THE SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED

INVITATION TO PRE-QUALIFY FOR THE PROCUREMENT OF A NATIONAL INTELLIGENT TRANSPORT SYSTEM AND INTEGRATED SUPPORTING SYSTEMS SOFTWARE AND THE DEPLOYMENT THEREOF IN GAUTENG, KWAZULU-NATAL AND THE WESTERN CAPE

MARCH 2010 VOLUME 1 OF 3: PRE-QUALIFICATION FRAMEWORK, INSTRUCTIONS AND PROJECT INFORMATION

THE REGIONAL MANAGER
NORTHERN REGION
SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED
38 IDA STREET
MENLO PARK
PRETORIA
SOUTH AFRICA

NAME OF APPLICANT: ........................................................................................................................................
1. **INTRODUCTION**


a. **Project Background**

SANRAL has deployed Intelligent Transport System (ITS) technologies in Gauteng, KwaZulu-Natal and the Western Cape to improve mobility and safety on the roads it owns and/or manages. In total, over 450 kilometres of roads under SANRAL management are instrumented with ITS devices, with some sections still under construction. The devices typically includes, amongst others, closed circuit television (CCTV) cameras, variable message signs (VMS), and vehicle detection systems. A Traffic Management Centre (TMC) has been in operation in Gauteng for over 3 years, while a newly built Traffic Management Centre (TMC) is being constructed in KwaZulu-Natal and a newly built transport management centre (TMC) in the Western Cape.

SANRAL intends procuring a national Intelligent Transport System (ITS) which will ensure consistent and sustainable ITS elements in support of SANRAL’s mandate. This will include the extension and/or upgrading of its current ITS elements, operations in its regional centres in Gauteng, KwaZulu-Natal and Western Cape (subject to change), as well as maintenance of the ITS infrastructure. It is also the intent to procure supporting systems software to manage ITS operations and to provide traveller information.

b. **Envisaged “contracted” entity for the Project**

SANRAL intends to pre-qualify (i) Applicants for the Design-Build-Operate-Maintain (DBOM) Component of the Project and concurrently, (ii) Applicants for the Systems Software Provider (SSP) Component of the Project. Once a pool of pre-qualified DBOM contractors and a pool of pre-qualified SSPs have been identified, they will be invited to Tender in joint venture (or other association) as the Main Contractor (MC) for the Project. This process is described in Figure 1 following.
It is envisaged that a **Main Contractor** will be contracted for the Project, who shall assume full responsibility for:
• Providing **design** capacity to design ITS elements to add functionality to and/or expand the SANRAL ITS deployment based on achieving the programme goals. This function is described in Volume 2 of the PQD.

• Providing build (construct) capacity to **build** ITS elements to add functionality to and/or expand the SANRAL ITS deployment based on achieving the programme goals. This function is described in Volume 2 of the PQD.

• The **operation** of the SANRAL ITS. This operation is described in Volume 2 of the PQD.

• The supply and **maintenance** of all SANRAL ITS field and central devices and systems.

• Providing and integrating systems software and accompanying 3rd party commercial ‘off the shelf’ (COTS) software (e.g. database applications, operating systems, etc) to operate the SANRAL ITS including ATMS software to support incident management activities and manage ITS devices, Advanced Traveller Information System (ATIS) software and Hosted Internet solution to support the aggregation and dissemination of real-time and non-real time traveller information, computer aided dispatch (CAD)/automated vehicle identification (AVI)/automated vehicle location (AVL) software to facilitate the dispatch of incident response. These systems and services are described in Volume 3 of the PQD.

• Developing software data exchange interfaces for systems software provided under this Project as well as interfaces with 3rd party platforms to uni-directionally or bi-directionally exchange data including toll AVL/AVI system, external CAD platforms, and external traveller information platforms and services. These systems and services are described in Volume 3 of the PQD.

• Providing systems software maintenance and support services including for all systems software and accompanying 3rd party software supplied under this tender.

*It is envisaged that the Main Contractor will be contracted for five (5) years with an option available to SANRAL, at its sole discretion, to extend the period for another three (3) years.*

It should be noted that no Pre-qualified Applicant shall be permitted to participate in the Tender (i.e. the Tender pursuant to the Pre-qualification of Applicants in terms of this Pre-qualification Notice) with another entity who has not successfully Pre-qualified for the relevant Component (i.e. the DBOM component or the SSP Component, as the case may be).

Given the above, it is envisaged that only the MC element of the contract will be put to Tender. It is important that the Applicants strategically align themselves and ensure that they do in fact Pre-qualify in their own right.

It is recorded that the information and descriptions provided in this Pre-qualification Notice (and in particular in Volumes 2 and 3 of the PQD) are general in nature, not intended to be comprehensive and are merely aimed at providing Applicants with an overview of the envisaged Project and the systems and services required to successfully implement the Project. The information and descriptions should not be viewed as final and are subject to
amendment or change at any time. The Tender process, which shall follow this Pre-qualification process, shall finalise the detail and information. It is during the Tender process that Applicants (who have Pre-qualified under this process) shall be invited to submit a Tender in joint venture (or other association). Applicants may submit alternative designs or system configurations, subject to the Applicant also submitting a fully compliant and postulated bid (Tender).

The envisaged Main Contractor responsibilities, as described above, are indicated in the following organogram:

Figure 2: Envisaged Main Contractor Responsibilities*

*The above organogram is for informational purposes only. The required Components vary by geographic location and are further explained in Volumes 2 and 3 of the PQD.

c. **SANRAL’s Procurement Intent regarding the Main Contractor**

SANRAL intends, subsequent to having Pre-qualified various Applicants for the DBOM component and Applicants for the SSP Component pursuant to this Pre-qualification process to enter into a Tender process for the appointment of a Main Contractor.
The following critical ITS Components require Pre-qualification by suitable Applicants pursuant to this Pre-qualification Notice:

**DBOM (PQD 1, Volume 2):** The provision of design capacity to design ITS elements, build (construct) capacity to build ITS elements, the operation of the SANRAL ITS and the supply and maintenance of all ITS field and central devices and systems called for herein and in the PQD.

**SSP (Volume 3):** The supply of the Systems Software which includes the development, deployment, integration, testing and maintenance of all related ATMS, ATIS, and CAD software.

The relationship between the two Components is indicated in Figure 3 below:

![Figure 3: Pre-qualification Components](image)

2. **INVITATION & PROCUREMENT PROCESS**

SANRAL hereby invites applications from suitably qualified and experienced Applicants (companies, joint ventures, consortia or partnerships) that meet the Pre-qualification requirements and evaluation criteria pursuant to the PQD in order to Pre-qualify for either one or both of the Components as described in Section 1 (Introduction) above.

SANRAL’s intention is to follow a procurement process that includes four (4) primary
steps. These are:

**Step 1:** SANRAL will distribute a list of all Applicants who have drawn a PQD in terms of this Pre-qualification Notice for the Project to all other Applicants who have drawn the same;

**Step 2:** Preparation and submission of Applications by the Applicants, and the evaluation of Applications (for Pre-qualification) submitted under this process by SANRAL;

**Step 3:** The distribution of a list detailing all Applicants who have Pre-qualified and the Components for which they have Pre-qualified; and

**Step 4:** SANRAL intends (subsequent to this Pre-qualification process) to enter into a Tender process. Pre-qualified Applicants who have Pre-qualified for the DBOM Component will, at their sole discretion and risk, select and set-up competent Tender groupings and agreements with preferred Pre-qualified Applicants who have Pre-qualified for the SSP Component in order to prepare and submit compliant Tenders and visa versa, which ever the case may be as the Main Contractor under the Tender process. The set-up of groupings shall be based on the Pre-qualification lists pursuant to Steps 2 and 3 above.

### 3. PRE-QUALIFICATION DOCUMENTATION & FEE

The PQD is defined as and consists of:

**Volume 1:** Contains the Pre-qualification framework, instructions and Project information;

**Volume 2:** Applies to prospective Applicants making Application to Pre-qualify for the DBOM Component; and

**Volume 3:** Applies to prospective Applicants making Application to Pre-qualify for the SSP Component.

The PQD, together with the application forms and appendices to be completed by Applicants, will be available from 9 March 2010 for download off the SANRAL website – (www.nra.co.za) or can be purchased directly at the SANRAL’s Northern regional offices (Refer to paragraph 6 for physical address). As part of the documentation download, the Applicants will be required to register company and contact information on the website. This information will be used to compile the distribution lists of Applicants who have registered.

The following referenced documentation will also be available off the SANRAL website, for information purposes only:

- Directions to the SANRAL TMC in Gauteng (for the compulsory clarification meeting)
- Directions to the Cape Town TMC in the Western Cape (for the optional clarification meeting)
- the SANRAL Northern Regional Office (for Tender submissions).

A non-refundable fee of ZAR One Thousand (ZAR 1 000.00) is payable prior to or at the clarification meeting scheduled for 17 March 2010. “Form EL 2.8 and/or Form EL 3.8:
Attendance of Clarification Meeting* (as contained in Volumes 2 and 3) will be signed by a
duly authorised SANRAL representative at the clarification meeting on proof of this
payment. The signed Form EL 2.8 in Volume 2 and/or Form EL 3.8 in Volume 3
will be required to be submitted together with the Application.

Payments are to be made to:

Account: SA National Roads Agency Ltd
Bank: ABSA Bank
Account Number: 01045510073
Branch: Hatfield (632005) SWIFT: ABSAZAJJ
Beneficiary Reference: Pre-qualification National ITS.

Queries: Ms. E Phiri at +27 12 426 6200.

Proof of payment is to be faxed to +27 12 844 0156 (for attention: Mr. F van der Walt) or emailed to frans@techso.co.za.

4. CLARIFICATION MEETING

A compulsory clarification meeting will be held on 17 March 2010 at 10h00 South
African time (GMT + 2 hours) at the Gauteng TMC of:

The South African National Roads Agency Ltd
c/o No 2 First and Smuts Avenue
Halfway House
Midrand
Johannesburg
Gauteng
South Africa

Non attendance of the clarification meeting will disqualify the Applicant.

All prospective Applicants are kindly requested to notify SANRAL by 14 March 2010, by
e-mail to Mr. F van der Walt (frans@techso.co.za), of the number of people that will
attend the clarification meeting. Please restrict the number of people per prospective
Applicant to three.

The meeting must be attended by an authorised representative of the Applicant. No
Application will be considered for Pre-qualification if the Applicant has not submitted
documentary evidence of their attendance at the clarification meeting. Applicants are
referred to complete Form EL 2.8 in Volume 2 and Form EL 3.8 in Volume 3,
which requires the signature of both the Applicant and a duly authorised representative of
SANRAL.

An optional site tour meeting will be held on 18 March 2010 at 11h00 South
African time (GMT + 2 hours) at the Eastern Region offices of:
The South African National Roads Agency Ltd
58 Van Eck Place
Mkondeni
Pietermaritzburg
Kwazulu-Natal
South Africa

All prospective Applicants are kindly requested to notify SANRAL by 14 March 2010, by email to Mr. F van der Walt (frans@techso.co.za), of the number of people that will attend the clarification meeting in Kwazulu-Natal. Please restrict the number of people per prospective Applicant to three.

A second optional site tour will be held on 19 March 2010 at 11h00 South African time (GMT + 2 hours) at the Western Cape TMC at:

c/o Smartt Road and Richmond Street
Goodwood
Cape Town
Western Cape
South Africa

All prospective Applicants are kindly requested to notify SANRAL by 14 March 2010, by email to Mr. F van der Walt (frans@techso.co.za), of the number of people that will attend the clarification meeting in the Western Cape. Please restrict the number of people per prospective Applicant to three.

5. ENQUIRIES

Applicants should submit all enquiries per email or facsimile to:

Techso (Pty) Ltd
Attention: Mr. F van der Walt
Fax: +27 12 844 0156
e-Mail: frans@techso.co.za

No enquiries will be entertained after 28 March 2010.

6. SUBMISSIONS

Hard copies (the original Application plus two (2) additional copies), and electronic copies (2 x CD or DVD media) of the Application shall be placed in the tender box at SANRAL’s Northern Region offices or couriered to arrive at the address shown below, on or before 14h00 South African time (GMT + 2 hours) on 7 April 2010.

The address for the submission of the Application is:

The South African National Roads Agency Ltd: Northern Region
Tender Box
38 Ida Street
Menlo Park
Pretoria
Gauteng
South Africa

Attention: Ms. Gail Bester
Tel: +27 12 426 6200

Applications will be opened in public on the submission date at 14h00 South African time (GMT + 2 hours). Late submissions will not be accepted and will be returned unopened.

All Applications must comply with the conditions, instructions requirements and criteria set out in the PQD.
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SECTION I: INSTRUCTIONS TO APPLICANTS

A. GENERAL

This section specifies the procedures to be followed by Applicants in the preparation and submission of their Applications for Pre-qualification. Information is also provided on the opening and evaluation of Applications. This section further contains provisions that are to be applied without modification.

