

asphalt now



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Reporting on the asphalt industry

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Delivering lower emissions

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ROUTE TO
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ISSUE



EMBRACE NET ZERO RESPONSIBILITIES

We must play our part: there's a lot to do but we can be proud of the progress already made

With the ink drying on COP26 agreements, it's clear that we still have a long way to go to limit global warming to 1.5 degrees in the years to come.

As a sector we must embrace our responsibilities and play our part, which is why this issue is focused on cutting carbon and our route to net zero. There's a lot to do but we can be proud of the progress already made, with innovation and collaboration enabling positive steps to be made at both a micro and macro level.

A significant move has been National Highways' announcement to accelerate the specification of Warm Mix Asphalts (WMAs) as standard, removing the need for

cumbersome departures to specifications (page 11). WMAs can help cut the CO₂ emissions associated with asphalt production by up to 15%, so it's not surprising that the AIA supports the call made at our online Sharing Best Practice event (pages 8 and 9) to "make warm the norm".

Several case studies in this issue also highlight how local highway authorities are increasing the recycled content of asphalt, helping to reduce the use of primary materials and cut embodied emissions and energy use. Elsewhere, innovation in the area of additives to asphalt mixtures, such as those being trialled in the ADEPT Live Labs (page 6), is also seeking to reduce carbon

and increase durability.

Meanwhile, announcements from Government (page 13) indicate that progress on carbon reductions may become linked to funding. While this puts the issue in the spotlight, it misses a critical point: all local authority highway teams need sufficient funding if they are to deliver sustainable networks. The recent Spending Review (page 13) may have promised some surety of funding until 2025 – but it remains wide of the mark when it comes to the levels needed to underpin resilient local roads with still-developing net zero technologies.

Rick Green

Chair, Asphalt Industry Alliance

INNOVATION REPORT URGES COLLABORATIVE EFFORT

■ **The Local** Council Roads Innovation Group (LCRIG) has published a report on innovation within local authority highways covering activity levels, barriers and preferred incentives to encourage new ideas and processes.

Innovation in Highways is the result of a survey facilitated by the Asphalt Industry Alliance (AIA) as an addendum to its 2021 Annual Local Authority Road Maintenance (ALARM) survey.

The key findings, based on data analysis by LCRIG, show that:

- More must be done to drive innovation forward.
- More focus on delivering innovation in the areas of new products/materials is needed.
- Collaboration with local highway authorities and their supply chains through trade groups such as LCRIG is seen as important.

- Lack of funding is seen as the biggest barrier to innovation.

- Councils face procurement issues when delivering innovation.

- Political and senior leaders have a will to push forward innovation within councils.

- There is little being done to recognise and reward innovations through areas such as staff incentives.

- More needs to be done to promote digitisation/innovation when attracting new graduates and apprentices into the sector.

LCRIG Chief Executive Martin Duffy said: "While there are many positives to take from the findings, there are also areas of concern which must be addressed to achieve greater parity among councils.

"At LCRIG we have a role to play in this, but it must also be said that only a collaborative effort will ensure this happens. So how can this be achieved? First and foremost, councils must work in partnership



with the private sector. Ultimately, this is about innovation delivering value across the whole market and these types of collaborative partnerships will be key going forward as the sector aims to Build Back Better from the pandemic."

Asphalt Industry Alliance (AIA) Chair Rick Green added: "As a Partner Member of LCRIG, the AIA is pleased to have been able to help facilitate this survey on innovation. The data and analysis rings true for us as it highlights the potential for benefits to be gained for innovators and clients working in partnership.

"It also emphasises the challenges faced by highways teams and individuals looking to innovate and 'do the right thing', despite tight budgetary constraints and in an historically conventional and risk averse sector."

The LCRIG innovation report can be downloaded from: <https://bit.ly/3CsTxUw>



“While there are many positives...there are also areas of concern which must be addressed to achieve greater parity among councils.”

Martin Duffy, Chief Executive, LCRIG

FLEXIBLE SOLUTION FOR BRIDGE REFURBISHMENT

■ A durable mastic asphalt has been used to complete a £6 million bridge deck refurbishment programme on the Tamar Bridge, a key transport link between Devon and Cornwall.

The existing surface of the main bridge deck was nearing the end of its serviceable life and needed to be replaced for user safety and to prevent damage to the steel deck structure from vehicle wear and weather.

The solution was to use Gussasphalt plus a waterproof membrane, designed to provide the required 20-25 year service life. The specialist asphalt, produced by Hanson at its Gunnislake plant in Cornwall on behalf of Aeschlimann AG, is a dense, machine-laid, self-levelling and self-compacting mastic asphalt. It is made up of a high-performance polymer-modified bitumen mixed with gritstone coarse and fine aggregate to

provide the stiffness and durability but with the flexibility needed on the steel bridge deck running surface. High PSV, lightly coated chippings are embedded in the hot surface by rollers to provide surface texture.



AWARDS CELEBRATE INNOVATION

■ The inaugural

MPA (Mineral Products Association) and British Precast Health and Safety Awards presented online in early November celebrated a variety of initiatives and innovations which address key sectoral health and safety challenges, including those within in the asphalt industry.

The overarching theme for the 2021 Awards broadcast was 'Safer by Sharing, Safer by Action'. This year there were 136 topic award entries from 37 companies, plus nominations for the Young Leader Award and Individual Recognition category.

