A DRAFT INTELLIGENT TRANSPORT SYSTEMS POLICY FOR SOUTH AFRICA
This document was developed by the Transport Policy Analysis Unit. Until the document is accepted by the Department of Transport’s Executive Committee, the views expressed in it are not official DOT policy.
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The United States Department of Transport (USDOT)  
U.S Commercial Service  
The Transport Research Board (TRB)  
The Marriott Hotel Group  
The Standard Hotel  
The Cornell Group  
Courtesy Associates  
The Maryland CHART Operations Centre  
The American Public Transportation Association (APTA)  
Maryland Railway Corporation (MARC)  
Coordinated Highway Action Response Team (CHART)  
State Highway Administration  
ITS Joint Programme Office (JPO)  
American Association of State Highway and Transportation Officials (AASHTO)  
ITS America  
Federal Highway Administration (FHWA)  
Federal Transit Administration (FTA)  
Georgia Department of Transport (GDOT)  
Metropolitan Atlanta Rapid Transport Authority (MARTA)  
The Hilton Hotel Group  
Los Angeles Department of Transportation (LADOT)  
Los Angeles County Metropolitan Transport Authority (LACMTA)  
Southern California Regional Rail Authority (SCRRA)  
Alameda Corridor Transportation Authority (ACTA)  
Utah Department of Transportation (UDOT)  
Utah Transit Authority (UTA)

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Mr Peter Filby  
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Ms Lungile Mchunu  
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MINISTER’S FOREWORD

The benefits of the Intelligent Transport Systems in the execution of the transport mandate have been a subject of both research, innovation, and deployment since the early 1990s. While this idea also gripped the South African transport industry, and has led to partial deployment along the Ben Schoeman Highway in 2006, there has been no policy document and strategy from which implementing municipalities and agencies proceeded. This document is the first of such a policy and strategy base.

The lack of co-ordination that has existed in the past has got to be addressed by all concerned stakeholders. Government institutions and their agencies have to respond by developing their own policies and ordinances. But these developments should not leave out the societal groups and the economic services sector.

It is incumbent upon all the three groupings, namely government institutions, civil society and business, to evolve new innovations by undergoing rigorous research and development, knowledge, education, production and applications protocols.

All spheres of government need to co-operate with one another, so that a seamless ITS deployment is engendered, and that a similar monitorable and regulated standards base is applied for all ITS deployments in South Africa. Larger metros and affording municipalities should provide assistance to their adjacent municipalities and traffic departments that cannot afford.

With such a variety of end users, any policy proposal on the ITS requires informed inputs and comments. I therefore release this document to kick-start these contributions, and I would like to call on all stakeholders in both government and industry, transport research houses, traffic engineers, road construction engineers, transportation planners and students of transport to engage with the document.

It is only through their contribution that South Africa can have an ITS policy of which we shall all be proud.

J.T. RADEBE, MP
MINISTER OF TRANSPORT
### ABBREVIATIONS

<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
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<td>ACTA</td>
<td>Alameda Corridor Transportation Authority</td>
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<td>AGOA</td>
<td>Africa Growth Opportunities Act</td>
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<td>ANSI</td>
<td>American National Standards Institute</td>
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<td>APTA</td>
<td>The American Public Transportation Association</td>
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<tr>
<td>ASTM</td>
<td>American Society For Testing And Materials</td>
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<tr>
<td>ATMS</td>
<td>Automated Traffic Management System</td>
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<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
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<td>CHART</td>
<td>Coordinated Highway Action Response Team</td>
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<tr>
<td>CMS</td>
<td>Changing Message Signs</td>
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<tr>
<td>COO</td>
<td>Chief Operating Officer</td>
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<tr>
<td>COTO</td>
<td>Committee of Transport Officials</td>
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<tr>
<td>CSIR</td>
<td>Centre for Scientific and Industrial Research</td>
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<td>D.C</td>
<td>District of Washington</td>
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<td>DFA</td>
<td>Department of Foreign Affairs</td>
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<tr>
<td>DMI</td>
<td>Distance Measuring Instrument</td>
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<td>DNA</td>
<td>Deoxyribonucleic Acid</td>
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<td>DNI</td>
<td>Department of National Intelligence</td>
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<td>DOC</td>
<td>Department of Communications</td>
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<td>DOT</td>
<td>Department of Transport</td>
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<td>DST</td>
<td>Department of Science and Technology</td>
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<td>DSS</td>
<td>Department of Safety and Security</td>
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<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<tr>
<td>EUROGI</td>
<td>European Umbrella Organization For Geographic Information</td>
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<td>EVA</td>
<td>Economic Value Add</td>
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<tr>
<td>EWS</td>
<td>Early Warning System</td>
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<td>Ex-Im</td>
<td>Export Import (Bank)</td>
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<td>FGDC</td>
<td>Federal Geographic Data Committee</td>
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<td>FHWA</td>
<td>Federal Highway Administration</td>
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<td>FTA</td>
<td>Federal Transit Administration</td>
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<td>GDOT</td>
<td>Georgia Department of Transport</td>
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<td>GERD</td>
<td>Gross Expenditure and research Development</td>
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<td>GIS</td>
<td>Geographical Information Services</td>
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<td>HOV</td>
<td>High Occupancy Vehicle</td>
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<td>ICASA</td>
<td>Independent Communications Authority of South Africa</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<tr>
<td>ID</td>
<td>Identification</td>
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<tr>
<td>IEEE</td>
<td>Institute For Electrical and Electronics Engineers</td>
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<td>INFRACO</td>
<td>Infrastructure Company</td>
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<td>ISO</td>
<td>International Standards Organisation</td>
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<tr>
<td>ISP</td>
<td>Internet Service Provider</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>ITE</td>
<td>Institute for Transport Engineers</td>
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<td>ITS</td>
<td>Intelligent Transport Systems</td>
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<td>ITSSA</td>
<td>Intelligent Transport Systems South Africa</td>
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<td>JPO</td>
<td>Joint Programme Office</td>
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<tr>
<td>KBYG</td>
<td>Know Before You Go</td>
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<tr>
<td>LACMTA</td>
<td>Los Angeles County Metropolitan Transport Authority</td>
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<tr>
<td>LADOT</td>
<td>Los Angeles Department of Transportation</td>
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<tr>
<td>MARTA</td>
<td>Metropolitan Atlanta Rapid Transport Authority</td>
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<tr>
<td>MDB</td>
<td>Municipal Demarcation Board</td>
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A Draft National Intelligent Transport Systems Policy For South Africa – Draft Two

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<thead>
<tr>
<th>Acronym</th>
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<tr>
<td>MEC</td>
<td>Member of the Executive Council</td>
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<tr>
<td>MINMEC</td>
<td>Minister and MECs</td>
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<tr>
<td>MOA</td>
<td>Memorandum of Agreement</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>MRCC</td>
<td>Maritime Rescue Coordination Centre</td>
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<tr>
<td>MTEF</td>
<td>Medium Term Expenditure Framework</td>
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<tr>
<td>MTSF</td>
<td>Medium Term Strategic Framework</td>
</tr>
<tr>
<td>NATMAP</td>
<td>National Transport Master Plan</td>
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<tr>
<td>NEMA</td>
<td>National Electric Manufacturers Association</td>
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<td>NFLS</td>
<td>National Freight Logistics Strategy</td>
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<td>NLTTA</td>
<td>National Land Transport Transition Act</td>
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<tr>
<td>NTCIP</td>
<td>National Transport Communications Internet Protocol</td>
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<tr>
<td>OGC</td>
<td>Open Geospatial Consortium</td>
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<tr>
<td>OPIC</td>
<td>Overseas Private Investment Corporation</td>
</tr>
<tr>
<td>PDA</td>
<td>Personal Digital Assistant</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RFID</td>
<td>Radio Frequency Identification</td>
</tr>
<tr>
<td>ROI</td>
<td>Return On Investment</td>
</tr>
<tr>
<td>RSA</td>
<td>Republic of South Africa</td>
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<tr>
<td>SADC</td>
<td>South African Development Community</td>
</tr>
<tr>
<td>SAE</td>
<td>Society of Automotive Engineers</td>
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<tr>
<td>SAITSCO</td>
<td>South African ITS Company</td>
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<tr>
<td>SALT</td>
<td>Southern African Large telescope</td>
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<td>SANRAL</td>
<td>South African National Roads Agency Limited</td>
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<td>SANSSA</td>
<td>Standards South Africa</td>
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<td>SAQA</td>
<td>South African Qualifications Authority</td>
</tr>
<tr>
<td>SCOA</td>
<td>Standards Chart of Accounts</td>
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<tr>
<td>SCRRA</td>
<td>Southern California Regional Rail Authority</td>
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<tr>
<td>SDO</td>
<td>Standards Development Organisations</td>
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<tr>
<td>SHA</td>
<td>State Highway Administration</td>
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<tr>
<td>SKA</td>
<td>Square Kilometre Array</td>
</tr>
<tr>
<td>TCPIP</td>
<td>Transmission Control Protocol/Internet Protocol</td>
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<tr>
<td>TDC</td>
<td>Transport Data Centre</td>
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<tr>
<td>TMDD</td>
<td>Traffic Management Data Dictionary</td>
</tr>
<tr>
<td>TOC</td>
<td>Traffic Operations Centre</td>
</tr>
<tr>
<td>TOR</td>
<td>Terms of Reference</td>
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<td>TRB</td>
<td>Transport Research Board</td>
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<tr>
<td>UAV</td>
<td>Unmanned Aerial Vehicle</td>
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<tr>
<td>UDOT</td>
<td>Utah Department of Transportation</td>
</tr>
<tr>
<td>UML</td>
<td>Unified Modelling Language</td>
</tr>
<tr>
<td>USDOT</td>
<td>The United States Department of Transport</td>
</tr>
<tr>
<td>USTDIA</td>
<td>The United States Trade and Development Agency</td>
</tr>
<tr>
<td>UTA</td>
<td>Utah Transit Authority</td>
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EXECUTIVE SUMMARY

We first raise the endemic problems in the execution of the transport mandate such as environmental sustainability, efficiency safety and security, congestions etc, and indicate that the deployment of ITS can assist in solving some of the problems. This is in line with the exposition of the practical functions of the ITS which we also give in this document.

The status quo analysis, tracing the development and the underdevelopment of the ITS in South Africa is discussed, and we indicate that there have are current efforts to deploy in metros but these deployments are hindered by institutional inconsistencies.

We acknowledge that there is a need for the national co-ordination of the deployment of the ITS, and we call for the setting up of an interim structure as a holding mechanisms until a line function of the ITS is established in the national department of transport. We suggest that structure and the funding of this holding mechanism.

The ideal ITS system is suggested and we suggest that this policy is needed as an urgent intervention to solve some of the problems identified, such as the environment, safety and security, accident preventions, interchanges management, heavy vehicles segregation etc.

This cannot be achieved without international cooperation and we make a call for South Africa to take advantage of its international friends and the technologies already inexistence. We are however, aware that our international credibility and our seriousness in the deployment of the ITS will be judged by our regulatory mechanisms, which we also recommend should be set up under the auspices of the Standards South Africa. Related to the regulatory mechanisms is the need for good corporate governance.

Reliable data is at the centre of a reliable ITS service, and we call for the establishment of the Data Centre to drive the ITS.

We recognize that Its will not solve all transport and traffic problems, and we call for the integration and cooperation of ITS into already existing projects and systems aimed at addressing transportation problems, including the continuation of the human aspects of traffic management.

The system will require protection and we make recommendations about how the system and its users can be protected.

The international deployment of ITS is driven by its adherence to standards and we make a recommendation that while South Africa should adopt already existing standards, there is a need for the ITS community in South Africa to take part a member of the standards development organisations.

We suggest a funding mechanism for the deployment of ITS and we finally chart a way forward for the engagement of the interested parties and members of the public in the development and acceptance of this policy.
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1. PROBLEM STATEMENTS

1.1 South Africa, like the developed and industrialized countries worldwide, is faced with similar transportation problems. The issue is not only an increasing demand for mobility coupled with additional expansion of all modes infrastructure, but also the high latent cost of the increasing pollutants associated with potentially atmospheric and environmental hazardous risks.

1.2 According to the national land transport principles, public transport services for all modes are aimed at providing affordable transport to the public and are so designed as to have value to the customer.

1.3 In addition, the needs of special categories of passengers must be considered in the ITS policy for the planning and providing public transport infrastructure, facilities and services, and these needs should be met as far as may be possible by the system provided for mainstream public transport.

1.4 In the abundance of technology currently available, the traffic cop who hides behind trees to catch speedsters is becoming a rarity, and the need to begin to convert this traffic warden mentality human assets into ones that engage newer technologies in transportation management, has to begin in earnest.

2. VISION

2.1 To provide Intelligent Transport Systems that will detect, connect and collect information and data for the benefit of the transport users and members of the public, and assist in the reduction of discomforts on the road network and to facilitate the movement of goods and people and reduced costs to the state and users.

3. AIMS

3.1 The aim of developing the ITS policy is to adopt the National Department’s Vision of enhancing the elements of safety, efficiency, affordability, integration and environmental friendliness.

3.2 South Africa faces the same problems as those facing other developed and developing countries. These problems relate to the need for environmental protection, high demand for mobility, high costs of infrastructure construction, provision of infrastructure and reduction of travel costs. One major aim of this policy document is to address these problems by creating a safer multi-modal system, and using the existing transport capacity efficiently and sustainably.

3.3 Orthodox traffic management is becoming a costly exercise. The aim of this policy is to leverage technology to avoid some of these avoidable costs. The technologies may initially appear costly themselves, but the benefits, such as 24/7 availability, no sick-leave, continuous improvement all come to the equation of making this important policy departure.

4. ITS POLICY OBJECTIVES

4.1 Specific ITS Objectives

4.1.1 The following are ITS proposed objectives:

- Promotion of transport safety and security;
- Supporting trade and tourism;
- Improving the quality of life;
- Promoting strategic investments in transport.
- Building awareness and demonstration of the potential wide spread use of interoperability of the Intelligent Transport System across RSA and internationally;
- Supporting strategic deployment and integration of Intelligent Transport Systems across urban and rural areas and on inter-city and Southern African Regional transport corridors; and
- Strengthening of RSA’s ITS industry to take advantage of the growing global market opportunities.

4.2 Resonance Of The White Paper On National Transport Policy

4.2.1 These policy objectives do not deviate from those goals and objectives that are ensconced in the White Paper On National Transport Policy of September 1996, to wit:

- To enable customers requiring transport for people and goods access the transport system in ways that best satisfy their chosen criteria.
- To improve safety, security, reliability, and speed of transporting goods and people.
- To improve South Africa’s competitiveness and that of its transport infrastructure and operations through greater effectiveness and efficiencies to better meet the needs of different customer groups, both locally and globally.
- To invest in infrastructure or transport systems in ways which satisfy economic, social, economic, or strategic investment criteria; and
- To achieve the above objectives in a manner which is economically sustainable and minimizes the negative side effects.

(Source: The White Paper On National Transport Policy, September 1996 Pp 3-5)

5. ITS DEFINITION AND PRACTICAL FUNCTIONS

5.1 What ITS Is

5.1.1 Intelligent Transport Systems include the application of advanced information processing (by Radio ID /GIS/GPS/Computer), communications, sensor and control technologies, and management strategies in an integrated manner to improve the functioning of the transport system.

5.1.2 It is maps, databanks, real time data, philosophy, practice and attitude that seek to change the manner in which the management of the transportation networks works and is managed.

5.1.3 It refers to platforms that are aimed at assisting the quality, safety and security of transportation systems.

5.1.4 It is technologies that assist individual travellers, transportation officials, incident management agencies, and vehicle owners to have value-add in their operations reduce vehicle emissions, and to make intelligent decisions about how their vehicles should be integrated into the road network.

5.1.5 It is also knowledge and information that helps car manufacturers, car repairers and vehicles retrofitters, to build better safer and smarter vehicles;

5.1.6 It is a tool, or a combination of tools, to help transportation planners to evolve new approaches to traffic and transportation planning.

5.1.7 It is technology that assists environmentalists to advocate for environmentally friendly transport practices among transport owners and users and manufacturers.
5.1.8 It assists governments to spend their national budgets wisely and to redirect their financial resources to areas where they are mostly needed.

