

## Investigating Opportunities to Minimise the Impact of Street and Road Works on Climate Change

HAUC(UK) and Transport for London (TfL) are looking for research partners to undertake a comprehensive study on the Street and Road works sector, the impact it has on the environment and opportunities for the sector to support the UK's drive towards Net Zero and help tackle Climate Change.

The infrastructure sector is responsible for almost one-sixth of total UK emissions and the road and streetworks industries need to come together to help do our part to make that change.

There are already numerous initiatives being undertaken to support the drive to Net Zero however, the spectrum is broad, and the benefits / efficiencies not often shared. Example areas targeting Net Zero:

- Robotics capable of repairing pipe networks from within, removing the need for excavation and the materials / emissions that arise as a result
- New working practices and technologies that minimise the footprint of works and the time taken with which to undertake them
- New materials are being trialled and tested, which can be recycled and increase longevity.
- Increase in the sharing and collection of data to support collaboration across the sector and the cumulative saving it provides.

More details can be found in Appendix 1

### Funding

HAUC(UK) and TfL are offering funding to undertake research into the sector to fully understand the current situation; identify any developments within the field which may already be available but underutilised; and opportunities for further development.

We are open to single or collaborative bids to understand the road and streetworks industries using different approaches from alternative sectors. These can be from academic institutions or research organisations.

Funding has been approved by the Lane Rental Governance Committee, sourced through TfL's Lane Rental Scheme and is in accordance with Regulation 7(2) of The Street Works (Charges for Occupation of the Highway) (England) Regulations 2012.

We are offering three grants of up to **£70,000** per study, to undertake one of the three separate research categories below (one grant per category / study) that must be completed within eight months from the start date. This shall be split, six months for research followed by a maximum of two months for reporting and recommendation. It is expected that these projects will have complimentary elements and that they will not be done in isolation.

Additional funding is potentially available to run some Proof of Concepts (POCs)

## Bids

Please submit bids to **contact@hauc-uk.org**

### Outlining

- 1) The approach you would take
- 2) An indication of the sectors and areas you will research
- 3) Experience of undertaking this kind of research
- 4) The team and partners and their relevant experience
- 5) A timeline of proposed work

Please use tables and diagrams as needed.

Submissions should be no more than 4000 words.

Submission deadline **29<sup>th</sup> April 2022**

Latest Start date of research **31<sup>st</sup> May 2022**

## Areas of interest for research

HAUC(UK) and TfL are interested in all areas of Climate Change and Net Zero. However, some areas to consider are. (note these are examples and should not restrain your thinking if you have ideas)

### Material / Process Innovation

- Sourcing and composition of materials and the ability to withstand environmental conditions should climate change take effect
- Virgin materials vs recycled (longevity, effectiveness, complexity of use)
- Process: Sourcing, logistics and implementation (incl. transport, operatives, and materials)

### Climate Change, Net Zero and beyond

- Sector vehicles and machinery
- Temporary traffic management including temporary traffic lights and alternative technologies
- Move from a linear economic model to a circular model Supporting active travel
- Supporting Autonomous vehicle technology
- Changes to legislative framework

### Measuring Environmental Performance

- Optimum methodology for measuring carbon emissions caused by sector. (incl. emissions from idling traffic, machinery deployed to execute works etc.).

- Carbon emissions baseline for matrix of different works (e.g., industry / duration) and quantify overall carbon emissions caused by sector in England
- Potential reductions in carbon emitted by introducing alternative technologies and methods
- Quantify and recommend a tri-level (high, medium, and low probability) industry-wide targets for reducing carbon emissions over a 5, 10 and 20 year period.

## Expected Deliverable

The outcomes of the project will be reported back to the industry by way of

- 1) A report of on the current position including
  - Subject areas where benefits can be realised
  - Established and active research areas
  - Established and active Innovative practices, and
  - key players
- 2) Recommendation for opportunities for the sector
- 3) An action plan/roadmap to take the industry forward
- 4) Create an initial draft of a “Carbon Calculator” which takes into consideration the findings from all three projects

