

## MAG submission regarding ULEZ proposals

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This is the Motorcycle Action Group's (MAG's) response to Transport for London's (TfL's) proposals to introduce an Ultra Low Emissions Zone (ULEZ) with accelerated implementation timings. MAG sets out how motorcycles should be utilised in order to assist with the achievement of TfL's targets. We clarify the importance of exempting motorcycles of all ages from the charge – including in the case of early implementation of the ULEZ.

MAG has studied a great deal of the research pertaining to NOx and Particulate Matter (PMs). A number of our findings could prove highly significant in the health debate at the core of these proposals. We include our findings as a supplementary section at the end of this submission.

### Background

MAG is the UK's foremost riders' rights campaigning body (1). We represent the interests of those using scooters and motorcycles, basing our policy recommendations on data, primarily gleaned directly from documents and references available through official channels such as TfL and the Government.

MAG's aim is to responsibly represent its 57,000 members and the c.200,000 'every day' riders, and thousands more occasional riders, in the Capital. We do not seek preferential treatment for riders – simply a level playing field which fairly reflects the contribution Powered Two Wheelers make to help TfL achieve its emissions targets.

### Remit of this analysis

MAG's response covers:

- 1 Powered Two Wheelers' relative contribution to relevant air pollution.
- 2 The net emissions effect of modal shift towards motorcycles.
- 3 Proposals relating to PTWs in the context of TfL's policy objectives.
- 4 Research conducted by MAG into the effect of air quality on human health - conducted in the context of understanding the scientific facts.

This analysis does *not* cover:

- 1 Safety issues, as these are not relevant to the emissions debate.
- 2 Speculation on as yet unproven or unavailable solutions.

## Section 1

### ***Air pollution and the relative contribution of powered two wheelers***

Powered Two Wheelers (PTWs) are part of the solution, not the problem. In this sense, MAG is closely aligned to the conclusions drawn about PTWs in the Government's report and proposals entitled 'Improving air quality: national plan for tackling nitrogen dioxide in our towns and cities (2).

In the Government's supporting technical document (3) on page 7, motorcycles are confirmed as producing virtually no relevant emissions. TfL itself estimates the emissions generated by PTWs at 0% (4). Allowing for rounding errors, TfL, the Government and MAG agree. The Government's technical report also indicates buses, which form the majority of public transport on London's roads, are very major producers of NOx (3). Since the intention is to reduce the absolute level of NOx in London, it is logical to promote the shift of commuters to an essentially zero NOx emissions mode of transport, namely PTWs, and away from much more significant NOx producing forms of transport. Note the number of people on a bus does not significantly increase or reduce its emissions, but the necessary expansion of the bus fleet to accommodate any increase in demand caused, for example, by the dissuasion of riding in the Capital, would unquestionably increase the emissions levels in the city, as well as contributing to congestion and thus to secondary pollution. Even hydrogen and electric buses cause these secondary emissions as long as there are any polluting engines in the congestion mix.

It follows that if those currently using cars and buses shift to motorcycles and scooters, this would reduce the overall level of emissions in the city.

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### ***London riding is commuter focussed; and cost and congestion sensitive***

A report commissioned by TfL (5) confirms that there is a heavy emphasis on commuting in terms of motorcycle usage in London, that economic considerations are very important and that small capacity machines are much more heavily relied upon in the Capital than across the UK as a whole. The report concludes, amongst other things that:

*'In general London motorcyclists show the following characteristics that differentiate them from other motorcyclists:*

- *They are slightly younger, and thus more likely to be single.*
- *Despite their age, they have a higher employment status and an associated higher income...*
- *...but are more likely to own machines with an engine capacity less than 250cc.*
- *They are three times as likely to be commuter/work riders and half as likely to be leisure only riders.*
- *They are less likely to be riders who are returning to motorcycling after a break.*
- *They report choosing to ride a motorcycle mainly to avoid congestion and cite financial reasons for running a motorcycle.*
- *They use their machines for twice as many commuting or at work trips, and for half as many leisure trips.*

- *London motorcyclists choose to ride either small or large machines, with few riding midsized bikes.*
- *There are possibly two "clusters" of London motorcyclists - those who use their low powered machines for commuting or at work trips and the remainder who use their machines for a variety of purposes.*

This TfL sponsored research confirm MAG's long held assertion that riders who commute are much more likely to do so for reasons of avoiding congestion and cost, and that they use motorcycles of small capacity, and therefore low emissions.