5.1.9 It gives policymakers all the information and data they need to come up with new transportation policies and to develop polices that will provide seamless transportation of people and goods.

5.1.10 But we need to give the warning upfront that ITS is not everything!

5.2 Practical Functions

5.2.1 To provide, if not immediately, on a layered and upscaling basis, under the slogans we propose should be adopted in the South African context;

- Information collections systems such as CCTV
- Congestion sensors, under the slogan “We See You”
- Weather sensors, under the slogan “Know Before You Go” (KBYG)
- Driver Notification, under the same slogan “KBYG”
- Information Analysis, under the slogan “Right Info Everytime”
- Traffic Operations Centre capacity under the slogan “Control From The Centre”
- Arterial Monitoring, under the slogan “Enter With Knowledge”
- Emergency Dispatching, under the slogan, “All The Help You Need”
- Dilemma Zone Protection under the slogan “Safer Zones For All”

6. THE PRINCIPLES

6.1 An effective and efficient ITS shall exhibit the following attributes:

- Its accessibility to the greatest number of people though a myriad of media, such as radio, telephone, Internet, e-mail, mobile and print.
- Its adaptability to new technologies, and its scalability for new additions and more enablers; Its multi-modalism to deal with transport problems across the spectrum,
- Its ability to offer multi-solutions to a single problem, and also be able to offer a single solution to multi-problems;
- Its ability to highlight knowledgeable partnerships as the most vital building block;
- Its ability to adapt to an RSA compliant ITS Architecture;
- Its ability to foster innovation;
- It ability to promote private and public sector development;
7. GOALS

7.1 The deployment of ITS in South Africa shall meant to meet the following goals:

- To enable customers requiring transport for people or goods to access the transport system in ways which best satisfy their chosen criteria.
- To improve the safety, security, reliability, quality, and speed of transporting goods and people.
- To improve South Africa’s competitiveness and that of its transport infrastructure and operations through greater effectiveness and efficiency to better meet the needs of different customer groups, both locally and globally.
- To invest in infrastructure or transport systems in ways which satisfy social, economic, or strategic investment criteria.
- To support communication services which include voice (speech) data, image, video, and signaling.
- To accommodate a variety of terminals, i.e. fixed, portable, mobile and in-vehicle mobility instruments;
- To preserve the horizontal and vertical compatibility.
- To allow mobile and fixed operator to utilize services seamlessly;
- To provide service flexibility so that any combination of services may be used;
- To make an economic use of the spectrum;
- To provide authentication and billing functions;
- To provide a varying degrees of network security that preserves user privacy;
- To develop a modular structure that starts from the simple to the complex, and
- To cater for people with disabilities.
8. STATUS QUO ANALYSIS

8.1 The ITS Challenge

8.1.1 ITS deployment has started in earnest, with both agencies of the Departments of transport and metros taking the lead. This has happened without a national policy basis in relation to ITS, but has been subsumed under a different policy of congestion reduction, speed monitoring and safety of the road system.

8.1.2 This has forced the national department to respond as a catch up with developments already under way, but with the added responsibility of developing the policy in such a manner that the efforts that have been started are not compromised by exclusion, and plans for the future for these agencies and metros are not jeopardized.

8.1.3 What has given impetus for the need for this policy development has been the following:

- **Environmental concerns** as a result of growing car ownership, and the extent to which intelligent transport systems can help against environmental destruction has come into sharp focus in government, private sector and communities.
- The **World Cup** that will be hosted in 2010 brings with it pressures to respond to the environmental standards that have been achieved by some of the visitors’ governments, in both the issues of traffic congestion and air quality concerns.
- The World Cup also presents the opportunity for South Africa to develop transportation systems that will both help the movement of people and goods during the tournament, and remain with the **legacy of such transportation systems** for the future benefit of the country.
- **Congestions** of the road network, even for South Africa’s own benefit (even if the World Cup was not to take place) require innovation and leapfrogging mechanisms such as the ITS, so that the effort of moving people and goods can be made easier and seamlessly.
- The **costs of traffic management** are growing. In the past governments could apportion funds from the national fiscus to build more roads and employ more people to manage the movement of traffic. This will not be a sustainable option into the future, and even more so when there are technologies that can assist governments and agencies to reduce their traffic management costs.
- In the specific case of South Africa, the **growing vehicle population** as a result of the improving economic circumstances, and the entry of new members into the so-called middle class, exacerbates the situation. This growth is also enhanced by the view of car ownership as a status symbol and a display of newly-found wealth. It is quicker to resort to technological means of traffic management than to embark on efforts to change the culture that is attached to car ownership.
- The **freight cargo traffic management** in all modes is a course for concern on South African transport networks. The safety issues and the guarantee of delivery and just-in-time approaches demand of the South African government and industries to move with speed to allay the concerns of freight operators and customers. The concerns of the customers in this regard are well captured in the National Freight Logistics Strategy (NFLS) (September 2005). With the deployment of ITS for cargo management, the objectives of the NFLS are likely to be realized sooner than later. At the time of drafting this draft policy discussion document, the Freight Logistics team was adjudicating a tender for the provision of RFID expertise for the Department of Transport.

8.2 Previous Efforts

8.2.1 It is not the first time that Intelligent Transport Systems (ITS) has been probed by the Department of Transport. The debate started with the “First Steps Towards an Intelligent

8.2.2 It was envisaged that the findings presented in the “First Steps” would ensure that South Africa’s transportation system reaps optimal benefits from ITS in the 21st century without reinventing the wheel by conducting Research and Development (R&D) at an exorbitant cost. Transportation is ultimately going the ITS route and should be leveraged on the most appropriate platforms and placed timeously to avoid costly bridging strategies that would overcome product and vendor lock-in situations.

8.2.3 In addition to a reference to the development and motivation for the ITS policy initiative, the following recommendations were made in the Contract Report CR-2002/17; March 2003:

- That a functionary with ITS responsibility be appointed within NDOT, to build in-house capacity with emphasis on urgency;
- That the generic ITS Strategies be accepted as the basis of ITS implementation plan for Southern Africa;
- That the National Land Transport Strategic Framework (NLTSF) priorities, the Road to Safety Strategy and the current ITS-related projects be investigated to determine the areas where ITS will have potential to enhance delivery of the respective services;
- That areas with greater potential be prioritized and that ITS strategies be refined to address the specific issues relevant to each of these priority areas;
- That each area be addressed through appropriate processes, ultimately leading to appropriate policies for the optimal application of ITS components and the integration of these in the long term; and
- That an action plan with timeframes be developed for the progressive development and implementation of ITS, ultimately leading to the incorporation of ITS into mainstream transportation planning.”

8.3 Reviving A Stalled Process

8.3.1 The development of the First Steps Towards an Intelligent Transport System Policy Framework” Contract Report CR-2002/17 edited March 2003, was not followed by a tangible policy proposal for the deployment of ITS. This document was only followed up after the recognition of another project, and the role that ITS could play in the achievements of the objectives of that project. That Project was asbestos transportation in South Africa.

8.3.2 As a background, the mining of asbestos was banned in South Africa, but the after effects on the ex-miners, their families and the adjacent communities continue. The aim of the project was to lend a transportation tangent to the transportation of this material, with a view of not spreading the material further in the event of a collision or the rolling over of a truck.

8.3.4 Based on mere observation of road traffic in South Africa, and using the labeling system of the United Nations Orange Book, 13th Edition, it can be argued that about three quarters of cargo on the South African roads is dangerous goods.

8.3.5 As soon as the role of ITS was realized, additional benefits of ITS were pursued. The assistance of the United States Federal Highway Administration (FHWA), based on the Memorandum of Understanding between DOT (RSA) and the United States Department of Transport (USDOT), which had been lying dormant for 10 years, was revived.

8.3.6 As a result of this revived relationship, the issue of ITS became paramount, and a delegation, with the assistance of the United States Trade and Development Agency (USTDA), was sent
to the United States for a period of two weeks to study, among other things, the ITS functions in the United States.

8.3.7 The work presented here is the preliminary work that had been put together by the official responsible for the asbestos project, and the additional work that has been added by the team that visited the United States. The comments and viewpoints of the experts in the various State DOTs in the United States have also been taken into consideration.

8.4 Institutional Inconsistencies

8.4.1 A cursory glance of the ITS development in South Africa shows that the institutions in both government and outside it, have not been talking to each other.

8.4.2 The City of Johannesburg has laid some foundation for the deployment of ITS within the city and a budget has been set aside for this effort. However, the adjacent cities with which the city infrastructure could be extended through a co-operative understanding have not started. The potential for the conflict of infrastructure equipment and architecture for the deployment of ITS in these metrocities can not be discounted. There is therefore no common approach between the Metro of Ekurhuleni, Joburg and Tshwane in relation to ITS. The possibilities for “blue on blue” conflicts cannot be discounted.

8.4.3 The City of ETekwini has started on some ITS deployment, using their status as host city of the World Cup 2010 as a catalyst. There is no evidence that the neighbouring municipalities, such as those of KwaDukuza, Ilembe, Ugu and Umsunduzi will, in the near future, be part of the architecture that will be developed by ETekwini.

8.4.4 The City of Cape Town has also made some developments towards ITS deployment, but there is no clarity as to whether this deployment will extend beyond the environs of the city, so as to include the greater part of the Western Cape Province.

8.4.5 The Centre for Scientific and Industrial Research (CSIR) funded by the State, has an ITS laboratory that has not been leveraged for the research and development, commercialization and the eventual deployment of ITS in the country. The underutilization of this facility has got to be addressed within a policy framework that opens up the state-funded facilities for optimal utilization. The assistance of the Department of Science and Technology in this regard is paramount.

8.4.6 An agency of the Department of Transport, the South African National Roads Limited (SANRAL) has started with the development of some ITS on the national road known as NI or Ben Schoeman. The effects of this pilot project have not been felt yet, and the assessment of the impact has not been done. A shoulder lane has been provided, albeit on a very short distance and a High Occupancy Vehicle (HOV) pilot was made during the October Transport in 2006. The agency promises to extend the deployment to other areas of congestion.

8.4.7 Even though it is early days to pronounce on the effectiveness of the system installed on the NI, the information boards and the Changing Message Signs (CMS), both fixed and portable, are sometimes blank, and there is no information to direct the traffic, and no information is provided to the drivers about congestions. Partly because of evolving technologies, and the anecdotal evidence of the less that 100% functioning of the current pilot project, the issue of training is paramount. This will be discussed in the relevant sections of this document.

8.4.8 The role that is played by SANRAL is not faulted, as the tendency in the world is to devolve such powers to the agencies. However, SANRAL is not a “Highway Administrator,” but a facilities and infrastructure provider. There is therefore a conflict of interest, or an absence
of mandate for SANRAL to have the dual role of a referee and a player at the same time. The tendency, and the temptation, may be to build an ITS infrastructure that agrees with its road infrastructure, and the objectives of an independent ITS deployment may be compromised.

8.4.9 An association of ITS, known as ITS South Africa (ITSSA) (with the name soon to be changed) has played some co-ordination role. Members of the local municipalities of eThekwini, Johannesburg and Cape Town take part in the deliberations.

8.4.10 There is, however, a large number of municipalities which will also host the World Cup (to the extent that the World Cup will need ITS) who have not started their ITS programmes, who do not have a budget, and who do not belong to the co-ordinating structure of the ITSSA. There is a need to encourage, and assist these municipalities to establish Traffic Operations Centers (TOCs) which will use ITS and to provide the infrastructure necessary for this.

8.4.11 The municipalities that are deploying ITS are basing their application on the SCOOT system. Without the other evaluation matters discussed in this document, it is not easy at this stage to decide this way or the other whether the SCOOT system is the appropriate system to base RSA’s ITS.

8.4.12 In our discussions with the ITS companies in the United States it was revealed to us that Spoornet, a state utility had entered into an business agreement one company to provide the Radio Frequency Identification (RFID) Automatic Equipment Identification for its 80 000 wagons and the company was teaming with another to provide 160 000 tags for the wagons.(www. Business Wire.Com). The State utility has started its ITS application and the policy should lock this start into it.

8.4.13 In all these efforts, and shortcomings, the National Department of Transport has not provided leadership, either through the development of policy from which these structures could operate, or from the provision of funding and co-ordinating functions for the efforts that are currently under way, or even from establishing an ITS line function within itself. This has led to the state of uncertainty, and the unchannelled development and deployment of ITS.

8.4.14 An issue of concern is that ITS personnel, or people who are willing to take this matter forward in Government are in short supply. There is pressure for people to multi-task, and for them to be available to take the matter of ITS forward in addition to their own responsibilities.

A: POLICY STATEMENT

A.1 DOT’s Co-ordinating Role

A.1.1 The Department of Transport’s shall establish an ITS Unit which shall co-ordinate all efforts of ITS deployment in the country so that all institutional and deployment differences and conflicts are dealt with from a central point.
9. THE INTERIM ARRANGEMENTS

9.1 Movement of People and Goods A Priority

9.1.1 The Policy proposal relating to ITS shall first and foremost be concerned with the movement of people and goods. The accommodation of cars and motor-vehicles shall be secondary to the movement of goods and people. In the event that the gridlocks are caused by motor-vehicles, the Government shall have the right to intervene in giving people and goods first priority to move over the accommodation of vehicles on the road networks.

9.2 ITS Line Function

9.2.1 The “national” Department of Transport will establish an ITS capacity which will play an advocacy, co-ordination and promotion role of ITS in the country. This capacity will ideally be a line function, and be placed within a Branch that shall be decided by the Director-General. In the interim, the Director-General must identify a group of people, or a line department, that will play this co-ordinating role until a line function has been established.

9.2.2 The line function shall consist, or invite a cross cut of other units within the DOT which will stand to benefit from the ITS deployment. Two most important components, or user line functions for the ITS shall be the Freight Logistics and the Public Transport Branches. Its status shall be at a Chief Directorate level reporting to a Deputy Director-General that shall be decided by the Director-General or the Minister of Transport. In its articulation of the Public Transport Action Plan, the Public Transport Branch had made serious recommendations about the use of ITS in the implementation of the action plan. This ITS policy is giving effect to those ITS recommendations.

9.2.3 There shall be two Directors, one responsible for Operations Co-ordination and the other for Institutional Co-ordination, Four Deputy Directors and a Secretary.

9.3 A Holding Mechanism

9.3.1 The holding mechanism for the continuation of what has started will have to be co-ordinated with the current government structures that have already embarked on the deployment of the ITS, and the invitation to all municipalities where ITS has not started shall be extended as a matter of urgency. Such a holding structure shall be referred to as a National ITS Task Force, and shall consist of all the government officials who undertook an Orientation Visit on the ITS to the United States during the month of January 2007.

9.3.2 The major responsibility of the National ITS Task Team shall be to decide on the National Architecture, develop ITS standards, to promote the use of ITS to solve transportation problems in South Africa, draw up a Strategic Plan for the deployment of ITS and to calculate the funding that shall be required for the setting up of the National ITS Architecture.

9.3.3 Upon the establishment of the ITS line function within the DOT, this structure shall cease to exist and members of the Task Team shall pursue their ITS responsibilities within their municipalities and provinces under the guidance of the established line function.

9.4 Structures of the Holding Mechanism

9.4.1 The Steering Committee of the ITS holding mechanism shall be comprised of the four most senior SA Government officials who undertook this trip. This will mean that the COO of the Department of the National Department of Transport, the Head of Transport and Public Works in the Western Cape Provincial Government, the Deputy Director-General in the Free
State Department of Roads, and the Deputy Director-General responsible for the National Transport Master Plan in the national Department of Transport shall form this Steering Committee and they shall provide strategic direction and approvals that will be needed for the deployment of ITS, from its nascence we currently experience, to its fruition.

9.4.2 The Department of Transport’s Chief Director of Policy shall head The Policy Committee. Since the need for policy is paramount as a bedrock for all implementation and deployment processes, and since there were not many policy officials in the delegation, the Chief Director will employ the resources of the Project Manager of ITS, and shall call upon any other official in the Policy divisions of the national, provincial and local governments to assist with policy issues.

9.4.3 The NDOT Freight Logistics Branch, and municipalities such as EThekwini, Joburg and Cape Town shall be the implementing arms, and shall have the power to call on all others would-be implementers to be part of their Implementation Committee.

