INVITATION TO BID: MBD1

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*POLOKWANE MUNICIPALITY*)					
BID NUMBER:	PM69/2017	CLOSING DATE:	**14 SEPTEMBER 2018**	CLOSING TIME:	10H00
BID DESCRIPTION	**PROVISION OF THE AUTOMATIC FARE COLLECTION SYSTEM (AFC) AND PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS)FOR THE POLOKWANE IRPTS FOR 3 YEARS**				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7) or SERVICE LEVEL AGREEMENT OF POLOKWANE MUNICIPALITY.					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (Polokwane Municipality, Civic Centre, corner, Bondenstein and Landdros Mare Street) not later than 10:00 on 14 September 2018,

An official and compulsory briefing session will be held on **Monday, 20 August 2018 at 10H00**. Bidders are requested to meet the **New Peter Mokaba Stadium Complex, Executive Lounge 1st Floor Polokwane**.
The Bid box is generally open 24 hours, 7 days a week.
Complete Bid document, fully priced and signed must be sealed in an envelope marked “Bid: Descriptions and bid number”
Bidders should ensure that bids are delivered timeously to the correct address. If the bid is late, it will not be accepted for consideration.
Bids documents containing the Conditions of Bid and other requirements in terms of the Supply Chain Management Policy will be downloaded from e-tender Publication Portal at www.etenders.gov.za at no fee.

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE			NUMBER	
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE			NUMBER	
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		**OR**	CSD No:	
B-BBEE STATUS LEVEL NUMBER	----------				

B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No	B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes ☐ No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]			
ARE YOU THE ACCREDITED REPRESENTATIVE **IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		**TOTAL BID PRICE**	**R**
SIGNATURE OF BIDDER	……	**DATE**	
CAPACITY UNDER WHICH THIS BID IS SIGNED			

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
MUNICIPALITY	POLOKWANE	CONTACT PERSON	Mr. Malose Lamola
CONTACT PERSON	Mr. K. Mashiane	TELEPHONE NUMBER	015 290 2608/2325
TELEPHONE NUMBER	015 290 2148	FACSIMILE NUMBER	N/A
FACSIMILE NUMBER	N/A	E-MAIL ADDRESS	malosela@polokwane.gov.za
E-MAIL ADDRESS	kwenaMa@polokwane.gov.za	Principal agent/ Project Manager/s: Trevor Chambers / Stefanus vd Merwe Telephone: +27 12 349 1664 E-mail address: tchambers@projectivity.co.za / Stefanus@itsglobal.co.za	

TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR ONLINE**

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.

2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.

2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.

2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?
☐ YES ☐ NO

3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?
☐ YES ☐ NO

3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?
☐ YES ☐ NO

3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?
☐ YES ☐ NO

3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?
☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.
NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER:_____

CAPACITY UNDER WHICH THIS BID IS SIGNED: _____

DATE: _____

TABLE OF CONTENTS:

PORTION 1: TENDER

PART T1: TENDERING PROCEDURES

PART T1: TENDERING PROCEDURES

T1.1: TENDER NOTICE AND INVITATION TO TENDER

BID NO: PM/69/2017

BID DESCRIPTION: FARE COLLECTION (AFCS) AND PUBLIC TRANSPORT MANAGEMENT (PTMS) SYSTEMS FOR THE POLOKWANE IRPTS FOR 3 YEARS

DIRECTORATE: TRANSPORTATION SERVICES

BUSINESS UNIT: TRANSPORTATION SERVICES

The Polokwane Local Municipality intends inviting tenders for the Public Transport Management System (PTMS) and Automatic Fare Collection (AFC) System forming part of the Integrated Rapid Public Transport System respectively. In pursuit of the best value for money proposition for the municipality, bidders are invited to offer a reduced price should they be awarded both bids whilst remaining compliant with the contractual and technical requirements of both. **PLM prefers to award both Part A and Part B to one bidder and reserve the right to enter into negotiations to this effect.**

The following bid options are thus available to prospective bidders;

Part A – tender for AFC

The bidder is to submit a response in accordance with the requirements of bid number PM/69/2017.

Part B – tender for PTMS

The bidder is to submit a response in accordance with the requirements of bid number PM/69/2017.

Part C – tender for both

The bidder offers alternative financial offers (Part C2 – Pricing data) for Part A and B as well Part C, which will be the only apply in the event that the bidder is awarded both the AFC and PTMS elements. The bidder is required to provide a total amount for Part A and for Part B, should both bids be awarded to the specific bidder.

Bidders for Part C will be required to meet the quality criteria required to be considered for financial evaluation for both Part A and B separately. Should the bidder not meet the quality criteria for either Part A or Part B, the Part C offer will not be considered

Should the bidder be successful under Part C, the bidder will be awarded a contract based on relevant FIDIC contract system, incorporating the alternative Pricing Data

Bids are hereby invited for the Design, Build, Operation, Maintenance and Transfer of an Automatic Fare Collection System (AFCS) and for the Design, Supply, Installation, Commissioning, Maintenance and Operational Support Public Transport Management System (PTMS) For the Polokwane Integrated Public Transport System.

Bids documents containing the Conditions of Bid and other requirements in terms of the Supply Chain Management Policy will be downloaded from e-tender Publication Portal at www.etenders.gov.za at no fee.

Complete Bid document, fully priced and signed must be sealed in an envelope marked **"Bid** No: **PM/69/2017**:

Bidders should ensure that bids are delivered timeously to the correct address. If the bid is late, it will not be accepted for consideration

THIS BID IS SUBJECT TO THE, PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATION, 2017, AND THE GENERAL CONDITIONS OF CONTRACT (FIDC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT (PARTICULAR CONDITIONS).

The Municipality shall adjudicate and award bids in accordance with B-BBEE status level of contribution on 90/10 point system, 90 points for the price and 10 points for B-BBEE status. Prospective bidders must accept that the bid will be adjudicated, according to the said legislation. Bids will remain valid for 90 (ninety) days.

N.B: NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE [AS DEFINED IN REGULATION 1 OF THE LOCAL GOVERNMENT: MUNICIPAL SUPPLY CHAINS MANAGEMENT REGULATIONS]

MR D H MAKOBE
MUNICIPAL MANAGER
CIVIC CENTRE
LANDDROS MARE STREET
POLOKWANE

RESPONSIVENESS AND EVALUATION CRITERIA

POLOKWANE LOCAL MUNICIPALITY WILL CONSIDER NO BID UNLESS IT MEETS THE FOLLOWING RESPONSIVENESS CRITERIA

- The bid must be properly received in a sealed envelope clearly indicating the description of the service and the bid number for which the bid is submitted.

- The bid must be deposited in the relevant bid box as indicated on the notice of the bid on or before the closing date and time of the bid.

- Bid forms must be completed in full and each page of the bid initialed.

- Submission of a Joint Venture Agreement, where applicable, which has been properly signed by all parties.

- Proof of payment of municipal rates and taxes.

- Complies with the requirements of the bid and technical specifications.

- Registered in the relevant professional body in the specific field

- Adheres to Pricing Instructions.

  a) Policy, the Preferential Procurement Policy Framework Act, and other applicable legislations.

  b) The Council reserves the right to accept all, some, or none of the bids submitted – either wholly or in part – and it is not obliged to accept the lowest bid.

By submitting this bid, bidder authorises the Council or its delegate(s) to carry out any investigation deemed necessary to verify the correctness of the statements and documents submitted and that such documents reasonably reflect the ability of the Bidder to provide the goods and services required by the Council.

PLEASE NOTE

The Municipal Manager may reject the bid or quote of any person if that person or any of its directors has:

a) The person committed a corrupt or fraudulent act during the procurement process or in the execution of the contract, or

b) An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the contract that benefited that person.

c) Failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months;

d) Failed, during the last five years, to perform satisfactorily on a previous contract with the Polokwane Local Municipality or any other organ of State after written notice was given to that bidder that performance was unsatisfactory;

e) Abused the supply chain management system of the Municipality or have committed any improper conduct in relation to this system;

f) Been convicted of fraud or corruption during the past five years;

g) Wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or

h) Been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No. 12 of 2004) or has been listed on National Treasury's database as a person prohibited from doing business with public sector.

GENERAL PROCEDURES

General Directives
The following general procedures contained in this document have been laid down by the Council and are applicable to all bids, orders and contracts, unless otherwise approved by the Council prior to the invitation of the bids.

Where applicable, special conditions or procedures are also laid down by the Council to cover specific supplies or services.

Where such special conditions or procedures are in conflict with the general conditions and procedures, the special conditions (T1.2) or procedures shall apply.

The bidder shall satisfy himself/herself with the conditions and circumstances of the bid. By bidding, the bidder shall deem to have satisfied himself/herself as to all the conditions and circumstances of the bid.

Formal contracts are concluded with the contractors only where this requirement is stated in the bid invitation.

All bids with regard to the bidding of a service e.g. materials, cleaning services; professional services, etc. shall be subject to the negotiation of a Service Level agreement between the successful contractor and the Municipality. The acceptance of this Service Level Agreement is subject to the approval by the Council of the Municipality.

The written acceptance of bid shall be posted to the bidder or contractor concerned by registered or certified mail.

Issuing of bid documents
On the date that the advertisement appears in the Municipality's Tender Bulletin, and or media, prospective bidders may request copies of the tender documentation.

The Supply Chain Management Unit will keep a register and potential bidders should sign for receipt of the bid documentation. If a fee is payable, an official receipt must be issued before the bid document is handed to the bidder.

No bid responses from any bidder should be accepted if sent via the Internet, e-mail or fax.

Only the Supply Chain Management Unit will have direct communication between the potential bidders and will facilitate all communication between potential bidders and the Municipality with regard to any advertised bid. No line function staff should be allowed to communicate with potential bidders without the approval by the Manager: Supply Chain Management Unit.

The Supply Chain Management Unit will only consider request for the extension of the closing dates of advertised bid if the postponed date can be advertised in the media used to advertise before the original closing date. The closing time may be postponed only if all potential bidders can be advised of the postponed time, in writing, before the original closing time.

The decision to extend the closing date or time rests with the Manager: Supply Chain Management Unit, who must ensure compliance with all relevant rules and regulations and must confirm prior to the action being taken.

Payment of bid documents
Bids documents containing the Conditions of Bid and other requirements in terms of the Supply Chain Management Policy will be downloaded from e-tender Publication Portal at www.etenders.gov.za at no fee.

Public Invitation for competitive bids
The following are procedures for the invitation of competitive bids:
Invitation to prospective providers to submit bids must be by means of a public advertisement in the national treasury publication portal www.etenders.gov.za, the website of the municipality or any other appropriate ways (which may include an advertisement in Polokwane Local Municipality Notice board)

Public advertisement must contain the following:
The closure date for the submission of bids, which may not be less than 30 days in the case of transactions over R10 million (Vat included), or which are of a long term nature, or 14 days in any other case, from the date on which the advertisement is placed in a newspaper; subject to (iii) below; and

Accounting officer may determine a closure date for the submission of bids which is less than the 30 or 14 days requirement, but only if such shorter period can be justified on the grounds of urgency or emergency or any exceptional case where it is impractical or impossible to follow the official procurement process.

Bids submitted must be sealed.

The following information must appear in any advertisement:

- Bid number;
- Description of the requirements;
- The place where the bid documents can be obtained;
- The date, time and venue where site inspection/briefing session will be (if applicable);
- Closing date and time;
- The fee applicable that must be paid before the bid documents will be issued; and
- The name and telephone numbers of the contact person for any enquiries

Site meetings of briefing sessions
A fully explanatory site inspection must be conducted before the close of the bids to ensure that the bidders understand the scope of the project and that they can comply with the conditions and requirements.

It should be a condition that prospective bidders attend a site inspection and non-attendance should invalidate a bid, where a site inspection/briefing session is applicable.

