



MAGNA BC

**OVERLOAD CONTROL
PROJECT REFERENCES AND
EXPERIENCE**



Prepared by:

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1. PROJECT REFERENCES AND EXPERIENCE

1.1 OVERLOAD CONTROL PROJECTS COMPLETED

The following overload control systems and weighbridge operations projects were performed by the various companies within the **Magna BC** group of companies.

Namibian Overload Control Computer Monitoring System

Value

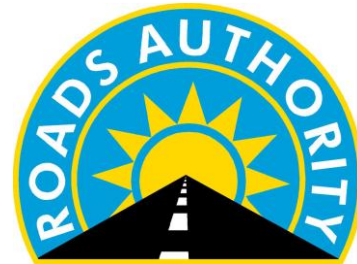
R 750,000

Duration

11 months to implement at 8 sites, delays in completion of the civil works at the remaining 4 sites have prevented implementation of the system at these sites at this stage.

Client

Namibian Roads Authority
Private Bag 12030
Ausspannplatz
Windhoek

**Contact****Mr Conrad Lutombi**

Manager: Road Transport Inspection Services

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Mr Hendrik Amadhila

Operations Manager

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Map of Namibia showing TRAFMAN™ Weighbridge installations



Inside the Brakwater weighbridge facility in Namibia, where Weighbridge module of the TRAFMAN™ is installed and operational.

Scope

The contract entailed implementation of an overload control computer monitoring system at 12 weighbridges. Currently, the system is already deployed at the completed 8 weighbridges in the country, with the additional 4 being implemented as soon as the facilities are completed over the next few years. The weighbridges currently completed and in operation are situated at:

- Onhuno,
- Katima Mulilo,
- Oshivelo,
- Windhoek North,
- Windhoek South,
- Walvis Bay,
- Noordoewer, and
- Ariamsvlei.

The weighbridges are all connected to a central server at the Roads Authority head office in Windhoek where head office staff can monitor the operations and obtain consolidated statistics centrally.

The project comprised a study where the existing overload strategy of Namibia was reviewed. User requirements were identified for the overload computer monitoring system and the processes and technological tools needed to operate weighbridges were documented and summarised.

The computer monitoring systems that are available on the market were evaluated against the user requirement specification and the client decided to implement TRAFMAN™, supplied by **Magna BC**. The TRAFMAN™ system was enhanced to cater for the Namibian specific requirements to comply fully with the user requirements.

The implementation comprised the installation of hardware and equipment, the installation and configuration of software as well as the training of users.

The system has been successfully in operation in Namibia for 18 months, fully administering the weighing and prosecution processes at the weighbridges, assisting the authorities with the curbing of malpractices at the weighbridges and providing a useful management tool to make informed decisions on overload control in the country.

N4 Maputo Corridor

Value

R 10.2 million

Duration

Implementation Phase – 14 months, completed on time
Maintenance Phase – 60 months initially, currently ongoing

Client

Implementing Authority, comprising the South African National Roads Agency (SANRAL) and ADMINISTRAÇÃO NACIONAL DE ESTRADAS in Mozambique.

PO Box 415
PRETORIA

Contact

Ismail Essa, Manager North Region of SANRAL
Tel +27 12 426 6200



N4 weighbridge facility in Middleburg, where Weighbridge module of the TRAFMAN™ system is installed and operational.

Scope

The scope of work under this contract which we are performing in partnership with Mikros Traffic Monitoring (Pty) Ltd (who is responsible for the WIMs, cameras and various traffic control devices) involves, inter alia:

- the establishment of 5 Load Control Centres (LCCs) at the following locations:
 - Middelburg (Witbank, RSA);
 - Middelburg Westbound (RSA);
 - Middelburg Eastbound (RSA);
 - Machadodorp Westbound (RSA);
 - Machadodorp Eastbound (RSA), and
 - Komatipoort (RSA);
- the provision and installation of application software and peripheral computer equipment at the LCCs;
- the provision and installation of application software and peripheral computer equipment for mobile load control units (MLCUs);
- maintenance and support of computer equipment and application software;
- the provision, maintenance and operation of HSWIM equipment, and
- collection and provision of traffic data for each weighbridge.