1 DEFINITIONS AND INTERPRETATION

1.1 In the Pre-qualification Documentation ("PQD"), as defined in paragraph 3 of the Pre-qualification Notice to this Volume 1, the following words shall, unless inconsistent with the context, bear the following meanings:

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<tr>
<td>115</td>
<td>Prospective nationwide traffic information phone number with interactive voice recognition and associated website</td>
</tr>
<tr>
<td>10111, 10177</td>
<td>Examples of nationwide public safety emergency phone numbers</td>
</tr>
<tr>
<td>Agency</td>
<td>South African National Road Agency Limited (SANRAL)</td>
</tr>
<tr>
<td>Alarm</td>
<td>An Alarm is a system action that occurs when a device or system meet defined criteria that is intended to solicit the attention of a system user</td>
</tr>
<tr>
<td>Applicant</td>
<td>A Person who applies in terms of the PQD for purposes of being Pre-qualified. An Applicant may apply to be Pre-qualified for the DBOM Component or the SSP Component</td>
</tr>
<tr>
<td>Application</td>
<td>The application submitted by an Applicant for purposes of being Pre-qualified in accordance with this PQD, together with all annexures thereto. In such Application, Applicants are to clearly identify what Components they are pre-qualifying for i.e. the DBOM Component or the SSP Component</td>
</tr>
<tr>
<td>Advanced Traveller Information System</td>
<td>Advanced Traveller Information System, including a range of information dissemination tools to provide road users with access to transportation network information. Includes roadside infrastructure (including VMS), Internet, phone, mobile applications, email alerts, media traffic updates. The private sector also operates traveller information services, often using a subscription-based business model</td>
</tr>
<tr>
<td>ATIS Gateway</td>
<td>The SANRAL ATIS Gateway is a system that shares information amongst various agency systems and/or provides traveller information to agency personnel, subscribers and/or the public at large. Information provided is envisaged to include traffic flow information, event information, and current field device message information (e.g., VMS, HAR)</td>
</tr>
<tr>
<td>Advanced Traffic Management System</td>
<td>The hardware and software system included in the scope of this document</td>
</tr>
<tr>
<td>ATMS Instance</td>
<td>An ATMS instance corresponds to an installation of the software on one or more servers, such as at a TMC. Each ATMS instance is separate and distinct from one another apart from a separate data exchange interface</td>
</tr>
<tr>
<td>Automatic Vehicle Location</td>
<td>Wireless transmitter on a vehicle that enables real-time vehicle information, including current location and speed. Most often uses a GPS, a communications link between vehicle and dispatcher, and tracking software program</td>
</tr>
<tr>
<td><strong>Broad-based Black Economic Empowerment</strong></td>
<td>Broad-based Black Economic Empowerment as contemplated in the Broad-based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003) of South Africa, and any specific conditions or requirements of SANRAL</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td><strong>Business Model</strong></td>
<td>A planned approach taken to achieve a desired return on an expense or investment. For a private sector for-profit entity, this is the plan for achieving a profit that will sustain or grow the business. For the public sector, it defines its role with respect to the private sector for the procurement or exchange of goods to meet goals of the agency</td>
</tr>
<tr>
<td><strong>Computer-aided dispatch</strong></td>
<td>Most commonly associated with public safety/law enforcement dispatch functions. In the context of SANRAL’s ITS programme, a police or emergency services CAD would provide real-time incident data and details and updated as dispatchers update the progression of the incident</td>
</tr>
<tr>
<td><strong>Closed Circuit Television</strong></td>
<td>Cameras which are deployed on roadways to provide traffic surveillance for traffic management agencies</td>
</tr>
<tr>
<td><strong>Commercial Vehicle Management System</strong></td>
<td>A Commercial Vehicle Management System is a system used to manage the commercial vehicles and their contents as they travel through the Country</td>
</tr>
<tr>
<td><strong>Concept of Operations</strong></td>
<td>A Concept of Operations (ConOps) defines the overall scope and needs of a system</td>
</tr>
<tr>
<td><strong>Concessionaire</strong></td>
<td>Contracted operator of systems or roads; could include toll facilities, traffic management system control facilities</td>
</tr>
<tr>
<td><strong>Contract</strong></td>
<td>The contract which emanates from the award of a Tender pursuant to this Pre-qualification process and by which the Main Contractor is appointed to undertake Project Works (refer to Section 1b of the Pre-qualification Notice in Volume 1)</td>
</tr>
<tr>
<td><strong>Contractor</strong></td>
<td>The Contractor is the successful Tenderer awarded the contract to supply goods and services for the ATMS project</td>
</tr>
<tr>
<td><strong>Commercial off-the-shelf</strong></td>
<td>Equipment or systems that are pre-designed to perform specific functionality and can be implemented in an interoperable system easier than a proprietary system</td>
</tr>
<tr>
<td><strong>Comma-Separated Values</strong></td>
<td>A common text-based data format</td>
</tr>
<tr>
<td><strong>Comprehensive Traffic Observation Stations</strong></td>
<td>Comprehensive Traffic Observation Stations collect traffic data for use by management agencies</td>
</tr>
<tr>
<td><strong>Data Aggregation/Fusion</strong></td>
<td>Consolidation of data from more than one source, and formatting data for re-use in other applications. Commonly found in traveller information systems where multiple data types from different sources are consolidated and formatted, and made available for redistribution through multiple channels</td>
</tr>
<tr>
<td><strong>Data Validation</strong></td>
<td>Process whereby data from an external source is verified for accuracy and completeness. In this context, private sector speed data would need to be validated as a viable source of network speed data to support traveller information, performance monitoring and other functions</td>
</tr>
<tr>
<td><strong>Design-Build-Operate-Maintain</strong></td>
<td>Type of procurement and deployment model including building out system and then operating and maintaining that system</td>
</tr>
<tr>
<td><strong>Dynamic message sign</strong></td>
<td>Interchangeable term with VMS, although not commonly used in South Africa</td>
</tr>
<tr>
<td><strong>Department of Transport</strong></td>
<td>Refers to the National DOT entity in South Africa</td>
</tr>
<tr>
<td><strong>Dube Tradeport</strong></td>
<td>New airport, trade zone and cyber port located just north of KZN region along coast; new airport expected to launch in May 2010, Tradeport is envisioned to be a major inter-modal hub in the KZN region</td>
</tr>
<tr>
<td><strong>Emergency Management Services</strong></td>
<td>Emergency Management Services, including fire, ambulance, and other incident and emergency responders</td>
</tr>
<tr>
<td><strong>Engineer</strong></td>
<td>The Engineer is the ITS Project Manager appointed by SANRAL</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
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</tr>
<tr>
<td>eThekwini Transport Authority</td>
<td>eThekwini Transport Authority is the metro roads authority in the KwaZulu-Natal region. ETA manages arterial and freeway operations in the eThekwini metro area, including ITS</td>
</tr>
<tr>
<td>Event</td>
<td>An Event is a system record of a traffic related activity such as an accident, stall, debris, sporting event, special event or any other activity in the real world that could affect traffic</td>
</tr>
<tr>
<td>Event Planner</td>
<td>An Event Planner is any organization that holds events that are large enough to require special planning with SANRAL prior to the event in order to address transportation concerns. Examples include sporting arenas and organizations responsible for parades or marathons</td>
</tr>
<tr>
<td>External Event</td>
<td>An External Event is a traffic related event provided to the ATMS from another system, not originating from an ATMS System Operator</td>
</tr>
<tr>
<td>External System</td>
<td>Any system to which the ATMS connects</td>
</tr>
<tr>
<td>Facilities Maintenance</td>
<td>The maintenance of buildings and infrastructure utilised for ITS operations and equipment installations</td>
</tr>
<tr>
<td>Freeway management system</td>
<td>Software, field devices, communications infrastructure and personnel that collectively manage traffic on the freeway network</td>
</tr>
<tr>
<td>Field Equipment</td>
<td>Field Equipment includes any device controlled or monitored by the TMC that is located outside of the TMC</td>
</tr>
<tr>
<td>Gauteng Freeway Improvement Project</td>
<td>Freeway expansion implementation project in the Gauteng region</td>
</tr>
<tr>
<td>Geographic Information System</td>
<td>A Geographic Information System (GIS) is a system for creating, storing, analyzing and managing spatial data and associated attributes. A GIS is a tool that allows users to create interactive queries (user created searches), analyzes spatial information, and edits data</td>
</tr>
<tr>
<td>Highway advisory radio</td>
<td>Highway advisory radio provides traveller information via radio to travellers. Can be permanent installations, or portable equipment.</td>
</tr>
<tr>
<td>Hosted Services</td>
<td>Contracted services for SMS/email/web traveller information systems</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers is a standards set used for interoperability of systems</td>
</tr>
<tr>
<td>Intelligent Devices, Inc</td>
<td>Intelligent Devices, Inc – the developer of the current SANRAL device management system</td>
</tr>
<tr>
<td>Intergovernmental Agreement</td>
<td>An Intergovernmental Agreement formalizes relationships between public agencies</td>
</tr>
<tr>
<td>Incident Management System</td>
<td>SANRAL’s nationally-focused program aimed at improved coordination and response to incidents on the national road network. Multi-agency, cooperative strategy</td>
</tr>
<tr>
<td>Integrated Rapid Transport</td>
<td>Integrated Rapid Transport is the transit provider in the KZN region</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Electronic systems management and support</td>
</tr>
<tr>
<td>Intelligent Transportation System</td>
<td>Intelligent Transportation System is a term used to encompass intelligent devices deployed on roads as well as the systems that communicate to those devices</td>
</tr>
<tr>
<td>ITS Architecture</td>
<td>An ITS Architecture is a planning tool that is technology-neutral and explains the use of a system or systems from the perspective of stakeholders and sets functional goals and expectations for ITS projects</td>
</tr>
<tr>
<td>i-traffic</td>
<td><a href="http://www.i-traffic.co.za">www.i-traffic.co.za</a> – SANRAL’s traveller information website and brand for SANRAL’s national ITS programme</td>
</tr>
<tr>
<td>Joint Command Centre</td>
<td>Emergency operations involving multiple entities within one area, collocated in an emergency operations centre, able to coordinate strategic and tactical responses to incidents and emergencies</td>
</tr>
<tr>
<td>Key Performance Indicators</td>
<td>Key Performance Indicators are measures that are used to evaluate performance of systems and agencies</td>
</tr>
<tr>
<td>Lane Control Signals</td>
<td>Lane Control Signals, used to designate available or restricted lanes of freeway traffic using overhead electronic signs</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lane Link</td>
<td>A Lane Link is a representation of a single lane along a logical section of roadway and is bounded by either a Node or the start or end point of the lane</td>
</tr>
<tr>
<td>Lead Member</td>
<td>The Member of an Applicant group, who shall lead the group (i.e. consortium, joint venture or partnership) constituted for purposes of this Pre-qualification process. For clarity, if an Applicant has only one Member, that Member will be the Lead Member</td>
</tr>
<tr>
<td>Link</td>
<td>A Link is a connection between any two points along a roadway segment</td>
</tr>
<tr>
<td>Maintaining Agency</td>
<td>Agency, firm, or entity under contract or arrangement to maintain and/or operate a portion of the FMS</td>
</tr>
<tr>
<td>Main Contractor</td>
<td>The Pre-qualified Applicant for the DBOM Component and the Pre-qualified Applicant for the SSP Component who Tendered in joint venture (or other association) and who have been appointed for the execution of the Contract pursuant to the Tender process initiated by SANRAL</td>
</tr>
<tr>
<td>Maintenance System</td>
<td>A Maintenance System is a system that assists SANRAL in managing outstanding maintenance requests and evaluating the performance of equipment</td>
</tr>
<tr>
<td>Market Package</td>
<td>Customised diagrams that illustrate the information exchanges between agencies or centre-to-field connections within each regional ITS Architecture</td>
</tr>
<tr>
<td>Media</td>
<td>The media is any outlet that provides news and other information to the public at large</td>
</tr>
<tr>
<td>Member</td>
<td>In respect of any Applicant, any Person, whether as a single entity or as a member of a consortium, joint venture or partnership who submits an Application pursuant to the Pre-qualification Notice in Volume 1</td>
</tr>
<tr>
<td>Mobile Applications</td>
<td>Applications which are accessible via a mobile phone, including graphics-based maps, alerts, and other information</td>
</tr>
<tr>
<td>N1, N2</td>
<td>National roads operated and maintained by SANRAL</td>
</tr>
<tr>
<td>National ITS Architecture</td>
<td>The National ITS Architecture is the framework that the United States uses as a basis for Regional ITS Architectures</td>
</tr>
<tr>
<td>Node</td>
<td>A Node is a point along or at the end of a Roadway Segment that defines the logical start and end of Lane Links</td>
</tr>
<tr>
<td>National Transportation Communications for ITS Protocol</td>
<td>National Transportation Communications for ITS Protocol is a standards set used for interoperability of systems</td>
</tr>
<tr>
<td>Open Road Tolling</td>
<td>The levying and collection of toll in a free flow electronic tolling environment without the use of toll lanes at conventional toll plazas, also known as “Multi Lane Free Flow tolling”</td>
</tr>
<tr>
<td>Other Traffic Centre</td>
<td>Any other traffic management system to which the ATMS connects is called an &quot;Other Traffic Centre.&quot; This may be another ATMS located within the same TMC (e.g., the traffic signal system) or another ATMS located within another regional centre</td>
</tr>
<tr>
<td>Other ATMS Instance</td>
<td>Another ATMS Instance is another Traffic Centre that happens to use the same software package that is used by the subject ATMS and is technically capable and institutionally authorized to serve as a redundant system to the ATMS, if needed</td>
</tr>
<tr>
<td>Overload Control</td>
<td>Enforcement of height and weight restrictions for commercial vehicles on certain routes</td>
</tr>
<tr>
<td>Pan-Tilt-Zoom</td>
<td>Refers to camera control capabilities</td>
</tr>
<tr>
<td>Parallel Event</td>
<td>A Parallel event refers to a specific event’s unique existence in an external system, such as a computer aided dispatch system or other system outside of the ATMS. The ATMS maintains an event record that includes a unique ATMS Event ID and the event ID as defined in the external system</td>
</tr>
<tr>
<td>Performance Measure</td>
<td>Performance Measures are methods of collecting and analyzing specific types of data to measure the performance of the network, system, or agency against predefined goals</td>
</tr>
</tbody>
</table>
### Performance Monitoring
Performance Monitoring is the ongoing management of performance measures and data quality, quantity, and availability to support performance measures.