Handling of bids submitted in response to public invitation

Closing of bids

All bids will close at **10H00** on a date as stipulated on the advertisement, which must be reflected in the bid document.

Bids are late if they are received at the address indicated in the tender documents after the closing date and time.

A late bid should not be admitted for consideration and where practical should be returned unopened to the bidder accompanied by explanation.

Opening of bids

Bids are opened in public as soon as possible after the closure in the presence of the Manager: Supply Chain Management or his/her delegate.

The official opening the bids should in each case read out the name of the bidder and the amount of the bid.

The bid should be stamped with the official stamp of the Municipality and endorsed with the signatures of the person opening it and of the person in whose presence it was opened.

Bids should be recorded in a register kept for that purpose.

Validity Period of the bids

The validity period should not exceed 90 (ninety) days and is calculated from the date of bid closure endorsed on the front cover of the bid document.

Should the validity period expire on a Saturday, Sunday or Public holiday, the bid must remain valid and open for acceptance until the closure on the following working date.

Consideration of bids

The Council takes all bids duly admitted into consideration.

The Council reserves the right to accept any bid received based on the result of the evaluation.

The decision by the Municipality regarding the awarding of a contract must be final and binding.

Evaluation of bids

The following are criteria against which all bids responses will be evaluated:

Compliance with bid conditions;

- Bid submitted on time,
- Bid forms signed and each page initialled
- All essential information provided
- Submission of a Joint Venture Agreement, which has been properly signed by all parties

- Payment of Municipal Fees

Meeting technical specifications and comply with bid conditions.

Financial ability to execute the contract; and

(i) The number of points scored for achieving Government's Broad-Based Black Economic Empowerment objectives and points scored for price.
(ii) Only bidders who are registered in the relevant professional body will be considered. This requirement will remain in force as long as it is a requirement of that specific professional body.
(iii) All companies, which are part of the joint venture, must be registered with the professional body. The company that meets the requirement of professional body will be considered.

Evaluation of bids on functionality and price
All bids received will be evaluated on functionality and price.

The conditions of bid may stipulate that a bidder must score a specified minimum number of points for functionality to qualify for further evaluation.

The number of points scored for achieving Government's Broad-Based Black Economic Empowerment objectives must be calculated separately and must be added to the points scored for price.

Only the bid with the highest number of points will be selected.

Acceptance of bids
Successful bidders must be notified at least by registered post of the acceptance of their bids, but that acceptance however, will only take effect after completion of the prescribed contract form.

The successful service provider will be required to sign the service level agreement.

Unsuccessful bids should not be returned to bidders, but should be placed on record for audit purposes.

A register or records should be kept of all bids accepted.

Publication of bids results
The particulars of the successful bidders should be published in the Municipality's Tender Bulletin, website as well as the newspaper on which the bid was advertised.

Cancellation and re-invitation of bids
In the event that in the application of the 80/20 preference point system as stipulated in the bid documents, all bids received exceed the estimated Rand Value of R50 000 000.00, the bid invitation must be cancelled. If one or more of the acceptable bid(s) received are within the R50 000 000.00 threshold, all bids received must be evaluated on the 80/20 preference point system

In the event that, in the application of the 90/10 preference point system as stipulated in the bid documents, all bids received are equal to or below R50 000 000.00, the bid must be cancelled. If one or more of the acceptable bid(s) received are above the R50 million threshold, all bids received must be evaluated on the 90/10 preference point system

If a bid was cancelled as indicated above, the correct preference point system must be stipulated in the bid documents of the re-invited bid.

Municipal Manager may, prior to the award of a bid, cancel the bid if:
Due to changed circumstances, there is no longer a need for the services, works or goods requested.

Municipal Manager must ensure that only goods, services or works that are required to fulfil the needs of the institution are procured.

Or funds are no longer available to cover the total envisaged expenditure.

Municipal Manager must ensure that the budgetary provisions exist prior to inviting bids.

No acceptable bids are received (If all bids received are rejected, the institution must review the reasons justifying the rejection and consider making revisions to the specific conditions of contract, design and specifications, scope of the contract, or a combination of these, before inviting new bids).

Sale and Letting of Asset
The Preferential Procurement Regulations, 2017 is not applicable to the sale and letting of assets.

T1.2: TENDER DATA AND SPECIAL CONDITIONS OF TENDER

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (July 2015) as published in Government Gazette No 38960, Board Notice 136 of 10 July 2015. (See www.cidb.org.za). These are included in Part T1.3 for reference.

The Standard Conditions of Tender make several references to the Tender Data. The Tender Data shall take precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender to which it mainly applies.

The Special Conditions of Tender to be added to the Standard Conditions are included in the table below. The Special Conditions of Tender shall take precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender to which it mainly applies.

Reference to relevant clauses in Standard conditions of Tender		**Addition or variation to Standard conditions of Tender**
F.1.	General	**Insert** the following NOTE in bold and capital letters: **"THE TENDERER'S ATTENTION IS DRAWN TO THE FACT THAT THE CONTRACT WILL BE AWARDED FOR 3 YEARS.** **THE EXTENSION OF THE CONTRACT PERIOD BEYOND THE INITIAL 3 YEARS SHALL BE SUBJECT TO A REVIEW OF THE CONTRACTORS PERFORMANCE AND THE SUCCESSFUL COMPLETION OF THE PRESCRIBED PROCESS TO BE FOLLOWED IN TERMS OF SECTION 33 OF THE MUNICIPAL FINANCE MANAGEMENT ACT, Act 56 of 2003.** **POLOKWANE LOCAL MUNICIPALITY THEREFORE DOES NOT GUARANTEE THAT THE CONTRACT WILL EXTEND BEYOND THE INITIAL 3 YEAR PERIOD."** • PLM promotes enterprise development. In this regard, successful bidders are required to subcontract a minimum 30% of the contract value to an Exempted Micro Enterprise (EME) or Qualifying Small Enterprise (QSE) which is at least 51% owned by black people as contemplated in the Preferential Procurement Regulations of 2017 in terms of Section 5 of the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000). (RDC21) CSI Corporate Social Investment - The bidder should give details of any proposed CSI projects to be undertaken, such as training, bursaries, capacitation of taxi industries, community projects, etc.

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.1.1	Actions	The Employer is: **THE POLOKWANE LOCAL MUNICIPALITY**: Directorate Transportation Services cnr Landdros Maree and Bodenstein Streets, Polokwane The term “bid” in the context of this standard is synonymous with the term “Tender”.
F.1.2	Tender documents	The Tender documents issued by the Employer comprise: **PORTION 1: TENDER:** **Part T1: Tendering procedures** T1.1 Tender notice and invitation to tender T1.2 Tender data and special conditions of tender T1.3 CIDB Standard conditions of tender **Part T2: Returnable documents** **PORTION 2: CONTRACT:** **Part C1: Agreements and contract data** C1.1 Form of offer and acceptance C1.2 Contract data C1.3 Form of guarantee C1.4 Health and safety agreement **Part C2: Pricing data** C2.1 Pricing instructions C2.2 Preamble to the Price schedule C2.3 Price schedule Part C3: Scope of work Part C4: Site Information ***Tenderers are reminded that irrespective of any other provision or requirement contained in this tender, the only mandatory required documents to be submitted with this tender are listed in Part T2 of the Returnable Documents. Where Tenderers are required to provide information in response to specific returnable forms or sections of the bid inquiry document, whether this is to be entered in the space provided in the form or by referenced annexure, such***

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		response will take precedence over conflicting information provided by Tenderers in other documents submitted. **The Conditions of Contract are:** **PART A: AFC** - The "General Conditions", which form part of the "Conditions of Contract for Contract for Design, Build and Operate Projects" First Edition 2008 (Gold Book), published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC), plus the "Particular Conditions", which include amendments and additions to the General Conditions as set out in section C1.2.2. and / or **PART B: PTMS** - The "General Conditions", which form part of the "Conditions of Contract for Plant and Design, Build for Electrical and Mechanical Works and for Building and Engineering Works Dedsigned by the Contractor" First Edition 1999 (Yellow Book), published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC), plus the "Particular Conditions", which include amendments and additions to the General Conditions as set out in section C1.2.2.
F.1.3	Interpretation	
Add the following new clauses: "F.1.3.4		The Tender documents have been drafted in English. The contract arising from the invitation of tender shall be interpreted and construed in English."
"F.1.3.5		The following words or abbreviations shall have the same meaning: • ***City of Polokwane, Polokwane Municipality, Polokwane Local Municipality, Polokwane, the City, the Municipality, COP or PLM"***
F.1.4	Communication and Employer's agent	Agent: Mr. . Malose Lamola Address: Polokwane Local Municipality Directorate Transportation Services Ground Floor Civic centre Cnr Landdros Maree & Bodenstein streets Polokwane Tel: *(015) 290 2095* Fax: *(015) 290 2106/086 599 1896*

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		E-mail address: *malosela@polokwane.gov.za*
F1.5.2	The employer's right to accept or reject any tender offer	**Replace** the contents of the sub-clause with the following: The Employer may subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work **Add the following**: The Municipality shall not accept or incur any liability to a tenderer for such cancellation and rejection.
Add the following to sub-clause: "F.1.6.1	Evaluation and award of tender	The Municipality reserves the right to accept the whole or any portion of a tender. The lowest or any tender will not necessarily be accepted."
F.1.6.3	Two staged system	The bidding procedure shall be a three-staged system: Stage1 – Administrative Compliance Stage 2 – Points based on Quality, Functionality Stage 3 – Price and Preference More details given in F.3.11
F.2.1	Eligibility	Tenders will be checked for responsiveness and administrative compliance in **Stage 1**. In **Stage 2** (Functionality and Quality) Tenderers need to Score Minimum of **80** points for **AFC - Equipment, design and contractor requirements**. Tenderers also need to score a minimum of **80 (Individually for both Part A: AFC and Part B: PTMS)** for the remaining requirements.

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		Only Tenderers who successfully passed **Stage 2** will be eligible for **Stage 3** (Price and Preference) scoring.
F.2.1.1		Add the following to the clause: A Tenderer will not be eligible to submit a tender if: (a) the Tenderer submitting the tender is under restrictions or has principals who are under restriction to participate in the Employer's procurement due to corrupt of fraudulent practices; (b) the Tenderer does not have the legal capacity to enter into the contract; (c) the Tenderer submitting the tender is insolvent, in receivership, bankrupt or being wound up, has their affairs administered by a court or a judicial officer, has suspended business activities, or is subject to legal proceedings in respect of the foregoing; (d) The Tenderer does not comply with the legal requirements stated in the Employer's procurement policy; (e) The Tenderer cannot demonstrate that it possesses the necessary expertise and competence, financial resources, equipment and other physical facilities, managerial capability, personnel, experience and reputation to perform the contract; (f) The Tenderer cannot provide proof that it is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract. (g) The Tenderer fails to have the "Signing of the Attendance Register" in Part T2.1 - List of Returnable Documents signed by the **Head: Polokwane Local Municipality Directorate Transportation Services, or his/her representative**. (h) The minimum criteria for the tender have not been met.
F.2.2.1	Cost of tendering	**<u>Add the following</u>** to the clause: "Accept that the Employer will not compensate the Tenderer for any costs incurred in attending interviews or presentations in the office of the Employer or the Employer's Agent."