9.4.4 ITSSA shall be the Reference Group for the National Architecture. An agreement between them and the Department of Transport will have to be entered into.

9.4.5 There is also a complication of individuals who will belong to all or most or two groups of the structure. The solution to this issue will need further engagement among the parties concerned.

9.5 The Funding Dilemma

9.5.1 The funding mechanisms for the operation, meetings and co-ordination of the National task team shall be sourced from National Department of Transport, and all meetings shall be held in rotation based on the number of localities of the membership of the task team. This in essence will mean that the meetings of the Task Force will be held in eThekwini, Tshwane, Cape Town, Johannesburg, and Bloemfontein on a rotational basis.

9.6 Redefinition of the Role of SANRAL

9.6.1 The Department of Transport shall redefine the role of SANRAL in relation to the agency’s role in the provision of ITS on the road network that are maintained by it. This role may have to be devolved to RTMC, or to a local traffic management structure.

9.7 New ITS Deployments

9.7.1 Municipalities that have not established TOC with ITS platforms shall be encouraged to do so. Depending on their needs, these municipalities shall be expected to build from the simple to the complex. In the final analysis, TOC’s shall have the following:

- Incident Contingency Plans;
- Control reference Books;
- Channel Configurations;
- Transport Operational Centre (TOC) Operation Manuals;
- Detection Configurations;
- Fibre/Conduiting Routing;
- Timing references;
- Systems Software;
- Monitors; and
- Data translators.
9.7.2 The barest data translators that shall be leveraged for the functioning of these TOCs shall be based in the following but not limited to the following:

- Incident alerts;
- PRN File texts; and
- Advanced Transportation Management Systems Database,

and shall use the following mediums:

- Video;
- Acoustics materials;
- Inductive Loops,
- Radar;
- Data Loggers; and
- Other Multi-technologies.

9.7.3 Of all the media that have been highlighted, the acoustics is a value-add. To further exploit this new medium, there is a need for the TOCs to use it to the maximum, and to find out whether the acoustics medium cannot be combined or converged to other media.

9.7.4 The barest outputs for the TOCs shall be the following:

- TGM Texts
- Trip Times
- Traffic Management Data Dictionary (TMDD)
- Reports
- ATMS
- E-Mail

9.7.5 In the encouragement of new municipalities to establish TOCs there shall be due cognizance of the municipalities abilities to maintain the system. In general, a perfect balance of costs shall be made between the establishment of the system and the financial ability to maintain it, as this would prevent white elephant systems and TOCs.

9.8 The Return of Investments (ROI)

9.8.1 Infrastructure investments should be made after analysis of the return on such investment (ROI). Long-term investment decisions will be based on sound and explicit criteria aimed at optimizing the use of scarce resources. One of the criteria for decision taking is the ITS innovative technology which will ensure that its utilization will address the infrastructure expansion requirement when necessary.

B. POLICY STATEMENT

B.1 Interim Arrangements

B.1.1 Before the ITS National Architecture is formalized and formally approved, the interim arrangements shall be informed by the following:

- The prioritization of the movement of goods and people shall continue over and above those of motor vehicles.
- The initial steps to the establishment of a line function within the Department of Transport shall be started:
- The Structure Of the Holding Mechanism shall be composed of a Steering Committee, a Policy Committee and a Reference Group:
Interim Funding for the Holding Mechanism shall be sourced internally within the Department of Transport:
- The Role of SANRAL in the provision of the ITS shall be reviewed: and
- ITS deployment happening in the interim shall be guaranteed Return on Investment (ROI).

10. THE SYSTEMS FUNCTION

10.1 The System

10.1.1 The systems provide management of traveller information to increase the safety, security and efficiency on decision making of the modal system for passengers and freight across borders and in both urban and rural areas, and both domestic and internationally.

10.1.2 It also provides valuable, real–time information to system operators such as commuters, commercial vehicle fleets, and emergency and security surveillance on containers destined for imports and exports.

10.1.3 By the introduction of ITS the key goal is to establish safety and security measures through Radio Frequency Identification (RFID) device by tracking down freight and passenger consignments. A key goal is to build southern Africa’s competitiveness in international trade by ensuring that the region’s competitive advantages can be accessed and marketed. The transport element of the cost of goods and services can be significant and deterring proportion of the final cost of both exports and imports.

10.1.4 Systems functions are to bring users, vehicles and infrastructure together into one integrated system that enables the exchange of information for better management and use of available limited resources.

10.2 The Type of System South Africa Needs

10.2.1 What we want ITS to solve in the immediate and in the different modes of transportation are the following:

- Rail – signaling, safety of cargo, punctuality, and theft of infrastructure cables
- In Maritime – and safeguarding maritime resources, and sea rescue- guarding the increased Exclusive Economic Zone (EEZ) response; and assisting the Maritime Rescue Coordination Centres (MRCC)
- Subterranean- mine rescue issues, and disaster management
- Road - Tracking, pilferage, hijackings, safeguarding cargo contents
- Space - supplement existing support industries, exploring more Greenfield and blue skies areas
- Air - terrorism, security, navigational aids, and baggage theft.

10.2.2 The system that shall be used in South Africa shall be the one that responds to the following characteristics:

- In its interoperability, it should be able to
  - Integrate existing systems;
  - Have correct message sets;
  - Have the same service to all vendors;
  - Have the high definition of data description to all modes;
  - To be continuous, consistent and have the high quality of interaction;
  - To have data communication controls on the same mode; and
✓ For all parties to understand the geographic location identified.

- **Flexibility**, it shall be able to
  ✓ Provide environmental stress peculiar to South Africa;
  ✓ Accommodate infrastructure failures;
  ✓ Be modular and flexible in design;
  ✓ To cater for both urban and rural settings equally, and
  ✓ To allow continuous upgrading;

- **Accessibility**, it shall be able to provide
  ✓ Safety and security to users and of the system itself, and
  ✓ An easy code to remember by all users

- **Efficiency**, it shall be able to provide
  ✓ The use of the same data for several of its functionalities;
  ✓ Avoid duplications;
  ✓ To incur no additional expenditures on procurement operations and maintenance; and
  ✓ To offer no redundant data management.

- **Maintainability** it shall
  ✓ Respond to all weather patterns
  ✓ Have a self-contained error detection and Early Warning System (EWS)
  ✓ Have the Reparability of the system

- **Safety and security**, it shall be able to
  ✓ Offer a back up system
  ✓ Have a fire walling protocols and firewall capacities
  ✓ Guarantee no unauthorized access
  ✓ Respond to safety hazards, and
  ✓ Survive accidental attacks

### 10.3 State ITS Parastatal

10.3.1 In the initial stages of ITS deployment, there will be a role that will be played by the state in both funding co-ordination and operations. This cannot be done within the current DOT staff complement. The Department of Transport should consider the establishment of a state company, provisionally named the South African ITS Company (SAITSCO) to take care of its investments in ITS.

10.3.2 There are platforms which currently exist either for the consolidation, or the procurement of, broadband, IT and ITS within the state agencies. This may offset the costs from the private sector. A few of these existing platforms are:

- **SENTECH**, in which government owns 100%;
- **Telkom**, in which government owns 38%;
- **Neotel**, in which government, through Transnet and Eskom, owns 38%, and
- **Infraco**, in which government owns 26%

10.3.3 There are also further possibilities for additional state telecommunications capacity and leverage in the:

- **Southern Africa Large Telescope (SALT)**
- **Square Kilometre Array (SKA)**
- **Eastern African Submarine Cable System (EASSy)**
10.3.4 Once such deployment has been achieved, the Department of Transport should consider whether to exit the business of ITS, and for the Government to play only an allocative and regulatory role.

C. POLICY STATEMENTS

C.1 Development Of A The National ITS Architecture

C.1.1 The Department of Transport shall develop a National Architecture for ITS that will provide the following
- Accessibility;
- Flexibility; Efficiency;
- Safety and security;
- Maintainability, and
- Interoperability

C.2 State ITS Company

C.2.1 The Department of Transport shall establish the State ITS Company which will take care of its interest.

11. THE NEED FOR INTERVENTION

11.1 Safety And Security

11.1.1 RSA domestic trans-boundary business and goods movements, including hazardous material require, International Standards Organization (ISO) and international harmonization regulations for interfacing modes to effectively comply and conform operationally. Such a requirement is to relate to globalization practices.

11.1.2 The Department of Transport should be the custodian of a pioneering project for identification and tagging labels on commodities at their point of origin to point of destination, irrespective of location. This can be achieved through the effective deployment of ITS.

11.1.3 Routes passing through areas which are prone to unrest may require an Intelligent Transport System in order to facilitate visibility to enhance emergency service response.

11.2 Environment

11.2.1 In respect of the climatic and atmospheric changes, it should be noted that all kinds of pollutions, in particular vehicle exhaust fumes, need to be prevented by monitoring tools. Of concern are activities of trans-boundary and transit freight traffic movements, carrying both gaseous and hazardous volumes of high-risk materials. ITS would be better placed to prevent an occurrence (meaning incident and accident) in the transport network.

11.3 Traffic Volume Recognition

11.3.1 High traffic volumes do not only contribute to high accident rate fatalities and pollution, but also results in greater consequences when occurrences do happen. ITS would be better placed to detect potential accident.
11.4 Heavy Motor Vehicle Volumes Segregation

11.4.1 Proper identification of volumes of heavy motor vehicle traffic on any route is an important factor to consider because occurrences involving them are generally more severe and take longer to clear than those involving light motor vehicles.

11.4.2 Prior planning for re-routing of large volumes of heavy motor vehicle traffic, especially vehicles transporting hazardous materials, can only be seriously considered and can be detected through installation of ITS technology.

11.5 Accident Ratings

11.5.1 Routes experiencing high accident rates are strong candidates for Intelligent Transport System technology which can be utilized for monitoring occurrences and assignment of alternative plans.

11.6 Road Infrastructure Capacity

11.6.1 A road which reaches or exceeds its designed or projected capacity might be saturated during peak period (e.g. daily/holidays). ITS should be considered to avoid the slightest occurrence on highway as this would invariably lead to substantial delays.

11.7 Suitability Of Alternative Routes

11.7.1 Where an alternative route is either not available or is of standard not suitable to deal with different vehicle traffic classifications, a traffic diversion should be considered through an Intelligent Transport System.

11.8 Interchange / Intersections/Rail-Crossings

11.8.1 Interchanges that are infrequently spaced may pose problems for emergency services that need to access an occurrence scene, and this may also delay the re-routing of traffic. Alternatively, traffic could become highly complex, causing additional problems with regard to manpower requirements.

11.8.2 Under the above circumstances, an Intelligent Transport System which preplans responses to these occurrences should prove to be valuable.

11.9 Topographical Barriers And Geometrical Standards

11.9.1 ITS should be utilized where topographical hindrance and constraints, such as access to emergency services during an accident scene, prove difficult

11.9.2 The geometric characteristics of a road may be inappropriate – in particular in rural areas – for traffic conditions resulting in an unacceptable accident rate. ITS could reduce these negative effects by facilitating vehicle flow and thereby reducing expenditure requirement for infrastructure expansion.

11.10 Strategic Issues

11.10.1 Routes of social, strategic and economic importance, as well as routes known to be used to transport hazardous and perishables or high value goods, should receive special consideration.

11.10.2 Particular attention should be valued for defence and strategic routes thereby isolating and prioritizing them from the social and economic ones.
D. POLICY STATEMENT

D.1 The Execution Of The DOT Mandate

D.1.1 The Department of Transport shall execute its mandate as authorized by the National White Paper on Transportation Policy of September 1996. Some of the issues that the DOT will execute its functions shall relate to:

- Provision of safety and security in transportation;
- Protection of the environment;
- Managing traffic volumes;
- Rating of accidents for future prevention strategies;
- Managing the road infrastructure capacity;
- Suggesting alternative routes;
- Managing interchanges and rail crossings; and
- Avoiding topographical barriers in road and rail construction.

12. INTERNATIONAL RELATIONS

12.1 Under training, we have referred to the need for the secondment of officials to TOCs and ATMS with the best practice of ITS deployment. Most of these are in found in the international community and development agencies.

12.2 While these are applied with greater efficiency in the developed world, there are developing states such as Chile and Mexico which have embarked on ITS. There is a need for the Department of Transport to apply ITS with due regard to their effectiveness in the developing world conditions.

12.3 There is however, a realization that South Africa a country of two worlds: one developed, one developing, where opulence and poverty sit side by side, which forms the basis for Government’s economic policy thrust of closing the gap between the first and the second economy.

E. POLICY STATEMENTS

E.1 Encouraging International Partnerships

E.1.1 The DOT shall facilitate the involvement, membership, liaison, networks and friendships with international bodies and partnerships in the ITS family. All international relationships shall be done with the assistance of the Department of Foreign Affairs from a diplomatic angle, and the assistance of the Department of Trade and Industry from the procurement and acquisition side.

E.1.2 In its interactions with international service providers and best practitioners, ITS South Africa shall take into account the firms reach, and such reach shall take into account the products, needs and requirements and peculiarities of a developing country such as South Africa.

E.1.3 In order to position RSA’s ITS industry to take advantage of growing international markets, the Department of Transport will consider working with the international partners to develop and deploy export opportunities for RSA firms and this will include expertise throughout the African region and in particular SADC.
E.1.4 The issue of regional co-ordination shall demand of the ITS deployment in South Africa to develop a Work Plan for the integration of the South African Development Community (SADC) into the South African National ITS Architecture.

E.1.5 RSA will have to partner, benchmark and adapt best practices identified in the international markets and must be sensitive to replacement policies - allowing innovative and technological changes but not to re-invent the wheel in terms of R&D.

E.1.6 RSA will ensure that products and services that are adapted, are seamlessly integrated and out of the best practices. The rules and standards will be identified coupled with the need to support interoperability of technologies, across modes, and jurisdictions.

E.1.7 The building blocks must not only be an agreement and identification of international partnerships and harmonization but also facilitate knowledge in regional partnerships at all level of government, the private sector, ITS associations, academia, and consumers vital for the deployment of ITS across RSA and building relations amongst stakeholders as benefits.

E.2 Cession Of Proprietary Rights By Vendors

E.2.1 All products procured from international markets shall cede their proprietary rights to a South African concern they have entered into an agreement with, and these rights shall reside in the purchasing agency and/or the local authority concerned.

13. REGULATORY ISSUES

13.1 Will DOT be seen as the provider of ITS or the regulator of it?

13.2 A number of copycat products may find their way into the South African ITS networks. This will be more so if the original vendors do not have sales clauses that guarantee post sales customer relations such as service and maintenance.

13.3 The DOT as a government Department cannot play a regulatory role, as regulators regulate the relationship between the private sector and government among other responsibilities. In addition, the Department of Transport may not have the capacity to have regulators of ITS in their employ.

13.4 The ITS has a communication component, and it may be prudent to have this side regulated by the Independent Communications Authority of South Africa (ICASA). This issue will still need further discussion with the Authority.

13.5 On the other hand the quality of products may require a different type of regulation, and this can be found in the standards body of South Africa.

13.6 ITS Policy Framework will be based on the premise that all other agencies are developing intelligent transport systems technology in an institutional vacuum, and that the roles and responsibilities of the DOT have not been clarified to regulate and consolidate all institutional ITS technological requirements.

13.7 The issue of regulation, particularly the role of the Department of Transport, is caught up in a paralysis. At one point there is a need for the articulation of the Single Transport Regulator, at another there is laxity in the establishment of sub sector regulators. Those regulators that do exist are at arms length, and operate on their own without a strong DOT overlordship.
13.8 It would be taxing on the DOT to establish an ITS regulator in the light of these shortcomings, and for the time being this regulation should rest with the existing regulators outside the Transport sector, such as the Competition Commission, ICASA and the SABS. Only when the DOT has concretized its approach to regulation should the issue of ITS regulation be considered for reinstatement to the DOT.

F. POLICY STATEMENTS

F.1 Using Existing Technology

F.1.1 Since there is no developed ITS and GIS standards in the country, the ITS shall use the equipment that has already been developed in other countries. However, the equipment shall take into account the peculiarities of the South African situation.