### Person
Any natural or juristic person, partnership, corporation, firm or other entity.

### Portable Sign
A Portable Sign is a Variable Message Sign that is mounted on a trailer and can be readily relocated.

### Premium Services
Represents value-added information and services available from traveller information service providers (typically private sector), for a subscription fee. Examples include customised route guidance, navigation support or customised alerts.

### Pre-qualification Document
Volumes 1, 2 and 3 as defined in the Pre-qualification Notice in Volume 1.

### Pre-qualified
In relation to an Applicant, the Applicants having been short-listed having met the Pre-qualification requirements based on the criteria of the PQD for purposes of selection and/or participation in the Tender in a form most beneficial to SANRAL. “Pre-qualify” and “Pre-qualification” shall have a corresponding meaning.

### Preset Scene
A Preset Scene shall comprise camera position (pan and tilt), zoom, focus, and other controller selection options for a given camera.

### Private Sector Data
Private Sector Data is traffic conditions data that is collected by private sector companies which utilizes a number of methods such as vehicle location (probe/GPS), historical data, and sensor-based detection devices.

### Private Sector Traveller Information Service
Private Sector Traveller Information Services are provided by the private companies which collect and disseminate their own information typically provided by subscription services or publicly accessible websites.

### Probe Data
Probe Data is real-time traffic data that is collected using vehicle location and timed collection of that data; most often represented as speed or travel times.

### Project
The design, build, operation and maintenance of a national ITS and integrated supporting systems software and the deployment thereof in Gauteng, KwaZulu-Natal and the Western Cape.

### Project Works
The works envisaged to be undertaken by the Main Contractor, and which are described in more detail in Section 1b of the Pre-qualification Notice in Volume 1.

### Public Safety Agency
A Public Safety Agency is an agency that is responsible for maintaining the safety of the public, such as a police department, fire department, etc.

### Ramp Meters
Ramp Meters are signals at an on-ramp to freeways that regulate the vehicle traffic onto the freeway in order to maintain a consistent freeway travel time.

### Real-Time Traveller Information
Information that provides travellers across a variety of transportation modes with situational awareness regarding current infrastructure conditions including information related to incidents, congestion, service disruptions, weather, and associated fees.

### Remote Device
A device under the control of another ATMS Instance.

### Remote User
A Remote User is a user of the ATMS located at a remote location, which may be another TMC, another SANRAL office, a residence, or elsewhere.

### Response Plan
Response Plan is the set of recommended actions that the ATMS Operator can take in response to an event. These actions include four areas:
1. The Operator may use the ATMS to select and recommend modifiable VMS and VMS messages.
2. The Operator may create and edit Highway Advisory Radio Messages.
3. The Operator may create and edit an Advanced Traveller Information System message for dissemination to external systems.
4. The Operator may create and edit a list of relevant personnel to contact for a specific event.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Plan Template</td>
<td>A Response Plan Template is a defined message structure for an Event, for a specific response type such as VMS, ATIS, or HAR based upon the combination of location, lane blockage type and pattern, impact, and type of event</td>
</tr>
<tr>
<td>Road Works</td>
<td>Construction and maintenance activities on roadways</td>
</tr>
<tr>
<td>Roadside Devices</td>
<td>Devices that collect traffic information on the road network conditions and typically send that information to operations centres for use</td>
</tr>
<tr>
<td>Roadway Segment</td>
<td>A Roadway Segment is a logical representation of a roadway as stored within a GIS. The start and end points of Roadway Segments within a GIS do not necessarily line up with the definition of Links within an ATMS. Thus, the ATMS defines a link-node network on top of the Roadway Segment definition of the GIS</td>
</tr>
<tr>
<td>Roadway Service Patrol (RSP)</td>
<td>A Roadway Service Patrol (RSP) is a person that patrols the transportation network in order to provide a quick response to events. The patroller normally travels the transportation network in a truck that contains basic vehicle repair equipment, gasoline to refuel vehicles, and basic safety equipment that can be deployed to divert traffic around an incident scene</td>
</tr>
<tr>
<td>Service Level Agreement</td>
<td>A Service Level Agreement formalizes relationships between agencies</td>
</tr>
<tr>
<td>Standard Operating Procedure</td>
<td>Standard Operating Procedure – defined operational processes</td>
</tr>
<tr>
<td>Subsystem</td>
<td>Elements that represent the source of multiple levels of information transfer – such as a centre, a device, a software system</td>
</tr>
<tr>
<td>Supervisor</td>
<td>A Supervisor is a System Operator who is authorized to perform control functions that require special permissions</td>
</tr>
<tr>
<td>System Map</td>
<td>The System Map is the main graphic display screen of the system providing a visual image of the relative location of field devices and the transportation network. It is fully expected that the map will consist of numerous layers/themes or objects describing spatial features</td>
</tr>
<tr>
<td>System Integrator</td>
<td>The Person who will take on the technical responsibility of combining all the subsystems and ensuring that these subsystems interface and function as is required and “System Integration” shall have a corresponding meaning</td>
</tr>
<tr>
<td>System Operator</td>
<td>A System Operator is any user of the ATMS who is authorized to enter information or control devices</td>
</tr>
<tr>
<td>System Requirements</td>
<td>A System Requirement defines how the operational procedures, processes, interactions, and outcomes are achieved</td>
</tr>
<tr>
<td>System User</td>
<td>A System User is any person with access to log into the ATMS via a valid user name and password</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>Systems Engineering is an interdisciplinary approach to developing systems and, through checkpoints back to the beginning of concept development, ensures that the design and what is deployed meets the project intent</td>
</tr>
<tr>
<td>Tender</td>
<td>The Tender pursuant to this Pre-qualification process in terms of which SANRAL shall enter into a Contract for purposes of appointing the Main Contractor who shall be responsible for the Project Works. In this regard, only Pre-qualified Applicants who have applied and Pre-qualified for the DBOM Component and applied and Pre-qualified for the SSP Component in terms of this Application process, shall be invited to participate in the Tender process for purposes of being appointed as Main Contractor.</td>
</tr>
<tr>
<td>Transport Information Call Centre</td>
<td>Centralised information centre for City of Cape Town</td>
</tr>
<tr>
<td>Traffic Management Centre</td>
<td>Any facility that houses one or more dedicated workstations for the ATMS – term also used is TCC for Traffic Control Centre</td>
</tr>
<tr>
<td>Traffic Signals</td>
<td>Traffic Signals provide regulated access through intersections of roadways</td>
</tr>
<tr>
<td>Turbo Architecture</td>
<td>Software tool that provides a database to develop customised and region-specific ITS Architectures as well as update the architecture based on new implementation and growth</td>
</tr>
</tbody>
</table>
Urban Traffic Control | ATMS system used in Cape Town and KZN regions to control arterial traffic management devices
Vehicle Detector Station | A location with one or more detectors covering one or more lanes of traffic, where traffic data for individual lanes is typically aggregated into a single measure
Video Management System | Allows for control, monitoring, and archiving of video images obtained from CCTV cameras.
Variable Speed Limit Sign | Variable Speed Limit Sign used to regulate traffic on roadways based on real-time road conditions
Wireless Communications | Wireless Communications is a media used to send data from one system/device to another system/device without requiring physical connection

1.2 Any reference to:

1.2.1 Any one gender includes the other genders;
1.2.2 a natural person includes an artificial person and vice versa; and
1.2.3 the singular includes the plural and vice versa.

1.3 The headings of the clauses in the PQD are used for reference purposes only and shall in no way affect their interpretation.

2 ABBREVIATIONS

The following reflects a list of the key abbreviations used in the PQD:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMS</td>
<td>Arterial Management System</td>
</tr>
<tr>
<td>ATIS</td>
<td>Advanced Traveller Information System</td>
</tr>
<tr>
<td>ATM</td>
<td>Active Traffic Management</td>
</tr>
<tr>
<td>ATMS</td>
<td>Advanced Traffic Management System</td>
</tr>
<tr>
<td>AVI</td>
<td>Automatic Vehicle Identification</td>
</tr>
<tr>
<td>AVL</td>
<td>Automatic Vehicle Location</td>
</tr>
<tr>
<td>BBBEE</td>
<td>Broad-based Black Economic Empowerment</td>
</tr>
<tr>
<td>BRT</td>
<td>Bus Rapid Transport</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer-Aided Dispatch</td>
</tr>
<tr>
<td>CCB</td>
<td>Change Control Board</td>
</tr>
<tr>
<td>CCC</td>
<td>Central Communication Centre</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>COTS</td>
<td>Commercial off-the-shelf</td>
</tr>
<tr>
<td>CSV</td>
<td>Comma-Separated Values</td>
</tr>
<tr>
<td>CTO Stations</td>
<td>Comprehensive Traffic Observation Stations</td>
</tr>
<tr>
<td>DBOM</td>
<td>Design-Build-Operate-Maintain</td>
</tr>
<tr>
<td>DMS</td>
<td>Dynamic Message Sign</td>
</tr>
<tr>
<td>BO</td>
<td>Back Office</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transport (National Entity in South Africa)</td>
</tr>
<tr>
<td>DSRC</td>
<td>Dedicated Short Range Communications</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>EMS</td>
<td>Emergency Management Services</td>
</tr>
<tr>
<td>ESRI</td>
<td>Environmental Systems Research Institute</td>
</tr>
<tr>
<td>ESS</td>
<td>Environmental sensor station</td>
</tr>
<tr>
<td>ETA</td>
<td>eThekwini Transport Authority</td>
</tr>
<tr>
<td>FMS</td>
<td>Freeway Management System</td>
</tr>
<tr>
<td>FIDIC</td>
<td>Fédération Internationale des Ingénieurs-Conseils or International Federation of Consulting Engineers</td>
</tr>
<tr>
<td>GB</td>
<td>Gigabit</td>
</tr>
<tr>
<td>GFIP</td>
<td>Gauteng Freeway Improvement Project</td>
</tr>
<tr>
<td>HAR</td>
<td>Highway Advisory Radio</td>
</tr>
<tr>
<td>HOV</td>
<td>High Occupancy Vehicles</td>
</tr>
<tr>
<td>IDI</td>
<td>Intelligent Devices, Inc.</td>
</tr>
<tr>
<td>IGA</td>
<td>Intergovernmental Agreement</td>
</tr>
<tr>
<td>IMS</td>
<td>Incident Management System</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>IRT</td>
<td>Integrated Rapid Transport</td>
</tr>
<tr>
<td>ISP</td>
<td>Information Service Provider</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transportation Systems</td>
</tr>
<tr>
<td>JCC</td>
<td>Joint Command Centre</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicators</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>LCS</td>
<td>Lane Control Signals</td>
</tr>
<tr>
<td>MOU</td>
<td>Memorandum of Understanding</td>
</tr>
<tr>
<td>NMC</td>
<td>Network Management Centre</td>
</tr>
<tr>
<td>No</td>
<td>Number</td>
</tr>
<tr>
<td>NTCIP</td>
<td>National Transportation Communications for ITS Protocol</td>
</tr>
<tr>
<td>OD</td>
<td>Origin-Destination</td>
</tr>
<tr>
<td>ORT</td>
<td>Open Road Tolling</td>
</tr>
<tr>
<td>OS</td>
<td>Operating System</td>
</tr>
<tr>
<td>PDS</td>
<td>Pre-qualification Data Sheet</td>
</tr>
<tr>
<td>PSA</td>
<td>Public Service Announcement</td>
</tr>
<tr>
<td>PTZ</td>
<td>Pan-Tilt-Zoom</td>
</tr>
<tr>
<td>RDBMS</td>
<td>Relational database management system</td>
</tr>
<tr>
<td>RFP</td>
<td>Request for Proposals</td>
</tr>
<tr>
<td>PQD</td>
<td>Pre-qualification Document</td>
</tr>
<tr>
<td>RSP</td>
<td>Roadway Service Patrol</td>
</tr>
<tr>
<td>RTMC</td>
<td>Road Traffic Management Corporation</td>
</tr>
<tr>
<td>RWIS</td>
<td>Road Weather Information System</td>
</tr>
<tr>
<td>SAN</td>
<td>Storage Area Network</td>
</tr>
<tr>
<td>SANRAL</td>
<td>South African National Roads Agency Limited</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>SLA</td>
<td>Service Level Agreement</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service – also known as text messaging</td>
</tr>
<tr>
<td>SAPS</td>
<td>South African Police Service</td>
</tr>
<tr>
<td>SQL</td>
<td>Structured Query Language</td>
</tr>
<tr>
<td>SLA</td>
<td>Service Level Agreement</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>SSP</td>
<td>Systems Software Provider</td>
</tr>
<tr>
<td>SQL</td>
<td>Structured Query Language</td>
</tr>
<tr>
<td>TDM</td>
<td>Travel Demand Management</td>
</tr>
<tr>
<td>TIC</td>
<td>Traffic Information Centre</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Management Centre, and in the case of the Western Cape, Transport Management Centre</td>
</tr>
<tr>
<td>UPS</td>
<td>Uninterruptible Power Supply</td>
</tr>
<tr>
<td>UTC</td>
<td>Urban Traffic Control</td>
</tr>
<tr>
<td>VKT</td>
<td>Vehicle Kilometres Travelled</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Message Sign</td>
</tr>
<tr>
<td>VLS</td>
<td>Variable Speed Limit Sign</td>
</tr>
<tr>
<td>WIM</td>
<td>Weigh-In-Motion</td>
</tr>
<tr>
<td>XML</td>
<td>eXtensible Mark-up Language</td>
</tr>
<tr>
<td>ZAR</td>
<td>South African Rand</td>
</tr>
</tbody>
</table>
3 APPLICATION PROCESS

3.1 SANRAL will issue the PQD to interested Persons (prospective Applicants) for the purpose of preparing Applications for one of the Components.

