



Registration No: 1998/009584/06

# **THE SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED**

## **STANDARD SPECIFICATIONS FOR OPERATIONS AND MAINTENANCE OF CTROM PROJECTS: GENERAL**

OCTOBER 2010

VOLUME 2 BOOK 2a

ISSUED BY:

THE CHIEF EXECUTIVE OFFICER  
SOUTH AFRICAN NATIONAL ROADS AGENCY LIMITED  
P O BOX 415  
PRETORIA  
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## **SECTION 1. OVERVIEW OF OPERATIONAL ENVIRONMENT**

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## **1.1 TYPES OF TOLL OPERATIONS**

### **1.1.1 Introduction**

1.1.1.1 Toll Operations in this specification are described in terms of the following types of Toll Plaza Operations:

- (a) Conventional type Toll Operations in the form of manual lanes that may include Electronic Toll Collection, (i.e. ETC), in the form of Mixed Manual/ETC lanes.
- (b) Hybrid type Toll Operations which include Operations in Conventional Toll Plaza lanes as well as in a Dedicated or Express ETC lane or lanes.
- (c) Conventional / ORT type Toll Operations, which are Toll Operations that occur as a result of a combination of Conventional Toll Plaza Operations and ORT Operations at one Plaza location.
- (d) Open Road Tolling (ORT) type Toll Operations.

### **1.1.1.2 Toll Operations**

- (a) The Toll Operations to be performed by the Contractor on behalf of the Employer is, in general, concerned with the capturing and collection of each individual toll transaction, the processing thereof and the collection of the associated toll payments, interfacing with road users which includes delivering Customer Services (such as registering of accounts, receipt of payments etc), delivering the toll transactions for collection of the associated toll by either the Transaction Clearing House (TCH) for ETC transactions or directly by the National Payment System (banks), as applicable, as well as the Operations and Maintenance of the Tolling System and the toll facilities.
- (b) These Standard Specifications for Operations and Maintenance therefore address the scope, functions and responsibilities of the Contractor in respect of the Operations and Maintenance of the Toll Road with emphasis upon the toll-related Operations and Maintenance. It also provides information regarding the interfaces with regard to various external entities, including the TCH and the Violations Processing Centre (VPC).

### **1.1.1.3 TCH Operations**

- (a) TCH Operations, which is the responsibility of a national TCH entity, is applicable to all Toll Plazas or Tolling Schemes in respect of which ETC is implemented. The TCH performs transaction-clearing services for a Toll Authority or a Toll Agency and central management of Customers' accounts. The functions of the TCH include account set-up, allocation of the toll transactions to individual accounts, processing of credit payments or top-ups received from Customers and to identify toll transactions for which no payment is received and pass these transactions on to the VPC (if opted-in)

for further processing. The Contractor shall interface fully with the TCH, as indicated in this document.

**1.1.1.4 VPC Operations**

- (a) VPC Operations, which is the responsibility of a national VPC entity, deals with debt recovery and preparatory actions for the transfer of possible toll infringement cases into the AARTO process. The VPC is responsible to handle the evidence related to possible infringements and the administration of prosecuting procedures as required by the AARTO process. The option for a Toll Agency (including the Contractor) to Opt-in to the VPC at a particular stage of a toll project will be available at the full discretion of the Employer. The Employer's conditions will apply to a Toll Agency that decides to Opt-in to the VPC. The Contractor shall interface to the VPC as indicated in this document.

**1.1.2 Conventional Toll Plaza Operations**

**1.1.2.1 Conventional Toll Plazas without ETC implementation.**

- (a) At Conventional Toll Plazas without ETC, only manual payment options are accepted and these consist of cash as well as accepted bank cards (such as VISA and Master Cards), and ISO-type Contractor cards, approved by the Employer, as specified in this document. Manual payment options in this case may also include automatic card machine payments. The Operator Cards are for purposes of pre-paid accounts and discounts as detailed in this specification.

**1.1.2.2 Conventional Toll Plazas with ETC implementation**

- (a) At such Toll Plazas, ETC may be implemented in manual toll collection lanes and this implementation is referred to as Mixed Manual/ETC lanes.
- (b) For Conventional Toll Plazas with ETC, all the Tag transactions shall be submitted to the TCH for processing. This means that interfacing with the TCH is a requirement.
- (c) Toll Lanes within Conventional or Hybrid Toll Plazas shall be operated in a "boom-down" scenario, i.e. under controlled traffic operations where the exit boom in a toll lane shall only be opened following a completed toll transaction where the applicable toll fee was received.

**1.1.3 Hybrid Toll Plaza Operations**

- 1.1.3.1 These are Toll Plazas at which all-manual payment options and ETC Tags are accepted and processed, either in some or all manual toll lanes and in Dedicated and/or Express ETC lanes as follows:

**1.1.3.1.1 Hybrid Toll Plazas: Dedicated ETC Lanes:**

- (a) These are Plazas at which one or more toll lanes accept and process only ETC Tags. These lanes shall be operated as “boom-down”.

**1.1.3.1.2 Hybrid Toll Plazas: Express ETC Lanes**

- (a) These are Plazas at which one or more toll lanes accept and process only ETC transactions within special dedicated ETC lanes designed to pre-validate a vehicle with an ETC Tag and to prevent the passage of a vehicle without a valid ETC Tag by means of traffic lights and booms.

**1.1.4 Conventional / ORT Toll Plaza Operations**

1.1.4.1 Conventional / ORT Toll Plaza Operations are applicable where both Conventional or Hybrid Toll Plaza Operations and ORT Operations are performed at the same location on the Toll Road. In such a case, the road user will have the opportunity to either make use of the Conventional or Hybrid Toll Plaza section (for example, on the left hand side of the Toll Road) where a vehicle has to stop in a manual toll lane or pass through a Mixed Manual/ETC lane or a Dedicated ETC lane to pay the required toll fee or alternatively to make use of the adjacent ORT section of the Toll Plaza that enables the road user to travel through the Tolling Point under free-flow conditions.

1.1.4.2 For Conventional / ORT Plaza Operations, the Contractor shall interface with the Transaction Clearing House (TCH) as well as with the VPC (if opted-in). The Contractor shall, when the Employer decides to Opt-in to the VPC, ensure that full compliance with the Employer's conditions as further described in the Employers Requirements are met.

**1.1.5 ORT Toll Plaza Operations**

1.1.5.1 For ORT Operations, the Contractor shall interface with the TCH and, if the Employer elects to Opt-in, to interface with the VPC. To Opt-in to the VPC the Contractor shall fully comply with the Employer's Requirements.

1.1.5.2 ORT Operations is concerned with the capturing of transactions at the Tolling Points along the road, the collating of data at the ORT Back Office, the validation thereof and the transmittal of the transactions to the TCH Back Office System.

## **1.2 KEY OPERATIONS OBJECTIVES**

### **1.2.1 General**

- 1.2.1.1 Regardless of the type of Operations, Toll Road Operations shall be performed in order to achieve the key operations objectives of the Employer as defined the Standard Specifications for Operations and Maintenance of CTROM Projects: Scope of Works – Generic CTROM (Volume 2 Book 1a).

## **1.3 CRITICAL SUCCESS FACTORS**

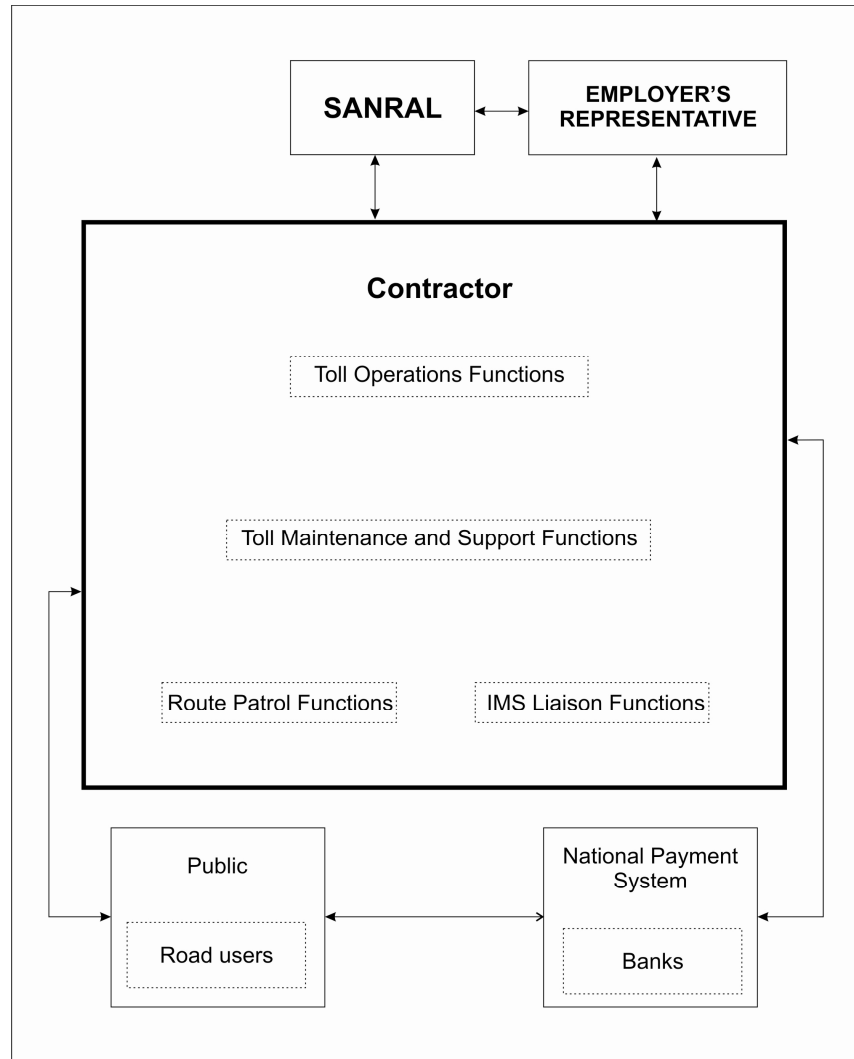
### **1.3.1 General**

- 1.3.1.1 Given the key operations objectives, the Contractor shall perform Toll Operations in order to adhere to the Critical Success Factors as defined in the Standard Specifications for Operations and Maintenance of CTROM Projects: Scope of Works – Generic CTROM (Volume 2 Book 1a).
- 1.3.1.2 These Critical Success Factors form the underlying structure of the Performance Measurement regime, as fully described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

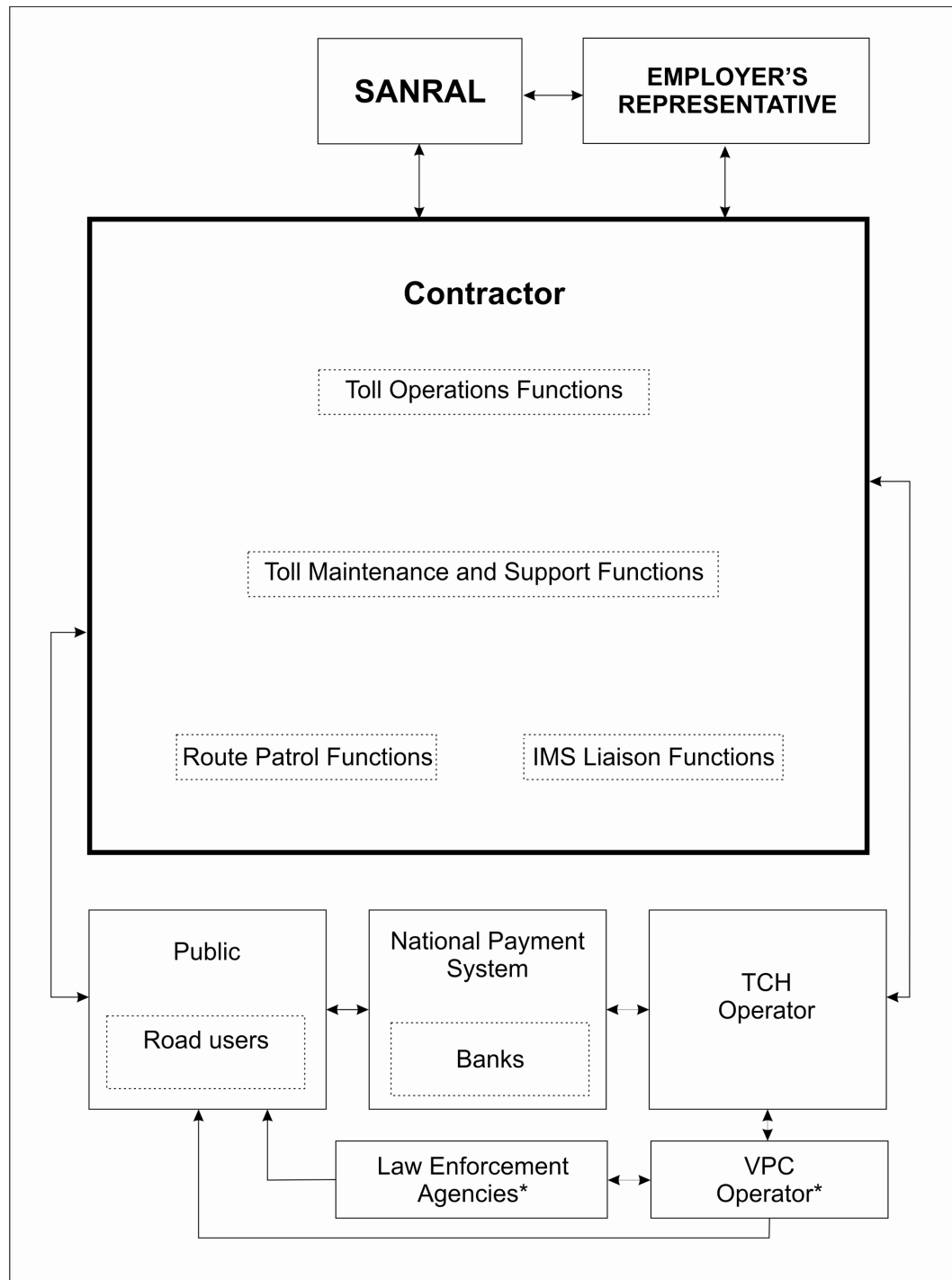
## **1.4 MAIN ROLE PLAYERS**

### **1.4.1 General**

- 1.4.1.1 The relationships of the main role players for Conventional Toll Plaza Operations, excluding ETC implementation, are shown in Figure 1-1 below.
- 1.4.1.2 The relationships of the main role players for all Toll Plaza Operations with ETC, including Conventional Toll Plazas with ETC implementation in Mixed Manual/ETC lanes, Hybrid Toll Plazas, Conventional/ORT Toll Plazas and ORT Toll Plazas are shown in Figure 1-2 below.



**FIGURE 1-1:      RELATIONSHIP OF ROLE PLAYERS (CONVENTIONAL PLAZAS EXCLUDING ETC)**



**FIGURE 1-2: RELATIONSHIP OF ROLE PLAYERS (ALL PLAZAS WITH ETC OR ORT)**

\* Only when the Employer is willing to provide the option at that stage of the project and subject to the Contractor's compliance with the Employer's conditions



## **1.5 OVERALL OPERATIONS RESPONSIBILITIES OF THE CONTRACTOR**

### **1.5.1 Contractor's Overall Operations Responsibilities**

1.5.1.1 The Contractor's overall Operations responsibilities are summarized as follows:

- (a) The Operation and Maintenance of all facilities, systems, equipment and installations to ensure efficient and effective Toll Operations;
- (b) The provision of toll road services, including:
  - i. Frequent route patrols – frequency as specified in Section 19.3 of this document.
  - ii. Participation and liaison in the IMS structures;
- (c) The provision and continual update of an Operations and Maintenance Plan, toll procedural manuals, training manuals and maintenance manuals;
- (d) The provision of all labour, materials, administration, management, co-operation, transport and any other resources required to ensure compliant and efficient Operations services;
- (e) Ensuring compliance to legal requirements such as VAT, archiving of records, etc;
- (f) Ensuring compliance to traffic safety and traffic management requirements;
- (g) The optimisation of the market share of ETC transactions in order to provide road users with the comfort, convenience, cost and timesavings associated with ETC.

### **1.5.2 Contractor's Specific Operations Responsibilities**

1.5.2.1 The Contractor's Operations responsibilities are as follows:

- (a) Capturing and processing of all toll transaction records;
- (b) Toll System maintenance;
- (c) Facilities maintenance of all buildings, structures (Toll Plaza canopies, Tolling Point gantries, etc.), Customer Service Kiosks, Technical Shelters and the like;
- (d) Back Office operations including data validation, automated data processing, data management and storage, reporting and financial management;
- (e) Maintaining a communications system and service, when supplied by the Contractor as specified in Section 11.1 of this document.

- (f) Customers' Account management and Tag issuing to Customers upon request;
- (g) Management of discounts and exempted transactions;
- (h) Adherence to required road user interfaces such as methods of payments, traffic and toll signage, etc;
- (i) Interfacing to the national TCH System for central account management and Transaction Record management purposes for all ETC transactions;
- (j) Implementing appropriate and sufficient operational work-around processes, where necessary, to ensure continuous and effective Toll Operations in case of system supply deficiencies.
- (k) The provision of the necessary Customer Service Operations at the Point of Presence Customer Service Facilities at Toll Plazas or at locations as and when required by the Employer, including Customers' account management and Tag issuing to Customers.
- (l) The optimisation of the market share of registered Tag account transactions in accordance with Employer's marketing strategies as defined in accordance with Section 15.3 of this document.
- (m) The optimisation of the availability of toll payment channels (through Point of Presence Customer Service Facilities).

### **1.5.3 ORT Contractor's Additional Operations Responsibilities**

1.5.3.1 The ORT Contractor's additional Operations responsibilities are as follows:

- (a) The capturing of complete and compliant transactions at the Tolling Points as well as the processing of all Transaction Records.
- (b) The maximisation of the payment by road users of any Violations prior to the Violation entering the AARTO process.
- (c) The provision and maintenance of Mobile Policing vehicles and Mobile Payment Stations for use during law enforcement activities.

## **1.6 OVERALL RESPONSIBILITIES OF THE EMPLOYER IN RESPECT OF TOLL OPERATIONS**

### **1.6.1 General Employer Responsibilities**

1.6.1.1 The general Employer's responsibilities are as follows:

- (a) Supervision, inspection and auditing of the Toll Operations in order to ensure that the Contractor delivers and performs in compliance with the Employer's requirements.

- (b) The provision of a national interoperable Transaction Clearing House, including the supply of ETC Tags.

## **1.6.2 ORT Operations – Employer Responsibilities**

1.6.2.1 The Employer's responsibilities are as follows:

- (a) The provision and performance of the strategic marketing function and the active promotion of the “user pays” principle.
- (b) The provision, through law enforcement agencies, of law enforcement officers and/or officials (peace officers) who will form part of the Mobile Policing Unit.
- (c) The provision of a national Violations Processing Centre.

## **1.7 PERFORMANCE MONITORING AND MEASUREMENT**

### **1.7.1 General**

1.7.1.1 In order to ensure that the key Operations objectives are met and that the Operations requirements of the Contract are complied with, the Employer will, through the Employer's Representative (ER), monitor and measure performance in respect of Toll Operations. The performance monitoring and measurement shall be performed based on the following:

- (a) Regular monitoring and measurement of **Key Performance Indicators (KPIs)**, as detailed in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a)).
- (b) Application of the **penalties** for non-conformance to specific requirements as detailed in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a)).

## **1.8 MODEL FOR TCH SERVICES**

### **1.8.1 General**

1.8.1.1 This section provides an overview of the TCH concept and the TCH functions and services to the different Toll Agencies.

1.8.1.2 A national interoperable Electronic Toll Collection (ETC) solution allows a road user to register an ETC toll account that will be valid for use across all current and future ETC enabled toll roads nationally. To this end, a TCH was established by the Employer, which is operated by an appointed agent for the national distribution of toll Tags, central ETC Customer account registration and management, transaction clearing services and account settlement to the various participating toll agencies, including concessionaires, in respect of

all ETC transactions. This will include those ETC transactions generated on all the Employer-funded toll roads and those ETC transactions generated at the all South African CTROM-type Toll Plazas and the toll road Concessionaire's Toll Plaza's. It is, therefore, an Employer requirement that the Contractor shall use the TCH for the Contractor's ETC Customer account management and transaction clearing services in respect of all ETC transactions.

1.8.1.3 The TCH will provide, amongst others, the following functions:

- (a) A single processing centre for establishing and maintaining ETC Customer accounts nationally
- (b) Periodic on-line publishing to all ETC-enabled toll agencies of Validation lists in respect of identifiers (Tags, vehicle license numbers) of vehicles associated and not associated with valid Customer accounts
- (c) ETC transaction reporting to all ETC Customers nationally through the provision of statements and/or tax invoices via the national website, SMS, e-mail, post and/or the TCH Call Centre
- (d) Payment of toll revenue to Toll Agencies, including CTROM Contractor's for all compliant ETC transaction records sent to the TCH
- (e) Procurement of toll Tags from SANRAL-nominated suppliers, warehousing and bulk-issuing of Tags to ETC-enabled Toll Agencies, including CTROM Contractor's.

1.8.1.4 Whilst most TCH services will be rendered by the TCH itself from its central location in Gauteng, certain TCH services related to the TCH need to be rendered in the region in which the Works is located. These related services shall be rendered by the Contractor and mainly include the provision of ETC-related Customer Services at all Points of Presence Customer Service Facilities selected for the Works by the Contractor and/or Employer in order to achieve the ETC market share required for acceptable Toll Plaza Operations.

1.8.1.5 Toll Agencies shall have the option to process their Violations through a national Violation Processing Centre (VPC). These Toll Agencies are referred to as Opt-in Toll Agencies. Toll Agencies who decide to handle Violations internally is referred to as Opt-out Toll Agencies.

1.8.1.6 Transaction Records

- (a) ETC Transactions, which are generated in the Lanes of Conventional and Hybrid Toll Plazas, are received and validated by the Back Office System. From there the Back Office will send them to the TCH. The TCH System will either process or reject the Transaction Record.
- (b) All ETC Transaction Records sent by the MIS to the TCH System shall comply with the minimum Transaction Record requirements as set out in the Standard

Specifications for Operations and Maintenance of CTROM Projects: Toll Systems  
(Volume 2 Book 4a).

- (c) The TCH System will not accept any duplicate Transaction Records.

#### 1.8.1.7 TCH Transaction Process Flow

- (a) Transaction records shall be sent to the TCH within a predefined time in accordance with the Business Rules in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability – Business Rules (Volume 2 Book 8a).
- (b) Transaction Records send to the TCH will be verified and validated by the TCH. The Transaction Record can be:
  - i. Directly linked to a pre-paid Customer Account;
  - ii. Directly linked to a post-paid Customer Account;
  - iii. An Exempt Account;
  - iv. A Free-passage Account; or,
  - v. A Potential Violation.
- (c) Transaction Records that are not valid will be rejected by the TCH.

#### 1.8.1.8 Description of TCH Services

- (a) The TCH fee, as indicated in Section 1.9, includes for the following services to be rendered by the TCH to the Contractor:
  - i. Continuous management and maintenance of the third party interfaces for the TCH services related to the Toll Agencies, including the Contractor's
  - ii. Financial management, reconciliation, administration and reporting for the Toll Agencies. This includes for all processes and activities to perform the setting-up and operation of Inter-Entity Accounts and the preparation and checking of statements and tax invoices and a summary of Inter-Entity payments. Refer to section 1.8.3 for more details.
  - iii. Transaction processing fee for Transaction Records processed: This includes for all processes and activities, including account management, to ensure that each transaction record that is received from the Contractor is either allocated to an account (either an existing or a newly created account or a non-identified vehicle account) or sent back to the Contractor if the transaction record is not compliant and, therefore, rejected. This also provides for the management,

upkeep and correct distribution of the validation lists. Refer to section 1.8.4 and 1.8.6 for more details.

- iv. Processing of payment of Customer Account Transactions: This includes for either cash payments received or payments via the banking system (credit cards, debit cards, EFTs). Refer to section 1.8.6 for more details.
  - v. Cost of communication with Customers to facilitate payment of Transaction Records, etc.: This includes for communication by means of SMS, e-mails, cell-phone and landline calls, fax and letters.
  - vi. Receiving, testing, packaging, preparation of fitting instructions and storage of Tags: Refer to section 1.8.7 for more details.
  - vii. Tag status changes, support, monitoring and reporting functions and other Tag-related tasks: See 1.8.7 for more details.
  - viii. The establishment, management and operation of a call centre to handle ETC account-related and other enquires from and communication with Customers.
  - ix. The handling of queries from the public by means of the TCH website, e-mail, fax and post.
  - x. Incentive payments to the TCH for every account registered and activated at the call centre.
  - xi. Incentive payments to the TCH for every account registered and activated through the TCH web-site or by fax, e-mail or post.
- (b) The TCH Operator will provide certain national services as listed below. In return the Toll Agency shall pay a transaction fee to the TCH and shall receive payment for their services from the TCH for all transactions associated with both unregistered users and TCH Customers.

## **1.8.2 Third Party Interfaces**

- 1.8.2.1 The TCH Operator will be responsible for checking any messages that are flagged as not conforming to agreed interface standards, such as Transaction Records and will manage the timelines for message transmission from and acceptance by the TCH system.
- 1.8.2.2 The TCH Operator (or the TCH system) is able to request individual messages and to respond to such requests. It shall also enable any missing messages to be identified.
- 1.8.2.3 Below please find a list of required third party interfaces to the TCH:
- (a) Interface between the TCH and a Toll Agency such as a CTROM Contractor.

- (b) Interface between the TCH to Customer (Web site, Call Centre, post)
- (c) Interface between the TCH and Point of Presence Customer Service Facilities
- (d) Interface between the TCH and RTIA (NaTIS)
- (e) Interface between the TCH and the VPC (This is only applicable to Opt-in Toll Agencies)
- (f) Interface between the TCH and the Banks
- (g) Interface between the TCH and the Employer for reporting purposes

1.8.2.4 The TCH Operator will prepare and enter into service level agreements with each Toll Agency or other party that interfaces to it.

1.8.2.5 The service level agreements shall detail the payment structures between the TCH and Toll Agency or other party and the reporting and accounting requirements that need to be kept in place so that the necessary invoices and statements can be prepared and checked and if necessary queried by the receiving party.

### **1.8.3 Financial Management**

1.8.3.1 The TCH Operator will set up and operate an Operational Account for business relations with all Entities and other organisations that the TCA Operator has a business or contractual relationship with.

1.8.3.2 The TCH Operator prepares (or receives) statements/Tax Invoices for/from each Entity/organisation that he has a business relationship with. The TCH Operator will also handle any queries raised on statements/Tax Invoices issued by him. Inter Entity payments or payments to/from another organisation shall be made and recorded in accordance with the agreed terms of the service level agreement.

1.8.3.3 The TCH Operator reports on a monthly basis to the Employer.

### **1.8.4 Transaction Record Processing**

1.8.4.1 The TCH System data base keeps a record of each Transaction Record received and the action taken with it. These records will be used as a basis for reporting, reconciliation and status checking. These records will be continuously updated.

1.8.4.2 The TCH system will perform a check of various aspects of all Transaction Records received to ensure that they conform to the Project Business Rules and are Valid Transaction Records. Non-Valid Transaction Records may be rejected.

1.8.4.3 Local Discounts, as applied to Transaction Records at the Toll Agency will be checked by the TCH when the Transaction Record is allocated to the Customer Account.

1.8.4.4 The TCH Operator will have procedures to handle Tag mis-use, Incomplete Transaction Records etc.

### **1.8.5 Validation Lists**

1.8.5.1 Although there will be many lists being exchanged between the TCH and Toll Agencies, there are specific lists of interest that needs to be made available, such as the Green List, Grey List and Red List.

#### **1.8.5.2 Green List**

- (a) The Green List contains all Tag numbers and VLN's (where applicable) that are to be accepted by the Toll Agencies.
- (b) The Green List is made available in full once a day at an off-peak time.
- (c) Changes to the Green List are available at regular configurable intervals, according to the Business Rules as contained in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).
- (d) The Green List contains at least the following information for each vehicle linked to a Customer Account:
  - VLN (Applicable to ORT Operations);
  - Personal Account Number (Tag number);
  - Generic Vehicle Class;
  - Project Vehicle Class;
  - Account type, e.g. Pre-paid Tag Account; and
  - Discount Category.

#### **1.8.5.3 Grey List**

- (a) The Grey List contains a list of Personal Account Numbers and VLN's (where applicable) where the associated Pre-Paid Customer Account has a low balance.
- (b) The full list is made available at regular configurable intervals as defined by the Business Rules as contained in the Standard Specifications for Operations and



Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).

(c) The Grey List contains at least the following information:

- VLN (Applicable to ORT Operations); and
- Personal Account Number (Tag number).

#### 1.8.5.4 Red List

a. The Red List contains a list of Personal Account Numbers and VLN's (where applicable) where the associated Account has insufficient funds.

(b) The full list is made available at regular configurable intervals as defined by the Business Rules as contained in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).

(c) The Red List contains at least the following information:

- VLN (Applicable to ORT Operations);
- Personal Account Number (Tag number); and
- Reason.

#### 1.8.5.5 Exempt List

(d) The Contractor shall compile and manage a detailed list of Exempt Vehicles and Free Passage vehicles, applicable to each route and/or gantry.

### 1.8.6 Registration and Management of Accounts

1.8.6.1 The TCH Operator is responsible for the registration and management of Accounts, which include the following:

- (a) Account registration and updates;
- (b) Tag and VLN Identifier registration;
- (c) Linking of payments means to the Account and receipt of payments;
- (d) The linking and storing of communication (voice, fax, electronic etc) received to the Account;
- (e) Receiving of Transaction Records from the Toll Agency and posting of the Transaction Records to the Customer Account;

- (f) Processing of payments received from Customers;
- (g) Generation of Statements and invoices;
- (h) Account corrections;
- (i) Reconciliation of the Transaction Records received from the Toll Agency, and
- (j) Interfacing to the TCH bank for payment requests and reconciliation purposes. Typical payment requests include debit orders and credit card Transaction Records (Card Not Present) linked to payments.

1.8.6.2 The following functions are not necessarily visible to the Customer Account holder but they must be integrated as part of the complete Account management:

- (a) Tag issuing;
- (b) Lost, damaged and stolen Tags;
- (c) Tag life expectancy, and
- (d) Reporting.

#### **1.8.7 Tag Management**

1.8.7.1 The TCH Operator will manage the distribution of Tags from the time of their receipt from the Tag Supplier until they are written off due to damage, loss or expired life, or are subject to hand back in accordance with the provisions of the Contract. The management responsibility will be undertaken through the use of the stock control system. Tags associated with Legacy Accounts may be subject to different arrangements, subject to the agreement of the issuing Toll Agency.

1.8.7.2 The TCH Operator will also arrange suitable branding and packaging.

1.8.7.3 The TCH Operator will implement a Customer Account Identification Card which will be a bank card sized plastic card with a unique visible reference number, the same number encoded on a magnetic stripe and on a bar code. The reference number will be linked to the Customer Account and will provide an easy means for the Customer to reference his account for top up or enquiry services.

1.8.7.4 The TCH Operator will implement the concept of a 'Tag in a Bag' product. This is a Tag and holder, linked Customer Account Identification Card, fitting instructions and Customer Account set up instructions packaged in a suitable branded metallised bag or other suitable packaging and available for distribution to Appointed Agents and Point of Presence Customer Service Facilities. 'Tag in a Bag' Tags shall be accepted in the Lanes of the Toll Agency.

1.8.7.5 The TCH Operator will receive and account for any payments required for lost, stolen or damaged Tags required by the Project Business Rules.

1.8.7.6 The TCH Operator will manage changes to the Security Keys used to protect the DSRC communication to ensure that it remains secure.

## **1.9 COST OF TCH SERVICES**

### **1.9.1 General**

1.9.1.1 The cost of TCH services will be published by the TCH and/or the Employer from time to time. A Provisional Sum is allowed in the Schedule of Payments for these costs. The cost categories of the TCH services are shown below.

1.9.1.2 The cost of TCH Services to the Contractor will be divided into the following categories

- (a) in respect of fees/commissions payable to banks and to other providers of payment means:
  - i. A percentage (%) of the value of the relevant ETC transactions in the case of credit card payments; and
  - ii. A percentage (%) of the value of the relevant ETC transactions in the case of debit card payments;
- (b) in respect of fees/commissions payable to payment channels such as e-commerce gateway, retailers with point of sales terminals, A percentage (%) of the value of the relevant ETC transactions;
- (c) A fixed price per toll Tag.
- (d) A fixed service fee payable to the TCH per Transaction Record.

#### **1.9.1.3 Fees / Commission**

The fees referred to above shall change from time to time in accordance with instructions by the Employer.

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**SECTION 2. PROJECT COMMENCEMENT: HANDOVER AND  
PROVISION OF DOCUMENTS**

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## **2.1 GENERAL**

### **2.1.1 Introduction**

2.1.1.1 This section relates to the provision of documents, drawings and Software (excluding Operations and Maintenance reports, which are described in Section 18) by the Employer and the Contractor.

2.1.1.2 The submission of all documentation, as described in this Section, (excluding the Toll System preliminary and detail design documents, as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a)), shall be as follows:

- (a) One electronic copy
- (b) Four hard copies

### **2.1.2 Assignment of responsibility for Documentation**

2.1.2.1 Contractor's Documents; if the Contractor constructs and/or provides new facilities and/or systems and/or installations (e.g. Plant) as part of the Contract, all the documentation, drawings, Software etc that relates to the new facilities and/or systems and/or installations shall be the responsibility of the Contractor, as specified further in this Section.

2.1.2.2 Employer's Documents: If the Contract includes existing facilities and/or systems and/or installations to be handed to the Contractor, the Employer will be responsible for the provision of the applicable documentation, drawings, Software etc. as specified further in this Section.

## **2.2 EMPLOYER'S DOCUMENTS, DRAWINGS & SOFTWARE**

### **2.2.1 General**

2.2.1.1 The Employer shall issue to the Contractor all available documentation as listed below at no later than the Tolling Date.

2.2.1.2 As-Built Drawings: The Employer will issue the Contractor with any available as-built drawings in respect of facilities, systems and installations as and where applicable.

2.2.1.3 Equipment User Manuals: The Employer will issue the Contractor with any available equipment user manuals for the Operations and Maintenance of all existing Equipment. Where applicable, the Employer shall issue, inter alia, any available Equipment user manuals for the:

- (a) Back Office System and related Equipment;
- (b) Toll Plaza and Road Side System Equipment;
- (c) Electrical and mechanical Equipment;
- (d) Incident Management Systems and related Equipment.

2.2.1.4 Equipment and System Manuals from 3<sup>rd</sup> party suppliers: Where applicable, the Employer will issue the Contractor with any available equipment and system supplier's manuals in respect of 3<sup>rd</sup> party supplier's equipment.

2.2.1.5 Software and Software User Manuals: The Employer will issue the Contractor with any Software and Software user manuals in accordance with any licensing conditions which may apply.

## **2.2.2 Electrical Certificate of Compliance**

2.2.2.1 On or before Tolling Date, the Employer will issue the Contractor with electrical certificates of compliance for each existing Toll Plaza, Tolling Point, structure or building facility.

2.2.2.2 The certificate of compliance will not be older than 4 (four) months before Tolling Date. The certificate of compliance will reflect all modifications to electrical equipment prior to Tolling Date.

2.2.2.3 The certificate of compliance will be issued in accordance with the latest versions of SABS 10142 and the Occupational Health and Safety Act, 1993.

## **2.2.3 Asset Register**

2.2.3.1 The Project Document: Volume 3, will include a provisional asset register as well as the required Employer format for the Asset Management System.

2.2.3.2 On or before Tolling Date, the Employer will issue the Contractor with an updated asset register.

2.2.3.3 No later than 1 (one) month after the Tolling Date, the Contractor shall implement an electronic Asset Management System in accordance with the Public Finance Management Act of 1999 and the required Employer format. If the required Employer format was not issued, the Contractor shall request such in writing from the Employer. The Asset Management System shall include an equipment record system as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The Contractor shall maintain and update the Asset Management System to

reflect any changes in the register implemented by the Contractor in accordance with the provisions within this document.

## **2.3 CONTRACTOR'S DOCUMENTS, DRAWINGS & SOFTWARE**

### **2.3.1 New or Upgraded Toll System or Equipment**

2.3.1.1 The Contractor shall within 1 (one) month after installing and commissioning any new or upgraded Toll System and/or equipment, submit to the Employer all the related manuals and Software, which shall include the following:

- (a) Back-up, archive and restore utility manuals;
- (b) Equipment user manuals for the different levels of users;
- (c) Equipment supplier's manuals;
- (d) Equipment maintenance manuals;
- (e) As-built drawings and diagrams;
- (f) Full Toll System recovery pack, that shall include all Software required to fully re-install and/or re-configure the Tolling System. The full Tolling System recovery pack shall also include a comprehensive installation manual which will enable a Toll System technician to completely install such Tolling System;
- (g) Toll System administrator's manual that shall enable any suitably skilled system administrator to maintain the Tolling System. The Tolling System administrator's manual shall include:
  - i. Data dictionary;
  - ii. Network configuration;
  - iii. Parameter set-up information for operating system, database and application Software;
  - iv. Toll System layout and hardware configuration information, including hardware specifications and layout diagrams; and
  - v. All passwords and user configuration information with regards to the different staffing responsibilities, for example:
    - Toll Collector;
    - Supervisor;
    - Admin clerk;

- Bookkeeper;
- Plaza Manager;
- Auditor;
- Maintenance technician; and
- Operations Manager.

- (h) Back-up, archive and restore utility;
- (i) Set of equipment and system user manuals on various levels of use; and
- (j) A set of guidelines and protocols for good housekeeping, general system administration and emergencies in the event of system failure and management of related incidents.

### **2.3.2 Software Licences and ESCROW agreements**

2.3.2.1 The Contractor shall comply with the requirements with regard to proprietary Software licences and escrow agreements as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The Contractor shall procure all third party Software licences in respect of any new third party Equipment and/or systems. These licences shall be perpetual, unrestrictive, where any is required, for all software i.e. Operating Systems, databases, applications software, firmware, etc, for any new equipment and/or systems in the name of the Employer, so that any propriety in respect of such software and or hardware licences vest in the name of the Employer. These licences shall be transferred to the Employer at successful commissioning of the respective Equipment and/or systems or in the event of Contract termination. All third party licences shall have no time or period related restriction on any such licenses or system functionality.

2.3.2.2 In addition, the Contractor shall, for every new version or patch of the Toll System Software, ensure that the upgraded Tolling System Software source code and associated design, installation, user and support documentation that form the escrow package, be placed into escrow, within 30 (thirty) days after such new version or patch has been approved by the Employer.

### **2.3.3 Operations and Maintenance Manuals**

2.3.3.1 The Contractor shall draft procedure manuals in respect of all aspects of the Operations and Maintenance, which shall include the following:

- (a) Procedures for traffic management;
- (b) Procedures for transaction and financial management;



- (c) Procedures for route patrols;
- (d) Procedures for safety and security;
- (e) Procedures for the Operation and Maintenance of the Tolling System;
- (f) Procedures for the Operation and Maintenance of the electrical and mechanical equipment;
- (g) Procedures for the Operation and Maintenance of the emergency communication system;
- (h) Procedures for the Operation and Maintenance of the Asset Management System; and
- (i) AVC quality control system manuals.

2.3.3.2 All Operations and Maintenance Manuals shall be based on principles contained in the most current version of ISO 9001. The Contractor shall also ensure that all procedures followed for Operation and Maintenance shall be ISO 9001 compliant.

2.3.3.3 The Contractor shall submit all Operations and Maintenance Manuals to the Employer's Representative in accordance with the Contractors proposal and approved establishment programme as contained in the Project Document: Volume 3 or one month before commissioning of any new Toll System.

2.3.3.4 On submission of the Operations and Maintenance procedure manuals by the Contractor, the Employer shall evaluate whether these manuals have been drafted in a manner appropriate to their purpose and whether all elements of the various procedures have been adequately addressed. Any significant omissions and/or modifications which are identified in respect of these manuals shall be remedied by the Contractor to the satisfaction of the Employer.