### ***Charging older motorcycles contradicts the aims of the ULEZ***

Motorcycles from about 2007 onwards are already scheduled to be exempt. MAG argues that the logic contained in the data requires all motorcycles to be exempt as there has been no case put forward which indicates any benefit to the emissions targets through charging older machines. Again, using Greater London Authority's (GLA's) figures, 21% of NOx in central London comes from London buses and coaches, compared to 8% diesel cars. Petrol cars generate 3% of NOx in Central London, and even across greater London 7%. The GLA claims that 1% of traffic in Central London is PTWs. (MAG asserts that it is at least twice that but we will use TfL/GLA's figure). According to TfL sponsored research (5), a cluster of machines with an average capacity of 175cc appears to be primarily involved in the process of commuting (5). This represents an average cubic capacity which is one sixth or less of a typical car. The NOx emissions therefore tend towards zero and would effectively be un-measurable – even for older machines which themselves are a small proportion of the motorcycling stock.

However, the net effect of riding an old small capacity machine versus driving a comparatively larger capacity car is profound. Each car which is replaced by a typical commuting motorcycle will reduce the overall emissions in the city. It does not make logical sense to hinder this modal shift through a user charge – and certainly TfL's sponsored research (5) indicates that motivations for motorcycle use are such that a charge will undermine the perceived benefits of riding. This would cause a net reduction in motorcycle use, leading to increased loadings on NOx heavy buses plus an already overstressed tube system, all for no benefit to the emissions targets TfL is attempting to meet. On the contrary, the emissions will increase as the city would need more bus capacity to deal with the switch from two wheels to other forms of transport. Let's recognise that we're dealing with a marginal effect here. The number of machines are relatively low and their impact negligible. But it is in principle wrong to charge them on the basis that each machine is part of the solution, not the problem in terms of air quality. A charge on usage would be venal rather than rational.

### ***TfL's motorcycle versus car comparison regarding emissions***

During the Silvertown Tunnel public hearings and in discussions directly between TfL and MAG, Transport for London claimed emissions from a motorcycle range between about 25-110% of that of a car. Yet the data presented shows a bike creates less than 18% of the emissions of a single occupancy car at similar and typical commuting speeds. Note that the 110% estimate does not appear to accord with either common sense or the laws of physics, given the vastly lighter mass and air resistance of a PTW versus any car. Furthermore, the 110% figure, even in TfL's own illustration,

relates to a PTW and a car travelling at about 115km/h. There is no proposal to increase speed limits to these levels in the ULEZ.

If one compares a motorbike with a car at realistic speeds, and also taking into account the accepted ability of a PTW to avoid being detained in congestion, we again see that the motorcycle has a far lower emissions footprint in any comparable scenario. In addition, the top speed of a typical commuting motorcycle, such as a 125cc Honda, is 105km/h. Thus even if a rider wanted to go at 115km/h, they couldn't. MAG is happy to share the workings of this data, and to supply the information provided by TfL to MAG in the Silvertown talks regarding these figures.

To summarise, the generally accepted view is in relation to the relative insignificance of PTWs in terms of emissions. For the avoidance of doubt, a report by the IPPR further confirms the negligible contribution by PTWs – their report excludes this mode of travel entirely from their charts (6). There is no suggestion – and there never has been - that PTWs make any significant contribution at all to NOx in Central London.

### ***Consideration of PM emissions creates a case for either exempting PTWs or charging electric vehicles***

There are other emissions. PM2.5 and PM10 (meaning Particulate Matter with a diameter of 2.5 and 10 microns) is an example of a particulate that is said to cause harm to health. However, 35% of PM10 emissions come from tyre and brake wear. TfL is inviting comment on whether this emission (which is particulate not gaseous in nature) should also be charged.

It is beyond MAG's remit to hold a position on taxing diesel vehicles, as no diesel motorcycles or scooters currently exist. However, there is an important additional element here – one based on the need for consistency regarding what is charged and what is not. Since an electric vehicle has brakes and tyres, it is reasonable to assert that, on account of its mass, six times more kinetic energy needs to be dealt with by the brakes and tyres of an electric car than by a PTW (and in the case of an average small 125cc vehicle the differential is nearer to 9 times more – even including the rider). Even if there is a degree of 'energy conservation' between power storage and kinetic energy, there is no doubt that an electric car generates more PMs than a motorcycle. The Government is correct to recommend exclusion from the charge of these lightest polluting vehicles on the road in terms of PMs if they are recommending the exemption of electric vehicles. Any other approach would be an inconsistency. In this sense, if PM emissions are to be taken into account, there is more reason to charge electric vehicles and even less reason to charge motorcycles.

