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1. SANRAL background

- SANRAL is an Agency of the Ministry of Transport, operating as an independent agency;

- Derives its mandate from the SANRAL Act, No. 7 of 1998;

- Manages 16,170 km of national road network, includes both toll and non-toll network;

- 81% non-toll roads and 19% toll
1.1 SHIFT TOWARDS OPERATIONS FOCUSED

- Historically Road Authorities focused only on infrastructure to meet growing traffic needs

- Shift towards Network Management and Operations

- Aim:
  - Reduce impact of congestion
  - To improve Road Safety
  - To provide users with real time information
1.2 WHAT IS INTELLIGENT TRANSPORT SOLUTIONS?

- The use of technology to enhance transport operations.

- **NOT A NEW CONCEPT** – ITS applications have been used internationally since the 1960’s. These applications have proven to benefit the road user and optimise the usage of existing road capacity.

- These technologies encompass a wide range of applications, including those relating to traveller information, incident management and prevention, emergency responses, freeway management, electronic toll collection etc.
1.3 How does FMS work?

Real-time traffic data, i.e., CCTV Surveillance, traffic detectors, probe data.

Information Dissemination

Information is processed at the FMS Operations Centre.
1.4 WHY DO WE NEED TO USE TECHNOLOGY?

- Traffic Growth resulting in congestion and delays, Road user frustration and accidents.
  - 9,9 million registered vehicles
    - 39 % in Gauteng Province
    - 2,75% Growth in vehicle population since 2010
    - ADT in the order of 100 000 to 180 000 vehicles per day
- Accident statistics
  - 10845 fatal crashes in 2011
  - 13923 fatalities
  - 29% Driver fatalities
  - 38% Passenger fatalities
  - 33% Pedestrian fatalities

Source: Arrive Alive 2011 Annual Report
1.4 WHY DO WE NEED TO USE TECHNOLOGY?

- **AGENCY CHALLENGES:**
  - Congestion continues to worsen
  - Expanding role of agencies’ maintenance functions to support key operational areas
  - Budgetary demands
  - Performance agreements
  - Resources and appropriate skills
  - Institutional cooperation
2. FREEWAY MANAGEMENT SYSTEM (FMS) EXTENT
2. FMS EXTENT

- In pursuit of optimising existing road capacity and addressing safety

- SANRAL implemented the 1st Freeway Management System (FMS) officially launched by Minister of Transport, previous Hon. Jeff Radebe – October 2006.

- An extensive deployment programme was then implemented nationally to two other regions.
2.1 CURRENT DEPLOYMENTS - Gauteng

- Current deployment on over 260km of roadway
- 1555 lane km’s
- 47% of network has 6 lanes per direction
- Current system includes
  - CCTV
  - VMS
- Future systems
  - Travel Time forecasts
  - Traffic temperature/speed maps
  - Mobile applications
2.2 CURRENT DEPLOYMENTS - KZN

- Current deployment on nearly 100 km of roadway
- KZN TMC operational since 2010
• Current deployment on over 154 km of roadway

• Current system includes
  – CCTV - 197
  – VMS - 46
3. CONTRACT MODEL
With the implementation and emergence of the three TMC’s SANRAL reviewed it’s current management approach.

Hence a critical juncture for SANRAL to:

• Ensure result-oriented objectives with measurable standards of achievement;

• Ensure that an integrated transportation management approach is achieved regionally and nationally;

• Maintain efficient and effective service given the expansion nationally.

3.1 CONTRACT MODEL
3.2 CONTRACT MODEL

A performance based Design, Build, Operate & Maintain (DBOM) approach was considered. Contract award of 5 yrs with possibility to extend further 3 yrs. Project financed by SANRAL.
3.3 ITS vs traditional infrastructure projects: differences

- **Evolving Technology**
  - ITS technology rapidly changing;
    - Need to keep abreast with fast developing information technologies;
    - Recognise equipment life cycles, maintenance and upgrade requirements;
    - Implementation and integration challenges
  - Expected end product often changed towards project completion;
    - Uncertainties of outcome often exist.

- **Design criteria and standards**
  - Limited design criteria standards to guide implementation;
  - Heavy reliance required from design team (client or consultant).
Two options were investigated:

Option 1: Single Contract where Prequalify ATMS vendor

Option 2: Two separate contracts. Appointing ATMS vendor as nominated sub contractor to Main Contractor

A performance based Design, Build, Operate & Maintain (DBOM) approach was considered. Contract award of 5 yrs with possibility to extend further 3 yrs. Project financed by SANRAL.
3.4 PERFORMANCE MEASUREMENT

Performance measurement critical to ensure pre-defined goals and objectives, reflect:

- Satisfaction of customer/user
- Concerns of owner.

Performance measurement was developed to incentivise/disincentivise the Main Contractor by utilising performance-related adjustments to meet and or exceed defined target service levels.
### 3.5 PERFORMANCE REGIME

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<th>Performance areas</th>
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**TARGET SERVICE LEVELS DEFINED**
4. ENHANCED FUNCTIONALITY
4.1 IMPROVED INCIDENT MANAGEMENT

Accident happens --- Traffic flow disrupted

Accident reported

Emergency Services dispatched

Arrive on scene

Life Death

Minimise Road User Costs

Leave scene

Traffic flow back to normal

Reduce length of Incident Timeline

Trained approx 900 emergency services personnel in last fin. year

Incident Timeline
4.2 ON ROAD SERVICES

Services will be managed by the TMC utilizing:

- Computer Aided dispatch (CAD) for emergency and enforcement vehicles
- Automated Vehicle Identification (AVI)
- Automated Vehicle Location (AVL)

To effectively manage roadway and provide a safer and efficient network

First Responders: Incident Response Service

Incident Recovery Service

Medics on bikes
Assumptions

12 mins at ave of 80km/h = 16km

Turnaround only possible at next interchange
4.3 DATA COLLECTION

**Day of the Week**

**Time of Day**
4.4 REAL TIME INFORMATION DISSEMINATION

NATIONALLY 13 000 twitter followers

Report to 15 radio stations
4.4.1 REAL TIME INFORMATION DISSEMINATION

- Provide road users accurate travel times on the VMS
- Access to live video feed and network status
- Arm the road user with information, to make informed decisions
5. CONCLUSION

• ITS is a “soft engineering” tool to enhance the capacity and design life of road network;

• Provides road users with real time information to make informed decisions both pre-trip and en-route;

• The primary objective of this procurement model is to deliver regionally- and nationally-integrated ITS functions at a consistently high quality level.

• Performance measurement is key to this project.