#### **2.3.4 Penalties**

2.3.4.1 For the non-compliance of hand-over obligations, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **2.4 MAINTENANCE OF DOCUMENTS, DRAWINGS & SOFTWARE**

#### **2.4.1 General Requirements**

2.4.1.1 The Contractor shall keep all documents, drawings and Software in a safe place, in good order and up-to-date, and in a condition which shall make such documents auditable by the

Employer at any time. The Contractor shall keep all versions of documents in hard copy format and in electronic format.

2.4.1.2 At the request of the Employer at any time, the Contractor shall provide an additional hard or electronic copy of any document, drawing and/or Software.

2.4.1.3 The Contractor shall maintain a register in respect of all documents in the Asset Management System referred to in these documents in electronic format. The register shall contain at least the following:

- (a) All documents, with the following information:
  - i. The subject of the document;
  - ii. Document or drawing number
  - iii. Document title;
  - iv. Origin of document (Entity name, Name of Document Owner)
  - v. File Name
  - vi. Date issued (e.g. Commencement Date or other);
  - vii. Status of document (e.g. draft, for review, approved, implemented, outdated, etc.) date revised and revision number.
- (b) All drawings, with the following information:
  - i. Drawing title;
  - ii. Drawing number;
  - iii. Date issued;
  - iv. Date revised and revision number.
- (c) All Software: For each Software package, the following shall be included in the register:
  - i. Details of the Software developer (company, telephone number(s), website, e-mail addresses, support contacts' names and cellular numbers).
  - ii. IT specialist (person responsible for controlling the Software package, with contact details).
  - iii. Type of Software.
  - iv. Version control number.

- v. Licences and/or serial number.
  - vi. Validity date of licence (start date, end date).
  - vii. Place of storage (e.g. safe 1 – building a).
  - viii. A configuration and version control manual.
- (d) All other assets, as described in the section on the Asset Management System. For Systems and equipment (i.e. Plant), the following shall be provided by the Contractor to the Employer
- i. A register with means to identifying individual items as part of Plant;
  - ii. Each asset shall be uniquely numbered to make identification and linking of each asset to this register easy;
  - iii. The Contractor shall ensure that this register contains the asset's date of purchase, asset description, asset number, purchase value, life expectancy and other information required for tax purposes.
- (e) The Contractor shall update the document register upon the issuing of new documents, drawings or Software or the revision of existing documents, drawings or Software. To this end, the Contractor shall implement a revision control system in respect of all documents, drawings and Software.
- (f) The Contractor shall provide the Employer and/or Employer's Representative with access to all documents for the purpose of inspection and audit.
- (g) If, during an audit by the Employer and/or the Employer's Representative they discover the absence/omission of documents, the Contractor shall replace all such missing documents within 1 (one) month of such audit.

## **2.5 RETURN OF DOCUMENTS, DRAWINGS AND SOFTWARE**

### **2.5.1 General**

- 2.5.1.1 For return of documents, drawings and software, refer to Section 17: Project Completion and Hand back of this document.

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## **SECTION 3. OPERATIONAL FOOTPRINT**

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### **3.1 CONVENTIONAL AND HYBRID TOLL PLAZAS: OPERATIONAL FOOT PRINT**

#### **3.1.1 General**

3.1.1.1 For Conventional and Hybrid Toll Plazas, the operational footprint will consist of the Toll Plaza area, inclusive of the Toll Lane area and Plaza buildings. In the event that ETC is implemented, the footprint will also include the Point of Presence Customer Service Facilities, i.e. Satellite Centres, Customer Service Kiosks (permanent and temporary) and the premises of appointed agents of the TCH, such as the retail outlets providing Customer Services. The Point of Presence Customer Service Facilities is specified in Clause 3.1.2 below.

3.1.1.2 The above-mentioned Point of Presence Customer Service Facilities will, inter alia, serve road users who want to register Customer Accounts and/or apply for Tags and/or make payments. It may be located at toll plazas or remote locations.

3.1.1.3 Permanent Kiosks may either be provided by the Contractor or it may be provided by the other contractors or Toll Agencies that are also operating Toll Roads. All Customer Service Kiosks are however interfaced with the national TCH.

#### **3.1.2 Permanent and Temporary Customer Service Kiosks**

3.1.2.1 These are to be located at Toll Plazas, selected shopping centres, fuel service stations, public areas and the like, as required in the Project Document: Volume 3, to provide facilities at which road users can register an account, collect a Tag, pay accounts, make account queries, utilise after sales support services on Tags, etc.

3.1.2.2 Permanent Kiosks are either rented retail space at shopping centres or a facility at a toll Plaza which are fitted and equipped with service counters where the Contractor's staff provides Customer Services to the public.

3.1.2.3 Temporary Kiosks provide the same Customer Services, but from moveable facilities that operate as typical trade fair stands in the corridors of shopping centres. The Temporary Kiosks can be moved between locations depending on demand. It can be dismantled to be used at later stages when, for instance, special marketing drives takes place.

3.1.2.4 Based on the specified footprint as described in Clause 3.1.2.1 above, the Contractor will be responsible to identify rentable retail floor space that is visible from the public's point of view, is safe and conformant with parking facilities and in accordance with the requirements the Project Document: Volume 3. The Employer will be involved, with the Contractor, to negotiate the monthly rates whilst the Contractor shall manage the entire procurement process and sign the rental agreement/s.

3.1.2.5 The Contractor shall draft the operational and functional specifications of the permanent and temporary Kiosks in accordance with the marketing plan and project branding guidelines of the Employer and/or the TCH in order to enable the Contractor appointed architect, (as approved by the Employer), to design the Kiosks. The design of the Kiosks will include the shop fittings, furniture, branding applications as well as the stands of the temporary Kiosks.

3.1.2.6 The Contractor shall, in accordance with the designs of the above-mentioned architect, procure the manufacturing and construction of the Kiosk shop fittings and furniture.

## **3.2 CONVENTIONAL/ORT AND ORT TOLL PLAZAS (WHEN TRIGGERED)**

### **3.2.1 Conventional/ORT and ORT Foot print**

3.2.1.1 The following facilities will form part of the Operations footprint in relation to the ORT part of Conventional/ORT and ORT Toll Plazas:

- (a) A Central Operations Centre, which can be located at a Conventional Plaza, or as specified in the Project Document: Volume 3 at which the centralised project Operations shall take place.
- (b) Tolling Points to accommodate Open Road Tolling, consisting of gantries and associated Technical Shelters, which Shelters shall accommodate the components of the Roadside Systems not mounted on the Tolling Point gantries themselves.
- (c) Tolling System and Operations Disaster Recovery centre, as specified in accordance with the Contractor's business continuity plan, Clause 5.5.
- (d) Satellite Centres shall provide facilities to accommodate the Customer Service, ITS, Mobile Policing and maintenance functions. The Contractor shall be fully responsible for the Customer Service and maintenance functions at these Centres. Satellite Centers shall only be available if and when as specified in the Project Document: Volume 3.

#### **3.2.1.2 Customer Service Kiosks**

- (a) If ORT operations are triggered, the Employer may decide to increase the number of permanent Customer Service Kiosks to be operated by the Contractor.
- (b) The Employer may, in addition, deploy temporary Customer Service Kiosks to accommodate the additional account registration demand after ORT is triggered. The number and locations of temporary Customer Service Kiosks shall be decided by the Employer when ORT is triggered.
- (c) The identified locations of the temporary Customer Service Kiosks will, furthermore, be based on the marketing plans and strategy of the Employer and/or the TCH.

- (d) The Employer shall negotiate rental rates and the rental term and the Contractor shall sign the rental or lease agreement with the Landlord of each identified location.

**3.2.1.3 Mobile Payment Stations**

- (a) The Mobile Payment Stations to be provided by the Contractor shall serve two purposes. Firstly, they shall be used as Customer Service Kiosks during the account registration and Tag distribution before the commencement of Open Road Tolling. Secondly, they are required from commencement of Open Road Tolling, for use at enforcement locations and / or lay-byes where road users can register an account and/or make payments when such road users are prohibited from using the motorway due to their actual or potential Violator status. This application of the Mobile Payment Stations (MPSs) for enforcement purposes shall take precedence after the implementation of ORT. The MPSs shall, therefore, only be used for Customer Service if there is no specific enforcement need during that period.
- (b) The number, type and sizes (i.e. number of workstations per MPS) of MPSs to be deployed by the Contractor shall be decided by the Employer when ORT is triggered.

**3.2.1.4 Information Points**

The Employer may decide that the Contractor implement information points, in accordance with the Project Document: Volume 3, prior to and after the commencement of Open Road Tolling. The purpose of the information points would typically be to convey to the public information on where accounts could be registered, Tags could be ordered, collected, etc, through either direct communication with the public or by means of the handing out of information pamphlets. These facilities will not be required to provide any account registration services.

**3.3 SUMMARY OF TOLL FACILITIES**

**3.3.1 Toll facilities available for the different types of Operations**

- 3.3.1.1 The table below indicates the facilities that are required for each type of toll Operation. Some of the facilities are required for more than one type of Operation while others are restricted to a specific type of toll Operation.

**TABLE 3-1: SUMMARY OF TOLL FACILITIES FOR EACH TYPE OF TOLL OPERATION**

<b>Toll Facility</b>	<b>Conventional &amp; Hybrid Operations</b>	<b>Conventional / ORT Operations</b>	<b>ORT Operations</b>
Conventional Toll Plaza with toll lanes and toll plaza buildings	<b>X</b>	<b>X</b>	

Toll Facility	Conventional & Hybrid Operations	Conventional / ORT Operations	ORT Operations
Tolling Points with Technical Shelters		X	X
Central Operations Centre	X <sup>1)</sup>	X <sup>1)</sup>	X
Permanent Customer Service Kiosks	X	X	X
Temporary Customer Service Kiosks – during ramp-up	X	X	X
Satellite Centres	X <sup>1)</sup>	X	X
Mobile Payment Stations	X <sup>2)</sup>	X	X
Mobile Policing vehicles		X	X
Information Points		X	X
Tolling System and Operations Disaster Recovery Centre		X	X

<sup>1)</sup> if warranted by the size of the toll project

<sup>2)</sup> depending upon the intensity of the marketing required to increase the ETC market share

### 3.4 TOLL PLAZAS, SATELLITE CENTRES, CUSTOMER SERVICE KIOSKS AND MOBILE PAYMENT STATIONS: HIGH-LEVEL SPECIFICATIONS

#### 3.4.1 General

3.4.1.1 As the Satellite Centres, Customer Service Kiosks and Mobile Payment Stations will provide one or more Point of Presence contact points (i.e. service counters) to the Road Users, they shall have a professional appearance and adhere to the Employer's branding in order to be easily recognisable. Branding will be determined based on the marketing plans and strategies of the Employer and the TCH. The design, layout and quality are to be approved by the Employer.

3.4.1.2 Aspects to be considered by the Contractor in the drafting of the functional and operational specifications to enable the nominated Employer architect to design the Customer Service Kiosks and Mobile Payment Stations are the following:

- (a) The Contractor's own specific operational requirements at the facility;
- (b) Number of workstations / Customer-points at each Customer Service Kiosk: The Contractor shall supply at least three Customer Service workstations and one supervisor workstation in each Kiosk unless otherwise specified in the Project



Document: Volume 3. The workstations shall be linked to the TCH (and VPC Systems, if opted-in).

- (c) Size of the Customer Service Kiosk: The Kiosk size shall depend on the number of workstations that is to be provided. The sizing of the Kiosks should be designed to accommodate the personnel, required equipment, and a waiting and serving area for Customers.
- (d) Hours of Operation:
  - i) If the Customer Service Kiosks are located in a shopping centre with pre-scribed business hours, the hours of operation shall comply with the shopping centre requirements. Otherwise, the working hours shall be as specified in the Project Document: Volume 3,
  - ii) The Customer Service facilities at Toll Plazas shall be open to the Road Users from 08:00 until 17:00, or as specified in the Project Document: Volume 3.
  - iii) The Customer Service Kiosks shall be available for 99,7% of the time. Performance measurement shall be carried out in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- (e) Lighting requirements: The lighting requirements shall be as per the minimum requirements for office and public areas.
- (f) UPS requirements: UPS power is required for at least 30 minutes of operation of all the workstations to enable full Point of Presence operations.
- (g) Standby generator / emergency power: If the Kiosk is situated within a shopping complex where emergency power is available, the Contractor shall utilize such emergency power. The Operations and Maintenance Plan shall provide the requirements and procedures for the use of emergency power where emergency power is not available within shopping complexes for approval by the Employer.
- (h) Data communication requirements: All necessary communications, including a back-up communications link, are required for effective Point of Presence Customer Service operations, with appropriate security measures.
- (i) Branding: The branding shall be Project related and in accordance with the Employer's branding manual. The proposed branding application shall be approved by the Employer.
- (j) Ablutions: The use of the shopping centre facility ablutions is acceptable should the Kiosk not have its own ablution services. Mobile Payment Stations shall be equipped or have attached ablution facilities.

- (k) Furniture: The Contractor shall provide all furniture, i.e. desks, counters, chairs etc to be able to perform his functions as part of Contractor's equipment. Provision shall be made for a waiting area for the public, including chairs and tables. This is to be included in the Operations and Maintenance Plan for approval by the Employer.
- (l) Security: As a minimum, the following security measures are required:
  - i. Secure lockable doors,
  - ii. Alarm system with a panic button for armed response
  - iii. A day-safe to accommodate for at least one operational day, the cash collected and float requirements.
  - iv. Security surveillance cameras
- (m) The following system and other interface requirements shall be provided by the Contractor:
  - i. All necessary equipment, systems, interfaces and communications for Point of Presence Customer Service Operations.
  - ii. The devices required to link to the banking institutions to enable transaction payments by means of bank credit cards, debit cards etc.
  - iii. The Tag readers for Tag issuing and support purposes.

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**SECTION 4. TOLL PLAZA EXPANSIONS AND UPGRADES, ROAD  
IMPROVEMENTS AND OTHER IMPROVEMENTS**

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## **4.1 TOLL PLAZA EXPANSIONS**

### **4.1.1 Toll Plaza Expansion Schedule**

4.1.1.1 Toll Plaza expansion includes the following:

- (a) The addition to, upgrading or conversion of Lanes at any of the mainline, local ramp and/or remote ramp Toll Plazas; and
- (b) The associated addition to, upgrading or conversion of Employers Fixed Assets and Employers Equipment (i.e. existing toll equipment).

4.1.1.2 The Toll Plaza expansion schedule envisaged by the Employer shall be included in the Project Document: Volume 3. The expansion schedule shall indicate the number of Lanes that will be added including the possible reconfiguration of Manual Lanes, Mixed Manual/ETC Lanes and Dedicated ETC Lanes and the Employers Fixed Assets that will be provided. The expansion schedule shall be based on the criteria and parameters for future Toll Plaza expansions, as indicated below:

4.1.1.3 Criteria and parameters for Virtual Toll Plaza sizing and future Virtual Toll Plaza expansions or upgrading, taking into account different types of Toll Lane combinations (excluding ORT Plazas,) are the following:

- (a) The design traffic criteria is the 30<sup>th</sup> highest traffic volume processed by a Virtual Plaza during the last 12 months, or as specified in the Project Document: Volume 3.
- (b) A higher than average projected traffic growth rate in order to be conservative (for example, 4% p.a. traffic growth);
- (c) In the case of a bi-directional Toll Plaza, directional splits varying between 50%:50% and 75%:25% or as otherwise indicated in the Project Document: Volume 3;
- (d) Manual Lane Average Service Rates shall be as follows, unless indicated otherwise for each Toll Plaza in the Project Document: Volume 3.
  - i. 250 vehicles per Lane per hour for rural Toll Plazas, typically with irregular Users and high percentages of Heavy Vehicles.
  - ii. 300 vehicles per Lane per hour for urban Toll Plazas, typically with regular road users and lower percentages of Heavy Vehicles.
- (e) Average Service Rates for Mixed Manual/ETC Lanes not less than those for Manual Lanes. The actual Service Rates shall be dependent upon the percentage vehicles with Tags in the Lane.

- (f) Average Service Rates for Dedicated ETC Lanes with booms of 700 vehicles per Lane per hour;
- (g) Average Service Rates for Dedicated ETC Lanes without booms of 1200 vehicles per Lane per hour;
- (h) Average Service Rates for Automatic Card Lanes of 300 vehicles per Lane per hour;
- (i) Average Service Rates for an express ETC Lane, 600 vehicles per hour.
- (j) Manageable Flow Rates, i.e. those hourly vehicle volumes at a particular Toll Plaza at which the Vehicle Processing Specification (and, more specifically, the Queue Length Specification) can only just still be complied with 95% of the time in terms of queuing theory and the Average Service Rates and ETC market share applicable to a Toll Plaza. The queuing theory functions used will be provided in the Standard Specifications for Operations and Maintenance of CTROM Projects: Scope of Works (Volume 2 Book 1a);
- (k) Triggers for implementing Dedicated ETC lanes: Refer to Section 4.2.
- (l) Triggers for implementing ORT: Refer to Section 4.3.
- (m) In the event that an expansion is required, provision must be made for sufficient capacity for 8 (eight) years of traffic growth after the expansion.

4.1.1.4 The Contractor's Operations and Maintenance Fee shall be based on the Toll Plaza expansion schedule provided in Clause 4.1.1.2. During the Operations Service Period, the Contractor may submit an alternative Toll Plaza expansion schedule, as a Value Engineering proposal, in terms of clause 13.5 of the Standard Specifications for Operations and Maintenance of CTROM Projects: FIDIC Conditions of Contract (Volume 1 Book 1), which it will require in order to comply with the Vehicle Processing Specification. In compiling this schedule, the Contractor shall have applied the same parameters as listed in Clause 4.1.1.3, but may, at its discretion, apply improved Average Service Rates and/or Manageable Flow Rates. It should also include a realistic target ETC market share for each Toll Plaza, justifying Dedicated or Express ETC lanes.

4.1.1.5 The Contractor may propose, as part of the Value Engineering proposal, to incorporate innovative measures in its Toll Plaza expansion schedule that it intends to implement in order to delay expansion as foreseen by the Employer. Such measures should support the primary objective of the Employer to increase the market share of the ETC payment method and could include promotional or other measures to increase the ETC market share, improving the Average Service Rates of Toll Collectors or other improvements. Any such innovative measure requiring an investment in Employers Fixed Assets, albeit small, shall require the approval of the Employer.

4.1.1.6 If the Contractor tenders an alternative Toll Plaza expansion schedule, the Employer shall, prior to the Commencement Date decide which schedule shall be contractually binding.

4.1.1.7 The Contractor shall inform the Employer of possible changes in the Toll Plaza expansion schedule or if, in the Contractor's opinion, expansions are required. Notwithstanding the aforementioned, during the Operations Service Period the Employer may in its sole discretion revise or adjust the applicable expansion schedule. In the event of such revision or adjustment, the Operations and Maintenance Fee shall be adjusted in accordance with the Schedule of Payments / Cost Matrix.

4.1.1.8 Since some of the parameters upon which the planning of Toll Plaza expansion is based, will change with time, Toll Plaza expansion shall only be justified if the conditions in Clause 4.1.2 below are met.

#### **4.1.2 Justification for Toll Plaza Expansion**

4.1.2.1 Toll Plaza expansion (inclusive of innovative measures as part of a Value Engineering proposal) shall only be justified if the following conditions apply:

- (a) the Queue Length Specification is not expected to be met at any Virtual Toll Plaza in accordance with the design traffic criteria, as specified in Clause 4.1.1.3 for the Virtual Toll Plaza(s); and
- (b) Average Service Rates, equal or higher, as specified in Clause 4.1.1.3 for each specific Virtual Toll Plaza is being maintained, and
- (c) All Lanes are in use and all reversible Lanes are used in the direction of highest flow; and

4.1.2.2 Where the Contractor's envisaged Toll Plaza expansion schedule is the applicable one and it indicates that innovative measures in accordance with Clause 4.1.1.5 would be implemented to delay expansion as foreseen by the Employer, the Contractor shall be responsible for the funding and delivery of the Permanent Design-Build Assets required implementing such measures.

4.1.2.3 Where the conditions for Toll Plaza expansion are applicable in accordance with Clause 4.1.2.1, the Toll Plaza shall be expanded in accordance with:

- (a) the Contractor's tendered expansion schedule adjusted for actual versus predicted traffic growth and the associated 30th highest hourly volume; or
- (b) The Employers expansion schedule provided in specified in Clause 4.1.1.2, adjusted for actual versus predicted traffic growth and the associated 30th highest hourly volume, as applicable in accordance with the terms herein set out.

4.1.2.4 During the currency of this Agreement, the Employer may, subject to Clause 4.1.3 revise the applicable expansion schedule.

4.1.2.5 The Employer may conclude a separate contract on an open tender basis for the provision of these Employers Fixed Assets. The Contractor may tender for such separate contract.

4.1.2.6 In the event that a Toll Plaza expansion occurs either earlier or later than that specified in the applicable Toll Plaza expansion schedule, payment of the Schedule of Payments / Cost Matrix entry relating to such expansion, shall be accelerated or deferred to coincide with the Toll Plaza expansion.

#### **4.1.3 Obligations During and After Toll Plaza Expansions**

4.1.3.1 The Contractor acknowledges that any construction works may interfere with Operations and Maintenance and accordingly undertakes that it shall make suitable arrangements to accommodate such interference and shall co-operate with all parties involved with such construction.

4.1.3.2 The Operations and Maintenance Fee shall make allowances for all costs, which may be incurred by the Contractor due to the Toll Plaza expansions, and for reduction in Toll Income resulting from reduced attraction rates at the Toll Plazas. The Contractor shall have no further claims as a result of such expansion.

### **4.2 EXPANSIONS FOR ELECTRONIC TOLL COLLECTION**

#### **4.2.1 General**

4.2.1.1 The Employer's ETC expansion programme shall be included in the Toll Plaza expansion schedule envisaged pursuant to Clause 4.1.1.2.

4.2.1.2 The type of ETC Lanes to be implemented, i.e. Mixed ETC Lanes, Dedicated ETC or express ETC Lanes will depend on the available spare Lane capacity at each Toll Plaza and the introduction of these Lanes may require the conversion of existing Lanes into ETC Lanes and/or the construction of new ETC Lanes.

4.2.1.3 Once ETC is introduced as a method of payment, it should be available at all times in both traffic directions at a mainline Toll Plaza and at every local and remote ramp Toll Plaza,

#### **4.2.2 Triggers for Upgrading to Dedicated ETC Lanes**

4.2.2.1 **Trigger for the Introduction of a Dedicated ETC Lane at a Toll Plaza in a direction of travel:** When the actual traffic volume in a Mixed Manual/ETC Lane at a Toll Plaza in a direction of travel exceeds 200 vehicles per hour during any three or more hours (note: not consecutive hours), a Dedicated ETC Lane can be supplied in such a direction of travel at that Toll Plaza.

**4.2.2.2 Trigger for the Introduction of a Second Dedicated ETC lane at a Toll Plaza in a direction of travel:** When the traffic volume in one direction of travel at a Toll Plaza in the existing mixed manual/ETC lanes and the existing Dedicated ETC lane at that Toll Plaza exceeds 500 vehicles per hour during any three or more hours (note: not consecutive hours), a second Dedicated ETC Lane can be supplied in such a direction of travel at the relevant toll plaza.

**4.2.2.3 Trigger for the Introduction of the Third and Subsequent Dedicated ETC lanes at a Toll Plaza in a direction of travel:** Similarly, for every additional actual ETC traffic volume of 500 vehicles per hour in one direction of travel at a Toll Plaza (over and above the Dedicated ETC trigger traffic volume of 500 ETC transactions per hour in a direction of travel referred to in the previous paragraph), another Dedicated ETC lane can be supplied in such a direction of travel at the relevant Toll Plaza.

### **4.3 TRIGGER TO IMPLEMENT ORT**

#### **4.3.1 General**

**4.3.1.1** The Project Document: Volume 3, shall contain the Employer's intended programme and/or triggers for implementing ORT.

**4.3.1.2** The implementation of Open Road Tolling at a particular Toll Plaza may be triggered by the Employer if any of the following events occur:

(a) the annual average daily traffic volume (AADT) at the Toll Plaza exceeds 90 000 vehicles per day for a calendar year

or

(b) the required number of Dedicated ETC lanes in a traffic direction exceeds 5

or

(c) the ETC market share at the relevant Toll Plaza exceeds 70%.

### **4.4 ROAD IMPROVEMENTS**

#### **4.4.1 Road Improvement Schedule**

**4.4.1.1** Road improvements relate to any work that may be performed by any third party on the Road but excluding Routine Road Maintenance and shall include:

(a) Work on the existing Road surfacing;

(b) Rehabilitation of layerworks; and



(c) Construction of additional lanes.

4.4.1.2 The Project Document: (Volume 3) shall contain the envisaged Road improvement schedule for the duration of this Agreement, as well as the estimated duration and schedule for each Road improvement contract which may be concluded by the Employer and any third party together with the envisaged method to accommodate traffic.

4.4.1.3 The Contractor shall take note of the envisaged Road improvement schedule, and shall make allowance in the Operations and Maintenance Fee for any potential reduction in Income resulting from reduced attraction rates caused by the Road improvements. The Contractor shall not have any claim including a claim against the Employer, for additional payment, for loss, damage or expenses as a result of any Road improvement.

4.4.1.4 The Employer will not be bound by the envisaged Road improvement schedule specified in Clause 4.4.1.2.

#### **4.4.2 Obligations During and after Road Improvements**

4.4.2.1 In the event that the Employer does not revise any specifications to take account of the Contractor's proposals, the Contractor shall not be relieved of any of its obligations and liabilities under this Agreement, and the Contractor shall have no claim whatsoever against the Employer in this regard.

4.4.2.2 The Contractor acknowledges that any construction works occasioned by Road improvements may interfere with Operations and Maintenance and accordingly undertakes that it shall make suitable arrangements to accommodate such interference and shall co-operate with all parties involved with such construction.

4.4.2.3 The Operations and Maintenance Fee shall include for all costs incurred by the Contractor due to the Road improvements, and for all reduction in Income resulting from reduced attraction rates at the Toll Plazas.

4.4.2.4 The Contractor shall have no claim whatsoever, including a claim for additional payment, loss, damages or expenses against the Employer.

### **4.5 OTHER IMPROVEMENTS**

#### **4.5.1 General**

4.5.1.1 The Employer reserves the right to implement any other improvements of a general nature on the Site including improvements relating to overloading control stations. This shall not relieve the Contractor of any of its obligations or liabilities under this Agreement.

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## **SECTION 5. ESTABLISHMENT**

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## **5.1 GENERAL: ESTABLISHMENT**

### **5.1.1 Contractor's General Establishment Responsibilities**

5.1.1.1 The Contractor shall perform all establishment activities necessary to establish the organisation, resources and procedures needed prior to Tolling Date and / or again prior to Trial Operations after ORT was triggered, and in accordance with the Project Document: Volume 3.

5.1.1.2 The establishment activities shall be provided in sufficient detail in the Contractor's Operation and Maintenance Plan, and which will be approved by the Employer. The Contractor's programme shall indicate the establishment activities.

5.1.1.3 The Contractor shall, as and when required, review and updates his establishment programme, which shall be integrated with the relevant interface milestones of the Contractor's programme.

5.1.1.4 The Contractor shall convene and administer fortnightly progress meetings with the Employer during the establishment, or at such other intervals as may be required by the Employer.

### **5.1.2 Recruitment of human resources**

5.1.2.1 The Contractor shall as a minimum perform the following:

- (a) Development of conditions of employment;
- (b) Development of letter of appointment for personnel;
- (c) Performance of recruitment activities such as advertising and/or the appointment of recruitment agencies;
- (d) Interviewing of applicants; and
- (e) Appointment of management, supervisory, Customer Service, administration, cash control, technical and any other personnel required to execute the Contract.

5.1.2.1.1 The Contractor shall develop and set the minimum skills and knowledge required per job profile, of which the results shall be verifiable in terms of acceptable and appropriate human resources practices by using a skills audit that shall contain the following minimum information:

- (a) List of positions, key skills, knowledge and competencies required per job profile;
- (b) List of candidates for each position in the entire operation;

- (c) Detailed description of a standard scoring mechanism per job profile or position; and
- (d) Reporting of overall competency levels per position and an overall quantified summary to demonstrate readiness for Operations.

5.1.2.1.2 The Contractor shall assess the skills readiness level of personnel involved at least 30 days before any tolling Operation commences. In addition, the skills or competency level of personnel may be verified independently in whole or partly by the Employer at any stage during the contract period.

### **5.1.3 Establishment functions prior to Tolling Date**

5.1.3.1 The establishment functions to be performed by the Contractor, prior to the Tolling Date, shall include all those necessary to manage, administer, implement and ensure successful, satisfactory and timely completion of all required activities included in, but not limited to, the functions below:

- (a) Establishment of a management team(s), which shall be able to perform the following minimum functions:
  - i. Resource procurement;
  - ii. Programme management;
  - iii. Quality control;
  - iv. Health and Safety implementation;
  - v. Environmental implementation;
  - vi. Training; and
  - vii. Any others necessitated by and associated with the provisions of the Contract.
- (b) Document development: The Contractor shall as a minimum perform the following:
  - i. Delivery of a complete and comprehensive Documentation Management System design and updating thereof whenever necessary;
  - ii. Development and implementation of the Contractor's Operation and Maintenance Plan;
  - iii. Development and implementation of general Operational procedures;
  - iv. Development and implementation of specific and comprehensive Operation and Maintenance Manuals, including but not limited to management manuals; supervisory manuals; administration manuals; Customer Service manuals; cash collection manuals; electrical and mechanical maintenance procedures; Tolling

- System maintenance procedures; Health, Safety and Environmental manuals; Tag lifecycle management manuals, etc.;
- v. Development and implementation of appropriate training manuals;
  - vi. Design, development and procurement of pre-printed documentation and stationery;
  - vii. Development and implementation of quality assurance systems, plans and procedures;
  - viii. Development and implementation of marketing plans and procedures and input into the Employer's strategic marketing strategy;
  - ix. Development and implementation of asset registers and management systems.
- (c) With regard to the establishment of subcontracts with third parties, the Contractor shall ensure the timely development and set up of all subcontracts, arrangements and interfacing protocols that shall include:
- i. Cash transport and cash-in-transit insurance service agreements;
  - ii. Utility transfer arrangements (electricity, etc);
  - iii. Any other agreements or arrangements necessitated by and associated with the Toll Operations and those required in order to comply with the provisions of the Contract.
- (d) Asset and consumable procurement. The Contractor shall be responsible for the on-time procurement and commissioning of, inter alia, the following Contractor's Equipment and other assets:
- i. Traffic control equipment (e.g. cones, signs, delineators, safety vests, etc), where necessary;
  - ii. Finance and administration equipment (e.g. photocopy, facsimile and coin counting equipment, personal computers, peripherals, etc);
  - iii. General Contractor's Equipment (e.g. waste bins, tools, battery lights, first aid kits, ladders, etc.);
  - iv. Contractor's office furniture (e.g. desks, chairs, cabinets, kitchen equipment, etc.), including furniture for offices for the use of the Employer and the Employer's Representative;
  - v. Contractor's vehicles such as passenger and light delivery vehicles, trailers, etc;
  - vi. All stationery and consumables; and

- vii. All other items required and to be provided pursuant to the provisions of the Contract.
- (e) The Contractor shall be responsible, during establishment, for the on-time procurement and commissioning of facilities, which, amongst others, shall include the following:
  - i. Equipment and facilities requiring design, manufacture and commissioning by the Contractor;
  - ii. Satellite Centres, Customer Service Kiosks, Mobile Payment Stations.
- (f) Training and takeover. In addition to the general requirements with regard to training and takeover as indicated in the Project Document: Volume 3, the Contractor shall provide the following specific training to personnel (to the satisfaction of the Employer) in respect of the operational areas listed below and shall perform all functions necessary in relation to the specific takeover of facilities and systems listed below:
  - i. Public relations training;
  - ii. Supervisory training;
  - iii. Administrative training;
  - iv. Cash collection training;
  - v. Systems training, including the use and operation and maintenance of hardware and Software;
  - vi. Third party liaison/interfacing training;
  - vii. Telephone call centre systems and operation training;
  - viii. Electrical and mechanical system Operations and Maintenance training;
  - ix. Takeover of the Employer's toll facilities such as office buildings, Toll Plazas, Satellite Centres, gantries at the Tolling Points and Technical Shelters;
  - x. Takeover of all the Tolling Systems and communications systems;
  - xi. Takeover of the electrical and mechanical systems of the toll facilities; and
  - xii. Takeover of all other toll-related equipment and facilities contemplated by the provisions of the Contract.

#### **5.1.4 Contractor's general liaison functions:**

- 5.1.4.1 The Contractor shall provide and perform the following support functions:

- (a) Participation, input and liaison in relation to the Incident Management Systems
- (b) Participation, input, liaison, support and advisory services in relation to the strategic marketing strategies and plans of the Employer, including those of the TCH and VPC, when relevant.
- (c) Offer continuous input, liaison, support and advisory services in relation to the enforcement and Violation debt collection strategies to the VPC, if Opted-in.
- (d) Deliver extensive and effective efforts and implementation actions in order to optimise the ETC Customer Account penetration.
- (e) Launch effective efforts towards the optimal distribution of Tags and the maximisation of the registration of Customer Accounts.

## **5.2 ESTABLISHMENT PROGRAMME**

### **5.2.1 Documentation Development**

- 5.2.1.1 This establishment programme shall form part of the Contractor's programme as required and specified in the Project Document: Volume 3.
- 5.2.1.2 The establishment programme of the Contractor shall indicate the planned durations, start dates and end dates of all the Contractor's establishment and establishment activities.
- 5.2.1.3 The establishment programme shall indicate all contractual documentation submission milestones and activities.
- 5.2.1.4 All document submissions to be reviewed, commented on or approved by the Employer or the Employer's Representative shall be detailed in the establishment programme.
- 5.2.1.5 The Contractor shall allow 10 working days for review of each establishment document submission that is subject to approval.
- 5.2.1.6 The final documentation submissions after review shall also be indicated in the programme.

### **5.2.2 Recruitment of human resources**

- 5.2.2.1 The establishment programme shall indicate the planned durations, start dates and end dates of all the Contractor's activities associated with the human resource procurement processes.

- 5.2.2.2 The establishment programme shall reflect the duration for verification of skills (Contractor's skills audits) of all human resources prior to commencement of the Pre-operation and Operation periods.

**5.2.3 Establishment of sub-supply agreements**

- 5.2.3.1 The establishment programme shall indicate the planned durations, start dates and end dates of all the Contractor's activities relating to the establishment of sub-supply agreements, arrangements and associated interfacing protocols.

**5.2.4 Asset procurement**

- 5.2.4.1 The establishment programme shall indicate the planned durations, start dates and end dates of all the Contractor's activities relating to procurement of assets.

**5.2.5 Training and takeover**

- 5.2.5.1 The establishment and establishment programme shall indicate the planned durations, start dates and end dates of all the Contractor's activities relating to training and takeover.
- 5.2.5.2 The establishment and establishment programme shall reflect the Contractor's earliest and latest start dates for training in respect of each module of the system(s), including the Tolling System, such as Operations and Maintenance training.

**5.2.6 Take-over of Facilities**

- 5.2.6.1 The establishment and establishment programme shall indicate dates for the takeover of all critical and non-critical facilities to be provided by the Employer.

**5.3 OPERATION MANAGEMENT**

**5.3.1 Contractors Operations Management Responsibilities**

- 5.3.1.1 If ETC is to be implemented from the Tolling Date, the Contractor shall perform all Operation and Maintenance services required prior to the Tolling Date to ensure the maximisation of Customer Account registration.
- 5.3.1.2 The Contractor shall continuously seek, identify, record, implement and monitor improvements to all the Contractor's documents pertaining to the Toll Operations in order to ensure continuous improvement of his personnel's competency and the level of service.
- 5.3.1.3 The Contractor agrees that the Employer and/or the Employer's Representative may use any of the Contractor's Documents associated with the Toll Operations (e.g. Operations and



maintenance manuals drafted by the Contractor) to measure and determine the Contractor's performance, progress and compliance in relation thereto for the purpose of applying the provisions of the Contract.

## **5.4 OPERATIONS AND MAINTENANCE PLAN**

### **5.4.1 Contractors General Responsibilities**

- 5.4.1.1 The Contractor shall ensure that an initial draft of the Operations and Maintenance Plan is submitted before the Tolling Date and the final version within 4 months after the Tolling Date.
- 5.4.1.2 When ORT is triggered, the updated Operations and Maintenance Plan shall be submitted 3 (three) months before the planned date of implementation of Open Road Tolling for review and approval by the Employer. Any revisions are to be submitted to the Employer for approval.
- 5.4.1.3 The Contractor shall continuously seek, identify, record, implement and monitor improvements to his Operations and Maintenance Plan.
- 5.4.1.4 The Contractor shall, either every 3 months or when requested to do so, submit a status report to the Employer in relation to the afore-mentioned improvements.
- 5.4.1.5 The Operations and Maintenance Plan shall contain all activities that will be needed to meet the requirements associated with Trial Operations.
- 5.4.1.6 The Operations and Maintenance Plan shall be updated to include all improvements identified during the performance of the Operation services.
- 5.4.1.7 The Operations and Maintenance Plan shall include the following:
  - (a) The establishment strategies and key activities.
  - (b) A specific detailed strategy on how the Contractor will ensure the maximization of Toll revenue.
  - (c) A specific strategy on how the Contractor plans to minimize the number of toll violations, especially with regards to ORT.
  - (d) A detailed strategy on how the Contractor will mitigate his operational risks.
  - (e) A detailed description of the Customer Service's that will be provided at the Point of Presence Facilities, namely the Customer Service Kiosks, the Toll Plaza buildings and, in case of ORT, at the Mobile Payment Stations.

- (f) A marketing plan and strategy, taking into account aspects such as branding, payment channels, the specified operational footprint, etc.
- (g) In case of ORT, a detailed enforcement strategy, consisting of the number and sizing (i.e. number of workstations) of Mobile Payment Stations, number of Mobile Policing vehicles, staffing, etc.
- (h) Back-up communications solutions plan.

## **5.5 BUSINESS CONTINUITY PLAN**

### **5.5.1 Contractors Business Continuity Plan Responsibilities**

- 5.5.1.1 The Contractor shall develop a business continuity plan, if specified in the Project Document: Volume 3, consisting of a detailed Disaster Recovery plan for the Tolling System and other systems and an operational Disaster Recovery plan. The key personnel of the Contractor shall be familiar with how to effectively implement the Disaster Recovery plans when an unpredicted disruption of Operation and/or a major system failure occurs.
- 5.5.1.2 The business continuity plan shall cover for disasters due to Exceptional Events in accordance with clause 18 of the FIDIC Conditions of Contract (2008) (Volume 1 Book 1) as well as disasters that may occur due to the doing or negligence of the Contractor.
- 5.5.1.3 System Disaster Recovery plan
  - (a) For requirements of the System Disaster Recovery plan, refer to the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).
- 5.5.1.4 Operational Disaster Recovery
  - (a) The Project Document: Volume 3 shall provide and indicate the facilities to be used for an Operational Disaster Recovery:
  - (b) The Operational Disaster Recovery (ODR) plan shall consist at least of the following:
    - i. A list of people trained to take charge of a particular situation (life threatening, operational, system failure etc.);
    - ii. A plan to provide a safe environment for personnel and the public in case of a fire, robbery or similar life threatening event that shall include an action plan to attend to medical emergencies quickly;
    - iii. A register/report on the status of people present at the facility, assets and systems;

- iv. An action plan to implement for different scenarios of disruptions that could have a huge impact on the environment, financial and operation performance;
  - v. A plan to employ temporary personnel (when required);
  - vi. A plan to repair, replace or restore damaged infrastructure, equipment, systems and other assets;
  - vii. An accommodation plan in terms of office space for personnel, equipment and related aspects of the operation;
- (c) Risk Matrix: The Contractor shall identify potential risks for partial or complete system and/or operational failure or stoppage. These risks shall be documented in a risk matrix that identifies events with a high probability of causing an unpredicted disruption in operations. The risk matrix document shall be updated at least every 6 months thereafter.

