



# Powered Two Wheelers: An Air Quality Solution



Colin Brown, Director of Campaigns &  
Political Engagement  
The Motorcycle Action Group



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## Motorcycle Action Group

The Motorcycle Action Group (MAG) is the leading voice for riders' rights in the United Kingdom. With 57,000 members, we represent the interests of 1.5 million regular motorcycle and scooter users, and 5 million occasional riders in the UK. MAG was established in 1973.

The term Powered Two Wheeler (PTW) covers all forms of motorised two-wheel transport, including motorcycles, scooters and mopeds.

## Introduction

In July 2017 Defra published a UK Air Quality Plan for tackling nitrogen dioxide [1].

The UK Air Quality Plan for tackling nitrogen dioxide (NO<sub>x</sub>) sets out the draft proposals of the Government for bringing nitrogen dioxide levels down to acceptable levels across the UK, with a particular focus on those 100 major roads which, national modelling suggests, will continue to have air pollution problems (NO<sub>x</sub> exceedance of EU Value Limits) in 2021, mostly in cities and towns.

The Plan expects that local actions will be taken to address these problem areas. Local authorities already have air quality obligations under the Environment Act 1995 to monitor air pollution and take action where it is found that it is unlikely to meet national targets. The Plan goes further to list all those local authorities with roads that have NO<sub>x</sub> levels above the legal limits based on national modelling, and identifies those local authorities with areas where exceedances are projected beyond 3 to 4 years, either by urban traffic or on a road that passes through or around a town or city. Local authorities with persistent exceedances are required to undertake local assessments to consider measures to reduce NO<sub>x</sub> levels to within the legal limits within the shortest time possible and submit initial plans to Government to be approved.

The threat of court action and fines is defining the agenda, as much as measurable health benefits. The key driver that all local authorities need to recognise in their assessments is “within the shortest time possible”. This requirement implies that authorities and government need to fully consider any and all possible solutions, and should be particularly interested in policies that can be delivered today.

The Motorcycle Action Group’s review of the UK Air Quality Plan reveals that the Government is taking a localised approach, which involves devolving responsibility to local authorities to consider their own local solutions. The plan’s suggestions for possible alternative policies to charging Clean Air Zones (CAZs) are vague and far from comprehensive, thus leaving individual authorities with a task to develop their own localised solutions. MAG expresses concern that this will lead to a range of different solutions rather than a co-ordinated and global approach to improving air quality. MAG believes that this approach is detrimental to arriving at a logical and harmonised approach to improving air quality.

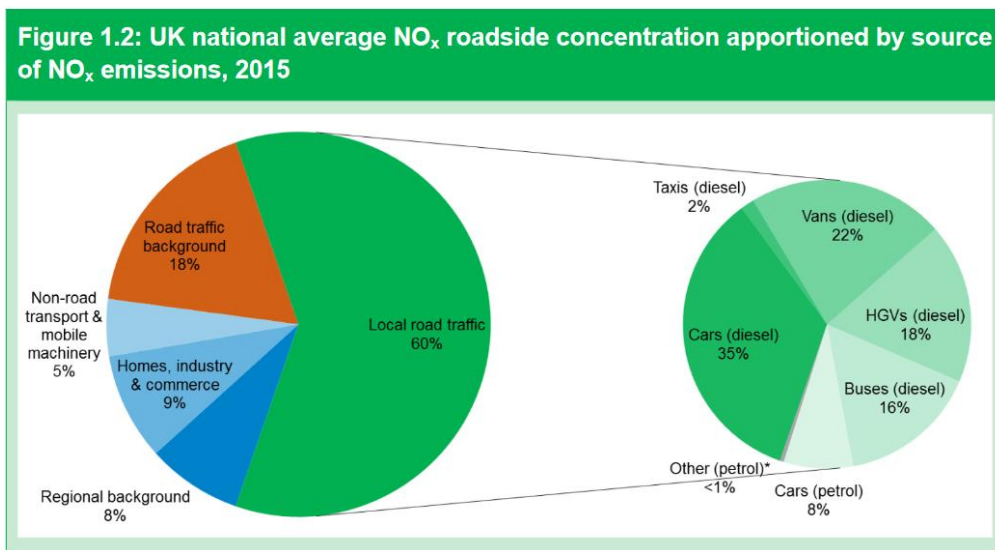


With regards to PTW's, MAG welcomes to some extent the comment contained in the Technical Report [2] which states "The impact of including motorcycles and mopeds in CAZs have not been modelled. These vehicles only represent a small proportion of total NO<sub>x</sub> emissions so it is not expected that they will be included in the access restrictions for the majority of zones."

