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Written evidence submitted by Dr Moshe Kinn (IAQ0035)

1. Some sources of air pollutants:

I understand that there are three main sources of pollutants from road vehicles. These are (1) emissions from the burning of fuels to move the vehicle, (2) from the wearing down of the tires when they rub on the road surface and (3) from the wearing down of the brake pads as they engage to slow the vehicle down.

2. Local government Road Layout policies: May be the problem not the solution

In the Governments' paper about tackling NO₂ concentrations, it only mentions the word 'congestion' once in reference to 'changing road layout' as being a solution. However, in my experience in Manchester, and in city centres or areas along roads where there are shopping parades local government road policy has changed the road layout and created huge congestion.

For example, in my area of Manchester we have Bury Old Road and Bury New Road, the two main arteries from the M62/M60 Motorway into Manchester City Centre. Over the last 15 to 20 years local government road policy has seen the introduction of bus lanes, cycle lanes, turning-only lanes, and the widening of the pavement around parking bay areas to guarantee that even when no cars are parked, the road is restricted to one lane each way. In residential areas humps have been placed in the road that cause braking and acceleration which was not required before they were installed. Every day, twice a day, like many main arterial roads in and out of city centres during rush hour (and in some cases up to 2 hours) very large stretches of these roads, become congested. This is especially true where the traffic flows from two lanes into the one lane bottleneck. Vehicles that are being forced to slow down and brake, and then accelerate to keep the traffic flowing are causing excessive wear on tires and breaks. This increases the level of pollutants in the exact place that we don't want it to be, along the shopping parades of our cities. I believe that part of the pollution problem is caused by local government policy that have caused the congestion themselves. The solution to road layout problems is to remove all restrictions thus increasing the flow of traffic and reducing the time traffic sits and pollutes poor air quality hotspots.

Many want to blame the congestion on the volume of cars, but is there any research to corroborate this? Have the researchers also taken into consideration newly installed road layouts? Research is needed to identify the extent that lane reducing policy has increased traffic jams and therefore localised air pollutants. In order not to falsely identify traffic volume as the only cause of high overall pollutant, the research must look to identify if roads have two lanes, then the high levels of pollution are restricted to a shorter time period than if there is one lane.

See Box 1 for some examples in Manchester where local government road management policies are causing major traffic congestion that is in my opinion, the direct cause of pollution:

BOX1

Before summer of 2017, Bury New Road at Prestwich village, had parking bays that if they were not in use were able to be used as driving or passing lanes. However, now they have been boxed in by bringing the pavement out such that this arterial road is reduced in the shopping area from two lanes each way to one. Also along the same road at the junction of Singleton Road and Moor Lane an only turn right lane into Singleton road has been installed on the north bound side. There is no traffic light signal for this right turn so cars wanting to turn have to wait in the middle of the road. This creates a bottleneck in rush-hour that reduced the road to a single lane even when there are no cars turning. In my experience perhaps less than 3 cars usually turn. Further toward Manchester city centre, they have installed a bicycle lane that reduces another stretch of road to one lane each way. The junction at Bury New road and the B6187 is a T- junction, with a right hand turn into the B6187. Coming out of the B6187 the road is turn-left only, therefore no cars can turn right into Bury New Road travelling south. However when the light is green on the B6187 the southbound lane on Bury New Road is red, this causes a bottle neck along Northumberland Street outside a local primary school and in rush hour can cause a backup along Bury New Road such that if it is green at the junction with Northumberland street the cars traveling south of Bury New Road have nowhere to go as the light is red a 100 metres up the road at the junction with the B6187.

The reader may find what I have written complicated, however the point is, that along this mile and a half to two mile stretch of a main arterial road, it has been local government road policy that has reduced the flow of traffic in and out of Manchester. The same has happened on Bury old road leading up to what we call Cheetham Village in both directions, and on a long stretch of the B6187 Great Clews Street with a very expensive yet, from what I have seen, little used bicycle lane that have reduced the road to one lane each way. If this is true in my areas I believe it is happening all over the country. For some reason, other than to increase air quality, reduce CO₂ emission and to reduce other particulates caused by slow moving and stop-start travel conditions, local road planners seem in the last 20 years, to have tried their best to create as many bottlenecks in the roads as they are able, causing daily long tailbacks and congestion. Which all increase air pollutants and carbon emissions. (Some sceptics have suggested, that it is a conscious road policy instituted by those who see cars as a means of local tax and therefore by causing traffic jams they can put forward the argument that volume of traffic is causing pollution and therefore tax is a solution to reduce volume. But do they look at how their road policy has reduced the flow of traffic which reduces air quality?)