## **5.6 TOLL OPERATION PROGRAMME**

### **5.6.1 General**

- 5.6.1.1 In addition to the requirements as stated in the Project Document: Volume 3, the programme related to toll Operation shall include the activities related to the establishment phase, the Operation period (i.e. the period after the Tolling Date) and in the case of ORT, Trial ORT Operations and hand back phases of the CTROM Contract.
- 5.6.1.2 This programme shall include all key operational activities and shall be comprehensive and of sufficient detail to enable and permit the Employer's Representative to perform effective progress measurement.
- 5.6.1.3 The programme shall be integrated and updated with the Design-Build activities.

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**SECTION 6.        OPERATIONS PERIOD – TRANSACTION  
                         MANAGEMENT AND PROCESSING**

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**6.1 GENERAL: TRANSACTION MANAGEMENT AND PROCESSING FOR CONVENTIONAL / HYBRID AS WELL AS CONVENTIONAL / ORT AND ORT OPERATIONS**

**6.1.1 General**

6.1.1.1 This “General” section provides transaction management and processing requirements for Conventional and Hybrid Toll Plazas as well as for Conventional / ORT Plaza Operations and ORT Operations.

6.1.1.2 The Contractor shall ensure that the transaction processing for all transactions captured at the Toll Plazas including the Tolling Points, if applicable, and which are transmitted to and processed by the Toll System Back Office, is performed accurately, and in a secure manner and that it is fully auditable.

6.1.1.3 The Contractor shall comply with the Vehicle Classification Structure, as defined in the Project Document: Volume 3, and ensure that the applicable Toll Tariffs, Tag Discounts, Frequent User Discounts and Local User Discounts for all Vehicle Classes are applied and processed.

6.1.1.4 It shall be the responsibility of the Contractor to ensure that the Toll System provides accurate classification and count of vehicles in accordance with the Vehicle Classification Structure. In this regard, refer to the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). Performance shall be measured in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

6.1.1.5 The Contractor shall ensure that the Back Office System receives all transactions and all associated data from the Toll Lanes and/or Road Side Systems. To this end, the Contractor shall ensure that the required system processes at the Toll Plazas and data communication systems are functional and fully operational to achieve this.

6.1.1.6 The key operational functions with regard to transaction management and processing are:

- (a) Equipment monitoring, diagnostics and maintenance
- (b) Disaster Recovery
- (c) Security key management
- (d) Toll lane and/or road side data collection
- (e) Transaction management
- (f) Database management

(g) Record keeping

(h) Reporting.

6.1.1.7 Equipment monitoring and diagnostics during transaction processing: The Contractor shall monitor the Toll Plaza, Tolling Point and Back Office equipment to initiate corrective measures (as indicated in detail in the section dealing with maintenance) where required, for:

(a) Measuring specified performance levels

(b) Measuring Tolling System availability

(c) Ensuring Tolling System redundancy

(d) Measuring storage and operating capacity

(e) Performing maintenance diagnostics.

6.1.1.8 Archiving, back-up and Disaster Recovery

(a) The Contractor shall be responsible for Disaster Recovery.

(b) The procedures, proposed scheduling and process to be followed for archiving, back-up and disaster recovery is to be submitted to the Employer's Representative for approval.

(c) No data shall be deleted without the data being archived.

## **6.1.2 Security Key Management**

6.1.2.1 The Contractor shall be responsible for security key management as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), and he should include the procedures regarding the handling, safe storage and possible updating of security keys in the Operations and Maintenance Plan. The Contractor shall ensure to load and activate the security keys in accordance with the approved Operations and Maintenance Plan.

## **6.1.3 Transaction Management for ETC Transaction**

6.1.3.1 The Contractor shall be responsible for the following:

(a) Ensuring that all transactions are compliant in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).

- (b) Controlling Vehicle Class discrepancies:
  - i. In the event of a Vehicle Class discrepancy between the AVC and the Registered Vehicle Class on a Customer Account, the Contractor shall view and allocate the Actual Class. If the image is not available or sufficient, the Contractor shall follow the applicable Business Rules in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).
  - ii. If a Vehicle Class for classes 1 and 2 cannot be verified by the Contractor, the Registered Vehicle Class shall be used. It is further required that positive discrepancies shall be manually verified, i.e. when a vehicle with a higher Vehicle Class is being detected than the one that is registered.
- (c) Controlling detection accuracy:
  - i. The detection accuracy shall be controlled as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).
- (d) Management of Faulty Tags
  - i. If for any reason, a Tag fails or is not read successfully during a passage, the Contractor shall use ANPR or MNPR to identify the Vehicle Licence Number (VLN). If this number corresponds with a number registered against an existing Tag user, then the passage will be allocated to that specific account and the charge for a Tag user shall apply. These passages shall trigger a mechanism (alarm) that informs the user of a faulty Tag.
  - ii. An appropriate business rule, approved by the Employer, shall be proposed and implemented by the Contractor that gives faulty Tag users the associated Tag Discount for a maximum specified period.
  - iii. The Contractor shall ensure that Tag users are aware of the additional onus on them to ensure that the Tag functions properly in order to qualify for the associated Discount.
- (e) Responding to Customer queries on transactions:
  - i. In the case of a query by a Customer with respect to the applied Vehicle Class, the transaction shall be returned from the TCH to the Back Office System for verification of the actual class. In the event that the manual validation process can verify the actual Vehicle Class, the actual Vehicle Class shall be applied by the Contractor. If during the manual validation process the actual Vehicle Class cannot be determined, the Vehicle Class as registered on the Customer's Account shall be used as the actual class. The Contractor shall re-transmit the transaction with the registered to the TCH.

- (f) Application and management of any applicable Discounts.
- (g) Validation monitoring: Monitoring and ensuring that the validation lists that are transmitted from TCH to the Back Office System are downloaded to the toll Lanes and/or Road Side Systems at the gantries, if applicable.
- (h) Monitoring and ensuring that the transfer of packaged transactions from the Back Office System to the TCH (including corrected transactions requiring retransmitting) takes place.
- (i) Receiving of returned transactions from the TCH to the Back Office System, for re-processing thereof, possible rectification of those transactions and the re-transmitting of the corrected transactions back to the TCH.
- (j) Performing transaction reconciliations to update transaction status in terms of paid transactions, violations, exempted road users, missing data or identifiers, etc.
- (k) Monitoring and verifying possible status of transactions:
  - i. The Contractor shall ensure that all transactions are captured at the Road Side Systems for processing at the Back Office System in order to be sent from the Back Office System to the TCH.
- (l) Charging accuracy in terms of classification and discounts shall be measured in terms of the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

#### **6.1.4 Database Management & Monitoring**

6.1.4.1 The responsibilities of the Contractor shall include:

- (a) Managing the automated process of transfer of validation lists between TCH and Back Office System and the Back Office System and Toll Plaza / Road Side System, which includes the monitoring, and acting on failure.
- (b) Managing of the validation lists by ensuring that it will include all identifiers (e.g. Tag, VLN, or other), Registered Vehicle Classes, low balance information, Tag validity information, exempt user information etc.
- (c) Monitoring of image and data capture, storage triggering, as well as to facilitate account based information to the motorists (using the Tag-beep system).
- (d) Performing full database functions such as back-up and restore, database mirroring, upgrading the version of the database as needed to keep it current, etc.
- (e) Managing and monitoring of transaction transmission to ensure that each transaction that is sent from the Toll Plaza / Road Side System to the Back Office System and



from the Back Office to the TCH Back Office System is sent once and only once. No transactions should be lost or duplicated.

**6.1.5 Transactions to TCH**

- 6.1.5.1 The Contractor shall ensure that all transactions, whether compliant or non-compliant, which are captured by the Toll Plaza / Road Side System and processed in the Contractor's Back Office System, are continuously sent to the TCH.

**6.1.6 Transactions within Time**

- 6.1.6.1 All transactions (including those that require manual validation) shall be processed by the Contractor's staff within the time as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a) and measured in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**6.1.7 Recording of Data**

- 6.1.7.1 With regard to record keeping, back-up, and data retention on the Back Office System and the Toll Plaza / Road Side Systems, the Contractor shall ensure that all data is recorded on the Tolling System in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).

**6.2 CONVENTIONAL / HYBRID AND CONVENTIONAL / ORT TOLL PLAZA OPERATIONS:**

**6.2.1 General**

- 6.2.1.1 For Conventional and Hybrid Toll Plazas and for the conventional part of a Conventional/ORT Toll Plaza, transaction processing shall take place at the Toll Plaza building facilities that are located within the Toll Plaza area. Where more than one Toll Plaza is in operation, transaction processing may take place at a central Toll Operations facility that may be located at one of the main Toll Plazas at the discretion of the Contractor.

**6.2.2 Digital Video Grabbing System (VGS)**

- 6.2.2.1 The Contractor shall supply, install and commission an appropriate digital video grabbing system (VGS) with a camera in each Toll Lane, and as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The system shall be compliant and operational no later than 3 (three) months after the Commencement Date. The Contractor shall Operate and Maintain the system for the duration of the Works Period.

- 6.2.2.2 The Contractor shall use the VGS to manage reportable incidents that occur at the Toll Plaza. The VGS shall provide the Employer with an audit tool to verify operational activities of the Contractor.
- 6.2.2.3 For Toll Lanes that operate Manual Mode, the Contractor shall ensure that the VGS records on a continuous basis for those lanes.
- 6.2.2.4 The Contractor shall record digital images continuously on a storage device.
- 6.2.2.5 A back up of the triggered Incidents and linked images shall be performed on a weekly basis.
- 6.2.2.6 The Contractor shall ensure that the Employer shall have full access to this data if so required by it.

### **6.3 ORT OPERATIONS: TRANSACTION MANAGEMENT AND PROCESSING**

#### **6.3.1 General**

- 6.3.1.1 The Contractor shall be responsible for the capturing of Compliant and Complete Transaction Records for all vehicles processed at the ORT section of a Conventional/ORT Toll Plaza and at each Tolling Point in accordance with the above-mentioned Vehicle Classes, Tariffs and Discounts. The Contractor shall take all risks for Transaction Records that do not comply with the Transaction Record requirements as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).
- 6.3.1.2 For ORT Operations either in respect of the ORT section of a Conventional/ORT Toll Plaza or an ORT Toll Plaza (a Tolling Point), transaction processing shall take place at the Back Office System located at a Control Centre.
- 6.3.1.3 The Customer Service Facilities, namely the Satellite Centres, Customer Service Kiosks and Mobile Payment Stations shall be provided and linked by the Contractor to the TCH by means of data communication links, including back-up data links.
- 6.3.1.4 In the event of communication failures, the responsibilities of the Contractor shall be to collect transaction data from the Road Side System by means of back-up communication links and procedures. The back-up procedures shall be contained in sufficient detail in the Contractor's Operations and Maintenance Plan, and will be submitted to the Employer for approval.

### **6.3.2 ORT Transaction Management**

6.3.2.1 The Contractor shall be responsible for the managing and monitoring of transaction flow from the Tolling Points to the Back Office System and between the Back Office System and the TCH. Performance measurement, in terms of timeliness of transaction transmission, shall be in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a). The following objectives, amongst others, should be specifically managed and controlled at each Tolling Point:

- (a) To maximise the number of vehicles at each Tolling Point generating a Transaction Record.
- (b) To maximise the number of vehicles at each Tolling Point generating a Compliant Transaction Record.
- (c) To conform to the required AVC accuracy at each Tolling Point.
- (d) To conform to the required ANPR capture, trigger and correct read rate at each Tolling Point.
- (e) To conform to the required DSRC (or Tag) capture rate at each Tolling Point.
- (f) To conform to the required vehicle framing accuracy at each Tolling Point.

6.3.2.2 Ensuring performance of manual-NPR, (i.e. MNPR), including in the event of:

- (a) ANPR processing of images for which the Vehicle Licence Number cannot be automatically detected or did not meet minimum confidence requirements in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a) and the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), with regards to the required confidence levels.
- (b) Class discrepancies being detected.
- (c) Discrepancies occurring between the Vehicle Licence Number as registered on the Tag account and the Vehicle Licence Number as determined by the ANPR process.

6.3.2.3 Controlling registered VLN (Tag VLN) and detected VLN discrepancies:

- (a) If a particular Tag is not eligible for Discount, the Vehicle Licence Number need not be verified, unless these transactions are queried by the road user later on (keeping in mind that images shall be stored at the RSS and that image verification is a possibility within the storage period).

- (b) The Vehicle Licence Number derived from the ANPR process will be compared with the Vehicle Licence Number in the Validation List(s), also known as the registered Vehicle Licence Number.
- (c) With regards to the management of mismatches between the registered VLN and the VLN determined through the ANPR process, the Contractor shall ensure to adhere to the requirements in accordance with the Business Rules in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).
- (d) If only some of the mismatches can be manually verified, then the count shall be adjusted with the verified number of mismatches. The number of VLN mismatches that the Tolling System automatically detects after which MNPR will be invoked, shall be a configurable parameter.
- (e) If a road user continues to misuse the system, as verified by means of MNPR, the Discount of a road user shall be terminated. The Back Office System shall no longer apply the Discount to Transaction Records linked to the Tag Identifier.
- (f) The Back Office System shall in turn reset the count of mismatches after notifying the TCH and/or at the beginning of the month.

#### 6.3.2.4 Controlling detection accuracy

- (a) The detection accuracy may be controlled either by means of a parallel and independent continuous vehicle detection system as implemented by the Employer, or by means of video streams using audit cameras provided and implemented by the Contractor, and sampling techniques.
- (b) Use of video streams:
  - i. The Contractor shall provide detailed procedures to verify the detection accuracy of the Tolling System, for approval by the Employer. The Contractor shall select random periods during each week, or otherwise as instructed by the Employer, at each Tolling point to obtain continuous video streams from the audit cameras to perform manual traffic counts at each Tolling Point.
- (c) A statistically significant proportion of vehicles shall be captured by means of the audit cameras to compare the number of vehicles as captured on the Tolling System. The detection accuracy shall be determined on a monthly basis for each Tolling Point.

#### 6.3.2.5 Ensuring that the required quality of images is achieved:

- (a) The Contractor shall select random locations from which images shall be quality assured on a daily basis. The full set of manual validation records shall be captured by the Contractor in order to enable him to maintain quality of image-based

transactions across the ORT/TCH interface. The Contractor shall include this quality procedure in his Operations and Maintenance Plan for approval by the Employer.

- (b) A statistically significant proportion of all image events, which were captured, shall be checked and verified to determine if the quality of the images that were captured, are acceptable to perform manual validation. In the event that it is found that particular cameras do not provide acceptable images, the Contractor shall replace those cameras and the Contractor remains liable for associated lost transactions.
- (c) The above quality procedure shall contain aspects such as sample size, validation criteria, reporting and the like. Performance measurement will be performed as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**6.3.2.6 Ensuring the Transaction framing process is performed:**

- (a) Ensuring that the process of transaction framing is performed by the Road Side Systems, i.e. that the whole process of collation and packaging of gantry passages (per account or vehicle, whichever applicable) is taking place and transmitted to and captured on the Back Office System. Further, ensuring that the process of filtering of transactions at the Back Office System is taking place to identify and to resolve any duplicate transactions or transactions for instance where the Road Side System has incorrectly identified the same vehicle as both a violation and a valid tag transaction, or otherwise.

**6.3.2.7 Ensuring that Evidential Records are processed by the Road Side System and the Back Office System and stored as per the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).**

**6.3.2.8 Ensuring the compliance of the ORT Road Side Systems and Back Office System as required for law enforcement as described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).**

**6.3.2.9 The following status of captured transactions is possible together with the required actions and/or outcomes. This list is not comprehensive but provides an overview of the Contractor's role in ensuring that Complete and Compliant transactions are transmitted to the TCH. Table 6.1 indicates the possible status of transactions as well as possible actions by the Contractor.**

TABLE 6-1: STATUS OF CAPTURED TRANSACTIONS

TAG READING	NUMBER PLATE READING (ANPR OR MNPR)	NUMBER PLATE AND TAG INFO CORRESPONDS (NO N-PLATE DISCREPANCY)	AVC READING	AVC - AND REG. TAG CLASS CORRESPONDS (NO CLASS DISCREPANCY)	STATUS	ACTION
Yes	Yes	Yes	Yes	Yes	Compliant transaction	System sends Transaction to TCH. No specific action from Contractor apart from monitoring.
Yes	Yes	Yes	Yes	No	Compliant transaction	If queried by Customer, Contractor to view image, add actual class to transaction.  System to send Transaction to TCH.  Contractor to react on class discr through maintenance.
Yes	Yes	No	Yes	Yes	Compliant transaction	User has exchanged Tag to other vehicle.  Contractor to verify by means of MNPR and add actual number plate.  Contractor incurred additional costs.  System sends transaction to TCH.  TCH to action further. (e.g. additional admin cost)
No	Yes	N/a: if un-reg. Yes: if reg**	Yes	N/a: if un-reg. Yes: if reg**	Compliant transaction	System sends transaction to TCH.  TCH assume Tag failure – notify user.  Contractor to test tag if returned by customer.
No	Yes	N/a: if un-reg. Yes: if reg**	No	N/a: if un-reg. Yes: if reg**	Compliant transaction	System sends transaction to TCH.  TCH assume Tag failure – notify user.  Contractor to test tag if returned by customer.  Contractor reacts to AVC not reading.

TAG READING	NUMBER PLATE READING (ANPR OR MNPR)	NUMBER PLATE AND TAG INFO CORRESPONDS (NO N-PLATE DISCREPANCY)	AVC READING	AVC - AND REG. TAG CLASS CORRESPONDS (NO CLASS DISCREPANCY)	STATUS	ACTION
No	No	N/a	Yes	N/a	Non-compliant transaction	Equipment failure. Contractor to attend. System send transaction to TCH
Yes	No	N/a	Yes	Yes	Compliant	Possibly number plate missing or obscured. No action

\*\* Can obtain account registration detail from number plate

6.3.2.10 The Contractor shall comply with SANS requirements on all images as well as on the applicable equipment used to capture, process and store the images.

6.3.2.11 All transactions and evidential records provided by the Tolling System to the TCH must be quality assured, in accordance with the approved QAP.

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## **SECTION 7.      OPERATIONS PERIOD – FINANCIAL MANAGEMENT**

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## **7.1 GENERAL: FINANCIAL MANAGEMENT**

### **7.1.1 Contractor's general obligations**

7.1.1.1 This section provides financial management requirements for Conventional and Hybrid Toll Plazas as well as for Conventional/ORT and ORT Toll Plazas

7.1.1.2 The Contractor shall only accept the South African Rand (ZAR) currency.

7.1.1.3 All toll fees collected from road users for toll transactions (manual transactions in toll lanes or ETC transactions) shall be and remain the sole property of the Employer and no right whatsoever to such toll collections shall be vested in the Contractor.

7.1.1.4 Customer Accounts, as described further in Section 9, consist of two types of accounts, namely non-Tag accounts (i.e. for Road Users with pre-paid accounts that do not have Tags) registered on the Contractor's Back Office System and Tag accounts registered at the national TCH. With regard to all Customer Accounts, all the toll deposits and top-ups collected at the Toll Plazas and/or Customer Service Facilities shall remain the sole property of the Customer and no right whatsoever to such payments and top-ups shall vest in the Contractor.

7.1.1.5 The Contractor shall, under no circumstances, employ the collected toll fees, toll deposits and top-ups whether temporarily or permanently, for its own gain or return or for the gain or return of any other person.

### **7.1.2 Contractor's Main Functions**

7.1.2.1 Drafting and implementing procedures to maximise the efficiency of the Customer payment processes including deposits and top-ups and to minimise financial risk to the Customer and to the Contractor.

7.1.2.2 Filing and storing all accounting records in accordance with South African legal requirements. The Contractor shall specifically act in accordance with the Public Finance Management Act of 1999, as amended, and the National Archives Act of South Africa.

7.1.2.3 Ensuring the processing of all payment options tendered by the Customers e.g. cash, credit cards etc.

7.1.2.4 Ensuring that the correct Discount and exempt allocation is being done for the applicable transactions.

7.1.2.5 Ensuring the control and reconciliation of payments collected and maintaining of records.

- 7.1.2.6 Provision of Tax Invoices and/or statements if requested by the Customers and provision of responses with regard to account queries.
- 7.1.2.7 Transporting and depositing of cash into the Employer's bank account.
- 7.1.2.8 Maintaining an accounting system for financial management, including reconciling and reporting.
- 7.1.2.9 Recording all cash deposits, shortages and surpluses, bankcard deposits, commissions, fees, rejections, charge-backs, non-cash transactions, collector debts, tax invoices and credit notes.
- 7.1.2.10 Reporting functions for management and Operations as indicated in the Reporting Section of this document.

### **7.1.3 Financial Audits and Auditability**

- 7.1.3.1 The Contractor's accounting system shall be subject to external audits of the Auditor-General and internal audits by the Employer at any time. The accounting system shall be subject to the requirements of the Public Finance Management Act of 1999 and the requirements of this Agreement.

### **7.1.4 Tax Requirements**

- 7.1.4.1 The Contractor shall comply with all Applicable Laws relating to taxes, Value Added Taxes and other tax requirements, as amended from time to time.

### **7.1.5 User Account Charges**

- 7.1.5.1 The Contractor shall be at liberty to levy reasonable Road User account charges for the following services.
  - (a) Operator Card issue and replacement (magnetic and smart);
  - (b) Provision of detailed transaction listing. This does not include the electronic mailing of detailed transaction statements as part of the monthly consolidated Tax Invoices;
  - (c) Mailing of statements and Tax Invoices. This does not include the electronic mailing of Tax Invoices; and
  - (d) Provision of a copy Tax Invoice.
  - (e) The maximum charge that may be levied per service type shall be indicated in the Project Document: Volume 3. These charges shall be escalated with CPI.

- (f) All User charges and fees relating to Operator Cards, ETC-tags and other account charges shall be recorded on the Toll System and receipts and Tax Invoices issued in the name of the Employer.

## **7.1.6 Procedures, Records and Accounting for Toll Revenue Collected**

### **7.1.6.1 Procedures and Records**

- (a) The Contractor shall establish procedures and keep records to ensure that it accounts for every transaction involving any passage through the Toll Plaza.
- (b) At Lane level, Toll Collectors shall tender cash or appropriate documentation for all passages other than Bank Issued Card transactions which are validated by using the swipe card reader.
- (c) For the purposes of accounting and auditing, the Contractor shall initiate, introduce and maintain an integrated accounting system per Control Centre that reflects full details of all transactions involving a passage through the Toll Plaza. All of these records shall be stored as data in a Back Office System as an integral part of the Toll System that is more fully specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The Toll System shall include, without limitation:
  - i. All transaction-related information including date and time of passage conclusion, Toll Collector, payment options, Toll Collector classification, AVC classification, actual Toll Class as confirmed and verified by the Contractor, unique TCC and AVC sequential transaction numbers, Tax Invoice number and transaction value at the time of processing;
  - ii. All printed Tax Invoices (according to the VAT requirements as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4) and Receipts;
  - iii. Income and traffic related information as specified in the Employer/MIS/AVC interfaces;
  - iv. Incidents relating to the AVC; and
  - v. Debtors.
- (d) All transactions shall be valued at their nominal value, i.e. before bringing into account the fact that such transactions might be or have been subject to a discount. The amount of discount shall be allocated to the registered account. Details of the nominal transactions and discount shall be available per account.

- (e) The Contractor shall be required to transmit statistical information to the Employer on a daily basis, as specified herein and in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).

**7.1.6.2 Accounting System**

- (a) The Contractor shall initiate, introduce and maintain an accounting system, integrated with the Toll System, in order to comply with the required user-account functionality and other reporting requirements of this Agreement.
- (b) The Contractor shall keep control of all accounts in respect of Exempt User transactions, Run-through Violations and No-Payment transactions per User group, for all pre- and post-paid transactions.
- (c) The Contractor shall use the accounting system to manage all outstanding ISO Bank Card payments. Banks shall also be treated as a debtors or creditors depending on the transaction type.
- (d) The updating of payments received for ISO Bank Cards shall be done as a minimum on a weekly basis and at month-end, timeously for submission of the required information to the Employer.

**7.1.6.3 Filing and Storage of Accounting Records:** The Contractor shall file and store all accounting records in accordance with the Public Finance Management Act of 1999 and the National Archives Act of South Africa. Should the Contractor have inadequate storage due to archiving of document from the previous Contractor, then the Contractor must obtain alternative storage facilities and the cost shall be recovered from the Employer.

**7.1.6.4 Additional Requirements**

- (a) Various additional requirements relating to procedures and documentation apply to this Agreement.
- (b) The additional requirements are listed below under the following headings:
  - i. Violations;
  - ii. Exempt Users;
  - iii. Local Users and Local Public Transport Operators;
  - iv. No-Payment transactions; and
  - v. keyed-in card transactions.

### **7.1.7 Exempt User's Management**

- 7.1.7.1 The Contractor shall accept applications for all Exempt Vehicles as specified in the Government Gazette or other legislation and where applicable from time to time. Any new additions to the Exempt Vehicles as gazetted in future, during the Contract Period, will also be for the Contractor's account. The current Exempt Vehicles according to the Government Gazette are the South African Police Services (SAPS) and the South African National Defence Force (SANDF).
- 7.1.7.2 The Contractor shall only accept exempt user applications which consist of original documents with unique serial numbers and which bear the date, the signature of a manager in the issuing authority and the Vehicle Licence Number and comply with the criteria of the applicable legislation.
- 7.1.7.3 Institutions that qualify for free passages and any other institutions not included in the Government Gazette (such as Emergency Response Units, Fire Brigade, Metro Police, etc.) shall apply to be registered as a "Free Passage" user following the approval process defined by the Contractor.
- 7.1.7.4 The Contractor shall develop procedures for the application, approval and monitoring of exempt users.
- 7.1.7.5 The Contractor shall control and store all account applications in respect of Exempt User's and Discounts.
- 7.1.7.6 The Contractor shall ensure that the Exempt Transactions Records is monitored and a process of incident management be implemented as to manage the possible misuse of Exempt Transactions. The results from the incident management, where possible misuse is detected, are to be communicated to the applicable authority.
- 7.1.7.7 The Contractor shall assist with Tag installation for approved Exempt Vehicles and Free Passage vehicles, if requested.
- 7.1.7.8 The Contractor shall compile and manage a detailed list of Exempt Vehicles and Free Passage vehicles, applicable to each route and/or gantry.
- 7.1.7.9 The Contractor shall record all Exempt Vehicle and Free Passage transactions per applicable Vehicle Class, per exemption category and take the risk of accepting false or incorrect applications.
- 7.1.7.10 Exempt Vehicles without a Tag shall be identified with ANPR or MNPR or other acceptable means.

7.1.7.11 The Contractor shall keep separate accounting of all Transaction Records regarding Exempt Vehicles and Free Passages.

7.1.7.12 Over and above, the monthly receipts that are generated and issued by the TCH, the Contractor shall provide a receipt or statement on request of the exempt user authority.

#### **7.1.8 Payment Schemes and Payment Options**

7.1.8.1 With regards to aspects such as account payments and triggers for topping-up, which are configurable parameters on the TCH Back Office and decided by the Employer, the Contractor shall refer to the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a) where the specific requirements are indicated.

7.1.8.2 The Contractor shall allow Customers with pre-paid accounts to pay discretionary amounts if the automatic option is not chosen.

7.1.8.3 Payment options: The Contractor shall accept the following payment options:

(a) Payment options within a toll lane

- i. Cash in South African Rand.
- ii. Credit cards (VISA or MasterCard linked), and all associated garage and petrol cards.
- iii. Fleet cards managed and issued by the members of the South African Fleet Card Issuers, issued by petroleum companies and others that may be approved by the Contractor.
- iv. Identifiers linked to a Customer Account, namely:
  - ETC Tags (linked to a TCH account)
  - Toll Operator Cards
  - Smart Cards (implementation only if instructed by Employer)
  - Credit Cards (linked to a non-Tag account).

(b) Payment options accepted at a Point of Presence Customer Service Facility:

- i. Cash in South African Rand.
- ii. Credit cards (VISA or MasterCard) and all associated garage and petrol cards.

- iii. Fleet cards managed and issued by the members of the South African Fleet Card Issuers, issued by petroleum companies and other issuers that may be approved by the Contractor.
  - iv. Debit cards from all South African banks.
  - v. Electronic Fund Transfers via Internet banking interfaces, debit orders and stop orders.
- (c) Discretionary payment options:
- i. Acceptance of the following payment options shall be entirely at the Contractor's discretion:
    - Charge Cards

7.1.8.4 Payment schemes are the following:

- (a) Automatic replenishment
- (b) Discretionary Customer payments.

#### **7.1.9 Summary of Payment Schemes and Payment Options**

7.1.9.1 The combinations of possible payment schemes and payment options which shall be accepted at the Point of Presence Customer Service Facilities are indicated in Table 7-1 .

**TABLE 7-1: ACCOUNT TYPE, PAYMENT SCHEME AND PAYMENT OPTIONS FOR POINT OF PRESENCE CUSTOMER SERVICE FACILITIES**

Account type	Payment scheme	Payment option
Pre-paid Account	- Automatic payment [on specific day of month or at defined level of balance]	- Visa/Master credit card - Debit order
	- Discretionary payment	- Cash - Debit card - Visa/Master credit card - Fleet card - EFT
Post-paid Account	- Automatic payment	- Visa/Master credit card; or - Debit order

Account type	Payment scheme	Payment option
	- Discretionary payment (Implemented at discretion and risk of Contractor)	- Cash (Limited to cash volumes in accordance with V2B8b) - Debit card - Visa/Master credit card - Fleet card - EFT

### 7.1.10 Penalties

7.1.10.1 For non-compliance of the provision of the required payment schemes and payment options, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

7.1.10.2 For non-compliance of the VAT requirements, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### 7.1.11 Discounts

#### 7.1.11.1 General

- (a) The Contractor shall apply the applicable Discounts on the effective dates as published in the Government Gazette or instructed by the Employer from time to time. The various types of Discounts applicable are shown in the Project Document: Volume 3.
- (b) The Contractor shall not implement any other additional Discounts, except as instructed by the Employer.
- (c) All discounts, except national discounts, are applied on the Toll System Back-Office level.
- (d) Management of Discounts
  - i. The application forms for the Discounts, drafted and compiled by the Contractor, shall contain all necessary information to enable verification of eligibility, including, but not limited to, the Customer's name, telephone number, identity number and residential address, Vehicle Licence Number, colour, make and model, and reason for Discount.
  - ii. The Contractor shall approve and register the eligible road users in terms of the Government Gazette or as instructed by the Employer for the various Discounts.



- iii. Due to the fraud potential associated with Discount applications, the Contractor shall manage and control non-eligible applications. The Contractor shall prevent illegal use of discounted transactions and shall ensure that the Vehicle Licence Number, or any other relevant details as on the original application, corresponds to that of the actual vehicle.

**7.1.11.2 National Discounts**

- (a) These are discounts that are applied by the TCH on a national level, in accordance with the Government Gazette or as instructed by the Employer or TCH entity.

**7.1.11.3 Tag-based discounts.** These are discounts applied by the Contractor on the Back-Office System for Tag Account Customers, as decided from time to time by the Employer, or which are Gazetted.

**7.1.11.4 Local User Discounts**

- (a) The Contractor shall grant a Local User Tariff only to eligible Users in terms of the most current edition of the relevant Government Gazette from time to time.
- (b) The Contractor shall as a minimum utilise Bank Issued Cards and Operator Cards in accordance with the account management functions specified in Section 9.
- (c) Details of the applicable Local User Tariffs shall be included in the Project Document: Volume 3.
- (d) Application forms for a Local User Tariff shall contain all necessary information to enable verification of eligibility, including, but not limited to, the Users name, telephone number, identity number and residential address, vehicle registration number, colour, make and model, and reason for discount.
- (e) Application forms for a Local User Tariff shall be filed, and the application form shall be linked to a specific Operator card or ETC Tag. Uncollected Operator Cards shall be destroyed and ETC Tags shall be re-programmed within 2 (two) months of the proposed collection date.
- (f) The Contractor shall manage and control the illegal use of Operator Cards or any other Method of Payment linked to a Local User Tariff and shall ensure that the vehicle registration number, or any other relevant details printed and/or embossed on the Operator Card or stored on the ETC Tag corresponds.

**7.1.11.5 Local Public Transport Operator Discounts**

- (a) The Contractor shall grant a Local Public Transport Operator Tariff only to eligible Users in terms of the most current edition of the relevant Government Gazette from time to time.

- (b) The Contractor shall as a minimum utilise Bank Issued Cards and Operator Cards with the account management functions specified in Section 9.
- (c) The details of the applicable Local Public Transport Operator Tariffs shall be included in the Project Document: Volume 3.
- (d) Application forms for a Local Public Transport Operator Tariff shall contain all necessary information to enable verification of eligibility, including but not limited to, the Users name, telephone number, identity number and residential address, vehicle registration number, colour, make and model, and reason for discount.
- (e) Application forms for a Local Public Transport Operator Tariff shall be filed, and the application form shall be linked to a specific card or ETC Tag number. Uncollected Operator Cards shall be destroyed and ETC Tags shall be re-programmed within 2 (two) months of the proposed collection date.
- (f) The Contractor shall manage and control the illegal use of Operator Cards or any other Method of Payment linked to a Local Public Transport Operator Tariff User, and shall ensure that the vehicle registration number or any other relevant details printed and/or embossed on the Operator Card or stored on the ETC Tag corresponds.

**7.1.11.6 Frequent User Discounts**

- (a) The Contractor shall grant Frequent User Discounts only to eligible Users in terms of the most current edition of the relevant Government Gazette from time to time.
- (b) The Contractor shall as a minimum utilise Bank Issued Cards and Operator Cards with the account management function specified in Section 9.
- (c) Details of the applicable Frequent User Discounts shall be included in the Project Document: Volume 3.
- (d) Application forms for Frequent User Discounts shall contain all necessary information to enable verification of eligibility, including but not limited to the road Users name, telephone number, identity number and residential address, vehicle registration number, colour, make and model, and reason for discount.
- (e) Application forms for Frequent User Discount shall be filed, and the application form shall be linked to a specific card number. Uncollected Operator Cards shall be destroyed and uncollected ETC Tags shall be reprogrammed within 2 (two) months of the collection date.
- (f) The Contractor shall manage and control the illegal use of Operator Cards and any other Payment Mechanism used to implement a Frequent User Discount, and shall ensure that the vehicle registration number and registration number or any other relevant details printed and/or embossed on the Operator Card correspond.

**7.1.11.7 Other Discounts**

- (a) The Contractor shall not offer any other accounts to Road Users in addition to the discounts set out herein, unless instructed by the Employer. The amount of the discount or the qualifying conditions of such discount shall be at the discretion of the Employer.
- (b) Details of these types of discounts shall be included in the Project Document: Volume 3.

**7.1.12 Tariff Setting**

7.1.12.1 It is the sole responsibility of the Employer to determine the applicable Tariffs which Tariffs shall be published in the Government Gazette from time to time.

7.1.12.2 The applicable Tariffs will be implemented by the Contractor by following, inter alia, the following procedures:

- (a) Populate the Tariff and Discount tables on the applicable Back-Office database.
- (b) Set the activation date.
- (c) Ensure that the Tariff table is activated at the various Toll Plazas and Tolling Points on the effective date and time, and that the prevailing Tariff tables are at all times loaded and active.
- (d) Update all the Tariff boards (signs) along the Toll Road and at the relevant toll Lanes.
- (e) Draft operational procedures, as part of the quality assurance process, to be approved by the Employer, for the management of the entire process of changing any Tariff in order to ensure full compliance with the provisions of the Government Gazette and to address all possible risk factors. The Contractor shall accept all risks associated with the Tariff setting procedures and process.

**7.1.13 Incidents / alarms**

7.1.13.1 The Contractor shall act in a responsible manner to the incidents (System generated alarms) as provided and reported by the Toll System. The Contractor shall investigate and, where required, react to all incidents and record all possible information to provide a comprehensive financial and operational audit trail.

7.1.13.2 The Contractor shall distinguish between the following types of Incidents and report on the frequency of the incidents as indicated in the Reporting Section of this document:

- (a) Financial
- (b) Operational
- (c) Equipment and maintenance

#### **7.1.14 Links to the Banks**

##### **7.1.14.1 Links to the Banks and Card Merchants for Recovery of Card Transactions and Reconciliation.**

- (a) The Contractor shall establish direct electronic links with all the necessary banks and the Employers acquiring bank and card merchants for handling Bank Issued Card transactions so that recovery of the monies associated with non-cash transactions can be timeously accomplished. The Contractor shall however comply with the national interface used by the toll industry and honour the conditions set in the individual merchant agreements. If the Contractor wishes to use new interfaces, these interfaces and reasons for deviating from the standard shall be submitted to the Employer for approval.
- (b) The Contractor's Toll System shall have the capability of submitting consolidated or individual card transactions to the relevant banks and card merchants.
- (c) The Contractor shall perform all reconciliation relating to Bank Issued Cards and shall report in accordance with Section 18 hereof.
- (d) The Contractor shall bear the risk of all late payments and bad debts on Bank Issued Card transactions due to late submission of the transactions. The Contractor shall manage and bear all risk in relation to its own debtors accounts and all Revenue not deposited directly into the Joint Account by the banks or card merchants. The Contractor shall control its credit risk, which control may include denying credit to any Person which the Contractor considers to be a credit risk.

#### **7.1.15 Payments received and Transfer to the Banks**

##### **7.1.15.1 Non-ETC Toll transactions and account payments: The Contractor will hold one or more transmission accounts in the joint name of the Contractor and Employer at a banking institution, in accordance with the requirements of the Employer, for the depositing of the following moneys:**

- (a) Toll fees received in the Lanes at Conventional and Hybrid Toll Plazas and at the conventional part of a Conventional/ORT Toll Plaza (excluding deposits into and top-ups of accounts).
- (b) Payments and top-ups by Customers in respect of non-Tag accounts.

- 7.1.15.2 ETC (i.e. TCH) Account payments: The Contractor will deposit all payments in a transmission account/s in the name of the Employer (or TCH and VPC) at a banking institution, in accordance with the requirements of the Employer (or TCH and VPC). The Contractor shall have viewing privileges to this account/s.
- 7.1.15.3 The following payments will be deposited in the bank accounts:
- (a) With Tag registration and initial deposit by Customers at the Point of Presence Customer Service Facilities.
  - (b) Regular top-up's by Customers at the Point of Presence Customer Service Facilities.
- 7.1.15.4 The Contractor shall deposit all cash toll receipts and cash account payments received at the various Toll Plazas and Point of Presence Customer Service Facilities into the transmission accounts of the Employer and/or the TCH at least once per business-day, or as indicated accordance with the Operations and Maintenance Plan and the Project Document: Volume 3, and also taking into consideration the amount of cash, security, insurance and the like.
- 7.1.15.5 There shall be a daily clearing of the Joint Accounts to the Employer and/or TCH bank accounts designated by the Employer. The Contractor shall have read-only access to the bank statements of the Joint Accounts. The Employer and/or TCH shall exercise full control over the Joint Account.
- 7.1.15.6 All Bank Issued Card, including Bank Debit Card transactions shall be processed and transferred the next business day to the banks or card merchants, or as indicated in the Project Document: Volume 3.
- 7.1.15.7 The Contractor shall be liable for the payment of interest in respect of late payments at the prime overdraft interest rate, as amended from time to time. The Contractor shall be liable for the payment of shortfalls on deposits made, interest on any late payment and interest on any shortfall on deposits made into the transmission account.
- 7.1.15.8 The Contractor shall ensure that all monies collected by it are protected, and, where necessary, insured. Such insurance shall note the Employer's interest in such funds.
- 7.1.15.9 The Contractor shall remain fully liable in respect of all monies that may be collected until such time as the said monies have been received and accepted into the bank accounts of the Employer and/or TCH. The Contractor shall make no withdrawals from the Joint Accounts.
- 7.1.15.10 The Contractor shall submit a month-end merchant's data file (bank file) for all outstanding Bank Issued Card, Bank Debit Card and Smart Card transactions, not processed and transmitted up to the last calendar day of the month.