However this statement equally demonstrates that there has been no consideration of the global benefits that are currently delivered by PTWs in terms of air quality. Equally there is no recognition that promotion of a modal shift from single occupancy cars to motorcycles is a viable and immediate solution that should be considered.

**MAG recognises that riding a motorbike or scooter will be beyond the skill or inclination of many, but more modal shift from cars or vans to powered two wheelers improves air quality. It is utterly incongruous to introduce a charge on powered two wheelers when these actually contribute to the goals of a charging scheme.**

An analysis of the contribution to pollutants reported in the Technical Report states that the category of "Other (petrol)" is <1%.



This category is generally taken to refer to motorcycles, but the report states "Other (petrol) is made up of petrol vans and motorcycles." Reports produced by Transport for London (TfL) consistently report - erroneously - that motorcycles contribute <1% of emissions.

However the actual figure for motorcycles, as revealed in data from the National Atmospheric Emissions Inventory [3], amounts to 0.3%.

**MAG would contest that, in failing to consider the potential benefits of modal shift to PTWs, the UK Government and any local authority is being negligent with respect to its duty to consider all options to improve air quality standards “in the shortest possible time”.**

This document sets out the case for modal shift to PTWs, addresses potential issues raised against following such a policy and suggests a number of simple actions to promote modal shift.

The Motorcycle Action Group would welcome the opportunity to work with any authority wishing to understand more or develop policies to promote modal shift to Powered Two Wheelers.

Please contact us at:

The Motorcycle Action Group Limited

[www.mag-uk.org](http://www.mag-uk.org)

email: [central-office@mag-uk.org](mailto:central-office@mag-uk.org)

Tel: 01926 844064

Unit C13, Holly Farm Business Park, Honiley, Kenilworth CV8 1NP

## The Case For Promoting PTWs

### Evidence that Modal Shift to PTWs Reduces Congestion and Pollution



The most in-depth and reliable study into the effect of modal shift from single occupancy cars to PTWs was conducted in 2011 by Transport & Mobility Leuven. Their report “Commuting By Motorcycle: Impact Analysis” [4] clearly shows that in a scenario where there is a 10% modal shift overall emissions are reduced as follows:

CO2:	-7.5%
NOX:	-5.5%
PM2.5_exhaust:	-4%
PM2.5_non-exhaust:	-16%



MAG has contacted TM Leuven who confirmed that, whilst the study was completed in Belgium, they had originally planned similar test models in the UK, including for London, Birmingham and Manchester. They are willing and able to complete these studies in the UK if the necessary funding is made available.

MAG would contest that Central Government funding is available to all local authorities for conducting the necessary research, and that this would be a logical route to take.

There is also a TfL research study specifically relating to PTW access to bus lanes: “Evaluation of Journey Time and Emissions of PTWs in Bus Lanes” [5]. Whilst we appreciate this is specific to bus lane access, the results do add real-world testing evidence that PTWs produce lower levels of pollutant than cars. The report demonstrated that:



- Small petrol cars emit an average of 6 times more CO<sub>2</sub> than small PTWs using bus lanes.
- Small petrol cars emit an average of 6.5 times more Oxides of Nitrogen than small PTWs using bus lanes.
- Medium petrol cars emit twice as much CO<sub>2</sub> on average as medium PTWs using bus lanes.
- Medium petrol cars emit an average of 1.5 times more Oxides of Nitrogen than medium PTWs using bus lanes.
- Large petrol cars emit twice as much CO<sub>2</sub> on average as large PTWs using bus lanes.
- Large petrol cars emit an average of 2.5 times more Oxides of Nitrogen than large PTWs using bus lanes.