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.2.7	Clarification meeting	Where applicable, details of the **COMPULSORY CLARIFICATION MEETING** with a representative of the Employer are stated in the Tender Notice and Invitation to Tender. Tender documents ***will not be made available*** at the site clarification meeting. Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list. The minutes of the briefing meeting will be issued as an addendum to the tender.
F.2.8	Seek clarification	**Replace** the contents of the clause with the following: "Request clarification of the tender documents, if necessary, by notifying the Employer's Official or the Employer's Agent indicated in the Tender Notice and Invitation to Tender in writing at least seven working days before the closing time stated in the foregoing notice and clause F2.15."
F.2.11	Alterations to documents	**Add the following** to the clause*:* The Pricing Schedules will be provided in electronic format via email to all the attendees of the Compulsory clarification meeting as an MS-Excel spreadsheet. The printed sheets have been provided for reference purposes. Tenderers shall not make any changes to the content, format/layout of formulae of the spreadsheet other than to add cost items specific to the Tenderers proposed solution, which have not been included. Tenderers shall complete the electronic schedules by inserting all the required rates and lump sums and shall print and sign the completed schedules, and insert them into their tender submissions. Tenderers shall ensure that the Pricing Schedule is printed in the same format as they appear in this document. In addition to the printed and signed Pricing schedules, tenderers shall submit an electronic version in MS-Excel format. "In the event of an error having been made by a tenderer on the printed price schedule, it shall be crossed out in ink and be accompanied by an initial at each and every price alteration." ***No correction fluid may be used*** in a Price Schedule where prices are calculated to arrive at a total amount. **If correction fluid has been**

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		used, the tender as a whole will not be considered. The Municipality **will reject** the bid if corrections are not made in accordance with the above."
F.2.12	Alternative tender offers	**Alternative offers** will only be considered if tenderer(s) have submitted a fully completed main offer. For alternative offers a complete separate detailed activity, quantities and bill/price schedule must be submitted as a separate document.
F.2.13	Submitting a Tender offer	
F.2.13.3		Each Tenderer is required to return the complete set of documents as listed in Part T2 with all the required information supplied and completed in all respects. Tender offers shall be submitted as one (1) original plus two (2) additional copies plus one (1) electronic copy on CD. All volumes of the original tender shall be clearly marked "ORIGINAL" and all volumes of the copy shall be clearly marked "COPY" The CD copy shall be labelled with a printed label with the name of the tenderer and the tender reference and description as set out in T1-F.2.13.5. All files on the CD shall be in printable document format (.pdf). Tenderers shall submit an electronic version of their completed Price Schedule in MS-Excel format on the CD.
F.2.13.4		**Add the following** to the clause: "Only authorised signatories may sign the original and all copies of the Tender Offer where required in terms of F.2.13.3 In the case of a **ONE-PERSON CONCERN** submitting a Tender, this shall be clearly stated. In case of a **COMPANY** submitting a Tender, include a copy of a **resolution by its board of directors** authorising a director or other official of the company to sign the documents on behalf of the company. In the case of a **CLOSE CORPORATION** submitting a Tender, include a copy of a **resolution by its members** authorising a member or other

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		official of the corporation to sign the documents on each member's behalf. In the case of a **PARTNERSHIP** submitting a Tender, **all the partners** shall sign the documents, unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case **proof of such authorisation** shall be included in the Tender. In the case of a **JOINT VENTURE/CONSORTIUM** submitting a Tender, include **a resolution** of each company of the joint venture/consortium together with a resolution by its members authorising a member of the joint venture/consortium to sign the documents on behalf of the joint venture/consortium." In cases where the Tenderer has not submitted proof of authorisation with the Tender, the Employer reserves the right to, at any time after the closure of the Tender, but before the award of the Tender, request the Tenderer to provide proof of authorisation within 7 (seven) calendar days from date of notification. **Accept that failure to submit proof of authorisation to sign the Tender shall result in a Tender Offer being regarded as non-responsive.**
F.2.13.5		The identification details are: Tender Reference: **PM/69/2017** Tender Description: **Provision of the Automatic Fare Collection (AFCS) and Public Transport Management (PTMS) Systems for The Polokwane IRPTN For 3 Years** Closing Time: **10:00** Closing Date: **14 September 2018** Each tender shall be enclosed in a sealed envelope, bearing the correct identification details and shall be placed in the tender box located at: **Polokwane Local Municipality, Supply Chain Management Office, Ground Floor (left hand side of the security reception), Civic Centre, cnr Landdros Maree and Bodenstein Streets, Polokwane**

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.2.13.6 F.3.5		A two-envelope procedure ***will not be followed***.

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.2.15 F.2.15.1	Closing time	The closing time for submission of Tender Offers is: **14 September 2018 at 10:00** Telephonic, telegraphic, faxed or e-mailed tenders will not be accepted.
F.2.16	Tender offer validity	The Tender offer validity period is **90 days**.
F.2.16.1		**Add the following** to the clause: "If the Tender validity expires on a Saturday, Sunday or public holiday, the Tender offer shall remain valid and open for acceptance until the closure of business on the following working day."
F.2.17	Clarification of Tender Offer after Submission	**Replace** the contents of the clause with the following clause: "Provide written clarification of a Tender Offer in response to a request to do so from the Employer or his Agent during the evaluation of Tender Offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors resulting from the product of the unit rate and the quantity by the adjustment of certain line item totals. No change in the unit rate or prices or substance of the Tender Offer is sought, offered, or permitted. Tenderer's may be required to present their technical proposals and tender offer during the evaluation of tender offers. This will include providing details and demonstrations of products and software as well as clarification of their proposed project methodology,"
F.2.19	Inspections, tests and analysis	The Tenderer must provide access during working hours to his premises for inspections on request.
F.2.23	Certificates	Refer to part T2: Returnable Documents for a list of documents that are to be returned with the tender.

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		Tenderers are to ensure that all certificates are submitted and forms completed as set out in part T2. Tenderers shall provide confirmation by completing the checklist in part T2. In the case of a Joint Venture/Consortium the tax clearance certificate must be for the Joint Venture/Consortium or individual valid tax clearance certificates for all the members of the Joint Venture/Consortium."
Add the following new clause: "F.2.24	Canvassing and obtaining of additional information by Tenderers	Accept that no Tenderer shall make any attempt either directly or indirectly to canvass any of the Employers' officials or the Employer's agent in respect of his Tender, after the opening of the Tenders but prior to the Employer arriving at a decision thereon. No Tenderer shall make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of Tenders."
Add the following new clause: "F.2.25	Prohibitions on awards to persons in service of the state	Accept that the Employer is prohibited in terms of Clause 44 of the Supply Chain Management Regulations to award a Tender to a person– a) who is in the service of the state; or b) if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or c) a person who is an advisor or consultant contracted with the municipality <u>or</u> municipal entity. **"In the service of the state"** means to be – a) a member of – • any municipal council; • any provincial legislature; or • the National Assembly or the National Council of Provinces; b) a member of the board of directors of any municipal entity; c) an official of any municipality or municipal entity; d) an employee of any national or provincial department, national or e) provincial public entity or constitutional institution within the

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999); f) a member of the accounting authority of any national or provincial public entity; or g) an employee of **Parliament or a provincial legislature."** In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 – Returnable Documents must be completed in full and signed. Should a contract be awarded, and it is subsequently established that clause 44 has been breached, the employer shall have the right to terminate the contract with immediate effect."
Add the following new clause: "F.2.26	Awards to close family members of persons in the service of the state	Accept that the notes to the Employer's annual financial statements must disclose particulars of any award of more than R2000 to a person who is a spouse, child or parent of a person in the service of the state (defined in clause F.2.25), or has been in the service of the state in the previous twelve months, including – a) the name of that person; b) the capacity in which that person is in the service of the state; and c) the amount of the award. In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 – Returnable Documents must be completed in full and signed."
Add the following new clause: "F.2.27	Certificate of Independent Bid Determination (MBD 9)	Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive tendering (or tender rigging). Collusive tendering is a *per se* prohibition meaning that it cannot be justified under any grounds. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to: (a) take all reasonable steps to prevent such abuse;

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		(b) reject the tender of any tenderer if that tenderer or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and (c) cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the tendering process or the execution of the contract. In order to give effect to the above, the Certificate of Tender Determination (MBD 9) must be completed and submitted with the tender.
Add the following new clause: "F.2.28	Appeal Process	In terms of Regulation 49 of the Municipal Supply Chain Management Regulations persons aggrieved by decisions or actions taken by the Municipality, may lodge an appeal within 14 days of the decision or action, in writing to the Municipality. In dealing with these appeals, the Municipal Manager will apply the following procedure: 1. All appeals (clearly setting out the reasons for the appeal) and queries with regard to the decision of award are to be directed to: **The Municipal Manager** [Attention Mr D.H. Makobe] Civic Centre Landdros Mare Street **POLOKWANE** Facsimile: (015) 290 2106 2. A copy of the appeal will be forwarded to the Chairperson of the Bid Adjudication Committee, who must provide a response in writing within seven days. 3. In the event that there are allegations made against third parties, they will also be given an opportunity, to respond to the allegations within seven days. 4. These responses will then be sent to the appellant for a reply within five days. The appeal will be considered on these written submissions, unless the appeal authority is of the view that there is a need for oral submissions, in which case, the appellant will be notified of the date, place and time of such

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		hearing. 5. The Appeal Authority will consider the appeal and may confirm, vary or revoke the decision of the committee, but no such variation or revocation of a decision may detract from any rights that may have accrued as a result of the decision. 6. The Appeal Authority must commence with the appeal within six weeks and decide the appeal within reasonable period.
F.3.1	Respond to requests from tenderer	**<u>Replace</u>** the contents of the clause with the following: "Respond to a request for clarification received up to seven calendar days before the Tender closing time stated in the Tender data and notify all Tenderers who drew procurement documents"
F.3.4	Opening of Tender submissions	The time and location for opening of the tender offers are: Time: **10:00** Date: **14 September 2018** Location/Venue: **Tender Box, Ground Floor Civic Centre, cnr Landdros Maree & Bodenstein Streets, Polokwane**
F.3.9 "F.3.9.1	Arithmetical errors, omissions and discrepancies	**<u>Replace</u>** the contents of the clause F3.9 with the following: Check responsive Tender Offers for arithmetical errors, correcting them in the following manner: a) Where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern. b) If a bill of quantities (or schedule of quantities or schedule of

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		rates) applies and there is an error in the line item total resulting from the product of the unit rate and the quantity, the <u>rate shall govern and the line item total shall be corrected</u>. c) Where there is an error in the total of the prices either as a result of corrections required by this checking process or in the Tenderer's addition of prices, the total of the prices shall be adjusted to reflect the arithmetically correct summation of corrected line item totals.
F.3.9.2		Consider the rejection of a Tender Offer if the Tenderer does not accept the correction of the arithmetical errors in the manner described in F 3.9.1."
F.3.11 F.3.11.1	Evaluation of Tender offer General	The procedure for evaluation of responsive Tender Offers will be in accordance with the CIDB, Standard Conditions of Tender July 2015, Municipality's revised Procurement Policy that was adopted by full council on 26 May 2016, the Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (2017). Proposals will be evaluated by an evaluation panel appointed by the Employer. Three stages will apply to evaluation of tenders: **<u>Stage 1: Administrative Compliance</u>** All bids duly lodged will be examined to determine compliance with bidding requirements and conditions. Bids with obvious deviations from the requirements/conditions, will be eliminated from further evaluation. **Mandatory Criteria**: The following mandatory criteria have been identified for this bid and any non - compliance thereto will lead to the bid being regarded

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		as non-responsive and disqualified from further evaluation: • Completed and Signed Form of Offer and Acceptance **(C1.1)** • Completed and Signed declaration of interest form **(RDA1)** • Completed and signed declaration on past SCM practices form **(RDA2)** • Certificate for Municipal Services and Payments. Copy of municipal rates and taxes statement of account which is not older than three (3) months or proof of valid leasing agreement for service providers who are renting or leasing offices and letter from Tribal Authority, not older than three (3) months **(RDA3)** • Signed J/V agreement submitted (Where applicable) **(RDA4)** • Provide Central Supplier Database (CSD) number (attached CSD Summary report) **(RDA5)** • Compulsory briefing session attendance and signing of the register thereof **(RDA6)** • Company (in case of J/V all Companies involved) to submit Three (3) year audited Financial Statements • All pages of the bid document initiated and signed where required. **The bidder must return all documents listed in T2 under RD.A.**

