of the Toyota Prius plug-in, as well as other lower cost vehicles, over time as they come onto the market, may assist with lessening the total costs to businesses of complying with the ULEZ.</td>
<td>Update 3 would lessen this impact but not remove it</td>
<td>No change to scale of impact</td>
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