Small petrol cars emit an average of 6.5 times more Oxides of Nitrogen than small PTWs using bus lanes.

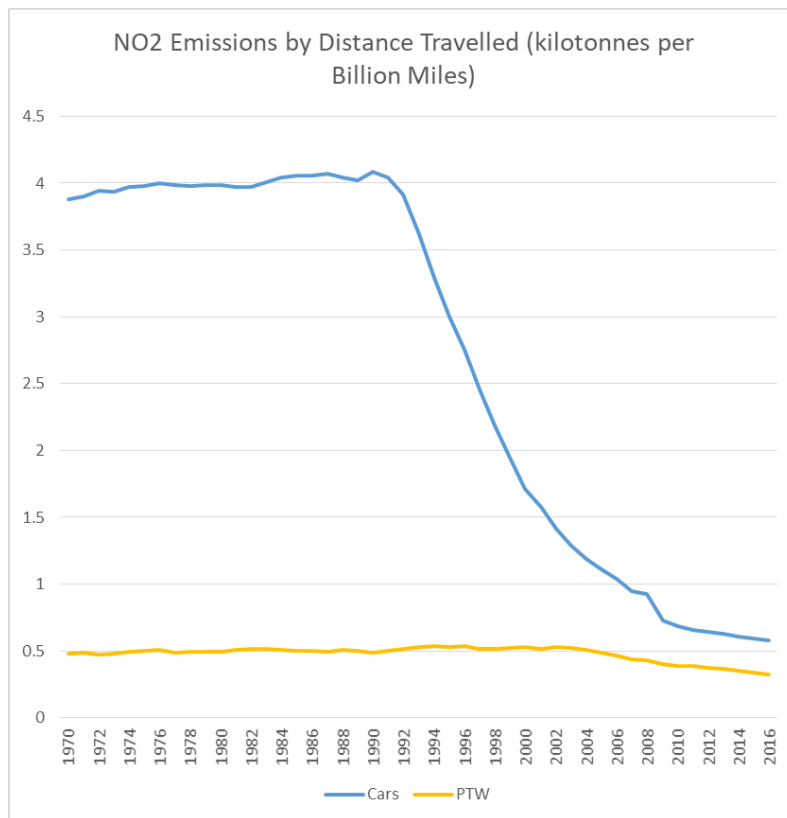
[Transport for London](#)

Some authorities currently permit access to bus lanes for PTWs. Whilst benefits on routes not having bus lanes will be reduced there is still the advantage gained by filtering through congested traffic.



## Evidence of Real World PTW Emissions in the UK

Currently motorcycles represent approximately 1% of trips nationally. Clearly at this level of road transport share, PTW emissions are going to be a small proportion of the overall emissions. In order to assess the effect of positive modal shift from cars to PTWs it is necessary to consider how emissions will be affected by a greater share of road trips being made by PTW. If, as is sometimes suggested, mile for mile, PTWs emit more emissions than cars, then a modal shift would be detrimental.



MAG’s analysis of data from the National Atmospheric Emissions Inventory table of emissions by vehicle type [3] and the DfT statistics for Vehicle Miles by Vehicle Type [6] confirms that PTW emissions are much lower than car emissions on a mile-for mile-basis. This calculation is based on current real world performance, meaning modal shift to motorcycles as a solution for reducing overall emissions with the current vehicle fleet is entirely legitimate. The choice for road users to switch a proportion of their journeys from cars to PTWs will reduce overall NO2 emissions.

## Charges on powered two wheeler users are socially regressive

Road User Charging schemes inevitably have greatest impact on the poorest and least privileged road users in the UK. MAG can supply conclusive evidence that commuters using powered two wheelers are, on average, lower income earners. As such, the taxes are socially regressive as a percentage of income which is required to pay them.

