ROAD TRAFFIC MANAGEMENT CORPORATION RFP

LICENSE PLATE RECOGNITION SYSTEM FOR THE ARRIVE ALIVE PATROL CAR PROJECT

BY: Isolethu Consortium

1. Introduction

Road Traffic Management Corporation

Arrive Alive Patrol Car Project
Number Plate Recognition System

Isolethu Consortium is pleased to introduce our digital license plate recognition or automatic number plate recognition system for Arrive Alive Patrol Cars and would like to offer the following proposal from HIGH TECH SOLUTIONS, the world leader in OCR (optical character recognition). "Hi-Tech Solutions" is a System & Software development company that is engaged in various computer-engineering activities since 1992. Its main line of business is design and development of advanced image processing systems.   The company specializes in Optical Character Recognition (OCR) systems in harsh environments. The company uses Neural Network Technology and unique image-processing algorithms it has developed. The company supports its products by a range of hardware subsystems and software applications.

The HIGH TECH SOLUTIONS vehicle surveillance solution is currently used in over 1000 sites worldwide, including over 30 local municipalities. This is a market leading ANPR solution providing reliable and quality images that interact with a central Back Office Facility (BOF).

Figure 3-1: A few examples of South African number plates

Despite many company's claims, there are very few products working effectively within the South African complex license plate environment; it is important to check that full LOCAL references are given. With more sites and systems installed in SA than all the competitors together, **Isolethu Consortium** and HTSOL are the default leaders in South Africa.

There are very suppliers offering a total currently working solution for this tender, please check carefully the non compliance aspects and what is required to ensure that they are correct.

Isolethu Consortium have substantial capital support available for larger projects such as this, it is not true that only the largest companies are capable of supplying these solutions when in fact most of them are unable to fulfil the total requirement.

Policing Applications

The HTSOL **Isolethu Consortium** ANPR solution can be used in fixed, mobile and transportable ANPR Units. The ANPR software automatically reads the number plates of vehicles from one or more video cameras. Each plate is stored into a local database and, if required, checked against one or more 'hot list' databases. A number of different 'hot lists' containing details of vehicles of interest can be supported. An alarm is generated when a match, or 'hit' occurs. The ANPR Software, and its user-friendly graphic user interface, has been specially written to ensure ease of use by the operator whilst maintaining the ability to access vast areas of information and database historical information by quick and easy selection of big button touch screen icons. When an entry is stored to the database, an image of the plate from the recognition camera is stored with the recognition. In addition, an image from another camera (typically a colour wide-field image) can also be stored to show the vehicle in the context of its surroundings. This image is normally only stored if a hit has occurred.
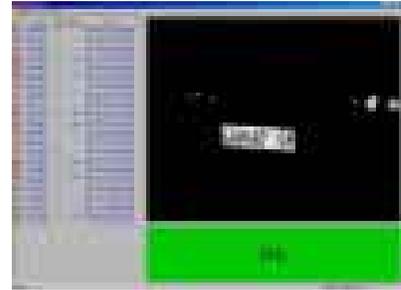
A number of different types of hot list can be used:
- Specific Format databases that cannot be edited such as NaTIS, downloaded once a month.
 - Local provincial or municipal hot lists – hot lists can be created, edited and imported into the system.
There is no limit to the number of local hot lists of up to as many entries as required in each can be used. These hot lists can be imported or edited on the fly while the system is operational with minimal impact on system performance.
- SAPS hot lists – large hot lists in a pre-defined format, and recognition will be continuing while they are imported.
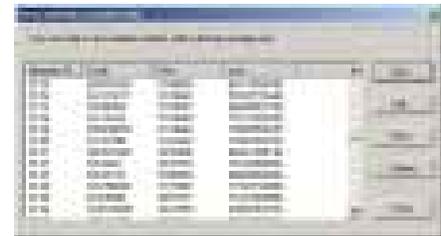
The ANPR software can also be connected to a remote hot list database and perform live checks for each plate against the remote database. This connection can use an arbitrary bearer, e.g. GSM or GPRS modem. If a communication modem is fitted, the system can send SMS pager messages for each hot list hit. The system can also integrate with a Back Office Facility (BOF),
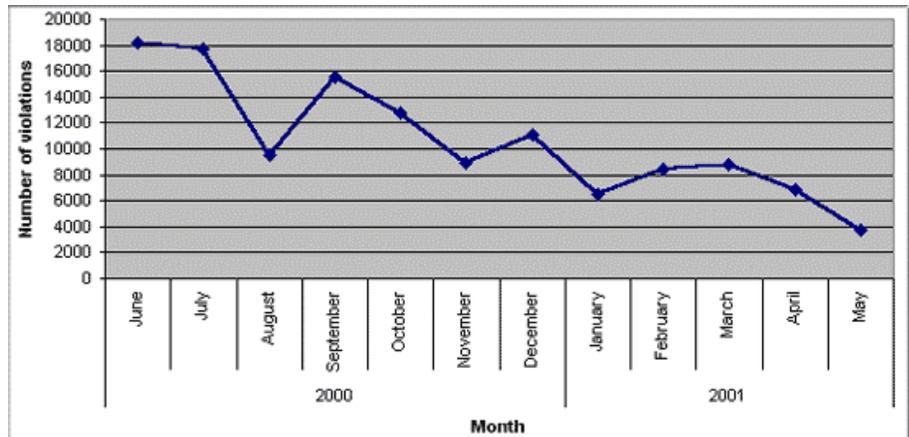
which allows recognition, and alarm data to be downloaded to the BOF for long-term storage, historical browsing, fixed connections to remote databases and integration with other BOF installations. The BOF can also be used to automatically update databases held on associated remote, mobile or transportable sites via the communications modem or via a network connection. This is achieved without operator intervention.