It is also worth observing that Westminster and Kensington and Chelsea – the two Boroughs with the highest PM2.5 levels in the country – are also enjoying some of the highest life expectancy figures in the land. We return to this curious fact in our supplementary section, below, together with references.

MAG's – and the Government's - argument is summed up in a Telegraph article confirming the view held by MAG that motorcycle commuting is good for the entire commuting population (7).

## Section 2

### ***The net effect of modal shift towards - and away from - powered two wheelers from other modes of transport.***

In the Capital, 59% of cars, according to TfL's data (8) for Central London, are single occupancy. Evidence generated by TfL (9) underlines the attractions for modal shift from car to bike in terms of reducing congestion and pollution. Motorcycles are shown to be effective at reducing the emissions generated in congestion by stationary traffic and at the same time reducing the emissions from the moving PTW versus a single occupancy car. It would defeat TfL's own emissions targets to disincentivise this shift through user charging of motorcycles (of any age). Any charge will effectively do that.

Each single occupancy car journey which is replaced by an average PTW journey reduces congestion and emissions. Every petrol or diesel powered car journey which shifts to a PTW typically reduces that user's emissions footprint by over 80%. If half of single occupancy car journeys were taken on PTWs, that would reduce the total relevant emissions of single occupancy journeys by almost 50%. While there would be a small increase in the level of emissions from motorcycles, this amount would still be negligible compared to the reduction in overall emissions.

TfL will again recall that evidence presented to MAG by TfL during the Silvertown Tunnel public inquiry also indicates a bike creates less than 18% of the emissions of a single occupancy car, like for like. If one compares a motorbike with a car at realistic speeds and also taking into account the accepted faster commuting velocities of a PTW, the motorcycle has a far lower emissions footprint. MAG is happy to provide all this evidence on request.

### ***The Government recognises the case for exempting PTWs***

The technical supporting document published by the Government supports this assessment (3). Page 62 (and repeated on page 63) states:

*The impact of including motorcycles and mopeds in CAZs have not been modelled. These vehicles only represent a small proportion of total NOx emissions so it is not expected that they will be included in the access restrictions for the majority of zones.*

Again for completeness, MAG explored extreme cases of very high density motorcycle usage. Research in Vietnam was conducted – it is a country with very high dependence on powered two wheelers (11).

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The research concluded that, even with a motorcycle flow of 11,000 units per hour at some junctions, it was still unlikely that a reduction in PTW density would reduce congestion. Such a reduction in PTW usage could actually increase congestion, because of modal shift to other forms of vehicle. This makes intuitive sense. With increased congestion comes increased pollution. Although the circumstances in the UK and Vietnam are evidently not identical the message is clear: in any credible modal shift scenario, higher PTW usage means lower emissions.

The Government proposals in the technical document (3), for example on page 92, consider promoting Ultra Low Emissions Vehicles (ULEVs). This option would seek to extend the existing plug-in car grant set up by Government which incentivises the adoption of ULEVs, comprising both battery operated vehicles and plug-in hybrid electric vehicles. By securing additional funding, it is envisaged that around 160,000 ULEVs would be purchased over a three-year period. As ULEVs have low NOx emissions, air quality improvements stem from the assumption that each additional ULEV is replacing a conventional car.

Finally, TfL has included a precedent in its documentation, specifically in regard to a motorcycle charging exemptions. This has appeared in its consultation document regarding Silvertown Tunnel (11). This states:

*TfL's approach to developing a user charging strategy is underpinned by the following principles:*

*(a) The impact of the system upon individual road users should be seen as fair;*

*(f) The charge scheme should be cost effective - with the charging method delivering the expected outcomes while also providing value for money; and*

*(g) Charges should as far as possible relate to the amount of use made of the scarce road space and promote the wider goals of the Transport Strategy.*

For the reasons already outlined, all three of these points are assisted by the exemption of motorcycles. This is for three reasons: it is not fair to charge motorcycles of any age, given their net contribution to reducing emissions; charging will work against the expected outcomes; and charging ignores the fact that filtering motorcycles reduce the overall use of road space, thereby reducing traffic and congestion.