F.2 The Role of STANSA

F.2.1 The Department of Transport shall relinquish the regulatory aspects of standards for ITS platform to the STANSA. STANSA shall be tasked with filtering below standard products and shall recommend and vet all ITS applications that come into the country.

F.3 ICASA

F.3.1 The Department of Transport will enter into negotiations with ICASA with a view of the authority playing a regulatory role in the ITS Communication protocols.

14. CORPORATE GOVERNANCE

14.1 In the formulation of the ITS policy, the Minister is required to collaborate with the provinces to integrate the ITS with the information system kept by provinces. Hence every Member of Executive Council (MEC), every transport authority, every metropolitan city and every municipality must provide the Minister, in the manner and at the times as prescribed by the Minister, with the information so prescribed about their actions or position with regard to matters so prescribed that are relevant to

- the objects and purposes of this Act;
- the national land transport policy;
- the utilization of moneys made available to them by the Department, whether directly or indirectly, for the performance of their functions with regards to land transport in term of this Act.

14.2 The national agencies that have deployed the ITS report to the Department of Transport. They are entities of the Department of Transport. Municipal ones report to the City, and the provincial ones report to the Provincial Government.

14.3 The overarching Corporate Governance for all these agencies should be driven from the National Department of Transport.

G. POLICY STATEMENTS

G.1 The Role of Public Entity Oversight

G.1.1 The Public Entity Oversight (PEO) Branch of the Department of Transport shall liaise with the Provincial MECs and Local municipalities about all Corporate Governance issues related to the deployment of ITS.
These issues of Corporate Governance shall be discussed at a platform of MINMEC, with the backing group of Transport officials in the Committee of Transport Officials (COTO).

15. FUNCTIONS OF THE TRANSPORT DATA CENTRE

15.1 Challenges Related To Transport Data

15.1.1 For both planners and traffic controllers, the centrality of reliable and verifiable data has continued to be a challenge. In relation to transport planning alone, the non-use or under-utilization of data has been characterized by the following:

- The concentration on the collection of traffic volume data rather than travel speed and the reliability of data;
- The time allocated to data collection is limited usually to the peak hour. It is also limited to the geographical areas where there are perceptions of congestions. In this way there is no planning for the use of roads during low traffic times, and that rural areas are usually neglected.
- The data is historical or anecdotal, and it is old data by the time it reaches users.
- Data is collected as estimates rather than as properly measured data.
- Network models cannot be properly calibrated and validated as a result of insufficient data;
- It is expensive to collect speed and delay data.

15.1.2 The activities of the TDC are to be focused on five core areas – for the National Transport Information System. These five areas are listed and briefly elaborated below:

15.2 Identification Of Data Needs

15.2.1 Support national transportation policy making would require a detailed assessment of what information is required, where data is missing, and what the priorities should be.

15.3 Data Compilation

15.3.1 Limited and highly focused on multi-modal surveys and inter-modal data. Management of the proposed National Passenger and Commodity Flow Surveys, which is handled by ad hoc informed means.

15.4 Data Standards And Quality Assurance

15.4.1 Taking the lead in setting the standards for data compatibility and improving the compatibility and quality of the source data. A technical advisory committee of outside experts in transportation statistics and analysis should be established to provide periodic advice – setting data standards.

15.5 Data Synthesis And Analysis

15.5.1 Interpreting data into meaningful information, which is useful for national transport policy – making there must be synthesis, analysis and interpretation.

15.6 Data Dissemination

15.6.1 Responsible for disseminating the data it collects or obtains from others in a format that is useful for both the department and transportation community.
15.7 The Importance of Probe Data

15.7.1 The real time nature of probe data is an essential element of ITS deployment. It is therefore crucial that the deployment of ITS should as a first step recognize the role that can be played by toll tags at a tollgate and the cutting down of the costs that are related to the construction of infrastructure at toll gates. This will require that motor vehicles should have on board sensors, and combine this with the use of cellular technology so as to pass specific data when the vehicle passes a certain point.

15.7.2 Cell probes are part of the Probe Data envisaged in this policy document. The role of the cellular network operators and the companies that provide cellular services, including the Internet Service Providers (ISP) should be brought into the policy loop as a matter of urgency, as the changing technologies and their plans for telephony for the future should take cognisance of the need for their integration into the ITS deployment. For this, the Department will have to assure the companies and the cellular users that the fire walling mechanism will be in pace, and the traffic probe privacy shall be protected at all costs.

15.8 INFRACO

15.8.1 The new state company, INFRACO, which will provide bandwidth and access at affordable prices, there is a need for the Department of Transport to engage the new company and to determine the role that will be played by this company in the provision of ITS deployment.

H. POLICY STATEMENTS

H.1 The Basic Needs For the TDC

H.1.1 The Transport Data centre (TDC) shall be established and it shall contain, among others the following information:
- Identification of Data Needs;
- Data Compilation;
- Data Standards and Quality Assurance;
- Data Synthesis and Analysis; and
- Data Dissemination

H.2 The Role Of Cellular Network Operators

H.2.1 The Cellular Network Operators shall be approached for their views on the use of cellular infrastructure, including masts for their integration into the ITS deployment in South Africa.

H.3 The Role of INFRACO

H.3.1 The Department of Transport will engage the Infrastructure company to determine the role that this company should play in the deployment of the ITS. This will be done through the shareholder department, the Department of Public Enterprises.
16. DEPLOYMENT OF ITS

16.1 A Long Process

16.1.1 The development of National Architecture for the Intelligent Transport Systems is a process that takes long. The advantage of this long process is that there is a possibility for addition of new bundles and the accommodation of new technologies as they develop. One new technologies that should be assessed for compatibility with ITS is “Bluetooth” (with the necessary guidelines and protections against mobile hacking that goes with it)

16.1.2 Bundles go hand in hand with the user services that benefit from those bundles. Although mentioned earlier, in this section we wish to match the bundles to their user services to illustrate this point of the accommodation of new bundles. This is based on the ITS classification by the US Department of Transportation.

<table>
<thead>
<tr>
<th>Bundles</th>
<th>User Services</th>
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<tr>
<td>Travel and Transport Management</td>
<td>En-Route Driver Information</td>
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<td>Route Guidance</td>
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<td>Traveller Services Information</td>
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<td>Traffic Control</td>
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<td>Incident Management</td>
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<td>Incident Management</td>
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<td>Emission Testing and Mitigation</td>
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<tr>
<td>Travel Demand Management</td>
<td>Pre-Trip Traveller Information</td>
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<td></td>
<td>Ride Matching and Reservation</td>
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<td>Demand Management and Operations</td>
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<td>Designing of original destination tables</td>
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<td>Better travel time and speed data for model calibration</td>
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<td></td>
<td>Potential for developing new generation models and redesigning existing models.</td>
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<tr>
<td>Public Transport Operations</td>
<td>Public Transportation Management</td>
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<td></td>
<td>En-Route Transit Management</td>
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<td>Personalized Transit Management</td>
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<td>Public Travel Security</td>
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<tr>
<td>Electronic Payment</td>
<td>Electronic Payment Services</td>
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<tr>
<td>Commercial Vehicle Operations</td>
<td>Commercial Vehicle Management Electronic Clear</td>
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<td>Automated Roadside Safety Inspection</td>
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<td>On-Board Safety Monitoring</td>
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<td>Commercial vehicle Administration Processes</td>
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<td>Hazardous Material Incident Response</td>
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<td>Commercial Fleet Management</td>
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<tr>
<td>Emergency Management</td>
<td>Emergency Notification and Personal Security</td>
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<td>Emergency Vehicle Management</td>
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<tr>
<td>Advanced Vehicle Control and Safety Systems</td>
<td>Longitudinal Collision Avoidance</td>
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<td>Lateral Collision Avoidance</td>
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<td>Intersection Collision Avoidance</td>
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<td>Vision Enhancement For Crash Avoidance</td>
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<td>Safety Readiness</td>
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<td>Pre-Crash Restraint Deployment</td>
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<td></td>
<td>Automated Highway System</td>
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</table>
16.1.3 Ideally, the NHTS that would serve the purposes of South Africa would resemble something like the following diagram. (Adapted From A Presentation Made By An official of the United States Department of Transportation.

16.2.1 There are various data and skills in the country which when marshalled together can assist in the development of the National Architecture. This may require legislation as indicate in one of the policy statements in this document. One of the opposition to this suggestion of legislation will be the competitive advantage of the companies and individuals concerned, the issue of proprietary rights and the fair compensation at market value that may be decided between the Government and those institutions that hold this information.

16.2.2 However, there is no skill within the Department of Transport to develop this National Architecture and there is a need for this to be outsourced to experts. This is made worse by the fact that there is no line function that deals with this issue.

16.2.3 Even if the line function is established, as suggested in this policy document, it is not possible for the new line function to develop the National Architecture from the low base of skills, and the need for outsourcing this will still stay.

16.3 Assistance From The Federal Highway Administration (FHWA)

16.3.1 The Federal Highway Administration has been kind enough to make the United States National Architecture available gratis to the South African delegation to assist in the development of the Architecture. This Compact Disk (CD) based document is the National ITS Architecture version 5.0: A Framework for Integrated Transportation In the 21st Century. The outsourced experts will therefore not have to start from scratch, but will have to study the US National Architecture and tweak it to suit South Africa’s peculiarities.
16.4 Sub-Architectures

16.4.1 In short, the National Architecture “Definition” is a combination of architectures.

- There is the Logical Architecture which has three volumes of a description, process specification and data dictionary. What is contained in this type of architecture and diagrams of processes and data flows which define data elements;
- There is the Physical Architecture that describes the transportation and communication layers;
- There are Market Packages describing how these market packages can be used to customize the architecture according to the country’s needs;
- There is a Theory Of Operations which shows how the architecture can support its users.

16.4.2 The Architecture Evaluation is based on six documents, namely:

- The Communications Document which provides an analysis of the communications requirements f the National Architecture;
- The Evaluatory Design which evaluates the performance of the national architecture, its benefits its costs based on the spatial areas when its can be deployed – meaning in the rural setting, in the urban setting and in the environmentally challenging areas.
- The Cost Analysis which develops a high level cost estimate of the expenditures associated with the implementing the ITS components and is also used as a costing tool for the implementers
- The Performance and Benefits Study assesses the technical performance of the National Architecture Study.
- The Risk Analysis looks at the critical risks that are associated with the costs of delays in the implementation of the ITS and there are also risk mitigation plans;
- The Evaluation Results contains various evaluations which are based on Evaluatory Design, Communications Analysis, Cost Analysis, Performance and Benefits and Risk Analysis

16.4.3 The Implementation Strategy gives an account of the phased implementation of the ITS services, including future research and development, operational tests, training and standards activities.

16.4.4 The Standards Development Plan includes the issues that are related to the development of systems interface standards.

16.4.5 The Security Document indicates how the issues of security are reflected in the functioning of the ITS.

16.4.6 There is also guidance about how the National Architecture can be applied to local conditions, and this is found in the Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS for Your Region document.

16.4.7 In addition, to all these there are issues of Training which are also mentioned in the Architecture.

16.4.8 It is our view that the use of this National Architecture as a point of reference, will assist South Africa achieve its ITS objectives earlier than anticipated.
I. POLICY STATEMENTS

I.1 Major Events As Building Blocks

I.1.1 All major events that shall be held before the finalization of the ITS Architecture shall be obliged to assist the formation of the National Architecture by providing their communication plans and procedure and implementation plans of their traffic control, crowd control, and transport plans so as to consolidate a National Architecture on the same platforms.

I.1.2 In order for this to happen, the national architecture should be accessible so that all types of information can be logged in with minimum effort.

I.2 Open Sourcing For ITS

I.2.1 The ITS National Architecture shall, as much as possible, be open source so as to encourage interaction with members of the public. It is however not decided at this stage whether the issue of open source platforms will be to the benefit of the public, as there are security issues that have to be taken into consideration.

I.3 Provision of Hardware and Software

I.3.1 Where possible, vendors should be able to provide both the software and the hardware for the ATMS and control centres so that no disconnects shall be experienced between hardware and software, and so that maintenance and servicing shall be possible within a short space of time.

I.4 Procurement For National ITS Architecture

I.4.1 The Department of Transport shall seek external expertise to develop National Architecture for ITS in South Africa. In the development of this National ITS Architecture, the following issues shall be paramount and be reflected in the Terms of Reference (TOR).

- The Physical Architecture;
- The Market Packages;
- The Theory of Operations;
- The Communications Document;
- The Evaluatory Design;
- The Cost Analysis;
- The Performance and Benefits Study;
- The Risk Analysis;
- The Evaluation Results;
- The Implementation Strategy;
- The Standards Development Plan;
- The ITS Security; and
- The South Africa Specific ITS National Architecture.

I.4.2 The Procurement mechanism of Government shall be followed in the procurement of any service or services that shall make the ITS National Architecture achievable.
17. INSTITUTIONAL MATTERS

17.1 The Powers of the Minister

17.1.1 It is required by the National Land Transport Transitional Act, that the Minister must develop, establish and maintain a national information system with regard to land transport, based on sound business processes, and in collaboration with the provinces integrate that system with the information system kept by provinces.

17.2 Legislative Issues

17.2.1 In rail, the Legal Succession Act to the South African Transport Services Act 1989, (Act No.9 of 1989) Section 23(4) and Section 23 (5) forms the basis for which ITS develop find its legal and legislative standing. This Act is omnibus, and there may be a need for it to be revised or amended to take into account the need for the deployment of ITS in the rail industry. This matter should rest with the Legal Unit of the Department of Transport.

17.2.2 Section 23 (5) subsection (1)(2) a) of this Act pertains to the powers of the rail organizations, particularly in the Transnet stable to enter into contract and (b) pertains to the goods and equipment which are movable and immovable.

17.2.3 The derivation of the ITS vision is also guided by the: -
   - The White Paper on National Transport Policy, Sep, 1996,
   - the National Land Transport Transition Act, 2000 (Act No, 22 of 2000) about interoperability network issues, the principles and provisions, and
   - the Legal Successor to the South African Transport Services Act 1989 (Act No. 9 of 1989)

17.2.4 In roads, the specific issues of enforcement are dealt with under the National Road Traffic Act, 1996 (Act No.73 of 1996.

17.3 The Role Of Other Departments

17.3.1 The Departments of Communications, Public Enterprises, National Intelligence and Safety and Security shall be invited to be part of the Committee that will decide in the use, acquisition and access to the National Architecture of the ITS and access protocols to the information that shall be generated within the Traffic Operations Centres.

J. POLICY STATEMENTS

J.1 ITS As Part of the ITPs

J.1.1 In their submissions to the Department of Transport in response to the NLTTA, municipalities shall indicate in their Integrated Transport Plans if they plan to establish ITS and indicate their willingness to cooperate with their neighbouring municipalities should they not have the capacity to do so.

J.2 Legislative Reviews

J.2.1 The Department of Transport shall review and revise the pieces of legislation under which road rail, maritime and air transport operates, and amend all laws and legislation that do not support the deployment of ITS.
J.3 Assigning Specific Responsibilities To Other Departments

J.3.1 The Department of Transport shall work in conjunction with other Government Departments to arrive at the expeditious deployment of ITS, granting these Departments their leading roles in their specific responsibilities.

18. BUILDING FROM WHAT ALREADY EXISTS

18.1 Current DOT Programmes And Projects

18.1.1 It must be mentioned upfront that this policy does not want to replace current programmes of the Department of Transport. Efforts that exist outside the scope of the ITS shall continue. Among these are the Arrive Alive campaigns, Overload Control Strategies and Road Safety Strategy, the National Freight Logistics Strategy (NFLS), and the National Transport Master Plan (NATMAP) and shall also include the continuation of other congestion reducing strategies such as ridesharing, teleporting, alternate work hours, shifts re-orientation and tailgating. What the ITS will do is to assist these programmes.

18.1.2 The departure of this policy document is clearly to “sweat the assets,” maximize current strategies, and to employ best practice.

18.2 Unmanned Aerial Vehicles (UAVs)

18.2.1 The Department of Defence and other security agencies operate unmanned vehicles for their surveillance. The Department shall enter into Memoranda of Understanding with these security agencies about how the UAV can be integrate into the Intelligent Transport Systems, without derogating the powers, rights and responsibilities of these organizations to perform their security-related duties.