2. Supplier

Isolethu Consortium – Automatic Number Plate Recognition Solutions

2.1 Our experience and references for ANPR Solutions.

HIGH TECH SOLUTIONS has been manufacturing and developing Digital recording solutions for more than sixteen (16) years. Major activates include:
 - Image Processing product line: a family of OCR products have been developed for transportation and security applications ("SeeCar", "SeeContainer" product lines).
 - Windows Software product line: The company has developed Windows-based software products, which also support its image processing products. (Additional Operating systems include Linux, WinCE and RtDOS for various products).
 - Hardware product line: The company develops and manufactures a series of subsystems that support its products.

I-CUBE (Integrated Intelligent Imaging) was appointed as the exclusive distributors for Hi-Tech Solutions, a system and software company that develops cutting edge optical character recognition (OCR) solutions by implementing the company's unique image processing software and hardware in a wide range of security and transportation applications. The technology is based on computer vision: the systems read the camera images and extract the identification data from the images. The recognition result is then logged together with the images. This is the main advantage of vision-based recognition: the records include both the image plus the extracted result ("Seeing is Believing").

Isolethu Consortium has installed a few select ANPR solutions into the local market (including with SPOORNET, AVIS, Toll roads, vehicle logging and high security applications) and has been actively marketing the ANPR options from HTSOL to a number of key clients including Provincial Legislatures, local municipalities additional Traffic Departments and country wide SAPS.

Isolethu Consortium can offer through our supplier, HTSOL their unique in-house expertise backed by over 14 years experience in selling and supporting our products world-wide. HTSOL products provide accurate, cost-effective systems for the Security, Police, and Commercial markets. From counter terrorism to congestion charging, high-speed application to roadblock solutions, HTSOL has the solution. After extensive discussion and review of their system's

abilities we are happy to offer to you this exclusive and well-supported range of products. Today HTSOL optical character recognition (OCR) system now in operation in over 1000 sites, including locally at Potch University with over 20 000 users and 16 entrances and internationally in LOS ANGELES, with over 60 high speed digital cameras. The product is also used for counter-terrorism, access control, journey time analysis, crime reduction, enforcement congestion charging and security. Directly and indirectly we therefore offer you an excellent reference list throughout the World with some leading Company names and Police Forces including many of the local traffic management companies**.** We feel rightly proud to be introducing the HTSOL system to **RTMC** and know that we are offering you market leading proven Automatic Number Plate Recognition systems.