Mobile Load Control Unit (MLCU) at a layby on an alternative route of the N4 Maputo Corridor



Traffic officer performing law enforcement inside an operational MLCU

- the provision and installation of application software and peripheral computer equipment at the LCCs;
- the provision and installation of application software and peripheral computer equipment for three mobile load control units (MLCUs) which patrol the alternative routes and operate from seven single deck static scales (lay-bys) to identify overloaded vehicles;

maintenance and support of computer equipment and application software by our dedicated maintenance staff roving amongst the sites;

Mantsole Traffic Control Centre (N1)

Value

R 1.02 million

Duration

Implementation Phase – 3 months, completed on time

Operation and Maintenance Phase – 60 months initially, currently ongoing

Client

Bakwena Platinum Corridor Concessionaire (Pty) Ltd
SUNNINGHILL



Contact

Hennie van Tonder, Operations Manager, Bakwena

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Scope

The centre is located on both sides of the N1 freeway that runs between Johannesburg and the Zimbabwean border, with weigh-in-motion equipment installed on the screening lanes and two four-deck static scales for each of the north-bound and south-bound traffic directions.



Aerial view of Mantsole weighbridge facility on N1

The scope of work under this five-year contract involves, inter alia:

- the provision and installation of application software and peripheral computer equipment at the TCC;
- maintenance and support of computer equipment and application software.

Operation of Heidelberg Traffic Control Centre (N3)

Value

R 55 million

Duration

Implementation Phase – 8 months, completed on time

Operation and Maintenance Phase – 60 months, completed April 2007

Client

N3 Toll Concession (Pty) Ltd
Second Floor, Acasia Block
Pellmeadow Office Park
60 Civin Drive
Bedfordview



Contact

Miles le Roux, N3TC
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Cell +27 82 805 4663

Scope

The centre is located on both sides of the N3 freeway that runs between the port city of Durban and Johannesburg, with weigh-in-motion equipment installed on the screening lanes and two four-deck static scales for each of the north-bound and south-bound traffic directions.

The scope of work under this five-year contract performed by our subsidiary T3C (Pty) Ltd involves, inter alia:

- manage and supply 37 staff members for the 24-hour operation of the centre, 7 days a week;
- carry out all weighing operations, assist traffic law enforcement authority in generating prosecution documentation and responsible for the administration of supporting documents to be submitted in court;
- maintain and support computer equipment and application software;

- manage various subcontractors who are responsible for the maintenance and support of the HSWIMs, static scales and various other equipment installed at the centre, and
- collect traffic and weighing data and report monthly on levels of overload and effectiveness of overload control.



Aerial view of Heidelberg West weighbridge facility on N3

T3C (Pty) Ltd was the first private sector operator whose appointment was approved by the SA National Road Agency to operate the Heidelberg Traffic Control Centre (HTCC) whilst the law enforcement resulting from the operations was performed by the Gauteng Department of Public Safety. Since the site had not been in operation before, **Magna BC** took responsibility for the establishment of operations. Even though the N3 carries the highest heavy vehicle traffic volume of any route in the country, the percentage vehicles overloaded above the allowed grace percentage has come down from more than 10% to below 1% on average during the period of operation by T3C.

The following positive aspects would be to the benefit of the client should **Magna BC** be responsible for the operations of a weighbridge:

- **Operational competence** derived from its experience during a 6 year period at the HTCC, together with the involvement of the **Magna BC** Group in other weighbridge related projects in South Africa and Namibia. From this involvement, the Group has a thorough understanding of the efficiencies and inefficiencies, the malpractices and the best practices that would stand the client in good stead for this contract.
- The regular but unscheduled polygraph testing adopted within the **Magna BC** Group in all projects where its staff are constantly approached by members of the public with

fraudulent or corrupt intentions, will continue to maintain company's **integrity and trustworthiness of its operations.**

In the period of almost 6 years that we have been operating the HTCC, there have only been 3 cases of known malpractice or corrupt behaviour and a fourth case of unethical behaviour of one of our staff members off site, which were all dealt with expeditiously and decisively. In two of the three cases, lack of system integration (provided by others) had evidently created the loophole for corrupt officers to take advantage. In the other case, the malpractice was uncovered through regular internal audits.

