USE OF TECHNOLOGY IN ENFORCEMENT: PROJECT E-FORCE

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ABSTRACT

The basis for traffic management is determined by the National Road Traffic Act and related legislation; supplemented by various policies, strategies, manuals and other supporting documentation. Traffic legislation not only addresses vehicle standards and driver behaviour on our roads - such as speeding, wearing of seatbelts, etc - but also prescribes, in detail, the exact process and procedures to be followed when, for example, a vehicle testing station or driving licence testing centre is assessed for registration and grading. The Act also prescribes the roles, responsibilities and duties of a number of role players in the road traffic environment – traffic officers, examiners of vehicles, etc.

No road traffic management system can operate optimally without the full support of an accurate, reliable and comprehensive road traffic information system. Access to information on, amongst others, drivers, vehicles, infrastructure and resources is needed on a continuous, timely and real-time basis by many role players within the system to plan and perform their daily tasks, as well as to measure performance and outcomes.

The ultimate aim, vision and mission of road traffic management are to promote compliance with legislative requirements, to improve road safety and to reduce fraud and corruption. Traffic management comprises many components that need to be integrated in a harmonised manner and ordered to such an extent as to obtain the desired results in the most effective way.

This paper briefly describes some of the systems in place to address the above issues, with emphasis on improved use of technology to support accelerated capacity building in policing, through the so-called Project e-Force. This project is mainly aimed at assisting and improving the efficiency of officials and officers in some of the functional areas of road traffic management and law enforcement in particular, with the ultimate goal to improve law compliance and reduce road traffic crashes.

1. INTRODUCTION

In order to combat the daily carnage in terms of traffic crashes on our roads, we need to effectively combat the occurrence of traffic offences and lower the level of user disobedience. We need a paradigm change.

The White Paper on National Transport Policy states:

“Traffic Policing (law enforcement) is a priority of traffic management, due to a severe breakdown in discipline on the roads, which in turn leads to unsafe conditions, damage to the road infrastructure, etc. The lack of discipline can only be rectified through strong

proactive and reactive control actions. The effectiveness of the traffic control function must be improved substantially."

The National Road Safety Strategy: 2006 Onwards, encompasses a variety of programmes, projects and issues to do just that. Targets have been set in carefully separated categories and stages to take realistic account of the constraints still facing us in the current phase of fundamental restructuring of road traffic safety management. The restraints holding us back are well known and include, amongst others: insufficient personnel levels; scarce financial resources; equipment needs; insufficient use of information; a lack of proper planning, inadequate scheduling and undertaking of enforcement operations; as well as challenges within the judicial system. Effective traffic law enforcement is the backbone of the country's capability to create a safe road environment, and in the Strategy a lot of emphasis is placed on improved and more effective enforcement

To overcome the identified restraints new procedures, technologies, equipment and systems are being developed and implemented. Some of these include, amongst others: The finalisation of the National Road Traffic and Transport Charge Book; completion of the National Road Traffic Law Enforcement Code; the implementation of AARTO; the completion of the "new" e-NaTIS (National Traffic Information System) and Project e-Force. It is envisaged that most of these will be in place and fully operational before the end of March 2007.

It is envisaged that Project e-Force will bring about a radical change in law enforcement and will assist traffic officers in working smarter and more effectively. Improved use will be made of crash, offence and other traffic information to plan and schedule law enforcement operations. Officers will also have continuous access to information from the roadside on drivers, vehicles and owners contained in the National Traffic Information System (NaTIS), as well as other electronic support information and forms, such as offence notices, accident reports, the Charge Book, etc.

In the past we have been relying too much on the human factor in our efforts to manage and control road traffic. Although we will never be able to replace the human element, the time has come to make use of technologies that are available.

2. THE NATIONAL TRAFFIC INFORMATION SYSTEM (NATIS):

The National Traffic Information System, (NaTIS), is the information backbone that supports legislation and a great variety of daily functions and transactions related to road traffic at all levels of Government. Government Departments such as the South African Police Service (SAPS), the South African Revenue Service (SARS), the National Intelligence Agency (NIA), etc. Private sector financing and banking institutions, as well as other role players, such as Business Against Crime (BAC), also rely on NaTIS for certain information requirements.

NaTIS not only facilitates the administration of road traffic legislation, it also contains comprehensive, accurate and timely data, information and statistics on most aspects relating to road traffic management, including the strategic decision making process in this regard. The enormous potential of NaTIS is not yet fully utilised, and additional, more effective functions and procedures are in the process of being developed and implemented to harness this source in support of increased law compliance.