Company Expertise

Company Summary

Isolethu Consortium's core business is bringing together, BEE I.T. companies which produce and manage technology solutions, around the defined requirements of our clients suited to their contexts enabling them to compete globally.
When we combine our skills and resources they produce a focused team that concentrates on improving and contributing to local technology solutions.
The experience which we have achieved over ten years have contributed to the successful technology solutions that we have provided for our customers that are from all different sectors of the market.
Relationships all over the country have led to us being a service provider that can provide our solutions anywhere in South Africa.

Members of the Consortium

1. Biz Africa
2. Deno Africa
3. Compuzone Technology
4. i-Cube
5. Bhukula Projects
6. Khanya Africa Networks

2.2 Quality and Reliability

HTSOL is capable of styling and supplying a range of options within an ANPR scenario. The design, manufacture and construction of these ANPR units are to the highest of International Standards and Certifications and compare to the respected UL, CE, GS, ISO 9001/2000, IEC60825-1, FCC15 and TUV quality assurance. The SEE TRAFFIC Mobile platform is a powerful ANPR recognition system designed to be permanently installed and operated in vehicles. Using HTSOL ANPR software, the platform is capable of simultaneously processing number plates from 4 ANPR cameras covering 4 lanes of high speed, high density traffic. Up to 4 additional image 'over view' cameras can be supported enabling the user to match plate reads with additional imagery. The platform

contains a powerful Pentium M computer with multiple 200 GB hard disks, allowing RAID 0/5 redundancy and the ability for users to create, control and manage 'on board' or local databases.

Typical databases would include stolen vehicles, wanted, elapsed registration etc. The system can also be 'lived linked' to a back office facility (BOF) or central database using the external GSM/GPRS modem

The unit is controlled and configured using a touch screen monitor or via a miniature keyboard. The platform has a 9-16 VDC PSU with power conditioner for clean power delivery.

Key Features

Rugged 'Zero' maintenance construction: The platform is manufactured from hard anodized steel with no cooling fans, minimising the number of moving parts and maintenance requirements.

Engineered for extreme conditions: The platform has been designed and tested to operate in extreme heat. Large heat sinks and heat pipe technology protect the system from temperature extremes. The platform is fitted with shock absorbing feet and internal parts are protected using dampers, preventing vibration and shock damage encountered in the mobile environment.

Small in size, big in power: The size of the shadow unit (300mm x 200mm x 135mm) offers flexibility in deployment with a variety of mounting options. Fitted with a Pentium M processor each shadow unit can process video from 4 ANPR cameras and 4 over view cameras.

Well connected: The unit comes with a host of interfaces and connections; the unit is supplied with a modem for wireless GSM/GPRS data communication.
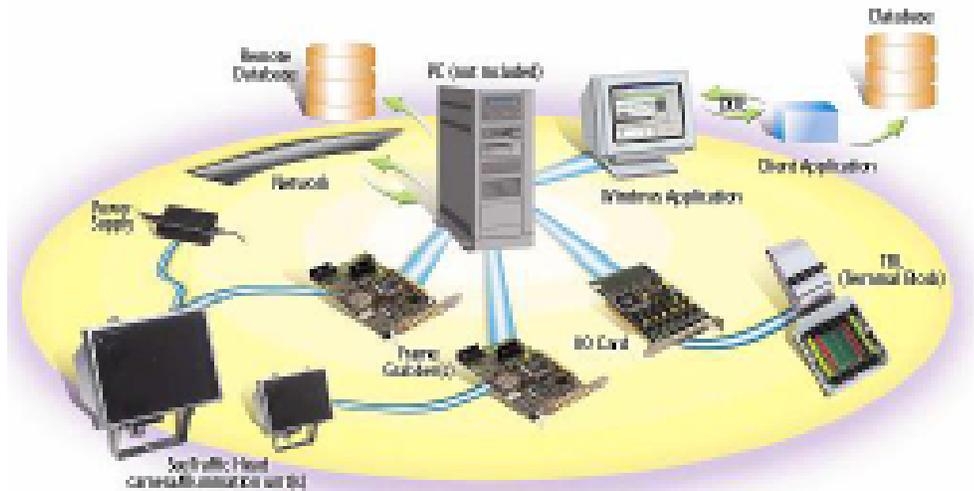
2. 3 Proven Track Record