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		The tenderes that meet the above administrative compliance will be evaluated on stage 2 evaluation on Quality and Functionality. **<u>Stage 2: Evaluation on Quality and Functionality</u>** Only those tenders which score a **PASS** in stage 1 are eligible for evaluation in Stage 2. Quality and Functionality scoring will be based on the table in F 3.11.9 below with a maximum of 100 point to be scored. **<u>PART A: AFC</u>** Tenderers who submit a tender for **Part A: AFC** will be evaluated only on **Part A: AFC** Criteria as listed in F 3.11.9 **It should be noted that tenderers submitting an offer for Part A: AFC will need to score a minimum of 80% for the criteria;** • Ability for equipment and contractor to fully comply with the specification and requirements criteria as set out in in RDD 1 Only after the tenderer has successfully passed this criteria as mentioned above for **PART A: AFC**, the remainder of the **Part A: AFC** quality and functionality requirements as listed in F.3.11.9 will be evaluated and scored. Tenderer also need to score a minimum of **80%** in order to continue to stage 3 evaluation. **<u>PART B: PTMS</u>** Tenderers who submit a tender for **Part B: PTMS** will be evaluated on **Part B: PTMS** Criteria as listed in F 3.11.9 Tenderer will need to score a minimum of **80%** in order to continue to stage 3 evaluation. **<u>PART C: COMBINED (AFC / PTMS)</u>** Tenderers who submit a combined tender for **Part A: AFC** and

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
		Part B: PTMS will be evaluated on both **Part A: AFC** and **Part B: PTMS** criteria individually as listed in F 3.11.9 the score for two parts will be averaged, score conforming to 80% minimum requirement for the two parts. **The Evaluation on Quality and Functionality will be based on all returnable documents submitted in RD.C and RD.D. Tenderer to score more than 80 points for all RD.D form where scoring is indicated.** **The bidder must return all documents listed in T2 under RD.C & RD.D.** **<u>Stage 3: Financial Offer and Preference</u>** The tender evaluation method to evaluate all responsive tender offers will be ***METHOD 1***. Apply the ***90/10*** Preference Point system where a maximum of ***ninety (90)*** tender adjudication point be awarded for price and a maximum of ***ten (10)*** points for B-BBEE status level of contribution. Refer to Part T2 – Returnable Documents. Tenderers are to submit an original or certified copy of the original BBBEE certificate. **The bidder must return all documents listed in T2 under RD.B.**
F.3.11.3		In this Clause, replace any reference to R1 million or R 1 000 000 with R 50 000 000. Sub-paragraph (5)(b), in the table, change the number of points awarded for B-BBEE level 3 from 8 to 6.
F.3.11.7	Scoring Financial Offers	The maximum possible number of tender evaluation points awarded for the financial offer = W_1 = ***90*** The financial offer will be scored in terms of ***FORMULA 2***, ***OPTION 1*** of the Standard Conditions of Tender (Section T1.3 of the document).

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.3.11.8	Scoring Preferences	Up to 100 minus W1 tender evaluation points **(10)** will be awarded for preference to tenderers who attain the BBBEE status level of contributor in accordance with form **(RDB1&2)** in T2. Tenderers who qualify as EMEs in terms of the B-BBEE Act must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates. Tenderers other than EMEs must submit their original and valid B- BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by a South African National Accreditation System (SANAS) accredited Verification Agency. A trust, consortium or joint venture, will qualify for points for their B- BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate. A full listing of conditions for the awarding of preference points is found under Clause 11 of the PPPFA Regulations which form part of this document by reference (see T1.2 : Tender Data – F.1.2) SANAS accredited verification agencies are listed on the following websites: www.thedti.gov.za/economic_empowerment www.sanas.co.za www.abva.co.za

Reference to relevant clauses in Standard conditions of Tender		Addition or variation to Standard conditions of Tender
F.3.11.9	Scoring quality/functionality	***Replace*** the contents of clause F.3.11.9 with the following: The quality criteria and maximum score in respect of each of the criteria are as follows: (See Table below)

Scoring Criteria for Quality and Functionality

					PART A: AFC		PART B: PTMS	
					Scores	**Maximum Number of points**	**Scores**	**Maximum Number of points**
1	**Relevant Project Experience** on similar contracts and Current Users of the system	Relevant experience of key automatic fare collection, EMV transit card or similar projects as described in RDD 2 and RDD 8.	**0**	The tenderer has no experience in the field of AFC/PTMS related projects. (**Very Poor**)	0	20	0	20
			40	The tenderer has **poor** and limited (1-2 projects) experience in the field of AFC/PTMS.	8		8	
			80	The tenderer has **satisfactory** and relevant (3-4 projects) experience in the field of AFC/PTMS related projects.	16		16	
			90	The tenderer has **good** and extensive (5-6 projects) experience in the field of AFC/PTMS related projects.	18		18	
			100	The tenderer has **very good** and outstanding (+6 projects) experience in the AFC/PTMS related projects.	20		20	
2	**Methodology and Technical Approach, Project Management and Programme**	Approach paper which responds to the scope of work and outlines the proposed approach / methodology, project management and programme including that relating to health and safety. (RDD 3)	**0**	**Very poor** response received which does not comply with this evaluation schedule.	0	15	0	15
			40	The technical approach and / or methodology are **poor** / are unlikely to satisfy project objectives or requirements. The tenderer has misunderstood certain aspects of the scope of work and does not deal with the critical aspects of the project.	6		6	
			80	The approach addresses the specific project objectives and methodology. The approach identifies the critical characteristics of the project and offers solutions that show an adequate understanding of the systems and services required. The quality plan, manner in which risk is to be managed etc. is adequate/**Satisfactory**.	12		12	
			90	The approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The quality plan and approach to managing risk etc is specifically tailored to the critical characteristics of the project (**Good**)	13.5		13.5	
			100	Besides meeting the “good” rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the- art approaches. The approach paper details ways to improve the project outcomes and the quality of the outputs (**Very Good**)	15		15	

3	**Operations and Maintenance plan (AFC)** **Maintenance plan and Technical Operational Support (PTMS)**	Ability to provide a suitable operations and maintenance plan to meet the specified requirements. (RDD 4) Ability to provide a suitable maintenance plan and Technical Operational Support (PTMS) to meet the specified requirements. (RDD 4)	**0**	**Very poor** response received which does not comply with this evaluation schedule.	0	15	0	15
			40	The proposed operations and maintenance plan may likely not meet the stated employer's requirements (**Poor**)	6		6	
			80	The proposed operations and maintenance plan may possibly be able to meet the stated employer's requirements (**Satisfactory**)	12		12	
			90	The proposed operations and maintenance plan is likely to meet the stated employer's requirements (**Good**)	13.5		13.5	
			100	The proposed operations and maintenance plan is most likely to meet the stated employer's requirements. (**Very Good**)	15		15	
4	**Organization and staffing**	Qualifications and general experience of key staff (**Project Manager, Technical and Operational Staff**) and Adequacy for the assignment (assigned personnel) in relation to the Scope of Works (Part C3). (RDD 5; RDD 6; RDD 7)	**0**	**Very poor/No** response received which does not comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in the schedule of experience of key personnel.	0	10	0	10
			40	The organization chart is sketchy, the staffing plan is weak/**poor** in important areas There is no clarity in allocation of tasks and responsibilities. Key staff have limited levels of project specific education, skills, training and experience (**Project Manager is < NQF7 (or Equivalent Qualification), Technical Staff is < NQF6 (or Equivalent Qualification) and Operational Staff (Relevant Qualifications)**).	4		4	
			80	The organizational chart is complete and detailed, the technical level and composition of the staffing arrangements are adequate/**Satisfactory**. Key staff have reasonable levels of project specific education (**Project Manager is NQF7 (or Equivalent Qualification), Technical Staff is NQF6 (or Equivalent Qualification) and Operational Staff (Relevant Qualifications)**), skills, training and experience (**5 years**)	8		8	
			90	Besides meeting the "satisfactory" rating, staff are well balanced i.e. they show **good** co-ordination, complimentary skills, clear and defined duties and responsibilities, and the approach to satisfying local consultants. Some members of the project team have worked together before on limited occasions. Key staff have extensive levels of project specific education (**Project Manager is NQF7 (or Equivalent Qualification), Technical Staff is NQF6 (or Equivalent Qualification) and Operational Staff (Relevant Qualifications)**), skills, training and experience (**6-10 years**).	9		9	
			100	Besides meeting the "good" rating, the proposed team is well integrated and several members have worked together extensively in the past. Key staff have outstanding/**Very Good** levels of project specific education (**Project Manager is NQF7 (or Equivalent Qualification), Technical Staff is NQF6 (or Equivalent Qualification) and Operational Staff (Relevant Qualifications)**), skills, training and experience (**+11 years**)	10		10	

5	Compliance with **Technical Specifications**	Provide Information and datasheets of the proposed solution that proves compliance with specifications: 1. High level overall design schematic. 2. Details on the Schedule Planning solution (incl snapshots) 3. Details on the Compliance monitoring solution (incl. snapshots) 4. Details on the Passenger Information system. 5. Details on the Reporting System solution (incl. snapshots) 6. Details on the proposed video wall solution. 7. Details on the AVL solution (incl. snapshot) 8. Details on the OBU and or MDT for the buses (including interfaces with other systems e.g. external display). 9. Details on the CCTV solution for the buses. 10. Details on the Passenger information display solution at the stations. 11. Details of the CCTV solution at the stations. 12. Details of the GSM/UTMS APN solution proposed for the complete system. 13. Details of the Workstation and IP Phone solution proposed. 14. Details of CMMS that will be used for maintenance management. 15. Details of the Station Public Announcement system.	**0**	Very poor			0	35
			40	poor/Limited			14	
			80	Satisfactory/average/relevant			28	
			90	Good/extensive			31.5	
			100	Very good/ outstanding			35	

	AFC - Equipment, design and contractor requirements	Ability for equipment and contractor to fully comply with the specification and requirements criteria as set out in RDD 1.		Min 80% compliance with key requirements.		20		
	Quality Control Procedures	Demonstrate the tenderers Quality Control practices and procedures. (RDD 9)	**0**	Very poor response received which does not comply with this evaluation schedule.	0	5		
			40	The described Quality control procedures are unlikely to ensure compliance with stated employer's requirements	2			
			80	The described Quality control procedures are likely to ensure compliance with stated employer's requirements	4			
			90	The described Quality control procedures are very likely to ensure compliance with stated employer's requirements, add to a well-managed project environment and ensure quality deliverables	4.5			
			100	Quality control procedures are very likely to ensure compliance with stated employer's requirements, add to a well management environment and are highly likely to add value to the project deliverables	5			
5	**Training Plan**	Detail the tenderers proposed Training programme. (RDD 10)	**0**	Very poor response received which does not comply with this evaluation schedule.	0	5		
			40	The training plan proposed may likely not meet the stated employer's requirements	2			
			80	The training plan is likely to meet the stated employer's requirements	4			
			90	The training plan is very likely to ensure compliance with stated employer's requirements	4.5			
			100	The training plan is very likely to ensure compliance with stated employer's requirements and add value to the capability of the operations team.	5			
	System compatibility	Demonstrate the ability of the system to integrate with similar 3rd party systems. (RDD 11)	**0**	Very poor response received which does not comply with this evaluation schedule	0	5		
			40	System compatibility is unlikely to ensure compliance with stated employer's requirements	2			
			80	System compatibility is possibly able to ensure compliance with stated employer's requirements	4			
			90	System compatibility is likely to ensure compliance with stated employer's requirements	4.5			
			100	System compatibility is most likely to ensure compliance with stated employer's requirements	5			

6	**Financial Capability**	Attach Audited Financial Statements for the past three years. (Liquidity ratio and gearing ratio in terms of industry)	**0**	The tenderer has a **very poor** financial ability.	0	5	0	5
			40	The tenderer has **poor** financial ability with unsatisfactory liquidity and gearing ratio.	2		2	
			80	The tenderer has a **satisfactory** liquidity and gearing ratio.	4		4	
			90	The tenderer has a **good** and extensive financial ability with good liquidity and gearing ratios.	4.5		4.5	
			100	The tenderer has a **very good** and outstanding liquidity and gearing ratio and the financial statements prove that tenderer is financial strong to deliver high quality project.	5		5	
Maximum possible score for Quality and Functionality Total points scored for AFC and total points for PTMS will be added and divided by two to give average points scored for both AFC and PTMS						100		100
<u>The Tenderer must score the following Minimum score to Pass Quality and Functionality:</u> • Minimum of 80% of overall average Functionality/Quality (Tenderer must score 80% for AFC and 80% for PTMS) • Minimum of 40% on relevant project experience for AFC and PTMS individually (Tenderer must score 40% for AFC and 40% for PTMS) • Minimum of 80% compliance with key requirements on AFC - Equipment, design and contractor requirements								

F.3.13 F.3.13.1	Acceptance of tender offer	Tender offers will only be accepted if: a) the tender offer is signed by a person authorised to sign on behalf of the Tenderer; b) valid Tax Clearance Certificates issued by the South African Revenue Service are included with the tender; c) a Tenderer who submitted a tender as a Joint Venture has included an acceptable Joint Venture Agreement with his tender; d) The tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; e) The tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract; f) The tenderer has not: • Abused the Employer's Supply Chain Management System; or • Failed to perform on any previous contract and has been given a written notice to this effect; g) the Tenderer is not in arrears for more than 3 months with municipal rates and taxes and municipal service charges;
F.3.17	Provide copies of Contract	The number of paper copies of the signed contract to be provided by the Employer is ONE (1).