Taking the award and Trophy, sponsored by associate MPA member and industry partner Eurobitume UK, was FM Conway. The award recognised the company's outstanding work in improving health




and safety in the road contracting and asphalt sectors. Other finalists included Hanson Contracting and John Wainwright & Co Ltd. FM Conway also won the

'Fatal 6' Award, for its 'Big 10 in 10' initiative, recognising exceptional innovation to eliminate high consequence hazards.

Siobhan McKelvey, Eurobitume Director General, said: "Supporting the continued development of safe working practices and improvement innovations is part of our mission and we are delighted to sponsor this award which recognises best practice in the asphalt sector."

Details of the awards and a full list of winners can be viewed at: <https://www.youtube.com/watch?v=ZS35HQ0PBYc>

 Supporting the continued development of safe working practices and improvement innovations is part of our mission..."

Siobhan McKelvey, Director General, Eurobitume



□ The Colas Group is expanding its Continental Bitumen operation to the UK through investment in a new bitumen production and storage facility and expansion of its manufacturing capability.

Continental Bitumen UK will deliver a range of bitumen products across the UK from its terminal in Avonmouth, Bristol, which is under construction and due to be completed in Q3 2022 and has also recently completed a project to expand polymer modified bitumen production at its Colas Warrington site. Construction of the Avonmouth site is being overseen by David Giles, General Manager of Continental Bitumen UK, who is also responsible for developing sales across the UK.



David has extensive experience in the bitumen sector, latterly as UK General Manager of trade association Eurobitume. During his time at Eurobitume UK, David also played an active role in the Asphalt Industry Alliance, helping to shape its work with policy makers and key stakeholders.

"The new terminal will allow us to bring in bitumen from across Europe and provide a secure supply of high-quality products to customers across the country," said David. "Our parent company Colas Group is committed to reducing its impact on the environment and to being carbon net zero by 2030. At Continental Bitumen we're supporting these goals by decarbonising our operations through investments in low carbon technologies, including two new Liquefied Natural Gas (LNG) bulk bitumen ships as well as LNG delivery vehicles."

□ **Data from** the Department for Transport (DfT) has revealed that one in every 25 miles of local A road in England was in the lowest 'red' condition category in the year ending March 2021.

It means that 4% of A roads are in poor overall condition and are likely to require planned maintenance within a year.

The data also reported that the figure for minor roads (B and C roads) was around 6% and even higher at 17% for unclassified roads. The DfT said the proportion of roads in the 'red' category is 'stable' following a slight increase during 2019/20.

AIA Chair Rick Green said: "The DfT figures paint a sorry picture, which aligns with the findings of our 2021 ALARM survey. Despite the sums announced in the October Budget, the promises being made are not sufficient to allow the backlog of repairs to be tackled and further decline prevented. All local authority highway teams will be able to do is continue to fire-fight."

□ **A collaborative** project between TRL and Gaist is looking to accelerate the development of a national 'digital twin' of UK roads, using data updated in near real time.

This digital mapping could play a vital role in managing road repairs, prioritising investments and interventions and reducing delays and disruption for road-users. It would also help planners and policymakers to better understand the useful lifetime of an asset and the demands it is likely to face as well as support predictions around how city transport systems can respond to the multiple burdens placed on them.

The project is part of Gaist's global partnership which will see the company collaborate with companies across the mapping, mobility and asset management sectors.

STEELPHALT OPENS FIRST NEW PLANTS SINCE 1960s



Responding to demand: Steelphalt's new asphalt plant in Cardiff

■ **Steelphalt has** opened two new plants to manufacture asphalt products using up to 95% secondary aggregates.

A new plant has been built in Cardiff and another one added at the company's existing facility in Rotherham. They are the first new plants the company has opened since it was established in the UK in the 1960s.

The components and processes used by Steelphalt can reduce the embodied carbon emissions associated with asphalt production by 40%.

"We are able to provide an innovative approach to quality management of slag by transforming it into a high-quality material that can be used in asphalt products," said Martin Gray, Managing Director of Steelphalt.

"The properties of the material means that its use provides a skid resistant, durable road surface while reducing the need for primary

aggregates and preventing the slag being sent to landfill. Opening these additional plants offers our parent company, Harsco, another resource for the handling of slag from our steel mill customers while also responding to the ever-increasing demand to be more sustainable and mindful of our impact in everything we do."

The new plant in Cardiff is situated to efficiently utilise slag from the surrounding area and is designed to produce up to 300,000 tonnes of asphalt products per year for use on road projects in South Wales and the South West of England.

The opening of the additional plant at the Rotherham site, the busiest independent asphalt plant in the UK, will allow for an increase in service and product offering as demand for more sustainable asphalt products increases.

FM CONWAY STRATEGY LOOKS TO NET ZERO TARGET

■ The FM Conway Group is celebrating its 60th anniversary and has launched its *Net Zero Strategy*, which sets out its roadmap for reducing carbon across its operations and processes to reach its net zero target by 2045.

Founder Frank Conway, father of Chairman Michael Conway MBE, started the business as a small family-run concern in 1961 and it has grown substantially since then, transforming into a leading infrastructure service group with nearly 2,000 employees.

The company has a long history in recycling, including recently delivering the resurfacing of a section of the M3 in Hampshire which contained the highest level of recycled content (70%) used on the strategic road network (see page 7).

The launch of its *Net Zero Strategy* builds on this and sets out its decarbonisation plans. The purpose of the strategy is to provide a mechanism for change, review and innovation that will lead to carbon savings for both the business and its clients.

It outlines the key areas in which the company aims to tackle carbon and achieve net zero ahead of the UK's government's deadline of 2050 and builds on the work it is already delivering in terms of materials



Adam Green

recycling in the highways industry.