NaTIS provides *inter alia* the following aspects:

- Vehicle registration and licencing and roadworthiness of vehicles;
- Registration of Operators;
- Driver and professional driver registration and licencing;
- Registration of authorised officers, examiners of vehicles and driving licences;
- Registration of vehicle and driver testing facilities;
- Recording of road crash information; and
- Recording of road traffic offences.

Although the Administrative Adjudication of Road Traffic Offences (AARTO) Act has not yet been put into operation, the Department of Transport is currently developing the implementation of the first phase of the National Contravention Register (NCR) on the e-NaTIS to accommodate all the management requirements of AARTO.

3. SECURE AND AUTHENTIC DRIVER AND VEHICLE DOCUMENTATION

The credit card format driving licence was introduced on 1 March 1998, more than 8 years ago. This driving licence card is a document of high integrity with a number of security features. These security features ensure that it is extremely difficult to produce a counterfeit card. Even if a person has the ability to successfully produce a counterfeit, the high cost would not be worthwhile in view of the fact that a driving licence card is valid for only five years.

One of the most important characteristics of the card is the two-dimensional bar code that appears on the back. All the information that can be seen on the card, including the driver's photograph, is encrypted in this bar code. The bar code can be deciphered using appropriate equipment; where-by the information contained in the bar code can be compared to the actual particulars on the card.

Motor vehicle registration certificates and licence discs are also secure documentation to prevent the illegal registration and use of un-roadworthy and un-licenced vehicles on our roads. Vehicle licence discs also contain a two-dimensional bar code containing some detailed information on the vehicle.

Both driving licences and vehicle licence discs can be scanned at the roadside to determine the authenticity of these documents. The so-called Card Verification Device (CVD) was introduced during 2003 for this purpose. However, malfunctioning of the device necessitated the withdrawal of most of them during 2005.

4. PROJECT E-FORCE

The objective of Project e-Force is to replace the current CVD's with suitable wireless, hand-held, "off-the-shelf" commercially available Pocket Computers that will, amongst others, enable continuous, fast, real-time electronic enforcement transactions. E-Force is a multifunctional system intended to:

- make full use of the capabilities and information contained in NaTIS;
- make use of the bar-coded information on driving and vehicle licences;
- incorporate the National Road Traffic and Charge Book;
- collect and analyse information in terms of the National Road Traffic Law enforcement Code;
- provide full support for the introduction of AARTO; and

- in the process provide managers at all levels of Government with comprehensive information for the effective management and control of the law enforcement function.

The wireless links to be provided will allow for access to real-time information, amongst others on:

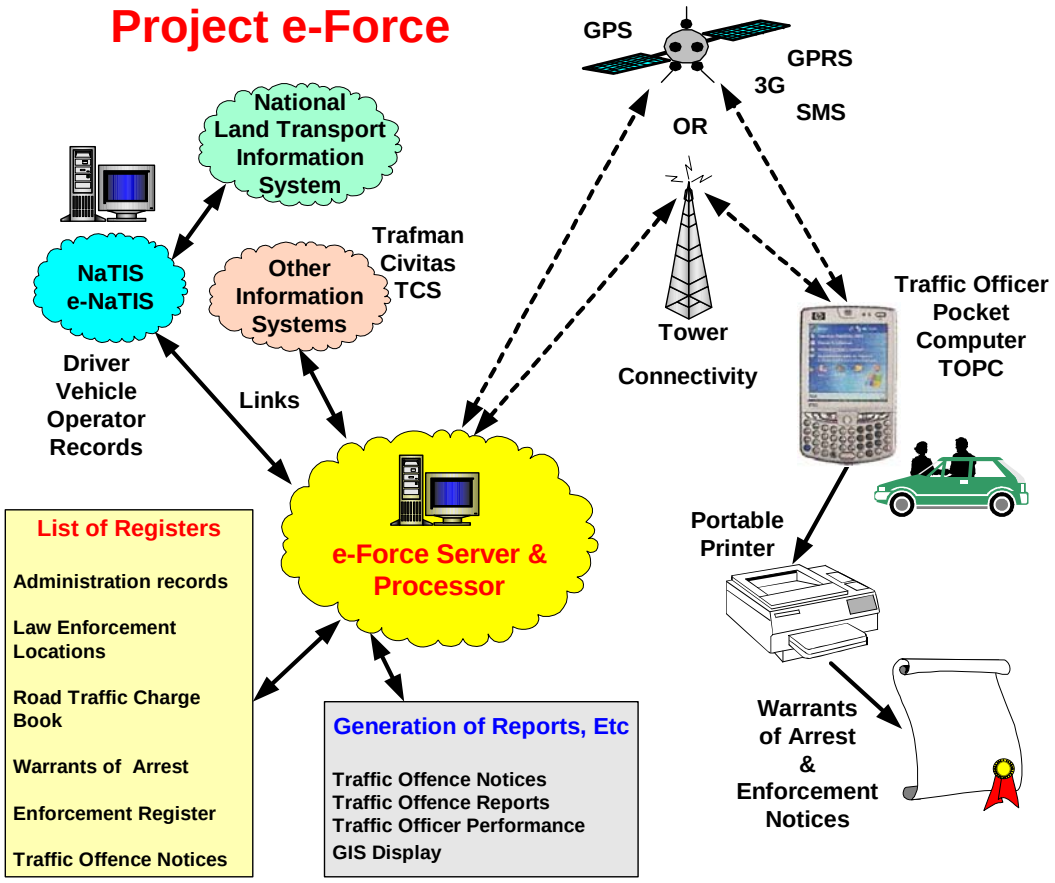
- Drivers and driving licence detail, such as the name, ID number, address and other contact detail of the holder, the date of issue, expiry date, issuing authority, warrants of arrest, suspensions, outstanding traffic fines, crash history, etc.
- Vehicle detail, such as the make, model, colour, engine and VIN numbers of the vehicle, date of registration, licencing and roadworthiness testing information; stolen vehicles, suspensions, crash history; and
- Owners of vehicles, such as the name, ID number, address and other contact detail of the owner.