In addition to instituting disciplinary actions against individuals implicated in misappropriating traffic fine money, all such monies that were fraudulently misappropriated were paid back by the company. As a result of these unpalatable experiences, all known loopholes regarding any kind of embezzlement at HTCC have been identified and closed down as part of the operational repertoire.

- As a result of our constant drive to improve the efficiency and effectiveness of our operational procedures, together with the setting of higher targets for our staff to achieve, **fine collection** was improved under the management of the **Magna BC** Group to 69% at HTCC versus 20% elsewhere on N3, with staff members of our company appointed by the chief magistrate to perform clerk of the court functions.
- The **compilation of Procedure Manuals** will only be finalised once the system integration process has been finalised. From our profile and experience in similar projects it is evident that formidable capacity is available within the Group that will facilitate such compilation in a smooth fashion.
- **Technical competence** inherent within the **Magna BC** Group offers the advantage to the client of a thorough understanding of the aspects relating to the maintenance of the equipment installed, as well as the general maintenance of buildings and facilities, gardening and cleaning services of the site.
- Given extent to which POPCRU has targeted HTCC at times, the HR support provided by the Group enabled our company to hold its own and **avoid almost certain disruptive industrial actions** at HTCC. This kind of experience would be particularly useful when dealing with procedural changes to be introduced to ensure operational efficiency.

KwaZulu-Natal (N2, N3 and various other routes)

Value

R 2.1 million

Duration

Implementation Phase – 6 months, completed on time

Current Maintenance Phase – 36 months initially, currently ongoing

Client

KwaZulu-Natal Department of Transport
Private Bag X9043
Pietermaritzburg



PROVINCE OF KWAZULU - NATAL - ISIFUNDAZWE SAKWAZULU - NATALI

**DEPARTMENT OF TRANSPORT
UMNYANGO WEZOKUTHUTHA**

Contact

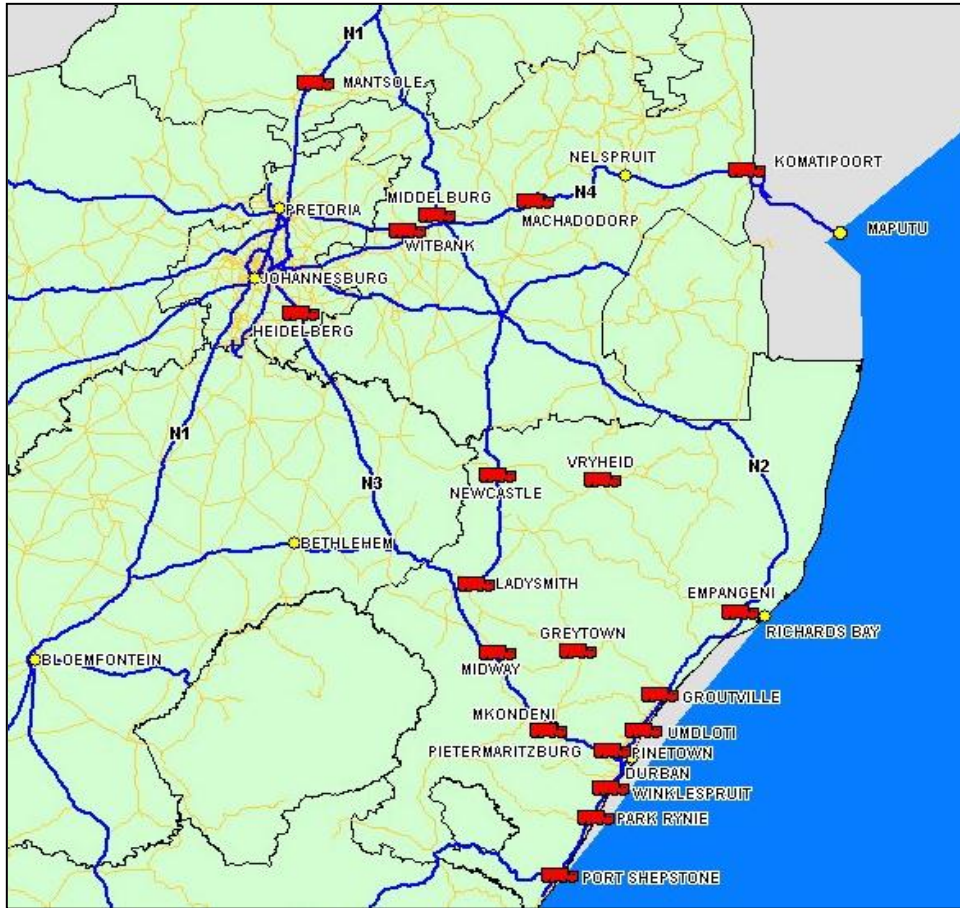
Mr Rob Abramson, Deputy Director
Tel +27 33 395 1800
Cell +27 83 628 1411