Adam Green, FM Conway CEO, said: "For over 30 years of our 60 years trading, FM Conway has pioneered sustainable construction activities that have ultimately led to a reduction in carbon. Our business has invested in sustainable infrastructure and is leading the way in the use of low carbon recycled asphalt materials. Our *Net*

Zero Strategy is the result of a structured and considered approach of how we can realistically reduce carbon within our business. I am delighted that we are now able to launch this strategy and look forward to working with our clients and partners on the journey to net zero."

The strategy can be viewed at: <https://bit.ly/3E88SeN>

HAMPSHIRE WINS GREEN AWARD FOR NEW RECYCLING FACILITY

■ Hampshire County Council has opened its own purpose-built recycling facility providing it with the means to reprocess and recycle material generated from road

repairs for reuse in maintenance projects.

The facility, located in Micheldever, will deliver a significant reduction in carbon emissions by reducing the use of primary



Hampshire County's new recycling facility at Micheldever



aggregates, replacing some warm and hot mix traditional asphalts with cold lay materials and reducing the total miles travelled for material supply.

It will also reduce waste costs by recycling tar bound material which would otherwise require specialist disposal.

The recycled material is laid cold, removing the need for specialist insulated lorries to collect and deliver the material, and there is no waste from unused material. The cold recycled road surface uses a fifth of the energy of traditional materials and saves 40% of CO₂ emissions.

The depot itself has also been recycled, having previously been an asphalt plant until the late 1990s. It has been refurbished and brought up to modern environmental standards and was awarded a 2021 Green Apple Award for Environmental Best Practice.



One of three trials of Shell Bitumen LT R is taking place in the Cumbrian town of Nenthead

CUMBRIA TRIAL TO CUT CARBON FOOTPRINT

CUMBRIA COUNTY Council is investigating the sustainability and suitability of using additives derived from waste plastics within its highways surfacing programme through its involvement with the ADEPT (Association of Directors of Environment, Economy, Planning & Transport) SMART Places Live Labs project.

Cumbria is one of eight local authorities across the country to be selected as part of the Live Labs programme, a £22.9 million initiative funded by the Department for Transport (DfT) to carry out real world tests using new highways technology and methods on local roads which could revolutionise the highways and waste industry. Cumbria's work is aimed at reducing the carbon footprint of highways schemes and providing a more resilient road network.

Hanson has been working with Cumbria County Council on the Live Lab project for around two years. As part of the project, the company is trialling Shell Bitumen LT R (low temperature recycled), which uses a chemically recovered waste plastic to make it compatible with bitumen, without compromising performance. As well as developing a beneficial use for plastic at the end of its life, Bitumen LT R is designed to

work at production and laying temperatures up to 30°C lower than conventional asphalt, helping to lower carbon emissions through reduced energy use during asphalt production. At the end of its life there is no detrimental effect compromising reuse.


Diverse trial settings

Shell estimates that for every kilometre of road laid using Bitumen LT R prevents 450kg of plastic waste going to landfill and saves one tonne of CO₂ emissions. In addition, Hanson is also trialling Shell's Cariphalte AgeSafe bitumen, which incorporates an additive to prolong the life of asphalt surfacing. The trials are taking place over three different sites in Cumbria – two in Penrith and one at Nenthead in the North Pennines – as well as at Hanson's office in Penrith where future coring and testing can be undertaken at regular intervals over the

coming years to track the ageing behaviour of the asphalts. The diverse trial settings will provide comprehensive performance results. The three asphalts were produced at Hanson's Shap asphalt plant in Penrith. In total 450 tonnes with Bitumen LT R and 340 tonnes with Cariphalte AgeSafe product were laid along with 300 tonnes of standard product as a control.

Cllr Keith Little, Cumbria County Council Cabinet member for Highways and Transport, said: "Cumbria County Council is pioneering the use of waste plastic material in our highways, and we're delighted to be the first in Europe to trial Shell Bitumen LT R product through the ADEPT Live Labs programme.

"I look forward to seeing the results of this trial taking place here in Cumbria on the A689 at Nenthead."

 ...we're delighted to be the first in Europe to trial Shell Bitumen LT R product through the ADEPT Live Labs programme..."

Cllr Keith Little, Cabinet member for Highways and Transport, Cumbria County Council



M3 SEES LARGEST EVER USE OF RECLAIMED ASPHALT

A SECTION of the M3 in Hampshire has been resurfaced using warm mix asphalt containing the highest proportion of reclaimed asphalt (RA) ever on the strategic road network. The asphalt includes 70% RA content in the base course and 50% in the surface course, reducing the use of primary materials (aggregates and bitumen) by 55%. Some 1,800 tonnes of planings were taken from a previous project on the M3 and were stored and processed before reuse.

Using warm mix asphalt reduced the production temperature from 180°C to 130°C, resulting in further carbon emission savings from a reduction in the energy used.

Matthew Wayman, Senior Pavements Advisor at National Highways, said: "We were happy to support this exciting opportunity presented by our supply chain colleagues at FM Conway and Kier Highways, and early collaboration gave us confidence that the materials installed would deliver the same level of performance as conventional materials.

"Although it has been common practice for many years to use a degree of recycled asphalt, this is a major step forward. It will help us reduce the amount of new



Resurfacing a section of the M3 in Hampshire

materials needed which in turn significantly reduces our carbon footprint by cutting the emissions and energy required to excavate, manufacture and transport the materials needed to make the asphalt."

More recycled content

The section of the motorway – on the northbound carriageway between junctions 6 (Black Dam Interchange) and 5 (near

Hook) – will be monitored regularly to assess performance. National Highways (formerly Highways England) will look towards routinely using more recycled content in its resurfacing work, saving carbon and helping it meet its net zero ambitions (see page 11).

