

# Focus on CSIR Built Environment Key Projects

March 2007

## NyendaWeb: ITS for improved traffic management

A multi-year CSIR research project is set to boost the performance of South Africa's transport system by developing a number of advanced systems for improved traffic management. Systems being investigated include hardware, sensors, software systems and data management systems. CSIR funding for the project amounts to a total of R7 million over a period of three years. Additional funding streams from collaborative research partners are being investigated.

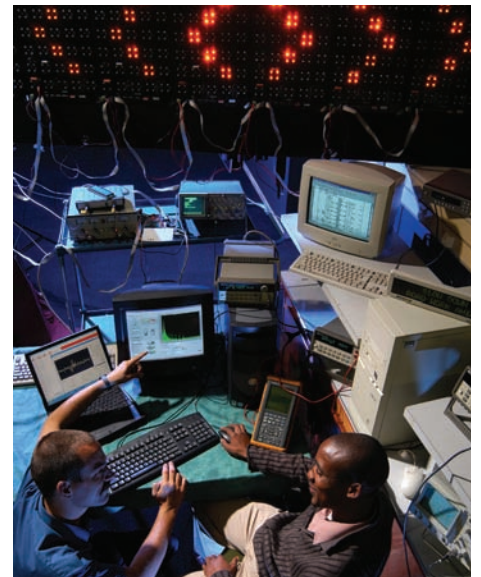
Car ownership in South Africa is expected to increase significantly over the next 10 years, at rates as high as 7 % per annum. This will aggravate congestion levels in the metropolitan areas. A typical example is the almost intolerable congestion during peak hours on the Ben Schoeman highway between Tshwane and Johannesburg. Congestion levels on this road have grown in the order of 14 % per annum over the past two years, negatively affecting the cost of freight logistics, which is currently at a level of about 15 % (almost double that of developed countries with much higher traffic flows).

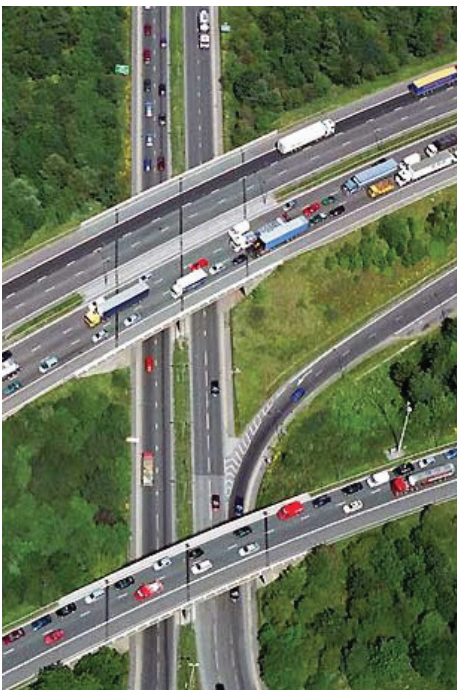
The scope to increase road capacity will become increasingly constrained as a result of environmental and spatial impact concerns and inhibiting costs of upgrading measures. There is also growing rec-



ognition of the inevitable limits to network capacity expansion, with the emerging concept of an essential road (or transport) network beyond which no further physical expansions would be tolerable.

The concept of an essential transport infrastructure infers that the servicing of mobility demands will rely increasingly on transport management (including mobility or travel demand management) to ensure the efficiency and productivity of person movement and goods transport. Effective management of transport systems includes the optimal utilisation of available infrastructure and facilities in a holistic





**Contact details:**  
CSIR Built Environment

Kobus Labuschagne

Tel: +27 12 841 4175  
Email: [flabus@csir.co.za](mailto:flabus@csir.co.za)

[www.csir.co.za](http://www.csir.co.za)

manner, coupled with the application of advanced capabilities and technologies to manage and control the flow of persons and goods more precisely on transport networks.

Monitoring the performance of transport systems and transport management activities is a fundamental aspect of sustainable transport systems of the future. The impacts of measures such as mobility management and road pricing, which are mainly region-wide, require consistent and accurate measurement of a wide spectrum of transport operations parameters.

Intelligent transport systems will be the enabler of mechanisms to support the drive towards sustainable cities and transport systems of the future. Against this background, the CSIR project focuses on the development of intelligent systems and supporting skills and capabilities for the delivery of a high-performance transport system.

The three-pronged research approach includes development of an open source platform, called NyendaWeb ('nyenda' is a Venda word meaning 'mobility') to connect transport and related sensors. There is a specific need for the use of efficient data-streaming technologies, real-time data acquisition systems, mobile communication technologies, data warehousing and advanced data analysis, including statistical analysis.

The research team will also investigate the development of innovative sensors to support the expansion of NyendaWeb. Real-time empirical data streams from NyendaWeb will be used for research on the improvement of transport infrastructure management and design and operation practices, as well as to provide credible real-time traffic information to transport users.

Envisaged project impacts include:

- cost and time savings through more efficient road traffic operations and seamless connections with other transport modes;
- lower freight logistics costs;
- the management of mobility demand through appropriate technical and policy measures that complement optimal capacity utilisation of the road network; and
- the availability of real-time traffic and road data in an integrated information infrastructure to assist traffic management and improve transport network management, with due consideration to social and environmental impacts.