In addition, special software to be developed and loaded on such Pocket Computers, for the purpose of this project termed Traffic Officer Pocket Computers (TOPC's), will allow officers to record traffic violations electronically at the road side and transfer the information via a central server to a traffic offence register. This server will, amongst others, be linked to the newly developed National Road Traffic and Transport Charge Book; an electronic register containing warrants for arrest; the National Traffic Information System (NaTIS); as well as other electronic support records and registers. The remote central e-Force Server will generate the traffic offence notice in the required format, store it in the relevant traffic offence register from where it will be transferred to the Contravention Register on NaTIS. However, the system will also enable notices to be transferred back to the TOPC at the roadside for printing on a portable printer in the required format, should a portable printer be available.

Managers at the various enforcement agencies will be able to generate a variety of law enforcement reports on request. These reports, which will be able to be viewed and transferred electronically or printed to high quality hard copy format, will include, amongst others: Daily enforcement schedules per traffic Enforcement Agency; Number of drivers and vehicles stopped and controlled; Number of driver and vehicle traffic infringement notices issued; Traffic Officer and Agency Performance Reports, etc.

5. SCHEMATIC RE-PRESENTATION OF THE E-FORCE PROCESS

A schematic re-presentation of the envisaged electronic information transfer process and various systems involved in Project e-Force is shown in the figure below.



6. DETAILED OPERATION OF E-FORCE : TRAFFIC CONTROL

Amongst other software programmes that will be provided on the Pocket Computer, is the Traffic Control software that will enable Traffic officers to check and verify driver and vehicle detail and electronically generate traffic offence or infringement notices. The various steps in this regard are briefly summarised as follows:

Step 1: Scan the driving licence. The driver information encrypted in the bar-code will be displayed on the screen.

Step 2: Should a scanning device not be available or if the scan was un-successful, the Traffic Officer would be able to enter the ID number of the driver on the screen and transmit the information and query to the e-Force server.

Step 3: The server will respond by providing detailed information on the driver on, amongst others, the following: warrant of arrest (if any); address and contact detail of the driver (which can be updated at the roadside if required); driving licence information and expiry dates; outstanding traffic fines; crash history and previous controls.

Step 4: Scan the vehicle licence. The vehicle information encrypted in the bar-code will be displayed on the screen.

Step 5: Should a scanning device not be available or if the scan was un-successful, the Traffic Officer would be able to enter the vehicle licence number of the vehicle on the screen and transmit the information and query to the e-Force server.

Step 6: The server will respond by providing detailed information of the vehicle on, amongst others, the following: whether it is stolen or not; address and contact detail of the owner (which can be updated at the roadside if required); vehicle licence information and expiry dates; outstanding traffic fines; crash history and previous controls.

Step 7: Will allow the Traffic Officer to control and record driver offence detail. A variety of driver offences, which will be linked to and based on the Charge Book, will be enabled. A copy of the proposed TOPC screen format in this regard is provided under *Annexure A* : *Primary Screen for Driver Control*.

Step 8: By ticking a specific offence category on the primary screen, the Officer will be transferred to the relevant secondary screen on which specific driver offences can be selected or ticked. The information that will be displayed on this screen is: Charge Code, brief legislation reference, a brief description of the particular driver offence and tick boxes for selecting a specific offence. An example of some secondary driver control screens is shown under *Annexure B*.