Imposing a charge of up to £12.50 per day on those who will only be able to afford a non-compliant scooter is going to do nothing for air quality. MAG is able to offer examples of low-paid essential workers who often work unsociable hours, and students from low or negligible income backgrounds, who depend on such vehicles. The social harm the charges will do can therefore be illustrated through hard facts. Many of these individuals simply cannot shift to walking, cycling or public transport for practical or economic reasons. Any daily charge on this group of riders is a crushing economic blow which has not been justified by any air quality evidence.

## Precedent



There is recent precedent in the UK for promoting a modal shift to motorcycles. Northamptonshire County Council has fully accepted the policy laid out in the Motorcycle Safety & Transport Policy Framework [11], and is making positive policy decisions to actively promote the mode.

“As part of our modal shift strategy Northamptonshire County Council embraces motorcycles and scooters as a sustainable transport mode within the countywide transport programme. Greater use of motorcycles can bring environmental, congestion and accessibility benefits particularly on journeys made for commuting to places of employment or education.” [7]

There is again recent European precedence for exempting conventionally powered PTWs from charging Clean Air Zones in Sweden.

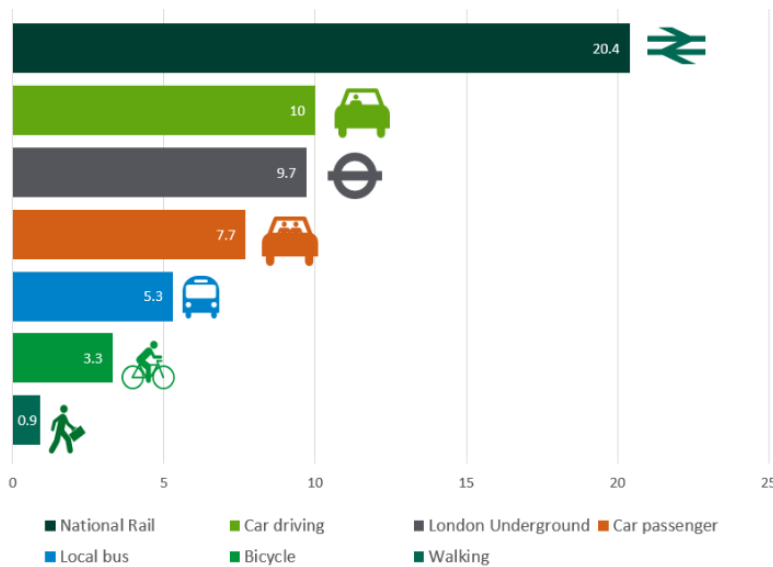


“From 2020 the local authorities in Sweden can choose to introduce three different low emission zones. When SMC was consulted last year, the Swedish Transport Agency proposed that only emission-free powered two-wheelers would be allowed in Zone 3. It was a pleasant surprise that the Government decided against the proposal from the Swedish Transport Agency and will now allow motorcycles and mopeds in all zones.” [8]

## Short and Long Term Impact

The Department for Transport’s publication, *Commuting Trends in England 1988 – 2015* [9] highlights the fact that “More than half (56% in 2013/14) of commuting journeys are made by car as a driver.” This prevalence demonstrates that alternative modes, including public transport, cycling and walking, are not as viable as personal motorised transport for the majority of commuters.

Simple consideration of the average commute distance by transport mode reveals the practical void between active travel and motorised transport. This gap explains the prevalence of cars as the dominant mode of transport. If embraced in transport policy, PTWs can provide a more environmentally sound, low-emission alternative form of personal motorised transport.



**Figure 14** Average distance of commuting journeys in miles, by main mode (2013/14). Source: National Travel Survey

The ONS 2011 Census Analysis - Distance Travelled to Work [10] shows that the average cycling commute is less than 6km and the average walk is less than 2km. It is unrealistic for typical commuters making an average daily round trip of 30km overall, and in London 22km, to walk or cycle to and from work. A modal shift from single occupancy cars to PTWs is achievable in the immediate short term as there is no requirement

for any change other than behaviour. There is currently a large proportion of enthusiast riders that ride for pleasure only. Well over one-third of current UK driving licences carry the relevant AM, P, Q, A1, A2 and A categories, demonstrating that there is an existing pool of suitably trained road users to enable this modal shift. By changing behaviour to make the motorcycle a natural choice for commuting, a significant percentage of single occupancy car trips can be replaced by PTW trips.