7.1.15.11 The Contractor shall be responsible for the safe transfer of cash to the relevant Banks.

## **7.2 CONVENTIONAL AND HYBRID TOLL PLAZAS AND THE CONVENTIONAL PART OF A CONVENTIONAL/ORT TOLL PLAZA**

### **7.2.1 General**

7.2.1.1 In addition to the previous Section, the Contractor's main functions and responsibilities pertaining to financial management for Conventional and Hybrid Toll Plazas and the Conventional Part of a Conventional/ORT Toll Plaza, includes:

7.2.1.2 To establish procedures and keep records to ensure that it accounts for every transaction involving any passage through a Toll Lane of a Toll Plaza and for all payments received at the Toll Plazas;

7.2.1.3 To reconcile all traffic that went through the toll lanes against income and revenue on the Back Office System;

7.2.1.4 To collect and settle all cashier debts, i.e. cashier shortfalls;

7.2.1.5 To reconcile all revenue banked vs. revenue registered on the Back Office System;

7.2.1.6 To send, on a daily basis, all credit card transactions from the Toll Plazas to the banks and to perform reconciliation and reporting thereof;

7.2.1.7 To provide and introduce daily cash-up procedures for all revenue received as well as deposits on the Back Office System;

7.2.1.8 The Contractor shall issue VAT Invoices in the Lane if and when requested by a Road User, except if any particular Bank Issued Card, Bank Debit Card, Operator Card or any other Payment Option is registered with that Contractor for issue of a monthly VAT invoice, or in the case of an ETC transaction, or where discount associated with the transaction is calculated on a monthly basis as opposed to a passage basis.

7.2.1.9 The Contractor shall group transactions relating to Bank Issued Cards, smart cards, Bank Debit Cards, Operator Cards or ETC Tags or any other Payment Option held by a single road user or group of road users on a single monthly statement and/or VAT invoice, on request by the road user/s, either per Toll Plaza, Control Centre or Toll Road. The information for all Toll Plazas and Control Centres shall be available at any one of the Control Centres along the Toll Road.

7.2.1.10 The Contractor shall bear all costs relating to the processing of any Payment Options, including cash, Bank Issued Cards, Bank Debit Cards, Operator Cards and ETC Tags, No-

Payment, Exempt Users or any other Payment Option including, without limitation, levies, service charges and cost of rejection. The bank commissions shall be paid to the relevant banks by the Contractor. The Contractor shall in-turn claim back the commissions through the monthly certificates. . The Contractor shall therefore verify the amount of the monthly bank commissions payable.,

- 7.2.1.11 The Toll System shall have the functionality to enable the Contractor to register Bank Issued Cards, Bank Debit Cards, Operator Cards and ETC Tags on a single account for use at all Toll Plazas covered under this Agreement.

## **7.2.2 Non-Payment Policy**

- 7.2.2.1 The Contractor shall process No-Payment transactions, as follows:

- (a) Free Passage: The Contractor shall accept all exemptions which the Minister of Transport may grant to Exempt Users from time to time in terms of the Act however, any new additions to the Exempt Users, during the duration of the contract, will be for the Employer's account. Such exemptions shall be described in the Government Gazette notices from time to time.
- (b) No-Payment:
  - i. If no acceptable form of payment is presented by a road user in terms of this Agreement, the Contractor shall cause such road user to be turned around by means of a passage through the Lanes in the opposite direction to its approach to the Toll Plaza.
  - ii. The Contractor shall take all reasonable care in turning such road user / vehicle around and indemnifies and shall keep the Employer indemnified against any claim of whatsoever nature which may be instituted by such a road user or any third party pursuant to the Contractor's acting under the provision of this Clause.
  - iii. For each No-Payment transaction, the Contractor shall provide a Receipt.
- (c) Run-Through Violation Policy
  - i. The Contractor shall apply adequate measures to prevent Run-through Violations.
  - ii. The Contractor shall be solely responsible for the pursuance of Run-through Violations through legal means at its own discretion.
  - iii. All toll lanes shall be operated with an automated exit barrier that shall restrict unauthorised passages by any vehicle type.

- iv. Violations include run-through Violations, Violations due to Contractor error (paid violations), Violations due to User error and technical Violations caused by equipment error.
- v. For each run-through Violation, the Contractor shall print a receipt. The toll system shall generate a sequentially and uniquely numbered Tax Invoice. Should the violation have occurred while the Lane equipment was out of order the Contractor shall generate a sequentially and uniquely numbered Tax Invoice from a pre-printed manual Tax Invoice book, recording at least the following information as captured by staff in the Lanes and/or if triggered and captured on the VGS System:
  - vehicle registration number,
  - colour,
  - make,
  - model, and
  - whether the offence was committed by a private, SAPS, SANDF or Emergency Vehicle.
  - The Toll System shall make provision for the correct allocation of such transactions to the relevant accounts in the accounting system.
- (d) For each Violation due to Contractor error, User error or equipment error, the Contractor shall record the reason for the Violation, vehicle registration number, colour, make, model, and whether the offence was committed by a private, SAPS, SANDF or Emergency Vehicle. The image captured on the Video Grabbing System shall be attached. This audit trail shall be ported to the Back Office System and stored for later verification.
- (e) Where the Contractor receives Toll for a Violation, the Contractor shall record such payment on the Back Office System and issue the relevant VAT invoice produced to the payee.
- (f) The accounting system shall identify and differentiate between violations for which payment was received and those with no income.
- (g) When credit notes are generated to write-off the losses of un-paid Violations, credit notes may not be generated for Violations for which payment was received.

### **7.2.3 Collection of Toll Revenue and Vehicle Classification**

- 7.2.3.1 The Vehicle Classification System together with the applicable Tariffs for Toll Classes shall be published in the Government Gazette from time to time.



- 7.2.3.2 It shall be the responsibility of the Contractor to familiarise itself and apply such Vehicle Classification System and Tariffs at all times and to classify vehicles in accordance with the Vehicle Classification System and without unlawful favour or prejudice to any Person.
- 7.2.3.3 The Contractor shall be responsible for collecting the correct Toll revenue for all vehicles processed through the Toll Plazas according to the applicable Toll Classes without unlawful favour or prejudice to any Person.
- 7.2.3.4 In the event of the Contractor collecting the incorrect Toll as a result of the incorrect change being tendered to the User, and/or the incorrect classification being applied by the Toll Collector, the Contractor shall endeavour to correct such error before concluding the transaction.
- 7.2.3.5 All Toll and pre-paid deposits collected at the Toll Plazas shall be and remain the sole property of the Employer subject to this Agreement, and no right whatsoever to such Toll and pre-paid deposits shall be vested in the Contractor, save as herein set out.
- 7.2.3.6 The Contractor shall under no circumstances employ such Toll revenue or pre-paid deposits, whether temporarily or permanently, for its own gain or return or for the gain or return of any other person.
- 7.2.3.7 The tendering of Toll at the Toll Plazas by any User and the acceptance thereof by the Contractor shall be deemed to be a financial transaction and a legally binding contract between the road user and the Employer. Solely in this regard, shall the Contractor be deemed to be the Employer's appointed agent. Save as elsewhere specified in this Agreement, there shall exist no relationship of agency between the Employer and the Contractor.

#### **7.2.4 Exempt Users**

- 7.2.4.1 Where the Contractor receives Toll for an Exempt User transaction, the Contractor shall record such payment on the Back Office System and issue the relevant Tax Invoice to the payee.

(a) Exempt User Warrants

- i. Exempt User Warrants shall be original documents with unique serial numbers, and shall bear the date, the issuing authority's signature, the vehicle registration number and the driver's identity number. In the case of SAPS and SANDF Exempt Users, the Users identity number shall be replaced by the User's police or Defence Force appointment certificate number, respectively.
- ii. The Contractor shall attach a Receipt to each Exempt User warrant and shall cancel such warrants on a daily basis

- iii. In the event of the Exempt User being issued an Operator Card then the application requirements that are applicable for Users qualifying for Local User Tariffs, Local Public Transport Operator Tariffs and Frequent User Discounts shall apply to the Operator Card.

(b) Keyed-in Card Transactions

- i. The Contractor shall complete a card voucher and provide a Receipt for each keyed-in card transaction.
- ii. The Contractor shall ensure that the imprint of the card number on the card voucher is legible.
- iii. The User shall sign the card voucher.
- iv. The Contractor shall record the Lane, date, Toll Class and Tariff on the card voucher before handing it to the User for signature.

**7.2.5 Money Float**

- 7.2.5.1 The Contractor shall ensure that an adequate money float and coinage is available at the various Toll Plazas to ensure that a road user will at all times obtain the correct change if any valid South African currency note or coin is offered as cash payment during a toll transaction.

**7.3 FINANCIAL MANAGEMENT REQUIREMENTS FOR ORT OPERATIONS**

**7.3.1 General**

- 7.3.1.1 In addition, for ORT Operations which include for the ORT Operations at a Conventional/ORT Toll Plaza, the Contractor's main functions pertaining to financial management include the following:
- 7.3.1.2 Establishing procedures and keeping records to ensure that it accounts for every transaction involving any passage through the Tolling Points.
- 7.3.1.3 Establishing procedures and keeping records to ensure that it accounts for all payments received at the Customer Service Facilities.
- 7.3.1.4 Reconciling all traffic that passed the Tolling Points against income and revenue as received from the TCH.
- 7.3.1.5 Ensuring the capturing of all toll transaction data and providing Compliant and Complete transactions from the Back Office System to the TCH.

7.3.1.6 The accounting, stock control, reporting and distribution of Tags collected or distributed by Point of Presence Customer Service Facilities.

7.3.1.7 Collecting and settling of all cashier debts, i.e. cashier shortfalls. This excludes the collection of Customer Account debts such as violations which is the responsibility of the VPC.

7.3.1.8 Reconciling all transactions that were transferred to the TCH with the actual transaction status as received back from the TCH in terms of paid transactions, violations, exempt passages, Discounts, etc.

### **7.3.2 Toll Revenue Management**

7.3.2.1 The accounting process on the Back Office System will not be required for invoicing, delivering of statements and tax invoices, as these functions will be performed at the TCH level.

7.3.2.2 The Contractor shall perform, inter alia, the following additional management functions:

- (a) Performing cash-up functions at the Point of Presence Customer Service Facilities at the end of each operational day on the TCH and VPC Systems, i.e. reconciling all payments, deposits and top-ups received at the Point of Presence Customer Service Facilities with what was registered on the TCH and VPC Systems and what was banked in order to determine whether there were any surpluses or shortfalls.
- (b) Depositing all payments received from all the Point of Presence Customer Service Facilities into the TCH / VPC transmission accounts at least once per business day as approved by the Employer, and in accordance with the Project Document: Volume 3.
- (c) The reconciliation of payments banked vs. payments registered on the TCH / VPC System.
- (d) The reconciliation of transactions transferred to TCH / VPC vs. payment that was registered on the TCH / VPC.
- (e) The reconciliation of AARTO infringement payments received at the Customer Point of Presence Facilities and that was banked.
- (f) Ensuring that the updating of transactions with regard to payments, late payments and violations, as received from the TCH, is performed, as a minimum, on a daily basis.
- (g) Preventing illegal use of discounted transactions and ensuring that the Vehicle Licence Number and/or any other relevant details, as on the original application for an account, correspond to that of the actual vehicle.

### **7.3.3 Road User types with regards to ORT Operations**

7.3.3.1 The Contractor shall make provision for the following type of road users:

- (a) Registered Tag users: These are road users who are registered on the TCH System with their full details.
- (b) Registered VLN users: These are Customers who have not installed a Tag. These vehicles shall be identified by means of their Vehicle Licence Number that shall be processed by means of ANPR or MNPR.
- (c) Registered Day Pass users: This scheme shall be recommended for occasional users to declare and pay for usage in advance, in multiples of days. A limit, as specified in the Project Document: Volume 3 shall be imposed by the Contractor on the use of Day Passes and it shall be the responsibility of the Contractor to monitor this.
- (d) Exempt Vehicle and Free Passage users
  - i. The Contractor shall assist with Tag installation for approved Exempt Vehicles and Free Passage vehicles, if requested.
  - ii. The Contractor shall compile and manage a detailed list of Exempt Vehicles and Free Passage vehicles, applicable to each route and/or gantry.
  - iii. Exempt Vehicles without a Tag shall be identified with ANPR or MNPR or other acceptable means.
- (e) Anonymous users; The need for this type of user may emerge from users that need privacy of travel. Only when instructed by the Employer, shall the Contractor be permitted to implement (together with the TCH) this road user type together with a customised application and implementation procedure as approved by the Employer.
- (f) Unregistered users
  - i. Unregistered users are those road users using the network without an account at the TCH.
  - ii. All first Transaction Records from identifiable vehicles that cannot be associated with an account shall be considered to be that of an unregistered user and shall be allocated to an unregistered user.
  - iii. An unregistered user account shall be automatically opened for an identifiable vehicle and all Transaction Records associated with that particular vehicle shall be allocated to that specific user account.
  - iv. The Contractor shall be aware that all Transaction Records of unregistered users shall be kept for a Grace period at the TCH, which Grace Period shall be

determined by the Employer from time to time. The whole batch of Transaction Records accumulated during the Grace Period, plus each Transaction Record received after the Grace period shall be transferred by the TCH to the VPC (if Opted-in) for processing as Potential Violations.

- v. The Contractor shall ensure that any Customer and/or unregistered user with Transaction Records pending at the TCH during the allowed Grace Period, shall be able to make payments at a Customer Service Kiosk.
- vi. The Contractor shall ensure that users with Transaction Records that were transferred from the TCH to VPC, thus in "Violator status", shall also be able to pay outstanding fees at a Customer Service Kiosk.

#### **7.3.4 Exempt Road Users**

- 7.3.4.1 An account shall be opened and a Tag shall be issued by the Contractor on approval of a valid Exempt road user application at a Customer Service facility. A Customer, including a business, may have one account for a multiple number of vehicles.
- 7.3.4.2 The Contractor shall ensure that all Exempt Transaction Records are recorded on the Back Office System and transmitted to the TCH.
- 7.3.4.3 Should the VPC detect an exempt road user that is not registered as such, the information will be passed to the Contractor via the TCH. The Contractor shall contact that Authority to encourage the Authority for registering as an Exempt user.

#### **7.3.5 Discounts**

- 7.3.5.1 The Contractor shall adhere to and apply the discounts as determined by the TCH from time to time.
- 7.3.5.2 The nominal tariff is the highest published Vehicle Licence Number (VLN) tariff. A registered user that does not have a Tag, shall pay the nominal tariff. The Contractor shall ensure that all Discount tariffs are calculated from the nominal VLN tariff.
- 7.3.5.3 Money float: The Contractor shall ensure that an adequate money float and coinage is available at the various Point of Presence Customer Services to ensure that a Customer will at all times obtain the correct change if any valid South African currency notes or coins are offered as cash payment during a account registration or top-up.

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## **SECTION 8.      OPERATIONS PERIOD – CUSTOMER SERVICES**

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## **8.1 GENERAL: CUSTOMER SERVICES**

### **8.1.1 Introduction**

8.1.1.1 This “General” section provides Customer Services requirements for Conventional and Hybrid Toll Plazas, ORT Operations as well as for Conventional / ORT Toll Plaza Operations.

8.1.1.2 The Contractor shall adhere to the following key objectives, in order to ensure that Customer Services shall:

- (a) Conform to the Operations objectives as stated in Section 1.2 of this document;
- (b) Be effective in terms of time and quality of service;
- (c) Ensure security, confidentiality and privacy in terms of Customers personal data and information;
- (d) Ensure that invoices, statements and records will have integrity in reflecting toll transactions with the necessary accuracy and precision;
- (e) Provide road user and Customer confidence that is manifested by low or non-existent error levels.

8.1.1.3 The Customer Services provided by the Contractor shall be measured in terms of performance criteria as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

8.1.1.4 The Contractor shall interact with the Customers at different levels as shown below:

- (a) Toll Plaza level: At Conventional and Hybrid Toll Plazas, Customers will be able to open either non-Tag accounts or Tag accounts, perform account payments, request statements and the like. (See Section 9: Management of Customer Accounts).
- (b) National Call Centre level: For Tag accounts, there will be a Call Centre service, managed by the TCH, which will receive calls on a national level. The Call Centre will direct calls to Contractor for resolving Contractor-specific queries that cannot be resolved by the Call Centre.
- (c) Point of Presence Customer Service Facility level. (Applicable for Tag registrations and Tag payments).
- (d) Website level: For Tag accounts, the TCH shall host a national website where Customers can open accounts online, have access to their accounts and have queries resolved etc. This website shall either contain web-pages to be managed by the Contractor or provide a link to the Contractor’s own website, where information such

as, amongst others, contact details, Tariffs, Discounts, application forms for opening of accounts, business hours and the like will be available. The Project Document: Volume 3 will specify the specific information that the Contractor shall provide on the website. It shall be the responsibility of the Contractor to continuously update his part of the website.

- (e) Commercial retail outlets and appointed agents: (Applicable for ORT Operations).
- (f) Courier, mail or e-mail service: The Contractor shall be aware that courier or mail services for delivering of statements, invoices, Tags etc will be managed by the TCH. The TCH will also be able to deliver statements and invoices by means of e-mail.

### **8.1.2 Customer Services at Point of Presence Customer Service Facilities**

8.1.2.1 The following Customer Services shall be provided by the Contractor at the Point of Presence Customer Service Facilities:

- (a) Account management services as described in Section 9.1, that includes aspects such as:
  - i. Account registration
  - ii. Receipt of account payments
- (b) Tag management services as described in a Section 11 in this document that includes aspects such as:
  - i. Tag ordering, inventory management, distribution (in case of ORT) to Point of Presence Customer Service Facilities.
  - ii. Returning of reported failed Tags to the TCH and interchanging to the Customer with a new or repaired Tag as and when reported by a Customer.
- (c) Processing of queries and complaints such as:
  - i. Logging or registering of complaints;
  - ii. Assisting with system (account) information where possible;
  - iii. Action a “follow-up” on the system.
  - iv. Providing information on toll fees, Discounts and exempts.
- (d) Information transfer to Road Users and Customers.

8.1.2.2 The availability of Customer Service Facilities will be measured in terms of the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).



### **8.1.3 Customer Services wrt Call Centre and Website Services**

8.1.3.1 With regard to Call Centre (Refer also to Section 19.3) and website services, the Contractor shall provide the following Customer Services:

- (a) For Customers with Tag accounts, attend to requests that were directed from the TCH Call Centre.
- (b) Resolve Customer issues that are applicable to the Contractor, which cannot be solved by the TCH Call Centre, such as route based Discount applications, applications for toll fee exemption, reporting of damage of Road Side Equipment by motorists, e.g. in the case of a vehicle accident and the like.
- (c) The Contractor shall maintain his part of the website (or the Contractor's website that is linked to the TCH) that were developed and provided by the TCH, and continuously update it with the latest information, such as, but not limited to the toll tariffs, various applicable Discounts, where and how to register for an account at the Customer Service Facilities, and the like.
- (d) There will be an option that Tags can be mailed to the Customer or collected by the Customer at any of the Point of Presence Customer Service Facilities for Tag Account applications that were registered on-line through the TCH website or Call Centre. The Contractor shall therefore facilitate the activation and issuing of these Tags to the applicable account.

## **8.2 ORT OPERATIONS: CUSTOMER SERVICES**

### **8.2.1 General**

8.2.1.1 The additional requirements for Customer Services for ORT Operations are indicated in this section.

8.2.1.2 Point of Presence Customer Services will be provided by the Contractor at the following facilities:

- (a) Satellite Centres which are located at strategic locations on the route as provided by the Contractor.
- (b) Permanent and Temporary Customer Service Kiosks.
- (c) Mobile Payment Stations, which facilities shall be provided by the Contractor.
- (d) Commercial retail outlets and appointed agents: The Contractor shall be aware that these potential third party outlets will be procured and managed by the TCH to provide convenience outlets at locations such as major chain stores/franchises within shopping centres and other major commercial facilities.

- 8.2.1.3 The Contractor's responsibilities and services at the Central Operations Centre, where the ORT Back Office are located:
- (a) Centralised and area-based Customer service management.
  - (b) All high level and project related Operations support and management.
  - (c) All Back Office management and Operations which includes monitoring of all the Back Office processes (including image processing), initiation of corrective actions and control of the entire ORT toll function.
  - (d) Centralised Tolling System and Facilities Maintenance management.
- 8.2.1.4 The Contractor's responsibilities and services at Point of Presence Customer Service Facilities are:
- (a) To comply with office hours as approved in the Operations and Maintenance Plan.
  - (b) To provide an efficient, courteous and high service level experience to all Customers.
  - (c) To accept payment from Customers for invoices that were issued by the VPC shall be possible at any of the Point of Presence Customer Service Facilities (Kiosks, Satellite Centres etc) by means of the interface to the VPC System.
  - (d) To electronically capture all data and information during the account registering process, including electronic signing, unless otherwise directed by the Employer's Representative. The objective is that the use and filing of paper hard-copies should be limited.
  - (e) Effective and efficient payment processing as part of the Customer Services.
  - (f) A one-stop service, one visit experience.
- 8.2.1.5 Satellite Centres. The Contractor shall be responsible for the following additional services:
- (a) Point of Presence Customer Service Operations as indicated above.
  - (b) To accept payment from Customers for fines, including fines that are non toll-related (i.e. through the AARTO process), shall be possible only at the Satellite Centres by means of a link to the AARTO system.
  - (c) Co-ordination of maintenance of Tolling System and facilities.
  - (d) Assisting Customers at the self help terminals if they are provided at the Satellite Centres.

8.2.1.6 Mobile Payment Stations: The Contractor shall in addition be responsible for:

- (a) The assistance of enforcement operations by providing Customer Service during such operations. See Section 16 in this regard.
- (b) Supplementing the Customer Service Kiosks as additional account registration and Tag issuing outlets during the ramp-up period, before Toll Operations commence.
- (c) Deployment of these stations as supplementary stations to the Customer Service Kiosk Operations during Toll Operations , as and when required by the Contractor.

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**SECTION 9.      OPERATIONS PERIOD   –   MANAGEMENT   OF**  
**CUSTOMER ACCOUNTS**

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## **9.1 GENERAL: MANAGEMENT OF CUSTOMER ACCOUNTS**

### **9.1.1 Introduction**

9.1.1.1 This “General” section provides requirements for the management of Customer Accounts for Conventional and Hybrid Toll Plazas, ORT Operations as well as for Conventional / ORT Plaza Operations.

9.1.1.2 It shall be the responsibility of the Contractor to register each road user that applies for an account on the Tolling System Back Office System or TCH (in case of Tag accounts) taking into account all the payment options (inclusive of bank issued cards, bank debit cards etc) as described further in this document. Where Customers are applying for an ETC Tag, the Contractor will be acting as an “agent” of the TCH.

9.1.1.3 The registration of Tag and VLN (in case of ORT) accounts, payments and account updates will be performed by the Contractor directly onto the TCH System.

9.1.1.4 The account management services to be provided by the Contractor, taking into account the applicable TCH procedures, shall include the following:

- (a) For non-Tag Accounts: Performance of Customer Account registration and support in accordance with the approved Contractor’s procedures.
- (b) For Tag Accounts: Performance of Customer Account registration and support in accordance with the required TCH procedures.
- (c) Receipt of account payments, invoice payments and Infringement Notice payments from Customers.
- (d) Account updates if and when Customer details changes (incl. account closing, change of details, etc).
- (e) Issue of regular (e.g. monthly) usage statements and copy Tax invoices, as well as issuing of these statements and invoices on Customer request.
- (f) Managing Customer Accounts, including reconciliation, cash transport and banking.
- (g) Closing of an account at any Plaza or Point of Presence Customer Service Facility.
- (h) Allowing account top-ups or settlement.
- (i) Processing applications for Discounts and Exempted Vehicles.
- (j) Attending to account queries, including account balances.
- (k) Providing original and copy Tax invoices.

- (l) Registering exempt road users.
- (m) Accepting all types of payment options as specified.
- (n) Ensuring that each Tag that is issued, shall be linked to a single valid account and vehicle.

9.1.1.5 The Contractor shall ensure that Customers shall, upon request, be able to obtain a statement of their account in respect of the requested period. For prepaid accounts, the starting and ending balances shall also be shown.

9.1.1.6 The Contractor shall issue consolidated statements on request.

9.1.1.7 The required account registration accuracy is 97,5% and account registration accuracy will be measured in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **9.1.2 Types of Customer Accounts**

9.1.2.1 Two types of Customer Accounts shall be provided for, namely:

- (a) Non-Tag accounts on the Contractor Back Office System (Pre- and post- paid accounts): These accounts are applicable at Conventional and Hybrid Toll Plazas where Customers have accounts directly with the Contractor and where Tags are not involved. With regard to these accounts, the Contractor shall:
  - i. Register these accounts on the Tolling System Back Office System as per the section “Accounts and Account Functionality”.
  - ii. Receive payments and top-ups.
  - iii. Issue a Toll Authority card which is linked to an account.
- (b) Tag and VLN (in case of ORT) accounts at the TCH (Pre- and post- paid accounts): These accounts are applicable where Customers have applied for Tags and therefore the accounts are with the national TCH. With regard to these accounts, the Contractor shall:
  - i. Register accounts on the TCH System per the section “Accounts and Account Functionality”.
  - ii. Receive payments and top-ups.
  - iii. Activate Tags and issue Tags where they are linked to accounts.
  - iv. If required by Customers, assist with the installation of Tags at Satellite Centres.

**9.1.3 Contractor's General Responsibilities for Registering Accounts**

- 9.1.3.1 With regard to Tag accounts, the Contractor shall ensure that any potential Customer shall enter into a contract with the TCH. The contract shall be supplied by the TCH, and the Contractor shall be responsible to have this contract signed by prospective Customers.
- 9.1.3.2 With regard to non-Tag accounts, the Contractor shall ensure that any potential Customer shall enter into a contract with the Contractor. The contract shall be supplied by the Contractor, and the Contractor shall be responsible to have this contract signed by prospective Customers.
- 9.1.3.3 The Contractor shall use an electronic signature device to capture a Customer's signature, which device and method shall be approved by the Employer. The Customer shall be issued with a proof of registration and a receipt for payment. The Contractor shall issue ISO or barcode type identification cards to the Customers for identification during Tag account payments.
- 9.1.3.4 The Contractor shall explain the use and conditions, including benefits of the applicable contract to the Customer and amongst others, highlight the rights and the obligations of the parties, Tag ownership (if applicable), toll fees, top-up's, statements, renewals, validity period and the like.
- 9.1.3.5 The Contractor shall ensure that when accounts are registered, the minimum pre-payment is received in accordance with the TCH procedures and system requirements.

**9.1.4 Account Termination**

- 9.1.4.1 The Contractor shall adhere to the procedures of the TCH and/or the Employer as to when and how accounts will be terminated.
- 9.1.4.2 The Contractor shall adhere to the TCH procedures and/or the Employer requirements for when receiving a request for termination from a Customer, inclusive of the refunding of the balance, if any.
- 9.1.4.3 For Non-Tag accounts, the Contractor shall develop procedures for account termination and include it in the Operations and Maintenance Procedures, which shall be approved by the Employer.

**9.1.5 Account Top-up**

- 9.1.5.1 For all accounts, the Customer will regularly be required to deposit funds into the pre-paid account, the level of which shall be prescribed by the TCH Business Rules and/or the Contractor's requirements to ensure that account balances remains above a minimum specified threshold.

**9.1.6 Pre-paid Accounts: General**

- 9.1.6.1 The recharging of the prepaid accounts, whether in the Lane, by monthly debit orders or any other mechanism, shall be at the road user's discretion.
- 9.1.6.2 The Contractor shall ensure that the top-up's of the pre-paid accounts whether by monthly debit orders or any other mechanism, shall be in accordance with the TCH Business Rules and/or the Contractor's requirements.
- 9.1.6.3 The Contractor shall provide all prepaid Customers their account balance upon request at any Point of Presence Customer Facility. (A Customer may also contact the national Call Centre to obtain account information).
- 9.1.6.4 The Contractor may implement a minimum account balance requirement, which requires that all prepaid accounts shall maintain a minimum balance and that any card shall be rejected once the account reaches that preset minimum balance. The minimum balance shall not be less than the value of 5 (five) trips at the maximum Toll applicable to the account holder multiplied by the number of cards/Tags issued/registered or as instructed by the Employer. In the case where a mix of Toll Classes is linked to an account, the highest Tariff may be used.
- 9.1.6.5 Should the account have insufficient funds to process the current transaction, the Contractor shall provide the road user with the account balance on request.
- 9.1.6.6 All prepaid account holders shall be able to obtain their account balance upon request when passing through any Lane where the account may be used at the Toll Plazas along the route. The Toll System shall be configurable to display the road users balance as requested. The User shall be provided with the option to request that his balance be displayed at every passage or that the balance display be suppressed. The Contractor shall also provide the User with his balance in the Manual Lane or Mixed Manual/ETC Lane on request. This shall be a printed balance or the balance shall be displayed on the UFD. The User shall not have to wait more than 2 (two) seconds to obtain such balance. The balance shall be no more than 6 (six) hours old at the time of display to the User and shall include all transactions and recharges at the relevant Toll Plazas along the route operated by the Contractor, prior to that 6 (six) hour period and shall also include the current transaction i.e. deduct the current transaction from the account balance downloaded to the Lane from the Back Office System.
- 9.1.6.7 Low balance warnings shall be displayed as set out in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems Volume 2 Book 4a. The low balance warning will be displayed once the balance drops below the value approved by the Employer.



**9.1.7 Pre-Paid Accounts: Tag and VLN (in case of ORT) Accounts**

- 9.1.7.1 The Contractor shall register Customers on a pre-paid account system on the TCH to process individual Customers and/or corporate road users for whom several ETC Tags (or any other Payment Mechanism such as Number plate transactions) can be linked to one account enabling a single recharge for all such accounts in respect of such clients.
- 9.1.7.2 All deposits made by Customers shall be deposited directly into the TCH's nominated transmission account.

**9.1.8 Pre-Paid Accounts: Operator Accounts (Non-Tag Accounts)**

- 9.1.8.1 As a minimum the Contractor shall implement an Operator prepaid account system that allows road users to use prepaid Operator cards , as approved by the Employer.
- 9.1.8.2 The Contractor shall implement an Operator prepaid account system to process individual road users and/or corporate road users for whom several Operator cards or any other payment option can be linked to 1 (one) account enabling a single recharge for all such accounts in respect of such clients.
- 9.1.8.3 The Contractor shall register Customers on a pre-paid account system on the Back Office System to process individual Customers and/or corporate road users for whom several vehicles can be linked to one account enabling a single recharge for all such accounts in respect of such clients.
- 9.1.8.4 All deposits made by Customers shall be deposited directly into the Contractor's bank account.
- 9.1.8.5 The Employer shall provide the Contractor with the values and details of the opening balances of all prepaid accounts as at the Commencement Date. Operator Cards shall not be usable at any toll plaza on a route controlled by a different operator unless approved by the Employer.
- 9.1.8.6 The Employer shall approve the issuer number to be used by the Contractor.

**9.1.9 Post-Paid Accounts**

- 9.1.9.1 Post paid accounts include all accounts that are linked to Bank Issued Cards, smart cards, Bank Debit Cards, Operator Cards or ETC Tags or any other Payment Mechanism or where a maximum negative balance on the account is accepted.

9.1.9.2 The Contractor shall ensure that the registering of a Customer post-paid account will be in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).

9.1.9.3 With regard to non-Tag accounts, the Contractor shall not allow post-paid accounts.

9.1.9.4 The registering of Post-Paid Accounts for Tag accounts (except accounts linked to valid bank credit cards) shall be subject to the delivery by a Customer of a guarantee as required and approved by the TCH.

9.1.9.5 The account information requirements shall be prescribed by the TCH and/ or the Contractor as applicable.

#### **9.1.10 Customer's Account Charges**

9.1.10.1 In case of all Accounts, the Contractor shall levy Customer's Account charges, strictly in accordance to the Business Rules as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: ETC Interoperability - Business rules (Volume 2 Book 8a).

### **9.2 ORT OPERATIONS: MANAGEMENT OF CUSTOMER ACCOUNTS**

#### **9.2.1 General**

9.2.1.1 Additional account management services to those stated under the General section at the Customer Service Facilities shall include:

- (a) The opening and closing of an account at any of the Customer Service Kiosks, including at the Mobile Payment Stations.
- (b) Registering accounts for Tag and Vehicle Licence Number (VLN) road users, as well as for occasional road users with day-passes.
- (c) The Contractor shall ensure that account top-up should be possible at all the Point of Presence Service Facilities.

9.2.1.2 The Contractor shall actively promote road user registration and simplify the sign-up process as much as possible.

9.2.1.3 Customer's Account charges: All user charges and fees relating to Tags and other account charges shall be recorded on the TCH System and receipts and Tax Invoices shall be issued by the TCH.

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## **SECTION 10.      OPERATIONS PERIOD – TRAFFIC MANAGEMENT**

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## **10.1 PROVISION OF AVAILABLE TRAFFIC DATA**

### **10.1.1 General**

10.1.1.1 The provision of available traffic information to the Contractor, as indicated below, will enable the Contractor to plan for initial traffic management, especially at the Conventional and Hybrid Toll Plazas.

(a) Traffic data for existing Toll Roads:

The Project Document: Volume 3 contains available historic hourly and/or daily traffic data, in respect of existing Toll Plazas and Toll Roads.

(b) Traffic data for new Toll Roads:

The Project Document: Volume 3 contains all available historic hourly and/or daily traffic data for all the Employer-owned traffic event loggers located on or in the corridor and / or vicinity of the Toll Road and on all relevant alternative routes.

## **10.2 VEHICLE PROCESSING SPECIFICATION**

### **10.2.1 General**

10.2.1.1 This section provides for traffic management at Conventional and Hybrid Toll Plazas and the conventional part of a Conventional/ORT Toll Plaza where the vehicle processing in the Toll Lanes determines the service levels that road users will experience in terms of queue lengths and service time at the toll booths.

10.2.1.2 The Contractor shall provide Toll Collection personnel in the toll booths that are capable of achieving the required vehicle processing specification.

10.2.1.3 The Contractor shall provide for personnel in the Toll Lanes to assist and direct stranded motorist, for instance in the Dedicated Lanes.

10.2.1.4 The Contractor shall comply with the Vehicle Processing Specification which is defined as follows:

(a) The Queue Length Specifications which consider the number of queuing vehicles, including those being attended to at the toll booths, in all open lanes of a Toll Plaza and in every direction of travel at every mainline and ramp Toll Plaza separately.

The Queue Length Specifications shall apply to the following two cases separately:

- The Mixed Manual/ETC lanes of a Toll Plaza only, i.e. excluding any Dedicated ETC Lane traffic. This group of lanes will be considered in each direction of travel separately.
- All the lanes in a direction of travel of a Conventional or Hybrid Toll Plaza or of the Conventional section of a Conventional/ORT Toll Plaza, i.e., for example, all the Mixed Manual/ETC lanes and the Dedicated ETC lanes together.

- (b) The Average Service Time Specification which, for the purpose of monitoring the performance of a toll collector, considers the average service time that a toll collector/s is/are offering. In the case of ETC transactions, the required average service time shall be such that the required minimum volumes per hour to be serviced by Mixed Manual/ETC and Dedicated ETC Lanes, as indicated further below in Clause 10.1.4.

- 10.2.1.5 Although the Employer will perform strategic marketing in respect of the promotion of Electronic Toll Collection, the Contractor shall be responsible to develop the ETC market share at the Toll Plaza and on the Toll Road in order to achieve the Vehicle Processing Specification, as defined in this Clause 10.2.

## **10.2.2 Traffic Composition and average vehicle length**

- 10.2.2.1 The composition of traffic, expressed as a percentage for each vehicle class, for each of the four light and heavy vehicle classes, shall be used to determine an average vehicle length for each Toll Plaza, based on the traffic composition of each Toll Plaza as follows:

- (a) For Toll plazas where historic traffic data is available for the previous 12 months, the previous 12 month's traffic data for a Toll Plaza shall be used to determine the traffic composition in terms of the four traffic classes and expressed as a percentage for the occurrence of each traffic class.
- (b) The length of each vehicle class, namely for class 1, class 2, class 3 and class 4 shall be as defined in the Project Document: Volume 3.
- (c) The average spacing between vehicles shall be 2m, unless as defined in the Project Document: Volume 3.
- (d) The average vehicle length for a specific Toll Plaza shall be calculated as follows: For each vehicle class, the vehicle length is multiplied with the percentage incidence of that class and the sum of the four vehicle classes (i.e. vehicle class length multiplied with the percentage incidence of that class) provides the average vehicle length at the specific Toll Plaza, as follows:

$$\sum_{x=i}^4 (Lx_i \times \text{Perc}Lx_i)$$

Where:

$Lx_i$  = Vehicle length of vehicle class  $X_i$  as defined in the Project Document: Volume 3.

$\text{Perc}Lx_i$  = Percentage occurrence of vehicle class  $X_i$  as determined in the traffic composition above.

10.2.2.2 For each anniversary year after the Tolling Date, the previous year's traffic data shall be used to determine the average vehicle length in terms of the four traffic classes.

10.2.2.3 For new Toll Plazas where no traffic data is available, the Project Document: Volume 3 shall specify the traffic composition that is to be used for the first 12 months.

### 10.3 QUEUE LENGTH SPECIFICATION

#### 10.3.1 General

10.3.1.1 The different Queue Length Specifications below all applies separately, but they could also be applied at the same time and are defined in terms of virtual queue lengths 1 and 2 as follows:

#### 10.3.2 Transgression of Virtual Queue Length 1: Mixed manual/ETC lanes at a Toll Plaza, i.e. excluding any Dedicated ETC Lanes

10.3.2.1 For all the Mixed Manual/ETC lanes at a Toll Plaza, i.e. **excluding** any Dedicated ETC Lanes that may form part of a Toll Plaza, and excluding the ORT lanes of a Toll Plaza, the maximum number of vehicles queuing, including those vehicles being attended to at toll booths or moving through a Mixed Manual/ETC lane (not having passed the actual toll booth location), shall not exceed 6 (six) multiplied by the number of open Toll Plaza lanes (excluding Dedicated ETC and ORT lanes) for 80 (eighty) or more out of 90 (ninety) measurements taken during any 15 (fifteen) minute period.

10.3.2.2 If the queue lengths in the approach toll lanes at any Toll Plaza begins to stretch beyond Virtual Queue Line 1, i.e. a line defined in such a way that it identifies a maximum queue of 6 vehicles per toll lane, taking into consideration the average vehicle length and average vehicle spacing, all as described in the section above, then the Contractor shall resolve the impedance of vehicle flow through the Toll Plaza by opening the appropriate type of additional lanes (manual/ETC and/or Dedicated ETC Lanes) in order that compliance with

the Queue Length Specification is restored as soon as possible and thereafter maintained. A continuation of the non-compliance with the Queue Length Specification in this sub-section will be subject to the continued application of penalties as described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**10.3.3 Transgression of Virtual Queue Length 1: All open Toll Plaza lanes, including the Mixed Manual/ETC lanes and Dedicated ETC lanes.**

10.3.3.1 For all open Toll Plaza lanes, **including** the Mixed Manual/ETC lanes and Dedicated ETC lanes, of a Conventional or Hybrid Toll Plaza or of the Conventional section of a Conventional/ORT Toll Plaza, the maximum number of vehicles queuing, including those vehicles being attended to at toll booths, or moving through Mixed Manual/ETC and Dedicated ETC Lanes (not having passed the actual or typical toll booth location), shall not exceed 6 (six) multiplied by the number of open Toll Plaza lanes (excluding ORT lanes) for 80 (eighty) or more out of 90 (ninety) measurements taken during any 15 (fifteen) minute period.

10.3.3.2 If the queue lengths in the approach toll lanes at any Toll Plaza begins to stretch beyond Virtual Queue Line 1, i.e. a line defined in such a way that it identifies a maximum queue of 6 vehicles per toll lane, taking into consideration the average vehicle length and average vehicle spacing, all as described in the section above, then the Contractor shall resolve the impedance of vehicle flow through the Toll Plaza by opening the appropriate type of additional lanes (manual/ETC and/or Dedicated ETC Lanes) in order that compliance with the Queue Length Specification is restored as soon as possible and thereafter maintained. A continuation of the non-compliance with the Queue Length Specification in this sub-section will be subject to the continued application of penalties as described in The Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**10.3.4 Transgression of Virtual Queue Line 2: All Toll lanes.**

10.3.4.1 This Clause 10.3.4. shall not be applicable unless it is confirmed to be applied in the Project Document: Volume 3 or is instructed by the Employer at any time during the Operations Service Period.