Scope

The project includes 14 weighbridges of which all but 4 are located on either the N2 or the N3 freeways (see map on previous page). The weighbridges are all connected to a central server at the Department of Transport's Central Traffic Data Processing Centre in Pinetown from where head office staff in Pietermaritzburg can access the system across the Wide Area Network to monitor the operations and obtain consolidated statistics centrally.

The scope of work under this three-year contract involves, inter alia:

- the provision and installation of application software and peripheral computer equipment at each of the weighbridges, and
- maintenance and support of the application software.



Map of South Africa showing TRAFMAN™ Weighbridge installations

1.2 OVERLOAD CONTROL PROJECTS COMPLETED IN 2010/2011

Beit Bridge Traffic Control Centre

Value

R 9.8 million

Duration

Implementation Phase – 12 months, completed early of 2010

Maintenance Phase – 12 months initially, currently ongoing

Client

South African National Roads Agency (SANRAL)

PO Box 415

PRETORIA

Contact

Rajan Padavattan

Project Manager



SA National Roads Agency Ltd
Northern Region
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Scope



The Beit Bridge Traffic Control Centre (BBTCC) is located on the N1 freeway approximately 5 kilometres south from the border with Zimbabwe.

In addition to the traditional overload control and roadworthiness inspections and prosecution performed at a TCC, it is envisaged at this macro facility that cross border road transportation permits and compulsory road user charge toll fees in respect of all heavy vehicles will be charged to remove the incentive for such vehicles to use secondary roads in an attempt to evade the toll plazas and paying toll fees along the N1 between Beit Bridge and Gauteng.

This facility includes screening lanes on both approaches to the site, where vehicles are weighed whilst travelling at speeds below 40 km/h and 2 cameras take photographs of each vehicle on the screener - one employs optical character recognition to recognise the number plate of the vehicle and the other records the context of the vehicle from front to back including the number of axles, shape of the vehicle, colour make, etc for verification purposes. Detection equipment installed on the main (N1) road sound an alarm and photographs heavy vehicles that bypass the screener lanes, for prosecution purposes.

From the screeners, the vehicles queue in the inspection lanes for an RFID tag to be placed on each vehicle and the documentation of the vehicles, drivers and load (permits) to be verified, whilst a superficial inspection of the roadworthiness of the vehicle is performed too. Vehicles that

comply in all respects (not overloaded on the screener, roadworthy and documentation in order) are allowed to rejoin the main road and proceed with their journey. Vehicles that do not comply in any aspect are directed to the static scale for weighing and/or the vehicle testing station and/or the holding yard, where the prosecution documentation is issued, overloads corrected and serious roadworthy issues corrected before being allowed to rejoin the main road.

RFID readers and direction or traffic lights have been installed at all the intersections that determines the direction in which a particular vehicle is to travel and the opening and closing of booms ultimately direct the vehicles to where they are intended to go.