3.2 Applicants shall provide relevant documentary evidence to demonstrate their ability and competency to deliver the anticipated scope of works pertaining to the relevant Component for which they apply for Pre-qualification purposes.

3.3 Applicants and their Applications shall be evaluated by SANRAL in accordance with the criteria (pursuant to the PQD) and where relevant to each Pre-qualification Component applied for.

3.4 All Applicants agree that SANRAL shall be entitled, on reasonable notice, to visit, inspect and verify their reference sites contemplated by their Applications. Consequently all Applicants agree to arrange such visits, inspections and verifications when requested by SANRAL. Both SANRAL and the Applicant will carry their own direct costs related to any visit, inspection and verification process.

3.5 SANRAL will distribute a list of Pre-qualified Applicants for each Component amongst all Applicants who Pre-qualify. These lists shall be used solely for purposes of the Tender process.

4 SOURCE OF FUNDS

The Project will be financed by SANRAL.

5 FRAUD AND CORRUPTION

5.1 It is SANRAL’s policy to require that entities who are engaged by SANRAL as service providers, contractors, suppliers and subcontractors observe the highest standard of ethics during the procurement and execution of any contract. In pursuit of this policy, SANRAL:

5.1.1 defines, for the purposes of this provision, the terms set forth below:

“corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of SANRAL or its staff or agents, or any official in the public service or in the employ of an organ of state, in any tender process; and

“fraudulent practice” means the misrepresentation of the facts in order to influence the Tender process or the award of a contract arising from a Tender offer to the detriment of SANRAL or any public entity or organ of state, including collusive practices intended to establish prices at artificial levels;

“collusive practice” is an arrangement between two or more Persons, designed to achieve an improper purpose, including to improperly influence any adjudication process;

5.1.2 shall reject an Application from an Applicant who has any representative, agent, director or employee who has been found to be involved in any corrupt, fraudulent or collusive practice relating to the Application or Tender process; and

5.1.3 shall sanction any Person, including any representative, agent, director or employee found to be involved in any of the aforesaid practices, including declaring ineligible, for a stated period, any Applications and/or Tenders by such Applicant.
6 ELIGIBLE APPLICANTS

6.1 An Applicant for the DBOM Component or the SSP Component shall be a Person or a combination of Persons associated or who intends to associate in the form of association/s including joint ventures (JV), consortiums or partnerships, as evidenced by a letter/s of intent signed by all the Members, that they have agreed their intention to enter into an association for purposes of submitting an Application(s) in terms of the PQD and Tender or participating in the Tender process if Pre-qualified, selected or invited.

6.2 The Lead Member of an Applicant who applies to be Pre-qualified for the DBOM Component or the SSP Component shall sign on behalf of the Applicant an irrevocable undertaking to submit a responsive Tender in the Tender process.

6.3 Failure to submit a responsive Tender in the Tender process, shall oblige the Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and the SSP Component as the Main Contractor to pay to SANRAL compensation in the amount of ZAR Fifty Thousand (ZAR 50,000-00), which shall be payable on written demand by SANRAL.

6.4 As security for that contemplated in 6.3 above, SANRAL will require the Lead Member of the Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and the SSP Component as the Main Contractor to submit a guarantee (bid bond) issued by a South African financial institution, or an international financial institution with a representative office in South Africa, acceptable to SANRAL, in accordance with Form EL 2.7 in Volume 2 or Form EL 3.7 in Volume 3 in the amount of ZAR Fifty Thousand (ZAR 50,000-00).

6.5 Should the Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and the SSP Component as the Main Contractor be invited by SANRAL to submit a Tender and fails to submit a Tender or a responsive Tender, SANRAL shall be entitled to demand and receive payment in terms of the guarantee.

6.6 The above mentioned guarantee must be provided to SANRAL, when requested, and will form an integral part of the Tender by the Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and SSP Component as the Main Contractor. Failure to provide such guarantee, in an acceptable form to SANRAL, within fourteen (14) days of being requested in writing to do so, may result in the Tender being regarded as non-responsive and the Pre-qualified Applicants being disqualified from the Tender process, notwithstanding that such Applicants may have Pre-qualified pursuant to this Pre-qualification process.

6.7 This guarantee shall come into effect on date of issue and remain in full force and effect until the earlier of:

6.7.1 The anniversary date (1 year) of the issue of the guarantee;

6.7.2 The award of the Tender to the Pre-qualified Applicants in joint venture (or other association) as Main Contractor by SANRAL and the Applicants having delivered a performance guarantee or bond in terms of the Contract; or

6.7.3 SANRAL having awarded the Tender to a third party.

6.8 Applicants and all Members of Applicant groups shall provide such information to substantiate the relevant minimum criteria pursuant to the PQD.

6.9 Applicants and all Members of Applicant groups shall provide such information as to their eligibility and complete all Application forms pursuant to the PQD.
6.10 Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and the SSP Component as Main Contractor, that participate in the Tender process shall have to demonstrate and provide documentary evidence of their compliance with BBBEE and specific Tender criteria to be determined as part of the Tender process by SANRAL. A broad overview of the applicable BBBEE criteria to be included in the Tender process is provided in Section 28.8.2 herein;

6.11 Pursuant to the submission requirements, each Applicant shall ensure compliance where all Members of Applicant groups are required to complete parts of an Application; and

6.12 An Applicant must submit a complete Application for the Component (PQD1 and/or PQD2) it wishes to Pre-qualify for.
B. CONTENTS OF PRE-QUALIFICATION DOCUMENTATION

7 GENERAL

7.1 The Pre-qualification Notice issued by SANRAL forms an integral part of the PQD.

7.2 The information contained in the PQD together with any subsequent addenda issued, is provided in good faith for the guidance of Applicants. SANRAL makes no representation or warranty, express or implied, nor accepts any responsibility or liability, as to the accuracy or completeness of the information contained in the PQD, or any other information (whether written or verbally provided) made available in connection with the Project and Tender process and nothing contained herein is, or shall be relied upon, as a promise or representation, whether as past, present or future. The PQD does not purport to contain all of the information that may be required to evaluate the Project and any Applicant should conduct its own independent financial and other analysis of the Project and of the information contained or referred to in the PQD and to obtain such professional advice as it deems necessary. In this regard it should be noted that the compulsory clarification meeting is integral to the information required by Applicants for purposes of an Application.

7.3 The information contained herein supersedes all other information previously communicated by SANRAL, or any of its advisors in connection with the Project.

7.4 The PQD is not intended to form the basis of a decision to enter into any transaction with respect to the Project and does not constitute an offer, invitation or recommendation to enter into any such transaction. The sole purpose of the PQD and the Application is to Pre-qualify Applicants for participation in the Tender.

7.5 The Applicants are responsible for all costs (including those for all travel and accommodation) associated with the preparation of their Applications, due diligence and, if applicable, completion of transactions in connection with an Application, the Contract and/or the Project.

7.6 The Applicants shall examine all instructions, forms, and terms in the PQD and are expected to furnish all information or documentation required by the PQD.

7.7 SANRAL reserves the right, at any time, to amend, suspend, cancel, alter or resume this Application process and shall not be obliged to Pre-qualify an Applicant and/or to subsequently enter into a Contract with any Applicant pursuant to the Tender. SANRAL will not be responsible for any costs incurred by the Applicant as a result of such actions by SANRAL.

7.8 The decision as to which Applicant(s) are Pre-qualified by SANRAL and for what Component, rests solely with SANRAL. The decision of SANRAL shall be final and binding and no correspondence will be entered into and/or reasons provided as to any decision taken by SANRAL regarding the Pre-qualification of an Applicant or the exclusion of any Applicant. An Applicant not Pre-qualified or subsequently appointed under the Tender shall have no claim of whatsoever nature against SANRAL and/or any of its directors, agents and/or employees.

7.9 It is further a condition of the Application that SANRAL, notwithstanding whether or not it Pre-qualifies any or all Applicants shall not be obliged to proceed to the Tender process and Applicants enter into this Application process (for purposes of Pre-qualification) on this specific understanding.

8 CLARIFICATION OF PRE-QUALIFICATION DOCUMENTATION
8.1 Applicants should submit all enquiries per email or facsimile to:

**Techso (Pty) Ltd**

Attention: Mr. F van der Walt  
Fax: +27 12 844 0156  
e-Mail: frans@techso.co.za

No enquiries will be entertained after **28 March 2010**.

8.2 **A compulsory** clarification meeting will be held on **17 March 2010** at 10h00 South African time (GMT + 2 hours) at the Gauteng TMC of:

**The South African National Roads Agency Ltd**

c/o No 2 First and Smuts Avenue  
Halfway House  
Midrand  
Johannesburg  
Gauteng  
South Africa

**Non attendance of the clarification meeting will disqualify the Applicant.**

The meeting must be attended by an authorised representative of the Applicant. No Application will be considered for Pre-qualification if the Applicant has not submitted documentary evidence of their attendance at the clarification meeting.

Applicants should note that Applications **will not** be received at the above-listed address (refer to paragraph 6 in Pre-qualification Notice for physical address).

An **optional site tour** will be held on **18 March 2010** at 11h00 South African time (GMT + 2 hours) at the Eastern Region offices of:

**The South African National Roads Agency Ltd**

58 Van Eck Place  
Mkondeni  
Pietermaritzburg  
Kwazulu-Natal  
South Africa

All prospective Applicants are kindly requested to notify SANRAL by 14 March 2010, by email to Mr. F van der Walt (frans@techso.co.za), of the number of people that will attend the clarification meeting in Kwazulu-Natal. Please restrict the number of people per prospective Applicant to three.

A **second optional site tour** will be held on **19 March 2010** at 11h00 South African time (GMT + 2 hours) at the Cape Town TMC at:

**c/o Smartt Road and Richmond Street**  
Goodwood  
Cape Town  
Western Cape  
South Africa
All prospective Applicants are kindly requested to notify SANRAL by 14 March 2010, by email to Mr. F. van der Walt (frans@techso.co.za), of the number of people that will attend the clarification meeting in the Western Cape. Please restrict the number of people per prospective Applicant to three.

8.3 Any response to a clarification regarding the Pre-qualification process will be communicated to all Applicants and only responses circulated in writing (e-mail) will be deemed to form part of the Pre-qualification process which forms the subject matter of this Application.

9 AMENDMENT OF PRE-QUALIFICATION DOCUMENTATION

9.1 SANRAL may amend the PQD by issuing addenda, no later than seven (7) calendar days prior to the closing date for the submission of Applications.

9.2 Any queries and or questions by the Applicant(s) must be received in writing (via e-mail) by no later than 28 March 2010. SANRAL does not undertake and shall not be obliged to answer any queries and/or questions received subsequent to this deadline.

9.3 Any addendum issued shall form part of the PQD and shall be communicated in writing (via e-mail) to all Applicants who appear on the PQD list distributed by SANRAL. Applicants will be required to submit acknowledgements of the addendums as part of their Application and will further be required to acknowledge per signed facsimile, receipt of addendums issued (refer to details in paragraph 8).

9.4 SANRAL reserves the right, on written notice to all Applicants whose names appear on SANRAL's PQD list (and the onus shall be on Applicants to ensure that their names appear on such list), to adjust the time periods applicable to this Application.

9.5 SANRAL reserves the right to query or seek clarification on any aspect of an Application in accordance with Section 19 of this Volume 1.
C. PREPARATION OF APPLICATIONS

10 COST OF APPLICATIONS

Applicants accept that SANRAL will not compensate the Applicant for any costs incurred in the preparation and submission of an Application, including but not limited to the costs of attending and preparation for any presentation (at the request of SANRAL) and any costs necessary to demonstrate that aspects of the Application satisfy requirements.

11 LANGUAGE OF APPLICATION

The Applications as well as all correspondence and documents relating to the Pre-qualification exchanged by an Applicant and SANRAL, shall be written in English. Supporting documents and printed literature that are part of the Application may be in another language, provided they are accompanied by an accurate translation, certified as accurate, by a sworn translator, of the relevant passages in English, in which case, for purposes of interpretation of the Applications, the translation in English shall govern.

12 DOCUMENTS COMPRISING THE APPLICATION

Each Application of each Applicant for each Component applied for shall comprise the following documents:

12.1.1 Application Submission Form pursuant to the relevant PQD requirements;

12.1.2 documentary evidence establishing the Applicant’s eligibility to Pre-qualify pursuant to the relevant PQD requirements;

12.1.3 documentary evidence of the Applicant’s and its Member’s disputes subject to litigation, arbitration or conciliation pursuant to the relevant PQD requirements;

12.1.4 documentary evidence establishing the Applicant’s financial ability to deliver the relevant Component applied for pursuant to the relevant parts and forms of the PQD requirements;

12.1.5 documentary evidence to demonstrate the Applicant’s experience, expertise, reference sites and ability to deliver the Package(s) applied for (pursuant to the relevant parts and forms of Volumes 2 and 3 of the PQD); and

12.1.6 any other documentation and information as required and specified in the PQD, PDS and the Forms.

13 SIGNING OF THE APPLICATION AND COPIES

13.1 For each Application, the Applicant shall prepare one original hard copy of the documents comprising the Application as described in clause 12 of this Volume 1 and shall clearly mark it “DBOM COMPONENT: ‘NAME OF APPLICANT’: ORIGINAL”, or “SSP COMPONENT: ‘NAME OF APPLICANT’: ORIGINAL”, as the case may be. This original hard copy of the Application shall be printed or typed or written in indelible black ink and shall be signed by a person duly authorised by all Members to sign on behalf of the Applicant.