10.3.4.2 If the queue length in any toll or road lane at any Toll Plaza stretches beyond Virtual Queue Line 2, i.e. a line defined in such a way that it identifies a maximum queue of 14 vehicles per toll lane, taking into consideration the composition of the traffic in terms of light and heavy vehicle classes, as described above, then the Contractor shall cease all toll collection and open all Toll Lanes for free passage of all vehicles until such time that the Queue Length Specifications can be complied with again, as follows:

- 10.3.4.3 Cease of toll collection: Conditions and requirements for opening Toll Lanes and to cease toll collection.
- (a) The Contractor shall contact the Employer telephonically and inform him that Virtual Toll Line 2 has been transgressed. Upon approval by the Employer, the Contractor shall cease toll collection and open-up the Toll Lanes as described in this sub-clause.
  - (b) All the Toll Lanes, when the queue reaches Virtual Toll Line 2, shall be opened for at least 5 minutes, or such longer time required until the queue lengths do not exceed Virtual Queue Line 1 anymore.
  - (c) Traffic control in each Toll Lane shall be accomplished by means of opening and closing the exit booms for each vehicle, but without collection of tolls.
  - (d) The Contractor shall not be liable for the loss in Toll Income when the Toll Lanes are opened and toll collection are ceased, if:
    - i. All Toll Lanes was in operation from the time of the queues reaches Virtual Queue Line 1 until Queue line 2 is reached and the Lanes are thereafter opened.
    - ii. The Average Service Time for all Toll Lanes complies with Clause 10.5 below.
  - (e) If one or more manual or mixed-manual Toll Lanes are out of operation due to Lane failure prior to the queue lengths exceeding the Virtual Queue 2, the Contractor shall collect toll fees in those lanes as follows:
    - i. In case of AVC failure, toll collection shall be performed with the DVSS capturing video streams continuously in that Lane.
    - ii. In case of TCC failure, toll collection shall be performed in Manual Mode with the DVSS capturing continuous images for that Lane. In this case, In this case, the Contractor shall be liable for loss of income in the Manual Mode operation as being the difference between the measured vehicle processing rate in the lane (by means of DVSS images) and the minimum required processing rate in accordance with 10.5 below.
  - (f) If one or more dedicated AVC lanes (Hybrid Plazas) are out of operation due to Lane failure prior to the queue lengths exceeding the Virtual Queue 2, the Contractor shall ensure that those Lanes remains closed whilst the remaining are used to disperse the queues. Should the queues not be dispersed within 5 minutes, the dedicated AVC lanes shall also be opened, while the DVSS cameras capture continuous images. In this case, the loss of income in these lanes shall be for the account of the Contractor.



### **10.3.5 Determination of Virtual Queue Line 2**

10.3.5.1 The Contractor will determine the location of Virtual Queue Line 2 at each Toll Plaza in terms of the methodology and formulae indicated below. The location of Virtual Queue Line 2 will be verified and approved by the Employer.

- (a) The calculation to determine the location of Virtual Queue Line 2 is based on the principle of a storage space for 14 vehicles per toll lane. The calculation for the storage space shall take into account the following:
  - i. The total number of toll lanes at the Virtual Toll Plaza (including all types of toll lanes except ORT lanes).
  - ii. The composition of traffic on the Toll Road in the vicinity of the Toll Plaza in order to determine an average vehicle length (as calculated above).
  - iii. The average spacing between queuing vehicles.
  - iv. The geometry of the approach plaza lane area tapers of the Virtual Toll Plaza.
- (b) The storage space (measured in terms of lane-meters) before Virtual Queue Line 2 is crossed, shall be calculated as follows:
- (c) Virtual Queue Line 2 storage space (lane-meter) = Maximum queue length per toll lane (m) x number of toll lanes.

Where

- i. Maximum queue length per toll lane (m) = {(average vehicle length (m) x 14) + (a (m) x 13)}
  - ii. The average vehicle length (m) is determined taking into account the vehicle composition in terms of light and heavy vehicles at the Virtual Toll Plaza;
  - iii. a (m) is the average spacing between queuing vehicles, for which 2,0m is to be used, unless as defined in the Project Document: Volume 3;
  - iv. the number of toll lanes include all toll lanes, including Dedicated and Express ETC Lanes.
- (d) Virtual Queue Line 2 shall be a perpendicular line across all approaching lanes of a Virtual Toll Plaza, positioned as follows:
- i. Plazas with an adequate storage area for at least 14 or more vehicles per lane:
  - ii. The Virtual Queue Line 2 shall be positioned perpendicular to the traffic flow direction, at a distance equal to the maximum queue length per toll lane from

the front-side of a vehicle that stop to pay at a toll booth to the location of Virtual Queue Line 2 across the Toll Plaza approach lane area.

iii. Plazas without an adequate storage area for 14 or more vehicles for each toll lane, where such storage will overflow into the Toll Road approach lanes:

- $Tsr$  (lane-meter) = Total available storage space of lanes restricted by Toll Plaza lane area tapers (m),
- $Tsr$  is calculated as follows:
- $Tsr$  (lane-meter) = (Lane 1 available storage space (m) + Lane 2 available storage space (m) + ... + Lane n available storage space (m)). Note that lanes 1 to n are all lanes that have storage space for fewer than 14 vehicles due to the plaza lane area tapers.
- To determine the available storage space (in m) of lanes within the tapering area of the lane area, only that part of the lane with a width of 2.0m or wider should be included into the calculation.
- $S$  = The number of lanes for which storage space is not restricted to fewer than 14 vehicles
- The Virtual Queue Line 2 (VQL2) shall be positioned at a location perpendicular to the traffic flow direction, using the following formula:
- $VQL2 = (\text{Virtual Queue Line 2 storage space} - Tsr) / S$
- Where:
- VQL2 is the distance measured from the front-side of a vehicle that stop to pay at a toll booth to the position of Virtual Queue Line 2 on the approaching Toll Road.

10.3.5.2 In order to comply with the Vehicle Processing Specification, as indicated above , the Contractor shall, based on the available traffic data, provide future predictions on toll plaza capacity to the Employer to ensure that sufficient toll lane capacity (in terms of open toll lanes) is provided by the Employer so that traffic flows through the Toll Plazas in an orderly manner and with a minimum disruption to such flow. The toll plaza capacity predictions shall be based on the 30<sup>th</sup> highest traffic hour and the vehicle processing requirements as specified.

10.3.5.3 The Contractor shall also ensure that traffic is processed with due regard to the safety of Toll Plaza personnel and road users.

### **10.3.6 Penalties**

- 10.3.6.1 For the non-compliance of the Queue Length Specification, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **10.4 DIGITAL QUEUE LENGTH MONITORING SYSTEM (QLS)**

### **10.4.1 General Contractor's Responsibilities**

- 10.4.1.1 The Contractor shall supply, install and commission a Digital Video Surveillance System (DVSS) at each mainline and ramp Toll Plaza, as specified in the Standard Specifications for Operations and Maintenance of CTROM Project : Toll System (Volume 2 Book 4a). The system shall be compliant and operational 3 months from the commencement of the Operations Service Period or as specified in the Project Document: Volume 3. The Contractor shall operate and maintain a QLS for the duration of the CTROM Contract
- 10.4.1.2 The DVSS shall indicate whenever the maximum queue length in a toll lane stretches beyond Virtual Queue Line 1. When the DVSS indicates that Virtual Queue Line 1 has been exceeded, The Contractor shall open additional toll lanes in order to achieve a return to compliance with the Queue Length Specification as soon as possible.
- 10.4.1.3 The Contractor shall keep these images for a minimum period of 30 days and make these available to the Employer weekly. The Contractor shall also provide the Employer' with remote access to the DVSS and with a weekly e-mail notification in the event of Virtual Queue Line 1 occurrences.. In addition, the DVSS shall be configured to send SMS notifications to the Employer in case of any queue length transgressions. The Employer shall monitor the Contractor's compliance with the Queue Length Specification All cases in which a queue length exceeding Virtual Queue Line 1 constitutes non-compliance with the Queue Length Specification.
- 10.4.1.4 The Employer will inform the Contractor on a monthly basis of all cases where queue lengths exceeding Virtual Queue Line 1 have occurred and are deemed to be subject to penalties and consider any representations from the Contractor regarding special circumstances exempting the Contractor from the Queue Length Specification, as indicated below.
- 10.4.1.5 The Employer shall keep a record of all penalties related to the queue length exceeding Virtual Queue Line 1 and the resulting penalties will be levied annually at the end of the financial year.
- 10.4.1.6 Similarly, the DVSS shall indicate whenever the maximum queue length in a toll or road lane stretches beyond Virtual Queue Line 2. When the DVSS indicates that Virtual Queue Line 2

has been exceeded, the Contractor shall open all toll lanes for traffic until such time that the Queue Length Specifications can be complied with again.

- 10.4.1.7 The Contractor shall also inform the Employer's Representative with an immediate e-mail or other notification of a breach of Virtual Queue Line 2. The Employer shall monitor the Contractor's compliance with the requirement that the toll lanes should be opened to traffic after a breach of Virtual Queue Line 2 after every such occurrence.
- 10.4.1.8 In the event where there are remote ramp Toll Plazas at the site of a mainline Toll Plaza, the Contractor shall install individual QLSs at all these Toll Plazas to ensure monitoring of each remote Virtual Toll Plaza. The sharing of QLS and VGS equipment at these remote sites may be considered and will be subject to the approval of the Employer. Should the operational functionality of any system be negatively affected, sharing of equipment will not be considered.
- 10.4.1.9 The Contractor shall record all images continuously unless otherwise instructed by the Employer.
- 10.4.1.10 The Contractor shall ensure that the images are archived at least on a weekly basis.
- 10.4.1.11 The Employer shall select a time period for evaluation. If the Queue Length Specification was not met, he shall provide such information to the Contractor no later than 30 (thirty) days after such original recording was done at a Toll Plaza.
- 10.4.1.12 The Contractor shall utilise the QLS to monitor queue lengths at any other time, as what was required by the Employer, as deemed necessary by the Contractor for the Toll Operations .
- 10.4.1.13 The Employer shall retain the right to also perform queue length observations on an *ad hoc* basis, either manually in person or by utilising the Contractor's QLS, in which case the Employer shall record the time period during which the Queue Length Specification is not met and shall submit such information to the Contractor no later than 30 (thirty) days after such recording was done.
- 10.4.1.14 The Contractor will have a 2 (two) weeks opportunity to indicate whether any of the conditions for exemption from the Queue Length Specification, as indicated below applies. The Employer will consider the submissions of the Contractor with regard to exemptions before possible penalties are applied.
- 10.4.1.15 The Contractor shall retain all data captured by the QLS for a period of not less than 4 (four) months after such capture date.
- 10.4.1.16 The Contractor shall ensure that the Employer will have full access to this data, if required.

- 10.4.1.17 The availability of the Queue Length Specification will be measured in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **10.5 AVERAGE SERVICE TIME SPECIFICATION AND SERVICE TIME MONITORING:**

### **10.5.1 General Contractor's Responsibilities**

- 10.5.1.1 In addition to the average service time specifications as provided above, the Contractor shall comply with the requirements below.

- 10.5.1.2 The service time is the time it takes a Toll Collector from being handed cash or a card for payment of toll to providing a road user with change or returning the card to the road user, or providing a user with a receipt or lane tax invoice, if so requested by the user, whichever occurs later. The average service time for a Toll Collector shall not exceed 10 (ten) seconds for Light Vehicles and 12 (twelve) seconds for Heavy Vehicles when 50 (fifty) measurements are taken during a 15 (fifteen) minute period or such longer period as may be required to obtain 50 (fifty) measurements.

- 10.5.1.3 The service time for ETC transactions (Mixed ETC Lanes, Dedicated ETC Lanes or ORT Operations) is the time it takes from the detection of a Tag (usually signified by the Tag beep) until the completion of the transaction which is signified by the change from a red to a green traffic signal or the lifting of the boom in the case of Conventional and Hybrid Toll Plazas and the conventional part of a Conventional/ORT Toll Plaza. The Contractor shall ensure that the average service time for ETC transactions shall be such that the Tolling System is able to process the following hourly traffic volumes:

- (a) For a boom-down Dedicated ETC Lane: 700 vehicles per hour.
- (b) For a boom-up Dedicated ETC Lane: 1 200 vehicles per hour.
- (c) For a Mixed Manual/ETC Lane: the Tolling System shall be able to process vehicles not lower than that as specified for manual lanes in Section 4.
- (d) For an Express ETC Lane: 600 vehicles per hour.
- (e) For an ORT lane: the Tolling System shall be able to process vehicles under free flow traffic conditions, which typically involves traffic volumes in excess of 2 500 vehicles per hour.

- 10.5.1.4 The Employer, accompanied by a Contractor representative at the Toll Plaza, shall perform average service time observations at any time in any toll lane.

- 10.5.1.5 The Employer shall submit to the Contractor the result of average service time observations in writing no longer than 30 (thirty) days after such observations were conducted.

- 10.5.1.6 The Contractor may monitor service times at any other time, as and when it is deemed necessary by the Contractor.

## **10.5.2 Penalties**

- 10.5.2.1 For the non-compliance of the average service time specification, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **10.6 EXEMPTION FROM THE QUEUE LENGTH SPECIFICATION**

### **10.6.1 General**

- 10.6.1.1 The Contractor shall be granted exemption from the Queue Length Specification only in the case of an accident or an Exceptional Event where the subsequent traffic conditions at a Toll Plaza is out of the control of the Contractor, limiting compliance to the specified vehicle processing requirements.
- 10.6.1.2 Initial opening of ETC Lanes: The Employer shall grant the Contractor an exemption from the Vehicle Processing Specification in ETC Lanes for a period not longer than 2 (two) months after the first ETC Lanes become operational at any Toll Plaza.

## **10.7 TRAFFIC CONTROL AT CONVENTIONAL AND HYBRID – TYPE TOLL PLAZAS**

### **10.7.1 General Contractor's Responsibilities**

- 10.7.1.1 The Contractor shall control and manage traffic flow through all the Toll Plazas at all times. The Contractor shall exercise such control in respect of:
- (a) Abnormal Vehicles
  - (b) Emergency Vehicles
  - (c) Convoys
  - (d) Obstructions to traffic
  - (e) Any emergency situation.

### **10.7.2 Control of Abnormal Vehicles**

- 10.7.2.1 The Contractor shall control the passage of Abnormal Vehicles through the Conventional and Hybrid Plazas and the conventional part of Conventional/ORT Toll Plazas so as to minimise the disruption to traffic flow.

10.7.2.2 Where reasonably possible, the Contractor shall identify all Abnormal Vehicles prior to their entering the Toll Lanes, direct such vehicles to the Extra Wide Lanes, and accommodate any traffic that may be affected by the passage of such Abnormal Vehicles. Where Extra Wide Lanes are not provided for through-traffic, the Contractor shall erect appropriate signage to indicate the Abnormal Vehicle route to be used by such Abnormal Vehicles, when applicable.

10.7.2.3 Abnormal vehicle transactions shall be processed at the correct Tariff with a correct Receipt or Tax Invoice being issued in the Toll Lane.

### **10.7.3 Control of Emergency Vehicles**

10.7.3.1 The Contractor shall assess whether an Emergency Vehicle is on an emergency mission and if satisfied of the existence of such an emergency mission, shall process the Emergency Vehicle in the minimum time possible at Conventional Toll Plazas, provided that the processing of such Emergency Vehicles, including queue time and service time, shall take no longer than 15 (fifteen) seconds.

10.7.3.2 The Contractor shall ensure that no Emergency Vehicle is unduly kept from proceeding to its destination, and shall make use of selected toll lanes where possible, as arranged with emergency rescue services, to pass through the Toll Plaza during peak or busy periods.

### **10.7.4 Control of Convoys**

10.7.4.1 The Contractor shall control the passage of convoys through the Conventional and Hybrid Toll Plazas and the Conventional/ORT Toll Plazas so as to minimise the disruption to traffic flow.

### **10.7.5 Obstructions to Traffic Flow**

10.7.5.1 In the event of a vehicle obstructing the traffic flow through a toll lane, the Contractor shall immediately arrange for and supervise removal of the obstructing vehicle or alternatively direct traffic to an unobstructed lane.

### **10.7.6 Traffic Signs**

10.7.6.1 All traffic signs that the Contractor erects and/or replaces shall be designed in accordance with the South African Road Traffic Signs Manual, to the satisfaction of the Employer.

10.7.6.2 All signage shall comply with South African Road Traffic Signs Manual as amended from time to time.

## **10.8 EMERGENCY SITUATIONS**

### **10.8.1 General Contractor's Responsibilities**

- 10.8.1.1 In the event of emergency situations at the Conventional or Hybrid Toll Plazas or the conventional part of Conventional/ORT Toll Plazas, the Contractor shall apply the applicable IMS protocols as arranged and agreed to by all relevant emergency rescue services.
- 10.8.1.2 In the event of any possible emergency situation at any Toll Plaza, the Contractor shall control the traffic flow through the Toll Plaza and take all reasonable precautions to ensure the safety of all personnel and road users.



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## **SECTION 11. OPERATIONS PERIOD – DATA TRANSMISSION**

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## **11.1 GENERAL: DATA TRANSMISSION**

### **11.1.1 General**

- 11.1.1.1 For Conventional and Hybrid Toll Plazas and the Conventional Part of a Conventional/ORT Toll Plaza: All transactions, excluding ETC transactions, the Contractor shall transfer all validated and un-validated in accordance with time frames as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).
- 11.1.1.2 The Contractor shall maintain a communication system and service, when supplied by the Contractor, or as specified in the Project Document: Volume 3, to enable the transfer of data along the Toll Road network generated by the Contractor.
- 11.1.1.3 Performance measurement related to time frames of data transmission will be done in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

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## **SECTION 12.      OPERATIONS PERIOD – TAG MANAGEMENT**

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## **12.1 GENERAL: TAG MANAGEMENT**

### **12.1.1 Introduction**

- 12.1.1.1 This “General” section provides Tag management requirements for Conventional, Hybrid, Conventional/ORT and ORT Toll Plazas.
- 12.1.1.2 With the introduction of ETC Tags, whether at a Conventional or Hybrid Toll Plaza or the conventional part of Conventional/ORT Toll Plaza or the implementation of ORT, the Contractor shall fully interface with the TCH for the account management and transaction processing. Furthermore, all ETC Tags shall be procured through the TCH.
- 12.1.1.3 Tag management, in summary, is a process that commences from where the Tags are procured, tested and stored by the TCH to where the Contractor orders the Tags from the TCH and takes charge of the entire management and distribution process to the Customer, inclusive of the support services as detailed below.
- 12.1.1.4 This section primarily deals with the role of the Contractor which includes aspects such as Customer information, education, and distribution of the Tags to the Point of Presence Customer Service Facilities, activation of the Tag on account registration and the ongoing support of the Tag.
- 12.1.1.5 The Contractor shall note that references to Tags include Tag mounting brackets, installation instructions, packaging, labelling, etc.

## **12.2 TAG ORDERING**

### **12.2.1 General Obligations**

- 12.2.1.1 The Contractor’s obligations are to order and collect the Tags from the TCH in accordance with the TCH lead times in order to be able to hold sufficient stock at any time at the Toll Plazas and/or Point of Presence Customer Service Facilities.
- 12.2.1.2 Tag forecasts shall be provided by the Contractor to the TCH in accordance with the forecasting periods as required by the TCH.
- 12.2.1.3 Registering of accounts by the Contractor:
- (a) For Conventional and Hybrid Toll Plazas with an existing Tag Account base: Account registering and Tag distribution shall commence with the commencement of the Operations Service Period.

- (b) For Conventional and Hybrid Toll Plazas where there is not an existing Tag Account base, and ETC functionality is to be implemented: Account registering and Tag distribution shall commence 3 (three) months before implementation or as specified in the Project Document: Volume 3.
- (c) When ORT is triggered: Additional account registering and Tag distribution strategies will be determined by the Employer, and the contractor will be instructed as to additional requirements.

#### **12.2.2 Minimum Tag stock levels:**

- 12.2.2.1 For Conventional and Hybrid Toll Plazas with an existing Tag Account base: The initial minimum Tag stock, which will be provided by the Employer to the Contractor is specified in the Project Document: Volume 3. Thereafter the Contractor shall on a continuous basis, with a lead-time of four months, request tag stock to the TCH as approved by the Employer.
- 12.2.2.2 For Conventional and Hybrid Toll Plazas where there is not an existing Tag Account base, and where ETC functionality is to be implemented or where ORT is to be implemented: The initial minimum Tag stock, which will be provided by the Employer to the Contractor is specified in the Project Document: Volume 3. A lead-time of four months before ETC implementation, including ORT, will be applicable for Tag distribution. Thereafter the Contractor shall on a continuous basis, with a lead-time of four months, request tag stock to the TCH as approved by the Employer.

#### **12.2.3 Tag Collection**

- 12.2.3.1 The Contractor shall be responsible to collect the Tags at the TCH warehouse door, and from there, for the delivery of the Tags to their points of distribution. This shall include virtual warehousing for Tags distributed directly from the TCH to the Contractor.

### **12.3 OWNERSHIP OF TAGS**

#### **12.3.1 General**

- 12.3.1.1 Tag ownership shall remain with the TCH Entity or the Employer, as applicable.

### **12.4 TAG STATUS**

#### **12.4.1 General**

- 12.4.1.1 The Contractor shall be responsible to change the Tag status on the TCH System after registering an account and when a Tag was reported as stolen, vandalised or damaged, in accordance with the TCH procedures and system requirements.

- 12.4.1.2 The TCH shall, within its Tag inventory system, monitor the status of the Tag during its life cycle, and the Contractor shall update any change in the status in accordance with in accordance with the TCH procedures and system requirements.

## **12.5 TAG DISTRIBUTION TO CUSTOMERS**

### **12.5.1 General Contractors Responsibilities**

- 12.5.1.1 As it may affect the Contractor's Customer Service Kiosk distribution (or footprint), the Contractor shall be aware that the TCH Entity may in addition, negotiate with and appoint third-party Tag distribution agents, as secondary distributors for local and/or national Tag distribution. These Tag distribution agents, such as some of the prominent retail outlets, which may also include a network of service stations, shall be managed by the TCH Entity.
- 12.5.1.2 The Contractor shall ensure that each Tag that is issued shall be linked to one specific and unique vehicle and linked to one specific account. One account may however be linked to multiple vehicles.
- 12.5.1.3 The Contractor shall ensure that Customers are provided with the correct Tag holders and that the Customers are appropriately advised on the fixing thereof.

## **12.6 CUSTOMER SERVICE & TAG SUPPORT**

### **12.6.1 General Contractor Responsibilities**

- 12.6.1.1 Upon request by a Customer, the Tags shall be fitted by the Contractor at any one of the Toll Plazas and/or Satellite Centres.
- 12.6.1.2 The Contractor's responsibility, in the case where a Customer presents a defective Tag that is linked to a Customer's Account, is to accept and to verify that that the Tag is defective by using a Tag reader. If defective, the Tag shall be registered as defective on the TCH System and be sent to the TCH for further testing and repairs. (The TCH shall either perform the repairs; return it to the supplier or write-off the Tag). The Contractor shall immediately issue the Customer a new activated Tag that is registered on the Customer's Account in exchange for the defective Tag.
- 12.6.1.3 The Contractor shall accept, at the Point of Presence Customer Service Facilities, any defective Tag that was either issued by the Contractor or issued by the TCH directly or issued by any other Toll Agency.
- 12.6.1.4 If the Tag was found by the Contractor to be misused and/or vandalised, or lost or stolen, the Customer's Account shall be debited with the value of the Tag in accordance with the TCH procedures and system requirements. If the Tag is defective and this is not due to the

action or cause of the Customer (such as normal wear and tear), there shall be no charge to the Customer, in accordance with the TCH procedures and system requirements.

12.6.1.5 The Contractor may add a service fee, over and above the charge as levied by the TCH for the cost of a new Tag, as specified in the Project Document: Volume 3, for, inter alia:

(a) In the case of a vandalised or misused Tag, or broken Tag mountings, a service fee for replacement, checking, activation and/or issuing of a new Tag, shall be levied.

(b) Replacement of the Tag battery (if applicable).

## **12.7 TAG MONITORING & REPORTING**

### **12.7.1 General Contractors' Responsibilities**

12.7.1.1 As the TCH shall be monitoring the Tag supply and distribution, the Contractor shall be informed on all appropriate parameters such as orders placed, Tags distributed, Tag performance characteristics, Tag failure patterns, Tag cloning, incidents of possible fraud, etc. to enable the Contractor to react to this information, as and where appropriate.

12.7.1.2 The Contractor shall be aware that the TCH System shall monitor the use of the Tags and before a Tag's life-time has expired, the TCH System shall notify the Customer that the specific Tag needs to be exchanged. The Contractor shall then provide a replacement Tag, once the Customer has returned the Tag to any Point of Presence Customer Service Facility, in accordance with the TCH Business Rules.

12.7.1.3 The Contractor shall generate suitable reports for Tag inventory purposes and in accordance with the above requirements.

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**SECTION 13. EQUIPMENT FUNCTIONALITY AND INTERFACES  
AND AGREEMENTS**

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## **13.1 TOLLING SYSTEM FUNCTIONALITY**

### **13.1.1 General**

- 13.1.1.1 The Contractor shall assume full technical responsibility for the design, supply, installation, integration, testing, operation, maintenance and support of the Tolling System as required in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a) and Standard Specifications for Operations and Maintenance of CTROM Projects: Electronic Toll Collection (Volume 2 Book 5a). The Contractor shall ensure that the Tolling System functions as required at all times.
- 13.1.1.2 A systems redundancy, back-up, data retention and disaster recovery solution is required, which includes data communications, as described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The Contractor will monitor the performance of the Tolling System and ensure that the sub-systems and procedures implemented are operating as required by the Contract at all times to prevent data loss and/or loss of income and to provide a high level of service to road users.
- 13.1.1.3 The Contractor will ensure that its communication systems, including the communication to the TCH, complies with the requirements of the Contract and with the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a). The Contractor will be required to physically collect data from the Toll Plazas and/or Tolling Points, should all automated data communications fail.
- 13.1.1.4 The Contractor shall complete the entire Toll System installation works, in full system compliance as defined in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), and in accordance with the time frame for Toll System upgrades/replacement indicated in the Project Document: Volume 3. The Contractor shall also comply with specific requirements as stated in the Project Document: Volume 3 for systems and equipment that shall be implemented at early time-frames, such as VGS Systems.
- 13.1.1.5 The Contractor shall provide a detailed program of all requisite Toll System upgrade/replacement activities, guided by the time frames indicated for the acceptance process in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).
- 13.1.1.6 For the initial Toll System upgrade/replacement, an implementation programme shall be submitted within 45 (forty-five) calendar days after the Contract Commencement Date or as stated in the Project Document: Volume 3 for approval by the Employers Representative. The approved program will form the basis against which progress on the Toll System acceptance process shall be measured.

### **13.1.2 Mode of Operation**

#### **13.1.2.1 AVC Error Mode**

- (a) To combat potential fraud and to protect the road users, in the event of Operation in AVC critical error mode, due to any reason, the Contractor shall immediately close the affected toll lane, processing only the queued vehicles. Measurement of critical and serious error mode will be in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- (b) In the event that the Toll Plaza experiences capacity problems due to such lane closures, the Contractor shall immediately commence with Manual Mode Operations.

#### **13.1.2.2 Manual Mode**

In the case of Manual Mode Toll Operations within Conventional, Hybrid or within the Conventional part of a Conventional/ORT Plaza, the Contractor shall ensure that all the Transaction Records are captured on the Tolling System within 24 hours. The Contractor, when operating in Manual Mode, shall however be liable for all the consequential penalties as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **13.1.3 Penalties**

- 13.1.3.1 For Toll Operations taking place in Manual Mode, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- 13.1.3.2 In case of MIS failure, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- 13.1.3.3 In case of processing vehicles whilst the AVC is in Critical Error Mode, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- 13.1.3.4 For non-compliance to Toll System functionality, in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), the Contractor shall be liable for penalties in accordance to the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **13.2 INTERFACES AND AGREEMENTS**

### **13.2.1 General**

13.2.1.1 These interfaces and agreements are generally between the Contractor and third parties to establish protocols for the provision of services, exchange of data or any interaction required between the Contractor and a third party. The Contractor shall be responsible to negotiate the commercial aspects of such interfaces and agreements and to finally sign such agreements.

13.2.1.2 The Contractor will establish and maintain interfaces with inter alia:

- (a) The TCH;
- (b) The VPC;
- (c) The Employer's acquiring bank for, inter alia, the processing of credit card transactions (e.g. in manual lanes at Conventional, Hybrid and Conventional/ORT Toll Plazas).

13.2.1.3 The Contractor shall ensure that the various interfaces are implemented and maintained through interaction, communication and agreements. Where reference is, therefore, made to interfaces, it is meant to include all the actions required from the Contractor to manage and maintain those interfaces.

13.2.1.4 The following interfaces and agreements are foreseen which are the responsibility of the Contractor to negotiate, implement and manage. The list below is not exhaustive and it is the Contractor's responsibility to identify and conclude the negotiations with regard to any interface and/or agreement that may be necessary to perform his obligations and meet his responsibilities.

### **13.2.2 Interfaces**

13.2.2.1 Contractor – TCH interface:

- (a) This interface, of which the detail is described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2, Book 4a), is to enable the transaction and account management of all ETC transactions.
- (b) The Contractor's Customer Service workstations shall have access to the TCH front-end to be able to provide account services such as to register accounts, receive payments, terminate accounts, etc.

- (c) The Contractor's Back Office System shall interface to the TCH to transfer all ETC transactions (complete and incomplete), as captured by the Road Side System or Toll Collection Lane Equipment, to the TCH.
- (d) The account validity lists shall be retrieved from the TCH to the Contractor's Back Office System.
- (e) The interface shall facilitate the daily cash-up of revenue collected from Customers for ETC accounts.

**13.2.2.2 Contractor – VPC interface (if opted-in):**

- (a) This interface is, amongst others, for the planning of deployment of Mobile Payment Stations during enforcement programs, as well as the compiling and provision of infringement and toll offender lists by the VPC to the Contractor for law enforcement operations. The interface shall entail the following:
  - i. The Contractor shall manage, co-ordinate and schedule Mobile Policing Operations and shall provide the Mobile Payment Stations for assisting in the Mobile Policing Operations which also include the provision of Point of Presence Customer Services, allowing account registrations, account payments, etc. to Violators or potential Violators.
  - ii. The interface shall also include a service level agreement between the Contractor and the VPC to ensure the ongoing maintenance and support of the VPC Software modules of the Tolling Systems that are installed on the Contractor's workstations.
  - iii. At the Satellite Centres, there will be an interface to NaTIS to process payments of AARTO issued infringement notices, inclusive of any traffic fines, on behalf of the VPC, who serves as an Issuing Authority for AARTO.

**13.2.2.3 Back Office System – Acquiring Bank interface**

The Contractor shall be required to gain access to the National Payment System (NPS) by interfacing with one or more nominated payment transaction Acquiring Banks.

**13.2.2.4 ITIS and Traffic Analysis System (ITAS) interface**

- (a) Conventional and Hybrid plazas and conventional part of a Conventional/ORT Plaza:  
The Contractor shall ensure that all data will be sent from the DCS to ITIS as specified in the Section: Data Transmission.

- (b) For ORT Operations, if a Traffic Analysis System (ITAS) is implemented, the Contractor shall ensure that the Abbreviated Transaction Records, as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), from the ORT Back Office System are transferred on a continuous basis to the TAS server.

### **13.2.3 Agreements**

#### **13.2.3.1 Contractor – TCH**

- (a) The Contractor shall enter into an agreement with the TCH regarding the hosting of its ETC accounts and the clearing of its ETC transactions.
- (b) Standard Specifications for Operations and Maintenance of CTROM Projects: Business Rules (Volume 2 Book 4a) indicates the methodology and procedures to be followed to account for the TCH fees for ETC transactions.

#### **13.2.3.2 Contractor - Commercial outlets**

With regard to the rental of space for Point of Presence Customer Service Facilities, the Contractor will identify suitable commercial rental or retail space in accordance with the footprint as specified in Section 3. The Employer shall be involved, with the Contractor, to negotiate usage agreements with the respective landlords, which agreements will be signed by the Contractor. The Contractor will be responsible to adhere to all aspects of the agreement, such as monthly rental, utilities, security and the like.

#### **13.2.3.3 Merchant Agreements with Banks**

- (a) Conventional and Hybrid Plazas for all transactions **excluding** ETC
- (b) The Contractor shall be bound to the Employer's merchant agreements with the Acquiring Bank for the clearing of credit and debit cards. The Contractor shall source and supply the POS equipment as required.
  - i. The Contractor shall establish direct electronic links with all the necessary banks and card merchants handling Bank Issued Card transactions so that recovery of the monies associated with non-cash transactions can be timeously accomplished. The Contractor shall however comply with the national interface used by the toll industry and honour the conditions set in the individual merchant agreements. If the Contractor wishes to use new interfaces, these interfaces and reasons for deviating from the standard shall be submitted to the Employer for approval.
  - ii. The Contractor's Toll System shall have the capability of submitting consolidated or individual card transactions to the relevant banks and card merchants.

iii. The Contractor shall perform all reconciliation relating to Bank Issued Cards and shall report in accordance with Section 10 hereof.

(c) ETC transactions and ORT Operations:

(d) The Contractor shall be bound to the Employers banking agreements where ETC transactions are concerned through the TCH.

**13.2.3.4 Contractor – Road Traffic Authorities**

When ORT is triggered, the Contractor shall, through the Employer, enter into agreements with relevant road traffic authorities for ORT enforcement operations.

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## **SECTION 14. ASSET MANAGEMENT**

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## **14.1 GENERAL: ASSET MANAGEMENT**

### **14.1.1 Introduction**

14.1.1.1 For asset management, no specific distinction is made between Conventional and Hybrid Toll Plaza Operations, ORT Operations and Conventional/ORT Toll Plaza Operations as the asset management concepts and requirements are equally applicable across these types of plaza Operations.

14.1.1.2 The overall maintenance philosophy and approach shall be contained in the Contractor' Operations and Maintenance Plan taking into account the requirements as indicated in this section, which will form the basis of the maintenance manuals and procedures to be developed by the Contractor.

14.1.1.3 The Contractor shall be responsible for the complete asset management and maintenance functions for all the above assets, as further described in this section.

14.1.1.4 The Contractor shall be responsible for the insurance of all the assets and in accordance with the Contract.

## **14.2 OWNERSHIP AND CATEGORIZATION OF ASSETS**

### **14.2.1 General**

14.2.1.1 Asset classification: The Assets, in accordance with the Contract, are generally divided into one of the following asset categories as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Particular Conditions of Contract (Volume 1 Book 2) and listed below.

### **14.2.2 Asset Categories**

14.2.2.1 A complete listing of different Asset categories is provided within Annexure 1, in accordance with the Asset classification system. The classification system includes the following four main Asset categories as provided below:

### **14.2.3 Employer's Assets**

14.2.3.1 Employer's Fixed Assets, which includes:

- (a) Toll plaza buildings and structures such as plaza canopies, toll lane area consisting of toll lanes, toll booths, protection structures and the like
- (b) Central Operations Centre



- (c) Satellite Centres
- (d) Structures, e.g. Toll Plaza canopies
- (e) Technical Shelters
- (f) Tolling Point gantry structures

**14.2.3.2 Employers Equipment, which includes:**

- (a) High mast and security lighting at the Toll Plazas, Central Operations Centre, Satellite centres and the Technical Shelters.
- (b) Lightning protection installations.
- (c) Cable markers
- (d) Generator installations at the Toll Plazas, Central Operations Centre, Satellite centres and the Technical Shelters;
- (e) UPS installations at the Toll Plazas, Central Operations Centre, Satellite centres and the Technical Shelters;
- (f) HVAC (heating, ventilation, air-conditioning, cooling), installations;
- (g) Kitchen equipment;
- (h) Distribution Boards.
- (i) High tension equipment, electrical reticulation and the like.
- (j) All other electrical and mechanical installations such as, SCADA systems, security systems, access control and the like.
- (k) Built-in furniture, built-in safes, etc

**14.2.3.3 Employer's Documents, which includes:**

- (a) Documentation handed to the Contractor by the Employer.
  - i) Software and Systems handed to the Contractor by the Employer.

**14.2.4 Permanent Design-Build Assets, namely:**

**14.2.4.1 Plant, e.g. assets related to Tolling System and equipment that is provided by the Contractor, e.g.:**

- (a) Toll lane systems and equipment and all peripheral equipment

- (b) Road Side Equipment and Systems,
- (c) Back Office Equipment and Systems
- (d) Communications equipment and Systems, excluding the communications backbone provided by the Employer and maintained by others.
- (e) Customer Service Kiosk systems and related equipment.
- (f) Mobile Payment Stations
- (g) Mobile Police Vehicles

14.2.4.2 Materials, e.g. spares, standby rigs, etc.

14.2.4.3 Contractors Documents, e.g. design documentation and Software.

#### **14.2.5 Contractor Facilities**

It includes items such as temporary office space.

#### **14.2.6 Contractors' Equipment**

- (a) It includes assets that belongs to the Contractor that is required to perform his responsibilities.
- (b) Consumables;
  - i. Movable Assets, such as:
  - ii. Furniture, desks, chairs etc;
  - iii. Ladders;
  - iv. Cherry pickers;
  - v. Office equipment;
  - vi. Tools;
  - vii. Consumables, etc,

### **14.3 DAMAGE TO ASSETS**

#### **14.3.1 Repair of Damage of and Responsibility for Repair**

14.3.1.1 This section is to be read together with Section 14: Asset Management, where specific maintenance responsibilities are described. It provides the requirements for the time-period in case of damages and/or failures for reaction and repair to repair the various types of Assets.

14.3.1.2 In the event of damage to any Employer's Facilities, Design-Build and/or Contractors Equipment on a Site, the Assets shall be repaired, rebuilt or replaced within a time period as specified below and such that normal Operations and Maintenance of the Toll Plazas is not unduly affected, and such that after repairing, rebuilding or replacing, the Assets shall be in equal or better condition as prior to such damage.

14.3.1.3 For the Toll System/s that are handed over to the Contractor, and that will be operated by the Contractor before the implementation of the new and/or upgraded Toll System/s, the Contractor shall be responsible for repair as stated above and also the maintenance and support responsibilities will fully apply and in accordance with Section 14: Asset Management.

#### **14.3.2 Damage to Employer's Facilities (Excluding Toll- and Communications Systems)**

14.3.2.1 Unless the damage was caused by, or due to the negligence of the Contractor, or full details of the liable party/persons involved were not recorded by the Contractor in terms of Clause 13.2.5, all expenses relating to the repairing, rebuilding or replacing damaged Employer's Facilities shall be borne by the Employer. For the Employer's Facilities, the Employer shall draft the specifications for repair or replacement of Assets, as and when required. The Contractor shall supervise the work, and shall be paid a percentage mark-up for supervising the work, in addition to the Operations and Maintenance Fee. The Contractor shall tender the percentage mark-up during the Tender Period. The Contractor shall submit and administer all claims against liable parties, and shall initiate legal proceedings, if instructed by the Employer.

14.3.2.2 Where the damage was caused by, or due to the negligence of the Contractor, or where full details of the liable party/persons involved were not recorded or incorrectly recorded by the Contractor, all expenses relating to repairing, rebuilding or replacing damaged Employer's Facilities shall be borne by the Contractor. The Employer shall draft the specifications for the Employer's Facilities as and when required.

