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Editorial

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The five papers in this issue address diverse elements of engineering, including energy and water supply, and road and rail transport. However, they have some common themes, which can be expressed in the form of questions. What is the relationship between the use of resources, provision of the related infrastructure and quality of life? To what extent is the choice and use of technology based upon social, economic and environmental considerations? Would greater community-level participation in decision making change the way these services are provided? The answers to these questions and others like them will determine the way sustainability is considered by the civil engineering profession and the things it creates. Now is a good time to consider them anew because the ICE has recently undertaken a review of its sustainability charter; more on that later.

The first paper in this issue is a review of over 30 years' work on developing renewable energy technology at the Centre for Alternative Technology in Wales. It is a testament to what can be achieved with ambition, commitment and a thirst for innovation. As well as an interesting history of technology development, the paper offers some important observations on how to achieve the aspiration of relying almost solely on renewable energy supplies. For instance, is only being able to run your washing machine when the sun shines or the wind blows a price worth paying to overcome the problems of intermittent electricity supply from renewables and to reduce the role of the national grid to that of a back-up system?

The work described in the second paper was started from an interest in sustainable water management (SWM) in the developing world. This is important in itself but the paper is of additional interest because it goes on to compare the principles of water management established there with the water supply system in England. The paper states that '*[t]he key feature of SWM is the synergy of state, market and community*'. The way these bodies interact helps shape the way individuals use water and the lack of community involvement in water management in this country does not help its long term sustainability, which is in the control of large formal institutions. Perhaps the same could be said about power supply and waste management? Is the answer to the 'not in my back yard' attitude to put greater responsibility with local communities for the supply of these services?

The remaining three papers are the first published in response to our call for papers on sustainable mobility and more will follow

in the next issue. More evidence, if it were needed, of the social, economic and environmental importance of transport in this country has recently been published in Department for Transport statistics.¹ In 2004, 160 billion tonne-kilometres of goods were moved in Great Britain. Road freight accounted for 64% (compared to 53% in 1980) and rail accounted for 8% (compared to 10% in 1980). Road traffic continues to increase to 502 billion vehicle kilometres in 2004 and more households have access to two or more cars than do not have access to a car at all. About a third of people claim to be adversely affected by road traffic noise, the same number that say motorway congestion is a serious problem.

The first of the sustainable mobility papers reports the results of computer modelling of the impact of future oil scarcity on transport, using Edinburgh as a case study. It reports on scenarios where, as a result of projected fuel shortages, increased investment is made in infrastructure and vehicle technologies and demand is managed by increasing fuel tax and other fiscal means. The broad conclusion is that both approaches will be needed to make a significant impact on CO₂ emissions and congestion. This implies the need for investment in both inter-urban road and rail infrastructure and in local rapid transit or bus improvements, coupled with road pricing and fuel taxes. The next paper promotes the benefits of building a high-speed rail link between Edinburgh and Newcastle. This would reduce the Edinburgh to London rail travel time to that of the current flight time and the resulting modal shift would reduce carbon emissions. This would require a change in UK transport policy to follow some European countries in developing a high-speed rail network. Both papers demonstrate the importance of investment decisions in making radical change in the impacts of transport but alone this cannot overcome society's addiction to low fuel prices and cheap flights.

The final paper argues that the social interactions made possible by road building in developing countries should be taken into account when making investment decisions. Currently these decisions are based mainly on economic factors such as access to markets for farmers. But social networks, such as community groups or extended families, are important in providing individuals and communities with coping mechanisms during hard times, particularly for the very poor who have no capital assets. Mobility is also required to provide access to education and political processes. This 'social capital' is particularly important in the absence of effective state support. When road

building itself becomes a community responsibility it can become a means of generating social capital as well as providing access to it. However, the need remains to understand better the link between mobility and poverty and for a method of assessing the value of social capital in prioritising investment. This would benefit from a look at other sectors, such as water and health services, where participation, collaboration and partnerships are emphasised. It would be interesting to compare this study on mobility in the developing world with our experience here in the way the paper on SWM has done. In some ways, increased mobility in the developed world might be thought to have reduced social capital, or to have isolated it from local communities, with the increase in dormitory estates and out-of-town shopping.

All the papers in this issue have implications for how we choose to live our lives and the society we live in and how they impact on the sustainability of our built infrastructure and the services it is needed for. But it is the social arm of sustainability that, as engineers, we often find most difficult to understand and account

for. How can it be measured and how can we improve it? As part of its review of the sustainability charter, ICE has agreed with the American and Canadian institutes a protocol for Engineering a Sustainable Future for the Planet. It will be formally signed on 4 July 2006 at the Triennial ICE/ASCE/CSCE Conference in London.² It commits the ICE and the profession it represents to develop and deliver a new action plan to improve sustainability. However difficult it may be, we must not shy away from considering the social impacts of our actions in producing this plan and shaping the future. The protocol can be seen on the ICE website and consultation will begin on the detail of the action plan. Your input would be most welcome.

REFERENCES

1. NATIONAL STATISTICS. *Transport Trends 2005 Edition*. Department for Transport, London, 2006.
2. See http://www.ice.org.uk/downloads/Safety&Security_Final_April06.pdf for more details.