18.3 Privately-Held Data

18.3.1 There is a large body of information that is held by private institutions which relates to transportation. The Department of Transport does not have access to this information. These private individuals use this information to enhance their advantage, either in their operational or competitive advantage over their competitors. The location of this information in private organisations may be as a result of the Department of Transport’s failure to collect its own data. This issue will need to be resolved through some institutional reconfigurations, and the restructuring of the Department of Transport.

18.4 The Need For Legislation

18.4.1 In the interim, there is a need for the Department to have access to this information. In future, the Department of Transport may have to consider legislation to regulate this area of information gathering by private individuals and one clause of this legislation will have to deal with the issue of the release of information that may be detrimental to the objectives of the Department of Transport.
K. POLICY STATEMENTS

K.1 Satellite Tracking Devices

K.1.1 All future vehicles shall be fitted with a satellite-based tracking device. No new vehicle shall leave the sale floor and be transferred to the new owner, and no new owner shall take delivery of a new vehicle that has not been fitted with a satellite-based tracking device.

K.2 Automatic Access To Data

K.2.1 The DOT shall have automatic access to all transport related data and information that does not reside in it. It shall have the first right of call to this information and no private organisation shall release or use information that shall be to the detriment of the objectives of the Department. Such access shall be determined through an MOU and Protocols, and shall be paid for on market-related prices.

K.2.2 These Protocols shall be signed with other state organs, state utilities, agencies, and private sectors.

K.2.3 The DOT shall consider the wisdom of developing legislation related to the holding of transport related information by private organisations.

K.3 Existing Platforms

K.3.1 The development of ITS shall take into account existing resources and funds already allocated for the implementation by Metros. The platforms that are national assets, such as SENTECH and South African Large Telescope (SALT), Square Kilometre Array (SKA) telecommunications network in which the State has a share, existing privately-owned vehicle tracking systems, ITS applications already on some major highways shall be leveraged for an eventual national architecture.

19. CAPACITY BUILDING AND TRAINING

19.1 Shortage of Skills

19.1.1 The ITS expertise in South African has not developed to a greater degree for easy and immediate implementation. Although there are low bases for the deployment such as those mentioned in the previous paragraph, there is a need for quick training and skills acquisition for the deployment of ITS.

19.1.2 The skills that currently exist are located in urban areas, and the CCTV’s that already exists create a good screen monitoring bases which should be augmented by the other technical expertise, and operational skills to understand ITS in its totality.

19.1.3 Educational institutions should be directed towards this expertise, or the current computer lessons should be tweaked to form a base for laying over ITS operational expertise.

19.1.4 An effective data has two essential components:

- Data should be organised in a framework keyed to the broad subject area of interest; and
- Analytic capability is critical to ensure that the data are translated into information that is for policy analysis.
19.2  Leveraging the Municipal Demarcation Data

19.2.1 The skills that are needed for the ITS deployment is varied, and includes the need to integrate the legacy data into the new ITS. One such legacy data is the one that was developed by the Municipal Demarcation Board. (MDB). Not only did this data divide the municipalities for the purposes of the elections, but it went further to collect extra data such as income distribution, age pyramids, etc, that could be used as a basis for further development and inclusion into the ITS deployment.

19.3  Leveraging Disaster Management Centre Data

19.3.1 There is also a need for the skills to overlay the information and data that resides in the Department of Provincial and Local Government (DPLG)’s Disaster Management Centre.

19.4  Leveraging GIS

19.4.1 The Department of Transport is engaged in the development of the Geographic Information Systems (GIS). The Department will be advised to find the linkages between its GIS development and the deployment of ITS, to the extent that the two have some compatibilities.

19.5  Leveraging e-Natis

19.5.1 The Department of Transport is also engaged in the development of National Transport Information Systems and there is an intention to further develop this into an electronic version (e-Natis). This can form a starting point for the collection of data for the deployment of ITS. The issue of standards is discussed in the relevant section of this document. It will suffice to state in this section that the International Standards Organisation (ISO) Numbers 19132, 19133, 19134 and 19141 should be understood by the integrators of the two systems, as they talk specifically to the transportation in general, but to the GIS and ITS in particular.

19.6  Fast Tracking RIFSA

19.6.1 The Road Infrastructure Framework of South Africa (RIFSA) which was presented by the Integrated Planning and Intersphere Co-ordination Unit at the Transport Lekgotla in 2006 will be the biggest beneficiary of the deployment of ITS. The issue of how long is a long road, and where do roads start and end, and all the problems related to road segmentation are at the heart of RIFSA and the extent to which the ITS and GIS can assist in this determination is enormous. From an ITS platform, a Road Measurement System, and the Distance Measuring Instrument (DMI) can be developed with ease.

19.6.2 This means that the skills set goes beyond the monitoring of screens, and shall include shall skills as systems architecture, systems integration, database design, and software development.

19.7  A Salad Bowl Of Services

19.7.1 The conclusion that can be reached for the integration of these services is that ITS platforms shall be based on a combination of base material, cadastral information, elevation, geodetic control, government units, hydrographical information, sea, land and air information, rail, national waterways telephony etc.
L. POLICY STATEMENTS

L.1 Secondment of ITS Officials

L.1.1 The DOT shall liaise with best practice ITS institutions to second South Africans to international institution for training exposure, updating, in service training on the use, establishment and updating ITS capacity in their institutions.

L.1.2 The funding mechanism for such training and funding shall be applied for from a DOT based funds which DOT shall in turn apply for from National Treasury.

L.2 Exhausting the MOUs And Other Agreements

L.2.1 As a first departure, the Department of Transport shall exhaust all existing Memoranda of Understanding, Bilateral and Multilateral Agreements with other countries and friendly developmental organizations.

L.3 Avoiding Duplications

L.3.1 The Department of Transport shall integrate all its systems currently under development, and to assist in the deployment of the ITS using these systems. Efforts shall be made not to duplicate, and to arrive at a system that shall be used for all purposes.

L.3.2 Two movements towards cutting of these unnecessary duplications from the Gauteng Province have emerged. It is early days for one to see the light of day, while for the other it is fait accompli:

- Firstly, at the African National Congress lekgotla, there was discussion about combining the data bases and to combine the Metro Police and the Traffic police to create a single authority (City Press, 4 February 2007 To the extent that ANC policy discussions end up being Government policy as a ruling party, this policy decision is likely to be accepted by Government.

- Secondly, the Gauteng Department of Transport intends to create a single Gauteng Transport Authority. (City Press 4 February 2007)

20. CO-OPERATIVE ARRANGEMENTS

20.1 Cross-Boundary Co-operation

20.1.1 Where a route crosses a boundary between provincial / countries, it is often necessary for emergency services from the same two provinces and countries negotiate for a Memorandum of Agreements (MOA) and coordinate their activities. When an inter-provincial/international route is closed and traffic needs to be diverted onto an alternative route ITS technology must be considered as a deterrent.

20.1.2 An Intelligent Transport System can facilitate emergency services in these situations by formalizing and coordinating response procedures.

20.1.3 There is acknowledgement that different municipalities are at different levels of deployment and that their priorities different according to their peculiarities. The sizes and the problems related to traffic management are not the same.
20.1.4 There are those municipalities who will never have the ability to deploy at all, and this will create gaps in the deployment at a national and wall-to-wall approach advocated in this document. These municipalities may have to relinquish their rights to neighbouring municipalities that can afford and are ready to extent their operations beyond their borders.

20.1.5 This is based on the understanding that to have 284 applications based on the demarcations would in anyway be cumbersome and unwieldy, and can pose the problems of different standardizations.

20.1.6 There is potential for competitions between municipalities, particularly adjacent ones which can afford to provide the ITS service. There is also a potential for competition between the government, its agencies, private sector and users. There is a need for a policy statement about co-operation.

M. POLICY STATEMENTS

M.1 Abutting Municipalities

M.1.1 Municipalities located close to, or abutting one another shall be encouraged to amalgamate their ITS architecture so as to cut down on unnecessary costs, eliminate unnecessary duplications and encourage seamless integration of systems.

M.1.2 Smaller municipalities and non-affording towns shall be allowed to develop the ITS on the closed loop system, to drive their ATMS and TOCs on a scalable basis. These weather resistant loops shall be able to react to transponders that shall be mounted on vehicles in future, so that, with scalability, the transponders shall be able to talk to traffic lights for easy movements.

M.1.3 These cooperative arrangements shall be based on MOUs and protocols over which the Department of Transport shall have arbitration and conflict resolutions powers.

M.1.4 Such cooperation will have to take into account the need of building from what already exists in municipalities.

M.2 Aspirant Metro Municipalities

M.2.1 All six metropolitan councils shall establish their ITS control centres, and other willing municipalities aspiring to Metro status, such as Msunduzi and Mangaung, shall prove that they have the ability to establish such control centres on their own balance sheets.

M.2.2 The responsibilities of the Metros to their rural abutting areas as required by national government shall be extended to include their responsibilities to ITS provision.

M.2.3 Agencies that provide ITS shall be under the direction of the Departments of Transport (national, provincial, and local) to which they report. Agencies shall cooperate among themselves, and the role of the police and the traffic management officials shall be paramount in this co-operation.

M.3 Other Interested Parties

M.3.1 The DOT shall liaise, integrate, encourage cooperation, network with local ITS agencies and interested parties, such s political leaders, ITS experts, academic institutions, inland operators and exporters to come to some agreement about how o solve stalemates.
21. **ASSESSMENT**

21.1 **Tenure of Government**

21.1.1 The term of office of government in South African is five years. The deployment of ITS is a long process, and the effects cannot be measured in a period equal to that of the Government term. However, in order to bring ITS deployment, the funding mechanisms and the political commitment that should go with it, there is a need for the assessment period to be aligned.

21.1.2 It is true that the period of assessment and the tenure of government may not necessarily coincide, and the Minister or Ministers to whom the responsibility was placed and by whom political commitment is given, may be replaced or transferred.

21.1.3 It is also acknowledged that the time of review (five years) there may not be sufficient information or date to make substantial decisions and policy changes. This time frame however will coincide with Government’s time framing.

21.2 **More Than One Political Term**

21.2.1 For the purposes of this policy document there shall be much alignment as possible, with the acknowledgement that the deployment may take more than one political term of office.

21.3 **MTEF**

21.3.1 There is also a consideration to be made on the Medium Term Expenditure Framework (MTEF) of Government, which takes a shorter period – 3 years – compared to the political term. But to do this, the issue of the ITS should be part of the Medium term Strategic Framework (MTSF).

21.4 **Criteria For Evaluation**

21.4.1 The assessment and evaluation of the ITS systems shall be based on some, or all, of the following methodologies and assessment practices:

- Economic Value Add;
- Multi-Criteria Analysis;
- Cost-Effective Analysis;
- Socio Economic Evaluation; and
- Environmental Impact Analysis,

and shall include quantitative and qualitative aspects such as (but not limited to):

- Construction costs;
- Travel time savings;
- Vehicle operating costs;
- Reduction of congestion;
- Air quality;
- Accident reduction;
- Increased traveller information;
- Enforcement improvements; and
- Navigation systems improvement;
- Growth of TOCs using ITS;
- Increase in real time transport data;
- Number of cars retrofitted to conform to ITS;
- Traveller Information hits recorded;
- Increase in data collected by CCTVs
- Growth of vehicles with satelitte tracking devices;
- Improvements in arterial monitoring;
- Time reduction in response to incidents and accidents;
- Growth in the number of problems identified;
- Number of ITS tools adapted to SA conditions;
- Growth of ITS Industry;
- Reduction in human based traffic management costs;
- Traffic congestion reduction;
- Improvement in freight management;
- Air pollution reduction;
- Fuel usage reduction;
- Delay reduction;
- Reduction in traffic accidents;
- Traffic volume recognition increase;
- Number of ITS standards developed or confirmed; and
- Number of regional ITS architectures deployed

21.5  Peculiarities and Jurisdictional Differences

21.5.1 The assessment system and elements to be assessed may vary from jurisdiction and application and deployment to application and deployment, and may also be driven by the exigencies and peculiarities of a particular implementing agency and or municipality. There is a need to arrive at the “basics of assessment” which shall apply to all implementing agencies while leaving a space/discretion for each implementing agency to include those elements and parameters that are peculiar to them.

21.6  Cost-Benefit Analysis

21.6.1 Three elements of the strategic cost benefit analyses should be considered when the assessment of the ITS deployment is made.

- The first will be the Economic Value Add (EVA). Part of the economic Value Add should be the socio economic evaluation of each of the systems;
- The Second will the Multi-Criteria Analysis which should be employed where there is no availability of money values, and the
- Cost-Effectiveness Analysis where costs are available but when there are not monetary values for the benefits.

21.6.2 There will also be a need for the cost benefit analysis of the generic technological capabilities that are related to the deployment of ITS. These technological capabilities should span six areas, namely:
- The communication links
- The processors
- In-vehicle storage devices
- Sensors
- Human-Machine Interface
- Transponders

(Source: Stevens, Alan. UK Perspectives On Cost-benefit Assessment of Intelligent Transport Systems)
21.7 Environmental Impacts

21.7.1 This evaluation is singled out specifically for the future pressure that will be exerted on the developing economies by the Kyoto Protocol. It is envisaged that Kyoto 2 to be negotiated after 2010 will out pressures on the countries that were non-annex, such as South Africa, India and China and Brazil to lower their emissions and sign the environmental destruction reduction protocols. Even if the developing countries succeed in wading off the pressures from industrialized countries, the saving of the environment is the “right thing to do,” and not because of compliance with international protocols:

21.7.2 In the assessment of environmental impacts and the deployment of ITS, the following should be considered:

- Noise
- Local Air quality
- Greenhouses gases
- Landscaping
- Townscaping
- Heritage and historic routes
- Biodiversity
- Water environment
- Physical Fitness
- Journey Ambience

(Source: Stevens. A. UK Perspective On Cost-Benefit Assessment of Intelligent Transport Systems)

N. POLICY STATEMENTS

N.1 Assessment Issues

N.1.1 The assessment of the effects and impacts of the ITS research, provision and deployment shall be done after a period of five years and shall take into account the following but not limited to:

- Distribution and equity of ITS;
- Environmental impacts;
- Affordability issues;
- Financial sustainability;
- Public acceptance;
- Technical risks; and
- Legal and Institutional problems;

N.2 Uniformity

N.2.1 Some uniformity in the basic elements to be assessed shall be determined, and implementing agencies shall have the right to add onto them those that are relevant to their operations and their needs. The basic elements and parameters shall be informed by, but not confined to:

- The consistency of approaches with other applications and implementation within the national architecture;
- The relevance of government policy to new ITS technological developments;
- Future expansion plans and the integration of abutting municipalities;
- Completeness and applicability of applications across all modes;
- Robustness of the system; and
- Accommodation of new and improving technologies.
N.2.2 The assessment period shall be aligned with both those determined by Government through other programmes, such as 2014, 2020, 2025, and shall also take into account the MTEF of Government and the other budgetary cycle sequencing and “perioding.”

N.3 Political Commitment To ITS Deployment

N.3.1 The political commitment that accrues to ITS deployment as a result of the political incumbent shall continue even when the incumbent is redeployed or replaced, so as to give continuity and value extraction from a programme that cannot be completed within one political cycle, and cannot be exhausted through the commitment of one political leadership.

N.3.2 In order for the alignment to transcend these political terms and periods, the issue of ITS should also be seen as a programme of Government, so that if the Minister is replaced, political commitment by Government shall continue.

N.3.3 The Minister of Transport shall be the Patron-In-Chief of the ITS Deployment, and all strategic issues shall be decided at this level.

22. CONDUITING

22.1 Cabling Material

22.1.1 South Africa is experiencing a spate of cable theft. Most of the wiring for the transportation and communication networks are copper based, and the failure or theft of these have led to blackouts/power outages and the dysfunctional signalling systems for rail services.

22.1.2 The advent of new conduit materials has to be explored to the full, or sufficient security mechanisms or back-up systems should be in place for such eventualities of theft. However, as these may not be immediately deployable by smaller and struggling localities, newer conduit materials should be envisaged.

22.1.3 While the materials will be an expense in the short term, the benefits into the future may be double and help to solve the problems currently being experienced.