Notwithstanding the fact that the traffic flow in terms of the seasonal and monthly/weekly/daily patterns and number of vehicles per hour are virtually the same in both directions of travel, 7 inspection lanes has been constructed in respect of vehicles approaching from Zimbabwe whilst only 4 inspection lanes have been constructed to deal with vehicles from South Africa on their way to Zimbabwe to save on both capital and operating costs.

The motivation supporting this difference in the design is that all vehicles entering the country should be fully inspected whilst those leaving the country may be subjected to a less stringent process. The challenge that it offers from an operational point of view is how to deal with such stringent process without clogging the facility. The software controlling the flow of traffic and the level of inspection afforded to a vehicle caters for a variety of scenarios and parameters that determine the intensity of inspection and time spent on a vehicle. The parameters can be set at different levels for vehicles entering South Africa relative to the vehicles leaving the country.

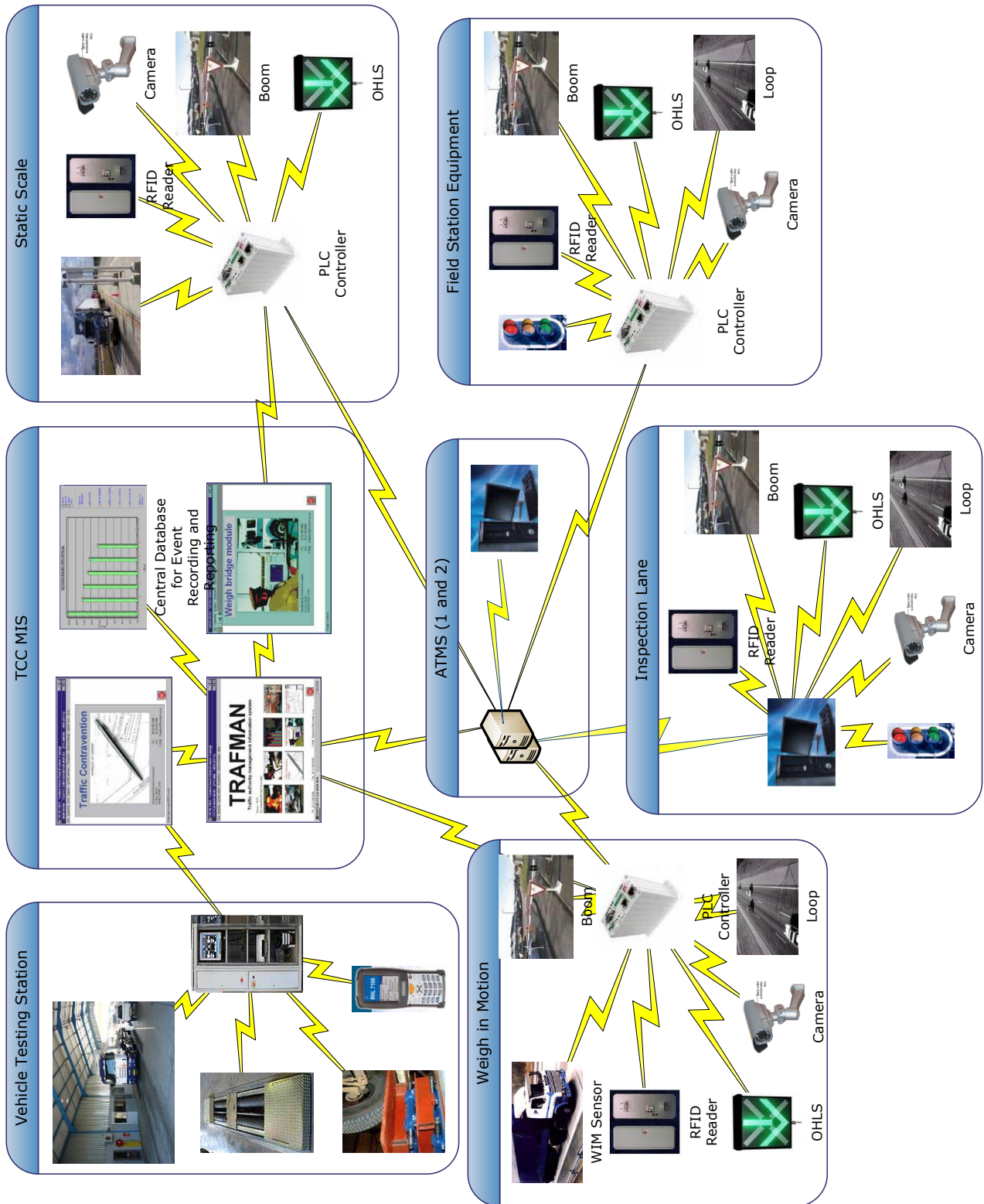
To determine the optimal combinations of the scenarios and the desired configuration under different loads of traffic, a simulation of the facility was developed and made available to the operational staff to continually refine the parameter settings in the software.