For those who do not find walking, cycling and public transport currently to be a viable alternative to car journeys, there is potential to reduce air quality implications of any journey by making trips on powered two wheelers.



In the longer term an immediate behaviour transfer and training of drivers to use PTWs will increase the benefits that can be gained by the relative benefits of electrically powered motorcycles over electrically powered cars.

Simple physics dictates that electric cars require more power than lighter weight electric motorcycles. Electric motorcycles therefore produce less strain on the power

generation industry to meet the increased demand for electricity that will result from the phasing out of fossil fuels.

Electric cars also do not solve the secondary air quality issues caused by contribution to congestion. Electrically powered motorcycles will have the added benefit of reducing congestion as well as zero emissions.

Electric cars do create particulate matter as a result of brake and tyre wear. In fact, due to weight, electric cars produce more brake dust and tyre wear than conventionally powered cars. Again the simple truth that electric motorcycles are lighter than electric cars means that they will act to reduce production of harmful particulate matter.

It is clear, therefore, that zero emission PTWs will have a significant role to play as a mid- and long-term solution. This role can be maximised by ensuring there is successful integration, promotion and support for conventionally powered PTWs. Charging infrastructure for PTWs has failed to be mentioned in any plans. Failing to recognise the benefits of PTWs will result in failure to enable future benefits to be realised.

*Zero emission PTWs will have a significant role to play as a mid- and long-term solution.*



## The Case Against Promoting PTWs

### Safety

Given the benefits that modal shift would provide, we need to look at the claimed dis-benefits of such a modal shift.

The most commonly quoted dis-benefit for motorcycles is the poor Road Safety statistics for the mode.

There is evidence however that the increase in proportions of trips made by motorcycle will actually have a positive impact on Killed and Seriously Injured (KSI) statistics.

The Motorcycle Safety & Transport Policy Framework [11], a joint publication by National Police Chiefs' Council, Motorcycle Industry Association and Highways England, highlights that "when motorcycle use increases to 10% of the vehicle stock, sharp falls in casualties start to occur."

*"...when motorcycle use increases to 10% of the vehicle stock, sharp falls in casualties start to occur."*

There is real-world evidence from London, again provided by TfL, that increased proportions of PTW trips equates to reducing numbers of collisions. As a result of the introduction of the London Congestion Zone from which PTWs were exempt, there was a predictable increase in the proportion of trips made by PTW in the zone compared with the area outside the zone. This correlated with a reduction in collisions involving PTWs which was not measured outside the zone where the proportion of trips remained unchanged. "It is notable that the reductions in the number of pedal cycles, powered two wheelers and buses and coaches involved in accidents inside the charging zone are occurring despite an increase in the number of these vehicles entering the charging zone in 2004 compared to 2003". [12]

MAG therefore contests that a promotion of modal shift from single occupancy cars to PTWs is actually also promotion of reduced level of KSIs for motorcyclists.

## Crime

There are currently issues relating to crime and anti-social behaviour relating to PTWs. There have been high levels of “moped-enabled crime” in London, incidences of assault on public figures and members of the public as well as physical injuries to innocent members of the public caused by reckless riding of off-road bikes.

This is clearly not the kind of behaviour that any Council would wish to be seen condoning or facilitating.

MAG has consistently stated that part of the cause of this kind of behaviour has been a lack of support for and mainstreaming of motorcycles as a legitimate form of transport. The resultant lack of investment in secure parking facilities for motorcyclists is partly to blame for the ease with which motorcycles can be stolen and used for criminal and anti-social behaviour. By recognising and embracing the legitimacy and benefits of the mode of transport, there will be funding made available to both policing of the issue and provision of secure parking facilities to reduce the theft figures. As an example in the West Midlands, in 2016 motorcycles were 13 times more likely than cars to be stolen. A dramatic 78% increase in car thefts in 2017 meant that the figure reduced, but motorcycles were still 8 times more likely to be stolen than cars.

