

Technology saves lives

OVERVIEW

Severe traffic congestion is experienced on freeways in most major cities of the world, and South Africa is no exception. Congestion has a negative effect on productivity, the running costs of vehicles, the time people spend with their families, as well as on the environment.

Besides recurring congestion, which is normally experienced on weekdays during AM and PM traffic peaks, the occurrence of incidents such as crashes and stationary vehicles on freeways add further delays to travel times. The ability to detect, respond and normalise traffic flow on a freeway as efficiently as possible not only saves significant time and road user costs, but can also be the determining factor between life or death for those involved in serious freeway crashes, and the deterrence of further secondary incidents.

The South African National Roads Agency SOC Ltd (SANRAL), realising the increasing constraints on the provision of infrastructure to effectively manage its road network and improve road safety, investigated alternatives by focusing on operational issues in response to road users' needs.

INNOVATIVE SOLUTIONS

In light of this SANRAL explored the use of Intelligent Transport Systems (ITS), with the specific application being referred to as a Freeway Management System (FMS). The FMS was first launched in September 2006 in Gauteng, and has subsequently



been deployed in eThekweni and Pietermaritzburg in KwaZulu-Natal, and in Cape Town in the Western Cape, instrumenting over 500 km on the major urban freeway networks. The aim of the FMS is to:

- Reduce congestion, with its accompanying impact on the environment
- Improve road safety
- Keep motorists informed of travel conditions
- Respond rapidly to traffic incidents.

The FMS allows for the collection of real-time information, which is conveyed to a Traffic Management Centre (TMC). The centre processes the data and uses the information to manage traffic flow and disseminate information to the road user.

In essence the FMS utilises technology to collect real-time traffic information through various devices and mediums. These include closed-circuit television (CCTV) cameras, and vehicle detection systems to predict travel time, traffic flows and density to provide situational analysis of traffic conditions and monitor the road network. Variable Message Signs (VMS) have been

SANRAL camera pole collecting real-time traffic information



SANRAL electronic message board communicating real-time traffic information to road users



SANRAL continually monitors the situation on South Africa's freeways



SANRAL response vehicles, from left: medical response unit, incident response unit, light towing recovery unit, heavy towing recovery unit (inset: motorcycle medical response unit)

placed at strategic positions on the network to influence travel patterns and inform road users of real-time and projected traffic conditions due to incidents, scheduled road works, weather advisories and special events.

SANRAL therefore developed a national website (www.i-traffic.co.za) – the Advanced Traveller Information Systems (ATIS) – which provides road users with accurate, timely information to assist with pre-trip and en-route trip decisions. Road users are therefore empowered with quality traffic information and road conditions. Having such information at their disposal helps drivers to improve their vigilance and adjust their driving behaviour accordingly.

The i-traffic website (www.i-traffic.co.za) displays real-time freeway information and provides still CCTV images of strategic interchanges. Users can subscribe to *My-i-TRAFFIC* to receive personalised and route-specific information via SMS and/or e-mail alerts.

A functionality that has been launched recently is travel time information. This is made possible through an algorithm which consolidates data from the combination of probe and traffic sensor data to determine average vehicle speeds and volumes. This data is then used to calculate the estimated travel times between various points.

Travel time information is disseminated via VMS, e-mail alerts and the i-traffic website. The VMS will be set to display travel time in minutes from the VMS location to various destinations on the freeways.

RESPONSE VEHICLES AND IMPROVED COORDINATION

A key element of the FMS project is the interaction with and enhancement of the existing incident management systems (IMS) in order to facilitate improved emergency and incident response. Real-time traffic monitoring and the efficiency of notification of an incident improves the response of emergency services, reduces the impact of an incident and improves safety for the road user.

Response coordination to an incident with other authorities (such as municipal traffic control) is key to the objectives of the FMS. A key augmentation of the incident management services is the deployment of specially outfitted and dedicated vehicles to provide on-road services on the Gauteng network. The On-Road Service (ORS) unit currently includes 10 incident response units, 10 towing recovery units, 8 heavy recovery units, 6 motorcycle medical response units and 6 medical response units. These units provide towing recovery, incident management and medical support. The units respond to approximately 800 incidents (70% of total incidents) per month.

The motorcycles enable medical personnel to reach crash scenes quickly during peak traffic hours and congested traffic conditions. This unit is staffed by fully trained paramedics and is operated by a reputable emergency medical care and response service provider on SANRAL's behalf. The aim of the emergency services is to provide a quick response for the



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first line of medical assistance, critical in the 'golden hour' following injury. These services do not replace the existing public services, but are seen as complementary, expediting the provision of emergency aid to road users in need.

The light and heavy vehicle towing services and rapid medical emergency services are stationed at strategic locations and at 'hot spots' along the freeway network. These units are mobilised and dispatched to incident scenes when informed by Computer Aided Dispatch (CAD), Automatic Vehicle Location (AVL) and Automatic Vehicle Identification (AVI) systems. Additional benefits include improved coordination between emergency services, particularly with the South African Police Service, and this reduces clearance times in the case of fatal crashes. Managers and supervisors of the responding emergency services are able to use the visual information to train and do post-incident debriefing.

The system of quick detection and verification of incidents, coupled with faster alerting of emergency services and provision of real-time incident alerts, is certainly enhancing motorist safety. Incident management timelines are measured and monitored continually (average incident detection notification, response and clearance times) and are discussed at incident management forums, with the aim of reducing the impact of incidents to the road user.

Road users can report incidents on the Gauteng freeway network, including crashes and stationary vehicles, by calling the 24-hour operations centre at 012 762 4300.

Some of the added benefits of the FMS include identification of areas with high pedestrian activity, the implementation of engineering interventions, together with enforcement and educational strategies.

REMAIN INFORMED VIA TWITTER

Road users can further share in the benefits of being informed on a real-time basis via Twitter, and the following handles and contact details can be used:

■ Gauteng	@ittrafficgp	012 762 4300
■ KwaZulu-Natal	@i_trafficKZN	033 846 2874
■ Cape Town	@CapeTownFreeway	021 812 4442

The Twitter site is updated by the FMS operators as and when incidents occur. In many instances photos of the back of queues are included in the tweet to illustrate the exact location and impact of the incident.

BREAKDOWN ASSISTANCE

As the safety of road users is SANRAL's main concern, the Agency will, in the event of a breakdown on the freeway, remove the vehicle free of charge to the nearest drop-off point. Arrangements from there will then be for the account of the motor vehicle owner.

CONTACT DETAILS

Any incident on the Gauteng freeway can be reported to:

- T: 0800 itraff (0800 487 233) / 012 762 4300
- E: contact@i-traffic.co.za | W: www.i-traffic.co.za □



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