14.3.2.3 **Urgent Repair:** Urgent repair relates to Severity Level 1 problems as indicated in Section 14

- (a) Where the estimated cost, excluding VAT, is less than or equal to a specified value as stated in the Project Document: Volume 3, the Contractor shall obtain three quotations for the work and submit these to the Employer within 24 (twenty-four) hours of the damage having occurred. The Contractor shall immediately implement interim measures to restore safety at the Site. On approval of the quotations by the Employer, within 12 (twelve) hours the Contractor shall instruct the supplier to proceed with such repair and repair must be completed within 7 (seven) days or within a reasonable period as agreed with the Employer
- (b) Where the estimated cost, excluding VAT, is in excess of a specified value as stated in the Project Document: Volume 3, the Contractor shall immediately implement interim measures to restore safety at the Site. The Employer shall let a contract to any third party for the repair, which shall stipulate repair times.

14.3.2.4 **Repair other than Urgent Repair,** relates to Severity Level 2 and 3 problems as indicated in Section 14

- (a) For Severity Level 2, where the estimated cost, excluding VAT, is less than or equal to a specified value as stated in the Project Document: Volume 3, the Contractor shall obtain three quotations for the work and submit these to the Employer within 48 (forty-eight) hours. On approval of the quotations by the Employer, the Contractor shall, within 12 (twelve) hours, instruct the supplier to proceed with such repair. Repair must be completed within 21 (twenty-one) days, depending on the availability of material.
- (b) For Severity Level 2, where the estimated cost, excluding VAT, is in excess of a specified value as stated in the Project Document: Volume 3, the Contractor shall immediately implement interim measures to restore safety at the Site. The Employer shall let a contract to any third party for the repair, which shall stipulate repair times.
- (c) For Severity Level 3, repair time shall be determined based on the scheduled day-to-day maintenance activities or as agreed with the Employer.

14.3.2.5 The Contractor shall notify the Employer and provide motivation in the event that it is unable to meet these time-periods. If the Contractor fails to repair, rebuild or replace Employer's Facilities that were damaged directly by the Contractor, or due to the negligence of the Contractor, within the specified repair times, the Employer shall be entitled to carry out such repair, rebuilding or replacement and shall be entitled to recover from the Contractor the cost thereof.

### **14.3.3 Damage to Design-Build Assets and Employer's Equipment**

- 14.3.3.1 Design-Build Assets; Employers Equipment: and Communications Systems that are damaged shall be repaired, rebuilt or replaced by the Contractor. The expenses relating to repairing, rebuilding or replacing damaged Design-Build Assets shall be borne by the Contractor.
- 14.3.3.2 The Contractor shall draft the specifications as and when required and the Contractor shall arrange for repair and supervise the work.
- 14.3.3.3 The time-period deemed to be reasonable for repair is a function of the cost of repair and urgency for repair allied to the efficient and safe Operations and Maintenance of the Works. The Contractor shall implement interim measures to restore safety at the Toll Plazas. Unless agreed with the Employer, time-frames for repair shall be as indicated below.
- 14.3.3.4 **Urgent Repair** is repair required for problems indicated as Severity Level 1 in accordance with Section 14
- (a) The Contractor shall immediately implement interim measures to restore safety at the Toll Plazas. Actions shall be undertaken to initiate repair within 12 (twelve) hours, and repair must be completed within 7 (seven) days or within a reasonable period as agreed with the Employer.
  - (b) Notwithstanding anything to the contrary contained herein, repair of any damage to any AVC, which is considered urgent repair, shall be completed within 24 hours of such damage having occurred.
  - (c) For Conventional, Hybrid and conventional part of a Conventional/ORT Plaza, where any AVC is not operational, the Contractor shall take all steps necessary to ensure that no traffic are allowed to pass through that Lane until such Lane is repaired.
- 14.3.3.5 The Contractor shall, despite the provisions above, remain liable for penalties or KPI measurement for non-performance in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- 14.3.3.6 Penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a) will not be applied if the extent of damage renders it impossible to repair the AVC within 24 (twenty four) hours, for example, in the event of extensive damage to civil or electrical infrastructure and the Contractor is able to prove that sufficient spares were available on Site (at least two complete replacement units shall be kept on Site at all times, per Control Centre) that the Contractor had taken all reasonable measures to ensure that the AVC was repaired as soon as practically possible.

14.3.3.7 **Repair, other than Urgent Repair:** This required repair is for problems indicated as Severity Level 2 and 3 in accordance with Section 14: Asset Management.

- (a) For Severity Level 2, actions shall be undertaken to initiate repair within 24 (twenty-four) hours, and repair must be completed within 21 (twenty-one) days, depending on the availability of material.
- (b) For Severity Level 3, repair time shall be determined based on the scheduled day-to-day maintenance activities or as agreed with the Employer.

14.3.3.8 Notwithstanding the above, the Contractor shall be liable for penalties or KPI measurement for non-performance in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

14.3.3.9 The Contractor shall notify the Employer and provide motivation in the event that it is unable to meet these time periods. If the Contractor fails to repair, rebuild or replace damaged Design-Build Assets within the specified repair times, the Employer shall be entitled to carry out such repair, rebuilding or replacement and shall be entitled to recover from the Contractor the cost thereof.

#### **14.3.4 Damage to Contractors Equipment**

14.3.4.1 Contractors Equipment that is damaged shall be repaired or replaced by the Contractor. The expenses relating to repairing or replacing damaged Contractors Equipment shall be borne by the Contractor.

14.3.4.2 For Severity Level 1 problems, actions shall be undertaken to initiate repair within 12 (twelve) hours, and repair must be completed within 14 (fourteen) days or within a reasonable period as agreed with the Employer and the Employer.

14.3.4.3 For Severity Level 2 problems, actions shall be undertaken to initiate repair within 24 (twenty-four) hours, and repair must be completed within 21 (twenty-one) days, depending on the availability of material.

14.3.4.4 For Severity Level 3 problems, repair time shall be determined based on the scheduled day-to-day maintenance activities or as agreed with the Employer.

14.3.4.5 Notwithstanding the above, if the Contractor fails to repair or replace damaged patrol vehicles, fire extinguishers or fire fighting Equipment within 14 (fourteen) days or within a reasonable period as agreed with the Employer, the Employer shall be entitled to carry out such repair or replacement and shall be entitled to recover from the Contractor the cost thereof.

#### **14.3.5 Recording and Reporting of Damage**

- 14.3.5.1 The Contractor shall report all damage to Assets to the Employer within 24 (twenty-four) hours of such damage having occurred or earlier depending on the nature and severity of such damages and the impact on normal operations.
- 14.3.5.2 The Contractor shall record all damage to Employers Facilities and Design-Build Assets. The register shall be updated on occurrence of such damage. The updated register shall be submitted monthly to the Employer. The register shall contain at least the following information:
- (a) Unique incident number;
  - (b) Date, time and place of incident;
  - (c) Visibility (bad, poor, good);
  - (d) Road conditions (wet, slippery, dry);
  - (e) Assets damaged;
  - (f) Details of the damage;
  - (g) Cost estimate of repairing the damage;
  - (h) Relevant details pertaining to the persons and vehicles involved:
    - (i) Vehicle registration number;
    - (j) Make, class and colour of vehicle;
    - (k) Owner's name, address and telephone number;
    - (l) Drivers name, identity number, address and telephone number; and
    - (m) Copy of driver's identity book or drivers licence. .
- 14.3.5.3 The Contractor shall report all damage caused by vehicles to Employers Facilities and Design-Build Assets at the nearest police station within a time period as is required by law. The Contractor shall obtain a case number. In the event that the driver of the vehicle responsible for the damage refused to supply any of the information specified in Clause 13.2.5.2 above, the Contractor shall state this in the affidavit, and the associated penalty and liability for expenses relating to the repairing, rebuilding or replacing of the damaged Employer's Facilities shall be waived.

#### **14.3.6 Penalties**

- 14.3.6.1 For non-compliance to the Contractor's obligations to repair damage to Assets, the Contractor shall be liable for penalties in accordance to the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **14.4 MAINTENANCE OF ASSETS**

#### **14.4.1 General Maintenance Requirements**

- 14.4.1.1 The Contractor shall be responsible for:
- (a) All the Asset maintenance that consists of the monitoring, routine and breakdown maintenance and the reporting thereof.
  - (b) All handyman work, which includes any non-specialised maintenance work that may be required on a day to day basis, such as replacement of glazing and/or broken doors, painting touch-up's, blocked drains etc.
- 14.4.1.2 The Contractor shall maintain, through repair and/or replacement all equipment, whether Plant, Contractor's Equipment or Employers Equipment, that is required to fulfil his Toll Operations obligations, including traffic control equipment, office automation equipment, furniture, canteen equipment etc.
- 14.4.1.3 The Contractor shall, as part of his Operations and Maintenance Plan, indicate the procedural manuals that will be provided for the ongoing maintenance, for approval by the Employer. The manuals shall contain a list of the minimum spares levels and tools that shall be available at any time on-site that is required to maintain the complete Tolling System.
- 14.4.1.4 The Contractor shall perform all maintenance including, without limitation, routine, corrective and breakdown maintenance, and keep all assets in a good working condition in a manner sufficient to ensure the required performance of such assets intended functions for Toll Operations and Maintenance. The Contractor shall further ensure to appropriately manage and maintain the assets and to enhance the desired public image of the Employer.
- 14.4.1.5 The Contractor shall perform routine maintenance which shall include, without limitation, the systematic inspection, cleaning, making of minor adjustments, lubricating, testing, measuring and recording, replacing of minor components or consumables and other similar measures necessary to prevent wear and/or to assure reliability of the assets.
- 14.4.1.6 The Contractor shall provide a detailed hardware maintenance and Software support manual describing the preventative and breakdown strategy and procedures of all equipment



constituting the Tolling System & equipment. This shall include, but not be limited to the daily, weekly, monthly, six-monthly and annual maintenance tasks.

- 14.4.1.7 The Contractor shall perform corrective maintenance which shall include, without limitation, scheduled overhauls, replacement of worn or failed components, correction of problems found during routine maintenance of the assets and any other similar procedures necessary to prolong economic life and/or assure reliability. This includes the subsequent repair or replacement of any defective components or major spares.
- 14.4.1.8 The Contractor shall perform breakdown maintenance which shall include, without limitation, the unscheduled restoration of assets to a condition equal to original or design capacity in the event of a random asset (including equipment) fault and includes the subsequent repair or replacement of any components or major spares found to be defective during breakdown maintenance.
- 14.4.1.9 The Employer may at any time inspect and test any asset, including performing any tests to confirm compliance.
- 14.4.1.10 The Contractor shall remain responsible for any replacement or repair that may be required on any Asset. The Contractor shall specifically take note of the maintenance related performance requirements as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
- 14.4.1.11 Maintenance overview

The maintenance of all the Assets covers a wide area consisting of maintenance of the Employer's Assets as well as the systems and equipment maintenance (generally defined as Plant) that the Contractor shall provide through the Design-Build part of the Contract. The table below shows the different maintenance areas and indicates how it will be dealt with in the Contract.

**TABLE 14-1: MAINTENANCE OVERVIEW – RESPONSIBILITY**

MAINTENANCE ASPECT	EMPLOYERS FACILITIES	PERMANENT DESIGN BUILD ASSETS (E.g. Plant, Contractor's Documents)
General Maintenance: All routine, corrective, breakdown and handyman maintenance.	Contractor to perform maintenance of Employers Facilities through Provisional Sums, excluding Tolling System. Tolling System, part of Employers Equipment, handed over to Contractor to be maintained through scheduled items in the Schedule of Payments.	Contractor to perform all maintenance through scheduled items.
Specialist maintenance of	a) During defect liability period: Contractor	N/A

MAINTENANCE ASPECT	EMPLOYERS FACILITIES	PERMANENT DESIGN BUILD ASSETS (E.g. Plant, Contractor's Documents)
Employers Equipment. (E.g. generators, UPS, air-conditioning etc) as listed in Annexure 1.	to manage required maintenance through the original supply equipment contractor that was responsible for the new equipment installation. b) After defect liability period: Contractor through Provisional Sum and/or scheduled rates, appoint specialist contractor and manage required maintenance.	
Expansions and upgrades requested by Employer	Contractor through Variation.	Contractor through scheduled items. If no scheduled items exists, through variation
Insurance	Contractor, except where specifically shown as Employer	Contractor
Replacement of Assets through Asset Replacement Schedule	Not applicable	Contractor
Disaster Recovery	Contractor, through Provisional Sums or Variation.	Contractor

#### 14.4.2 Severity levels for Maintenance and Support Purposes

14.4.2.1 A "Severity Level 1" problem shall mean a critical failure of the Tolling System (or any part thereof) and/or any of the facilities (buildings, structures etc) and/or any of the installations that has a material impact on the ability of the Tolling System and/or the Contractor to capture complete transactions and to provide Customer Services, which shall include, but shall not be limited to:

- (a) Instances where data processing has to revert from automatic to manual data processing or manual data transfer is required, for instance during communications failure;
- (b) Instances which could be life threatening or where serious risk exist to damage of Assets;
- (c) Any server crash;
- (d) Any Data Base Management System failure at any one servers;
- (e) System failure that results in an in-ability of the Tolling System to capture vehicle passage at any Toll Plaza or Tolling Point;
- (f) System failures that result in the capturing of non-compliant transactions;

- (g) System failures that result in the delay of the submission of bank card files for more than 2 days;
- (h) System failures that result in a delay of the month-end closure a month beyond the tenth (10<sup>th</sup>) of the next month.

14.4.2.2 A "Severity Level 2" problem" shall mean a serious failure of the Tolling System (or any part thereof) and/or any of the facilities (buildings, structures etc) and/or any of the installations, where that failure cannot be categorised as a Severity Level 1 problem, and where the Tolling System still remains active but its road users or Customers, are severely impacted. (i.e. platforms unstable, degraded Response Times) which shall include, but shall not be limited to system failures that result in an inability to capture account registrations and / or payments on the Tolling System.

14.4.2.3 A " Severity Level 3" problem" shall mean all other incidents not meeting the definition of a Severity Level 1 or Severity 2 problem would then be seen as Severity Level 3 problem which includes day-to-day maintenance or repair required with no material impact on the Employer's business or daily Toll Operations .

#### **14.4.3 Help Desk**

14.4.3.1 The Contractor shall make available an electronic Help Desk which shall record and track all system failures and support requests that are logged.

14.4.3.2 The Help Desk shall provide Help Desk Services on a 24 hour, 7 (seven) day a week, basis, which services shall include, amongst others: assistance on day-to-day Toll System and Toll System Interface issues, non-System issues such as electrical and mechanical issues, facility maintenance, user errors, providing end user training, trouble-shooting, repetitive tasks and other traditional end-user support services and the like.

14.4.3.3 The Help Desk shall be used to log faults or problems that require attention with regard to Tolling System and Tolling System interface issues, non-system issues such as electrical and mechanical issues, facility maintenance issues, user errors, and the like.

14.4.3.4 The Help Desk shall allow for support requests to be logged and tracked electronically. The Contractor will ensure that the Help Desk is capable of providing a real-time status on each problem logged, including the appropriate Response and Repair Times. For the sake of clarity, the Help Desk shall maintain a full audit report of all support actions and requests, which records it shall store for at least 3 years. The Help Desk shall be able to accommodate ad-hoc requests as well as filtering of data for trend analysis.

14.4.3.5 Once a fault is reported, the Help Desk shall verify the type of fault (Severity Level 1, 2, or 3) and shall forward the support request directly to the Contractor's support staff for action and resolution. The Help Desk shall ensure that the Contractor's support staff receive and

acknowledge all support requests and this fact will also be recorded and logged in the Help Desk system.

14.4.3.6 The Contractor's specialist maintenance teams shall provide first line technical and/or remote assistance in identifying and resolving problems relating to the Tolling System and Tolling System interfaces.

14.4.3.7 The Contractor will provide monthly progress and performance reports from the Help Desk. This will include information such as:

- (a) Number of calls received;
- (b) Type of support requests received, problems that occurred and support provided;
- (c) Actual Response Times versus minimum Response Times, including any relevant explanations;
- (d) Actual Repair Times versus minimum Repair Times;
- (e) Support calls resolved and closed on the Help Desk, including any relevant explanations;
- (f) Number of outstanding support calls;
- (g) Time spent on all support requests and other tasks

#### **14.4.4 Tolling System and Equipment Maintenance**

14.4.4.1 This section deals with the maintenance of the complete Tolling System including all the sub-systems e.g. the toll lane systems including the peripheral equipment, Road Side System, Back Office System, Mobile Payment Station systems and equipment and Customer Service Kiosk systems and equipment.

14.4.4.2 Specific maintenance requirements of the ORT equipment and Systems are contained in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).

14.4.4.3 The Contractor shall draft, for the use and implementation of the Toll Operations, maintenance manuals that shall contain the procedures to be followed in case of system generated incidents and / or breakdowns that occur.

14.4.4.4 The Contractor shall also be responsible for the maintenance and support of the TAS server, database and Software to ensure that the relevant data, as specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), is continuously transferred from the Back Office System to the TAS server.

- 14.4.4.5 The high-level maintenance objectives for the successful operation of the Tolling System are, inter alia:
- (a) Response and Repair Time to comply with requirements and incorporating an acceptable level of work quality.
  - (b) The resolution of all latent and patent Tolling System defects within a reasonable time frame.
  - (c) Tolling System to perform at performance and processing rates and as specified in Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a) and as measured in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).
  - (d) That the maintenance team/s pro-actively and efficiently identify and address problems in the Tolling System, Software and/or system Interfaces.
  - (e) The availability of suitably skilled experts, within the ranks of the Contractor to ensure that the Tolling System, inclusive of Software and/or system interfaces remain operationally available at all times.
- 14.4.4.6 The Contractor shall be responsible for all data base management services.
- 14.4.4.7 Disaster Recovery
- (a) The Contractor shall provide Disaster Recovery services in the event of a Disastrous Event.
  - (b) Disaster Recovery shall be in accordance with international ISO standards and SA banking industry standards.
  - (c) Suitable spares and replacement parts and the management thereof relating to any equipment shall be available for Disaster Recovery.
  - (d) Specific responsibilities of the Contractor shall also include, amongst others:
  - (e) Recovery of data and Tolling System configuration, in relation to the Tolling System should a Disastrous Event occur.
    - i. Ensuring that an updated system recovery pack is made available within 7 days of a new Software release or patch becoming available, and installed and tested within another 7 days.
    - ii. After a Disastrous Event, conducting a post event meeting to understand the cause of the event, to develop plans to eliminate or mitigate its future occurrence, to facilitate the revival of the performance of services and to discuss plans for resolution of any performance problems.

- (f) As part of the Operations and Maintenance plan, the Contractor shall provide a full Disaster Recovery plan, inclusive of the Disaster Recovery organisation plan, procedures indicating specific drills, procedures aimed at prevention of data loss, etc.

**14.4.4.8 Spares and Replacement Parts**

- (a) The Contractor shall provide and keep in stock all necessary spares and/or replacement parts and standby rigs at each Toll Plaza.

**14.4.4.9 Routine Maintenance Services**

- (a) The Contractor shall provide the all routine maintenance services in accordance with the relevant performance requirements, including the following:
- (b) The planning and scheduling of all routine maintenance on the Tolling System, consisting of daily, weekly, monthly, bi-monthly, 6-monthly and annual maintenance tasks.
- (c) The ongoing identification and correction of latent defects and errors in the Tolling System.
- (d) The provision, installation and configuration of updates, patches and bug fixes relating to the Tolling System as these become available from time-to-time.
- (e) The ongoing identification and analysis of problems and inefficiencies in the Tolling System with the view of developing and introducing ongoing upgrades and enhancements to the Tolling System so as to increase efficiencies and eliminate or minimise the occurrence of problems and errors.

**14.4.4.10 Management of defects, upgrades, Tolling System changes**

- (a) The Contractor shall provide system change control procedures, which includes the control and management of changes to the Tolling System, communication systems, hardware and/or network facilities on which the Tolling System is dependent.
- (b) The Contractor will maintain and administer a schedule of all known defects in the Tolling System, together with a status report on the progress of addressing and repairing each defect, and will make this schedule available to the Employer once a month.
- (c) The Contractor will ensure that the delivery, installation or configuration of upgrades and/or enhancements to the Tolling System will not interfere with the day-to-day running of the Tolling System as a whole, and that the planning and execution of such work, if it has a traffic impact, it shall be done outside any peak periods and as approved by the Employer.

- (d) Should it be foreseen that the delivery, installation or configuration of upgrades and/or enhancements to the Tolling System is likely to interfere with the ordinary use of the Tolling System, the Contractor shall duly inform the Employer.
- (e) The delivery, installation and configuration of upgrades and/or enhancements to the Tolling System (a “system change”) will be co-ordinated with the Employer and in this regard the Contractor shall conduct technical assessments, together with the Employer on any proposed system change, including any change that may be necessary to 3<sup>rd</sup> Party Software.
- (f) Prior to implementing a system change, the Contractor shall conduct fully integrated tests to be signed off by the Employer in a controlled manner and also provide the Employer with a comprehensive assessment of risks associated with the changes.
- (g) The Contractor shall maintain a full suite of development Software and test equipment and machines so that all testing can be done in a non-production environment before it is migrated to the production system. For any major upgrade, a test plan is required as well as Employer approval thereof.
- (h) The Contractor shall coordinate with the other Toll Agencies who use the same Tag’s on their routes in order to ensure that any system change shall not adversely affect those Toll Agencies.
- (i) Record all configuration setting changes that may occur as a result of a system change.
- (j) Updating the Software documentation to keep it current and accurate with any system changes, including the incorporation of all new functionality.

#### 14.4.4.11 Third-Party Software Management

- (a) Any new or upgraded third-party Software shall be logged on the Asset Management System.
- (b) The Contractor shall at all times for the duration of the Contract maintain a schedule of all 3rd Party Software necessary for the proper and effective operation of the Tolling System and ensure that all licences remains valid, legal and paid-up.
- (c) The Contractor must ensure that the schedule of all 3rd Party Software must include the following information:
- (d) The identity and contact details of the official licensee of the Software;
  - i. The identity and contact details of the official licensor and/or vendor of the 3<sup>rd</sup> party Software;
  - ii. The commencement date of the Software license and service level agreement, if applicable;

- iii. The expiry date of the Software license and service level agreement;
  - iv. The projected cost for renewing the Software license and service level agreement;
  - v. The standard operating environment (SOE) in which the Software is installed and operates, including what components or modules of the Tolling System is reliant on the 3<sup>rd</sup> party Software.
- (e) The Contractor must ensure that appropriate back-to-back service levels agreements are in place with the vendor/licensor of the 3rd party Software, so as to ensure that The Contractor is able to meet its obligations in terms of this Contract;
  - (f) The Contractor is to ensure that all 3rd party Software licenses are fully paid up a year in advance. At the end of the contract period as part of hand-back, proof to this effect is to be provided to the Employer;
  - (g) The Contractor will ensure that the current versions of the Software are fully warranted and supported by the vendor and the user licence is current;
  - (h) The Contractor will schedule Software version updates required to maintain the vendor warranty and support services.

#### 14.4.4.12 Skilled Staff

- a) The Contractor shall at all time use adequate numbers of suitably trained, experienced and skilled staff to provide the maintenance and support work and to meet the required Service Levels.

#### 14.4.4.13 Maintenance and support Meetings

- (a) As from the Tolling Date the following meetings shall take place;
  - i. Ad-hoc meetings with the Employer as reasonably required by the Employer.
  - ii. Monthly maintenance and support meetings with the Employer.

#### 14.4.4.14 Tolling System availability

The Tolling System availability shall be measured as indicated in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **14.4.5 Facility Maintenance: Buildings and Structures and surrounding Areas**

- 14.4.5.1 Maintenance of the following aspects shall be done by the Contractor on a daily basis. The Contractor shall ensure that:



- (a) Buildings are kept in a clean, litter-free, hygienic, safe and tidy condition, internally and externally. Without limitation, the Contractor shall ensure that, inter alia, all doors (hinges, handles and locking mechanisms) and windows (hinges, handles and locking mechanisms) toilets, showers, basins, urinals and geysers are maintained in good working condition.
- (b) Parking areas, paving and access roads are kept in a clean, litter-free, hygienic, safe and tidy condition, free of weeds, vegetation and debris; and
- (c) All drainage structures and channels are kept clean of debris and litter to ensure that they function properly and in the manner intended.
- (d) All perimeters and security fencing and all access gates are maintained in good working order and condition.
- (e) All activities that are necessary to ensure that all the assets are clean, tidy and generally in good working order and condition.
- (f) The Contractor shall maintain the toll tariff information sign boards approaching and at the Toll Plazas, on all approaches to the tolled motorway and at Tolling Points. The maintenance will include the annual manual changing of published toll tariffs.
- (g) The Contractor will be responsible for all insurance responsibilities related to the facilities, systems, equipment and installations. The Contractor shall therefore be responsible for the reinstatement or re-building of all facilities should they be damaged by any party and/or event.
- (h) The Contractor will, for emergency repair purposes, provide a set of spare gantry legs and “temporary” truss structure (without maintenance walkways) which can be used as an interim emergency Tolling Point gantry in the event of a damaged Tolling Point gantry structure. The Contractor will be fully responsible for the storage, erection, dismantling and maintenance of the “spare” gantry system.

#### 14.4.5.2 Painting and Corrosion Protection

- (a) The Contractor shall maintain all paintwork of all assets and shall treat and/or remove any flaking paint and/or rust from such structures, such as at but not limited to Conventional Toll Plazas and structures, toll gantries and Technical Shelters. Painting shall be performed as specified in the Standard Specifications for Operations and Maintenance of Toll Projects: Electrical and Mechanical Equipment (Volume 2 Book 3).
- (b) The Contractor shall ensure that patch-up corrosion protection, where needed, is being done on all structural steel-work and steel roofing.
- (c) The Contractor shall appoint a competent registered corrosion specialist to submit a comprehensive corrosion protection report to the Employer once every 3 (three) years.

- (d) The above mentioned report shall indicate the corrosion status of the facilities, (including water reservoir, fencing, building elements, poles and masts, structural steelwork, etc.) and contain recommendations regarding the paint systems required to protect the assets.

#### **14.4.5.3 Structures**

- (a) The Contractor shall maintain all structures, including all buildings, gantry structures, technical shelters, canopies, and the like.
- (b) The Contractor shall ensure that all rust be treated, water leaks repaired on occurrence, including leaking building roofs, and repairs effected of all joints and structural defects due to normal wear and tear forthwith upon their occurrence.

#### **14.4.5.4 Gardens**

The Contractor shall keep all gardens in a neat condition such as to provide a good and professional image to the general public.

#### **14.4.5.5 Buildings and Structures Facilities Maintenance Check-list**

- (a) A check-list and scoring-system shall be used to determine on a qualitative basis, the level of maintenance that is being performed by the Contractor. Refer to the Project Document: Volume 3.

### **14.4.6 Electrical and Mechanical (E&M) Maintenance**

14.4.6.1 All electrical and mechanical maintenance shall be supervised and managed by a registered person in terms of the Occupational Health and Safety Act, 1993, Electrical Installations Regulations. The registered person shall provide a technical report on the electrical and mechanical installations as required in the applicable legislation and the report shall include a Certificate of Compliance.

14.4.6.2 The Contractor shall perform all monitoring, checks and routine maintenance on a regular basis as indicated in the approved Operations and Maintenance Plan. He shall ensure that specialised maintenance on systems such as the generator, UPS, air-conditioning etc, shall be performed by competent specialist sub-contractors.

14.4.6.3 All the E&M maintenance shall comply with the Standard Specifications for Operations and Maintenance of Toll Projects: Electrical and Mechanical Equipment (Volume 2 Book 3).

14.4.6.4 Performance Measurement for SCADA is described in the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**14.4.6.5 Specialist Maintenance**

- (a) The Contractor shall appoint specialist maintenance contractors in order to perform specialist maintenance on, inter alia, the following: Generators; UPS's; fresh air supply and ventilation systems; air conditioning installations; SCADA systems; lifts in buildings; garden irrigation and sprinkler systems; water features with their pumps and control equipment; sculptures requiring specialist maintenance; industrial kitchen equipment; security fencing and gates including motorised gates; water storage reservoirs; booster pumps; borehole pumps; fire extinguishers; and water treatment plants. Further, all security systems and cameras, access control systems and fire suppression systems will also fall under specialist maintenance.
- (b) The Contractor shall assist and co-operate with the specialist maintenance contractor to perform first-line maintenance on the assets requiring specialist maintenance. The first-line maintenance shall include notifications and call-outs to the specialist maintenance contractor/s, implementation of any possible risk mitigation measures required during a breakdown and performance of regular basic checks and monitoring e.g. monitoring of fuel and oil levels of generators. The Contractor shall liaise with the specialist maintenance contractor before commencement of a specialist maintenance contract on the required first-line maintenance to be performed by the Contractor to ensure optimum functionality and successful operations of the particular Employers Equipment and other assets.

**14.4.6.6 Earthing tests: 6 (six) monthly reports**

- (a) The Contractor shall perform, utilising suitably skilled persons, two earthing tests per annum at each facility, including the Toll Plaza canopies and/or the ORT gantries, of which one test shall be performed at the height of the dry season and one during the rainy season. The Contractor shall provide the Employer of the procedure and methodology of the earthing tests to be performed at the various sites, for approval.
- (b) The Contractor shall provide the Employer with an as-built drawing indicating the test points with the test values obtained at the earth node. Each earth node shall be numbered that can be referred back to a comprehensive test report. The comprehensive test report shall be updated with every earthing test and submitted to the Employer every six months.
- (c) The earthing nodes will be tested as indicated on the as-built drawings with the values on the as-built drawings taken as the base values. Any changes in the earthing values will be investigated and corrective action motivated by the Contractor.
- (d) The Contractor shall also include a soil resistivity test in their six monthly earthing report. The final earthing report to be approved by the Employer with the option to add or change the report when required.
- (e) All historical records shall be made available to the next Contractor.

**14.4.6.7 Lighting**

- (a) The Contractor shall maintain the lighting installation on a group lamp replacement maintenance system at all the Toll Plaza facilities. The Contractor shall use energy efficient lamps as far as possible. The lamp replacement shall include replacement of lenses and reflectors, and checking of seals, if necessary.
- (b) Lighting maintenance undertaken by the Contractor shall be done according to the Standard Specifications for Operations and Maintenance of Toll Projects: Electrical and Mechanical Equipment (Volume 2 Book 3).
- (c) Group lamp replacement intervals shall be in accordance with acceptable standards, and contained in the maintenance manuals. The lamp replacement shall include replacement of lenses and reflectors, and checking of seals, if necessary. The Contractor shall provide the Employer on a bi-monthly basis with a report on the group lamp replacement and indicate when the next replacement is due per lamp type.

**14.4.6.8 Weekly inspection and test run of generators**

- (a) The Contractor shall inspect and test run the generators (mains failure) for a minimum of 5 (five) minutes, on a weekly basis and for 30 (thirty) minutes on a bi-monthly basis to identify any possible defects. A signed log shall be kept to document all test runs. All defects shall be noted in a logbook and reported to the Employer timeously.
- (b) The Contractor shall also check and verify that the UPS and electronic equipment is functioning according to specification during the test run of the generator.

**14.4.7 Penalties – Electrical and Mechanical Maintenance**

- 14.4.7.1 For non-compliance to Electrical and Mechanical Maintenance, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**14.4.8 Day-to-day Handyman Work**

- 14.4.8.1 The Contractor shall be responsible for all handyman type of maintenance at the buildings, gantries, technical shelters, Customer Service Kiosks and Mobile Payment Stations.

- 14.4.8.2 This maintenance work generally consists of work that requires lower skilled resources and typical examples of such handyman work are:

- (a) Window glazing
- (b) Doors, including hinges and locks
- (c) Ceilings

- (d) Roofing
- (e) Gutters
- (f) Plumbing
- (g) Security gates
- (h) Security fencing
- (i) Built-in cupboards and furniture
- (j) Window blinds
- (k) Carpets, Floor and wall tiles
- (l) Touch-up painting and the like.

**14.4.9 Maintenance of Mobile Payment Stations (MPS's) and Mobile Police Vehicles (MPV's)**

- 14.4.9.1 Where ORT operations are applicable, the Contractor shall ensure that the MPS's are maintained in such a manner that each vehicle remains roadworthy and free from dents and scratches or any other damage.
- 14.4.9.2 The mechanical maintenance and the frequency of the maintenance of each vehicle shall be done in accordance with the requirements of the manufacturer.

**14.5 ASSET MANAGEMENT SYSTEM**

**14.5.1 General Obligations**

- 14.5.1.1 The Contractor shall procure and implement an electronic AMS in accordance with the public finance management legislation.
- 14.5.1.2 The Asset Management System shall entail the capturing and tracking of the various assets in an electronic database with the continuous updating with the change of status, replacement, addition of new assets or the removal of assets that were written off, the labelling of assets etc.
- 14.5.1.3 The Asset Management System shall include a fully integrated equipment record system for the tracking of spares and equipment during the complete maintenance cycle of the assets.
- 14.5.1.4 The Contractor shall submit the proposed Asset Management System to the Employer for approval, within three months from the Tolling Date.

- 14.5.1.5 The Asset Management System shall be implemented within six months from the Tolling Date and shall be updated continuously. The updated asset register shall be submitted to the Employer on an annual basis.
- 14.5.1.6 During the Contract Period, the Contractor shall maintain and update his asset registers to reflect any changes in terms of status, modification and upgrades.
- 14.5.1.7 The Contractor shall keep a record of maintenance tasks that are “completed”, “overdue” and “scheduled” for each asset operated and maintained by him.
- 14.5.1.8 The Contractor shall utilise asset management statistics provided by the AMS to effectively monitor and manage assets operated and maintained by him.
- 14.5.1.9 For the purpose of the Contract the AMS shall be deemed part of the Contractor's Documents.

#### **14.5.2 Penalties**

- 14.5.2.1 For non-compliance to the requirements of an Asset Management System, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **14.6 MAINTENANCE DOCUMENTATION**

#### **14.6.1 General**

- 14.6.1.1 The Contractor shall provide the following documentation, for approval by the Employer. These documents shall be updated continuously as and when required.
  - (a) Maintenance manuals for Tolling System, installations and facilities
  - (b) Software support manual
  - (c) The maintenance and support manuals will clearly indicate the Contractor's obligations in terms of:
    - i. General maintenance and support procedures
    - ii. Health and safety aspects
    - iii. Communication protocols
    - iv. Preventative maintenance, corrective maintenance and breakdown maintenance procedures and checklists
    - v. Fault reporting requirements

- vi. Response procedures.

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## **SECTION 15. GENERAL**

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## **15.1 UTILITIES, SERVICES AND LEVIES**

### **15.1.1 General**

15.1.1.1 This section covers the supply of electricity, water supply, sewerage and other municipal levies to ensure continuous Operations.

15.1.1.2 The Contractor shall perform all arrangements to ensure that all applications for utility accounts are made in the Contractor's name and that utility accounts are sent to the Contractor's address and that these accounts are paid in time.

### **15.1.2 Electricity**

15.1.2.1 The primary supply of electricity to the facilities shall include:

- (a) The national Eskom reticulation network or the municipal reticulation networks;
- (b) Uninterruptible power supplies (backup battery banks); and
- (c) Diesel engine driven generator sets (for standby power).
- (d) The Contractor shall anticipate and address interruptions in the supply of electricity and shall ensure the availability of backup power supply systems for critical functions.

15.1.2.2 The Contractor shall supply sufficient diesel fuel as may be necessary for the generation of standby electricity.

15.1.2.3 The Contractor shall maintain all electricity installations to ensure the continuous availability of backup power.

15.1.2.4 Performance measurement and penalties relating to electricity supply shall be carried out in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

### **15.1.3 Water, Sewerage and other Municipal Levies**

15.1.3.1 The Contractor shall be responsible for the cost and payment of all accounts in respect of water, sewerage and other municipal levies.

**15.1.4 Penalties**

- 15.1.4.1 For non-compliance of Utilities, Services and Levies, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**15.2 TRAINING**

**15.2.1 General training responsibilities**

- 15.2.1.1 The Contractor shall perform all training activities and tasks necessary to perform Toll Operations.
- 15.2.1.2 The Contractor shall provide a comprehensive list of formal personnel training courses that shall be submitted to the Employer for approval.
- 15.2.1.3 The Contractor shall provide a formal training programme with supporting training manuals for all levels of system users.

**15.3 MARKETING**

**15.3.1 General marketing responsibilities**

- 15.3.1.1 The Contractor shall adopt and adhere to the marketing strategy of the Employer with regard to the various types of Toll Operations , and in particular with the distribution of ETC Tags.
- 15.3.1.2 The Contractor shall further develop an appropriate marketing plan to support the marketing strategy as specified by the Employer.
- 15.3.1.3 Media liaison, printed media and public relations
- (a) The Employer shall be responsible to co-ordinate and manage the public relations function for the national road network.
  - (b) The Contractor shall liaise with the Employer at all times and shall ensure that any information provided is in accordance with the policy and requirements and guidelines that shall be provided by the Employer.
- 15.3.1.4 The Contractor shall maximize the market share of registered Tag account transactions in accordance with the Employer's marketing strategies as indicated in the Project Document: Volume 3.

- 15.3.1.5 Marketing support will be measured in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **15.4 SAFETY AND SECURITY**

### **15.4.1 Security System**

- 15.4.1.1 The Contractor shall maintain any security equipment installed in an adequate way to ensure reliability and effectiveness.

- 15.4.1.2 The Contractor shall train personnel to use and keep the environment secure at all times for their own safety and to protect assets against potential loss or damage.

### **15.4.2 Access Control**

- 15.4.2.1 The Contractor shall be responsible for maintaining the access control system, including fencing, intercom systems, reading devices for identification, alarm systems and related equipment.

- 15.4.2.2 The Contractor shall develop access control procedures and provide suitably trained security personnel to monitor 24 hours of the day and ensure a safe environment for personnel, the public and all assets under its control.

- 15.4.2.3 The Contractor shall ensure that the access control system records the date and time of each person and vehicle that enters or exits the building facilities and/or the security areas, are captured on a 24 hour basis.

### **15.4.3 Penalties**

- 15.4.3.1 For non-compliance of Safety and Security Obligations, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **15.5 QUALITY ASSURANCE**

### **15.5.1 General**

- 15.5.1.1 The Contractor shall submit his quality assurance system for approval by the Employer.

- 15.5.1.2 The quality assurance system shall be based on the standards and follow the guidelines of quality management as stated in ISO 9001:2000 (or similar) and ISO 15288:2008 (or similar).

- 15.5.1.3 The quality assurance system shall include, amongst others, internal policies, processes, procedures and objectives that are needed by the Contractor to meet performance standards.
- 15.5.1.4 The Contractor shall ensure that his quality policy:
- (a) Meets all objectives stated in the Contract;
  - (b) Includes a commitment to continually improve the effectiveness of the quality management system and overall operations system;
  - (c) Provides a framework for establishing and reviewing quality objectives;
  - (d) Is communicated and understood within and across the Contractor's organization, including sub-contractors on Site;
  - (e) Is reviewed, updated and implemented in order to maintain ongoing sufficiency and suitability thereof; and
  - (f) Is fully auditable.
- 15.5.1.5 The quality assurance system shall be fully implemented by the Contractor prior to the Tolling Date.
- 15.5.1.6 The Contractor shall develop, implement, update and maintain a comprehensive electronic annual management planner to indicate all scheduled and periodic activities. The annual management planner shall, for example, include the following activities:
- (a) Periodic renewal of each subcontract and service level agreement;
  - (b) Annual review plan of the operations and maintenance procedure manuals;
  - (c) Annual review plan of the asset management system;
  - (d) Periodic review plan of the performance measurement system;
  - (e) Periodic asset audits and submission of reports;
  - (f) Periodic asset condition and replacement plans and submission of reports;
  - (g) Refresher personnel training plans;
  - (h) Service provider and other training plans;
  - (i) Routine and periodic contractual meetings;
  - (j) Routine Contractor's (in-house) management meetings;
  - (k) Safety meetings;

- (l) Review plans concerning health, safety and environmental matters;
- (m) Major asset improvement/replacement procurement plans;
- (n) Socio-economic development plans;
- (o) Periodic issue/re-issue of applicable personnel uniforms (that is for all personnel interacting face to face with the public);
- (p) Periodic reports; and
- (q) Periodic financial reporting as stipulated in the Employer's Requirements;
- (r) Any other periodic or pre-scheduled activities derived from the Contractor's general obligations under the Contract.