13.2 In addition, the Applicant shall submit two (2) hard copies of the signed original Application, and clearly mark them “DBOM COMPONENT: ‘NAME OF APPLICANT’: COPY NO ‘Y’ ” or “SSP COMPONENT: ‘NAME OF APPLICANT’: COPY NO ‘Y’ ”. In the event of
any discrepancy between the above-mentioned original (13.1) and these copies (13.2), the original shall prevail.

13.3 In addition, the Applicant shall also include two (2) electronic copies of the completed documents on CD or DVD media within the envelope that contains the original hard copy submission. Where registrations, certificates and notarised statements (etc.) are specifically required, these should be scanned, and included in the electronic copies.
D. SUBMISSION OF APPLICATIONS

14 SUBMISSION OF APPLICATIONS

14.1 All Applications shall be addressed to SANRAL, and delivered to the address, before the closing date, as stated in the PDS (PDS 1.11 (Section III of this Volume 1).

14.2 All Applications shall be delivered by hand or couriered to the address as stated in the PDS (PDS 1.11).

15 SEALING AND IDENTIFICATION OF APPLICATIONS

15.1 Applicants shall enclose the original and the copies of each Application in a sealed envelope that shall:

15.1.1 bear the name and address of the Applicant;

15.1.2 be addressed to SANRAL, in accordance with clause 14 of this Volume 1; and

15.1.3 bear the specific identification of this Pre-qualification process indicated in clause 13 and the PDS 1.3.

15.2 SANRAL will not accept any responsibility for not processing any envelope that was not identified as required.

16 CLOSING DATE FOR SUBMISSION OF APPLICATIONS

16.1 Applicants shall submit their Applications by the date and time specified in the PDS (PDS 1.12).

16.2 SANRAL may, at its discretion, extend the closing date for the submission of Applications by amending the PQD in accordance with clause 9, in which case all rights and obligations of SANRAL and the Applicants subject to the previous closing date shall thereafter be subject to the extended closing date.

17 LATE APPLICATIONS

Any Application received by SANRAL after the deadline for submission of Applications prescribed in accordance with clause 16 shall be returned unopened to the Applicant.

18 OPENING OF APPLICATIONS

All Applications shall be opened in public on the closing date and the names of the Applicants will be read out for each Application relating to each Component.
E. PROCEDURES FOR EVALUATION OF APPLICATIONS

19 CLARIFICATION OF APPLICATIONS

19.1 To assist in the evaluation of Applications, SANRAL may, at its discretion, request any Applicant for a clarification of its Application(s) which shall be submitted within three (3) days of such request, unless otherwise stipulated. Any request for clarification and all clarifications shall be in writing.

19.2 If an Applicant does not provide clarification of the information requested by the date and time set in SANRAL’s request for clarification, its Application may be rejected.

20 RESPONSIVENESS OF APPLICATIONS

20.1 SANRAL reserves the right, at any time, to amend, cancel and/or alter the Application process, should Applications received not meet the requirements of SANRAL.

20.2 Such action shall not result in a claim of whatsoever nature against SANRAL and/or any of its directors, agents and/or employees.

20.3 SANRAL may reject any Application and refuse to Pre-qualify any Applicant where the Application is not compliant with the requirements of the PQD.

21 SUBCONTRACTORS

Applicants who intend to subcontract any of the key elements of the relevant Component to Persons other than Members, shall specify the key element(s) or part(s) of the works intended to be subcontracted in the relevant Application Submission Form(s) pursuant to the PQD.
F. EVALUATION AND PRE-QUALIFICATION OF APPLICANTS

22 QUALIFICATION CREDENTIALS

Qualification credentials of the Applicants’ proposed subcontractors (other than Members or Applicants) pursuant to clause 21 of this Volume 1 of the PQD will not be considered during the evaluation of Applications.

23 SANRAL’S RIGHT TO ACCEPT OR REJECT APPLICATIONS

SANRAL reserves the right to terminate the Pre-qualification process and reject all Applications at any time, without incurring any liability, obligation or cost to any Applicant. Applicants, who wish to submit Applications, do so on this specific understanding.

24 NOTIFICATION OF PRE-QUALIFICATION RESULTS

24.1 Once SANRAL has completed the evaluation of the Applications it shall notify all Applicants in writing of the names of those Applicants who have been Pre-qualified and for the Component for which they have been Pre-qualified.

24.2 Pursuant to 24.1 above, Pre-qualified Applicants will be entitled to form a joint venture (or other association) for purposes of the Tender. SANRAL shall not be liable to and shall have no obligation to ensure that all Pre-qualified Applicants are incorporated within groupings for purposes of the Tender. In this regard it shall be the right and responsibility of Applicants who have Pre-qualified for either Component and who are invited to participate in the Tender to form groupings from Applicants who have Pre-qualified for the other Component and which shall thereafter result in compliant Tenders.

25 INVITATION TO PARTICIPATE IN TENDER

25.1 SANRAL intends to invite Tenders solely from the Pre-qualified Applicants who have Pre-qualified as Applicants for purposes of the Contract. They shall be responsible, together with their selected and Pre-qualified Applicants to complete and deliver the Tender.

25.2 Pre-qualified Applicants for either Component may participate in more than one Tender grouping for purposes of the Tender, if so invited by a Pre-qualified Applicant for another Component.

25.3 All Pre-qualified Applicants (being those Pre-qualified in respect of the DBOM Component) shall submit signed agreements regulating the association between them and their selected Pre-qualified Applicants (being those Pre-qualified in respect of the SSP Component) or vice versa, to SANRAL as part of the requirements of the Tender.

26 CHANGES IN COMPOSITION OF APPLICANTS

26.1 Any change in the membership, structure or formation of any Applicant (after being Pre-qualified), shall be subject to the written approval of SANRAL, which approval shall be given at the sole discretion of SANRAL, prior to the deadline for submission of the Tenders, provided that the Lead Member of any Pre-qualified Applicant shall not be entitled to be replaced. SANRAL will only consider the approval of a change in the structure of the Applicant if such a change can be motivated with valid reasons.
26.2 Such approval shall be refused if, as a consequence of such change, the Applicant no longer meets the criteria set out in the PQD, or if in the opinion of SANRAL, this may result in a substantial reduction in competition. Any such changes shall be submitted to SANRAL not later than seven (7) days after the date of the invitation for the Tenders.

27 GENERAL

27.1 The Pre-qualification Notice, Applications submitted in terms hereof and the Pre-qualification of Applicants, shall be governed and construed in accordance with the laws of South Africa.

27.2 Each Applicant and SANRAL undertake to accept the exclusive jurisdiction of the High Court of South Africa in respect of any dispute arising from or in connection with the Pre-qualification Notice, Applications submitted in terms hereof, the Pre-qualification of Applications and the Tender pursuant to this Pre-qualification process.
G. EVALUATION OF THE TENDER

28 TENDER EVALUATION (POST PRE-QUALIFICATION)

28.1 The paragraphs in this section outline certain of the Tender evaluation criteria and considerations, and do not relate to the Pre-qualification adjudication criteria in respect of this Application. This section is provided for information purposes only, and to assist Applicants in understanding the process. The information set out hereunder is however preliminary and is therefore subject to change. SANRAL shall not, for purposes of the Pre-qualification which forms the subject matter of the Application, be bound by the provision of this Section G.

28.2 The Tenders will be adjudicated in accordance with SANRAL’s then standard Tender conditions and prevailing legislation.

28.3 Particular attention will be given to a Tenderers’ quality and competency in relation to its proposed technical solutions (including design, installation, testing, commissioning, maintenance, management and the like) and which comply with SANRAL’s criteria and requirements.

28.4 The Tenderers’ capacity and ability to deliver the required ITS and integrated supporting systems software within the specified timeframes will be a key criterion in the evaluation of Tenders and award of the Tender.

28.5 Any gaps in functionality between the Tenderers’ proposed systems software functionality and the requirements as specified in the Tender, will be considered when assessing the Tenderers’ ability to deliver the required ITS and integrated supporting systems software as per the required functionality, and in the required time period. To this end, the following process will apply:

28.5.1 Tenderers will be required to complete a compliance matrix at time of Tender. The accuracy of information provided will be of paramount importance;

28.5.2 Tenderers will be required to nominate one or more reference sites which should verify the accuracy of their stated system and systems software compliance; and

28.6 SANRAL may choose to visit any nominated reference site in order to verify the information provided.

28.7 The Tenderers’ price proposals will be evaluated;

28.8 Further criteria that are to be considered during the Tender evaluation process are:

28.8.1 The capability, competency or the like of other suppliers (other than those that were required to Pre-qualify pursuant to the PQD) and who are proposed by the Tenderers for works not requiring Pre-qualification.
28.8.2 The appropriate demonstration and provision of documentary evidence of the Tender grouping's compliance with BBBEE objectives and any specific Tender criteria to be set by SANRAL, hereinafter referred to as “preference” criteria in the Tender process. Applicants should note that certain legislation has a bearing on the adjudication of Tenders. The legislation referred to in this clause is not comprehensive and should not to be construed as having precedence over any other applicable legislation. Applicants should note that:

28.8.2.1 The Preferential Policy Framework Act, 2000 (Act No. 5 of 2000) (PPFSA) stipulates the points that can be claimed for preference in meeting, among others, the requirements of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003). Further information can be found in the Codes of Good Practice on Broad-Based Black Economic Empowerment (the Codes) published in Government Gazette No. 29617 of 9 February 2007. Applicants should refer to the website of the South African Department of Trade and Industry (DTI) www.dti.gov.za.

28.8.2.2 The Tender submitted by a Pre-qualified Applicant for the DBOM Component and a Pre-qualified Applicant for the SSP Component in joint venture (or other association) as Main Contractor will be scored out of a hundred points, of which ten (10) points will be allocated to “preference”, in accordance with the PPFSA and measured for elements contained in the Codes such as BBBEE. This will include, amongst others, elements such as black management and control in entities, the commitment by the Tenderer to utilise South African suppliers, the engagement of Small Medium and Micro Enterprises (SMME’s) as subcontractors or suppliers, and the transfer of skills and training. The remainder of the points will be scored based on the technical proposals and Tender prices received.

28.8.2.3 SANRAL therefore encourages international bidders to align themselves with South African partners in order to leverage local skills and resources and to facilitate an awareness and understanding of the procurement requirements of SANRAL as well as the relevant legislation and practices pertaining to BBBEE.

28.9 All main and alternative Tenders received by SANRAL in the Tender process and meeting the Tender requirements and contractual obligations will be evaluated. The submission of compliant Tenders shall be a pre-requisite to entertaining any alternative Tenders.

28.10 SANRAL reserves the right to carry out an information accuracy verification process for one (1) or more of the reference sites as listed by Applicants in the Pre-qualification process. This accuracy of information provided at the Pre-qualification stage by Applicants will contribute to the final Tender scoring of each Tenderer in the Tender process. Applicants will therefore be bound in the Tender by information provided for purposes of this Application.
29 CONTRACT DOCUMENTS

29.1 It is envisaged that the Contract documents will be based on FIDIC–based Conditions of Contract*, supplemented by SANRAL’s special conditions, Project specifications and adapted standard specifications to suit the Project and business model. These will be issued with the Tender documentation during the Tender phase.

(* Reference website: www.fidic.org)

29.2 Business & Payment Models of the Contract:

29.2.1 A five (5) year operations term (starting on issuance of written Notice to Proceed) is foreseen. At its sole discretion SANRAL reserves the option to extend the period for another three (3) years;

29.2.2 Financing of the Project will be undertaken by SANRAL;

29.2.3 It is envisaged that the Main Contractor will be paid in accordance with a deliverable milestone payment schedule for the ITS infrastructure, systems software and other material supply components which shall include all ITS infrastructure, systems software and materials testing and defects resolution;

29.2.4 ITS operation and maintenance will be subject to appropriate and specific service level type obligations to ensure overall system and operational performance, with minimal downtime;

29.2.5 It is intended to include a defects liability period (on all systems, materials and hosted services delivered under the Contract) for the full Contract period;

29.2.6 For ITS operation and maintenance related services, it is intended that the Main Contractor will be paid on a monthly fee basis, which will be defined in the Tender;
SECTION II: PROJECT INFORMATION

This section includes preliminary Project information gathered, compiled and developed during previous Project studies as procured by SANRAL. It is explicitly noted that this information, including assumptions recorded, conclusions or decisions tabled and statistical predictions given, are subject to clause 7.2 of this Volume 1 of the PQD.

30 PROJECT INFORMATION

The Project information is detailed in Appendix A to this Volume 1.

The Project information provided represents summary information from a comprehensive ITS Institutional Requirements study undertaken to assess and provide recommendations and guidance to the SANRAL ITS programme. The ITS Institutional Requirements study assessed SANRAL’s ITS Programme needs from an Institutional, Operational, and Systems perspective and provided input on the Programme’s vision and strategy, as well as input on concepts of operation, systems technical requirements, traveller information needs and strategies, future deployment recommendations, and performance measures. The study findings are based on institutional relationships, existing and proposed system interconnections, and operational policies in-place or planned at the time of the study development. These recommendations have been used to inform this tender process and tender materials.
SECTION III: PRE-QUALIFICATION DATA SHEET (PDS)

This section consists of provisions that supplement the information or requirements included in the Instructions to Applicants pursuant to Section I of this Volume 1 of the PQD.