22.1.4 Most of the current systems are based on fibre-optic material. While this material has a lot of benefits, it may be a matter of time before this material too suffers the fate of copper, and its shares in illegal trading may rise.

O. POLICY STAMENTS

O.1 Conduit Materials

O.1.1 As much as possible, the conduit systems that shall be used to serve the TOCs shall be based on materials that discourage theft. The suggested approach would the wireless conduit systems where the conduit material cannot be seen.

O.1.2 All conduiting layouts, fibre optic, cell modem, dial up modem Ethernet, copper and wireless should be displayed and be available to disaster management centres for easy repair in cases of breakdowns or incidents and attacks.
23. **RADIOS/DVD/TVs**

23.1 **Public Service Radios**

23.1.1 There is some information that is provided by some radio stations which provide traffic information at regular intervals. The periods for the provision of this information is limited to peak hour times, usually in the mornings and in the afternoons. There is a need to extend this service, and for it to be available to travellers at any time of the day. This could be done with the listeners accessing this information themselves, over and above the radio traffic report cut-ins that are broadcast in the morning and the afternoon peak hours.

23.1.2 One weakness about these radio broadcasts is also that they do not cover the whole country, and they respond only to the peak hour information needs of urban residents. The radio stations do not have, as far as we could ascertain, have the ITS traffic control centres, but rely on the information that they get from road users using a Hotline to report congestions and accidents.

23.1.3 Clearly, the public goodwill is there to make our roads safer, and this should be extended to the optimal usage of our radios for transport user benefits.

23.1.4 The use of radios for information dissemination is the easiest, as most cars are now fitted with radios as standard.

23.2 **Satellite Radio**

23.2.1 The issue of satellite radios also need special mention. The advantage residing in this type of radio is its precision and its ability to pick up longer signals.

23.3 **DVDS and TVs**

23.3.1 Newer vehicles are purchased with custom built CD and DVD players and television facilities for the comfort of passengers. The primary purpose is to make the longer journeys shorter by using entertainment facilities.

23.4 **Hands Free Kits**

23.4.1 Hands free cellular mobile kits are already available in the market. However, the use of these by drivers has not grown to the extent that it should, and there is a need for the consideration of the installation of the hands free kits in the motor vehicles in future, while in the present drivers should be encouraged to purchase what is already in the market as stand alone, so that at all times both their hands shall be on the steering wheels.

23.4.2 A study conducted in the United States reveals that almost 80% of the crashes and 65% of the near crashes involve some form of driver inattention. The common distraction was the use of the cellphone. (Source: Sunday Times, March 18, 2007)

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**P. POLICY STATEMENTS**

**P.1 Linking Radio Stations To TOCs**

P.1.1 Where possible, a radio station or stations must be linked with the TOC so as to be able to relay traffic messages as a back up to those members of the communities who are radio listeners and for who technologies for easy access, such as internet, are prohibitive. If possible, some public broadcasting facilities should be located in the TOC.
P.1.2 Radios shall be able to pick up traffic cut ins even when they are switched off, so that the traffic information shall be available at all times to the drivers. Even when another radio function, such as a Tape Recorder or CDs are being played, the traffic cut ins should be able to be heard.

P.2 Satellite Radios

P.2.1 Satellite radio shall be at the discretion of the respective drivers but will be recommended for those motorists who drive for long distances, such as truck drivers (in the absence of other radios and contact mechanisms) and who usually drive to destinations where communication lines are weak.

P.3 DVDS

P.3.1 Where portable DVDs are played in the vehicle, they shall be played by passengers in the rear seats of the vehicle and the passengers on the front seat other than the driver shall not be permitted to play DVDs as this may detract the driver from concentrating on the road.

P.4 In-Vehicle Television

P.4.1 When Televisions, small screen and other entertainment gadgets of the same nature are fitted in the vehicle, they shall be not be fitted in the front panel/dashboards of the vehicle but shall be located either on the roof in the middle of the vehicle or located behind the front seats of the car.

P.4.3 In the event that there are no passengers in the back seats of the vehicle, these TV’s, DVDs and other small screen gadgets shall remain switched off.

P.5 Hands Free Kits

P.5.1 Use of hands free kits in the operations of the mobile cellular phones while driving shall be encouraged.

24. MAXIMUM ITS DEPLOYMENT

24.1 The deployment of ITS is varied and complex. In efficient ITS deployment there is a number of benefits which can be derived from an intelligent deployment. In this intelligent deployment maximum effects and benefits are the point of departure.

24.2 The following deployments are illustrative but they do not exhaust the whole deployment that can be made either now (with the current technologies) or in the future as ITS platforms become scalable and converge with other ICT tools:

24.2.1 In Free Way/Highway and Intercity applications the ITS shall be deployed in the following areas:

- Ramps control;
- Incident control;
- Areas control;
- Automated Speed control;
- Lane control;
- Electronic tolling; and
- Demand management
24.2.2 In **Intra-Urban Traffic**, the ITS will be deployed in the following areas:

- Intersection control;
- Area Traffic control;
- Incident Detection;
- Parking Management;
- Emergency prioritization; and
- Public Service Vehicle Access

24.2.3 In **Enforcement and Monitoring**, ITS shall be deployed to do perform the following tasks:

- Speeding Detection;
- Weighting;
- Traffic Monitoring; and
- Vehicle Classification

24.2.4 In **Driver Assistance**, ITS shall be deployed in the following:

- Driver information;
- Navigations Aids;
- Autonomous Route Guidance;
- Dynamic Route Guidance;
- Integrated Automatic Driving; and
- Adaptive Cruise Control

24.2.5 In **Fleet Management** ITS shall be deployed in the following instances:

- Vehicle Location; and
- Dynamic Fleet Management

24.3 As much as possible, such benefits should be, or efforts should be made to be, available real time for immediate usage. There is information that is already available real time in cities and municipalities that have deployed the ITS. Some of the products and assistance that is available real time is related to the following:

- Weather services;
- Roadside assistance;
- Congestion sensors;
- CCTV Cameras;
- Internet accessibility;
- Travel Information;
- Electronic Roadway Signs;
- Ramp Meters;
- Co-ordinated Traffic Signals;
- Incident Management; and
- Freeway Patrols.

**Q. POLICY STATEMENTS**

**Q.1 Strategic Locations**

Q.1.1 ITS shall be deployed in various strategic locations to extract maximum benefits for the management of traffic, avoidance of accidents, access for public vehicles and overall road
management efficiencies. The deployment shall not be limited to the National Freeways, but shall also be deployed in arterial roads where there are congestions, and in certain rural areas where research proves the need for the deployment of ITS.

Q.1.2 All efforts shall be made to extract maximum benefits from a single ITS tool, and duplications in the purchase of many tools and equipment to achieve the same objectives within a given area shall be limited and eliminated.

Q.1.3 TOCs shall provide, real time information and data through means and communication platforms to members of the public. The types and levels of information and data that shall be made available shall be determined between the Department of Transport and implementing agencies and TOCs.

**Q.2 Electronic Toll Payment**

Q.2.1 All toll road systems in South Africa shall provide a facility for electronic toll payment on (a) particular lane(s) to facilitate an expeditious movement of vehicles and to reduce congestions at tollgates.

**Q.3 Navigational Systems**

Q.3.1 All future vehicles shall be fitted with navigational systems so as to reduce the times spent by drivers caught in intersections and road networks because they have no sense of direction about their destinations, or are taking longer routes to their destinations than necessary.

Q.3.2 Navigation systems will have the leeway for personalization, so that if the drivers want to know information relevant to their needs, rather than a slew of information irrelevant to their needs, they shall be able to do so.

Q.3.3 The locations by navigational aids of “places of interest” shall include those that relate to assisting drivers reduce vehicular flows, such as emergency detections, emergency assistance, hospitals, and garages and rest areas. “Places of interest” that relate to the entertainment aspects of navigational tools shall be “add ons” onto those that are needed for road traffic management.”

Q.3.4 The ATMCs or the TOCs or municipalities shall decide whether the personalization of the navigations systems shall come at a cost, and the level of that cost shall be decided by the municipalities as an avenue to recoup some of their operational costs.

**Q.4 Safe and Sound Devices**

Q.4.1 In order to achieve accident reductions and for the control centers to be quickly informed of accidents, all future vehicles shall be fitted with the safe and sound service types of signals which will be automatically activated to send calls for assistance when airbags explodes.

**Q.5 Airbags**

Q.5.1 This means that all future vehicles will be fitted with maximum airbags for all passengers and these airbags shall be operational only in conjunction with seat belts. The seat belts shall indicate by emitting sound when they are not being employed, or the vehicle will disabled to start when these seatbelts have not be put on by all passengers, in both front and rear seats of the vehicle.
Q.6 Parking Assistance

Q.6.1 To prevent “parking rage” and vehicles that park over the allocated space, and which bump onto other objects, all future cars shall be fitted with rear reversing and front object sensors to facilitate proper parking and reversing. The noise emitted by the sensor shall be within the required levels, but not low enough for the drivers not to hear it.

Q.7 Weather Monitoring

Q.7.1 Weather monitoring ability of the TOCs and the ATMS shall be integrated into the ITS system, and shall provide information about rainfall, hurricanes, wind, floods etc.

25. SHORTCOMINGS OF ITS

25.1 ITS Is Not Panacea

25.1.1 We admit that ITS will not be able to solve all problems related to traffic. A symbiotic relationship will thus have to be developed between the new challenges in transportation and the new developments in technology.

25.1.2 In addition, the use of ITS shall be combined with the human factor. This means that while the technology will be used, there will be a need for the continuation of the human elements of road traffic management. This will, in turn, mean that there should be maximum co-ordination between the TOC and Field Personnel to corroborate what is being picked up by ITS.

25.1.3 The deployment of ITS and transportation planning based on it will have to consider the following:

- Existing facilities versus the construction of new facilities;
- Congestion management versus additional capacity;
- Travel time reliability versus average travel time and delays;
- Optimizing the use of the system versus individual facilities;
- The measurements of air quality as new environmental concerns grow in response to climate change and environmental degradation by transportation;
- The issue of safety and security as recurring policy objectives of transportation;
- The satisfaction of the customers and the users as the soft side of transportation planning;
- Emphasis on the movement of goods in response to the export led economy.

(Source: Pederson, Neil, Maryland State Highway Administration)

25.2 Public Opinion

25.2.1 Technology developments and other speed cameras and other speed detection devices have not received total public acceptability. A more visible traffic management personnel rather than the intrusive camera is still preferred.

25.3 Shortage Of Resources

25.3.1 The shortcomings of the public preference for visible traffic management has been described as the shortage of funds for human deployment, and the impracticality of employing a “traffic cop every kilometer and on every street.”
25.4 A Non-Judicial System

25.4.1 We have made a policy statement in this document that information obtained from the ITS cameras and equipment shall not be used for prosecutorial purposes. This is not aimed at limiting the execution of justice, but is informed by the fact that technologies in the ITS family cannot be used “in the beyond reasonable doubt” requirements of the South African justice system.

25.4.2 Currently the technologies follow the traffic patterns. Although pictures, both still and real time, do show cars, the movement of cars is not as clear-cut as to identify the driver or the registration plates. The actual speeds of cars and the physical presence cannot be guaranteed to be so technologically perfect as form evidentiary material.

25.4.3 We are also informed by the intentions and objectives of the ITS technology, namely, the management of traffic. It is not clear at this stage whether the technology developed for this particular purpose can be used for another one. There is circumspection in this view, as there are examples of new technologies, such as biotechnologies (e.g. DNA testing) which are now being used as evidentiary material in South African courts.

25.4.4 The policy position will have to be reviewed in future, with the development of precision technologies and there will be a need for the Department of Transport to enter into negotiations with the Department of Justice to resolve this issue.

25.5 Absence of a National Government Body

25.5.1 There is no dedicated national body for the ITS implementation. In the preceding policy statements we make a case for the holding (temporary) arrangement for the establishment of the ITS line function within the Department of Transport. However, as the issue of ITS is also related to the issue of communications (ICT) and is also related to science (in terms of blue skies research) the roles of the Department of Communications (DOC) and Science and Technology (DST) will have to be decided.

25.6 The Urban Bias

25.6.1 ITS can be applied to its full maximum in urban settings. This is because of the short distances between facilities to be monitored, the level of development over which ITS can be overlaid, the availability of expertise to operate the system, Government’s superior funding of urban areas, the levels of congestions and all the elements that define the urban rural dichotomies. Local municipalities which have large rural expanses may find it difficult to migrate their traffic management systems to ITS applications, and this will further widen the urban rural divide, and further complicate the Government’s objectives of closing the gaps between the First and the Second economies.

25.7 Equal Access For All

25.7.1 All efforts are being made for ITS technologies, data and information to be accessible to the greatest number of users. This assumes that users have achieved a certain level of literacy and education to be able to use the data and information provided through the ITS. The South Africa situation is however different, in that the levels of education throughout the country is unequal. Playing itself more into the urban rural dichotomies mentioned in the previous paragraph, the same educational and literary dichotomies are also evident in urban settings. One of the shortcomings of this policy will be that the understanding and the comprehension of the ITS data and information shall not be equal to all users.
25.7.2 This will require a 24/7-access telephone line.

25.8 Funding Problems

25.8.1 The issue of funding for the ITS will become contested. National Treasury is not easily convinced with projects that cannot sustain themselves in the long run, for which benefits are not clearly illustrated, and for which accounting measures are weak. In addition to the requirements of National Treasury, capital outlays for ITS are huge and the implementing municipalities should balance their priorities.

25.8.2 It will be of assistance to the implementing municipalities to begin to work with the Department of Science and Technology and the National Treasury along the lines of the Standard Chart of Accountings (SCOA) for the research and development spending items. This will mean that in their application for funding, there should be clarity on the following issues:
- Funding Segment;
- Objective Segment;
- Responsibility Segment;
- Item Segment;
- Project Segment.

25.8.3 This will allow National Treasury to operate the accounts easily on their Vulindlela Systems.

25.9 Administrative Incapacities

25.9.1 The problem of administrative challenges for technology platforms and applications that have not existed before are many. The administration will also face challenges because in administration, there will be a need for an administrative corps that understands both the administrative aspects of Government and the technological advancement that is needed in the ITS field. In such human resource shortages different and conflicting administrative regimes are bound to crop up.

25.10 Unimodality

25.10.1 ITS still lacks multi-modal applications. The emphasis is still on the road-based transport, and in it there is a string emphasis on passenger vehicles. Freight on the road system is weak, while there is an under emphasis on freight in rail aviation and maritime transportation.

25.11 The Domination Of Commercial Interests

25.11.1 The domination of commercial interests in ITS is a challenge. There is a need for the ITS also has to respond to social issues, and to the extent that Government will have a role to play in funding such ITS deployment, the issue of social dividends will have to be evident.

25.11.2 Incident Control and Speed Managements are the biggest beneficiaries of ITS. Ramp control which is crucial to freeway decongestion is still weak, and the pressure on the freeways is not relieved.

25.12 Acclusion

25.12.1 One weakness of the ITS, particularly its side fire detection is that it cannot pick up a vehicle that is hidden from the view by another vehicle. If a truck has blocked the view of a smaller vehicle to the blind side of the side road detector, this smaller vehicle may not be detected.

Failure Is Not An Option
This shortcoming may be there, but the greater benefit of the ITS and side fire detection is greater than the negative effects that may be experienced by a “hidden” vehicle. New technologies will have to be developed to prevent accusion.

R. POLICY STATEMENTS

R.1 Human and Technological Deployments

R1.1 The Department of Transport and its agencies shall deploy both the human and the technologically based resources to achieve their objectives of traffic management as neither one of them can individually deal with the challenges that face transportation in South Africa.

R1.2 In achieving one or the other, a perfect balance shall be struck between the need to increase employment of human personnel within the labour intensive instructions of government, and the deployment of technology to achieve and encourage the competitive edge of the South African transportation industry.

R1.3 The deployment of one or the other shall be decided on a case-by-case basis. In instances where the deployment of human capital achieves the best traffic management results, this will be done and in instances where the deployment of technology shall achieve the best possible results, such employment shall be the preferred option.

R.2 Secrecy of TOC Information

R.2.1 ITS footage, information both static, real time and archival shall not be available for prosecutorial matters, and all evidence obtained from national and regional ITS institutions shall not be available for court proceedings.