T1.3: CIDB STANDARD CONDITIONS OF TENDER

CIDB STANDARD CONDITIONS OF TENDER

(*July 2015 edition)*

As published in Annex F of the CIDB Standard for Uniformity in Construction Procurement in Board Notice 136 Government Gazette No 38960 of 10 July 2015.

F.1 General

F.1.1 Actions

F.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

F.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict, and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.
2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

F.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

F.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

F.1.3 Interpretation

F.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

F.1.3.2 These conditions of tender, the tender data and tender schedules which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

F.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:
   i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
   ii) an individual or organisation is in a position to exploit a professional or official

capacity in some way for their personal or corporate benefit; or

iii) incompatibility or contradictory interests exist between an employee and the organisation which employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

e) **organization** means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body;

f) **functionality** means the measurement according to the predetermined norms of a service or commodity designed to be practical and useful, working or operating, taking into account quality, reliability, viability and durability of a service and technical capacity and ability of a tenderer.

F.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

F.1.5 Cancellation and Re-Invitation of Tenders

F1.5.1 An organ of state may, prior to the award of the tender, cancel a tender if-

(a) due to changed circumstances, there is no longer a need for the services, works or goods requested; or

(b) funds are no longer available to cover the total envisaged expenditure; or

(c) no acceptable tenders are received.

F1.5.2 The decision to cancel a tender must be published in the cidb website and in the government Tender Bulletin for the media in which the original tender invitation was advertised.

F.1.6 Procurement procedures

F.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

F.1.6.2 Competitive negotiation procedure

F.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed

contract in the first round of submissions. Notwithstanding the requirements of F.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

F.1.6.2.2 All responsive tenderers, or not less than three responsive tenderers that are highest ranked in terms of the evaluation method and evaluation criteria stated in the tender data, shall be invited in each round to enter into competitive negotiations, based on the principle of equal treatment and keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of F.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

F.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh tender offer, based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

F.1.6.2.4 The contract shall be awarded in accordance with the provisions of F.3.11 and F.3.13 after tenderers have been requested to submit their best and final offer.

F.1.6.3 Proposal procedure using the two stage-system

F.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

F.1.6.3.2 Option 2

F.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

F.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

F.2 Tenderer's obligations

F.2.1 Eligibility

F.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

F.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the

employer's written approval to do so prior to the closing time for tenders.

F.2.2 Cost of tendering

F2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

F2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

F.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

F.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

F.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

F.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

F.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

F.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

F.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the

successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the tender data.

F2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

F.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

F.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

F.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

F.2.12 Alternative tender offers

F.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

F.2.12.2 Accept that an alternative tender offer may be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

F.2.12.3 An alternative tender offer may only be considered in the event that the main tender offer is the winning tender.

F.2.13 Submitting a tender offer

F.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

F.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

F.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

F.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

F.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

F.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

F.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

F.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

F.2.15 Closing time

F.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

F.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.16 Tender offer validity

F.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

F.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

F.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer’s agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted.

F.2.16.4 Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of F.2.13 with the packages clearly marked as “SUBSTITUTE”.

F.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: Sub-clause F.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

F.2.18 Provide other material

F.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

F.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

F.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

F.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

F.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

F.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the tender data.

F.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

F.3 The employer's undertakings

F.3.1 Respond to requests from the tenderer

F.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

F.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

F.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who drew documents.

F.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

F.3.4 Opening of tender submissions

F.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

F.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

F.3.4.3 Make available the record outlined in F.3.4.2 to all interested persons upon request.

F.3.5 Two-envelope system

F.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

F.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total

price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

F.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

F.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

F.3.8 Test for responsiveness

F.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) complies with the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

F.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

F.3.9 Arithmetical errors, omissions and discrepancies

F.3.9.1 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.3.11 for:

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or
c) arithmetic errors in:
   i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
   ii) the summation of the prices.

F.3.9.2 The employer must correct the arithmetical errors in the following manner:

a) Where there is a discrepancy between the amounts in words and

amounts in figures, the amount in words shall govern.

b) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of the arithmetical error in the manner described above.

F.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

F.3.11.2 Method 1: Price and Preference

In the case of a price and preference:

1) Score tender evaluation points for price
2) Score points for BBBEE contribution
3) Add the points scored for price and BBBEE.

F.3.11.3 Method 2: Functionality, Price and Preference

In the case of a functionality, price and preference:

1) Score functionality, rejecting all tender offers that fail to achieve the minimum number of points for functionality as stated in the Tender Data.
2) No tender must be regarded as an acceptable tender if it fails to achieve the minimum qualifying score for functionality as indicated in the tender invitation.
3) Tenders that have achieved the minimum qualification score for functionality must be evaluated further in terms of the preference points system prescribed in paragraphs 4 and 4 and 5 below.

The 80/20 preference point system for acquisition of services, works or goods up to Rand value of R1 million

4) (a)(i) The following formula must be used to calculate the points for price in respect of tenders (including price quotation) with a rand value equal to, or above R 30 000 and up to Rand value of R 1 000

000 (all applicable taxes included):

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where
Ps = Points scored for comparative price of tender or offer under consideration;
Pt = Comparative price of tender or offer under consideration; and
Pmin = Comparative price of lowest acceptable tender or offer.

(4)(a)(ii) An employer of state may apply the formula in paragraph (i) for price quotations with a value less than R30 000, if and when appropriate:

(4)(b) Subject to subparagraph(4)(c), points must be awarded to a tender for attaining the B-BBEE status level of contributor in accordance with the table below:

B-BBEE status level of contributor	Number of points
1	20
2	18
3	16
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

(4)(c) A maximum of 20 points may be allocated in accordance with subparagraph (4)(b)

(4)(d) The points scored by tender in respect of B-BBEE contribution contemplated in contemplated in subparagraph (4) (b) must be added to the points scored for price as calculated in accordance with subparagraph (4)(a).

(4)(e) Subject to paragraph 4.3.8 the contract must be awarded to the tender who scores the highest total number of points.

The 90/ 10 preference points system for acquisition of services, works or goods with a Rand value above R 1 million

(5)(a) The following formula must be used to calculate the points for price in respect of tenders with a Rand value above R1 000 000 (all applicable taxes included):

90/10

$$Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where
Ps = Points scored for comparative price of tender or offer under consideration;
Pt = Comparative price of tender or offer under consideration; and
Pmin = Comparative price of lowest acceptable tender or offer.

(5)(b) Subject to subparagraph(5)(c), points must be awarded to a tender for attaining the B- BBEE status level of contributor in accordance with the table below:

B-BBEE status level of contributor	Number of points
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

(5)(c) A maximum of 10 points may be allocated in accordance with subparagraph (5)(b).

(5)(d) The points scored by tender in respect of B-BBEE contribution contemplated in contemplated in subparagraph (5) (b) must be added to the points scored for price as calculated in accordance with subparagraph (5)(a).

(5)(e) Subject to paragraph 4.3.8 the contract must be awarded to the tender who scores the highest total number of points.

F.3.11.6 Decimal places

Score price, preference and functionality, as relevant, to two decimal places.

F.3.11.7 Scoring Price

Score price of remaining responsive tender offers using the following formula:

$NFO = W1 \times A$

where:

NFO is the number of tender evaluation points awarded for price.

$W1$ is the maximum possible number of tender evaluation points awarded for price as stated in the Tender Data.

A is a number calculated using the formula and option described in Table F.1 as stated in the Tender Data.

Table F.1: Formulae for calculating the value of A

Formula	Comparison aimed at achieving	Option 1[a]	Option 2 [a]
1	Highest price or discount	$A = (1 + (\frac{P - Pm}{Pm}))$	$A = P / Pm$
2	Lowest price or percentage commission / fee	$A = (1 - (\frac{P - Pm}{Pm}))$	$A = Pm / P$
[a] Pm is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration.			

F.3.11.8 Scoring preferences

Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences.
Calculate the total number of tender evaluation points for preferences claimed in accordance with the provisions of the tender data.

F.3.11.9 Scoring functionality

Score each of the criteria and subcriteria for quality in accordance with the provisions of the Tender Data.

Calculate the total number of tender evaluation points for quality using the following formula:

$$NQ = W2 \times SO / MS$$

where: S_O is the score for quality allocated to the submission under consideration; M_S is the maximum possible score for quality in respect of a submission; and

W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data

F.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

F.3.13 Acceptance of tender offer

Accept the tender offer, if in the opinion of the employer, it does not present any risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
c) has the legal capacity to enter into the contract,
d) is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
e) complies with the legal requirements, if any, stated in the tender data, and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

F.3.14 Prepare contract documents

F.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,
b) inclusion of some of the returnable documents, and
c) other revisions agreed between the employer and the successful

tenderer.

F.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

F.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

F.3.16 Notice to unsuccessful tenderers

F.3.16.1 Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period.

F.3.16.2 After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

F.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

F.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

F3.19 Transparency in the procurement process

F3.19.1 The cidb prescripts require that tenders must be advertised and be registered on the cidb i.Tender system.

F3.19.2 The employer must adopt a transparency model that incorporates the disclosure and accountability as transparency requirements in the procurement process.

F3.19.3 The transparency model must identify the criteria for selection of projects, project information template and the threshold value of the projects to be disclosed in the public domain at various intervals of delivery of infrastructure projects.

F3.19.4 The client must publish the information on a quarterly basis which contains the following information:

- Procurement planning process
- Procurement method and evaluation process
- Contract type
- Contract status
- Number of firms tendering
- Cost estimate

- Contract title
- Contract firm(s)
- Contract price
- Contract scope of work
- Contract start date and duration
- Contract evaluation reports

F3.19.5 The employer must establish a Consultative Forum which will conduct a random audit in the implementation of the transparency requirements in the procurement process.

F3.19.6 Consultative Forum must be an independent structure from the bid committees. F3.19.7 The information must be published on the employer's website.

F 3.19.8 Records of such disclosed information must be retained for audit purposes.