## Prejudice

The image of motorcycling has long been a major drawback to efforts to promote and realise the benefit of motorcycles as a legitimate mode of transport. Sadly there has been little leadership from central and local government to address this issue. In 2005, the DfT did launch a Motorcycle Strategy [13] aimed at making the mode an integral part of transport policy. As stated in the Foreword by David Jamieson, then Parliamentary Under-Secretary of State for Transport, “The principal aim of our strategy is to ‘mainstream’ motorcycling, so that all the organisations involved in the development and implementation of transport policy recognise motorcycling as a legitimate and increasingly popular mode of transport. We want to see an end to old stigmas and stereotyping – motorcycling can be a modern, practical way of getting around, and we all need to recognise it as such.”

*“... motorcycling can be a modern, practical way of getting around, and we all need to recognise it as such.”*

However, in recent years we have slipped back to a position where motorcycling is often viewed as a problem to be solved as opposed to a benefit to society that needs to be embraced and promoted.

## Practical Steps to Promote Modal Shift to Motorcycles

There are a number of steps that will promote motorcycles as a legitimate transport choice.

MAG accepts that as a transport mode PTWs will not be the right choice for all journeys in all circumstances, but by removing barriers to the option, the overall proportion of trips by PTW can be increased, thereby benefitting all by improving air quality and reducing congestion.

Many of these initiatives are listed in the MAG Pathways for Progress document [14], and some were actually incorporated into the Movement for Growth Strategy, but are yet to be delivered.

### **Promote PTWs as a viable option alongside walking, cycling and public transport**

Simply adding PTWs to the list of sustainable alternative choices to the car will help to raise awareness and legitimacy of the choice, allowing car users another option that bridges the gap between cycling and car driving for situations where personal transport is the only viable option.

This policy will necessitate equal and unbiased inclusion in all modal shift promotional activity and literature.

### **Appoint a Motorcycling Officer**

This would not necessarily be a new member of staff, but the role should be created to give a point of contact for an individual with the remit to champion and ensure that promotion of PTWs is embedded in all policy and communications.

### **Accelerate delivery of bus lane access across the UK**

Bus Lane access for PTWs is a decision for local transport authorities. Whilst many authorities are granting access, there is no consistent approach across the country. In some areas certain transport corridors may have different access policies along their length resulting in confusion and unfair penalties for unsuspecting users. For example, the access to bus lanes is inconsistent across the West Midlands (3 of 7 councils not allowing access). Simply delivering consistent policy across the region was agreed in the transport strategy but is yet to be delivered.

### Include guidance in planning policy and travel plans

Ensure that modal shift to motorcycles is promoted and enabled as a practical choice for new commercial developments.

### Promote and invest in motorcycle safety

Efforts to improve safety for motorcyclists need to be given equal priority and investment to cycling and walking. Small changes to road furniture design and placement, education awareness and training for all road users, and ensuring that motorcyclists are not adversely affected by safety initiatives designed to promote safety of other road users should be implemented.

There is not a large capital investment requirement in segregated infrastructure as in the case of cycling. MAG was involved in the production of the TfL Urban Motorcycle Design Handbook [15].

### Provide fit-for-purpose motorcycle secure parking and facilities

Provision of secure parking facilities that ensure motorcycle security as well as facilities for storage of motorcycle helmets and other Personal Protective Equipment (PPE) is imperative. If well thought-out and designed this infrastructure can often be made dual use to benefit both cyclists and motorcyclists.

### Incentivise use of zero emission PTWs

Provision of fit for purpose charging facilities and incentives to switch to zero emission PTWs.



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*The Motorcycle Action Group Limited*

*[www.mag-uk.org](http://www.mag-uk.org)*

*email: [central-office@mag-uk.org](mailto:central-office@mag-uk.org)*

*Tel: 01926 844064*

*Unit C13, Holly Farm Business Park, Honiley, Kenilworth CV8 1NP*