This project follows a successful trial by FM Conway on the M25 junctions 25-26 last year, where a road surface with 50% reclaimed content was used.

CIRCULAR APPROACH FOR BITUMEN

DURABILITY AND circularity are two key pillars of bitumen's low carbon credentials. European industry (trade) association Eurobitume has been working to increase awareness of these properties which offer benefits for developing asphalt solutions to meet net zero challenges.

Since 2019, its Bitumen Sustainability Steering Group (BSSG) has been pooling members' expertise to understand and coordinate sustainability-related tasks. The BSSG aims to provide direction, focus and understanding in specific areas including: recycling; circularity and the circular economy; life cycle assessments; carbon foot-printing and the use of secondary and waste materials, combined to bring a holistic approach.

"This work has been supported by two specialist task forces," said Siobhan McKelvey, Director General at Eurobitume. "The key aim of our task force on

environmental impact and life cycle assessment is to identify best practice and relevant methodologies for assessing bitumen's impact throughout its whole application life. This 'cradle to grave' and beyond approach includes re-use or recycling, as only a whole life assessment provides a complete picture of a product's overall impact on the environment.

"Simultaneously, our task force on secondary materials had the goal of ensuring that initiatives aimed at circularity when using secondary materials in bitumen, consider all aspects. This covers everything from preparation and performance to environment and health, based on sound science that looks at the overall net benefits to society across the entire bituminous product lifecycle as well as within the industry using it.

"It's clear there will continue to be an important role for bitumen to play in the



construction and maintenance of roads for future mobility and we're committed to helping members and stakeholders navigate their way through the evolving sustainability landscape."

Eurobitume has recently produced Bitumen and Sustainability – an at a glance introductory fact sheet that can be downloaded [here](#).



The Asphalt Industry Alliance's **Sharing Best Practice** (SBP) event was held online this year, for the second time. Over 150 highway engineers from 90 local authorities, as well as industry professionals, registered for the event, which included sessions under the themes of **Build Back Better** and **The Route to Net Zero Asphalt**.

SHARING BEST PRACTICE 2021 IS BIGGEST YET

ASPHALT INDUSTRY Alliance (AIA) Chair Rick Green welcomed delegates and confirmed that SBP 2021 was the biggest yet, which, he said, demonstrated the value that the sector places on collaboration and the benefits associated with finding out how industry colleagues are dealing with the challenges everyone is facing.

Building on the findings of the ALARM survey, Rick reinforced the AIA's commitment to advocating the need for local roads investment and how, along with improved conditions and efficiencies, it would also provide positive outcomes for health and the environment. "Better maintained roads will encourage more cyclists, cut congestion and improve air quality, improving the experience for all local road users," he said.

The first session, *Build Back Better*, was chaired by Rick Ashton, representing AIA partner organisation Eurobitume UK. In his introduction to the session Rick took a moment to consider what Build Back Better means for local roads and concluded that, in his opinion, it's about ensuring that the sector is doing all it can to deliver durable, sustainable road construction and maintenance solutions that support decarbonisation.

SBP Highways Sector Council

Leon Daniels and **Anna Delvecchio**

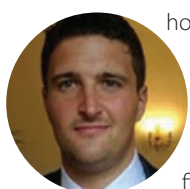
opened the session with a look at the work of the Highways Sector Council, including supporting calls for longer term funding for local roads and the need for increased collaboration, digital transformation and skills across the sector.

SBP Leading innovation and driving change within the highway service

Next up were **Scott MacDonald**, pictured



left, Highway Operations Manager at Derby City Council and **James Harper**, pictured above, Team Leader for Highways & Out of Hours Operations at City of Stoke-on-Trent Council, who both shared



how they have improved the efficiency of their service delivery through a significant investment in specialist 'pothole-fixing' machinery. At

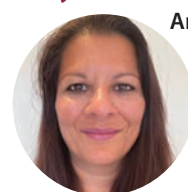
Derby, the team carried out a comprehensive review of the condition and deterioration levels on the network, which identified a £40.5 million backlog of repairs to bring the network up to a steady state. The compelling evidence presented led to the cabinet investing £9 million in the highways asset in 2019, much of which has been made in the workforce.

Coupled with the purchase of a Multihog, which followed a period of renting the machine to trial its performance, this has led to increased productivity, reduced costs and improved customer satisfaction, all of which contributed to the team being named Best Service Team: Highways, Winter Maintenance and Street Lighting Service at this year's APSE awards.

James talked with session chair Rick

Ashton about the background to Stoke's investment in the JCB Pothole Pro, particularly in terms of dealing with large repairs, and the benefits the authority has seen as a result. "It is also enabling us to bid for external work as well," he said. "We have won quite a lot of contracts – car parks, large surface areas – now we've got the machine so it's helping generate some income for us."

SBP Surrey's long-term plans for the maintenance of key highway assets – five years on



Amanda Richards, Group Manager, Network and Asset Management at Surrey County Council, rounded up the first session. She first spoke at SBP five years ago

when she outlined the council's long-term maintenance plans for the network and returned to share what has gone well, and not so well, since then. Summing up, Amanda said: "Data is one of the key



The Multihog has delivered increased productivity for the Derby highways team

things that we all need to be looking at improving to help us make better decisions and to give our decision makers the best information possible, but also the wider aspects of asset management such as using new technologies and having better communications with the public are also areas that we need to all be looking at to give the best service we can. There have been lots of changes over the last five years and I am really excited to see how we move forward again in the next five years."