SPOORNET HEAD OFFICE   2 Lane LPR system for access control and logging at
SPOORNET head officeR220 000.00   2004

AVIS   6 site (multiple lanes per site) LPR for logging vehicles at JHB, DBN and Cape Town Airport's and AVIS service areas.   R1,2 million   2002

POTCH University. It is used for gate control and theft prevention. The license plate of the entering cars is recorded along with the driver face. This data is compared to the information at the exit and the guard can see that the person at the entrance to the University was different than the person driving the car out. The system also provides statistics and data logging, as well as an on-line surveillance of the gates. After the installation of this system the number of thefts decreased sharply.

SEE FILM is installed in a traffic police violations processing center in Pretoria, South Africa (in conjunction with Labat Traffic Solutions using the Startrap Intelligence violation data processing system). It is used to automate the process of handling the fine processing (a fast turnaround from film to fine). The application reads both the license plate off the frame - together with violation information.

A sample violation is shown in the following photo. The frame, read from the film, includes the view of the car, the vehicle plate, and the violation information - which includes the date, location and speed, and is attached in the upper-right corner.

Toll road system in South Africa. The license plate is read and used as a key to fetch the vehicle information from the toll database. The information is compared to a swipe card which is used by the driver. This integrated system reduces fraud and increases the toll income.

The toll system is based on a multi-lane (SeeLane) system which reads and verifies the plate data and sends a message to the toll control application. This application uses the recognition information to obtain the vehicle data, which is matched to the swipe card information. The results are displayed to the operator and also sent to the control room for further processing of the frauds, and long-term data logging.

This system is installed in hundreds of border crossing lanes around the border of a European Country, and performs automated monitoring of the vehicles and the persons entering or exiting the Country. The plate number is read by the LPR system and verified by the operator. The passport data is also read (by another system) which also authenticates the document. A second camera stores the full view of the vehicle. This information is transmitted and stored on a central database. This database is later used to track all entries or exits to the Country, to track stolen cars and other purposes. The system also significantly improves the flow of the traffic at the crossing checkpoints. The entire crossing operation cycle time was reduced from several minutes to several seconds per vehicle.

HTSOL is a market leader within the INTERNATIONAL Markets
The Hi-Tech Solutions (HTS) Business Alliance includes selected companies who provide complementary technology products and services, either on a local or global basis. The companies listed below are members of the HTS Business Alliance:
B&W Automation www.bwautomation.com/index.asp
C-S - France www.c-s.fr
CTR www.ctrsystems.com
 DataPark www.dataparkinc.com
 InterPark www.interparkholdings.com
 InTrans www.intransgroup.com

MISCO www.misco21.com
ParTrak www.parktrak.com
SeCom International www.secomintl.com/autorev.html
Sectec
www.sectec.com.mx
Urbitran Associates Inc. www.urbitran.com

The following table shows the choice of applications in the SeeCar product line, and how they are implemented by our SeeCar product line. The table lists the application market (leftmost column), application type (second column), then recommends the available solution - and points to sample installations.

