

Editorial

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Welcome to the October issue of *Engineering Sustainability*. In this issue there are three papers covering sustainability issues related to transport and buildings. These two sectors are fundamental to our quality of life and as our global population grows, both sectors face significant challenges as to how to maintain and indeed improve our quality of life. Topics covered in this issue include how emerging technology in vehicles may be used to get more out of our highways; development of a methodology to evaluate the sustainability properties of different systems used in building facades; and finally, the sustainability benefits of using a by-product from sugarcane production as a building material in bricks.

The first paper by Hardy and Fenner (2015) considers how autonomous vehicle (AV) technology, such as Vehicle to Vehicle (V2V) technology and Co-operative Adaptive Cruise Control, can be employed to improve the efficiency of highways; allowing increased numbers of vehicles to be carried on the roads each hour.

The transport sector has one of the fastest growth rates in emissions of greenhouse gases (GHGs) and with a predicted two billion increase in our vehicle population by 2050 (ITF, 2011), we may require various types of interventions, including technology like AV, to manage down our GHG impacts. As well as potentially bringing about reduced GHG emissions, AV technology can also provide additional benefits in terms of the reductions in accident rates, congestion and journey times. Implementing this type of technology is not without its challenges and the paper provides a useful overview of the risks and opportunities of V2V technology and the policy initiatives required to support its implementation. The A14 in the UK is used as a case study and at the time of going to press, the paper does not reflect the recent announcement by the UK Government related to improvements on the A14.

Tools that promote a systematic and whole-life approach to sustainability often mean that approaches to assess and manage sustainability are more comprehensive and decisions made about designs are better informed overall. With this in mind, the second paper by Vega (2015) presents a new methodology that allows a systematic comparative analysis of facade building systems. The methodology carries out quantitative and qualitative comparisons of the sustainability of industrial building systems in facades and covers

environmental, social and economic aspects while taking a whole-life approach to the issue. The tool has a scoring system and the derived values gives the level of sustainability of the construction system.

An interesting paper by Madurwar and Ralegaonkar (2015) reviews the sustainability properties of sugarcane bagasse ash (SBA) as a building material for bricks, versus more traditional based materials such as pulverised fly ash (PFA). The study built model homes using SBA-based bricks and others using bricks based on PFA. The work compared the structural and thermal conductivity properties of the two different materials. As well as the SBA bricks meeting the physiochemical standards in India, the SBA brick model house was found to be more economical to construct. Bricks based on SBA were also found to be thermally more resistant than PFA, thereby reducing the amount of energy required for cooling homes.

The papers in this issue put forward potential methods and solutions for tackling important sustainability issues in transport and the construction and maintenance of buildings. I hope you find these papers interesting and I would be pleased to receive any input or observations you have on the issues raised in these papers.

REFERENCES

- Hardy B and Fenner RA (2015) Towards the sustainability of road transport through the introduction of AV technology. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **168**(5): 192–203, <http://dx.doi.org/10.1680/ensu.14.00053>.
- ITF (International Transport Forum) (2011) *Transport Outlook: Meeting the Needs of 9 Billion People*. ITF, Paris, France. See <http://www.internationaltransportforum.org/pub/11Outlook.pdf> (accessed 21/08/2015).
- Madurwar MV and Ralegaonkar RV (2015) Controlling indoor air temperature using bagasse ash bricks. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **168**(5): 216–226, <http://dx.doi.org/10.1680/ensu.15.00002>.
- Vega R (2015) Methodology for the sustainability assessment of facades. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **168**(5): 204–215, <http://dx.doi.org/10.1680/ensu.14.00047>.