Step 9: Will allow the Traffic Officer to control and record vehicle offence detail. A variety of vehicle offences, which will be linked to the Charge Book, will be enabled. A copy of the proposed format in this regard is provided under *Annexure C* : *Primary Screen for Vehicle Control*.

Step 10: By ticking a specific offence category on the primary screen, the Officer will be transferred to the relevant secondary screen on which specific vehicle offences can be selected or ticked. The information that will be displayed on this screen is: Charge Code, brief legislation reference, a brief description of the particular vehicle offence and tick boxes for selecting a specific offence. An example of some secondary vehicle control screens is shown under *Annexure D*.

Step 11: Should a vehicle tow a trailer, screens will be available to the Traffic Officer to also check and control vehicle offences or contraventions for trailers.

Step 12: After recording all the driver and vehicle related offences, the information will electronically be transferred to the remote e-Force server for processing and compilation of the offence or infringement notice. (Note: Should there be no reasonable strength signal available, the information will be stored and retained in the Pocket Computer until such time as acceptable and available signal strength is detected, at which time the notice will be transferred to the server. Should this be the case the noticed will be printed and posted from a central e-NaTIS location).

Step 13: On receipt of the offence information from the Pocket Computer, the central server will prepare a summary of the offences recorded, which will be transferred back to the PC for verification, possible amendments and signature by both the Officer and the Driver of the vehicle.

Step 14: The verified, signed summary of offences will then be transferred back to the server for storage. A complete offence notice will be prepared by the server and transferred back to the PC for printing on a portable printer at the roadside. A signed hard copy of the printed notice is then handed to the driver. (Note: as in the case described above for a poor or non-existent signal, and should a portable printer not be available at the roadside, the notice will be printed and posted from a central location).

7. GENERATION OF REPORTS

From the information generated by the Pocket Computers, it will be possible to generate a great variety of computerised performance management reports. These reports will be available “on-screen” on a Geographical Information System (GIS) linked to the central e-Force server, as well as allow for hard copies to be printed, duplicated and distributed.

For example, the collected information will enable reports on:

- The duration and number of person-hours spent on law enforcement actions at each enforcement location;
- The number of driving licences and vehicles, per type of vehicle (trucks, buses, motorcars) checked and controlled by individual officers per time period,
- The number of notices issued per category, etc.

An example of one such report is attached under *Annexure E*.

These reports, together with additional information, should be continuously used by supervisors and managers at the various enforcement agencies for monitoring and control purposes to:

- Determine performance criteria for law enforcement generally per authority, region or Province, as well as for individual officers;
- More effectively detect fraud and corruption committed at the roadside;
- Determine the effect and the duration of law enforcement on the level of lawlessness in particular areas, on specific routes or certain types of offences;
- Plan, schedule and set targets for law enforcement operations and actions;
- More effectively utilise scarce resources; and
- Prepare more accurate budgets and resource needs requisitions.

In addition to supporting the monitoring of the daily performance of individual traffic officers in terms of the requirements of the National Road Traffic Law Enforcement Code, the system will also support and provide for the traffic performance management model to be developed more comprehensively in order to determine the effect of traffic enforcement, and in particular on the offence rate and the occurrence of road traffic crashes.

8. GENERAL

Awaiting the introduction of the Administrative of Road Traffic Offences (AARTO) Act, No. 48 of 1998, it is envisaged that driver and vehicle offences could also be monitored and controlled in terms of the National Road Traffic Act, No. 93 of 1996 and specifically those offences provided for under Schedule 3 of the Criminal Procedure Act, No. 51 of 1977, as amended by Act 56 of 1979. These offences, for which section 341 notices can be issued, are:

- Driving a vehicle at a speed exceeding a prescribed limit;
- Driving a vehicle which does not bear prescribed lights, or any prescribed means of identification;
- Leaving or stopping a vehicle at a place where it may not be left or stopped, or leaving a vehicle in a condition in which it may not be left;
- Driving a vehicle at a place and a time where it may not be driven;
- Driving a vehicle which is defective or any part whereof is not properly adjusted, or causing any undue noise by means of a motor vehicle;
- Owning or driving a vehicle for which no valid licence is held; and
- Driving a motor vehicle without holding a licence to drive it.

The above provisions will cover most of the traffic offences that are required to be controlled for the purpose of this project.

The main advantage of using this section of the Criminal Procedures Act is that, although drivers will be stopped in person, notices may be posted afterwards and not required to be printed and handed to the driver at the roadside. This will eliminate the need for providing traffic officials with portable printers under certain circumstances.

However, the project will be developed with the main view to be operated in terms of the AARTO Act. Only if AARTO is not ready by the time of implementation of Project e-Force, will the Criminal Procedures Act route be followed.