## Next Steps

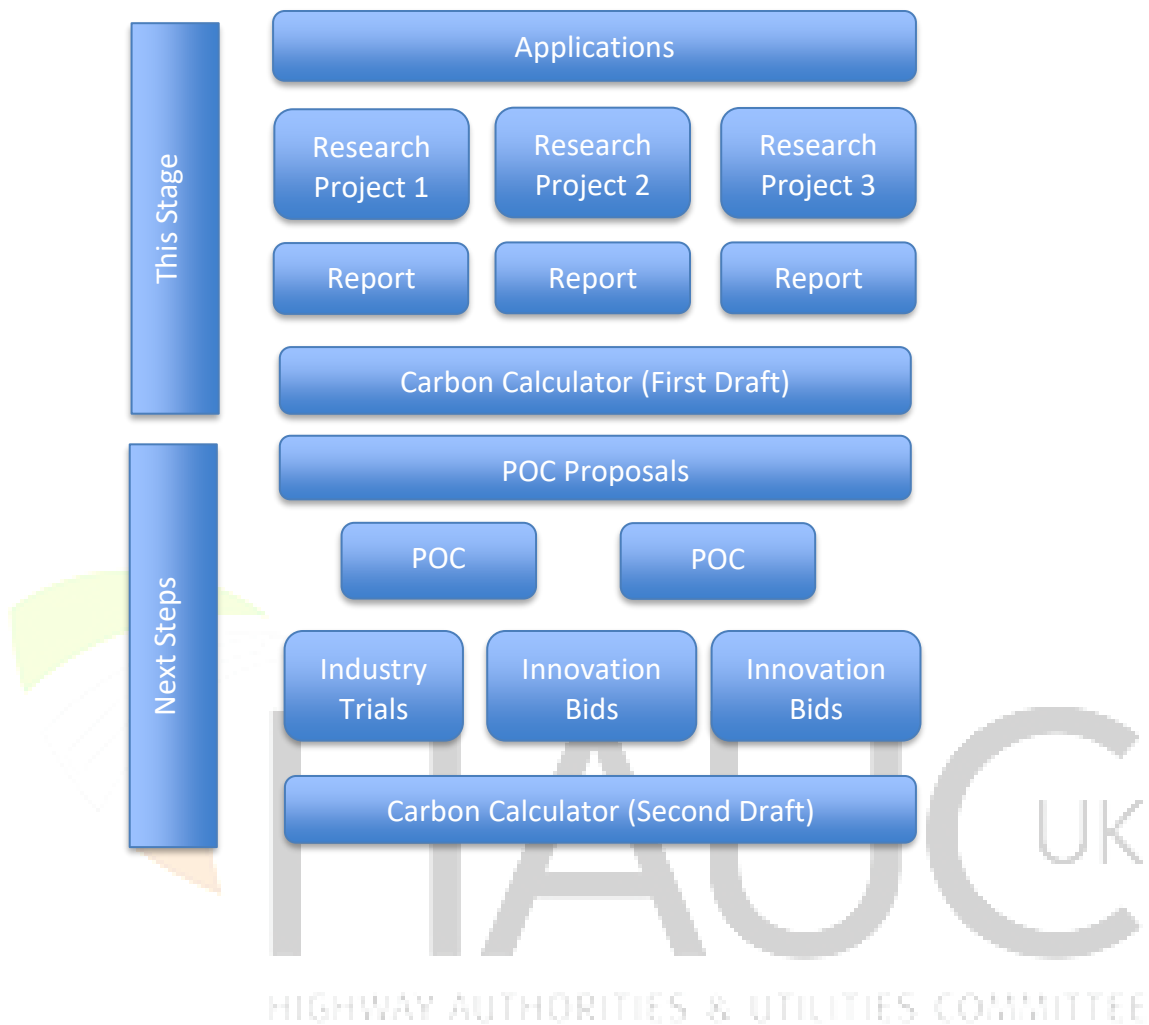
Upon completion of all three studies, HAUC(UK) and TfL aim to run between 1 and 3 proofs of concept, based on recommendations from the work.

The outcomes from the above will inform and contribute to establishing an innovation challenge or something similar in nature, with the aim of.

- a) finding solutions that tackle some of the recommendations,
- b) undertake trials of new and/or under-utilised innovations, and
- c) unite the sector in its ambition of tackling Climate Change

This is not a one-off project but a key element in driving continuous improvement within the sector and is supported by both utility companies and highway authorities alike.

## Project Stages Outline



## Appendix 1

Climate change is a subject on everyone's lips.

Our earth is finely tuned to work together. Everything is interconnected and we are only just beginning to realise how much that is apparent. Adjust something in one part and the ripples can be felt far and wide.

The weather is becoming ever more volatile, ecosystems are being destroyed, 26,000 species are currently in danger of extinction and that perfect balance of nature, that biodiversity, is under the greatest threat we've ever known. The facts are inescapable. What we do from now and how we go about our everyday lives will be critical to restoring that natural balance. The world's population continues to grow, having doubled since 1970 and with it, the requirements to support this vast number of people, consuming around 60 billion tons of the earth's natural resources annually (the equivalent of 1.6 earths). The world just can't keep up.

Then there are the emissions; the gases and particles which are put into the air or emitted by various human activities and quantified by CO<sub>2</sub>e. Globally, we emit around 50 billion tonnes of CO<sub>2</sub>e each year and the UK is ranked 17th, making up 1.1%. While the UK's emissions are on a steady decline, global emissions are still rising. When CO<sub>2</sub>e is released into the atmosphere, it traps the sun's heat, raising the average temperature, resulting in global warming and ultimately climate change. The effects of which are already starting to be felt.