Director of MPA Asphalt, Malcolm Simms chaired the second session looking at *The Route to Net Zero Asphalt*.

SBP National Highways' 2040 net zero ambitions: the pavement's perspective



Matthew Wayman, Senior Pavements Advisor at National Highways, was the first speaker in this session and gave an overview of the organisation's 2040 net

zero ambitions from the pavement's perspective. He highlighted the ambitious targets and the importance of working with industry to achieve them as well as how the lessons learned can be replicated on the local road network.

SBP Net zero asphalt policy, drivers and practice: European experience

Malcolm Simms then interviewed European colleagues **Carsten Karcher** from EAPA



(European Asphalt Pavement Association) and **Geir Lange** from Norwegian contractor Veidekke about the challenges, practicalities and progress made against Europe's emissions reduction ambitions and what the UK asphalt industry can learn from their experiences.

SBP Towards net zero carbon: Westminster City Council

The second half of the session included

an overview of how Westminster City Council's highways team is playing its part in helping to meet the authority's net zero



carbon target. **Dan Perks**, pictured, Operations Manager, City Highways, and **Ivan Farrell**, Performance Manager at Westminster's supply chain partner FM Conway,

talked about a wide range of measures the London borough has used in order to reduce carbon emissions, including the use of recycled materials, electric plant and tools, and sustainable travel and deliveries.

SBP Adopting warm mix asphalt as standard

Finally, consultant **Steve Isaacs** talked about his experiences of working with a number of local authorities encouraging the specification of warm mix asphalts as standard and encouraged other highways teams to "make warm the norm".

Feedback received from delegates after the event was overwhelmingly positive with 100% of respondents ranking it 'good', 'very good' or 'excellent' and all saying they would recommend future SBP events to their colleagues.

Videos of all the presentations – and slides where available – can be viewed at: <https://www.asphaltuk.org/events/>

DIARY DATES 2022

Some planned dates for your diary (subject to change):

18-19 May: **IAT 2022 Annual Conference: Asphalt Vision**, Titanic Quarter, Belfast
<https://www.iatconference.co.uk/>

14-16 June: **Traffex Parkex 2022**, NEC, Birmingham <https://www.traffex.com>

21-23 June: **Hillhead 2022**, Hillhead Quarry, Buxton <https://www.hillhead.com/>

2-3 November: **Highways UK 2022**, NEC, Birmingham
[2022 event website not yet live](#)

Nov/Dec: **2nd E&E Event**, Vienna, Austria [Details TBA](#)

May/June 2024: **8th E&E Congress**, Budapest, Hungary [Details TBA](#)

Useful link: **LCRIG – Event Calendar** <https://lcrig.org.uk/calendar#Calendar>



HOW THE ASPHALT SECTOR IS RESPONDING TO NET ZERO TARGETS

National Highways' Net Zero Plan includes all construction and maintenance activities being net zero by 2040. AIA Director **Malcolm Simms** outlines thinking on how the asphalt sector will respond to the challenge:

Q To what extent can road construction and maintenance (and specifically the carriageway itself) become genuinely net zero by 2040? How much will need to be achieved by offsetting?

A The National Highways Plan clearly identifies 'sub-targets' of 41% from zero carbon materials and 5% from offsetting. So, as an industry, that is what we will collectively work towards, or try to better.

National Highways predicts that a 50% reduction on total 2020 carbon emissions (from 734,000 tonnes to 350,000 tonnes) will be achieved from construction and maintenance without any of the additional actions stimulated by the Plan. That said, it is always the final percentage reductions that are the most difficult to achieve, even though we are already well on the way.

It is not clear, however, as to whether exceeding the reduction target in one sub-category of action – say materials – could be 'offset' or displaced against another – say transport or plant – which does not achieve its target. Nor if any offsetting is permissible in each sub-target, or if they should simply not total more than 5%.

Nevertheless, there will be a need for those in each action area to further identify the hotspots, quick-wins and longer-term needs, beyond current actions and predictions, to maximise the larger reductions and minimise any final/residual offset.

Q Which area of carriageway construction and maintenance has the potential to offer the biggest carbon savings?

A Savings can already be identified for product-embedded carbon through, for example, mixture temperature reduction, and optimising and maximising reuse of asphalt back into new material. The industry has been doing this for many years and the changes to the long-awaited MCHW Specification Clauses, which our members worked with National Highways to develop,



...it is always the final percentage reductions that are the most difficult to achieve...

now fully mandate these beyond trials and departures, and will help create a new status quo. Evolving and extending use of these technologies to achieve even greater savings seems like the logical next step.

At the same time, we need to extend asset



...there needs to be holistic and joined-up thinking across the sector...

life and ensure that interventions are carried out at an optimal time. This will reduce the total number of interventions, the scale and processes, as well as their associated carbon impact, without compromising performance or road user expectations. In reality, there needs to be holistic and joined-up thinking across the sector – presumably this will come from the roadmap for materials identified in the Plan, which it earmarks for next year.

Q Are the necessary technologies available now or being developed?

A A number of technologies are already available, including Warm Mix

Asphalts and reuse/recycling, but are not yet being deployed to their full potential. Broader acceptance and uptake is likely to make these more efficient and will also enable more accurate benchmarking and measurement of benefits, along with the need for further development and evolution.

To a degree, we are now in a 'revolution' phase, looking towards further evolution, while also trying to predict where the next revolution will need to happen. As a fairly conservative industry and sector, we are always cautious that 'disruptive' technologies may be more negatively than positively disruptive, and we look for potentially decades of evidence of benefit before taking the leap.