R.2.2 The Departments of Transport and Justice and Constitutional Development will periodically review the modalities of using the material obtained in ITS applications and monitoring equipment and archives for possible use in courts. In the event that the views of transport users are negative to the use of this evidence, and public opinion lean towards privacy and civil liberties, the original purpose for which ITS was deployed shall prevail.

R2.3 Although the issue of ITS is a transport specific responsibility, both in our view and the international practice, the roles of other Departments is also paramount. Cabinet guidance and allocation of responsibilities to the three Departments, namely Transport, Communications and Science and Technologies shall be requested and to the extent that Cabinet may decide to divide the responsibilities, the Department of Transport shall ideally be left with the responsibility of the traffic management.

R.2.4 The deployment of ITS shall ensure that the privacy and civil rights of citizens is not compromised by its deployment and the need to know basis shall be the modus operandus for the sharing of information derived from ITS platforms.

R.3 Responsibilities of Metros To Rural Areas.

R.3.1 The affording urban municipalities shall deploy their ITS platforms and architecture with due regard for the need to expand it to their adjacent rural areas. The wider the network that is covered irrespective of the municipal jurisdiction, the better for the effective deployment of ITS. Such expansion of the municipal reach through technology over another shall be monitored by the Department of Transport at a national level, and shall be mediated between the municipalities concerned and the Departments of Transport and Provincial and Local Government.
R.4 User Friendly Data

R.4.1 The TOC and the ITS service providers shall develop user-friendly data and information outputs so as to make the ITS services accessible to as many users of the transport system as possible. In instances where people should be taught how the systems work, service providers and municipalities shall engage in such educational campaigns.

R.4.2 In order to extract maximum benefit from ITS data and information, textual messages shall, as much as possible, use pictorials and diagrams.

R.5 Costing of ITS Deployment

R.5.1 The implementing municipalities shall make appropriate and properly-costed financial and monitorable applications to National Treasury to deploy ITS. The Department of Transport shall also make its budgetary applications within the requirements of the applications frameworks that are decided by National Treasury.

R.5.2 In order for funding for the ITS deployment to be properly considered, the deployment of ITS shall be deemed to be in the national rather than local interest, and the benefits shall be those that will benefit the South African public and increase the country’s competitive edge in transportation. For it to achieve such status, the project shall find political support from the highest echelons of Government, with the Minister of Transport being at the forefront of the political leadership of the project.

R.6 Training

R.6.1 To coordinate administration of the ITS deployment, there will be a need for the Department of Transport to train ITS administrators. In cases where this is possible, there will be a secondment of officials to TOCs that have deployed ITS, and the transfer of knowledge and the sourcing of administrative expertise shall be the responsibility of the Department of Transport.

R.7 Multi-Modalism

R.7.1 Service providers, municipalities and TOCs shall endeavour to spread the use of ITS across all modes. In instances where technology to do this is non-existent, new research in ITS technologies shall point towards the multimodal integration, and freight in all modes shall be the targeted beneficiary of such research.

R.8 Social Benefits Accounting

R.8.1 Both public and private sector shall benefit from ITS deployment. In cases where the State provides capital, the social benefits of such funding shall be clearly stated upfront, and the monitoring and assessment shall be such that the social benefits are clearly shown. These benefits could relate, but not limited to more public travel, more access to information for travel management, reduction of accidents, increased access for the elderly and the disabled etc.

R.9 Ramp Management

R.9.1 Implementing municipalities and Highway management operations shall endeavour to apply ITS technologies to ramp management so as to relieve the congestions that are experienced on the freeways.
R.9.2 Although established ITS establishment targets roads and traffic management, the deployment of ITS in South Africa shall take into cognizance, and be made compatible to applications in rail, aviation and maritime.

R.9.3 The transport system shall aim to minimize the constraints for the mobility of passengers and goods, maximizing speed and service, while allowing customers the choice of transport mode or combination of transport modes where it is economically and financially viable to offer a choice of modes.

R.10 Targeted Use By National Department

R.10.1 The National Department of Transport cannot be expected to monitor all traffic movements in the country because of sheer size and the reach of the country. The rest of the Traffic Office Control shall be left to the metros and implementing municipalities.

R.10.2 It is suggested that the NDOT National Traffic Control Office shall look at the

- Spaghetti Junction Management
- Metros traffic responsibility
- Ports Management;
- Strategic Border Posts, and
- Any Other strategic point where ITS shall be deployed

R.11 Funding

R.11.1 Funding shall be obtained from National Treasury. The criteria that National Treasury shall use to determine funding amounts shall be based on but not confined to, the following:

- Vehicle ownership;
- Gas consumption;
- Motorist assists;
- Crash statistics;
- Most need;
- Traffic volumes;
- Congestion rates;
- Number of routes patrolled;
- Population density; and
- Deployability of ITS

R.12 Common Telephone Number

R.12.1 A common telephone number shall be available for members of the public to access the services of the ATMS and the TOCs. All accidents and incidents shall be reported to this number, but the nearest response unit shall be the one that has to respond to the accident, incident and type of inquiry.

26. SUPPORTIVE RESOURCES

26.1 Land Use and Transport

26.1.1 The deployment of ITS will not in and of itself be the panacea for all our transport problems. The biggest consideration to the deployment of ITS will be the availability of resources and land use practices.
26.2 Vehicle Modifications

26.2.1 The deployment of ITS will mean that there should be concurrent vehicle modifications to have the achievements of scale as proposed in this document. These modifications will be integrated in the policy statements which will be in this document. It is suggested that at the finalization of this process, the Department of Transport separates these modification issues, and sends them out as **Regulatory Issues For the Manufacture Of New Age Vehicles**, and distribute them among vehicle manufacturers. For the purposes of this document, these vehicle modifications will be marked differently (in green), so that it will be easy for the Department of Transport to identify them within this document and to lift them as separate issues for further regulatory development.

26.2.2 The modifications of the vehicles needs to be done over a period of time. However, this time should be determined and vehicle owners be advised of the cut off date by when certain modifications should have been installed, or the vehicle manufacturers must be given a time period over which the vehicles would be modified.

26.2.3 These time frames will have to take into consideration the average vehicle ages in South Africa, the income differentials among the population of South Africa, and the economic disparities which result in the First and the Second economies.

26.3 Lights On

26.3.1 In South Africa there is no legislation which calls for the lights on during the rest of the day as in other countries. Although there is a requirement that vehicles should switch their lights on when the sun sets, this is not done at the same time, and the lights in vehicles are switched on when the driver feels like it. This is complicated by the fact that the sun sets at different times. There is a need for a policy around this.

26.3.2 In order to prevent accident, drivers are requested to switch on, but this happens during the festive season when there are more accidents expected. The DOT will need to be decisive about this and to make a regulation for the cars to switch on.

26.3.3 One cause of congestions is the bumping of cars by cars that follow them because they were not aware that the front car was stopping. Sudden dead stops create problems for the following drivers and there is a need to deal with this issue in policy.

26.4 Power Outages

26.4.1 The problem of power outages in South African will have negative effects on ITS applications and deployments that are dependent on electrical power supply. In the event of power outages, traffic crossings and technologies that support them cause confusion and increase the dangers and susceptibilities that ITS was supposed to prevent.

26.5 New Communication Tools

26.5.1 As technology and its convergence grow, more and more supportive mechanisms are being deployed to enhance the value and the applicability and access of ITS. Two such enablers that can be leveraged for greater access by users are the mobile phone and the personal digital assistants (PDAs). Since mobile phone service provision is governed under certain protocols, such as those residing in ICASA and the Department of Communication, and are provided by private and independent providers, are personal belongings rather than entity owned, some agreements would have to be reached among all parties.
26.6 Vehicle Insurance and Vehicle Registration

26.6.1 The presence of vehicles on our road systems that have not been insured is a cause for concern in the event of accidents. The recovery process, and the presence of tow vehicles to deal with accidents is enhanced if the vehicle or vehicles involved in an accidents are insured.

26.6.2 From the side of Government, the recovery process is a cost and for the other drivers the delays are also a cause for their anger. Congestions are a cost to both the environment and opportunity costs. There is a need for a policy on the issue of vehicle insurance for all vehicles.

26.6.3 There is also a need to develop an electronic registration system for vehicles and the ITS provides a platform for this. The electronic registration of vehicles will have the benefits, among others, of lowering the costs of vehicle registration transactions, reduce the number of uninsured vehicles and facilitate the interagency cooperation.

26.7 Wheels

26.7.1 There are two problems which may cause congestion on the road networks related to wheels.

- The first one is well document and it relates to the provision of a spare wheel in the case of a problem when one wheel or tyre bursts and no policy will be required for this as its is already in application.

- The second one relates to the lockability of wheels. There are instances where in the event of a wheel problem or tyre burst, the driver cannot take the wheel out because of the wheel nuts locking facilities. This causes delays because these wheel-locking nuts do not speak to each other, and they are custom made for particular cars.

26.7.2 The wheel locking mechanism is a welcome development to prevent the other problems related to congestion – that of wheel theft. There is however a need to correlate the wheel locking mechanism with the ability to quickly unlock it when there is a need for a wheel change so as to allow the traffic to flow when the road is blocked.

26.8 Speed Governors

26.8.1 There has been much debate in South Africa about speed governance. One of the benefits of ITS which has been highlighted in this document is speed monitoring and speed management.

26.8.2 The debate relates to the make of vehicles that can travel at a speed beyond the required maximum speed of 120 km per hour. One side of the debate is that as new cars are being made, and their stability and road holding necessitates the revision of this speed limit, there should be relaxation for certain newer models of cars.

26.8.3 On the other hand there is concern that most of the traffic accidents are as a result of speed. There is a need for the DOT to bring closure to this debate through policy. However, such a policy should be based on research.

26.9 Steering Wheels

26.9.1 There is a growing number of cars that are now manufactured with power steering wheels. This assists in the quick maneuvering of the vehicle in cases where there are obstacles to avoid. There is however, still a number of vehicles which still use the standard steering wheel.
which requires much effort from the drivers. There is a need for a policy position around the maneuverability of the vehicle through the steering wheel.

26.10 High Poles In Townships

26.10.1 In the period before 1994, the State provided long poles in townships to mount electricity for some townships. While the reason for this may not have had anything to do with the provision of power and electricity to townships but was driven by security concerns, the same poles can be used to mount the cameras that will assist in the provision of ITS for the township traffic. There are few townships in which these tall poles were provided, and it would be ideal for these townships to be used as pilots for the mounting of ITS tools. This should however be preceded by an educational campaign that highlights the necessity and the benefits of ITS for the townships as well.

S. POLICY STATEMENTS

S.1 New Energy Compliance

S.1.1 All ITS applications and products shall be easily adaptable, both for the present and the future, for migration to other sources of energy, such as solar and wind. This will both solve the environmental problems and the operational aspects that result as a result of the dependent on fossil fuel energies.

S.1.2 The deployment of ITS tools and equipment shall use the available resources, either in ICT or infrastructure, in the first instance and only consider new resources if existing resources have been depleted.

S.2 Lighting Up

S.2.1 All vehicles shall be fitted with the technology to detect the levels of light of day, upon which levels of darkness shall be automatically detected and the main lights of the vehicle shall be automatically turned in, irrespective of the time of day.

S.3 Insurance

S.3.1 It shall be an offense to drive a vehicle of whatever age on the South African road networks unless that vehicle has provable documents that:

- it is licensed to be on the South African road network
- it is insured and up to date with its payments;
- such insurance shall offset the costs of the state’s recovery of accidents.

S.4 Lockable Wheel Nuts

S.4.1 All wheels of new cars shall be fitted with one lockable nut each and the unlocking nut of the lockable wheel shall be in the vehicle and be readily available in cases of emergencies that require a wheel change.

S.5 Speed Governance

S.5.1 The Department of Transport will commission a study to determine whether there are categories of, and makes of vehicles that shall be allowed to drive at speeds above those that are mandatory.
## S.6 Additional Braking Lights

### S.6.1 All rear windows of cars shall be fitted with an additional braking light which shall work in tandem with the brake lights when brakes are applied in the vehicle. These lights shall be in a position where following drivers can see them.

## S.7 Power Steering Wheels

### S.7.1 All new cars shall be fitted with power steering wheels so that the vehicle can be easily maneuverable. Where possible, the steering wheel should have the radio controls for volumes and radio stations so that the drivers shall not spend time on manually maneuvering the radio controls.

## S.8 Swivel Ability of Cameras

### S.8.1 Cameras that shall be fitted on the high poles and in other infrastructure for the benefit of ITS detection and monitoring shall be able to revolve more that 360%, so that in the event of reverse traffic, these cameras can still be used. Ideally these cameras shall be able to provide colour images.

### S.8.2 The detection abilities of the cameras shall be maximum, and shall have multi approach abilities, and, depending on the number of lines, these could be done on both the direction and the approach basis. This will mean that the pixel capabilities of the cameras shall be high enough to extract maximum picture quality.

### S.8.3 The calibration for intermodalism and multimodalism and multi-sectoral approaches will mean that the ITS shall be “calibratable” for other land uses such as water reticulation, electricity, sewerage systems, spatial information telephony etc.

## S.9 Electronic Vehicle Registration

### S.9.1 The Department of Transport shall explore the extension of the ITS to the use of electronic vehicle registration because of the advantages attached to this application.

## 27. THE ROLE OF THE PRIVATE SECTOR

### 27.1 Evidence shows that the role that has been played by the private sector in the provision and deployment of ITS has been phenomenal. This refers to both the research and commercialization of the ITS platforms and products. We have made a point in the preceding paragraphs about the domination of the private sector. While this is true, the intention of this point is to jerk up the role of Government in so far as its allocative responsibilities are concerned.

### 27.2 This jerking up is occasioned by three observations, namely:

- that the Gross Expenditure on Research and Development (GERD) shows that 58% of spending on GERD is by the private sector (businesses, while the role of Government and Higher Education is 21% each;
- that the Technology Balance of Payments is very low in South Africa, and that
- the trade in high tech goods and services is also low.

### 27.3 Performance of part of the Department of Transport service delivery; should in principle, reduce the overall risk taking responsibility by the public sector and contracts such as Build –
Operate-Transfer (BOT) should be promoted as far as possible. The role of the private sector in the BOT schemes is very important.

27.4 There is a however, a need for the Government to take charge by showing its hand first, as it is the experience of Government that the private sector is not necessarily keen to embark on infrastructure development if the Government is ambivalent about its role.

27.5 There will be a need for the Department of Transport to declare its intentions, evolve regulatory regimes, and assure the private sector of the Return on Investment (ROI).

**T. POLICY STATEMENTS**

**T.1 The Role of the Private Sector**

T.1.1 The role of the private sector in the provision of ITS shall be encouraged. Private companies shall be assured of their return on investment, and the regulatory mechanisms for the ITS industry shall be strengthened.

**T.2 Assistance to SMMEs**

T.2.1 The Government shall leverage all its mechanisms for encouraging small players to enter the industry, using the Department of Trade and Industry Schemes, and shall be willing to assist the development of ITS through the involvement of partnerships between big and small players.

5.2.2 This assistance shall include but not limited to prototyping, development, commercialization and mass-marketing.

**28. PROTECTION OF THE SYSTEM**

**28.1 Hacking**

28.1.1 Hacking and illegal access to the IT systems of state and agencies is a threat. Hackers pride themselves on having hacked the most sophisticated system.

**28.2 Speed Camera Devices**

28.2.1 There are other illegal entries into the system that are aimed at avoiding being caught by the ITS and there are new technologies that are being developed such as detection of the speed cameras. The legality of the speed cameras avoidance technologies cannot be determined at the stage. This matter should be further explored by the Legal Division of the Department of Transport.

**28.3 Abuse Of Economic Advantage Of ITS**

28.3.1 The information in the possession of the TOCs is valuable. It can be used for nefarious activities if accessed by people of ill-intent. These could range from criminality to making an economic advantage.

28.3.2 We have indicated that the data and information and data in the possession of the TOCs shall not be used for prosecutorial purposes. We need to extend this to include other reasons outside the parameters of traffic movement management.
U. POLICY STATEMENTS

U.1 ITS Will Be A National Asset

U.1.1 The ITS National Architecture shall be governed under the National Keypoints Act (NKA) and violations such as illegal access, hacking, passing of information to third parties by employees and the unauthorized use of the information obtained through ITS data collection shall be punishable under this Act.