#### ***'Cradle to grave' analysis and secondary emissions***

MAG suggests it would be useful to conduct a 'cradle to grave' analysis of the full effects of these electric and hybrid cars, motorcycles and other vehicles. The production costs, in environmental terms, are enormous, especially with the construction – and for that matter, disposal – of the vehicles.

Whilst electric and hybrid vehicles may reduce emissions at the point of operation – though they still produce PMs from tyre and brake wear – the overall emissions in production are substantial. The production of the electricity, in the real world of the UK in the early 21<sup>st</sup> Century, also creates emissions. MAG believes PTWs have a vastly lower production footprint and commuting on powered two wheelers contribute less to the global emissions equation than the electricity generated for electric vehicle operations.

Within the specific goals of the ULEZ, TfL could legitimately argue that it is beyond its circle of concern to address the question of overall emissions, Yet it is nonetheless within TfL's circle of influence to help London lay its part as a global role model towards reducing these emissions. The more important local warming and emissions are to the London authorities, the more they may wish to take these macro considerations into account.

While it may also be theoretically possible to create a zero emissions power grid, this prospect is not credible in the medium term. Creating policy on hypothetical future scenarios which are, at the very least, decades away, is not credible or rational.

We also note that TfL has at no point sought to address the effect of electric vehicles on congestion, which in turn generates NOx through the secondary effect of non-electric cars which are caught in congestion to which electric cars directly contribute and to which motorcycles essentially do not. Again, if the only goal is the reduction of emissions, the replacement of electric cars with motorcycles would improve the situation. Research has shown (12) that a 10% modal shift from cars to motorbikes creates a 40% reduction in congestion. This statistic applies as much to electric cars as it does to any other form of car. This appears to be an unarguable point.

At the Silvertown Tunnel public consultation TfL has stated if electric cars rise to some unstated larger percentage of London traffic at some point they will be charged for entering the city. This recognises that at some point the environmental (and within this, congestion) impact of electric cars will become significant at some vehicle density. Again, we need consistency. Specifically, there should be no charge until such time that it can be shown a further increase in motorcycle traffic increases net emissions in the city. Until then, unless electric cars are charged for their direct (PM) contribution to emissions and indirect contribution (through contributing to congestion) to NOx, then it is impossible to justify charging motorcycles.

It goes without saying that hybrids generate both NOx and PMs and once again any exemption for these vehicles has to mean powered two wheelers are also exempt.

### ***Social justice and charging***

There is a social injustice if motorcyclists relying on older vehicles are charged. A proportion ride to and from work on small powered two wheelers purely because that is the cheapest way to get around. The evidence cited already illustrates this is a major consideration for motorcycle commuting in London. Charging low wage earners an emissions charge when they produce almost no emissions compared to alternative modes of transport is unfair. Many ride only because that's the most affordable means of transport. Forcing them to opt for comparatively more expensive public transport alternatives risks introducing a social injustice as the 'tax' is disproportionately greater for the lower wage earners. MAG is seeking to quantify the actual effect in this regard. Note that the cost of purchasing a post Euro 3 machine is in many cases prohibitive for this category of commuter.

MAG suggests the data already cited indicates an exemption for PTWs helps many of the poorest commuters at the same time as reducing emissions overall. Thus, modal shift away from other forms of transport towards PTWs is entirely in line with the goals of ULEZ and maintains access to a socially important commuting option. The only equitable and consistent arrangement is an exemption for Powered Two Wheelers, in keeping with the arrangements throughout the rest of London in terms of user charging.

For reference, MAG has obtained an assessment of riders' social groupings according to data collected through the profiles of those purchasing motorcycle insurance. This indicates that, using

employment as a guide to socio-demographic profile as collected by Bikesure, the following is the case:

A = 5%

B = 7%

C1 = 23%

C2 = 12%

D = 41%

E = 3%

Retired/not advised = 2%

Students = 7%

This means that 79% of riders insuring with this firm are C/D/E. This does not suggest particular wealth or opulence on the part of the riding community. Again, these are real figures from the insurance marketplace and MAG is happy to provide all references.

Many related points have been extensively covered in the Motorcycle Action Group's submissions to the Silvertown Tunnel enquiry which was conducted during 2016-2017. MAG is happy to provide all these documents at any time on request to TfL.