Sometimes things don't always do what they say on the tin but it is frustrating when they do that they have not been adopted sooner. Innovation is not free, nor is it likely that enabling technologies (and offsetting) will be.

Beyond what we can already achieve with established technologies, there will no doubt be a need to investigate other avenues of carbon/fuel efficiency – potentially fuel switching on production plants. Examples include biogenic and renewable sources, hydrogen fuels (for production and transport) and carbon capture, use and storage, which are some of the levers being investigated by colleagues in cement and concrete. While these may be potential options, there may yet be challenges in making them compatible and sustainable so learning from other sectors and industries will be essential to meet the challenging targets and trajectories.

Q Are the issues broadly the same for both the SRN and local road networks?

A Basically, yes for material production, transport and application as we use the same or similar products, transported

in the same vehicles and laid by the same equipment and people: it would almost certainly be less carbon-efficient to do otherwise.

However, local road networks have different user expectations, existing or underlying condition, and are funded in a very different way to those operated by National Highways. Years of struggling to keep local roads in good condition are evidenced every year in our Annual Local Authority Road Maintenance (ALARM) survey, and the potential impact of adding necessary resilience in a more carbon-friendly way may continue to expose funding challenges for this network, which accounts for 97% of all our roads.

Q How does the durability of road surfaces play into the carbon calculations for 2040?

A This is an interesting question and one that our members are currently trying to work through in collaborative research with National Highways on the broader issue of sustainability (of which carbon is only one measure).

Traditionally, we have assessed carbon impacts (and other sustainability measures) over the whole life of a road. National Highways' Net Zero Plan targets appear to



“We are under no illusion as to the scale of the challenges ahead...”

be set against absolutes and initial carbon impact.

So, we will need to define how to move from a 'carbon depreciation model' – where a potentially higher initial carbon impact may

give longer-life benefits (fewer interventions) – to a 'zero initial carbon cost model' – where a significantly reduced initial carbon impact may have a negative durability outcome, and increased whole-life carbon impacts of more repairs or replacement.

And durability is not always a constant. Roads are designed structurally for millions of standard axle loads, yet their durability is still perceived and assessed in years and months. This is an environment over which suppliers and contractors have no influence of the conditions, be that weather, traffic volume, density and speed, axle loads (which will probably increase for electrified, autonomous and platooned HGVs) etc.

Could the 12% carbon savings of 'digital roads' in the Plan have an unintended consequence on the remaining resilience of the network and future maintenance needs? We are under no illusion as to the scale of the challenges ahead and the trajectory that National Highways has set for meeting clear targets.

While the asphalt industry has already made strides in the right direction, there will clearly be a need for us to extend those, and pick up the pace on decarbonisation of production, upstream and end products, transport, installation and maintenance technologies and processes.

ROLE OF WARM MIX ASPHALTS IN CUTTING EMISSIONS

NATIONAL HIGHWAYS has set out its ambitious roadmap to achieving net zero.

The plan sets out the key milestones for decarbonising England's strategic road network (SRN), which include all road construction and maintenance activities being net zero by 2040 and all vehicles using the network being net zero by 2050.

Playing its part

As part of its carbon reduction plans, National Highways is now encouraging the use of Warm Mix Asphalts (WMAs) – which can help cut the CO₂ emissions associated with asphalt by up to 15% – as standard across the SRN. Previously its use required the application for a departure from standard, hampering its uptake. Rick Green, Chair of



National Highways has published its Net Zero Plan

the Asphalt Industry Alliance (AIA), said: “National Highways’ targets and trajectories are ambitious, but the asphalt industry is committed to playing its part in reducing emissions and supporting the Government in meeting its climate change goals.

“The AIA has long-advocated the role that WMAs can play in reducing carbon emissions, improving efficiencies, reducing disruption for road users, and delivering

workforce health and safety benefits.

“This move by National Highways will reduce time and costs associated with seeking specific approval and will also help pave the way for the wider adoption of WMAs on local roads which represent 97% of the total network – delivering scalable carbon reduction benefits.”

National Highways' Net Zero Plan can be accessed from: <https://bit.ly/32lyUgK>

NEW MATERIALS TESTING LAB

AGGREGATE INDUSTRIES' (AI's) contracting division has opened a new laboratory for materials testing as part of its commitment to improve resource efficiency through reuse, recovery and recycling.

The Centre for Recycling & Research enhances the division's existing surfacing, cementitious and recycling offering located in Tinsley, Sheffield, alongside the company's asphalt facility. The new laboratory has been independently certified by the United Kingdom Accreditation Service (UKAS).

The new lab is mobile, allowing it to be moved should major projects demand, and is an integral part of AI's work on recycled

product testing. The Tinsley Centre for Recycling & Research has already recycled more than 80,000 tonnes of reclaimed asphalt planings (RAP) from sites back into the local road network within asphalt mixtures and alternative foamix base and binder layers.

Neil Leake, National Technical Manager at AI's Contracting division, said: "Our new in-house laboratory will help our customers achieve greater cost efficiencies and faster reporting times and will enable us to push the boundaries of utilising recycled materials as part of our ongoing mission to make construction more sustainable."



"It means our project partners and clients now benefit from a complete, integrated service; from manufacture and installation to performance testing, driving a robust quality approach across all of its contracts."

BATCH ACCURACY IS KEY TO PREVENT ASPHALT WASTE

ENSURING THE consistent quality of asphalt is key to avoid unnecessary waste and improve the industry's sustainability credentials.