The exact layout of the site, duration of each of the processes and the appropriate probabilities that characterises each have been set up in the simulation model, also taking into account the travelling times between the various processes. Undesirable outcomes, such as vehicle queues stretching onto the main road have also been recorded in the model.

The following systems were integrated to supply the total solution:

- Site Security Surveillance by means of PTZ and static CCTV surveillance on several high rise masts and within the control buildings, inclusive of the recording of 3 months video streaming from all 12 cameras
- Access Control System by means of biometric verification of the fingerprint of authorised employees to access the various buildings and restricted areas within the control building
- Vehicle Identification System by means of server automatic number plate recognition (ANPR) cameras installed along the roads leading to the site and within the site, supplemented by the scanning of the 2D barcode on the licence disc of South African registered vehicles
- Vehicle Tracking System by means of RFID tags affixed to the windscreens of the vehicles entering the facility to verify whether a vehicle has undergone all the testing and weighing procedures identified in the initial inspection of the vehicle by a law enforcement officer
- Driver Identification System by means of scanning the barcode on the driving licence of the driver (or capturing the identity number of the driver)
- Communication Infrastructure by means of a high speed backbone with redundancy to relay all the video streaming and provide connectivity to all the devices (eg RFID readers and ANPR cameras) installed at strategic positions on the site
- Traffic Control Equipment by means of booms and traffic lights that are controlled by the Control and Operations Software to open or remain closed based on the routing scheduled for the vehicle associated with the RFID tag that was read by the RF readers
- Vehicle Weighing Equipment by means of weigh-in-motion (WIM) at 40 km/h to screen heavy vehicles for possible overload transgressions, before such vehicles are weighed on a four deck static scale, the telemetry of which allows recording of the actual mass on the prosecution system without any human intervention
- Vehicle Testing Equipment, inclusive of break roller testing and all other devices that are used at a vehicle testing station

A “Logical Solutions Architecture” diagram illustrating the holistic integration of the various systems and sub-systems directly related to “overload control and management” is provided:



BTCC Logical Solutions Architecture

Zebediela Traffic Control Centre

Value

R 39.8 million

Duration

Implementation Phase – 14 months, to be completed end of 2010
Maintenance Phase – 12 months initially, currently ongoing