#### ***The Mayor of London's stated position towards motorcycles***

It should also be noted that the Mayor of London, Sadiq Kahn, has overtly supported the case for enabling motorcycle use in London. The Mayor, in 'The Road' magazine in April 2016 (13) wrote:

*'As Mayor, I'll work with the motorcycling community to make sure that riders' rights and interests are taken on board as an integral part of the transport mix in the city. It's clear motorbikes and scooters generate far less pollution, save time and money for the rider - and don't create congestion. It's absolutely right for us to enable powered two wheelers to play their part in delivering a less congested road network... one clear policy area is the case for a more consistent approach to bikes in bus lanes – a scheme which has proved itself effective, without creating undue problems or risks for other road users such as cyclists. But riders can fall foul of regulations because boroughs don't all have the same approach. As Mayor, I'll work to create consistency across the city to make bus lanes open to riders throughout the Capital...I will meet with representatives of riders' rights organisations and learn at first-hand what you need and want....Politics is a dialogue, so that will be the beginning of what I hope turns out to be a very productive relationship between you and the city. From bikes carrying urgent blood supplies, Internet shopping deliveries through to commuters - this city IS big enough for all of us as long as we co-operate together.'*



MAG suggests that it is fully consistent with this commitment to exempt motorcycles from user-charging in the context of the ULEZ. Given the overwhelming evidence in favour of an exemption, and the spirit of the Mayor's commitment, to charge powered two wheelers would contradict the Mayor's policy statement.

### Section 3

#### Specific policy proposals relating to PTWs

In the light of our research and understanding of the benefit of modal shift to PTWs in the interests of reducing emissions both locally and globally, MAG proposes the following policy framework:

- 1 Exemption of PTWs from Clean Air Zone charging – specifically the ULEZ - on the basis that modal shift to PTWs currently reduces overall emissions.
- 2 Consistency of treatment regarding PMs – including in relation to electric vehicles, buses and other machines.
- 3 Access to bus lanes across London to further reduce commuting times for PTWs, reduce congestion and thereby reduce emissions which is the goal of the scheme.

On a separate point which, in fact, relates to all traffic, it is prudent to consider removing speed humps from the road surface. This carries with it three advantages:

- Conservation of fuel, reducing emissions.
- Reduced wear and tear on vehicles.
- With certain speed humps, an end to the tendency for vehicles to travel towards the centre of the road, thereby increasing the risk of collisions or traffic being slowed by two vehicles both seeking the centreline.

Motorcycles can pass through the spaces between humps when this arrangement is in place. However, they can be obstructed by other vehicles which accelerate and decelerate and therefore cause the biker to also suffer the additional cost of accelerating and braking. MAG supports the guidance for the removal of raised road obstructions.

#### ***Economic factors and the precedent of cycle lanes***

TfL should also revisit the increased emissions generated by the wholesale of additional cycle lanes. This has unquestionably increased congestion and therefore emissions. It is contradictory to introduce user charging to reduce emissions whilst persistently introducing segregation schemes which increase them. The apparent insistence in TfL regarding this strategy indicates that reducing emissions is not the prime consideration for the authority. As such, the many other advantages of promoting easy access and toll free riding for motorcyclists must also be factored into the equation. To favour cycles despite the obvious limitations regarding their use, whilst disfavouring the economically far more significant and longer range capabilities of powered two wheelers would be blatantly discriminatory. MAG is confident that TfL will wish to avoid this sort of discrimination, especially given the fact that, on average, the older the motorcycle, the less wealthy the rider is

likely to be. MAG is generating data based research to quantify this assessment of wealth, commuting and motorcycle use.

The economic cost of increased journey times must also be taken into consideration. Since it has already been shown that TfL is taking other factors into account, for example by trading greater cycle lane capacity in exchange for increased emissions from congestion, the authority need to consider the cost to the London economy of this lost time.

MAG is always willing to provide any further information upon request, and would be eager to meet with TfL our proposals at the earliest opportunity.

#### **(Supplementary) Section 4**

##### ***Analysis of claims about air pollution and effects on human health.***

MAG has included this supplementary section because, while preparing this response, MAG examined what is known and not known about the effect of air pollution, using the content and references in the documentation published by the Government in their consultation about improving air quality. We sought to understand the net impact of air pollution, and how these claims are then used to guide policy. While we recognise that this section is not associated uniquely with motorcycling considerations, we believe what we discovered may be helpful to the overall debate.