An asphalt mixture design that has been developed to produce the desired characteristics and performance criteria under laboratory conditions is always susceptible to variation when transposed to a production environment. That is why a critical aspect of producing high quality asphalt is ensuring the repeatability of accurate batch proportions as desired in the mixture design – as well as maintaining the appropriate quality of the component materials.

To improve batch accuracy, Tarmac applies statistical process control techniques to identify any weak points

in the process. Andy Foddy, right, Technical Optimisation Manager at Tarmac, explains: "By extracting and analysing batch data we are able to pinpoint errors and patterns that identify where plant improvements, calibrations and recipe changes are required to maintain or even improve product quality."

"Since adopting this approach we've recognised that precision has become more important, as smaller weights of individual components can be required. This is especially the case with special products and higher RA (reclaimed asphalt)



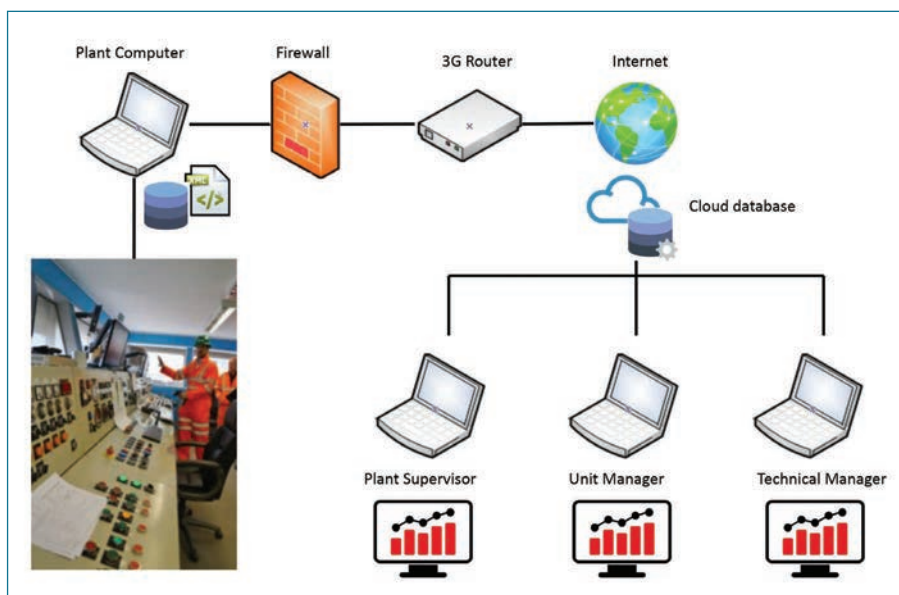
levels, which have become more pertinent as the industry drives to reduce its carbon footprint. We also recognise that bitumen, filler and dust are critical to the quality of asphalt so having the ability to control these better improves our product quality."

Tarmac has developed this process into a cloud-based software solution where each asphalt control system is able to upload individual batch records to a database. The software analyses the data and assesses the process capability of the plant to consistently achieve target weights within desired limits.

The system allows managers and supervisors to log on remotely and identify any issues at the plant and identify probable causes. In conjunction with factory production control test results, the system can be used to check that plant improvements have the desired effect on product quality. It is fast becoming an integral part of quality assurance at Tarmac and the web-based system can also generate performance data and reports in tabular and graphical format for mixture temperature compliance and plant alarms in addition to the batching accuracy data.

"This approach provides our customers with the confidence that they are receiving a compliant high-quality material consistently across batches, which will in turn allow them to deliver the end product their clients require," added Andy.

"As this system is becoming embedded and plants are improved, rejected material volumes are reducing accordingly, avoiding rework and improving sustainability credentials."



Automatic data collection: batch files collected and processed for user analysis

LOCAL ROADS SPENDING SET TO FALL SHORT

THIS AUTUMN'S Spending Review gives a longer-term settlement for local roads maintenance for the first time. Nonetheless, this could still be a missed opportunity when it comes to providing the levels of funding needed to ensure network durability, minimisation of waste and the underpinning of economic recovery post Covid-19.

Overall, HM Treasury allocations to the Department of Transport (DfT) for 2022/23, 2023/4 and 2024/5, represented growth in day-to-day spending of 6.8% on all transport, according to the Institute for Government. Reflecting the Chancellor's strategy to 'further road, rail, digital and infrastructure investments to support economic growth and make travel more accessible', this included significant allocations to rail, cycling and bus schemes, as well as £5.7 billion for

integrated transport settlements to eight English city regions outside of London.

Maintaining the local road network

However, while the Government's spending pledges also included £24 billion for strategic roads between 2020/21 and 2024/25, the sums allocated to maintaining the local road network have fallen short of the sector's expectations.

In fact, HM Treasury's *Autumn Budget and Spending Review: A Stronger Economy for the British People*, announced a commitment of £8 billion "to fill millions of potholes a year, resurface roads and repair bridges, as well as delivering over 50 vital local road upgrades" over the course of the current spending round. Of this, £5 billion has been allocated to local road maintenance, including an allocation of £915 million per year between

2022/23 – 2024/25 for local authorities outside a Mayoral Combined Authority.

The DfT states that this three-year settlement represents a funding level consistent with 2021/22 for local authorities outside a Mayoral Combine Authority (see below). However, based on current spending commitments, next year's allocations indicate that funding from central sources will drop by 3% on current levels – even before inflation is accounted for.