A. GENERAL

<table>
<thead>
<tr>
<th>PDS 1.1</th>
<th>Employer: The South African National Roads Agency Limited</th>
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<tbody>
<tr>
<td>PDS 1.2</td>
<td>The name of the Project is: INVITATION TO PRE-QUALIFY FOR A NATIONAL INTELLIGENT TRANSPORT SYSTEM AND INTEGRATED SUPPORTING SYSTEMS SOFTWARE AND THE DEPLOYMENT THEREOF IN GAUTENG, KWAZULU-NATAL AND THE WESTERN CAPE</td>
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<tr>
<td>PDS 1.3 (Clause 3)</td>
<td>Application Process</td>
</tr>
<tr>
<td>PDS 1.4 (Clause 12)</td>
<td>Application Documents</td>
</tr>
<tr>
<td>PDS 1.5 (Clause 6)</td>
<td>(i) The Pre-qualified Applicants in joint venture (or other association) for the DBOM Component and the SSP Component as the Main Contractor is liable to pay SANRAL, on written demand, compensation in the amount of ZAR Fifty Thousand (ZAR 50,000-00) applicable for the non-submission of a responsive Tender. To this end, a guarantee is required to be submitted to SANRAL by all Applicants, within forty(48) hours from Pre-qualification (Refer Form EL 2.7 in Volume 2 and Form EL 3.7 in Volume 3)</td>
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<td>(ii) Maximum number of partners in the joint venture shall not be limited.</td>
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</tbody>
</table>

B. CONTENTS OF THE PRE-QUALIFICATION DOCUMENTATION

<table>
<thead>
<tr>
<th>PDS 1.6 (Clause 8.1)</th>
<th>Applicants should submit all enquiries per e-mail or facsimile:</th>
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<tr>
<td></td>
<td>Techso (Pty) Ltd</td>
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<td></td>
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<td></td>
<td>Fax: +27 12 844 0156</td>
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<td>e-Mail: <a href="mailto:frans@techso.co.za">frans@techso.co.za</a></td>
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</tr>
</tbody>
</table>
clarification meeting. Applicants should note that Applications will not be received at the above-listed address (Refer to PDS 1.11 below).

C. PREPARATION OF APPLICATIONS

PDS 1.8 (Clause 11) Language: The language of the Application and all correspondence shall be English.

PDS 1.9 (Clause 12) All Applications shall include the following documents: Audited financial statements including balance sheets and income statements, letter of good standing from their bankers, and other supporting documentation as is required in the Application forms of the PQD.

PDS 1.10 (Clause 13.2) In addition to the original, the number of hard copies to be submitted with each Application is: Two (2) and the number of electronic copies is Two (2) on CD or DVD media.

D. SUBMISSION OF APPLICATIONS

PDS 1.11 (Clause 14) Hard copies (the original Application plus two (2) additional copies), and electronic copies (2 x CD or DVD media) of the Application shall be placed in the tender box at SANRAL’s Northern Region offices or couriered to arrive at the address shown below, on or before 14h00 South African time (GMT + 2 hours) on 7 April 2010.

The address for the submission of the Application is:
The South African National Roads Agency Ltd: Northern Region Tender Box 38 Ida Street, Menlo Park, Pretoria, South Africa Attention: Ms. Gail Bester (Tel: +27 12 426 6200)

Applications via telefax or e-mail will not be accepted.

PDS 1.12 (Clause 16) Closing Date: The closing date for Application submissions is:
Date: 7 April 2010 Time: 14h00 South African time (GMT + 2 hours)

PDS 1.13 (Clause 17) Late Applications shall be returned unopened to the Applicant.
SECTION IV: PRE-QUALIFICATION CRITERIA, REQUIREMENTS

This section contains the general method, criteria and requirements to be used to determine how Applicants will be evaluated for Pre-qualification purposes. The specific criteria and requirements in relation to each of the Components and related anticipated scope of works are given in Volumes 2 and 3 of the PQD.

A. CONTENTS

31 MINIMUM CRITERIA

The minimum criteria that each Application must satisfy in order to be considered for Pre-qualification is outlined in Volume 2 (DBOM Component) and Volume 3 (SSP Component), and typically include, amongst others, the following:

31.1 An Applicant or Lead Member of an Applicant must (for each Application and for the relevant Component applied for) complete, sign and provide a responsive Application Submission Form;

31.2 An Applicant and/or Members must complete and submit (for each Application and for the relevant Component applied for) all of the applicable Application forms pursuant to the submission requirements contained in all or any of Volumes 2 and 3 of the PQD;

31.3 The average annual turnover of the Applicant or the combined turnover of the Members over the last two (2) financial years must equal or exceed the amounts stated in the applicable minimum criteria of Volumes 2 and 3;

31.4 The Applicant or any individual Member must have successfully completed or is in the process of implementing at least one contract during the last five (5) years, with a value greater than the amounts stated in the applicable minimum criteria of Volumes 2 and 3;

31.5 The Applicant or any individual Member must have completed or is in the process of implementing the number of projects stated in the applicable minimum criteria of Volumes 2 and 3; and

31.6 The Applicant is not subject to the following:
• Insolvent or being wound up;
• Subject to proceedings for a declaration of insolvency;
• Convicted of a criminal offence or an offence concerning his professional conduct;
• Found guilty by a professional body of professional misconduct;
• Unfulfilled obligations relating to the payment of taxes in accordance with the legal provisions;
• Guilty of serious misrepresentation in supplying or failing to supply the information requested by an authority; or
• In the reasonable opinion of SANRAL, guilty of a corrupt practice, fraudulent practice and/or collusive practice (all as defined in Volume 1).

32 ASSESSMENT CRITERIA

Each Application for the relevant Component shall be measured against the following criteria:
A. COMPOSITION, MEMBER DETAILS AND UNDERTAKINGS
B. LITIGATION AND ARBITRATION HISTORY
C. FINANCIAL STANDING
D. EXPERIENCE (INCL. TECHNICAL AND PROJECT MANAGEMENT)
E. PROGRAMME INFORMATION
F. DATA, INFORMATION & SPECIFICATIONS

33 ADJUDICATION USING A POINT SYSTEM

The above stated criteria shall be used to adjudicate the Pre-qualification of each Application and Component applied for by Applicants. The maximum number of points that can be awarded for each criterion is outlined in Volumes 2 and 3.

34 INSTRUCTIONS TO APPLICANTS

Applicants shall provide all information and documents as requested and shall ensure compliance with the minimum requirements in clause 31.
SECTION V: APPLICATION FORMS

Application submission forms required to be submitted with each Application and for the relevant Component applied for are included in Volumes 2 and 3 of the PQD.

If an Applicant or Member of an Applicant group cannot complete the information in the prescribed space allocated, then the prescribed space should be expanded if the information is captured into SANRAL provided Microsoft Word format or an additional page with the same page number should be added before the next page.
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1. INTRODUCTION

This document describes the envisaged concept of operations for SANRAL’s ITS systems in Gauteng, KwaZulu-Natal and the Western Cape. It is intended to provide overarching context for the DBOM and SSP tenderers to supplement the specific scope of works and other documentation in the prequalification package.

With respect to the three regions, there is an established operations model in Gauteng and emerging ITS operations in KwaZulu-Natal and the Western Cape. The systems to support the ITS in the three regions will be compatible deployments as they are being procured and implemented from the same system specification. This lends itself to consistent operations in each of the three regions, but the concepts of operations do differ according to the unique operating environments and overall maturity of SANRAL’s ITS programmes in each of the three regional deployments. In the future, as specific regional needs arise, operating procedures and systems enhancements within the context of a national program and single contracting structure will be accommodated.
2. **Gauteng Region Concept of Operations**

2.1 Summary

The Gauteng ITS Programme is the most extensive and mature of the SANRAL ITS deployments. It provides for the most comprehensive SANRAL operational documentation of the three regions. There are several core components already in place, with additional functionality planned for near-term ORT implementation with which the ITS will need to interface. The Gauteng TMC has been operational for over 3 years, and the operations model continues to evolve as the ITS programme expands. Lessons learned (technical, operational as well as institutional coordination) from the Gauteng deployment can be applied to SANRAL’s other regional deployments.

The current Gauteng TMC and systems will be relocated and housed in the ORT building, which provides key opportunities to leverage ORT data collection capabilities to support a more robust ITS and real-time data strategy. Also, the deployment of the ORT will be vastly expanding the responsibility of SANRAL’s ITS enterprise in Gauteng. In conjunction with an envisaged dedicated freeway traffic law enforcement fleets, the MC will manage various fleets including Incident Response Units (IRUs) to facilitate incident response and clearance, and Motorcycle Medic Units (MMUs), who will provide on-site medical assistance.

There are several operating procedures already in place, some of which will be changed and others that are envisaged to be enhanced. The SOP discussions for Gauteng cover the full range of day-to-day traffic management, congestion/bottleneck management strategies, incident management and response, traveller information, and data collection, among others.

While the MC will be responsible for the field device design, construction and maintenance, as well as last mile communications links, SANRAL has also engaged a contractor to maintain the backbone communications network supporting both the ITS and the ORT systems.

**Figure 2-2** depicts the general flow of information centred on the ITS in Gauteng. It is a graphical depiction of the subsequent use cases in Section 5, which the system will be expected to support.
Figure 2-2: Gauteng Operations Model/Interactions
2.2 Existing Conditions/Current Situation

The freeway network in the Gauteng region is comprised of approximately 200 kilometres of roadway serving the cities around Johannesburg and Pretoria. Currently, SANRAL has jurisdiction over all of the 200 kilometres of roadway in the Gauteng province (Figure 2-3 below), and has built a Traffic Management Centre (TMC) to provide network monitoring and management capabilities. The current TMC system includes vehicle detection, CCTV, VMS, and ramp metering capabilities and supports pre-trip and en-route traveller information and interagency coordination.

Figure 2-3: Map of Gauteng ITS Deployment
3. CAPE TOWN CONCEPT OF OPERATIONS

3.1 Summary

The Cape Town institutional environment provides some unique opportunities for SANRAL, municipal and provincial coordination on integrated approaches to traffic management on the regional freeway network. With operational responsibility of the road infrastructure with three different entities in the Cape Town region—the city, the province and SANRAL—there are important considerations for multi-agency approaches to traffic and incident management, consistent practices for road user information, as well as joint operations strategies.

Collocation of SANRAL’s ITS within the City of Cape Town TMC provides further collaborative opportunities. The Cape Town region also offers a near-term opportunity to address multi-modal coordination between the City’s BRT operations and the other traffic management agencies.

Because of this multi-agency scenario, however, the MC will only be responsible for provision of the ATMS, and not any of the design, build operate or maintain functions in the Western Cape (subject to change).

Figure 3-1 depicts the general flow of information centred on the ITS in the Western Cape. It is a graphical depiction of the subsequent use cases in Section 5, which the system will be expected to support.
3.2 Existing Conditions/Current Situation

The road network system in the Western Cape has its own character and configuration which differs from the other provinces and metropolitan areas in South Africa. The location of the Cape Town Central Business District (CBD) in relation to the Atlantic and mountainous terrain induces a typical radial road network with its focus point being Cape Town CBD, strongly influenced by the Cape Town Port next to the CBD. These geographic constraints focus the traffic flows from/to the City Centre into a single quadrant.

SANRAL is the implementing agent for the deployment of ITS field devices on major freeways in the Cape Town Metropole. The extent of the Cape Town ITS covers major freeways that fall under the jurisdiction of SANRAL, the Provincial Government and the City of Cape Town. The freeways as depicted in Figure 3-2 includes portions of the N1, N2, N7, R300 and M5, and illustrates how the Cape Town ITS freeway jurisdiction is split between the three Road Authorities. The implementation includes partnering with the City of Cape Town and Provincial
Government deploying and funding the ITS. Traffic incidents often impact the road network across boundaries of road agency jurisdiction and effective communication between various agencies and similarly aligned policies are therefore required.

Figure 3-2: Map of Cape Town ITS Responsibilities

The ITS infrastructure planned to be provided for the ITS includes:

- **CCTV Video Surveillance System**: Approximately 175 CCTV cameras are in the process of being deployed on Cape Town Freeways.
- **Communications**: Ducted fibre optic cables are to be installed on all the routes indicated in figure 1, except the existing N2 alignment through Somerset West and the N2 Sir Lowry’s pass, where wireless Ethernet or 3G/HSDPA communications are to be used. In total approximately 150 km of optic fibre is being installed along Cape Town’s major freeways.
- **Variable Message Signs (VMS)**: A total of 48 Variable Message Signs are currently being strategically deployed on the routes as the principal means of providing information to road users during trips.
- **Traffic Sensors**: Limited traffic detectors (radar and camera) are being deployed on portions of the N1 and N2.
- **Transport Management Centre (TMC)**.

The City of Cape Town is currently implementing a new Transport Management Centre (TMC), which will be utilised to operate the ITS as well as other functions. SANRAL will have a presence in the TMC and will be part of the ITS operations.
4. **KwaZulu-Natal Concept of Operations**

4.1 **Summary**

In KwaZulu-Natal (KZN), SANRAL has established mutual cooperation, in respect of its ITS deployments, with the two other roads authorities in the province, these being the eThekwini Transport Authority (ETA) and the KwaZulu-Natal DoT.

ETA has an existing deployment of ITS devices which it manages in addition to a UTC traffic signal system. Close ties have been established with ETA, since the SANRAL TMC (currently under construction) at its Eastern Region Office in Pietermaritzburg and the ETA TMC will be directly linked to each other to effect the sharing of information and mutual handling of events.