3. The banning of petrol and diesel vehicles and the demise of the internal combustion engine

The Government proposal, to ban the sale of petrol and diesel vehicles and the demise of the internal combustion engine (ICE) (Section 6 of their plan), is in my opinion something that should never happen. The idea that the UK will by 2040, without nuclear fission, be able to generate enough electricity for millions of cars, on top of the electrification of the railways, without a massive increase in burning fossil fuels to generate the electricity is in my view unattainable. This could lead to a zero-sum gain.

The ICE is a very versatile piece of technology that can burn many types of fuels including clean bio-fuels and hydrogen. In fact, according to Professor Roy McAlister in Chapter 8 of his book *The Solar Hydrogen Civilisation* (ISBN: 0-9728375-0-7), burning hydrogen in an internal combustion engine can

act to clean the air and become a negative emissions vehicle. Hydrogen in the form of a gas can be burned in an ICE similarly to liquid petroleum gas (LPG), but using different technology. Therefore, a quick way to reduce emissions is to burn hydrogen as a gas in millions of ordinary internal combustion engines. Why are we using hydrogen in a fuel cell to produce electricity for locomotion? Fuel cell technology requires many types of rare-earth metals that will in the future become very expensive.

How much money is the Government presently putting into research that looks into the use of hydrogen as a means to reduce carbon emission and air pollution? Why have a policy that leads to the demise of the internal combustion engine, a technology that together with hydrogen can be a very sustainable solution? Did the Government consult with engine and hydrogen engineers when it made the decision that could cause the demise of the ICE?

A solution for future sustainable locomotion has to be to burn hydrogen gas in ordinary internal combustion engines.

4. Electric cars

Electric cars require rare-earth metals, large difficult to recycle batteries, a huge increase in electricity supply capacity in the UK, and they will still be providing rubber tire and brake disk pollutants, especially in congested areas. No vehicle can be said to be truly zero polluting, even ones that in operation make zero emissions.

I have seen research into the availability of rare-earth metals, many of which are abundant. The question is what will happen to their prices when demand across the world for electric cars reach into the tens of millions? Already the price of platinum has more than doubled in the last thirty years and, what will happen to its price when the demand for hybrid and electric cars reaches into the millions? Electric cars have their place, but are they the only solution to replace burning fossil fuels in internal combustion engines?

A solution to reduce many air polluting particulates is to burn hydrogen gas in ordinary internal combustion engines.

5. The use of smart traffic lights to keep the traffic flowing and reduce congestion

Everyone who drives has, at some point in their lives, sat at a red light with no cross traffic at all. These days every traffic lights should use smart sensors. Not only motion sensors that detect if any cars are approaching the junction, but time dependant sensors, that know from which direction a larger volume of traffic is coming from, so that they can be coordinated to allow maximum flow of traffic out of city centres at night and in in the mornings. Also if, as it is in London, every block has a traffic light, smart sensors should be used to increase the flow of traffic in the direction of the highest volume. From my experience in London, even at late night one could get through a few light and then one light seems out of sync and that's it. This may mean that at certain times of day, the light will be green for longer in a particular direction. In some roads near schools, toward in the morning and away in the evening, there should be traffic light that give priority to keep the school run traffic moving. These light may only be operational a few hours a day and only when the school is open. I am sure that there may be many more ways to use smart traffic light to keep the flow of traffic moving thus reducing local pollution.

A solution to increase the flow of traffic and thus reduce localised air pollution levels is to use smart traffic lights.

6. Congestion charge

If the problem is air quality, how can a congestion charge reduce the overall level of particulates?

The answer is it can't. All a congestion charge does is move the pollution somewhere else.

Furthermore it is a regressive tax. Who owns the older and more polluting cars those who can't afford to buy the newer or latest low emissions models. It will be the poorer and lower middle class who will now suffer this regressive tax. The solution has to be technical, which is as stated that these older cars can be upgraded to use hydrogen.

Solutions:

1. A solution to increase the flow of traffic and thus reduce localised air pollution levels is to use smart traffic lights.
2. A solution has to be to burn hydrogen gas in ordinary internal combustion engines.
3. Research should be carried out at air quality hotspots to ascertain what the road layout and traffic light coordination conditions now exist. If possible, perhaps looking at historical records, research should ascertain what level of congestion is caused by the road policy measures in place, and see if removing them and increasing traffic flow increases local air quality.
4. The main solution for reducing some of the poor air quality is, in my opinion, to keep the flow of traffic in, out and around our town centres optimised so that traffic jams are kept to a minimum.

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