PART T2: RETURNABLE DOCUMENTS

PART T2: LIST OF RETURNABLE DOCUMENTS

RD.A: RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

Note: ***Failure to submit the applicable documents will result in the tender offer being disqualified from further consideration.***

Document Name	**Reference**	**Confirmation of Document Included** *(Tenderers shall use this column to confirm documents have been completed and included in the tender)*
Form of Offer and Acceptance	Section C1.1	
Declaration of Interest (MBD4)	Form RDA1	
Declaration of Tenderer's past supply chain management practices (MBD8)	Form RDA2	
Certificate for Municipal Services and Payments	Form RDA3	
Signed J/V or consortium agreement submitted (Where Applicable)	Form RDA4	
Confirmation that Tenderer has been registered on the Central Supply Database (CSD)	Form RDA5	
Certificate of Attendance at clarification meeting	Form RDA6	

RD.B: RETURNABLE DOCUMENTS REQUIRED FOR PREFERENTIAL PROCUREMENT EVALUATION STAGE 3 PURPOSES

Note: ***Failure to submit the applicable documents will result in the tender offer being awarded with 0 (zero) preference points.***

Document Name	**Reference**	**Confirmation of Document Included** *(Tenderers shall use this column to confirm documents have been completed and included in the tender)*
Preference Points claim form in terms of the Preferential procurement regulations 2017 (MDB6.1)	Form RDB1	
B-BBEE Verification Certificate	Form RDB2	

RD.C: ADDITIONAL RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION STAGE 2 PURPOSES

Note: ***Failure to submit the applicable document will result in the Tenderer having to submit the same upon request within 7 days and if not complied with, will result in the tender offer being disqualified from further consideration [See also clause 2.18 of the Standard Conditions of Tender]***

Document Name	Reference	Confirmation of Document Included
Valid Tax Clearance Certificate (MBD2)	Form RDC1	
Company / CC / Trust / Partnership registration certificates	Form RDC2	
Certificate of Authority of Signatory	Form RDC3	
Certificate of Authority of Signatory for Joint Ventures and Consortia	Form RDC4	
Record of services provided to organs of state	Form RDC5	
Declaration For Procurement Above R10 Million (MBD5)	Form RDC6	
Classification of Business / Company Profile	Form RDC7	
Status of concern submitting tender	Form RDC8	
Status of concern submitting tender	Form RDC9	
Certificate of Independent Bid Determination (MDB9)	Form RDC10	
Letter of intent to provide Insurance Cover	Form RDC11	
Tenderer's bank details	Form RDC12	
Letter of intent to provide a Performance Demand Guarantee	Form RDC13	
Schedule of current commitments	Form RDC14	
Schedule of proposed subcontractors	Form RDC15	
Compliance with OHSA (Act 85 of 1993)	Form RDC16	
Acceptance and undertaking of OHS Act	Form RDC17	
Tenderer's indicative implementation programme	Form RDC18	
Tenderer's indicative monthly cash flow	Form RDC19	
Tenderer's Financial Ability (Bank Rating)	Form RDC20	
Declaration Certificate for Local Production and Content (MBD6.2)	Form RDC21	
The National Industrial Participation Programme (SBD5)	Form RDC22	

RD.D: ADDITIONAL RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION STAGE 2 PURPOSES THAT WILL BE INCORPORATED INTO THE CONTRACT

Note: ***Failure to submit the applicable documents will result in the tender offer being disqualified from further consideration.***

Document name	Reference	Confirmation of Document Included
Evaluation Schedule: Equipment, design and contractor requirements	Form RDD 1	
Evaluation Schedule: Relevant Project Experience	Form RDD 2	
Evaluation Schedule: Methodology and Technical Approach, Project Management and Programme	Form RDD 3	
Evaluation Schedule: Operations and Maintenance plan	Form RDD 4	
Evaluation Schedule: Organization and Staffing	Form RDD 5	
Evaluation Schedule: Key Personnel	Form RDD 6	
Evaluation Schedule: Curriculum Vitae of Key Personnel	Form RDD 7	
Evaluation Schedule: Current Users of the System	Form RDD 8	
Evaluation Schedule: Quality Control Procedures	Form RDD 9	
Evaluation Schedule: Training Plan	Form RDD 10	
Evaluation Schedule: System compatibility	Form RDD 11	

RD.E: OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

Note: ***Failure to submit the applicable documents will result in the tender offer being disqualified from further consideration.***

Document Name	Reference	Confirmation of Document Included
Form of Offer and Acceptance	Section C1.1	
Contract data (Part 2: Data provided by the Tenderer)	Section C1.2	
Performance Security Demand Guarantee	Section C1.3	
Health And Safety Agreement	Section C1.4	
Price Schedule	Section C2	
Record of Addenda to Tender Documents	Form RDE1	
Proposed Amendments (variations or deviations by tenderer)	Form RDE2	
Cost Price Adjustment (CPA) - Local Content (SEIFSA)	Form RDE3	
Cost Price Adjustment (CPA) – Imported Content (FOREX)	Form RDE4	

FORM RDA 1
MBD4: DECLARATION OF INTEREST

THIS FORM MUST BE COMPLETED IN FULL AND SIGNED. FAILURE TO COMPLY WILL RESULT IN THE TENDER BEING DISQUALIFIED.

(Refer to Clauses 2.25 and 2.26 in the Tender Data)

1. No bid will be accepted from persons in the service of the state[1].

2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

3. In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Full Name of bidder or his or her representative: _____

3.2 Identity Number: _____

3.3 Position occupied in the Company (director, trustee, hareholder[2]): _____

3.4 Company Registration Number: _____

3.5 Tax Reference Number: _____

3.6 VAT Registration Number: _____

3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state? **YES / NO**

3.8.1 If yes, furnish particulars. _____

_____

[1]MSCM Regulations: "in the service of the state" means to be –

a) a member of –
   (i) any municipal council;
   (ii) any provincial legislature; or
   (iii) the national Assembly or the national Council of provinces;

b) a member of the board of directors of any municipal entity;
c) an official of any municipality or municipal entity;
d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
e) a member of the accounting authority of any national or provincial public entity; or
f) an employee of Parliament or a provincial legislature.

[2] Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months? **YES / NO**

3.9.1 If yes, furnish particulars_____

_____

Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.9.2 If yes, furnish particulars_____

_____

3.10 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.10.1 If yes, furnish particulars_____

_____

3.11 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.11.1 If yes, furnish particulars_____

_____

3.12 Are any spouse, child or parent of the company's directors trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.12.1 If yes, furnish particulars_____

_____

3.13 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract? **YES / NO**

3.13.1 If yes, furnish particulars_____

_____

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

Signature

Date

Capacity

Name of Bidder

FORM RDA 2
MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Municipal Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any bidder may be rejected if that bidder, or any of its directors have:

a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐

4.3.1	If so, furnish particulars:		
Item	**Question**	**Yes**	**No**
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION
I, THE UNDERSIGNED (FULL NAME) _____
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM TRUE AND CORRECT.
I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

_____ _____
Signature **Date**

_____ _____
Position **Name of Bidder**

FORM RDA3

CERTIFICATE FOR MUNICIPAL SERVICES AND PAYMENTS

TO: MUNICIPAL MANAGER, POLOKWANE LOCAL MUNICIPALITY

FROM: _____ (Name of Bidder)

FURTHER DETAILS OF BIDDER(S); DIRECTORS/SHAREHOLDERS/PARTNERS, ETC.

Directors/ shareholders/ Partners	Physical address of the Business	Municipal Account No.	Physical residential address of the Director/Shareholder/ Partner	Municipal Account No.

NB: Please attach certified copy (ies) of ID document(s)

_____	_____
Signatory	**Date**

Witnesses

1. _____	_____	_____
Full Names	**Signature**	**Date**
2. _____	_____	_____
Full Names	**Signature**	**Date**

PLEASE ATTACH: COPY OF MUNICIPAL RATES AND TAXES STATEMENT OF ACCOUNT WHICH IS NOT OLDER THAN THREE MONTHS OR PROOF OF LEASING AGREEMENT FOR SERVICE PROVIDERS WHO ARE RENTING OR LEASING OFFICES AND LETTER FROM TRIBAL AUTHORITY

FORM RDA4

JOINT VENTURE AGREEMENT AND POWER OF ATTORNEY IN CASE OF JOINT VENTURE

This returnable schedule is to be completed by joint ventures.

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize Mr/Ms _____ _____., authorize signatory of the company, _____ _____ acting in the capacity of lead partner, to sign all documents in connection with the tender offer of Contract No_____ and any contract resulting from it on our behalf.

This authorization is evidence by the attached power of attorney signed by legally authorized signatories of all the partners to the Joint Venture.

NAME	ADDRESS	SIGNATURE	DATE

NOTE: A copy of the Joint Venture Agreement shall be appended to this schedule

This certificate is to be completed and signed by all key partners upon whom rests the direction of this affairs of the Joint Venture as a whole.

SIGNED ON BEHALF OF THE TENDERER:_____

FORM RDA5

CONFIRMATION OF REGISTRATION ON THE POLOKWANE LOCAL MUNICIPALITY DATABASE

Each Contractor/Service Provider is required to register as a supplier/ service provider on the Employer's vendor register before any payment can be done.

If the Tenderer is already registered as a vendor, it is required to record the vendor number in space provided on the cover page of this Tender document

COMPANY NAME	REGISTERED YES/NO	REGISTRATION NUMBER IF APPLICABLE

Tenderers who are not registered on the Polokwane Municipal Database are not precluded from submitting tenders, but must however must be registered after being appointed.

In this regard it is the sole responsibility of tenderers to ensure that this requirement is complied with. In the case of Joint Ventures and Consortia this requirement will apply to each party to the Joint Venture.

Vendor Registration Documents are available on the municipal website at:

https://www.polokwane.gov.za/City-Business/Pages/Supplier-Database.aspx

Note: The evaluation of tenders shall be deemed to take place when the Employer's Bid Evaluation Committee meets to make a recommendation to the Bid Adjudication Committee.

SIGNED ON BEHALF OF THE TENDERER: _____

FORM RDA 6
CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that:

(tenderer name):_____

of (address):_____

_____

was represented by the person(s) named below at the compulsory clarification meeting, for the **THE DESIGN, BUILD, OPERATION AND MAINTENANCE OF THE POLOKWANE INTEGRATED PUBLIC TRANSPORT SYSTEM (IRPTS) AUTOMATIC FARE COLLECTION SYSTEM (AFCS) FOR 3 YEARS**, held for all tenderers at:

Place: New Peter Mokaba Stadium Complex, Executive Lounge 1st Floor
Date: 20 09 2018
Time: 10:00

I / We acknowledge that the purpose of the meeting was to acquaint myself / ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for me / us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

Name :_____ Name :_____

Signature :_____ Signature :_____

Capacity :_____ Capacity :_____

Attendance of the above person(s) at the meeting is confirmed by the Employer's representative, namely :

Name : _____

Signature :_____

Capacity :_____

Date :_____

Time : _____

FORM RDB 1

MBD6.1: PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2

a) The value of this bid is estimated to exceed R50 000 000 (all applicable taxes included) and therefore the 90/10 preference point system shall be applicable; or

b) 90/10 preference point system will be applicable to this tender Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

1.3 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	90
B-BBEE STATUS LEVEL OF CONTRIBUTOR	10
Total points for Price and B-BBEE must not exceed	**100**

1.4 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.5 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) **"EME"** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(j) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right) \quad \text{or} \quad Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: . = ……(maximum of 10 or 20 points)
(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?
(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted.....…….……%

ii) The name of the sub-contractor……..

iii) The B-BBEE status level of the sub-contractor.....……..

iv) Whether the sub-contractor is an EME or QSE
(Tick applicable box)

YES		NO	

v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

Designated Group: An EME or QSE which is at last 51% owned by:	**EME** √	**QSE** √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:_____

8.2 VAT registration number:_____

8.3 Company registration number:_____

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

_____

_____

_____

_____

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 MUNICIPAL INFORMATION

Municipality where business is situated:_____
Registered Account Number:_____
Stand Number:_____

8.8 Total number of years the company/firm has been in business:_____

8.9 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

i) The information furnished is true and correct;
ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
   (a) disqualify the person from the bidding process;
   (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
   (d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   (e) forward the matter for criminal prosecution.