9. CONCLUSION

There are many traffic authorities that are currently enforcing only certain sections of the NRTA for various reasons, mainly due to the detailed comprehensiveness thereof. The use of the Traffic Officer Pocket Computers in this regard, will provide automatic access to the full set of applicable legislation at the roadside through the *National Road Traffic and Transport Charge Book.*

In addition to enabling the electronic generation of offence notices and supporting the monitoring of the daily performance of enforcement agencies; as well as individual traffic officers in terms of the requirements of the *National Road Traffic Law Enforcement Code*, the system will also support and provide for the traffic performance management model to be developed in order to determine the effect of traffic law enforcement in particular on the offence rate and the occurrence of road traffic crashes.

A user manual will be developed and users of these e-Force Pocket Computers will be adequately trained on how to use the equipment and access information from the system, generate traffic and transport notices, etc. A special help desk will be established at the RTMC to assist with any problems that may be experienced. A speed delivery service will also be put in place to replace faulty equipment as soon as possible.

Although initiatives such as the promulgation of legislation, the appointment of the various inspectorates, the establishment and operation of e-NaTIS, the use of secure documents and the registration of officers, examiners and facilities go a long way in the battle against crime, it is not enough. It is our duty to provide the necessary additional tools, technology, procedures and support to effectively fight this battle.

It is ultimately the way in which all officials involved will use the tools, technology and mechanisms provided, that determines their effectiveness in enforcing road traffic legislation. The integrity and dedication of these officials are amongst the most important factors in our struggle against road traffic offences and crimes. These officials, who work long hours under difficult circumstances, often risk their lives to make our roads safer – for which we must thank them.

Project e-Force is an initiative which is aimed at the accelerated capacity building in the traffic environment with the view to improve law compliance and reduce the number of crashes on South Africa’s roads, as well as to curb fraud and corruption in the traffic environment more effectively.

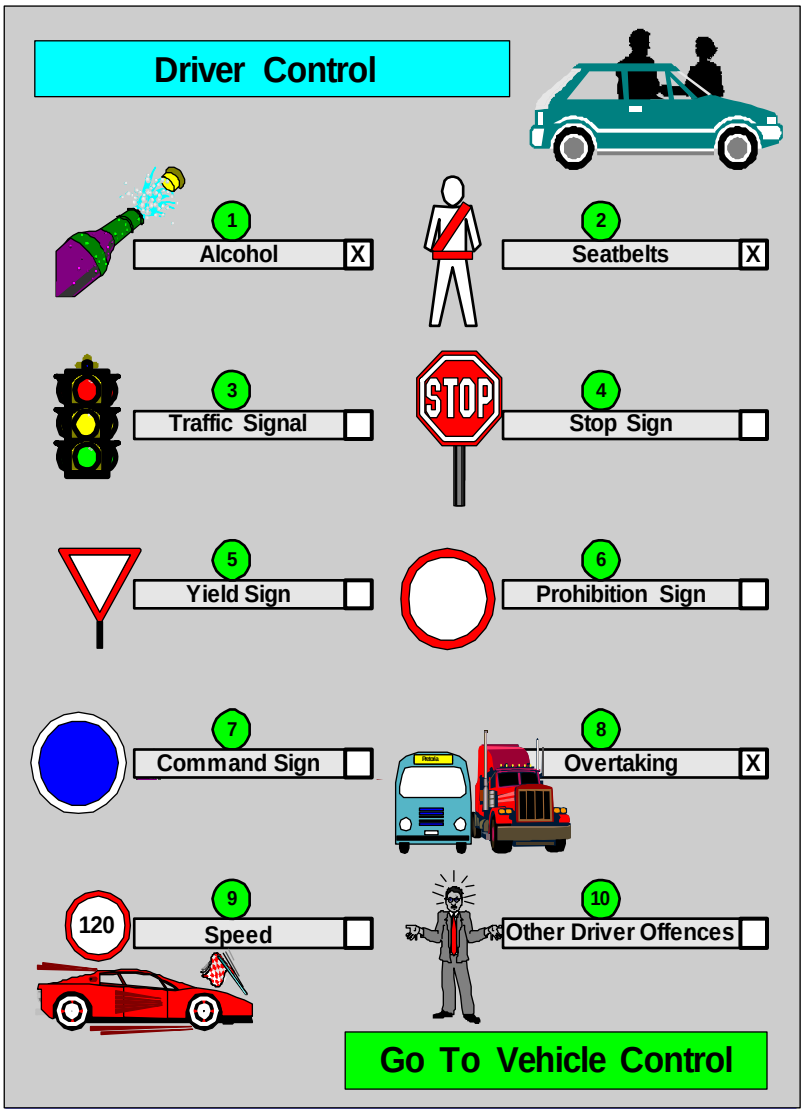
It is trusted that the current efforts and investment in new technologies will result in the much-needed positive benefits for road safety through a reduction in road user disobedience in the near future.