In the course of this analysis, we delved down as far as four levels into the source material and data sets referenced in the Government's and TfL's materials, particularly in the technical report (3). We have included the key documents we looked at in the references. This is not a complete account of all the materials we have investigated – just the most relevant ones (MAG examined approximately 40 different sources).

While incidental to our overall policy proposals, our analysis did raise some questions about the relationship between nitrogen oxide related gases and health effects. This is relevant to motorcycles because TfL is considering introducing measures to reduce NOx and NO2, and this touches on PTWs. Motorcycles generate a miniscule proportion of these gases in relative terms anyway. We wanted to see if these tiny levels could be reasonably considered harmful.

There are two elements here – the impact of these gases on health, and whether the production of such gases can be reduced through a modal shift towards motorcycles – which we cover later.

##### ***Health effects of emissions***

Dealing with the first of these elements, in studies cited in the Government's documentation, the negative health effect of these gases is questioned. The report labelled '*Hoek G, Brunekreef B, Goldbohm S, Fischer P, van den Brandt PA. Association between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. The Lancet 2002; 360: 1203-1209 (14), states:*

*'Because of the much higher concentrations of nitrogen dioxide associated with gas cooking than those recorded from traffic emissions, this pollutant probably does not cause death. Furthermore, results of experimental studies have shown little response to high nitrogen dioxide concentrations in*

*volunteers. The large number of ultrafine particles might be associated through pulmonary inflammation and release of mediators in the blood with increased plasma viscosity. Increased plasma viscosity could lead to cardiovascular events including death.'*

The report challenges claims about the effect of NO<sub>x</sub> on humans. While MAG recognises that the Government feels an obligation to achieve set legal targets for the emissions of these gases, the science seems to suggest the health effects are not as unequivocal as has been claimed.

Other research confirms a further issue about the relative health importance of emissions versus poverty. Confounding factors show up in the technical report (3). Page 130 states:

*'Air quality inequalities were largely an urban problem*

- *There were higher concentrations in the most deprived areas by 4.4µg/m<sup>3</sup> NO<sub>2</sub>*
- *Ethnically diverse areas had increased exposure of 10.1µg/m<sup>3</sup> NO<sub>2</sub>*

*Across the literature reviewed, there is a notable negative correlation between income and exposure to NO<sub>2</sub>. On this basis, any action that focuses on reducing the highest concentrations of NO<sub>2</sub> will disproportionately benefit lower income and more ethnically diverse groups. There is also strong evidence to show that more socio-economically deprived populations, as well as being more exposed, have a higher proportion of people with risk factors that make it more likely that they will be detrimentally affected by poor air quality. This includes children and people with pre-existing illnesses.'*

This implies other health risk factors are already present in the socio-economically deprived population. Yet this appears to be discounted when air quality effects are taken into account. Health problems, it seems, are disproportionately attributed to bad air quality rather than poor living circumstances or poverty. The report does not appear to acknowledge other factors could lead to illness, regardless of air quality, and that these could be *more important* factors.

MAG suggests the link between health and air quality has not been conclusively proved – at least not in the data presented in the report because it seems to say certain categories of citizens are more likely to be experiencing risk factors to their health and then makes the assertion that higher levels of NO<sub>2</sub> to ill-health are responsible. We could not find a robust, quantified causal link between NO<sub>2</sub> (in this case) and increased illness. To an extent, and to our surprise, we found the opposite. In one section of these supporting documents (15) on page 5 it states:

*'Examples of unacceptable variation in health outcomes are illustrated if we compare a relatively affluent Local Authority, like Westminster, and a relatively deprived Local Authority, such as Newham. For instance, if we look at early deaths from heart disease and strokes from 2007-09, the rate per 100,000 population is 62.05 in Westminster and 116.65 in Newham. Also the life expectancy in deprivation quintile 3 (2005-2009) for Westminster is 83.59, whereas the figure in Newham is 73.93. These local authorities are separated by nine stops on the Jubilee tube line.'*

### ***Life expectancy – an anomaly***

Life expectancy in Westminster is about 10 years longer than in Newham. Elsewhere (3) it states, again without any ambiguity, on page 128:

*‘...on average, air quality is low even in areas of London that are generally considered affluent, such as Westminster.’*

At the very least, the relationship between air quality and health in this example is unproven.

MAG also looked at particulate contamination. In terms of the levels of anthropomorphic PM2.5 (16) in the atmosphere in Westminster, it far exceeds that in Newham. Yet life expectancy is much longer in Westminster than in Newham. This implies that, whatever effect air quality has on life expectancy, other factors have a far greater effect.