Client

South African National Roads Agency (SANRAL)
PO Box 415
PRETORIA

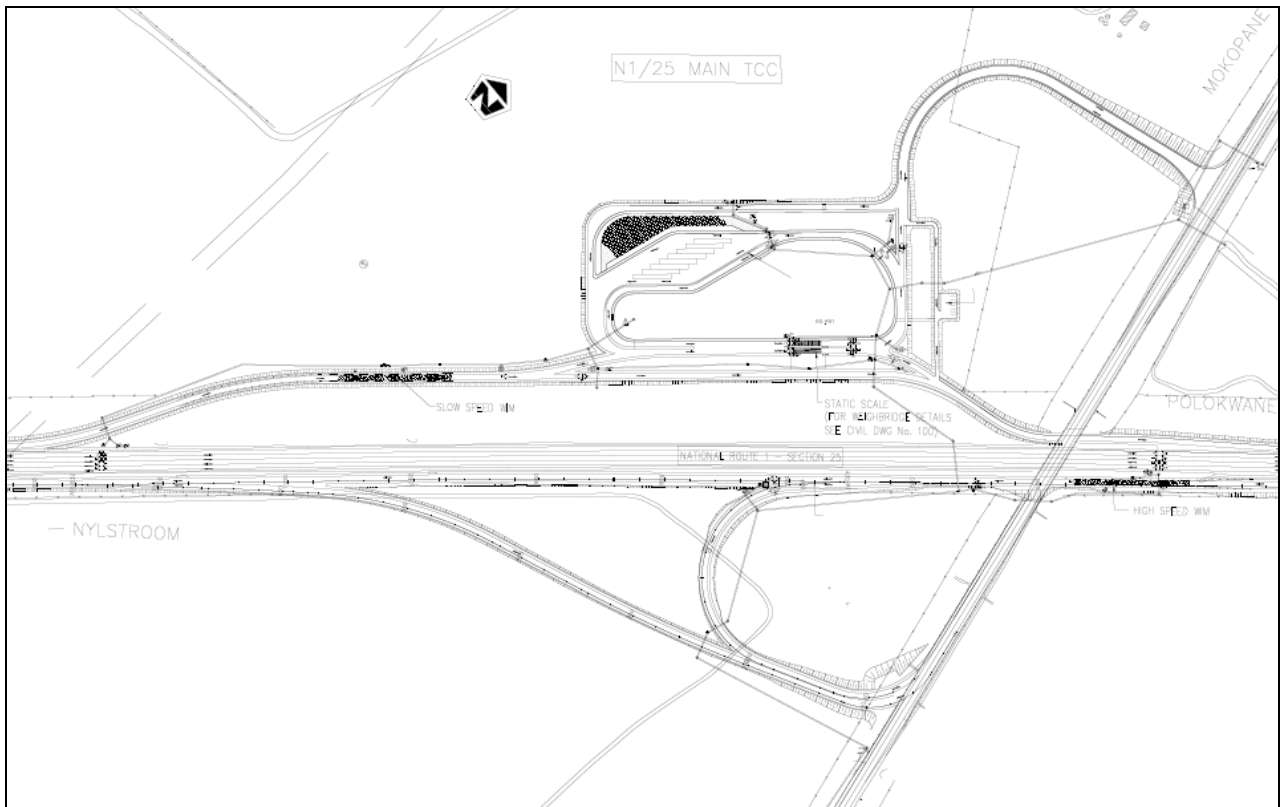


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Scope

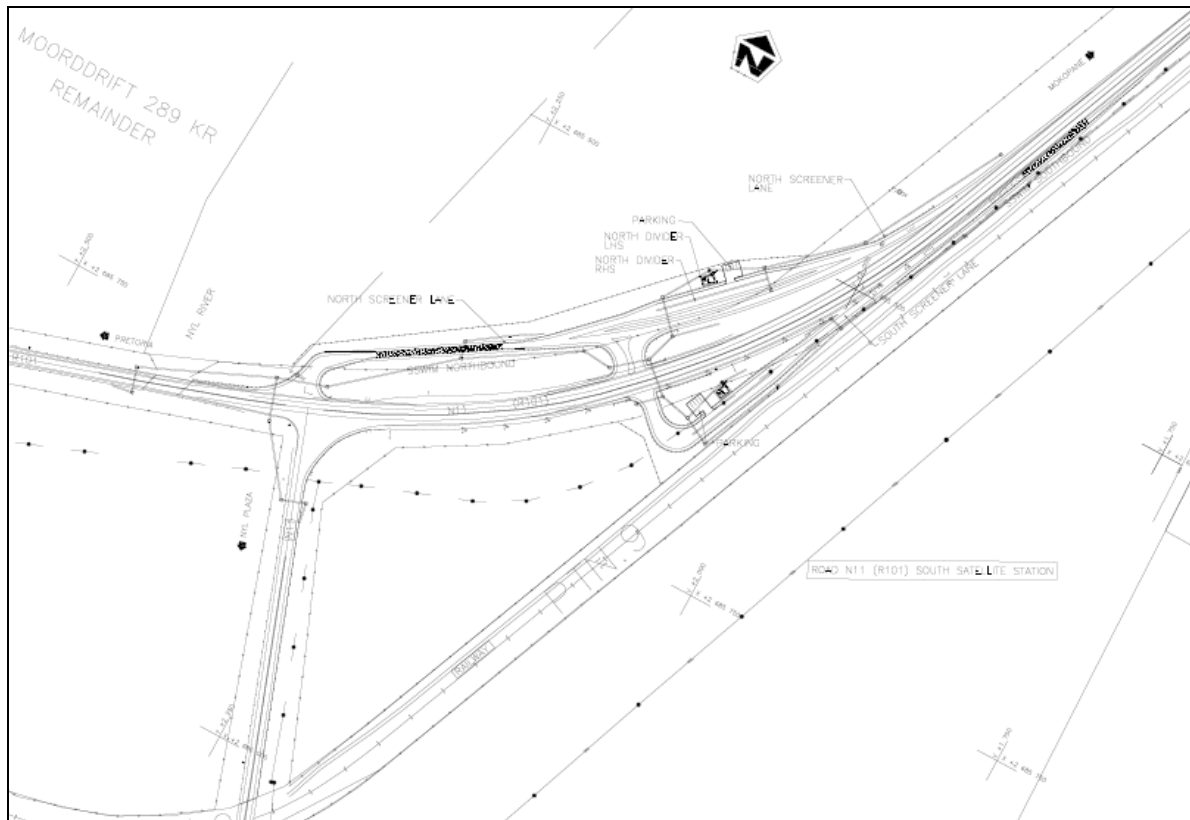
The project includes the Zebediela Traffic Control Centre on the N1 and two Satellite Stations on the N11 and on the R101.



Location of Zebediela Traffic Control Centre on the N1

The following systems will be integrated to supply the total solution:

- Site Security Surveillance
- Access Control System
- Vehicle Tracking System
- Vehicle Identification System
- Driver Identification System
- Communication Infrastructure
- Traffic Control Equipment
- Vehicle Weighing Equipment
- Vehicle Testing Equipment
- Man, Machine Interface Equipment
- Traffic Control Centre Data Processing Management System
- Electrical Infrastructure
- Integration: Control and Operations Software



Location of Satellite Station on the N11

Ermelo Traffic Control Centre

Value

R 8.9 million

Duration

Implementation Phase – 9 months, completed early 2011
 Maintenance Phase – 12 months initially, currently ongoing

Client

Mpumalanga Provincial Government

Contact

Gert Fourie
 Overload Control Manager
 Department of Roads and Transport
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Scope

The Ermelo Traffic Control Centre (ETCC) forms an integral part of the implementation of Mpumalanga’s strategic objective and mandate to protect the investment in the Province’s Roads Infrastructure through effective and ongoing monitoring and management of overloading by heavy motor vehicles.

This facility includes a screener on the one side of the town, from which vehicles are tracked by satellite in real time as depicted on the screen below, to the other side of the town where the weighbridge is located. As soon as a vehicle leaves the preset travelling corridor, the colour of the vehicle on screen changes from green to red and an alarm is given that the vehicle may be "escaping" from law enforcement.



Real time tracking of vehicles from screener via town to weighbridge

Kinross Traffic Control Centre

Value

R 3.9 million

Duration

Implementation Phase – 7 months, completed end of 2010

Maintenance Phase – 12 months initially, currently ongoing

Client

Mpumalanga Provincial Government

Contact

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Overload Control Manager
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Scope

The Kinross Traffic Control Centre (KTCC) forms an integral part of the implementation of Mpumalanga's strategic objective and mandate to protect the investment in the Province's Roads Infrastructure through effective and ongoing monitoring and management of overloading by heavy motor vehicles.

