

Action needed fast to address climate emergency

Efforts to reduce vehicle speeds and encourage behavior change can play an important part in helping the transport sector to reduce its carbon footprint, says Justin Ward.

'Climate emergency' was the phrase of the year for 2019 according to Oxford Dictionaries and – alongside many governments and the EU Parliament – half of UK local authorities have declared one.

Since the UK published its Climate Change Act in 2008 pressure on governments across the world to act on climate change has accelerated considerably.

In the 2008 Act, the Government was required to set five yearly carbon budgets, 12 years in advance, from 2008 to 2050.

The Government is required to consider – but not follow – the advice of the Committee on Climate Change (CCC, also created under the 2008 Act) when setting these budgets. Recent advice from the CCC flagged concerns to Government that, unless further progress is made by the transport sector, future carbon budgets may not be met.

Surface transport is the largest emitting sector in the UK, accounting for 23% of UK emissions, and they have not significantly reduced in recent years.

The headline target of the 2008 Act was amended in June 2019 to reflect the Government's net zero ambitions. The aim is to meet the 2008 Act's target



↑ Emissions from vehicles are a worry

LANA ELCOVA – SHUTTERSTOCK

of reducing greenhouse gas emissions by 100% (net zero) – by 2050 compared to 1990 levels. To understand how the steps to net zero are delivered for surface transport, it is fascinating to look at the forecasts by the CCC.

The committee provided a challenging, but perhaps achievable, scenario to 2030. It is said that real world conventional vehicle efficiency improves by 37% on average for new cars, 33% for new vans and by 24% for new heavy goods vehicles relative to 2010 and electric vehicles reach around 60% of new sales for cars and vans.

The CCC also offered a 'max' scenario indicating that it was technically feasible that even greater reductions in emissions could be made.

While low carbon technologies and fuels are crucial to reducing emissions from transport, individual behaviour can also affect emissions – from deciding to avoid a journey, choosing a lower carbon mode or altering driving style.

Last March the policy paper 'Future of mobility: urban strategy' stated that walking, cycling and active travel must remain the best options for short urban journeys and mass transit must remain fundamental to an efficient transport system.

The CCC, using the National Travel Survey, identified a set of car trips that might be amenable to switch to a lower carbon mode. This analysis suggested that 24% of car trips with the shortest length – representing 5% of car kilometres – could be switched to bus, cycling or walking given the appropriate policy support and investment.

Around 26% of urban trips could be shifted away from the car compared to only 16% of rural trips.

Part of achieving that shift lies in the application of careful policy making in shaping the environment; and therefore 'nudging' the choices we make within our environment.

↓ Environmental protesters gather in Whitehall



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For example, in October 'A Better Deal for Bus Users' noted that all new road investments in England which receive central UK Government funding will be required to either support bus priority measures or explain why doing so would not be necessary or appropriate in that instance.

The UK Network Management Board is looking to learn from measures such as bringing in speed restrictions to address climate change, as higher speed driving reduces fuel efficiency due to factors such as additional air resistance.

For instance, the Dutch government reduced speed limits to just 100 km/h (62mph) in November from the current 130 km/h (80mph) for climate change reasons.

CIHT launched a 'Climate Change Pledge' to spur action by individuals and organisations and in doing so recognise that solutions to the climate emergency rest with individual behaviour and wider system changes.

Even with efforts to mitigate climate change, there is a significant challenge of adapting our infrastructure to the effects of a changing climate.

The UK Bridges Board notes it is essential that we understand the impact of climate change, of rising water levels, increased flooding and consequent scour and changing environmental conditions.

And it must be remembered that scour is the greatest cause of bridge collapse and that flood damage in Europe is predicted to increase four fold by 2050, due to socio economic development alongside the impact of climate change.



↑ Urban trees can help in the fight against carbon dioxide CGA MOTION – SHUTTERSTOCK

As trees soak up carbon dioxide, they are considered to be one useful tool to help address the climate emergency.

UK Roads Board chair James Bailey, who is also assistant director of highways at Staffordshire County Council, says: "Over the last five to 10 years we now think more about the economic benefits and public health benefits from the local highway network; there is now a case for investment in green infrastructure."

The Forestry Commission's urban forestry advisor and Trees & Design Action Group member Jim Smith is keen to stress that many local authorities are doing great work to support the planting of trees in cities including Birmingham, Manchester and London.

For authorities concerned with their duty and liability of managing trees, it is worth knowing that most of the problems can be ameliorated with careful planting and tree selection. TDAG has produced helpful guides for authorities: 'Trees in the Townscape: a guide for decision makers' and 'Trees in the Hard Landscape: a guide for delivery'.

Part of the issue of managing trees is making the responsibility of ownership clear. In Devon there are around 448,000 ash trees within falling distance of a highway and 99% are on private land.

Landowners with trees adjacent to the 12,800km of public highway in the county are being encouraged to take urgent action to assess and ultimately fell any infected ash trees where necessary.

Devon County Council and a local resilience forum are helping to plant new trees to replace those suffering from ash dieback.

As the value of the local roads is estimated to be in the order of £400Bn it is important to make sure that all the local assets are valued: from pavements to footways, from lighting columns to bridges, and to green infrastructure.

The London Borough of Islington used the Capital Asset Value for Amenity Trees (CAVAT) that provided a basic structural value of £110M for street trees in the Borough. Using this tool enables authorities to establish an annual maintenance budget – around 1 to 1.5% for their financial budgeting.

Eco friendly corrosion protection offered by additive

According to the World Corrosion Organisation, corrosion causes \$2.5Tr in damage to steel structures every year, representing between 3 and 4% of the annual gross domestic product of most industrialised countries.



↑ Reduced zinc content in primers can help to protect aquatic life ALASTAIR LLOYD

Recently new primers containing zinc and other pigments have been introduced. These aim to fulfil the latest requirements for corrosion protection, as set out in an international standards document (ISO12944 – 2018), but unfortunately can also be highly toxic to aquatic life.

Users in marine environments are therefore increasingly demanding primers with a much reduced zinc content.

This is where graphene, a monolayer form of graphite, comes into play. Being a conductive material, graphene is able to favourably influence the electrochemical reaction that underlies corrosion, resulting in less rust. Additionally, graphene can strengthen the

adhesion of the binder in the coating system to the underlying substrate. This helps to prevent (salty) water from separating this protective coating from its substrate.

Furthermore, graphene also enhances the ability of paint coatings to control pollutants. For example, a 15 litre pot of 'Graphenstone' is capable of absorbing 4.8kg of carbon dioxide. In addition, the product is antibacterial, anti-mould and anti-fungal.

Satbir Gill, UK Bridges Board and London Technical Advisers Group chairman

For more on graphene, see *TP's* Innovation guide in this issue.