10. REFERENCE

[1] **Road Traffic Management Corporation**; Bid RTMC 11/2006: Development and Operationalisation of Pilot Project e-Force, October 2006.

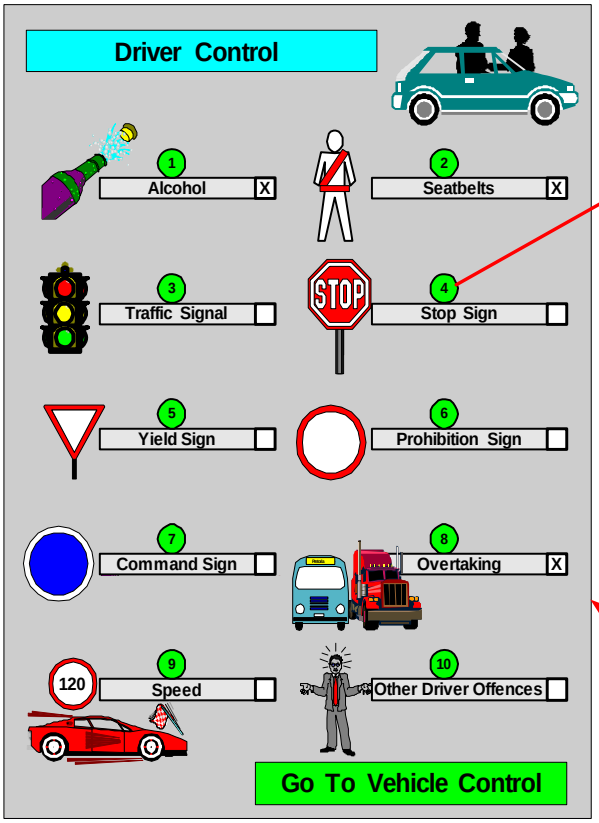
ANNEXURE A

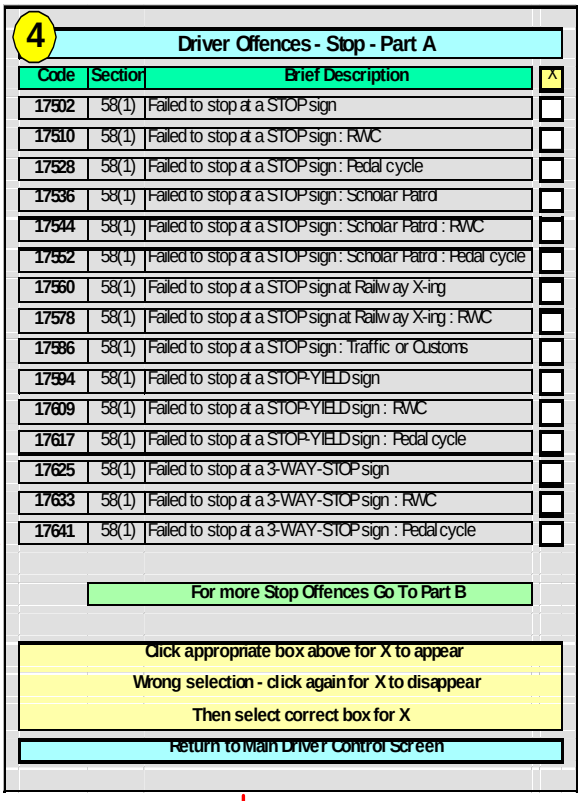
Primary Screen for Driver Control

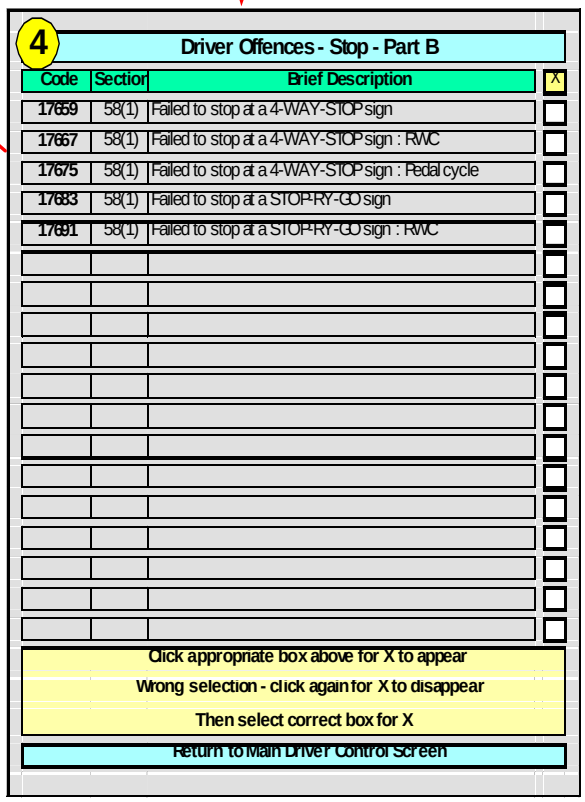


ANNEXURE B

Primary Screen Driver Control: Links to Secondary Screens

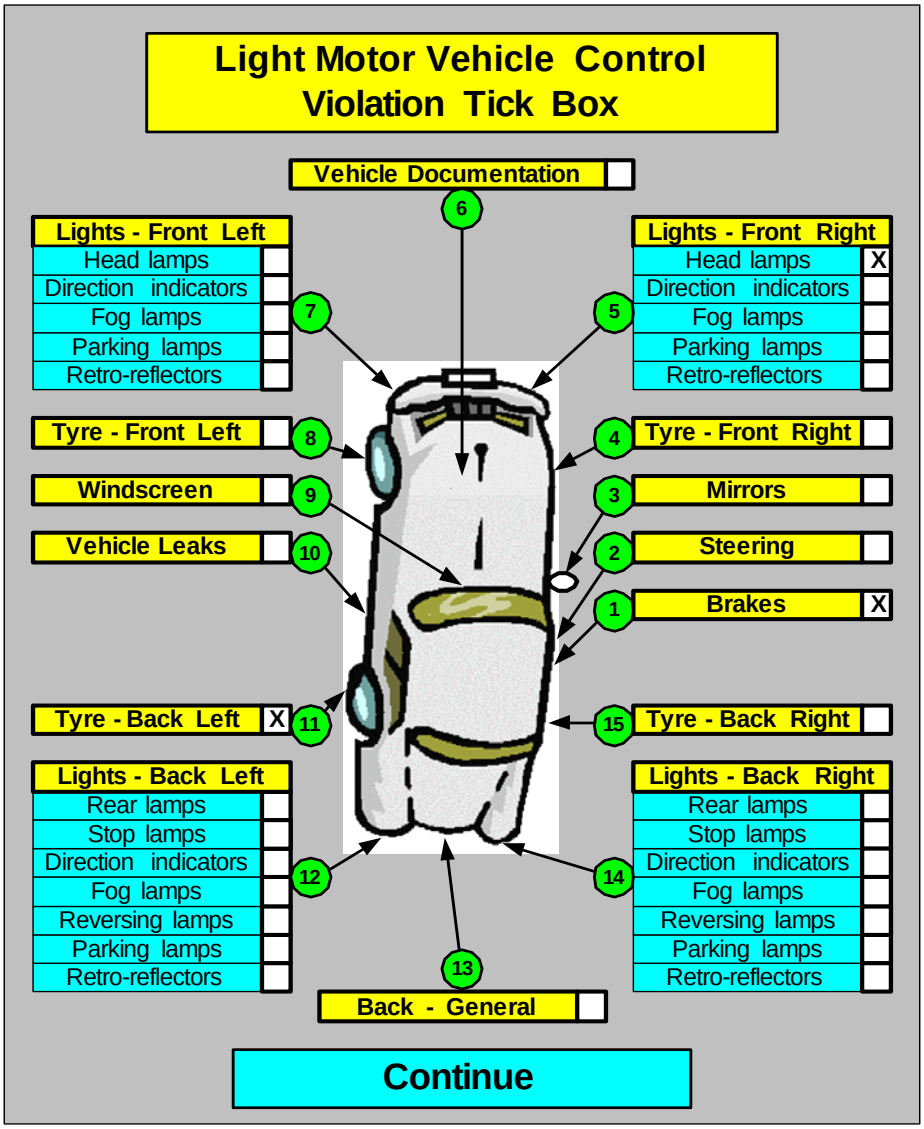






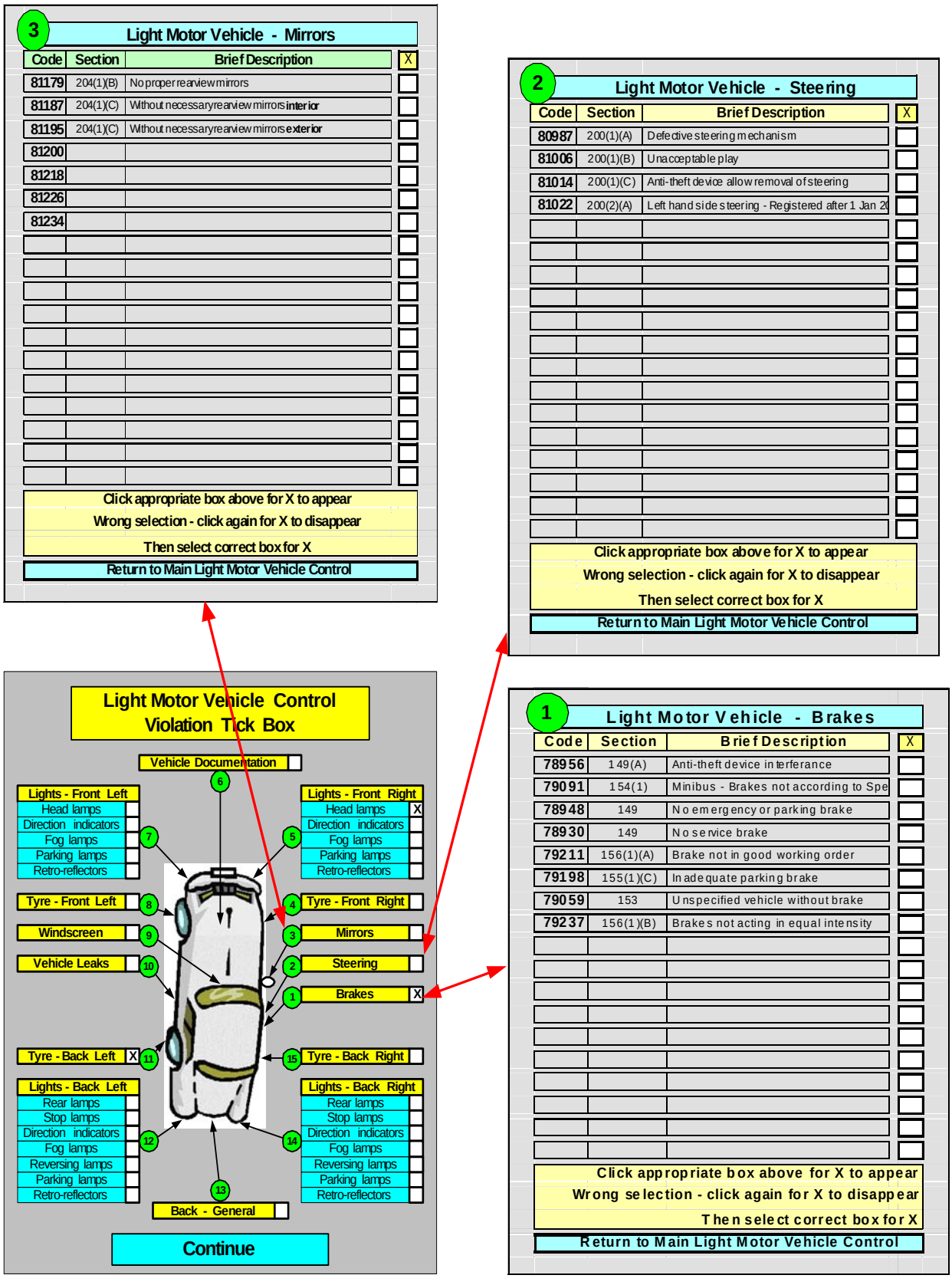
ANNEXURE C

Primary Screen for Light Motor Vehicle Control



ANNEXURE D

Primary Screen for Vehicle Control: Link to Secondary Screens