WITNESSES

1. _____

2. _____

_____
SIGNATURE(S) OF BIDDERS(S)

DATE: _____
ADDRESS: _____
_____
_____

ADDRESS ……..
……..
……..

FORM RDB 2
B-BBEE VERIFICATION CERTIFICATE

The tenderer shall attach to this page his original (or certified copy of) B-BBEE certificate in accordance with the requirements stated in RDB 1

In the event of a joint venture consolidated B-BBEE certificate must be submitted comply with the above requirement.

SIGNED ON BEHALF OF THE TENDERER: _____

FORM RDC 1
MBD2: CERTIFICATE OF TAX CLEARANCE

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

The tenderer shall attach to this page current Tax Clearance and VAT Registration certificates which shall be obtained by the tenderer from the South African Revenue Service (SARS).

1. In order to meet this requirement bidders are required to complete in full the SARS form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.

2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.

3. The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.

4. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.

5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.

6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

SIGNED ON BEHALF OF THE TENDERER: _____

FORM RDC 2
COMPANY / CC / TRUST / PARTNERSHIP REGISTRATION CERTIFICATES

The tenderer shall attach to this page a Company / CC / Trust / Partnership Registration certificate.

In the event of a joint venture each member shall comply with the above requirement.

SIGNED ON BEHALF OF THE TENDERER: _____

FORM RDC 3

CERTIFICATE OF AUTHORITY OF SIGNATORY

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

_____

_____

(Legally correct full name and registration number, if applicable, of the Enterprise)

Held at _____(place)

On_____(date)

RESOLVED that:

1. The Enterprise submits a Bid / Tender to the Polokwane Local Municipality in respect of the following project:

_____

_____

(Project description as per Bid / Tender Document)

Bid / Tender Number: _____ (Bid/Tender No as per Bid/Tender Document)

2. Mr/Mrs/Ms:_____

In *his/her Capacity as:_____(Position in the Enterprise)

And who will sign as follows:_____

be, and is hereby, authorised to sign the Bid/Tender, and any and all other documents and/or correspondence in connection with and relating to the Bid/Tender to the Enterprise mentioned above.

	NAME	**CAPACITY**	SIGNATURE

NOTE:
1. *Delete which is not applicable
2. NB: This resolution must be signed by all the Directors/Members/Partners of the Bidding Enterprise
3. Should the number of Directors/Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP

FORM RDC 4

CERTIFICATE OF AUTHORITY FOR JOINT VENTURES AND CONSORTIA

This Returnable Schedule is to be completed by joint ventures.
(Attach additional pages if more space is required.)

*Joint venture/consortium name: _____

We, the undersigned, are submitting this tender in a *joint venture/consortium and hereby authorise *Mr/Ms _____ authorised signatory of the enterprise _____ acting in the capacity of lead partner to sign the tender, and any and all other documents and/or correspondence in connection with and relating to the tender for the *joint venture/consortium mentioned above.

Registered Name Of Firm	Reg. Number	% Of Contract Value	Address	Duly Authorized Signatory	Mark (x) Lead Partner

Note:
1) *Delete which is not applicable.
2) IMPORTANT: This resolution must be signed by all the parties of the joint venture/consortium

Should the number of directors/members/partners exceed the space available above, additional names and signatures must be supplied on a separate page.

FORM RDC 5
RECORD OF SERVICES PROVIDED TO ORGANS OF STATE

Tenderers are required to complete this record in terms of the Supply Chain Management Regulations issued in terms of the Municipal Finance Management Act of 2003.

Include only those contracts where the tenderer identified in the signature block below was directly contracted by the Employer. Tenderers must not include services provided in terms of a sub-contract agreement.

Where contracts were awarded in the name of a joint venture and the tenderer formed part of that joint venture, indicate in the column entitled "Title of the contract for the service" that the contract was in joint venture and provide the name of the joint venture that contracted with the employer. In the column for the value of the contract for the service, record the value of the portion of the contract performed (or to be performed) by the tender.

Complete the record or attach the required information in the prescribed tabulation.

All services commenced or completed to an organ of state in the last five years

#	Organ of state, i.e. national or provincial department, public entity, municipality or municipal entity.	Title of contract for the service	Value of contract for service incl. VAT (Rand)	Date completed (State current if not yet completed)
1.				
2.				
3.				
4.				
5.				
6.				
7.				

Attach additional pages if more space is required.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender: .....

FULL NAME (BLOCK LETTERS): .....

SIGNATURE: .....

DATE: .....

FORM RDC 6

MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire:

1. The tenderer is required to provide audited annual financial statements with his tender reply:

   - for the past three years; or
   - since their establishment if established during the past three years.

   Confirm that these have been included in the tender reply: ***YES / NO***

2. Does the tenderer have any undisputed commitments for Municipal services towards a municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days?
   YES / NO

   If YES, state particulars

   .....

3. Has any contracts been awarded to the tenderer by an organ of state during the past five years?
   YES / NO

   If YES, state particulars

   .....

4. Has there been any material non-compliance or dispute concerning the execution of such contract?
   YES / NO

   If YES, state particulars

   .....

5. Is any portion of the goods or services expected to be sourced out from outside the Republic?
   YES / NO

   If YES, state what portion and whether any portion of payment from the Municipality is expected to be transferred out of the Republic.

   .....

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, certifies that the information furnished on the declaration is correct and accepts that the State may act against him / her should this declaration prove to be false.

Person Authorized to sign Tender: .....

FULL NAME (IN BLOCK LETTERS): .....

SIGNATURE: .....

DATE:

FORM RDC 7
CLASSIFICATION OF BUSINESS

1. **THE SMALL BUSINESSES ARE DEFINED IN THE NATIONAL SMALL BUSINESS ACT, 1996 (ACT 102 OF 1996).**
2. **INFORMATION FURNISHED WITH REGARD TO THE CLASSIFICATION OF THE SMALL BUSINESSES**

a. **Indicate** whether the company/entity is defined as a **small, medium or micro** enterprise by the National Small Business Act, 1996 (Act 102 of 1996). ***YES / NO***

b. If the response to paragraph is **YES**, the following must be completed:

i. Sector/sub-sector in accordance with the Standard Industrial classification

.....

ii. Size or class

.....

iii. Total full-time equivalent of paid employees

.....

iv. Total annual turnover

.....

v. Total gross asset value (fixed property excluded)

.....

(A schedule indicating the different sectors is attached to this form.)

The tenderer should substantiate the information provided above by submitting the following documentation:

c. A letter from the tenderer's auditor or an affidavit from the South African Police Services confirming the correctness of the abovementioned information,

d. Company profile indicating the tenderer's staff compliment, and

e. 3 year financial statement or since their establishment if established during the past 3 years.

"SCHEDULE"

(See definition of 'small businesses' in section)

SIZE OF CLASS	THE TOTAL FULL-TIME EQUIVALENT OF PAID EMPLOYEES	TOTAL TURNOVER	TOTAL GROSS ASSET VALUE (FICED PROPERTY EXCLUDED)
ARGRICULTURE			
Medium	100	R 5 mil	R 5 mil
Small	50	R 3 mil	R 3 mil
Very Small	10	R 500 000	R 500 000
Micro	5	R 200 000	R 100 000
MINING AND QUARRYING			
Medium	200	R 39 mil	R 23 mil
Small	50	R 10 mil	R 6 mil
Very Small	20	R 4 mil	R 2 mil
Micro	5	R 200 000	R 100 000
MANUFACTURING			
Medium	200	R 51 mil	R 19 mil
Small	50	R 13 mil	R 5 mil
Very Small	20	R 5 mil	R 2 mil
Micro	5	R 200 000	R 100 000
ELECTRICITY, GAS & WATER			
Medium	200	R 51 mil	R 19 mil
Small	50	R 13 mil	R 5 mil
Very Small	20	R 5.1 mil	R 1.9 mil
Micro	5	R 200 000	R 100 000
CONSTRUCTION			
Medium	200	R 26 mil	R 5 mil
Small	50	R 6 mil	R 1 mil
Very Small	20	R 3 mil	R 500 000
Micro	5	R 200 000	R 100 000
RETAIL AND MOTOR TRADE & REPAIR SERVICES			
Medium	200	R 39 mil	R 6 mil
Small	50	R 19 mil	R 3 mil
Very Small	20	R 4 mil	R 600 000
Micro	5	R 200 000	R 100 000
WHOLESALE TRADE, COMMERCIAL AGENTS AND ALLIED SERVICES			
Medium	200	R 64 mil	R 10 mil
Small	50	R 32 mil	R 5 mil
Very Small	20	R 6 mil	R 600 000
Micro	5	R 200 000	R 100 000
CATERING, ACCOMODATION AND OTHER TRADE			
Medium	200	R 13 mil	R 3 mil
Small	50	R 6 mil	R 1 mil
Very Small	20	R 5.1 mil	R 1.9 mil
Micro	5	R 200 000	R 100 000
TRANSPORT, STORAGE & COMMUNICATIONS			
Medium	200	R 26 mil	R 6 mil
Small	50	R 13 mil	R 3 mil
Very Small	20	R 3 mil	R 600 000
Micro	5	R 200 000	R 100 000
FINANCE & BUSINESS SERVICES			
Medium	200	R 26 mil	R 5 mil
Small	50	R 13 mil	R 3 mil
Very Small	20	R 3 mil	R 500 000
Micro	5	R 200 000	R 100 000
COMMUNITY, SOCIAL AND PERSONAL SERVICES			
Medium	200	R 13 mil	R 6 mil
Small	50	R 6 mil	R 3 mil
Very Small	20	R 1mil	R 600 000
Micro	5	R 200 000	R 100 000

The Tenderer shall submit a Company Profile as part of the RDC 7 submission.

FORM RDC 8
STATUS OF CONCERN SUBMITTING TENDER

	If the Tendering Entity is a:	Documentation to be submitted with the tender
1	Close Corporation, incorporated under the Close Corporation Act,1984, Act 69 of 1984	CIPRO CK1 or CK2 (Copies of the founding statement) and list of members.
2	Private Company incorporated with share capital, under the companies Act, 1973, Act 61of 1973 (including Companies incorporated under Art 53 (b))	Copies of: a) CIPRO CM 1 - Certificate of Incorporation b) CIPRO CM 29 – Contents of Register of Directors, Auditors and Officers c) Shareholders Certificates of all Members of the Company.
3	Private Company incorporated with share capital, under the companies Act, 1973, Act 61of 1973 in which any, or all, shares are held by another Close Corporation or company with, or without, share capital.	Copies of documents referred to in 1 and/or 2 above in respect of all such Closed Corporations and/or Companies.
4	Public Company incorporated with share capital, under the companies Act, 1973, Act 61of 1973 (including Companies incorporated under Art 21).	A signed statement of the Company's Secretary confirming that the Company is a public Company. Copy of CM 29.
5	Sole Proprietary or a Partnership	Copy of the Identity Document of: a) such Sole Proprietary, or b) Each of the Partners in the Partnership Copy of the Partnership agreement.
6	Co-operative	CIPRO CR2 - Copies of Company registration document. (The percentage of work to be done by each partner must clearly be indicated on Form RDB1 (or RDB2 as applicable) of the tender document: MBD6.1 Preference Points Claim Form in terms of the Preferential Procurement Regulations 2017).
7	Joint Venture	All the documents (as described above) as applicable to each partner in the JV as well as a copy of the Joint Venture agreement. (The percentage of work to be done by each partner of the joint venture must clearly be indicated in the Joint Venture Agreement).

Note:

1.) If the shares are held in trust provide a copy of the Deed of Trust (only the front page and pages listing the trustees and beneficiaries are required) as well as the Letter of Authority as issued by the Master of the Supreme Court, wherein trustees have been duly appointed and authorised, must be provided.

2.) Include a copy of the Certificate of Change of Name (CM9) if applicable.