Is this a consistent finding across the data? Yes. The life expectancy in Fermanagh (17), which has the second lowest level of anthropomorphic PM2.5 in the UK (16), is lower than that in Westminster. For completeness, the location with the lowest recorded PM2.5 in the United Kingdom, Eilean Siar (16) has an even lower life expectancy (18). Indeed, in this ‘record’ clean air zone life expectancy is below the national average (19).

To summarise, life expectancy can be long – and above the national average - in areas explicitly cited as having some of the poorest air quality, including the location measured as having the highest mean anthropomorphic PM2.5 (Westminster). By contrast, the place with the lowest average PM2.5 (Eilean Siar) is below average in terms of both male and female life expectancy. Air quality does not correlate to life expectancy. Whatever the impact of poor air quality, it seems safe to say other factors have a greater effect which overwhelm the effect of air quality. It also calls into question the validity of introducing PM related tolls – but if they are to be introduced, it ought to be done with consideration for the levels produced by different vehicles. If Motorcycles are to be charged a toll, then electric vehicles should certainly be charged. Alternatively it could be accepted that either PMs are not a legitimate emission regarding charging or that the threshold for charging falls below that emitted by certain diesel engines and above that emitted by electric cars. If the latter path is chosen, motorcycles must most certainly also be exempted.

Incidentally, the London Borough with the highest life expectancy is Kensington and Chelsea, far ahead of the majority of the city (20 & 21), even though it shares with Westminster the highest levels of mean anthropomorphic PM2.5 in the city. (16). Ironically, that would suggest that if PMs are seen as a prime health factor, higher PM levels improve life expectancy. It seems likely that either PMs have a negligible effect at normal levels of presence and that other factors, such as wealth, poverty and lifestyle choices and access to health provision are far more significant and make the impact of PMs effectively unmeasurable.

This assessment appears to be confirmed within Government documents (3). On page 165 it states:

*The Committee on the Medical Effects of Air Pollutants (COMEAP) has noted that there is no clear evidence for a threshold effect from exposure to NO2. Therefore, during the modelling it has been assumed that mortality changes in a linear manner with changes in NO2 concentrations. The impact on the analysis in this report, were a threshold to be present, is expected to be minimal as the*

reduction in concentrations through the measures is focused on populations with higher levels of exposure. A threshold effect is a dose or exposure concentration below which a defined effect will not occur. To reflect the range of current evidence of the mortality effect associated with NO<sub>2</sub> concentrations, the central risk coefficient (2.5%) has been compared against the range of risk coefficients as recommended by COMEAP (1% and 4%). Using COMEAP's lowest risk coefficient of 1%, the benefits of reducing NO<sub>2</sub> are 40% lower than the central estimate. In contrast, the maximum risk coefficient leads to estimated benefits that are 60% higher than the central estimate (Table 8.10).

We suggest the range of estimates regarding health effects is so wide as to be meaningless. Also, the assumption that mortality changes in a linear manner with changes in NO<sub>2</sub> concentrations seems to be a working assumption which does not follow from the data. As such, there seems no reliable data to associate realistic levels of PMs with health effects.

### ***In any scenario, motorcycles help London reduce emissions to legal levels***

MAG appreciates there may be a legal motivation to addressing air quality issues. On page 182 of the same document (3) it states:

*'The UK has signed up to tough legally binding ceilings in 2020 and 2030 for emissions of five major pollutants (NO<sub>x</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NH<sub>3</sub>, and NM-VOCs). These ceilings will require significant reductions in emissions (Table 9.4).'*

Recognising that these legal targets are in place, we simply suggest that it may be worth reviewing the evidence on which the policy is being developed. World Health Organisation data (22) also highlights the need for caution regarding making these claims, as summarised in their *Review of evidence on health aspects of air pollution – REVIHAAP Project Technical Report*. Note also that the document entitled *Public Health Outcomes Framework*, and published in November 2011, cites air pollution is ONE of 65 factors for consideration (23). Again, perhaps it is worth considering what is proportionate in terms of ascribing a link between health and air quality.

While there are attractions in a precautionary principle, there do seem to be anomalies in the conclusions versus the data. Given that PTWs help reduce the emissions under scrutiny, these findings are pertinent to the overall debate. The arguments for exemption of PTWs still stand.

### **References**

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