The SANRAL TMC which will serve as the base for its ITS operations will also allow for backup operations of the ETA TMC. Having the two TMCS on an IP network will allow for fault-tolerant network to be established. The ETA operations centre will be staffed and managed by ETA during peak periods. At all other times, operations will be out of SANRAL’s TMC. It is envisaged in the medium to long term, to facilitate efficient and seamless management of freeway networks, that the operations of the ETA ITS will be subsumed within the SANRAL TMC.

The MC will be required to take over any existing TMC staffing, provide additional staffing as may be necessary, conduct the TMC operations and provide maintenance support for the SANRAL TMC. Also in KwaZulu-Natal, the MC will be responsible for building maintenance for the TMC facility.

Moving forward, integration with ongoing IMS efforts and with various stakeholders will be crucial to provide effective incident management in KwaZulu-Natal. System level integration with call taking and dispatch software utilised by eThekwini CCC as well as other CCCs will provide coordination support. Similarly, the provision of video to the CCCs and other stakeholders will also be vital in providing effective incident management coordination with SANRAL operators on the N2 and the N3 as well as key controlled access and limited access routes in the eThekwini urban core.
4.2 Existing Conditions/Current Situation

The SANRAL eThekwini ITS (EITS) was initiated in February 2008. In its initial phase, it will cover approximately 100km of national road network. It will extend on the N2 national road from the vicinity of the current Durban International Airport northward to the Watson Highway interchange (just north of the Tongaat Toll Plaza) and on the N3 national road from the Candella road bridge to Cato Ridge. The deployment will consist of CCTV cameras (108), Variable Message Signs (18), ...
and traffic counting points (approximately 36). These devices will be linked via an optical fibre communications backbone to the SANRAL TMC. The initial phase of SANRAL’s ITS will focus on the N2 and N3 national routes, with expansion planned for additional ITS infrastructure on the N3.

Figure 4-2: SANRAL ITS Deployment Routes in KwaZulu-Natal
5. CONCEPTS FOR THE PROPOSED SYSTEMS

Several potential concepts have been drafted to illustrate the processes that will take place at each of the TMCs and within the systems software. These use cases focus on the TMC and its role, particularly relative to the capabilities of the ITS systems software. It should be noted that in each of the three regions, incident management systems (IMS) are being developed, which are defining the roles and responsibilities of the various response agencies relative to incident response and clearance activities.

5.1.1 Detect Incident

5.1.1.1 Detect Incident

Incident management is a core function of the TMC. There are different ways the TMC may learn of an incident. These include:

- ITS Operators using video to detect anomalous conditions
- Traffic detectors
- Incident Response Units (IRUs)
- Radio
- Police Scanners
- Phone calls from police or other external agencies
- Real-time data feed from external systems
- CCTV analytics systems

In each of these cases, the ITS operator will learn of the incident, seek to confirm it, and manually create an incident in the ITS systems software with the known characteristics of the incident. From this, the system will generate a suggested response.

To support the incident response activities at the TMC, it will be important for all agencies who receive calls from the public, both within the TMC as well as external to the TMC, to coordinate efficiently when an incident is detected. Along with the detection of new incidents, it is important for operators to detect updates to those incidents as they progress. For instance, for incidents blocking multiple lanes, the roadway will typically be cleared in phases and operators must reflect those changes in the status and response protocols (including road user information). In addition, the impact and severity of an incident may worsen in its early stages and this must be captured. Once an incident is detected for the first time, however, there may be lines of communication with on-scene personnel that may facilitate receiving these updates. Existing and evolving IMS protocols for on-scene information provide a valuable forum to incorporate incident status update to the management centre into the communications chain. It is expected initially that the primary means by which an ITS operator will learn of updates to an incident will be by viewing cameras.

5.1.1.2 Automatically Detect Incident via External System

Operators cannot be expected to detect all incidents quickly through visual observation. Rather, a more efficient way of detecting incidents is through external systems, of which there are two main types: systems that integrate with other incident management systems and systems that detect traffic anomalies automatically.

With respect to the former, public safety agencies typically learn of incidents quickly through emergency phone calls from motorists or witnesses. Calls may go to 10111, 10177 or another number, but are routed to the police or other agencies responsible for dispatching resources to the scene. While there are technical and institutional challenges to integrating software systems from multiple agencies, it is
desirable that the ITS operator receives alerts in real-time from external systems. Achieving this level of integration often requires software modifications to both the alerting and receiving software systems.

In Gauteng, relevant police/traffic enforcement agencies include JMPD, Tshwane Metro Police and Ekurhuleni Metro Police, Gauteng Traffic Police, Gauteng EMS and SAPS. SAPS uses a computer-aided dispatching (CAD) software called GEMC3, which is also used by various other agencies throughout the country. In Cape Town, relevant police agencies include the Metro Traffic Police, Provincial EMS and SAPS. All three of these agencies use the same emergency management and dispatching software, GEMC3, though each is a slightly different version and a different instance separated by institutional firewalls. In KwaZulu-Natal, relevant police agencies include the Durban Metropolitan Police, Fire and Rescue Management, KwaZulu-Natal Traffic Police, KwaZulu-Natal EMS, and SAPS. Both the KwaZulu-Natal EMS and SAPS use GEMC3, which is also used by various other agencies throughout the country. Therefore, is envisaged that an automated interface will be developed whereby the ITS will receive real-time incident information from GEMC3 so that a single interface could be replicated in multiple regions for multiple agencies using GEMC3.

The other main type of external system that detects incidents includes CCTV analytics systems, which generate alerts when stalled vehicles or other anomalies are detected. Through interfaces with the Gauteng ITS’s video management system (March Networks), the Cape Town ITS’s video management system (Pelco Endura) the City of Cape Town SSU video management system (Teleste), and the ETA video management system (Synectics) the ITS would generate a potential incident alert for an operator to verify visually via CCTV cameras or via correspondence with Incident Response Units (IRUs) or Motorcycle Medic Units (MMUs). The operator would then choose to confirm or reject the incident based on first hand information. From there, the system would generate a response for confirmed incidents.

In addition to these methods, SANRAL is currently utilising real-time traffic speed maps (generated from probe data) and incident information in Gauteng from nationwide private sector sources. It is expected these data will supplement ITS traffic monitoring capabilities.

5.1.2 Visually Confirm Incident

With CCTV camera coverage on freeways, a key role of the TMCs are to visually confirm incident alerts using video or in consultation with IRUs patrolling the network. If the TMC has been notified of the incident from an external agency or external system, operators have the opportunity to confirm or provide visual details on the incident to the agency that reported it. The TMC would notify agencies via phone or as part of the system’s incident response (Section 5.1.3). The system capabilities of the ITS will supplement the coordination on roles and responsibilities already defined within the IMS.

5.1.3 Manage Incident Response

When an incident or other event is entered or updated in the ITS software, the software will generate a suggested response plan for review by the operator based on the characteristics of the incident. It is envisaged that some activities may be initiated outside the context of a response plan. In this way, operators will focus on managing incidents and other traffic-related events rather than managing devices and notifications individually. This improves operator efficiency and decreases the probability of inaccurate information dissemination and the system’s internal checks reduce the probability of conflicting messages. Finally, it enables the review of the chain of events associated with an incident for post analysis. For this reason, it is critical that all system actions associated with an incident—including all incident response activity—be captured by the operator and logged by the system.
When an incident is cleared and the traffic impacts have subsided to the point where traffic conditions has normalised, the operator will close out the incident in the system. At this time, the associated response plan should end and all associated messages and traffic control states arising from the response plan should end.

5.1.3.1 Notify Partner Agencies

When a traffic-related event occurs, or when road works are planned, ITS Operators need to be able to efficiently disseminate this information with partner agencies. The ITS software must have the ability to store distribution lists of email addresses or phone numbers for SMS in order to send (or automatically generate for distribution) to the relevant role players or other entities. This requires logic that groups message recipients by location or road segment (e.g., within their jurisdictions), time of day (e.g., different numbers for daytime vs. evening hours), type of event, and severity. The alerts should be self-contained so that the most important information is in the initial message, with incident identifying information also included allowing recipients to follow up on the event at a later time.

In the Cape Town TMC, it will be particularly important that ITS operators notify AMS operators to coordinate signal operations on Smart Routes when they may be affected by freeway incidents.

5.1.3.2 Dispatch Incident Response Vehicles

ITS Operators will be required to dispatch personnel as needed to respond to incidents, and/or to deploy traffic control devices. In order to dispatch the most appropriate vehicle, the ITS Operator also needs to be aware of the current location, type and status of each vehicle (e.g., using an automated vehicle location system).

ITS Operators will be responsible for managing IRUs’ incident response on the Gauteng freeway network. IRUs will be required to respond promptly to incidents and assist in securing, managing the scene and clearing the incident. Such activities will be in accord with the agreed to IMS protocols. It is expected that the operations contractor, which will staff both ITS operator positions and IRUs, will be contractually required to meet certain minimum performance requirements such as maximum incident response time. It will therefore be important for operators to track and dispatch IRUs (which will be equipped with AVL). To this end, it will be important to promptly determine which vehicle is closest to the scene and whether that vehicle is occupied or available to respond. In addition, ITS operators must be able to track the activity of response vehicles to ensure they are utilized optimally and responding within a specified time period according to contractual performance requirements.

This functionality may be built into the ITS software, but another acceptable approach is to have it interface with native dispatching software.

5.1.3.3 Manage/Control Traffic

The TMC is the centralised hub/ control of the ITS field assets on routes being managed. Therefore, the ITS must enable the operator to access and control all field devices to manage and control traffic.

(a) **VMS.** TMC operators will be required to post messages to signs. These messages will be based off a set of templates that conform to the VMS policy adopted by SANRAL in cooperation with its partner agencies. The event-specific details populating the templates are generated by the system and confirmed by the operators. For instance, there may be a template for an incident that says, “XX LANE BLOCKED; XX KM AHEAD; USE ALTERNATE,” which may be populated based on incident location and
characteristics as “LEFT LANE BLOCKED; 3 KM AHEAD; USE ALTERNATE.” With the availability of travel time data, VMS units will be able to display network travel times under circumstances consistent with the VMS policy.

In addition, the system should support message priority queuing so that the highest priority message requested for a sign will always be displayed.

(b) **CCTV.** Operators need to be able to control and view live camera feeds. In addition, they need to be able to record at the touch of a button. If a camera is associated with an incident, the ITS should alert the operator of the need to initiate recording and end recording when the incident closes.

(c) **Ramp Meters.** Operators need to be able to readily access the current status of a single ramp meter or group with a set timing plan. The operator must be able to select from a single meter timing plan or group timing plan to override the current status in response to an incident, active road works or other traffic-related event.

(d) **Monitor Tunnel Systems.** In the future, it is anticipated that the ITS will need to assume monitoring responsibility of the Huguenot Tunnel on the N1 freeway between Paarl from Worcester. Operators must therefore be alerted of unsafe conditions in the tunnel so they may take the appropriate response, which may include starting backup power or closing the tunnel to traffic, in addition to traffic management measures.

5.1.3.4 Provide Traffic Information to the Public

Providing traffic information to the public is a core function of the ITS. This section describes the required/envisaged ways in which the ITS will do so. Additional detail can be found under the national concept of operations.

(a) **Email.** A primary means by which ITS operators will notify the public of incidents, road works and construction is via email. Motorists will be able to subscribe on the SANRAL web site to receive email alerts of traffic conditions that meet certain criteria (e.g., route/location, severity, time of day, etc.). The ITS will send email alerts to subscribers when these criteria are met.

(b) **SMS.** The market penetration of cellular phones in South Africa is close to 100% while that of Internet access is much lower, though vehicle owners are more likely to have access than the population as a whole. The ITS will provide an SMS subscription service for the public to subscribe to incident and other traffic information. The ITS will send incident alerts to subscribers according to the alert types for which they have registered.

(c) **Website.** Another way in which the TMC will provide information to the public is via the SANRAL i-traffic web site. This site will have portals for Gauteng traffic conditions, in addition to the Eastern and Western regions (KwaZulu-Natal and Cape Town). The ITS will update the website with current incident, road works and traffic information. The website will have a dynamic component to be able to provide road users with the most up-to-date (real-time) congestion data, including colour-coded real-time congestion maps and streaming video from the TMC. The ITS will stream low bandwidth video, either transcoded or directly from a separate video subsystem.

(d) **Telephone (115).** Although not currently operational, SANRAL is exploring use of an abbreviated, national number for road user information. 115 would provide an automated service whereby road users could inquire about conditions on specific routes or in specific regions. 115 would utilise the same ITS database of information that will be populating the web site.
(planned road works, incidents, traffic and congestion, events impacting traffic, and other road user information).

5.1.3.5 Manage HAZMAT Spill

When an incident involves a hazardous material, there are a specific series of steps the TMC must follow. First, it needs to be able to alert clean-up personnel to respond to the scene. TMC Operators can determine the UN number of the hazardous material, determine the substance, determine an appropriate response in the ITS with the appropriate cordon area and identify the appropriate treatment for on-site personnel.

5.1.4 Obtain Traffic Information from External Systems

The ORT System in Gauteng will allow the ITS to obtain travel time information from individual vehicles as they pass successive toll gantries. This information will be fed to the ITS in real-time and will be used to populate maps showing congestion levels that are used by operators. This information will also be made available to the public via the web site and to external partners via the ATIS Gateway. This data will be received as raw vehicle position data, i.e., timestamps for when vehicles with unique identifiers pass toll gantries.

The toll transaction data will be made available from an ORT ITS Server, which will store the transactions in a database in real-time. The ITS will reduce this data to real-time segment speeds and travel times by combining, filtering and smoothing the raw data. This raw data will also be useful for archiving for off-line analysis.

