

SP16 NEW CONCEPTS, NEW IDEAS TO FACE ISSUES OF SUSTAINABLE DEVELOPMENT

Recommendations to Decision makers

Tensions in the energy market are inevitable because of a shock-wave from the steep rise in demand for oil products which will happen in the next few decades. At the same time, growing evidence of climate change and global warming shows an urgent need for action to reduce greenhouse gases. In response, decision-makers will need to show leadership and set bold strategies to foster energy efficiency and sustainability. An example is the Berlin clean energy partnership involving the city authorities in concert with national government and energy supply companies to demonstrate a complete hydrogen-based energy supply and distribution chain. This example is very futuristic, but nevertheless a necessary practical demonstration of the need for vision in addressing energy supply problems.

A very substantial growth in the volume of freight and passenger traffic on the roads is forecast over the next decade (e.g. 50% growth for freight and 40% for passengers for the European Union in the period to 2020). This, too, will require leadership and high levels of investment and political commitment to secure measures which will promote sustainability and co-modality in the transport sector.

Safety on the roads is a further issue. European countries, for example, have abolished the death penalty for extreme crimes and now plan to make a big impact on road fatalities. The next goal should be to stop people getting killed when they miscalculate or fail to pay attention when driving.

Intelligent Transport Systems (ITS) have a big part to play, especially in the delivery of safer, cleaner road transport and in tackling congestion. The automobile industry is investing heavily in bringing new technology to market. There is a pressing need for a matching response from the roads authorities to deliver the full potential of these new technologies. Once more, leadership is the key. The development in Europe of a strategy for roll-out of ITS is a timely example.

Technical aspects

The technical challenges presented by these future scenarios are multi-dimensional and multi-faceted. Objectives are to reduce congestion, improve safety, protect the environment, improve energy efficiency and reduce dependence on fossil fuels. These objectives are often in serious conflict with one another.

Sustainability goals can be served by the introduction of energy-saving technology for vehicles, road construction and maintenance. There are proven reserves of oil to support 43 years or more of production and with further investment in production capacity this could be extended further. However, the limitation in supply of fossil fuels is a major issue for the automobile industry. Bio-diesel products can be used as a substitute for petroleum products but raise big political issues over the use of agricultural land.

Recycling of materials and the use of renewable sources in road works will play a big part. Research is needed to define energy-saving and renewable energy alternatives to conventional construction methods and materials. Innovation to identify renewable sources and substitutes for bitumen-based emulsions and binders in road pavement construction shows the way.

In the domain of ITS and road network operations, safety and efficiency benefits will be determined by the introduction of new technology both on the infrastructure and on vehicles. Developments in sensor technology and mobile communications are already bringing new services that can benefit road users (e.g. the Vehicle Information and Communications System (VICS) in Japan). The private sector now has the means to provide a complete information supply chain. Data from an improving range of on-vehicle sensors can provide high-quality monitoring and information on the road network. These services need to be placed within an operational framework established by the road authorities.

There is a growing recognition that these new services can achieve quite dramatic improvements in efficiency and safety. One example from Japan demonstrated an 80% reduction in accidents caused by congestion on the highway when drivers were warned of stopped vehicles on the curve ahead. Until recently, the cost of installing mobile communications was an obstacle to widespread deployment of these systems. Two initiatives - WAVE (Wireless Access Vehicular Environment) and CALM: (Communications Access for Land Mobiles) - will help facilitate these new services.

Deployment of ITS technologies will require new organisational capabilities and a partnership approach with the private sector. A clear legal and business framework is required, for example in road tolling and electronic payment for gasoline purchase and other services using common electronic payment technologies. Liability issues have also to be clarified, as between the vehicle driver, the vehicle manufacturer, the equipment or service provider and the road authority.

The World Road Association (PIARC) needs to be at the centre of the debate, not least to make sure the needs of those involved in planning, building and maintaining roads infrastructure are not overlooked. One way that deployment can be accelerated is through better understanding and co-operation between car manufacturers, communications providers, system suppliers and road administrations. As a World Road Association involving 113 countries from around the globe, PIARC is well-placed to do this. PIARC members must cooperate globally to interface with the automobile industry in addition to engaging in the more traditional activities of knowledge transfer and establishing recommended best practice.