#### **15.5.2 Quality Control**

- 15.5.2.1 The Contractor shall, as a minimum, implement and perform appropriate internal audits that shall comply with the standards and procedures of the Institute of Internal Auditors South Africa. Refer to [www.iiasa.org.za](http://www.iiasa.org.za).
- 15.5.2.2 The Contractor shall implement an efficient system to track and control scheduled audit dates and to report on progress and status of the audit activities. The scheduled audits shall include the Contractor's internal audits, audits by independent auditors and audits by the Employer.
- 15.5.2.3 All the audit findings shall be categorized, reported and followed up according to the level of urgency associated with the finding. The urgency will be determined based on the risk assessment of the finding, e.g. the most critical findings shall include findings where loss in income or loss of life occurred or where a risk and/or finding needs to be addressed immediately. Less critical findings include findings where non-compliance impacts on proper control and/or where the Contractor needs to address it in the next month. Low criticality findings shall include findings where no defined procedure is the main cause and where the findings need to be addressed before the next audit, etc. The Contractor shall submit a benchmark for categorizing the audit findings for approval by the Employer before commencement of the first internal audit.
- 15.5.2.4 The Contractor's auditing system shall include an evaluation mechanism whereby his internal audit results are compared against:
  - (a) An acceptable industry standard benchmark;
  - (b) Similar results of previous audits at the same location;
  - (c) Targeted results in relation to similar businesses; and

- (d) Benchmarks set for operations performance and approved by the Employer before commencement of the first internal audit.
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- 15.5.2.5 The Contractor shall submit an annual audit plan for approval by the Employer. The audit plan shall include the audit scope and the audit programme with required actions and target dates from the preparation for the audit to the final submission of the audit report and the subsequent follow-up on audit findings and recommendations.
  - 15.5.2.6 The Contractor shall submit a monthly status update on the progress of the items included in the annual audit plan, including an action plan to address the outstanding actions where target dates were not met and updates on new ad-hoc audits were performed and planned.
  - 15.5.2.7 The Contractor shall submit a monthly report on the audit finding statistics per location.
  - 15.5.2.8 The Contractor shall submit a monthly status update on the progress of the Contractor's action list for the implementation of recommendations or follow-up actions on audit findings from the previous audits, including an action plan to address the outstanding actions where target dates were not met.
  - 15.5.2.9 The Contractor shall ensure that continuous auditing on reportable incidents is included in the annual audit plan.
  - 15.5.2.10 The Contractor shall submit the incident scope and audit sampling plan to the Employer for approval, which approval shall not absolve the Contractor of any obligation in this regard.
  - 15.5.2.11 Reportable incidents to be included in the continuous audit shall include all incidents where the Contractor had to implement an operational procedure.
  - 15.5.2.12 The Contractor shall submit a monthly audit report on all audit findings to the Employer by the 10<sup>th</sup> day of every month.
  - 15.5.2.13 Target dates for actions required to resolve the audit findings will be included in the audit report and will be approved by the Employer
  - 15.5.2.14 The audit scope of the Contractor shall place particular emphasis on reportable incidents with a financial implication, such as the following:
    - (a) Under and over classification discrepancies;
    - (b) Exempt Vehicle Transaction Records;
    - (c) Violations;
    - (d) Non-payments;

- (e) Customer Account Transaction Record with a Vehicle Licence Number mismatch, i.e. the Vehicle Licence Number linked to the passage does not match the Vehicle Licence Number registered on the system, for the identifier used;
- (f) Customer Account Transaction Records with a Vehicle Class mismatch, i.e. the Registered Vehicle Class of the Tag does not agree with the Vehicle Class of the Transaction Record;
- (g) Discounts; and
- (h) System incidents that indicate the possibility of system tampering or malfunction.

15.5.2.15 For maintenance audits, the following shall apply:

- (a) The Contractor shall conduct quarterly audits on all maintenance responsibilities;
- (b) The maintenance audits shall be done according to an audit plan, which the Contractor shall compile and submit to the Employer for approval.
- (c) Such audits shall be separate and distinct from any inspection which the Employer or the Employer may periodically elect to conduct;
- (d) Instances of non-conformance of the condition of assets, such as may reasonably be expected to lead to imminent malfunction of the said asset or associated assets and result in the operation's being interrupted or compromised, shall be reported to the Employer within twenty four (24) hours of such non-compliance being discovered or suspected; and
- (e) The reports of audits so conducted by the Contractor shall be submitted to the Employer not later than 21 days after the conclusion of such audits.

15.5.2.16 Asset audits

- (a) The Contractor shall conduct annual audits on all types of assets.
- (b) The asset audits shall be done according to an audit plan, which the Contractor shall compile and submit to the Employer for approval. Such approval shall not absolve the Contractor of its obligations under the Contract
- (c) Such audits shall be separate and distinct from any ad hoc inspection or audit, which the Employer may periodically elect to conduct.
- (d) Non-conformance of the condition of assets or missing assets, such as may reasonably be expected to lead to imminent malfunction in the operation's performance, shall be reported to the Employer within 24 (twenty four) hours of such non-compliance.

- (e) The audits so conducted by the Contractor shall be completed in good time, annually, and reports of such audits shall be submitted to the Employer not later than 3 (three) weeks after the conclusion of such audits and not later than the financial year end of the Employer.

**15.5.2.17 Audit of financial and operational trends**

- (a) The Contractor shall include auditing of financial and operational trends in the annual audit plan.
- (b) The Contractor shall submit the scope and audit sampling plan for the measurement of trends to the Employer for approval. Trend audits shall, amongst others, include the following:
- (c) Income per method of payment and settlement option;
  - i. Revenue banked;
  - ii. Surplus cash;
  - iii. Cash shortages;
  - iv. Under and over classification discrepancies;
  - v. Exempt Vehicle Transaction Records;
  - vi. Violations;
  - vii. Non-payments;
  - viii. Rejected bank card Transaction Records;
  - ix. System performance;
  - x. Discounts;
  - xi. Submission of a monthly audit report (including all audit results) to the Employer by the 10<sup>th</sup> (tenth) working day of every month; and
  - xii. Submission of target dates for actions required to resolve the audit findings together with the aforementioned report.

**15.5.2.18 Audit of system audit trails**

- (a) The results of the continuous auditing of audit trails shall be included in the annual audit plan.



- (b) The scope of system audit trails will be dependent on the capability of the Tolling System. The Contractor shall maintain manual audit trails should the Tolling System not provide such audit trails automatically.
- (c) The Contractor shall submit the scope and audit sampling plan to the Employer for approval.
- (d) Audits of system audit trails shall, amongst others, include:
- (e) Changes to Transaction Records and other base data;
  - i. Changes to Contractor's system inputs;
  - ii. Changes to system configuration;
  - iii. Changes to Customer Account information;
  - iv. The submission of a monthly audit report on all audit findings to the Employer by the 10<sup>th</sup> (tenth) calendar day of every month; and
  - v. The submission of target dates for actions required to resolve the audit findings, together with the aforementioned report.

**15.5.2.19 Potential fraud audits**

- (a) The Contractor shall perform audits whenever fraud is suspected by the Contractor or the Employer.
- (b) The Contractor shall notify the Employer and the Employer when fraud has been reported or is suspected within 2 (two) working days since the potential fraud was detected.
- (c) The Contractor shall submit an audit plan for the Employer's approval within 5 (five) working days after notification that fraud has been reported or is suspected.
- (d) Audit reports shall be submitted to the Employer no later than 2 (two) weeks after the completion of the audit.
- (e) Target dates for actions required to resolve the audit findings shall be included in the audit report.
- (f) Follow-up audits shall be conducted to confirm the progress and status of audit findings and shall be added to the annual audit planner.

**15.5.2.20 Failure by the Contractor to perform audits**

- (a) Should the Contractor at any time fail to perform audits to the satisfaction of the Employer or the Employer as stated herein, the Employer and the Employer reserves

the right to appoint a 3<sup>rd</sup> party auditor to perform such audits as it deems necessary, at the expense of the Contractor.

**15.5.3 Continuous Improvement**

- (a) The main goal of the Contractor's continuous improvement efforts shall be to:
- (b) Improve Customer satisfaction and service delivery;
- (c) Improve the product and service quality;
- (d) Maximize the Contractor's revenue stream and minimize the Violation Rate on the Project; and
- (e) Lower operating and capital costs over the life of the Project.

15.5.3.1 The Contractor shall initiate continuous improvement initiatives and investigations whereby business processes, procedures and systems are constantly evaluated to improve overall efficiency, effectiveness and flexibility.

15.5.3.2 The Contractor shall identify, reduce and eliminate sub optimal processes by applying value engineering principles.

15.5.3.3 The Contractor shall report on all continuous improvement activities to the Employer.

**15.5.4 Penalties**

15.5.4.1 For non-compliance of Quality Assurance Obligations, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

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## **SECTION 16. ENFORCEMENT**

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## **16.1 GENERAL: ENFORCEMENT**

### **16.1.1 Introduction**

- 16.1.1.1.1 The enforcement responsibilities are separately described for Conventional and Hybrid type plazas and for ORT Operations.

## **16.2 CONVENTIONAL AND HYBRID PLAZAS AND THE CONVENTIONAL / HYBRID SECTION OF A CONVENTIONAL/ORT PLAZA**

### **16.2.1 Enforcement in “Boom-down” Scenarios**

- 16.2.1.1 For “boom-down” Conventional and Hybrid Toll Plazas and the Conventional part of a Conventional/ORT Plaza, the Contractor is not obliged to implement enforcement actions involving Mobile Payment Stations or enforcement facilities and/or equipment as are required for ORT Toll Plazas in terms of Clause 16.3 below.
- 16.2.1.2 Despite the provision of entry and exit booms, toll lane violations may still occur. The implementation of additional measures such as cameras and video grabbing systems, as required in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a), shall record possible toll lane violations which for which the Contractor shall take the full risk of toll collection in this situation.

### **16.2.2 Enforcement in “Boom-up” Scenario**

- 16.2.2.1 Boom-up scenarios shall not be allowed or implemented by the Contractor.

## **16.3 ORT TOLL PLAZAS**

### **16.3.1 General**

- 16.3.1.1 For ORT Operations, the option to Opt-in to the VPC will be available in the absolute discretion of the Employer and subject to the Employer’s conditions for Opting-in. For ORT Operations, the Employer shall provide an enforcement strategy to the Contractor, which shall be based on the Employer’s specific requirements at the time.
- 16.3.1.2 In the case of ORT Operations, when triggered, and where the Employer has instructed that the Contractor shall Opt in to the national VPC. the Employer will decide and provide for the assistance of traffic officers to facilitate the execution of toll payment enforcement. The level of assistance will be at the discretion of the Employer.

16.3.1.3 The responsibilities of the Contractor in respect of enforcement for ORT Operations after reaching the ORT triggers are as follows:

- (a) The Contractor shall provide Mobile Policing vehicles with the necessary equipment and systems and shall be responsible for the maintenance of such vehicles in order to enable Mobile Policing operations by the appointed Mobile Policing Unit. The equipment and systems shall as a minimum enable the Mobile Policing Unit to identify offending vehicles by means of Tag Readers and ANPR cameras, radio communication equipment, remote communications links to the VPC, TCH and the Contractors Back Office Systems, on-board computer and printer, validation system to determine outstanding offences and or fines and a GPS based vehicle tracking system.
- (b) The Contractor shall provide Mobile Payment Stations (MPSs) with the necessary equipment and systems, including two work-stations and peripheral equipment such as printers, scanners and remote communications links to the VPC, TCH and the Contractors Back Office Systems and radio communication equipment for the Contractor's own operational organisation (and shall be responsible for the maintenance thereof) as well as trained staff, as described below. A third work-station shall be provided as an ANPR work-station to identify possible offenders and violators. The MPSs shall provide for at least a 3 work-station operation, i.e. two work-stations for Customer Services with links to the VPC and TCH and one work-station for ANPR operations.
- (c) The staffing of the MPSs by the Contractor shall be as follows: Two trained persons to man the two work-stations and peripheral equipment referred to in the Clause above, and sufficient number of other personnel with the appropriate level of skills to assist the traffic officers in tasks such as to escort and assist motorists during the process of motorist identification, verification of toll violation status, and payment of outstanding invoices or fines. Another trained person shall be required to man the ANPR work-station. The Contractor shall specifically be responsible to identify Violators and inform the traffic officers of which vehicles should be pulled off. The traffic officers who will be provided by the applicable law enforcement agency (in terms of agreements with the Employer) will be responsible for the pulling-off of vehicles with Violations, instructions to motorists as well as for overall traffic safety, control and all legal requirements.
- (d) The number of MPSs (inclusive of management, staffing, equipment, maintenance and operations) required to be provided by the Contractor shall be calculated as follows:
  - i. For urban and semi-urban Toll Roads or Toll Road sections: The number of MPSs shall be equal to 30% of the total number of on-ramps or at-grade access points to the Highway. The calculated number shall be rounded upwards to the nearest integer.

- ii. For rural Toll Roads or Toll Road sections: If the rural Toll Road or Toll Road section is 50km or less, the Contractor shall provide one MPS. For rural Toll Road sections longer than 50km, the Contractor shall provide one MPS per 50 km or part thereof. For the purpose of these calculations, a rural Toll Road section shall be a rural road section with a town or other major destination at either end. The various rural Toll Road sections may not be added up and divided by 50 kms for the purpose of this calculation.
- (e) The number of Mobile Policing vehicles that shall be provided by the Contractor (inclusive of equipment and maintenance thereof, vehicle maintenance and covering of all vehicle operating costs such as the provision of fuel and tyres) shall be calculated as follows: The amount equal to 1,5 times the number of MPSs to be provided by the Contractor. The calculated number shall be rounded upwards to the nearest integer.
- (f) The Contractor shall liaise with the Employer for the necessary traffic officers to be supplied by the road traffic authorities. The Contractor shall engage in a three party agreement with the Employer and the applicable road traffic authority for the manning and operations of the Mobile Policing Vehicles to perform ORT enforcement.
- (g) The Contractor shall play a supporting role in the Mobile Policing by providing data and violation patterns to the Mobile Policing Unit to enable effective and efficient ORT enforcement.
- (h) The Contractor shall, by means of the MPSs and the MPS staff, support the Mobile Policing operations, during which the road users will be provided the opportunity, during the Mobile Policing operations, to pay their outstanding toll fees, fines and/or to register new accounts.

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## **SECTION 17. PROJECT COMPLETION AND HAND BACK**

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## **17.1 GENERAL: PROJECT COMPLETION AND HAND BACK**

### **17.1.1 Introduction**

- 17.1.1.1 This “General” section provides hand back requirements, in addition to the requirements as contained in the Contract.
- 17.1.1.2 During the hand back period the Contractor shall perform all activities necessary to de-establish his organisation and resources.
- 17.1.1.3 The Contractor shall provide a hand back programme 30 days before the commencement of the hand back period, which period commences 3 months before the Completion Date, for approval by the Employer.
- 17.1.1.4 The Contractor shall on a continuous basis before and during the hand back period maintain, review and update a hand back programme in order to minimise any negative impact that the hand back processes may pose on the Contractor’s Operations.
- 17.1.1.5 The Contractor shall arrange and administer fortnightly progress meetings with the Employer during the hand back phase, or at such other intervals as may be agreed.
- 17.1.1.6 The Contractor shall hand back a full functional Tolling System, without serious and/or material defects and with spares and standby rigs as indicated in the approved maintenance manuals.
- 17.1.1.7 The Contractor shall establish a hand back management team to perform the following tasks:
- (a) Training and transfer to the Employer and/or next Contractor;
  - (b) Transfer of Customer Services functions.

## **17.2 HAND BACK OF DOCUMENTS AND DRAWINGS**

### **17.2.1 General responsibilities**

- 17.2.1.1 The Contractor shall return all documents to the Employer after completion of the Contract and before the handover to the next Contractor or the Employer.
- 17.2.1.2 The Contractor shall be obliged, prior to the handover to the next Contractor or the Employer to replace all missing documents.



- 17.2.1.3 It shall be the responsibility of the Contractor to ensure that the register of documents is accurate and up to date.
- 17.2.1.4 The electronic document copies (unless otherwise arranged with the Contractor) shall be provided in the following formats, unless differently agreed with the Employer:
- (a) MS Word and portable document format (PDF) for text documents;
  - (b) MS PowerPoint for slide presentations;
  - (c) Bitmap, JPEG, TIFF, PNG or GIF format for images;
  - (d) Multi-media or sound recordings shall be in WAV or another accepted format; and
  - (e) Databases shall be handed over in the Employer's approved file formats;
  - (f) System design documents in Visio, MS PowerPoint or specialist design tool; and
  - (g) Technical drawings in AutoCAD and/or similar program.
- 17.2.1.5 The Contractor shall ensure that at least two (2) hard copies and two (2) electronic copies of each of the documents as indicated below, in its final draft or approved state and all subsequent documents and revisions thereof shall be handed over to the Employer. The hand back of documents and drawings, as a minimum shall include the following:
- (a) Documentation control system, listing all latest revisions of all documentation;
  - (b) Operations and Maintenance Plan;
  - (c) Customer Service procedures;
  - (d) Supervisory manuals;
  - (e) Administration manuals;
  - (f) Operations procedures and manuals;
  - (g) Tolling System maintenance procedures and manuals;
  - (h) Electrical and mechanical maintenance procedures and manuals;
  - (i) Pre-printed documentation and stationery designs;
  - (j) Health, safety and environmental procedures;
  - (k) Quality assurance systems, plans and procedures;
  - (l) Marketing plans, procedures and input in relation to the Employer's strategy;

- (m) Asset registers, and
- (n) Any other manuals, procedures, periodic plans, systems and the like that may become necessary pursuant to the Contract or the Employer's reasonable requirements.

### **17.3 CONTRACTOR'S DE-ESTABLISHMENT**

#### **17.3.1 General de-establishment responsibilities**

- 17.3.1.1 The Contractor shall arrange for local clearances and de-registrations, when and where applicable.
- 17.3.1.2 The Contractor shall perform all things necessary in relation to the de-establishment and transfer of financial systems, bank accounts and any others needed.

### **17.4 HUMAN RESOURCES TERMINATION AND POSSIBLE TRANSFER**

#### **17.4.1 General responsibilities**

- 17.4.1.1 The Contractor shall render all support during the selection, interview and transfer of selected personnel to the next Contractor.
- 17.4.1.2 The Contractor's personnel to be considered for takeover selection at the next contractor's discretion will consist of management personnel, supervisory personnel, Customer Service personnel, administrative personnel, cash control personnel, technical personnel, and any other personnel needed for a complete and successful hand back.

### **17.5 SUBCONTRACTS**

#### **17.5.1 General responsibilities**

- 17.5.1.1 The Contractor's hand back obligation shall include the transfer of agreements and/or the latest protocol arrangements in relation to the following, amongst other aspects:
  - (a) Transfer of rental agreements for office space used to perform Operations and/or provide Customer Services;
  - (b) Financial institution/bank (where bank payment mechanisms are introduced) agreements and/or latest protocol arrangements;
  - (c) Cash transport and cash-in-transit insurance service agreements where applicable;
  - (d) Maintenance service agreements;

- (e) Cleaning and security service agreements;
- (f) Service contracts/arrangements (electricity, telecommunications, etc);
- (g) Communication services (Internet, diginet, mobile phones, etc.); and
- (h) Transfer of all other agreements and/or arrangements needed to enable an effective and smooth continuation of the Toll Operations (or any part thereof) by the next Contractor.

## **17.6 ASSETS HAND BACK**

### **17.6.1 General Hand-Back Responsibilities**

- 17.6.1.1 The Contractor shall undertake all things necessary to hand back all facilities where applicable. The condition of these assets at hand back shall be in no worse condition as at the time of takeover from the Employer, fair wear and tear excepted.
- 17.6.1.2 The Contractor's hand back obligation shall include all tasks in relation to the hand back of all systems and equipment, except for the ETC Tags in use but including those in stock and those that should be in stock. The condition of these assets at hand back shall be in no worse condition as at the time of takeover from the Employer, fair wear and tear excepted.
- 17.6.1.3 It shall include the hand back of the Software and computer programmes, systems and equipment where applicable, inclusive of the testing, inspections and certification needed. The condition of these assets at hand back shall be in no worse condition as at the time of the issue of the section commissioning certificates (save for the outstanding or defective parts that shall have been rectified), fair wear and tear excepted.
- 17.6.1.4 The assets to be handed over shall be free of defects and deficiencies that may hamper the performance of the Operations next Contractor.
- 17.6.1.5 For the purpose of hand back of above assets, the Contractor shall provide comprehensive, appropriate, updated and complete registers and documentation for signing off by the next Contractor engaged to continue with the Toll Operations .
- 17.6.1.6 All assets handed back may be inspected and verified for completion and correctness by the Employer.

## **17.7 TRAINING OF NEXT CONTRACTOR**

### **17.7.1 General**

17.7.1.1 The Contractor shall provide training on existing systems, where and when applicable, to the satisfaction of the Employer to the next Contractor to ensure a smooth transition. Operational training shall include the following:

- (a) Toll Operations supervisory training;
- (b) Administrative training such as cash collection training;
- (c) Tolling Systems Operations and maintenance training;
- (d) Electrical and mechanical system Operations and Maintenance training.

## **17.8 HAND BACK PROGRAMME**

### **17.8.1 General**

17.8.1.1 Hand back programme: The hand back programme shall indicate the planned durations, start dates and end dates of all the Contractor's activities relating to hand back.

17.8.1.2 The hand back programme shall state the order of testing, inspection and hand back of all Tolling System and equipment, systems, Software and all others needed pursuant to the Contract.

## **17.9 HAND BACK OF LICENCES AND SOFTWARE**

### **17.9.1 General**

17.9.1.1 The Contractor shall hand back, for all proprietary and third party Software, all Software licences and /or agreements for use.

### **17.9.2 Penalties**

#### **17.9.2.1 General**

17.9.2.1.1 For non-compliance of Hand Back Requirements, the Contractor shall be liable for remedies to the Employer in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

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## **SECTION 18.     REPORTING**

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## **18.1 GENERAL**

### **18.1.1 Introduction**

- 18.1.1.1 This “General” section provides detailed reporting requirements for Conventional Toll Plazas, ORT projects as well as for Manual / ORT plaza Operations.
- 18.1.1.2 All reports shall be submitted to the Employer and the Employer in an electronic medium, i.e. CD/DVD/e-mail in a format as proposed by the Contractor and to be approved by the Employer.
- 18.1.1.3 The Employer shall be able to access standard reports on demand using a friendly user interface. However, if requested, the Contractor shall provide to the Employer any ad-hoc report requests, on standard system reports, within 24 hours.
- 18.1.1.4 Reports which frequency is indicated as “ad-hoc” shall be readily available and submitted only when requested by the Employer, without any additional cost to the Employer. All other reports shall be submitted strictly in accordance with the frequency requirements as indicated in Table 8-1 below.
- 18.1.1.5 Reports shall indicate which data, if any, is not yet complete or final. The report generation dates shall be indicated on the reports and where statistics or summaries are involved, it should clearly indicate the representative period of the report.
- 18.1.1.6 The principle of the reporting shall be that summary reports shall be available online and that drill down capabilities exist to obtain more detailed data.
- 18.1.1.7 Performance measurement for delivery of reports shall be carried out in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

**TABLE 18-1: REPORT REGISTER**

<b>No.</b>	<b>Report Name</b>	<b>Purpose</b>	<b>Minimum Information</b>	<b>Frequency</b>
<b>Traffic Reports</b>				
a)	Hourly , Daily and Monthly Traffic Report, (per traffic direction and all directions)	Reports on the hourly, daily and monthly traffic per Vehicle Class.	<ul style="list-style-type: none"> <li>Total traffic per Vehicle Class per hour, day and month per lane, Toll Plaza / Tolling Point</li> <li>Total traffic for all Toll Plazas / Tolling Points</li> <li>Reporting generated from Back Office System</li> </ul>	Monthly (on daily and monthly traffic. Hourly traffic only on request. Exact combination of reporting to be submitted to be instructed by Contractor)

No.	Report Name	Purpose	Minimum Information	Frequency
Transaction Processing Reports				
a)	Transaction tariff report	To supply the latest tariff structure	<ul style="list-style-type: none"> <li>Tariffs per Vehicle Class</li> <li>Reporting generated from Back Office System</li> </ul>	Bi-Annually
b)	Discount structure report	To supply the latest discount structures	<ul style="list-style-type: none"> <li>Toll Plaza / ORT Discount structure per Vehicle Class</li> <li>Reporting generated from Back Office System</li> </ul>	Bi-Annually
c)	Transaction Record Details	To resolve queries on a Transaction Record and the relevant images	<ul style="list-style-type: none"> <li>Transaction Record information</li> <li>Image information (if available)</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
d)	Class discrepancy acknowledgements	To monitor the acknowledgements of discrepancies	<ul style="list-style-type: none"> <li>Unacknowledged discrepancies</li> <li>Bulk acknowledged discrepancies</li> <li>Manual acknowledged discrepancies</li> <li>Discrepancies automatically acknowledged by the system</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
Financial Reports				
a)	Discount / exempt report	To supply information on Discount and Exempt Transactions	<ul style="list-style-type: none"> <li>Discounted Transaction Records and the associated nominal and discounted Toll Tariffs</li> <li>Exempt Transaction Records and the associated Toll Tariffs</li> <li>Reporting generated from Back Office System</li> </ul>	Monthly
b)	Account Status	Reports on accounts per account type	<ul style="list-style-type: none"> <li>Total number of accounts.</li> <li>New accounts for past month</li> <li>Accounts terminated.</li> <li>Status of accounts in terms of balances (above thresholds, below thresholds).</li> <li>Reporting generated from Back Office System and TCH System</li> </ul>	Monthly
c)	Payment trends	To report on trends of usage of payment options and payment	<ul style="list-style-type: none"> <li>Users per payment option and payment mechanism.</li> <li>Reporting generated from Back</li> </ul>	Monthly

No.	Report Name	Purpose	Minimum Information	Frequency
		mechanisms.	Office System	
Audit Trails				
a)	Audit trails	To monitor additions and changes to data.	<ul style="list-style-type: none"> <li>• Original data</li> <li>• Changed data</li> <li>• User identification of system user who was responsible for the addition / change of the data.</li> <li>• Reporting generated from Back Office System</li> </ul>	Ad Hoc
b)	Access control	To monitor access to the system.	<ul style="list-style-type: none"> <li>• System user who logged in/logged out</li> <li>• Date and time of login / logout</li> <li>• Reporting generated from Back Office System</li> </ul>	Ad Hoc
c)	Version control lists	To monitor the versions installed on the system	<ul style="list-style-type: none"> <li>• Module name / number</li> <li>• Version number</li> <li>• Compilation date of module</li> <li>• Reporting generated from Back Office System</li> </ul>	Ad Hoc
d)	Day/Month closures	To determine the status of the day and/or month	<ul style="list-style-type: none"> <li>• Current system status for the day / month</li> <li>• Reporting generated from Back Office System</li> </ul>	On closure of the day/month Ad hoc
System Maintenance Reports				
a)	AVC Accuracies	Reports on the overall accuracies of the AVC when comparing the AVC class to the Actual Class.	<ul style="list-style-type: none"> <li>• AVC accuracy per lane / Tolling Point</li> <li>• AVC accuracy for all lanes / Tolling Points</li> <li>• Reporting generated from Back Office System</li> </ul>	Monthly
b)	MTBF	Reports on the calculated MTBFs (based on the up-time) for all the major subsystems.	<ul style="list-style-type: none"> <li>• MTBF of the sub-systems</li> <li>• Reporting generated from Back Office System</li> </ul>	Ad Hoc
c)	System availability	Reports on the calculated availability (based on the duration of the down-time) for all the major subsystems, per	<ul style="list-style-type: none"> <li>• Time the system is in use</li> <li>• Time spent on maintenance</li> <li>• Down-time</li> <li>• Reporting generated from Back Office System</li> </ul>	Monthly



No.	Report Name	Purpose	Minimum Information	Frequency
		subsystem and/or lane / Tolling Point.		
d)	Equipment failures report	Reports on the equipment failures	<ul style="list-style-type: none"> <li>Equipment failures per lane / Tolling Point and subsystem during a selected period.</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
e)	Incident report	Reports on incidents that occurred on the system	<ul style="list-style-type: none"> <li>Incident type</li> <li>Date and time when incident occurred</li> <li>Corresponding Transaction Record (if available)</li> <li>Summarized incident information per lane / Tolling Point.</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
f)	Response and Repair Times	To report on the incident response and repair time	<ul style="list-style-type: none"> <li>Time Incident occurred</li> <li>Time when it was acknowledged</li> <li>Time when it was resolved / repaired (If applicable)</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
g)	Dashboard	To report on information as supplied by the dashboard Software applications	<ul style="list-style-type: none"> <li>Depends on the dashboard Software application</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc
Other Maintenance Reports				
a)	Upgrade reports	To report on upgrades of system or equipment.	<ul style="list-style-type: none"> <li>System and hardware upgrade information.</li> <li>Reporting generated from Back Office System and manually</li> </ul>	Monthly
b)	Problem data reports	To report on any data losses, data corruption, data problems.	<ul style="list-style-type: none"> <li>Transaction Record and payment data lost</li> <li>Corrupt Transaction Record and payment data</li> <li>Other data problems.</li> <li>Reporting generated from Back Office System</li> </ul>	Ad-hoc
c)	Support Reports	To report on all support and	<ul style="list-style-type: none"> <li>Number of support requests</li> </ul>	Ad-hoc

No.	Report Name	Purpose	Minimum Information	Frequency
		maintenance actions.	<ul style="list-style-type: none"> <li>• Support request actions</li> <li>• Problem resolved status</li> <li>• Reporting from the support Help Desk</li> </ul>	
d)	Stock and spares reports	To report on stock and spares levels.	<ul style="list-style-type: none"> <li>• Tags in stock</li> <li>• Spares levels along the route</li> <li>• Reporting from the Asset Management System</li> </ul>	Ad-hoc
Accounting and contractual				
a)	Financial Statements	To report on the financial status of the Contractor	The Contractor shall supply the Employer within 90 (ninety) days of the end of the operating year the annual audited financial report and accounts of the Contractor as per the GAAP.	
b)	Contractual Reporting	To report on contractual issues	<p>The Contractor shall notify the Employer prior to taking any action which would result in any change in:</p> <ul style="list-style-type: none"> <li>• Management and organisational structure;</li> <li>• Change in appointment of Chief Executive Officer, Chief Finance Officer or any other senior technical staff of the Contractor;</li> <li>• Contracts to be executed by the Contractor for the purpose of implementing the Agreement;</li> <li>• Change in fiscal year; and</li> <li>• Change in Memorandum and Articles of Association or the shareholders agreement of the Contractor.</li> <li>• Any change shall require consent from the Employer as such a change may not alter the shareholder composition in terms of the tendered black economic empowerment content within the original Tender as well as the associated overall financial position of the Tenderer.</li> <li>• Manually created report.</li> </ul>	
Electrical and Mechanical				
a)	General electrical	To report on	<ul style="list-style-type: none"> <li>• The report shall include but not</li> </ul>	Every 2 years

No.	Report Name	Purpose	Minimum Information	Frequency
	equipment report	electrical issues.	<p>be limited to the following minimum inspection and testing requirements:</p> <ul style="list-style-type: none"> <li>• Inspect all distribution boards</li> <li>• Test all earth leakage units</li> <li>• Inspect wiring</li> <li>• Labelling</li> <li>• Legend cards</li> <li>• Generate manually from inspections.</li> </ul>	
b)	Generator report	To report on the electrical and mechanical status of all the standby generators	<ul style="list-style-type: none"> <li>• Generator status</li> <li>• Generator room condition</li> <li>• Generator test results</li> <li>• Oil sample test results by an approved lubrication analyst laboratory.</li> <li>• Availability of spares and the supplier's details.</li> <li>• Dummy load test.</li> <li>• A copy of the generator lock book for the period of the report.</li> <li>• Rotation testing of the movable generator. The movable generator to be tested at several sites so that the movable generator and change over system can be tested at each site once a year.</li> <li>• Generate manually from inspections.</li> </ul>	6-Monthly
c)	UPS report	To report on the status of all the UPS's	<ul style="list-style-type: none"> <li>• The UPS status i.e. all available voltages frequencies, currents and alarm conditions. Any data recorded by the UPS to be included in the UPS report. The Contractor to obtain the required communication device from the manufacturer to extract data if required at their own cost.</li> <li>• The condition of the UPS room i.e. cleanliness of the room, room temperature, etc.</li> <li>• UPS load test. The load test will be done over a period of 30min with readings every 5 minutes. The results shall be plotted on a</li> </ul>	2-Monthly

No.	Report Name	Purpose	Minimum Information	Frequency
			<p>graph to estimate the total battery standby time.</p> <ul style="list-style-type: none"> <li>The Contractor shall also execute an impedance test on each battery and report the value.</li> <li>A copy of the UPS logbook for the period of the report.</li> <li>Generate manually from inspections.</li> </ul>	
d)	Earthing and lightning protection status report	To report on the earthing and lightning protection	<ul style="list-style-type: none"> <li>As-built based drawing indicating the test points with the test values obtained at the earth node.</li> <li>Each earth node on the drawing shall be numbered that can be referred back to a comprehensive test report.</li> <li>A comprehensive test report that shall be updated with every earthing test and submitted to the Employer every six months</li> <li>The earthing nodes shall be tested as indicated on the as-built drawings with the base values on the as-built drawings as reference. Any changes in the earthing values will be investigated and corrective action motivated by the Contractor with reference to the SANS regulation</li> <li>The comprehensive test report shall also include a soil resistivity test taken on the day of the earthing test.</li> <li>The final earthing report to be approved by the Employer with the option to add or change the report when required.</li> <li>All surge arrestors shall be inspected and the status reported.</li> <li>Generate manually from inspections.</li> </ul>	6-Monthly
e)	Corrosion protection report	To report on the corrosion status of the facilities, i.e. steel structures,	<ul style="list-style-type: none"> <li>Discuss the corrosion status of the ORT facilities, (e.g. water reservoir, fencing, building elements, poles and masts,</li> </ul>	3 Yearly

No.	Report Name	Purpose	Minimum Information	Frequency
		roofs etc.	structural steelwork, etc) <ul style="list-style-type: none"> <li>Recommendations regarding the paint systems required to protect the assets.</li> <li>Provide a program to attend to the corrosion problems identified in the corrosion report.</li> <li>The report shall be compiled by a competent registered corrosion specialist to the Employer.</li> <li>Generate manually from inspections.</li> </ul>	
f)	Handyman report	To report on all damaged and failed equipment and the corrective action taken.	<ul style="list-style-type: none"> <li>All damaged and failed equipment i.e. taps doors, windows locks, paint, cracks, etc.</li> <li>Corrective action and an estimated completion date with a program if necessary or as requested by the Operational Manager.</li> <li>Generate manually from inspections.</li> </ul>	Monthly
g)	Heating Ventilation and Air Conditioning report	To discuss the status of the HVAC equipment and maintenance carried out.	<ul style="list-style-type: none"> <li>The report shall discuss the status of the HVAC equipment and maintenance carried out.</li> <li>The Contractor shall also provide corrective action and an estimated program on the repairs to the Employer on problems identified in the HVAC report.</li> <li>Generate manually from inspections.</li> </ul>	Ad-hoc
h)	Fire detection system report.	To report on the status of the fire detection system	<ul style="list-style-type: none"> <li>Status of the fire detection system.</li> <li>Action taken to restore any problem or alarm condition</li> <li>Generate manually from inspections.</li> </ul>	Ad-hoc
i)	SCADA, Security and access control report	To report on the status of the security and access control system	<ul style="list-style-type: none"> <li>The status of the SCADA, security and access control system</li> <li>Action taken to restore any problem or alarm condition.</li> </ul>	Ad-hoc

No.	Report Name	Purpose	Minimum Information	Frequency
			<ul style="list-style-type: none"> <li>The SCADA, alarms and access control system reports to be extracted and added to the Contractors SCADA, security and access control report</li> <li>A corrective action and program to attend to problems identified in the SCADA, security and access control report</li> <li>Generate manually from inspections.</li> </ul>	
Performance Measurement Reports				
a)	Performance Measurement Report	<p>To report on all the KPIs that is applicable in the Contract in accordance with The Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a)</p> <p>This report serves as input in the performance adjustments in the monthly payment certificate of the Contractor</p>	<ul style="list-style-type: none"> <li>For each KPI, the Performance Measurement score shall be provided for the immediate previous month</li> <li>The comparative previous 12 months scores shall also be provided</li> <li>The report shall be supported by an Annexure containing the measurements and calculations to determine the KPI scores</li> </ul>	Monthly

## 18.2 CONVENTIONAL AND HYBRID PLAZAS

### 18.2.1 General

18.2.1.1 The additional requirements for reporting for Conventional and Hybrid Toll Plazas, including the conventional part of Conventional/ORT Plazas, are indicated in this section.

18.2.1.2 Reporting is required on an ad hoc basis, monthly and annually as indicated below:

**TABLE 18-2: CONVENTIONAL TOLL PLAZA ADDITIONAL REPORT REGISTER**

No.	Report Name	Purpose	Minimum Information	Frequency
<b>Traffic Reports</b>				
a)	Hourly, Daily and Monthly Traffic Report, (per traffic direction and all directions)	Reports on the hourly, daily and monthly Traffic per Vehicle Class.	<ul style="list-style-type: none"> <li>Total traffic per Vehicle Class per hour, day and month per Lane, Toll Plaza</li> <li>Total traffic for all Toll Plazas</li> <li>Reporting generated from Back Office System</li> </ul>	Monthly (on daily and monthly traffic. Hourly traffic only on request. Exact combination of reporting to be submitted to be instructed by Contractor)
<b>TRANSACTION PROCESSING REPORTS</b>				
<b>Financial Reports</b>				
a)	Daily Payments	Reports on payments received on local Customer Accounts	<ul style="list-style-type: none"> <li>Payments received per calendar day for account registering, recharges etc, including cash, Bank Issued Card transactions, Bank Debit Card transactions, Smart Card, etc received at each Toll Plaza and in total.</li> <li>Reporting generated from the Back Office System</li> </ul>	Monthly
b)	Revenue Banked	Reports on Revenue banked	<ul style="list-style-type: none"> <li>Revenue banked daily, indicating cumulative difference between Revenue banked and Revenue received at all Toll Plazas.</li> <li>Reporting generated from the Back Office System</li> </ul>	Monthly
c)	Cash-up Reports	To report on cash-ups performed on the system.	<ul style="list-style-type: none"> <li>Reconciliation of income declared versus income expected by the system.</li> <li>Reporting generated from the Back Office System.</li> </ul>	Monthly
<b>Audit Trails</b>				
a)	Validation Lists Retrieved	To audit the movement of the Validation List(s) from the banks	<ul style="list-style-type: none"> <li>Listing of:</li> <li>Validation List(s) identification number / name</li> <li>Time retrieved from the banks</li> <li>Time transferred to the lanes.</li> <li>Reporting generated from Back Office System</li> </ul>	Ad Hoc

### **18.3 ORT OPERATIONS**

18.3.1.1 The additional requirements for reporting for ORT Operations are indicated in this section.

18.3.1.2 During the four month period prior to the Tolling Date, reporting shall be done on a weekly basis or ad-hoc basis, as prescribed and / or requested by the Employer. The purpose of the frequent reporting during this period is to assess the success and progress of account registration on an on-going basis in order to be in a position to change and adapt marketing strategies as quick and effective as possible.