While only a small piece of this puzzle, the infrastructure sector is responsible for almost one-sixth of total UK emissions and all of us within our respective road and streetworks industries need to come together to help do our part to make that change. Innovation will be our key to ensuring a sustainable, safer, and less disruptive industry for many years to come. Crucial to this change will be the development of a circular economy, moving away from the current linear process of Take, Make, Use, Lose, which is not sustainable.

Construction generated around three fifths (62%) of total UK waste in 2018, equating to 67.8 million tonnes. Of that, 92.3% was recovered, while the rest entered landfill. The recovery rate from construction waste has remained at similar levels between 2010 to 2018 and with a limited number of landfill sites now available in the UK, plus the impact that these sites have on surrounding areas, the first choice must be to move to a circular process with recycling at its heart.

262,300 miles of roads run through the UK and with it the requirement / materials / machinery to lay, replace and repair them and the utility assets that lay beneath. Freshly laid asphalt and heavy machinery doesn't really have the perception of 'natural' or 'environmentally-conscious'. Asphalt roads account for over 95% of all roads in the UK and 26 million tonnes are produced every year. Made from distilled crude oil and mineral aggregate, these two resources are finite and in short supply. Quarries in the UK are also struggling to keep up with the demand for virgin aggregates.

Local authorities have a statutory duty to maintain the highway, but budgets are tight, resulting in the current frequency of resurfacing taking place every 68 years. There is £10

billion back-log of work required to return roads to a state that is fit for purpose. In England, around 2.5 million road works are carried out each year, but what does the whole picture for the industry look like?

- what goes in to carrying this out?
- What resources do we use, waste and recycle?
- Do we, as an industry, truly understand the impacts we are having on the planet?
- Do we have the knowledge, skills and people to deliver our ambitions?

In London, pollution and congestion can be exacerbated by works, with a population just shy of 9 million, the streets and roads are the veins and arteries of the Capital, making up some 80% of public space. Accommodating a variety of transport modes, they enable the people who live, work and visit the city to go about their daily lives unhindered. When they work well, they bring activity and essential services but when clogged up and overcrowded, they can damage the health and economy of a City. Some 400,000 works take place in London and as the City evolves and grows its more important than ever that this is done sustainably with the environment being a key driving force. The Mayor's Transport Strategy and Active travel plan is a testament to this, and London is currently ahead of national reductions for emissions.

The COVID-19 pandemic has made us more acutely aware of how we impact the planet and the potential consequences. The Government recently promised to Build Back Better, issuing its ten point plan for the Green Industrial Revolution; but how we will achieve this within street and road works without a holistic view of the entire sector and all that it involves.

The UK became the first major economy to pass a net zero emissions law, one of the most ambitious in the world, that will require the UK to bring all greenhouse gas emissions to net zero by 2050. Industries across the UK are already stepping up to the challenge with some setting their sights on trying to achieve this sooner.

HAUC (UK) have recently set a five-year vision for change which looks to build upon collaboration between Highway Authorities and Utility Companies and is defined by five main themes; digitalisation; innovation; skills and workforce; collaboration; and environment and decarbonisation. Their mission: 'By 2025, the street and road works sector will make the most of new technology to drive forward safety, quality, efficiency and collaboration, while prioritising the interests of our customers and general public. The sector will ensure the right skills are in place to deliver the infrastructure the UK needs to thrive in the information, carbon-neutral age.'

Water UK have unveiled a ground-breaking plan to deliver a net zero water supply for customers by 2030 in the world's first sector-wide (water) commitment of its kind. They have estimated that 10 million tonnes of greenhouse gas could be saved by reaching net zero two decades ahead of the 2050 target.

The energy industry is in the first stages of moving to zero carbon energy sources such as hydrogen, solar, wind power and biomethane, all of which are sustainable and could allow for a significant reduction in greenhouse gas emissions.

There is widespread commitment from the communications industry on achieving net zero and providing fully electric vehicles by 2030.

TfL has published their first Sustainability Report and new Corporate Environment Plan 2021 to align with the new Vision of being a strong green heartbeat for London. It sets out the approach to supporting the Mayor's ambition of a carbon neutral London by 2030 and delivering existing environmental commitments, as set out in the Mayor's Transport Strategy and London Environment Strategy. This is in unison with many other highway authorities, organisations and companies producing their sustainability reports and plans to achieve government targets.

There are also game changing initiatives being undertaken by so many of us across street and roadworks and the Lane Rental Governance Committee continues to be that collaborative driving force, including:

- Robotics capable of repairing pipe networks from within, removing the need for excavation and the materials / emissions that arise as a result. Where this is not possible there are;
- New working practices and technologies that minimise the footprint of works and the time taken with which to undertake them
- New materials are being trialled and tested, which can be recycled and increase longevity.
- Data is also a key element for bringing companies together, providing them with the information they need and enabling a collaborative approach which has a cumulative saving.

There just isn't a centralised and single source of truth to enable us to track progress and direct future requirements.