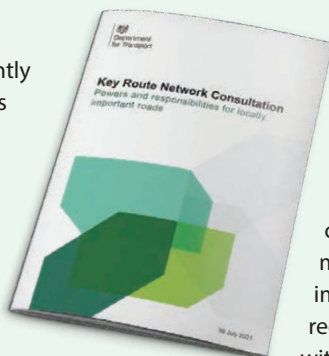
LCRIG President, Will Britain, commented: "Having access to a long-term funding pot allows local highway teams to prioritise accordingly for the benefit of all road users. But maintaining the long-term resilience of roads is a challenge and the work of local highway teams needs to be reflected through funding to ensure that road users see highways maintained to the standard they expect and deserve."

REVIEW OF MAYORAL POWERS

THE DEPARTMENT for Transport (DfT) is currently reviewing the responses to its consultation on increasing the powers that metro mayors and Mayoral Combined Authorities (MCA) have over Key Route Networks (KRN).

Described as a potential 'step change in levelling up how towns and cities look, feel and operate', the move could give city region mayors the highway powers necessary to deliver their transport priorities and develop a more integrated approach to the allocation of road space and new infrastructure.

A KRN would cover a collection of locally important strategic routes intended to integrate highways across a city region, largely cutting across multiple local authority (LA) boundaries that make up the combined authority. Strategic oversight, including on connectivity and transport integration, sits at mayoral level within MCAs, while, currently, individual local highway authorities have a statutory duty to manage, maintain and service



the key routes in its area. The DfT's proposals suggest that, for highways maintenance, mayors would assume control of determining maintenance and improvement requirements for a KRN, with delivery potentially remaining at local authority

level within the existing asset management arrangements. As well as ensuring a holistic approach across city regions, the DfT sets out that adjusting responsibility for key routes would support delivery of the Government's Gear Change, cycling and walking plan as well as its Build Back Better national bus strategy, underpinning its sustainability goals.

The consultation also asked for feedback on whether MCAs' highway powers could actually be restricted, so metro mayors can only intervene on highway decisions where they consider it absolutely necessary. There are currently more than 40 local authorities within a combined authority or MCA arrangement in England.

Roads minister Baroness Vere has set out that local authority transport plans will: "need to set out how quantifiable carbon reductions will be achieved in local areas, with future transport funding dependent on these plans being robust, ambitious and achievable."

Speaking at LCRIG's recent Strictly Highways event, she advised that as part of the Government's net zero aims, its climate budget commits to a nearly 80% reduction in [carbon emissions] by 2035.



The Welsh government has put a halt to all new road building projects while it conducts a review as part of its plans to reduce carbon emissions and tackle the climate emergency.

An expert panel is now reviewing all proposed schemes and plans are to re-direct the money, if a decision is made not to build a new road, into maintaining and improving existing ones, including creating new bus and cycle lanes. It is hoped that the approach will help Wales reach its 2050 net zero emissions target.

Leicestershire County Council has pledged to become a carbon neutral council by 2030 and to achieve net zero across the county by 2045 – five years ahead of the Government target.

LOW CARBON SOLUTIONS FOR COUNTY SCHEMES

TO CONTRIBUTE to achieving its carbon neutral ambition, Leicestershire's highways' teams, working with main contractor Aggregate Industries, have been trialling the use of recycled and low carbon products in its bypass improvement schemes on the A426 at Blaby, the A6 at Market Harborough and the A47 at Hinckley. Both the A426 and A6 schemes are now complete.

The resurfacing projects have been funded through a successful £5 million bid awarded through the Department for Transport's Challenge Fund to assist with recovery following Covid-19.

Durability and performance

At Blaby, a rubber modified warm mix asphalt supplied by Tarmac was used to resurface and strengthen parts of the road. The mixture incorporates 5,000 recycled tyres, preventing them going to landfill, and the use of warm mix, instead of traditional hot mix, contributed to the reduction in carbon emissions as it required less energy to produce.

White lines on the northbound carriageway were also marked out using a cold plastic product which is said to last three times longer than traditional ones. The southbound carriageway was marked with traditional hot thermoplastic road markings to allow a direct comparison of the durability and performance of both products over the coming years.

In addition, all the bituminous material removed from the carriageway during



resurfacing works has been identified for reuse with the new asphalt base layer containing 25% reclaimed asphalt and the surface layer containing 10%.

The three projects together will have generated over 21,000 tonnes of worn out carriageway material for reuse while the new materials used on the schemes incorporate approximately 3,700 tonnes of reclaimed asphalt.

Cllr Ozzy O'Shea, Cabinet Member for Highways

and Transport, said: "Using recycled and carbon friendly components for our road improvements emphasises our commitment to improving the environment and is in line with the council's net zero carbon pledges."

Brian Kent, National Technical Director at Tarmac, added: "It's fantastic to see Leicestershire County Council embracing

the many benefits of these new asphalt technologies.

Sustainable highways solutions

"It is the first authority to use the new rubber modified warm mix material for a project of this scale and it is vital that others follow their lead in adopting the use of

the more sustainable highways solutions available if net zero targets are to be reached."

Across all three bypass projects, Leicestershire County Council is saving a total of 32 tonnes of carbon, estimated to be the equivalent of the emissions generated by travelling over 165,000 miles in a standard car.



Using recycled and carbon friendly components for our road improvements... is in line with the council's net zero carbon pledges."

Cllr Ozzy O'Shea,

Cabinet Member for Highways and Transport, Leicestershire County Council

Asphalt Now is published by the AIA, a partnership between the Mineral Products Association (MPA) and Eurobitume UK. The generic term 'asphalt' used in this magazine refers to the range of asphalts and coated macadam available in the UK. Views expressed in *Asphalt Now* are not necessarily those of the Mineral Products Association or Eurobitume UK.

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