U.2 Categories of Public Data

U.2.1 The TOCs and implementing agencies shall produce a list of data and information that shall be available to the public and all efforts shall be made to make these data and information packages to be easily accessible through all forms of media.

U.2.2 There are elements of the system that shall be available for public access, such as Traveler Information and weather warnings. However, there shall be systems and access points that are denied to the members of the public, particularly when the commercial and business advantage of the providers shall be compromised.

29. COMMUNICATING THE POLICY

29.1 We have alluded to the need for the Know Before You Go (KBYG). The success of this KBYG will rely on constant communication with the road users as it will mean a long-term change of culture. We have also alluded to the need for the radio to play a role with traffic cut ins, and we have also made a point tat all cars should have radios to facilitate these traffic-cut ins.

29.2 There are various other communication technologies that have developed and are being developed. These can be used both as tools for maximum ITS deployment and the dissemination of information about the policy. In this category we include such tools as the mobile telephones, radios, newspapers, electronic boards etc.

V. POLICY STATEMENTS

V.1 Communication Partnerships

V.1.1 The media, both electronic and print, shall be partners in the dissemination of the information about the policy itself and shall be leveraged as platforms for use as part of the ITS. This will mean that to reach the client base, all communications media such as telephones, radios, newspapers, mobile phones shall be used to reach the targeted audience.

V.1.2 The responsibility for the communication of the policy shall rest with the Communication Unit of the Department of Transport. However, there shall be other communication that will have to come from the Metro’s themselves, but a balance must be struck between all spheres of Government so that a single message about ITS goes out.

V.1.3 On the operation level, the TOCs and the ATMCs shall use all communication media to reach their targeted audiences, and shall use the media to its maximum to increase its user base.
30. STANDARDS

30.1 The Difficulty of Standards

30.1.1 The issue of standards in the provision of ITS and its deployment is a whole subject that requires a chapter on its own. For the purposes of this policy document, a few of the issues related to standards shall be mentioned in this document.

30.1.2 The difficulty of dealing with this issue within the South African context is that it is not a well developed debate in South Africa, and the debates that do occur do not advocate a “South African” standards as no such exists, but seeks to combine a number that have been developed a round the world.

30.1.3 There are a number of these standards and organizations that develop their own standards. Some of them are the following:

- ISO/TC 204
- ISO/TC 211
- Federal Geographic Data Committee (FGDC)
- National Transport Communications Internet Protocol (NTCIP)
- European Umbrella Organization For Geographic Information (EUROGI)
- Transmission Control Protocol/Internet Protocol (TCP/IP)
- American Association of State Highway and Transportation Officials (AASHTO)
- American National Standards Institute (ANSI)
- American Society For Testing And Materials (ASTM)
- Institute For Electrical and Electronics Engineers (IEEE)
- Institute for Transport Engineers (ITE)
- National Electric Manufacturers Association (NEMA)
- Society of Automotive Engineers (SAE)
- Permanent Committee on GIS Infrastructure
- Open Geospatial (Consortium OGC)

30.1.4 One observation of the team that visited the Transport Research Board’s 86th Annual Meeting was that although there is a South African representative to the ISO/TC 204, this individual’s was not known to the Department of Transport’s delegation. This indicated the disconnects that relate to the development of the ITS in the country, and it immediately calls for the co-ordination of efforts mentioned in this discussion document.

30.1.5 The ITS platforms are based largely on the International Standards Organizations (ISO)’s TC 204. A number of Working Groups in the TC 204 have been established to deal with the issues of adopting refining, and accommodating emerging standards. ISO 24531 specifically deals with the ITS Systems architecture and taxonomy.

30.1.6 The National Transport Communication Internet Protocol (NTCIP) is a US standard, and since the writing of this document has been spurred by the group’s visit to the United States, this seemed to be the dominant standards that dominated the debate.

30.1.7 There is a need for continued vigilance about the type standards and he post procurement regimes for the technologies that South Africa will need. In this cauldron of decision making, there is a need for the procurers not to be party to substandard technologies, which do not have intellectual priority rights (IPR agreements, and which may have been developed through “reverse engineering” techniques.
30.2 The Advantages Of US ITS Architecture

30.2.1 Although not prescriptively, we found that the United States National Architecture provides new ITS deployments with the following advantages:

- Maturity;
- Adaptability;
- Extendability;
- Experienced;
- New bundles friendly;
- Serviceable;
- Maintainable;
- Choice of many products;
- Private Sector Leadership; and
- Immediately available for deployment

30.2.2 In its deployment of the ITS, Canada adopted and adapted the United States architecture. This was because of the above-mentioned reasons but also United because of the regionality that is mentioned in the SADC.

30.3 Challenges of Implementing The Architecture

30.3.1 Four challenges that will be experienced in the employment of US-based architecture will be

- the Changing Of The Mileage System To The Metric System. However, this does not seem to be an insurmountable problem as US ITS technology is used all over the world, including in countries which use the Metric System.

- the Language Issues and the interpretation of the Universal Modeling Language (UML) because South Africa has 11 official languages;

- Environmental Patterns which are informed by South Africa’s lesser extreme weather patterns compared to the United States and the

- Legislative issues because there is no direct and relevant legal instrument for the establishment of the ITS in South Africa when in the United States such a law exists.

30.3.2 The ISO TC 211 Standards 19133 deals with the issues of Tracking and Navigational International Standards and the ISO/CD 17572 deals with the ITS location referencing and Geographic Databases.

30.3.3 One criticism that came from the presentations at the TRB against the ISO standards was that they are top-down standards developed by organizations and national bodies. The bottom-up approach of the OGC was the one hinted at as it was industry-wide and consisted of private organizations.

30.4 Topologies

30.4.1 For a developing country, and a new deployer of ITS, the topological issues related to connectivity have also been discussed, albeit briefly, and we came to the conclusion that for the time being the topological issues should be dealt with within the Non-Explicit Topology, so as to give the chance for the South African ITS development and deployment to cut and paste, add and subtract according to its own peculiarities.
30.4.2 The other connectivity topology, such as the Non-Planar Graph, may be achieved in the long term, but because of the urgency of the matter of deployment, this could be considered at a later stage. The nodes, points, lines and edges in this topology do not have a face yet, and the deployment of ITS should immediately bring this “face to the fore. (Paul Scarponani – International Standards for ITS – Adopted Standards and Emerging Issues. Transport Research Board 86th Annual Meeting. Washington D.C.)

30.4.3 From the above paragraph it is clear that the need for the integration of the information already in the possession of the Government, such as the one mentioned (Municipal Demarcation Board, Natis e-Natis etc) will have to be used to plot the points, polylines, dots, polygons and lines.

30.4.4 The use of Unified Modeling Language (UML) should be of immediate concern to those charged with the deployment of the ITS in South Africa. This can be placed under the need for a new skills set that has been discussed in this document.

W. POLICY STATEMENTS

W.1 Common Language

W.1.1 The Universal Modeling Language (UML) shall be the primary focus of the coverage model for the ITS and this UML shall employ all its subclasses to prove both continues coverage and discreet coverage. The discreet coverage model will have to rely on the firewalls related to this level of coverage.

W.2 Consensus, Industry and Voluntarism

W.2.1 The development of standards in South Africa shall take into consideration the three principles that inform the development of these standards, namely consensus, industry wide and voluntary standards.

W.3 International Partnerships

W.3.1 The Department of Transport will seek guidance from the Department of Foreign Affairs (DFA) regarding which international organization to join, and this should be based on the international approach of multilateralism which forms the basis of South Africa’s international thrust.

W.3.2 The Department of Transport shall seek membership to the international Standards Development Organizations (SDOs) and shall exercise its membership with due regard to South Africa’s ITS peculiarities.

W.4 Acquisition of ITS Equipment

W.4.1 Deploying agencies shall be allowed to source ITS equipment based on some of the standards mentioned above. However, two provisions shall be followed:

- The equipment shall be based and approved by the standards of the country from which it was sourced.
- Standards South Africa (STANSA) shall validate all equipment to be used in the South African ITS deployment in the same manner that the SAQA validates educational qualifications.
31. **FUNDING ISSUES**

31.1 **Presentation By Ex-Im Bank of the United States**

31.1.1 After the delegation had met with various ITS companies in the United States in a beauty parade, a presentation was made by the Export-Import (Ex-Im) Bank of the United States about the funding mechanisms should South Africa be interested in acquiring services from the United States service providers.

31.1.2 Three reasons led to the non-commitment by the delegation:

- Firstly, the presentation was for consideration and not binding on the delegation;
- Secondly, the issue of funding is a complicated one in which the DOT could not by itself come to a conclusion, and
- Thirdly, some municipalities have started deploying ITS on their own balance sheet, and there was therefore no need for the delegation to engage further on this issue.

31.2 **Comprehensive Funding**

31.2.1 The funding for the deployment of the ITS is not only related to Capital Funding, but also to the Operational Expenses to the extent that there shall be social benefits for the Traffic Operation Centers. In the applications for funding non-affording municipalities will have to include this aspect of funding as well.

31.2.2 Funding for the operations will not continue *ad infinitum*, and there will be a need for the operations centers to recoup their capital outlays. In their applications, this issue should also be included.

31.3 **Grants From USTDA**

31.3.1 Funding issues can be circumvented through the use of Grants that can be applied for from the USTDA. One such circumvention is seen in the technical services that are offered to the Mexican *Secretaria de Comunicaciones y Transportes*. The conditionalities of these Grants have not been studied, and there is a need for the leadership of National Treasury in this respect.

31.4 **AGOA**

31.4.1 There is also a need to use opportunities offered by the Africa Growth and Opportunity Act (AGOA). Again the developments in this regard, and the relationships that can be built to leverage the ITS implementation will need further elaboration and guidance from the National Treasury, the Department of Foreign Affairs and the Department of Trade and Industry.

31.5 **OPIC**

31.5.1 South Africa has already entered into an investment fund protocol for $120 million for equity investments in South Africa and Southern Africa by the Overseas Private Investment Corporation (OPIC). This again requires guidance from the relevant Departments mentioned above.

31.6 **The Suite Of Other Finances**
31.6.1 There is a suite of other financial sources that local and provincial governments can have access to, namely:

- Municipal Infrastructure Grant
- Community development Grant
- Provincial Infrastructure Grants
- IRMA

### X. POLICY STATEMENTS

**X.1 Funding Is A National Treasury Function**

X.1.1 The issue of funding for the deployment of ITS is a competence of National Treasury. The Department of Transport may consider, within the agreed Medium Term Expenditure Framework (MTEF), to lock in funding for the National ITS Architecture, but this issue will still need further internal engagements such as, among others:

- The location of the line function for the ITS National Architecture;
- The Cost-Benefit Analysis;
- The extent of the development by affording municipalities;
- The Costs of the non-affording Municipalities, and the
- The Time Framing of the Deployment of the ITS.

X.1.2 Applications for funding shall indicate the social spending and the social dividend that shall be derived from the deployment of ITS;

X.1.3 The applications for funding should also indicate when and how the operations will be able to be self-funding so that the burden on the national fiscus is reduced.

### 32. THE WAY FORWARD

**32.1 Who Does What**

**32.1.1 Government**

32.1.1.1 The Department of Transport (DOT) has the mandate to co-ordinate all the activities related to the ITS. Through its Public Entity Oversight, the Department has to guide the entities that report to Government in Corporate Governance compliance. The Integrated Infrastructure and Intersphere Coordination Branch has a role to play in providing the infrastructure that may be needed. The Transport Policy Analysis Unit will see to the development and acceptance of this policy.

32.1.1.2 The Transport Data Centre (TDC) has not been established, although there have been numerous suggestions for this to be established within DOT. Among some of its functions would be the identification of data needs, compilation of data, determination of data standards, assure the quality of data, synthesizing data, and dissemination of data.

32.1.1.3 The Department of Communications has responsibility towards the issues related to communication and the technologies that are involved in ITS include a communication element (ICT).

32.1.1.4 The Department of Public Enterprise is responsible for the shareholding of state owned companies. The level to which the proposed South African Intelligent Transport Company...
(SAITSCO) will operate and will be funded, has not been decided, but the role of DPE will be crucial in this decision.

32.1.1.5 The Department of Science and Technology (DST) will have to assist with the development of blue skies and new technologies in the provision of ITS.

32.1.1.6 The Department of National Intelligence (DNI) and the Department of Safety and Security (DSS) are sister Departments whose acceptance and possible access to the ITS data will have to be discussed with DOT. Although there is a policy intention of protecting this data and information, there may be reason of state security which may need some relaxation to this policy intention.

32.1.1.7 The Department of Environmental Affairs and Tourism (DEAT) has the responsibility for air quality control and environmental impact assessments which have been mentioned in this policy discussion document.

32.1.1.8 National Treasury will fund and evaluate the financial and costing proposals that are made by the municipalities which intend to deploy ITS.

32.1.1.9 Municipalities have a responsibility to deploy ITS in their jurisdictions, either on their own or in cooperation with other municipalities but in a cost effective manner.

32.1.2 Agencies

32.1.2.1 Standards South Africa shall determine whether the technology that is brought to South Africa is suitable for deployment in South Africa, and will make arrangements for that technology to comply with South African standards

32.1.2.2 SANRAL has started with the deployment of ITS. There is a need for the role of this agency to be redefined or a new mandate be granted to it by DOT. In the interim, the agency has to improve on what it has already deployed on the N1 Ben Schoeman Highway.

32.1.2.3 Intelligent Transport Systems South Africa (ITSSA) will be a reference group for the deployment of the ITS.

32.1.2.4 The Centre for Scientific and Industrial Research (CSIR) shall provide access and assistance to the ITS expertise that it has and that has been underutilized. This will be done at no further cost to the state.

32.1.2.5 The future of Infrastructure Company (INFRACO) has been clearly defined. Based on its intentions, the company will have to assist in the provision of broadband that may be required for the deployment of ITS.

32.1.3 Regulators

32.1.3.1 ICASA shall deal with the regulatory issues that relate to the provision of communications for the ITS platforms. This it will do independently of the Department of Communications.

31.2 Further Consultation On Policy

31.2.1 The document will require different approval and reconfiguration stages in terms of comments received.
31.2.2 The document was submitted to the group that went on the Orientation Visit to the United States between January 20 and 31, 2007 for their comments for a period of two months. The comments of the Orientation Visit team will be incorporated into the document.

31.2.3 The next step was circulation of the document internally for comments by the Department of Transport. This will be for the period of two months.

31.2.4 The document will be taken to EXCO for their approval for it to be submitted to other Departments for their comments. The crucial departments will be the Departments of Foreign Affairs, Trade and Industry, Public Enterprises, Provincial and Local Government, National Intelligence, Safety and Security. The period that will be given to these departments will also be a month.

31.2.5 The document will serve before COTO and MINMEC for their comments and strategic guidance.

31.2.6 After the integration of the comments of these Departments, Cabinet will be requested to give permission to have the document released for public comments.

31.2.7 After the integration of public comments, the document will be sent to Cabinet again for authorization as policy.

31.2.8 Once this approval has been obtained, the document will be given to the Legal Division of the Department of Transport to draft a Bill or sets of Bills that will be required to make this legislation. The role of the Policy Division will cease at this stage.

31.2.9 Once the legislation is in place, the outsourcing for the development of the national ITS Architecture will begin. This will be led by the Line function that shall be decided by that time

33. IMPLEMENTATION STAGES

(Adopted from presentation by Dr Robert Jaffe’s VEE Model)

**A:** Decomposition and definition Stage
1. Feasibility Study and Concept Exploration
2. Concept of Operations
3. System requirements
4. High Level Design
5. Detailed Design
6. Software/Hardware Development Field Installation

**B:** Integration and Recomposition
7. Unit or Device
8. Subsystem Verification
9. System Verification and Deployment
10. Operations and Maintenance
11. Changes and Upgrades
12. Retirement or replacement

**WHERE**

2 and 6 needs A systems validation Plan
3 and 9 Needs A System verification Plan
4 and 8 Needs a Subsystem Verification Plan
5 and 7 Needs Unit or device Testing Plan