ANNEXURE E

Example of Traffic Officer Performance Report

Project e-Force Performance Report		**Province** : **KwaZulu-Natal**						**Page** 5
		Authority : Pinetown						
		Route No. : M6						
		Location : Cnr Lynnwood Rd. & Church St.						**Year** 2006
		Coordinates : S Coord S25°44.485 E Coord E028°15.89						
Report No. 38		**Time** : **From :** 06:00 **To :** 18:00						
Number of Notices Issued		**TOPC No.** : 356						**Week** 47
Vehicle Contraventions		**Traffic Officer** L J Mkono **(Issued)**						
Faulty Head Lights		**ID No.** : 5503265044004						
		Force No. : 98753						
		Traffic Officer J M Schnell **(Used)**						
		ID No. : 5503265044004						
		Force No. : 68504						

Day of Week	**Sun**	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Week**
Date	**16 Nov**	**17 Nov**	**18 Nov**	**19 Nov**	**20 Nov**	**21 Nov**	**22 Nov**	**Total**
Motorcars & stationwagons								
Minibuses								
Midi-buses, Buses & Bus-trains								
Motorcycles, Tricycles								
Light delivery vehicles (LDV's)								
Rigid Trucks								
Trucks (horse only)								
Light load trailers (<3500kg)								
Medium load trailers (3500kg-9000kg)								
Heavy load trailers (>9000kg)								
Other								
Total								