Market	Application Type	Product	Special Software	Special Hardware	Sample Install.
Security	Multi-Lane Access Control	SeeLane	.	.	
" "	Single-Lane Access Control	C3	.	.	
" "	Gated Communities, Visitor control	SeeLane	.	.	
" "	Access control with additional input	SeeLane, DLL	.	External reaaer or keyboard	
" "	Loitering Vehicles	SeeLane	Special Client application	.	.
Parking	Multi-lane	SeeLane	.	Requires Parking system	
" "	Lost Tickets, Fraud Control, Marketing Info, User Profiling	SeeLane, C3	Various options	.	.
" "	Airport Parking	SeeLane	Various options		
" "	Shopping Center parking limit	SeeLane	Additional client application		
" "	Street Parking (with portable PDA unit)	DLL	embedded software + offline application	PDA unit	
" "	University Complex, Industrial/Office complexes	SeeLane	Various options	.	
Surveillance	Border Control	SeeLane	.	.	
" "	Vehicle Montoring	DLL	Various options	Various options	.
" "	Car Flow	SeeTraffi	SeeCarFlow		.
Tolling	Toll Booths, Toll violation enforcement	SeeLane	Special Client application	.	
Car Wash	Visitor Statistics	SeeLane	.	.	.
Traffic Enforcement	Average Speed Violation	SeeTraffic	SeeSpeed	.	
" "	Traffic monitoring	c	.	.	.
" "	Speed Violation, Red Light	DLL	own software	own camera	.
" "	Roadblocks	SeeRoad		.	
" "	Film Processing (Speed/Red Light Fines)	SeeFilm	.	special scanner	
Plate Manufacturing	Production belt, Distribution & mailing control	SeeLane	.		

2.4 Warranty

Isolethu Consortium offers a comprehensive warranty at no extra cost.
The warranty term from date of installation is 12 months:

2. 5 Installation and After Sales Service

Isolethu Consortium is able to support these mobile solutions in the field.
Prices assume a carry in warranty but additional costs have been factored for on site support and maintenance. **HTSOL** directly contracts and trains its own installation teams – who are educated and experienced in working in the automotive and mobile
ANPR industry. If required, their technicians are available for specific detailed installation and support; however the costs for flights, accommodation, food and time need to be agreed in advance.

2.6 Solution Provision

Isolethu Consortium Mobile ANPR
application is fully capable of providing
The South
African Provincial Traffic Authorities with a
vehicle number plate recognition system
that will provide the following:

Vehicle Issues
- Identify Stolen Vehicles
- Identify Vehicles not complying with roadworthy requirements
- Identify Vehicles with expired licenses

Vehicle Owner Issues
- Vehicle Owners with outstanding traffic fines
- Vehicle Owners with warrants of arrest issued
- Vehicle Owners with expired driving licenses and/or PrDP's
Assuming that these details are correctly present on the NaTIS central database and communication is available.

Information - components:

• Watermark and Tamperproof secure recording of images
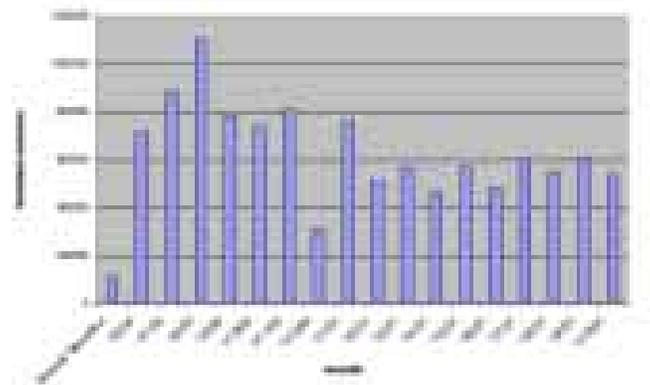
Confidential

Isolethu Consortium and HTSOL offer tamperproof secure recording, with the highest standard in the industry. The ANPR solutions offer a double security code for both Recorder and HD. The SEETRAFFIC LPR solution uses an uncompressed source for all video capture. Multiple snapshots are taken and overlaid with tamperproof date time stamp. The images are encoded with a watermarking system. Every image has a digital code, and if the digital code is in any way changed, it indicates that the image has been manipulated or tampered with.