18.3.1.3 Reporting is required on an ad hoc basis, monthly and annually as indicated below:

**TABLE 18-3: ORT ADDITIONAL REPORT REGISTER**

No.	Report Name	Purpose	Minimum Information	Frequency
<b>Traffic Reports</b>				
a)	Hourly , Daily and Monthly Traffic Report, (per traffic direction and all directions)	Reports on the hourly, daily and monthly Traffic per Vehicle Class.	<ul style="list-style-type: none"> <li>Total traffic per Vehicle Class per hour, day and month per Tolling Point</li> <li>Total traffic for all Tolling Points</li> <li>Reporting generated from Back Office System</li> </ul>	Monthly (on daily and monthly traffic. Hourly traffic only on request. Exact combination of reporting to be submitted to be instructed by Contractor)
<b>Transaction Processing Reports</b>				
a)	Back Office Transaction Record reconciliation report	Reports on Transaction Record reconciliation information per calendar day	<ul style="list-style-type: none"> <li>Transaction Records received from the RSS</li> <li>Transaction Records transferred to the TCH System</li> <li>Transaction Records to be processed, e.g. MNPR Transaction Records</li> <li>Transaction Records of previous days transferred to the TCH system</li> <li>Reporting from Back Office System</li> </ul>	Monthly
b)	Image processing	Reports on the ANPR and MNPR processing statistics	<ul style="list-style-type: none"> <li>Percentage of automatic reads (ANPR process)</li> <li>Percentage of manual reads (MNPR process)</li> <li>Percentage of unsuccessful reads due to equipment error</li> <li>Percentage of unsuccessful reads not due to equipment error</li> <li>Reporting from Back Office System</li> </ul>	Ad Hoc
c)	MNPR process tracking	To report on the disposition codes of images during MNPR process, together with the MNPR processing	<ul style="list-style-type: none"> <li>Successful processing</li> <li>Unreadable</li> <li>No Vehicle Licence Plate in image</li> <li>Image too dark</li> <li>Image too light</li> </ul>	Ad Hoc



No.	Report Name	Purpose	Minimum Information	Frequency
		statistics	<ul style="list-style-type: none"> <li>Reporting from Back Office System</li> </ul>	
<b>Financial Reports</b>				
a)	Financial reconciliation report	To supply the financial reconciliation information of the Transaction Records as they are handed over to the TCH	<ul style="list-style-type: none"> <li>Transaction Records sent to the TCH and the associated nominal Toll Tariffs</li> <li>Transaction Records sent to the TCH and the associated Discounted Toll Tariffs</li> <li>Transaction rejections</li> <li>Transaction Record processing costs for transactions sent to the TCH</li> </ul> Reporting from Back Office System	Monthly
d)	Payments banked	Reports on payments into Customer Accounts banked	<ul style="list-style-type: none"> <li>Payments banked daily, indicating cumulative difference between payments banked and payments received at all Point of Presence Service Centres.</li> <li>Reporting from the TCH System</li> </ul>	Monthly
e)	Transaction status	To determine the financial status of the Project in terms of transactions that were paid, violations, exempted, discounts etc.	<ul style="list-style-type: none"> <li>Reconciliation of all transactions that were sent from the Back Office to the TCH Back Office with the updated transactions as received back from the TCH.</li> <li>Reporting from the TCH System.</li> </ul>	Monthly
f)	Cash-up reports	To report on Cash-ups performed on the system.	<ul style="list-style-type: none"> <li>Reconciliation of payments received at CS PoP's and banked versus payments expected by the system.</li> <li>Reporting from the Back Office and TCH System.</li> </ul>	Monthly
<b>Audit Trails</b>				
a	Validation lists retrieved	To audit the movement of the Validation List(s) from the TCH to the RSS.	<ul style="list-style-type: none"> <li>Listing of:</li> <li>Validation list(s) identification number/name</li> <li>Time retrieved from the TCH System</li> <li>Time transferred to the RSS.</li> <li>Reporting from Back Office System</li> </ul>	Ad Hoc
b	Data transmission	To audit the movement of data from the Back Office to the TCH and vice versa.	<ul style="list-style-type: none"> <li>Listing of:</li> <li>Date and time when data were transmitted to the TCH System</li> <li>Date and time when data were retrieved from the TCH System.</li> <li>Reporting from Back Office System</li> </ul>	Ad Hoc

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## **SECTION 19. TOLL ROAD SERVICES**

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## **19.1 TOLL ROAD SERVICES**

### **19.1.1 General**

- 19.1.1.1 This section covers Toll Road services, namely the Incident Management System (IMS), customer call centre and the route service patrol, which shall be performed on the Toll Road.

## **19.2 INCIDENT MANAGEMENT SYSTEM**

### **19.2.1 Background**

- 19.2.1.1 The Contractor shall, participate within the IMS structure on the Toll Road or Toll Road network. The Contractor's Route Patrol services will play an important role in the IMS functions on the Toll Road or Toll Road network as they will have a permanent presence on the Toll Road.
- 19.2.1.2 The Contractor will liaise with other service providers and provide incident and road condition information. He will also provide possible assistance with interfacing the Toll Plaza's CCTV surveillance in the Lane's into the Employer's ITS systems where/when these are implemented on the toll routes
- 19.2.1.3 This Section provides a short overview of Incident Management as well as indicating the Contractor's participating responsibilities.

### **19.2.2 Introduction**

- 19.2.2.1 The development of IMS has been endorsed by the White Paper on National Transport Policy (September 1996) which states that "Government will implement an Incident Management System on all national roads."
- 19.2.2.2 The five key components that comprise the IMS strategy are:
- (a) Programme development;
  - (b) Development of systems communication plan and improve on;
  - (c) Communication and communication technology;
  - (d) Training and capacity building of services;
  - (e) Systems monitoring, public outreach and education; and
  - (f) Systems maintenance and incident management and evaluation.

**19.2.3 Definition and objectives of the Incident Management System**

- 19.2.3.1 For the purposes of this Section, an “Incident” shall mean the occurrence of any extraordinary condition or event which results in a reduction in road capacity, and/or creates a hazard for road users, for any period of time. An incident can be a major or minor traffic accident, shoulder/lane blockage, spilled load, construction area or special event.
- 19.2.3.2 “Incident Management” is that process whereby a set of co-ordinated activities is initiated by the Contractor when an incident occurs on a major road in order to minimise the direct and secondary effects of the incident and to restore normal capacity and safety levels to all affected road facilities as quickly and efficiently as possible.
- 19.2.3.3 The basis of the IMS is a guideline plan to be developed and / or improved by the relevant authorities. The guideline plan shall be a formal document, which details the manner in which various services may cooperate in terms of communication, Incident servicing requirements, organisational policies and operational procedures to be followed.
- 19.2.3.4 The guideline plan provides one set of protocols, which are agreed to and adhered to by all services involved, in order to promote teamwork and co-operation so as to ensure the effective management of all Incidents in a quick and efficient manner.

**19.2.4 Objectives of the IMS shall be to:**

- 19.2.4.1 Maintain the IMS system and ensure implementation in compliance with the agreed protocols.
- 19.2.4.2 Facilitate effective co-ordination and communication between the centralised communication centre and other existing service suppliers in the vicinity of the Incident Management site.
- 19.2.4.3 Minimise the direct and secondary effects of incidents.
- 19.2.4.4 Ensure proper management of incidents in terms of the agreed procedures and protocols and restore normal capacity and safety levels at all affected road facilities as quickly as possible.
- 19.2.4.5 Ensure adequate training and knowledge of the system amongst the emergency service personnel.
- 19.2.4.6 Prepare monitoring reports and to identify high incident clusters.
- 19.2.4.7 Address critical issues impacting on the effective implementation of Incident Management and.

19.2.4.8 Create awareness of the IMS.

19.2.4.9 The relevant authorities shall develop (or improve, in the case of an existing IMS), supervise, operate and maintain the IMS to meet these objectives.

**19.2.5 Responsibilities of Contractor**

19.2.5.1 The Contractor shall liaise with relevant IMS services in case of emergencies or incidents.

19.2.5.2 The Contractor shall attend and provide input into regular IMS steering committee meetings and other meetings as required, which shall consist of representatives of the appropriate services listed below.

19.2.5.3 The Contractor shall attend IMS workshops to identify solutions to existing and potential problems per functional area.

19.2.5.4 The Contractor shall provide input in accordance with his participation role, to develop IMS procedures and protocols, when required, in liaison with the various services

**19.2.6 Liaison with IMS services**

19.2.6.1 The Contractor shall liaise as and when required in respect of IMS-related services alongside the Contractor's Toll Road or Toll Road network in accordance with the IMS protocols when an incident occurs.

19.2.6.2 The IMS services that could be represented for each of the following functional areas are:

- (a) Rescue;
- (b) Fire;
- (c) Hazardous materials;
- (d) Traffic;
- (e) Law Enforcement Authorities
- (f) Emergency Services
- (g) Clean-ups.

**19.2.6.3** Minimum emergency services are:

- (a) Provincial ambulance and emergency medical services;
- (b) Private ambulance services;
- (c) Civil protection agencies;
- (d) Fire and emergency services;
- (e) South African Police Services; and
- (f) Specialised spill cleanup companies;
- (g) Traffic authorities.

**19.2.6.4** Minimum non-emergency services are:

- (a) Automobile Association of South Africa;
- (b) The Contractor;
- (c) Motor Industries Federation;
- (d) Road authority and maintenance departments;
- (e) Road Freight Association;
- (f) South African Road Federation;
- (g) CEO of local authorities;
- (h) Water authorities.

**19.2.7 Workshops to Identify Potential IMS Solutions**

**19.2.7.1** The Contractor shall attend workshops to identify solutions to existing and potential problems per functional area.

**19.2.7.2** Aspects which may be discussed include the following:

- (a) Response protocols for the various functional areas (rescue, fire, hazardous material, traffic, South African Police Services, ambulance services, alternative routes and clean ups);
- (b) Communications from the scene (e.g. for avoidance of duplication of call-outs and to apply the principle of centralised communications);

- (c) On-scene co-ordination (management teams, co-ordinators and forward co-ordination points);
- (d) The development of alternative route plans.

#### **19.2.8 Develop IMS Procedures and Protocols**

19.2.8.1 The Contractor shall assist, on an ad hoc basis, in the development of procedures and protocols, in liaison with the various services, for:

- (a) Detection of incidents and mobilisation of teams;
- (b) Assessment of incidents;
- (c) Incident management;
- (d) The centralised communication centre;
- (e) Debriefings;
- (f) Training; and
- (g) Other general items.

#### **19.2.9 Draft a Guideline Plan**

19.2.9.1 The Contractor shall contribute, when needed, to draft (or review and improve) a guideline plan, which shall be in the format of an operational document for use by the various services on the occurrence of any Incident.

#### **19.2.10 Meetings**

19.2.10.1 The Contractor shall attend regular steering committee meetings. The meetings shall comprise members from policy/senior management level of the emergency services as well as representatives of non-emergency organisations operating within the geographical boundaries of the IMS.

19.2.10.2 Steering committee meetings should focus on a report back to the emergency services by the project team of system maintenance activities (training, debriefings, meetings and monitoring) as well as to review the system through feedback from the services.

19.2.10.3 It is essential that the steering committee members are equipped to make decisions on behalf of their services.

- 19.2.10.4 Task/working group meetings. Task and working group meetings shall be attended as and when necessary, to address special issues such as communication difficulties, special campaigns and other.
- 19.2.10.5 Representatives at the task and working group meetings shall be operational members of the respective emergency services. Participation in of these meetings will thus vary according to the issues being discussed.
- 19.2.10.6 The meetings shall focus on a report back to the emergency services by the Contractor on IMS Operations and Maintenance (training, debriefing, meetings and monitoring) as well as a review of the system through feedback from the services.
- 19.2.10.7 Service Liaison: The Contractor shall be responsible for service liaison including, inter alia, the following activities:
- 19.2.10.8 Ongoing discussion with the emergency services concerning the implementation of Incident Management on scene in accordance with the agreed procedures and protocols of the system;
- 19.2.10.9 Discussion concerning difficulties encountered by the emergency services as well as possible solutions;
- 19.2.10.10 Debriefing requests where appropriate; Liaison may take the form of telephonic contact with the members of the IMS or scheduled visits with various role-players. Written correspondence for specific issues raised may be required.

#### **19.2.11 Training**

- 19.2.11.1 The Contractor shall provide general IMS training on an ongoing basis to his Route Patrol staff. The scheduling, content and format of training shall be as set out below:
- 19.2.11.2 Training shall be scheduled twice per annum; and training sessions shall follow a 3 (three) to 4 (four) hour workshop format encouraging active participation from participants;
- 19.2.11.3 Training content shall include the following:
  - (a) Background to IMS;
  - (b) Fundamental principles of the IMS;
  - (c) Detailed procedures and protocols of the IMS;
  - (d) Guideline plan;
  - (e) Monitoring;
  - (f) Debriefings;



- (g) Case study exercise.

19.2.11.4 Non-classroom training exercises shall also be provided at least once per annum. These exercises shall take the form of a simulation exercise.

19.2.11.5 On completion of the training, the Contractor shall forward certificates of attendance to trainees and shall send letters of acknowledgement to the heads of the agencies with feedback on the tests.

#### **19.2.12 Incident Monitoring and Data Evaluation**

19.2.12.1 The following tasks relating to Operations and Maintenance of the IMS shall be performed by other services and shall not be the responsibility of the Contractor:

- (a) Completion of IMS Incident report forms. This is the basis for monitoring of Incidents, and assists the CCC to co-ordinate an incident. Information recorded on this form includes location details, details of the IMS, vehicles involved, chemical spillage details, casualties, services notified and traffic information;
- (b) Immediate implementation of incident management procedures and protocols on receipt of a call for an incident, with the following aspects being addressed;
- (c) Detection and mobilisation:
  - i. Assessment of Incidents;
  - ii. Incident management (forward control point, management team, coordinator).

19.2.12.2 The following tasks relating to Operations and Maintenance of the IMS shall be performed by the Contractor:

- (a) Check that IMS incident report forms are completed for each Incident;
- (b) Check each incident report form to ensure that all details have been recorded and are logical;
- (c) Check, within 24 (twenty-four) hours of occurrence, that the protocols of the IMS have been adhered to and capture the details of the incident report form into the incident database. The Contractor shall follow up all incident report forms not submitted timeously by the CCC;
- (d) Maintain the Incident database for the Contract Period and maintain and procure all relevant equipment and software as required for the IMS, and perform data manipulations and extractions to produce documents and reports.

### **19.2.13      Debriefings**

19.2.13.1      The Contractor shall attend debriefings during which representatives of the emergency service services shall discuss the management of a specific incident. Debriefings shall be conducted after the following:

- (a)      Hazardous material incidents;
- (b)      Incidents requiring road closure or use of alternative routes;
- (c)      Incidents at which the procedures and protocols of the IMS were not adhered to;
- (d)      Well-managed incidents that would provide a learning experience;
- (e)      Debriefings shall be conducted within 7 (seven) days of the incident being recorded.

- Debriefings shall be conducted within 7 (seven) days of the incident being recorded.

## **19.3            CUSTOMER CALL CENTRE**

### **19.3.1          Introduction**

19.3.1.1      The Contractor shall operate on a Customer call centre on a 24 hour per day basis, seven (7) days per week, to handle calls from the travelling public on aspects such as reporting incidents, emergencies, requesting route information or tariffs, ect. The Contractor shall also handle calls from Customers via the TCH regarding account queries, in accordance with Section 8.1.3 of this document.

### **19.3.2          Customer Call System**

19.3.2.1      The minimum functionality is specified in the Standard Specifications for Operations and Maintenance of CTROM Projects: Toll Systems (Volume 2 Book 4a).

### **19.3.3          Customer Call Centre Operations**

19.3.3.1      The Contractor shall be responsible for Operations and Maintenance of the Customer Call Centre for the duration of the Contract.

19.3.3.2      Services to be provided include:

- (a)      24 (twenty four) hour manning of the call centre;
- (b)      logging of all incoming calls and action taken. All calls shall be logged with a description of the nature of the call and actions taken. The Contractor shall keep a statistical record of all types of calls (collision, secondary collision, hazardous

material, breakdown, information required, account queries, other) and all services alerted (rescue, fire, hazardous material, traffic, South African Police Services, ambulance services, alternative routes, and clean ups);

- (c) provision of communication links and assistance to Road Users wishing to report on or obtain assistance or information from ambulance/rescue services, police or breakdown services, in connection with Road collisions, illness, vehicle breakdown, information (e.g. route information, toll and account queries), unrest/terrorism, hazardous chemicals/loads, criminal reports, roadway comments or any other Incidents;
- (d) response to all calls received by the Call Centre, and/or IMS central communication centre within the response times as specified in the Project Document: Volume 3;

If a certain action, in order to reply to the Road User, takes longer than five (5) minutes, the Operator shall in any case inform the Road User by giving an updated status of the specific matter;

19.3.3.3 The Contractor shall report on the status of the system, in accordance with Section 10;

19.3.3.4 The Call Centre contact number shall be displayed on road signs along the Toll Road and in the Toll Plaza Lane Area, and shall be easily visible to Road Users; and

19.3.3.5 Performance measurement for the Customer Call Centre Operations shall be carried out in accordance to the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (The Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a)).

19.3.3.6 The Call Centre Operations shall comply to the following requirements:

- (a) Call Centre system availability of 99,5% of the time per day
- (b) Call queuing time of 90% of the calls to be answered within 52 minutes.

#### **19.3.4 Penalties**

19.3.4.1 For non-compliance of Customer Call centre Operations, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

## **19.4 ROUTE PATROL SERVICE**

### **19.4.1 General**

19.4.1.1 The Contractor shall provide a route patrol service, as described in the Project Document: Volume 3, along the Toll Road.

- (a) The route patrol services shall consist at least of the following:
  - i. One patrol vehicle for at least each 100km, or part thereof, shall patrol a road section continuously on a 24 hour basis, or as specified in the Project Document: Volume 3.
  - ii. Each patrol vehicle shall be manned by two persons.
  - iii. The patrol vehicles shall carry the minimum equipment as detailed in this section.
  - iv. The patrol persons shall have the minimum qualifications as detailed in this section.
  - v. All patrol vehicles shall be fitted with a vehicle tracking system.

19.4.1.2 The Contractor shall perform the following activities during the route patrol service:

- (a) Patrol the Toll Road and road reserve area, identifying disabled vehicles, and make safe stranded motorists, debris in the roadway, spilt loads, collisions, obstructions to traffic, and all other potential hazards or abnormal occurrences. In terms of the IMS protocols, the Contractor shall notify appropriate Toll Road and law enforcement personnel of the locale and nature of the situation;
- (b) Assist motorists by towing and/or pushing disabled vehicles off the roadway;
- (c) Provide gasoline or water, change tyres, provide jump starts with booster cables and perform minor repairs when and if reasonably possible;
- (d) Assist motorists when major repairs are required, by notifying an appropriate service station in terms of the IMS protocols;
- (e) Assist at accident scenes by notifying the law enforcement and other agencies for emergency assistance and/or removal of damaged vehicles from the roadway;
- (f) Remove minor debris from the roadway and/or call for assistance for complex clean-ups;
- (g) Report on damage of property to the Toll Road system, including the condition of the fencing along the road as well as the road signage;

- (h) Provide travel information and assistance to lost or stranded motorists;
  - (i) Provide emergency transportation to stranded motorists; and
  - (j) Maintain an established service patrol log and complete an entry for each incident encountered and/or handled.
- 19.4.1.3 The Contractor shall verify all Incidents encountered during each service patrol and assess the response needed.
- 19.4.1.4 The Contractor shall rectify minor Incidents and in the event of major Incidents encountered during a service patrol which cannot be solved immediately by the Contractor with the available resources, the Contractor shall notify, report to and follow-up with relevant specialist organisations in terms of the IMS protocols, in order to ensure a satisfactory service to the road user.
- 19.4.1.5 All the required equipment shall be provided by the Contractor.
- 19.4.1.6 The patrol personnel shall be adequately trained to perform the required duties including the following minimum qualifications:
  - (a) Level 3 first aid certificate
  - (b) Drivers licence – Code EB
  - (c) Advance driver skill/crash prevention certificates
  - (d) Fire fighting certificate (5 day course)
  - (e) Dangerous goods awareness certificate
  - (f) IMS certificate
  - (g) Traffic management and securing of accident scenes
  - (h) Basic computer literacy.
- 19.4.1.7 All relevant vehicles used shall be LDVs, fitted with a standard “Off-the-shelf” type tracking system, with the SMS option to alert the relevant Control Centre that the vehicle is off the route. The positioning data, including speed and direction, shall be transmitted in real time, to a computer situated at a location as indicated by the Employer.
- 19.4.1.8 The minimum equipment for these patrol vehicles is as indicated in the table below:

**TABLE 19-1: MINIMUM PATROL VEHICLE EQUIPMENT**

<b>1.</b>	<b>VEHICLE FITTINGS</b>	<b>No Off</b>	
1.1	LED Bar Light System -- Amber	1	
1.2	Reflective Markings		
1.3	The Employer Logo	1	
1.4	Tow Bar	1	
1.5	Communication to CCC	1	
<b>2.</b>	<b>PERSONNEL EQUIPMENT</b>		
2.1	Reflective safety jacket	1	per crew
2.2	Rain suit	1	per crew
2.3	Leather gloves	2	
<b>3.</b>	<b>VEHICLE EQUIPMENT</b>		
3.1	Fire fighting equipment		
	9 Kg Dry powder fire extinguisher	2	
	Fire beaters	2	
3.2	Hand tools		
	Hard broom	1	
	Shovel	1	
	Pliers for fence repairs	1	
	2 kg Hammer	1	
	5 kg Soft wire	1	
3.3	Liquid containers		
	5l for Petrol	1	
	5l for Diesel	1	
	10l for Water	1	
3.4	Lights		
	Rechargeable torch with red sleeves	1	
	4 LED Head light	1	per crew
3.5	750 mm Day-glow cones	10	
3.6	Digital camera with video clips	1	
3.7	First aid Kit for use by a Level 3 first aider	1	

1.	VEHICLE FITTINGS	No Off	
3.8	Binoculars	1	
3.9	Haschem book	1	
3.10	Incident management book	1	

**19.4.2 Penalties**

- 19.4.2.1 For non-compliance to Route Patrol Services, the Contractor shall be liable for penalties in accordance with the Standard Specifications for Operations and Maintenance of CTROM Projects: Performance Measurement (Volume 2 Book 6a).

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**SECTION 20.      ANNEXURE A1: SCHEDULE OF ASSETS**

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The purpose of the Tables A1 and A2 below is to provide a categorisation of possible assets, provided by the Employer or Contractor. The tables are provided to give guidance on responsibilities of each party involved in terms of the management of assets and to indicate the maintenance responsibilities of each party.

### **A-1: EMPLOYERS FACILITIES**

The 'Employers Facilities' (those Assets related to the civil, structural, building, services and electrical and mechanical infrastructure within the boundaries of the Site) are described and classified in Table A1 of this Annexure 1.

The 'Employers Facilities' are broken down according to:

- Employers Fixed Assets, refer to Table A1-1
- Employers Equipment: Electrical and Mechanical equipment, refer to Table A1-2
- Employer's Documents, refer to Table A1-3.

### **A-2 : PERMANENT DESIGN-BUILD ASSETS**

The 'Permanent Design-Build Assets' are described and categorised in Table A2 of this Annexure 1.

The Assets are broken down according to:

- Plant, refer to Table A2-1
- Materials, refer to Table A2-2
- Contractor's Documents, refer to Table A2-3

### **A-3: GENERAL NOTES TO THE TABLES**

The **"PROVIDED BY"**, means the party (either the Employer or the Contractor) responsible for the provision of the assets.

The **"ASSET MANAGEMENT BY"**, means the party (either the Employer or the Contractor) who is responsible to perform the asset management services.

The **"MAINTENANCE BY"**, means the party (either the Employer or the Contractor) that shall be responsible for the routine, corrective, breakdown and handyman maintenance of the 'Assets'.

The Contractor shall manage and maintain all the assets in accordance with his obligations as contained in the relevant Employer's Requirements.

The Contractor shall at the end of the Contract Period hand back all assets of which the Employer is defined as the owner or has become the owner during the Contract Period, in accordance with the hand

back requirements pursuant to the Standard Specifications for Operations and Maintenance of CTROM Projects: General (Volume 2 Book 2a).

**TABLE 20-1: EMPLOYER'S FIXED ASSETS**

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1.	Roadways and access roads	Employer	Contractor	Contractor
2.	Road signs, toll signs, road markings & road markers	Employer	Contractor	Contractor
3.	Building areas boundary fencing & gates	Employer	Contractor	Contractor
4.	Paving, walkways and parking areas	Employer	Contractor	Contractor
5.	Technical shelters & associated structures	Employer	Contractor	Contractor
6.	Trenching, sleeves, ducts, manholes, test pits (e.g. earth nodes) & draw boxes, excluding the associated tolling systems related communication backbone infrastructure, and those outside the Site boundaries	Employer	Contractor	Contractor
7.	Toll gantries & associated structures including test, spare and temporary gantries. (Corrosion control will be done under Provisional Sum)	Employer	Contractor	Contractor
8.	Lighting masts and poles (excluding related to highway)	Employer	Contractor	Contractor
9.	Garden areas (landscaped)	Employer	Contractor	Contractor
10.	Open Areas (natural vegetation)	Employer	Contractor	Contractor
11.	Building structures (Complete repainting will be done under provisional Sum)	Employer	Contractor	Contractor
12.	Main water supply lines	Employer	Contractor	Contractor
13.	Borehole(s)	Employer	Contractor	Contractor
14.	Water reservoirs (fire & building supply)	Employer	Contractor	Contractor
15.	Storm water infrastructure	Employer	Contractor	Contractor
16.	Firewater reticulation infrastructure	Employer	Contractor	Contractor
17.	Main sewerage reticulation & infrastructure (e.g. septic tank systems)	Employer	Contractor	Contractor
18.	Protection structures, barriers & restrictors	Employer	Contractor	Contractor
19.	Buildings water reticulation	Employer	Contractor	Contractor
20.	Tolling Point water reticulation	Employer	Contractor	Contractor
21.	Buildings sewerage reticulation & infrastructure (e.g. toilets)	Employer	Contractor	Contractor
22.	Tolling Point sewerage reticulation & infrastructure (e.g. toilets, drains etc )	Employer	Contractor	Contractor
23.	Immovable safes	Employer	Contractor	Contractor
24.	Cabling supply: Toll Systems i.e. Cable trays, ladders & power skirting	Employer	Contractor	Contractor
25.	Cable markers	Employer	Contractor	Contractor
26.	Electrical reticulation i.e. cabling & wiring [in and for facilities provided by the Employer]	Employer	Contractor	Contractor

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
27.	HV power supply installation	Employer	Contractor	3rd party
28.	HV transformer installation	Employer	Contractor	3rd party
29.	Distribution kiosks, mini-sub, transformers & metering equipment	Employer	Contractor	Contractor
30.	LV power supplies, distribution & sub distribution boards and cabling to and between DB's and sub-DB's in building and technical shelter facilities provided by the Employer	Employer	Contractor	Contractor
31.	Power supply to toll gantry LV point of supply	Employer	Contractor	Contractor
32.	Building facilities (provided by Employer): Complete road and area lighting installation (excluding components listed in Employer's Equipment)	Employer	Contractor	Contractor
33.	Tolling Points (provided by Employer): Area lighting including high masts, lighting poles and low voltage power reticulation for the purpose of proper Plant functioning (excluding components listed in Employer's Equipment)	Employer	Contractor	Contractor
34.	Fresh air supply systems; ducting,	Employer	Contractor	Contractor
35.	Diesel generator	Employer	Contractor	Contractor
36.	Conduits, trunking, ducts, trenching	Employer	Contractor	Contractor

TABLE 20-2: EMPLOYER'S EQUIPMENT

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1.	Distribution board components (switch gear) [at buildings, technical shelters, etc provided by Employer]	Employer	Contractor	Contractor
2.	Control panels & cabling	Employer	Contractor	Contractor
3.	Scissor or Hinge type mast counter weights where applicable (excl for highway lighting)	Employer	Contractor	Contractor
4.	HV switch gear installation	Employer	Contractor	3rd party
5.	Surge protection components in main and sub distribution boards up to class II protection [power reticulation, in buildings, in technical shelter / gantry areas provided by Employer].	Employer	Contractor	Contractor
6.	Lighting luminaires and components at facilities provided by the Employer (excl highway lighting)	Employer	Contractor	Contractor
7.	Power outlets (sockets & isolators at facilities provided by Employer)	Employer	Contractor	Contractor
8.	Warning beacons, fog lights or similar provided by Employer	Employer	Contractor	Contractor
9.	High mast raising winches / mechanisms / units, etc	Employer	Contractor	Contractor
10.	Rope kits	Employer	Contractor	Contractor
11.	Locking mechanisms (immovable safes)	Employer	Contractor	Contractor

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
12.	Garden irrigation, sprinkler systems, water features including pumps etc.	Employer	Contractor	Contractor -
13.	Sculptures requiring on-going specialist maintenance	Employer	Contractor	Contractor -
14.	Industrial kitchen equipment	Employer	Contractor	Contractor -
15.	Access motors or barriers & cabling	Employer	Contractor	Contractor -
16.	Security fencing electrification systems & cabling	Employer	Contractor	Contractor -
17.	SCADA monitoring system of critical equipment i.e. generator, UPS, equipment room temperature, incl. power monitoring system to be provided on the incoming supply from the local authority where applicable.	Employer	Contractor	Contractor -
18.	Air-conditioners & components [in and at building facilities and technical shelters provided by the Employer]	Employer	Contractor	Contractor -
19.	Generator shelter ventilation	Employer	Contractor	Contractor -
20.	UPS room ventilation	Employer	Contractor	Contractor -
21.	UPS system complete with electronic and battery cabinet with cabling	Employer	Contractor	Contractor -
22.	Central air-conditioning systems [at building and technical shelter facilities provided by Employer]	Employer	Contractor	Contractor -
23.	Diesel generator, alternator, switch gear, controllers, fuel tanks, fuel pumps, radiator, exhaust, dummy loads, batteries etc. provided by the Employer	Employer	Contractor	Contractor -
24.	Water storage reservoir pump(s) & controller(s)	Employer	Contractor	Contractor -
25.	Borehole pumps & controller(s)	Employer	Contractor	Contractor -
26.	Water treatment plants	Employer	Contractor	Contractor -
27.	Fresh air supply systems; fans, dampers, equipment, diffusers, filters, extractor fans, pre-heaters, etc [in and at building facilities and technical shelters provided by the Employer]	Employer	Contractor	Contractor
28.	Locking mechanisms & building fixtures (gutters, windows, doors and any part or associated accessory)	Employer	Contractor	Contractor
29.	Geysers, basins, taps, valves, showers, etc	Employer	Contractor	Contractor
30.	Loose safes	Employer	Contractor	Contractor
31.	Intercom system and cabling	Employer	Contractor	Contractor
32.	Service tunnel & canopy earthing and bonding installation	Employer	Contractor	Contractor
33.	Plant alarm system	Employer	Contractor	Contractor
34.	Security screens to protect electrical equipment	Employer	Contractor	Contractor
35.	Toll booths, toll booth protection structures, air-conditioners, load gauges, area barriers & impact attenuators	Employer	Contractor	Contractor
36.	Incident management system and database	Employer	Contractor	Contractor
37.	Servers, controllers, computers & recorders and peripherals	Employer	Contractor	Contractor

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
38.	Consoles, terminals & monitors	Employer	Contractor	Contractor
39.	Reading, mounting and other devices not listed	Employer	Contractor	Contractor
40.	Antennas & beacons	Employer	Contractor	Contractor
41.	Display units	Employer	Contractor	Contractor
42.	Printers	Employer	Contractor	Contractor
43.	Switches & sirens	Employer	Contractor	Contractor
44.	Communication equipment , peripheral communications, and associated equipment such as routers and media converters	Employer	Contractor	Contractor
45.	Data extraction ports	Employer	Contractor	Contractor
46.	Network cabling, copper & fibre optic (LAN)	Employer	Contractor	Contractor
47.	Gantry cabling	Employer	Contractor	Contractor
48.	Junction boxes	Employer	Contractor	Contractor
49.	Conduits, trunking, trays & ducts	Employer	Contractor	Contractor
50.	Automatic vehicle counting & classification equipment & peripherals (including detectors, loops, sensors, curtains, cameras and the like)	Employer	Contractor	Contractor
51.	Security and surveillance cameras - external & internal (Employer supplied)	Employer	Contractor	Contractor -
52.	Security control system equipment. (Employer supplied)	Employer	Contractor	Contractor -
53.	Building and site access control equipment and devices. (Employer supplied)	Employer	Contractor	Contractor -
54.	Fire detection and suppression equipment and systems. (Employer supplied)	Employer	Contractor	Contractor -

**TABLE 20-3: EMPLOYER DOCUMENTS**

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1.	Supplier manuals, design documentation and as-built drawings associated with general facilities provided by Employer	Employer	Contractor	Employer
2.	Supplier manuals, design documentation and as-built drawings associated with E&M facilities provided by Employer	Employer	Contractor	Employer

TABLE 20-4: PLANT ASSETS

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1.	Electrical reticulation i.e. cabling & wiring [in and for facilities, Plant & software provided by the Contractor]	Contractor	Contractor	Contractor
2.	LV power supplies, distribution & sub distribution boards and cabling to and between DB's and sub-DB's at toll gantries (for the purpose of Plant provided by the Contractor)	Contractor	Contractor	Contractor
3.	Power supply from toll gantry LV point to Plant (ie gantry equipment) provided by the Contractor	Contractor	Contractor	Contractor
4.	Surge protection equipment & earthing installations [for power reticulation, Plant & software provided by the Contractor]	Contractor	Contractor	Contractor
5.	Generator shelter ventilation	Contractor	Contractor	Contractor -1st line maintenance only
6.	UPS room ventilation	Contractor	Contractor	Contractor -1st line maintenance only
7.	UPS system complete with electronic and battery cabinet with cabling	Contractor	Contractor	Contractor -1st line maintenance only
8.	Central air-conditioning systems [at building and technical shelter facilities provided by Employer]	Contractor	Contractor	Contractor -1st line maintenance only
9.	Network equipment, racks & cabling (LAN)	Contractor	Contractor	Contractor
10.	Network equipment & peripherals (WAN)	Contractor	Contractor	Contractor
11.	CCTV equipment (matrix, cabling, lightning protection, card(s) and peripherals)	Contractor	Contractor	Contractor
12.	PABX, telephones and peripherals	Contractor	Contractor	Contractor
13.	TS Operational monitoring equipment	Contractor	Contractor	Contractor
14.	Servers (NET, exchange, web and the like), including peripherals such as routers, modems, security protection, remote interface units, etc	Contractor	Contractor	Contractor
15.	Work stations, PCs, terminals, monitors and the like, including peripherals such as screens, modems, readers, writers, sound cards, key boards, remote interface units, etc	Contractor	Contractor	Contractor
16.	Lightning protection units	Contractor	Contractor	Contractor

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
17.	Motors and mechanical parts of barriers & booms at Tolling Points for access control	Contractor	Contractor – 1ST line maintenance only	Contractor -
18.	TS Detection cameras & peripherals	Contractor	Contractor	Contractor
19.	Equipment labelling/encoding	Contractor	Contractor	Contractor
20.	Fibre optic cabling along the toll network between gantries	Contractor	Employer	Employer
21.	Software, computer programs, peripheral software, interface software, protocols & licenses	Contractor	Contractor	Contractor
22.	Source code software in escrow	Contractor	Employer (or appointed agent)	Contractor
23.	Assets (not listed elsewhere) needed for installation	Contractor	Contractor	Contractor
24.	Other hardware & equipment related Assets pursuant to the Contractor's back office systems design and the Contract	Contractor	Contractor	Contractor
25.	Mobile Payment Stations	Contractor	Contractor	Contractor
26.	Security and surveillance cameras - external & internal (Contractor supplied)	Contractor	Contractor	Contractor
27.	Security control system equipment. (Contractor supplied)	Contractor	Contractor	Contractor
28.	Building and site access control equipment and devices. (Contractor supplied)	Contractor	Contractor	Contractor
29.	Fire detection and suppression equipment and systems. (Contractor supplied)	Contractor	Contractor	Contractor
30.	Call centre control & communication equipment and peripherals	Contractor	Contractor	Contractor
31.	ETC point of sale equipment	Contractor	Contractor	Contractor
32.	ETC reading & testing equipment	Contractor	Contractor	Contractor
33.	ETC personalization equipment	Contractor	Contractor	Contractor
34.	ETC Tags	Employer or Contractor	Contractor	Contractor
35.	Printers & peripherals	Contractor	Contractor	Contractor
36.	Recorders & monitoring equipment	Contractor	Contractor	Contractor
37.	Auxiliary equipment for remote enforcement	Contractor	Contractor	Contractor
38.	Auxiliary equipment for remote customer services	Contractor	Contractor	Contractor
39.	Operating system software	Contractor	Contractor	Contractor
40.	Database system software	Contractor	Contractor	Contractor
41.	Application software	Contractor	Contractor	Contractor
42.	Protocol & communication software	Contractor	Contractor	Contractor

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
43.	Network interface & 3rd party interface software	Contractor	Contractor	Contractor
44.	Data security & protection software	Contractor	Contractor	Contractor
45.	Driver & DLL software	Contractor	Contractor	Contractor
46.	Source code software in escrow	Contractor	Employer (or appointed agent)	Contractor
47.	System & sub-system recovery packs, suppression equipment and systems	Contractor	Contractor	Contractor
48.	Configuration & version control software	Contractor	Contractor	Contractor
55.	Electrical spares for specialist maintenance	Contractor	Contractor	Contractor -

**TABLE 20-5: MATERIALS**

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1	Electrical spares & maintenance tools (excl for specialist maintenance)	Contractor	Contractor	Contractor
2	Electrical consumables and other equipment (globes, luminaries, etc)	Contractor	Contractor	Contractor
3	Mechanical spares provided by the Contractor	Contractor	Contractor	Contractor
4	Hardware spares, testing equipment and maintenance tools	Contractor	Contractor	Contractor
5	RSS (excluding test site): Spares such as power supplies, batteries, computers, converters, communication cards, detectors, boxes, boards, plates, sensors, disk drives, breakers, switches, monitors, buttons, connectors, protectors, signs, regulators, devices, units, etc	Contractor	Contractor	Contractor

**TABLE 20-6: CONTRACTOR DOCUMENTS**

ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
1.	Supplier manuals, design documentation and as-built drawings associated with E&M facilities provided by Contractor	Contractor	Contractor	Contractor
2.	E&M management & administrative systems, plans, procedures and programmes as a consequence to the execution of the Works and performance of the Operation Service	Contractor	Contractor	Contractor
3.	Supplier manuals, design documentation and as-built drawings associated with general facilities provided by Contractor	Contractor	Contractor	Contractor
4.	Operation and Maintenance Plan & Operation and Maintenance Manuals as per Employer's Requirements & contractual obligations	Contractor	Contractor	Contractor
5.	General management & administrative systems, plans, procedures and	Contractor	Contractor	Contractor



ITEM	ASSET CATEGORY DESCRIPTION	PROVIDED BY	ASSET MANAGEMENT BY	MAINTENANCE BY
	programmes as a consequence to the execution of the Works and performance of the Operation Service			
6.	Operating system software licences	Contractor	Contractor	Contractor
7.	Database system software licenses	Contractor	Contractor	Contractor
8.	Application software licenses	Contractor	Contractor	Contractor
9.	Peripheral software licences	Contractor	Contractor	Contractor
10.	Back office systems technical and design documentation & drawings	Contractor	Contractor	Contractor
11.	Hardware & software systems supplier guides and user manuals	Contractor	Contractor	Contractor
12.	Back office systems installation, testing & training manuals	Contractor	Contractor	Contractor
13.	Hardware & software testing, operation & maintenance protocols, plans, procedures and management / administrative systems	Contractor	Contractor	Contractor
14.	Other software & documentation related Assets pursuant to the Contractor's back office systems design and the Contract	Contractor	Contractor	Contractor
15.	Other software & documentation related Assets pursuant to the Contractor's RSS design and the Contract	Contractor	Contractor	Contractor
16.	Design documentation and drawings	Contractor	Contractor	Contractor
17.	Technical documentation & supplier manuals	Contractor	Contractor	Contractor
18.	Operation & maintenance manuals, procedures, protocols and management & administrative systems and plans	Contractor	Contractor	Contractor
19.	Other hardware and equipment related Assets pursuant to the Contractor's RSS design and the Contract	Contractor	Contractor	Contractor
20.	Other software & documentation related Assets pursuant to the Contractor's RSS design and the Contract	Contractor	Contractor	Contractor