There is an emerging market of private sector travel time services in South Africa, which collect vehicle speed data from GPS-equipped vehicles and cellular phones. A majority of private vehicles are equipped with tracking technology and services, which are used for emergency assistance or to recover the vehicle if stolen. In addition, commercial enterprises routinely track their vehicle fleets for efficiency and security. Data from these vehicles has become a rich source of traffic flow information. Even with the ORT data in Gauteng, this data will serve as a supplement and potentially monitor alternate routes not part of the ITS network. In the other regions, this may serve as a primary source of traffic information for System Operators.

5.1.5 Provide Traffic Information to the Media

SANRAL has a large number of video cameras deployed in the field. During incidents, the images provided by these cameras can provide partner transportation agencies and public safety agencies with an accurate representation of on-scene conditions. Furthermore, the public-at-large has consistently expressed interest in being able to view these images in order to determine traffic conditions on their planned route. As such, there is a need to provide these images to a wide variety of private entities.

However, the television stations will often show live video streams on the air. The sharing of video to media partners requires safeguards to ensure operators can block graphic incident scenes from airing. The media also typically requires higher quality video than what is provided on the web. In addition to television stations, more and more third parties are also capturing streaming video to publish on internet web sites. Means to ensure operators can block inappropriate content at the individual CCTV level will also be required for these users. All video sharing must align with SANRAL’s CCTV/Video Sharing Policy.

5.1.6 Distribute Video Images

Partner agencies may wish to access CCTV video streams to better assess conditions in the field, particularly to identify the appropriate response units to incidents. As public safety dispatchers are in constant communication with their field units, it would be valuable for them to access video for themselves. The ITS has a need to provide video access to
external partner agencies for internal use, within the parameters of SANRAL’s CCTV/Video Sharing Policy.

5.1.7 Manage Planned Road Works

One type of scheduled event is planned road works. ITS Operators must obtain this information from the various construction projects and routine maintenance schedules and update real-time road works information based on field input from contractors. Centralised management of planned road works is important to avoid conflicting lane closures.

The ITS needs to have the capability to be an authoritative database of planned road works that is shareable with other agencies in one or multiple formats via a web interface. This database needs to also include an impact severity index to help partners differentiate between minor road works (with minimal to no impact on travel lanes) and major road works which could require closure or restriction of key travel lanes, exit ramps, entrance ramps, etc.

5.1.8 Generate Maintenance Request

ITS operators access ITS field devices on a continual basis and should be in a position to identify malfunctions. Also, the ITS software is constantly communicating with field devices and should generate an alert and log entry when communications fails. Therefore, the ITS software should notify operators if a device is malfunctioning. Operators need to be able to efficiently generate a maintenance request enabling maintenance personnel to promptly troubleshoot and service the device.

It is envisioned that a single contractor will be responsible for operating the ITS and maintaining field and central system equipment. Both the owner of the system or field device (SANRAL, City of Cape Town, PGWC, ETA) and the contractor need be apprised of device and system failures in a timely manner; the contractor must be notified in order to meet any contractual uptime requirements and the system owner needs the ability to enforce any contractual uptime or maintenance response time requirements.

The system needs the ability to schedule and track preventative and unscheduled maintenance for all assets at any time. Supervisors need a system interface that is accessible to various individuals in various locations without dedicated software installed on their systems; a web interface is preferred.

At the end of each shift, ITS operations supervisors need reports on system maintenance activity and incident activity and status to ensure items are carried forward to operators in the next shift.

In addition to the maintenance management functionality that will be used by the ITS software, the City of Cape Town uses SAP for similar functions with its traffic signals, road network and associated infrastructure. Therefore, it is desired that the ITS also send those requests to the SAP system, which is used by City maintenance personnel. Other means of expanding the City’s use of SAP into ITS have been proposed, including a link with GEMC3 to track incidents in real-time.

5.1.9 Reports

It is important that the ITS software provide the ability to produce several report types. System users, supervisors, external agencies and decision makers need access to system performance and activity information. A sample of the types of reports needed for ITS operations includes:

- Accident Activity Reports and Accident Statistics. It is important for transportation agencies to track incident trends by location and characteristic so that they can implement roadway safety improvements where necessary. Municipal, provincial or
SANRAL has interest in tracking accident locations on roadways in their jurisdiction. These reports must provide detailed information on where accidents occur and the nature of those accidents, presented to support analyses of areas requiring remediation.

- **After-Action Review Reports.** After major incidents, ITS Operations Supervisors may wish to conduct after-action reviews to assess its performance in responding to incidents; this is also in alignment with the IMS protocols currently being finalised. The ITS needs to be able to capture the relevant information to support these reviews, including logging all system activity.

- **Performance Measures Reports.** There is a need to assess the performance of the ITS, both for reporting successes to decision makers and for internal assessments. To this end, the ITS must be able to capture the data to support and produce the reports detailed in a separate document entitled, SANRAL ITS Performance Monitoring Program Guidelines and Report Template. These reports may be programmed for monthly or annual production, or they may be requested as needed. They will feed data for larger reports such as the SANRAL Annual Report.
6. **National Concept of Operations**

There are relatively few functions that will take place operationally from a national perspective. Most of the operational functions will be carried out regionally. Nonetheless, there are some aspects that will need to be addressed at the national level. For instance, traveller information, overload control, and toll plaza queue monitoring will be managed and administered from a national perspective. **Figure 6-1** is a depiction of a national operations activities model.

![Figure 6-1: National Operations Activities Model](image)

**6.1 Traveller Information**

A national ATIS will be developed, whereby an ATIS Gateway server will support web, email, SMS and phone based road user information systems. The national ATIS Gateway will manage data storage and data requests as part of the traveller information programme. This will provide for a comprehensive, nationwide data management tool that will house both real-time and non-real time data, as well as provide for a secure means of disseminating data to external role players without provide direct access to the ITS systems software.

Partnerships with the private sector are envisioned to support various aspects of the traveller information programme. Because SANRAL’s system will be based on a common platform, there is an opportunity to negotiate with private partners on a national scale. Potential roles include the private sector as a data provider (for example through GPS/probe data to support travel times and congestion maps), as an information disseminator (such as through subscription services or the media), or through a contractor arrangement to operate and maintain components or services within SANRAL’s traveller information programme.

The following sections illustrate a picture of the full build out of SANRAL’s systems and capabilities to provide for a robust traveller information system that has a national scope but provides regionally significant and relevant information to road users. In order to achieve this vision, there are several gaps that will need to be addressed.

**Figure 6-2** depicts the Traveller Information Program, including data sources and information outlets in their current state, identifying where important gaps/opportunities in services,
capabilities and information sharing agreements. It is important to note that much of the data shown as existing is currently transferred manually; there are few existing automated interfaces. It is envisaged that new ITS systems software will potentially address several of the gaps and limitations previously identified. The ATIS Gateway, which would serve as the real-time data engine for SANRAL’s programme, is a key component of what is required.

Figure 6-2: SANRAL Traveller Information Program (Gaps in the Current State)

The following subsections provide an overview of each of the service area quadrants.

6.1.1 Real Time Data Collection Component

- Utilises real-time data inputs from SANRAL’s ITS in each region
- Utilises ORT data to support speed/travel time and congestion map
- Integrates law enforcement/public safety computer-aided dispatch data, where available
- Utilises event-driven database component to store and prioritise incidents within the system
- Integrates data from the private sector, which could include speed/flow data, incident data, weather data, or other data types, including real-time data from toll concessionaires
- Serves video data for other traveller information services
- Information is sent via automated data transfers to the ATIS gateway
- Where needed, manually entered information from the event-driven ITS systems database component

6.1.2 Non-Real Time Data Collection Component
- Planned road works, restrictions and closures from the event-driven database component of the regional ITS servers
- Provides a mechanism for external entities to send planned data (such as special events that will impact traffic) to SANRAL for inclusion in the traveller information programme

6.1.3 SANRAL Services Component (Information Dissemination)
- These programme components provide information directly to the road users using en-route infrastructure (such as VMS, Highway Advisory Radio)
- Information processed through the ATIS Gateway provides road users with real-time congestion information, segment travel times for urban area freeways, and incidents that could impact their travel on a particular route
- A website that serves as a national portal to be able to access inter-regional information as well as region-specific freeway traffic information
- Email and SMS traffic advisory subscription services
- Mobile applications draw on real-time data to push information to subscribers about conditions on their specific route. They also enable users to request specific information about travel conditions on-demand.
- 115 is a potential application that could make traveller information available via telephone.

6.1.4 Other Services Component (Information Dissemination)
- The SANRAL ATIS Gateway will make SANRAL-consolidated data available to multiple external entities to support a wide range of traveller information applications.
- Public and private sector entities will be able to access real-time freeway speed and conditions information, planned event data, incidents, and cameras
- Private sector entities will be able to integrate SANRAL data with their applications
- Media will also have access to SANRAL real-time information through the Gateway to support television traffic reports as well as radio traffic reports.
- Other agencies will be able to utilise SANRAL’s real-time information to make appropriate traffic management and traveller information notifications through their local systems to foster an integrated corridor management approach.

6.2 Toll Plaza Queue Length Detection

With the number of toll concessions operating large portions of the SANRAL road network, it is important to have a common interface strategy for incident and traffic data, and for monitoring queue lengths. This is important from a safety, traveller information and performance monitoring perspective. Interfaces with existing and prospective toll plaza queue length monitoring systems are envisaged.

6.3 Overload Control

It will be required that systems be in place to gather high speed weigh-in-motion (WIM) violator information from stations on national routes across the country. These systems will feed a national persistent offender database. When a vehicle in the database enters the ORT network,
the automatic number plate recognition (ANPR) system will flag the vehicle and generate an alarm.
7. REGIONAL ROLES AND RESPONSIBILITIES

7.1 Gauteng Partner Agencies

There are a number of partner agencies who, acting together, will make the Gauteng ITS a success. A high-level architecture schematic has been prepared to illustrate the connectivity and information flows among agencies in the Gauteng region to support the Concept of Operations. Figure 7-1 shows information sources, centres and information exchanges that will result from the connectivity and information sharing envisaged. Where information flows do not currently exist, they are indicated with *italics*. 
Figure 7-1: Data and Information Flows in a Regional Context

* Italics throughout diagram represent future functionality and information sharing.
7.2 Western Cape Partner Agencies

There are a number of partner agencies who, acting together, will make the Western Cape ITS a success. A high-level architecture schematic has been prepared to illustrate the connectivity and information flows among agencies in the Western Cape to support the Concept of Operations. Figure 7-2 shows information sources, centres and information outputs that will result from the connectivity and information sharing envisaged. Although there is a certain amount of coordination currently happening in the region, most of these interfaces are not yet automated, and as a result, the proposed flows are largely ‘planned’ status and are shown in italics.
Figure 7-2: Cape Town High Level Architecture Schematic
7.3 KwaZulu-Natal Partner Agencies

There are a number of partner agencies who, acting in concert, will make the KwaZulu-Natal ITS a success. A high-level architecture schematic has been prepared to illustrate the connectivity and information flows among agencies in the eThekwini region to support the Concept of Operations. Figure 7-3 shows information sources, centres and information outputs that will result from the connectivity and information sharing envisaged. Where information flows do not currently exist, these are shown in *italics*.
TRANSPORTATION MANAGEMENT
Provincial Government of KwaZulu-Natal (KZN-PG)
Metrorail
Port of Durban
DUBE Tradeport
La Mercy Airport

LAW ENFORCEMENT
South African Police Service (SAPS)
Provincial Government of KZN-PG
Traffic Services
ETA Metro Police Services
Pietermaritzburg Police

EMERGENCY MANAGEMENT SERVICES
Pietermaritzburg Emergency Services
KZN-PG EMS
Other Provincial EMS

DISASTER MANAGEMENT
KZN-PG Fire and Disaster Management
Durban Joint Operations Centre

SANRAL TRAFFIC MANAGEMENT CENTRE
Incident notification, incident information, vehicle location, schedule adherence

Sanral Operational Devices
FMS PTZ CCTV Cameras
Ramp Meters

VEHICLES
Road Users
ORT Freeway Incident Response Team
Bus Rapid Transit

Output Devices
VMS
Highway Advisory Radio

Services
eThekwini ATIS Database
Traveler Information (i-traffic website, 115 system)
SMS/Email Private Sector ISP

ETA OPERATIONAL DEVICES
ETA FMS CCTV Cameras
ETA Traffic Signals Arterial VMS

OUTPUT DEVICES
Video images, video control, signal control, work zone and meter control, road conditions from detection

SANRAL DATA COLLECTION
FMS Vehicle Detection
Weather Data Devices
ORT Tag Data Collection Devices
Private Sector ISP

ORT Service Centre
ORt incident information

ORT Dispatch ORT Security Centres

SANRAL DATA COLLECTION
FMS PTZ CCTV

ROADWAY CONDITIONS, COORDINATION
Toll and Tag data

SANRAL TRAFFIC MANAGEMENT CENTRE
Operational coordination

ETHEKWINI TRAFFIC MANAGEMENT CENTRE
Travel time, VMS data, VMS control, traffic conditions

Services
Traffic conditions, video images, archive data

Traffic conditions, video images, video control, signal control, road conditions from detection, travel time, VMS data, VMS control

Video images, video control, signal control, work zone and meter control, road conditions from detection

Video images, video control, signal control, work zone and meter control, road conditions from detection

Coordination by phone, incident data and video images

Coordination by phone, incident data and video images

* Italics throughout diagram represent future functionality and information sharing.
--- Dashed line indicates a potential future function.

Figure 7-3: KwaZulu-Natal High Level Architecture Schematic