• **Configuration software**

The configuration software is accessed through the SEE TRAFFIC FRONT END and is configured using static IP addresses and other networking set-ups for communication to the BOF. The live feed and ANPR capture for all nine Provinces are configured with the context check to enable an optimum capture of shot.

4. Reliability of HDD / MTBF:

Ambient Temperature: - 20° to +70° C
Working temperature: - 5° to +60° C

We are advised by our supplier and their HD board manufacturer that the temperature requirements between – 5° to + 60° C are met and guarantees the functionality within these parameters. To secure the functionality of the system, the recorder itself heats the HD to minimum -5°C. Therefore, we will have recording down to ambient temperatures of -20° C.

MTBF:
Recorder: 100.000 h.
**HDD: 30.000 h.**
Camera: 600.000 h.
TFT monitor: 30.000 h.

5. Concept for Quality Management

Isolethu Consortium is the sole system supplier for the SEE TRAFFIC ANPR system in Africa, that are certified to key INTERNATIONAL standards by their supplier, HTSOL.

General
This proposal is valid for the order and purchase of LPR mobile systems for the number plate recognition system for The Arrive Alive patrol car project as laid down by the **RTM**C. This proposal includes everything that is required as per the
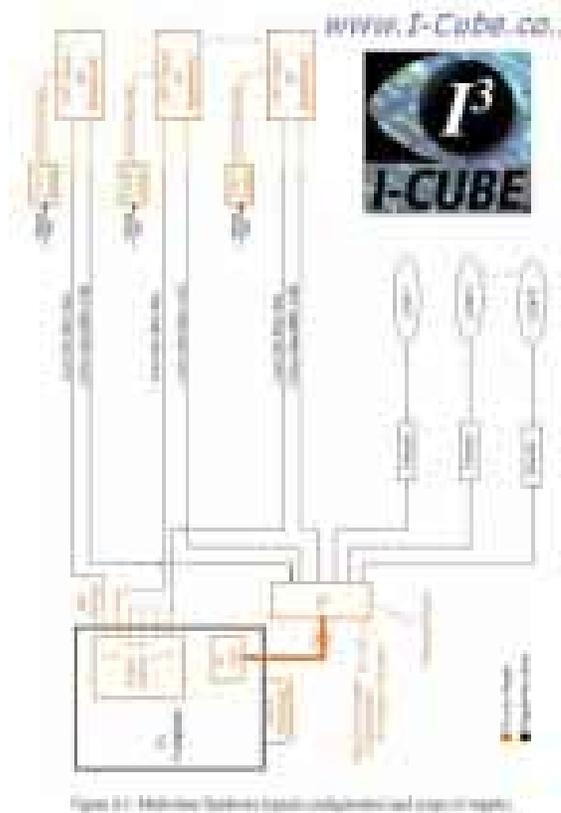
required SPEC. **Isolethu Consortium** will ensure that the ordered product is available for collection from their premises in DURBAN / JHB / CT and other centres as required and coordinate despatch with the relevant parties.

Delivery terms

By agreement in writing on placement of order

Terms of Payment

To be discussed.
All prices are per unit and exclude handling, shipping and insurance.

This proposal is valid for 90 days from closing of the tender, but note the Rand Dollar exchange rate used.

We look forward to a long and prosperous relationship. If you should have any questions please do not hesitate to contact us.

APPENDIX

SEE Traffic

SEE Utilities

User manual

High Speed LPR Camera

LPR overview

Mobile PC SPECS

Infrastructure Design (wireless)

Microsoft in Cars

Monitor Details