3.) Registered For Vat Purposes In Terms Of The Value-Added Tax Act(Act Nr. 89 of 1991)

(Make an X in the appropriate space below)

Yes	
No	

REGISTRATION NO: .....

FORM RDC 9
DECLARATION OF MUNICIPAL FEES

I, the undersigned, do hereby declare that the Municipal fees of

.....
(full name of Company / Close Corporation / partnership / sole proprietary/Joint Venture)

(hereinafter referred to as the TENDERER) are, as at the date hereunder, fully paid or an Acknowledgement of Debt has been concluded with the Municipality to pay the said charges in instalments.

The following account details relate to property of the said TENDERER:

Account	Account Number: to be completed by tenderer.
Consolidated Account No.	
Electricity	
Water	
Rates	
JSB Levies	
Other	
Other	

I acknowledge that should the aforesaid Municipal charges fall into arrears, the Municipality may take such remedial action as is required, including termination of any contract, and any payments due to the Contractor by the Municipality shall be first set off against such arrears. ATTACHED, to the back inside cover of this document, please find copies of the above account's and or agreements signed with the municipality.

- Where the TENDERER'S place of business or business interests are outside the jurisdiction of Polokwane Local Municipality, a copy of the accounts/agreements from the relevant municipality must be attached (to the back inside cover of this document).
- Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or official letter to that effect is to be attached (to the back inside cover of this document).

NAME : ..... (Block Capitals)

SIGNATURE : ……..……..…… DATE: .....
(of person authorised to sign on behalf of the Tenderer)

FORM RDC 10

MBD 9: INDEPENDENT BID DETERMINATION

1. This Municipal Bidding Document (MBD) must form part of all bids[1] invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging) [2]. Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
3. Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
   a. Take all reasonable steps to prevent such abuse;
   b. Reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
   c. Cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
4. This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
5. In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices of lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

(Bid Number and Description)

In response to the invitation for the bid made by:

_____

(Name of Municipality/Municipal Entity)

Do hereby make the following statement that I certify to be true an complete in every respect:

I certify, on behalf of: _____ that:

(Name of Bidder)

1. I have read and understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and compete in every respect;
3. I am authorised by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorised by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor"" shall include any individual or organization, other that the bidder, whether or not affiliated with the bidder who:
    a. Has been requested to submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    b. Could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    c. Provides the same goods and services as the bidder and/or is in the same line of business as the bidder.
6. The bidder has arrived at the accompanying bid independently form, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement of arrangement with any competitor regarding:

   a. Prices;

   b. Geographical area where product of services will be rendered (market allocation);

   c. Methods, factors of formulas used to calculate prices;

   d. The intention or decision to submit or not to submit, a bid;

   e. The submission of a bid which does not meet the specifications and conditions of the bid; or

   f. Bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements or arrangement with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or to the awarding of the contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practises related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No. 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted form conduction business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and combating of Corrupt Activities Act No. 12 of 2004 or any other applicable legislation.

[3] Joint venture of Consortium means an associations of persons for the purpose of combining there expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender: .....

FULL NAME (BLOCK LETTERS): .....

SIGNATURE: .....

DATE:

FORM RDC 11

PART A: AFC

LETTER OF INTENT TO PROVIDE INSURANCE COVER

The tenderer shall fill in the values below according to his tender offer and, should he be successful on this bid, undertakes to provide insurance cover to these values, acceptable to the Council, for the duration of the Contract.

i) Name of Tenderer:.....

ii) Period of Validity:.....

iii) Value of Insurance:

- Insurance for Works and Contractor's Equipment

  Company:.....

  Value: .....

- Insurance for Contractor's Personnel

  Company:.....

  Value: .....

- General public liability

  Company:.....

  Value: .....

- SASRIA

  Company:.....

  Value: .....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM RDC 11

PART B: PTMS

LETTER OF INTENT TO PROVIDE INSURANCE COVER

The tenderer shall fill in the values below according to his tender offer and, should he be successful on this bid, undertakes to provide insurance cover to these values, acceptable to the Council, for the duration of the Contract.

i) Name of Tenderer:.....

ii) Period of Validity:.....

iii) Value of Insurance:

- Insurance for Works and Contractor's Equipment

  Company:.....

  Value: .....

- Insurance for Contractor's Personnel

  Company:.....

  Value: .....

- General public liability

  Company:.....

  Value: .....

- SASRIA

  Company:.....

  Value: .....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM RDC 11

PART C: COMBINED (AFC and PTMS)

LETTER OF INTENT TO PROVIDE INSURANCE COVER

The tenderer shall fill in the values below according to his tender offer and, should he be successful on this bid, undertakes to provide insurance cover to these values, acceptable to the Council, for the duration of the Contract.

i) Name of Tenderer:.....

ii) Period of Validity:.....

iii) Value of Insurance:

- Insurance for Works and Contractor's Equipment

  Company:.....

  Value: .....

- Insurance for Contractor's Personnel

  Company:.....

  Value: .....

- General public liability

  Company:.....

  Value: .....

- SASRIA

  Company:.....

  Value: .....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM RDC 12

TENDERER'S BANK DETAILS

Notes to tenderer:

1. The tenderer shall attach to this form a letter from the bank at which he declares he conducts his account. The contents of the bank's letter must state the credit rating that it, in addition to the information required below, accords to the tenderer for the business envisaged by this tender. Failure to provide the required letter with the tender submission may render the tenderer's offer unresponsive in terms of tender condition F.3.8.

2. The tenderer's banking details as they appear below shall be completed.

3. In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.

The tenderer shall provide the following:

i) Name of Account Holder: .....

ii) Account Number: .....

iii) Bank name: .....

iv) Branch Number: .....

v) Bank and branch contact details .....

.....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM RDC13

PART A: AFC

LETTER OF INTENT TO PROVIDE A PERFORMANCE DEMAND GUARANTEE

It is hereby agreed that a Performance Bond drafted exactly as set out in the attached examples (See Section C1.3: Form of Guarantee) will be provided by the Surety named below:

Name of Surety (Bank or Insurer) _____

Address: _____

_____

_____

Signed:

_____

Name: _____

Capacity: _____

On behalf of Tenderer (name of Tenderer) _____

Date: _____

CONFIRMED BY Surety's Authorised representative

Signature(s):

_____

Name (print): _____

Capacity _____

On behalf of Surety (Bank or Insurer) _____

Date: _____

Note: Refer to Annexure to C1.3 Form of Guarantee for the List of Institutions from who Contract/Deposit Guarantees will be accepted.

FORM RDC13

PART B: PTMS

LETTER OF INTENT TO PROVIDE A PERFORMANCE DEMAND GUARANTEE

It is hereby agreed that a Performance Bond drafted exactly as set out in the attached examples (See Section C1.3: Form of Guarantee) will be provided by the Surety named below:

Name of Surety (Bank or Insurer) _____

Address: _____

_____

_____

Signed:

_____

Name: _____

Capacity: _____

On behalf of Tenderer (name of Tenderer) _____

Date: _____

CONFIRMED BY Surety's Authorised representative

Signature(s):

_____

Name (print): _____

Capacity _____

On behalf of Surety (Bank or Insurer) _____

Date: _____

Note: Refer to Annexure to C1.3 Form of Guarantee for the List of Institutions from who Contract/Deposit Guarantees will be accepted.

FORM RDC13

PART C: COMBINED (AFC and PTMS)

LETTER OF INTENT TO PROVIDE A PERFORMANCE DEMAND GUARANTEE

It is hereby agreed that a Performance Bond drafted exactly as set out in the attached examples (See Section C1.3: Form of Guarantee) will be provided by the Surety named below:

Name of Surety (Bank or Insurer) _____

Address: _____

_____

_____

Signed:

_____

Name: _____

Capacity: _____

On behalf of Tenderer (name of Tenderer) _____

Date: _____

CONFIRMED BY Surety's Authorised representative

Signature(s):

_____

Name (print): _____

Capacity _____

On behalf of Surety (Bank or Insurer) _____

Date: _____

Note: Refer to Annexure to C1.3 Form of Guarantee for the List of Institutions from who Contract/Deposit Guarantees will be accepted.

FORM RDC 14
SCHEDULE OF CURRENT COMMITMENTS

Notes to tenderer:

1. The tenderer shall list below all contracts currently under construction or awarded and about to commence and tenders for which offers have been submitted but awards not yet made.
2. In the event of a joint venture enterprise, details of all the members of the joint venture shall similarly be attached to this form.
3. The lists must be restricted to not more than 20 contracts and 20 tenders. If a tenderer's actual commitments or potential commitments are greater than 20 each, those listed should be in descending order of expected final contract value or sum tendered.

TABLE 1 CONTRACTS AWARDED				
CLIENT	PROJECT	EXPECTED TOTAL VALUE OF CONTRACT (INCL VAT)	DURATION (MONTHS)	EXPECTED COMPLETION DATE

TABLE 2 TENDERS NOT YET AWARDED				
CLIENT	PROJECT	SUM TENDERED (INCL VAT)	TENDERED DURATION (MONTHS)	EXPECTED COMMENCEMENT

SIGNED ON BEHALF OF THE TENDERER: ..... .

FORM RDC 15

PART A: AFC

SCHEDULE OF PROPOSED SUBCONTRACTORS

1. Schedule of work which can possibly be sub-contracted to EME's and/or QSE's as specified in C1.2.2, sub-clause 4.4.

WORK ITEMS WHICH CAN POSSIBLY BE SUB-CONTRACTED TO EME's and/or QSE's.				
#	**Pay-item #**	**Description**	**Value of work**	**% Mark-up**

Total value of work identified which can be sub-contracted to EME's and/or QSE's.		
Tender sum (excl. contingencies & VAT)		
% of work identified which can be sub-contracted to EME's and/or QSE's to Tender sum		

Add more pages if required.

I. Tenderers shall submit the CV of the person responsible to train, supervise and mentor the sub-contractors together with this Schedule. Also refer to Form RD.D3.

2. Further to the above, you, the Employer, are hereby notified that it is our intention to employ the following Subcontractors for work on this contract.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

Note: The Particular Conditions of Contract prohibit the subcontracting of 50% or more of the whole contract.

	Name and address of proposed subcontractor	Nature and extent of work	Approximate percentage of contract value

).			

(Attach additional pages if more space is required)

3. Total value of work to be sub-contracted to local (residing in Limpopo) entities and/or performed by local labour.

Summarise in the following table all work, sub-contractors, local businesses and/or local labour within the boundaries of Limpopo that will be used in the Contract.

	Name and address of proposed subcontractor/business	**Pay-item #**	**Nature and extent of work**	**Approximate percentage of local content value**

tal % of work by sub-contractors, businesses and/or local labour residing within the Limpopo boundaries.				

For sub-paragraph 3 above, as part of the Stage 2 evaluation scoring will be done as follows:

	Percentage value of local content allocated to businesses or local labour within Limpopo
Very poor (score 0)	0 to 5% of the local content will be performed by businesses and/or local labour within Limpopo
Poor (score 40)	5 to 10% of the local content will be performed by businesses and/or local labour within Limpopo
Satisfactory (score 80)	10 to 15% of the local content will be performed by businesses and/or local labour within Limpopo
Good (score 90)	15 to 20% of the local content will be performed by businesses and/or local labour within Limpopo
Very good (score 100)	20 to 25% of the local content will be performed by businesses and/or local labour within Limpopo

(Note: Sub-paragraphs 1 and 2 above does not form part of the Stage 2 evaluation procedure, but together with sub-paragraph 3 does have Contractual implications as per the General and Particular Conditions of Contract).

FORM RDC 15

PART B: PTMS

SCHEDULE OF PROPOSED SUBCONTRACTORS

4. Schedule of work which can possibly be sub-contracted to EME's and/or QSE's as specified in C1.2.2, sub-clause 4.4.

WORK ITEMS WHICH CAN POSSIBLY BE SUB-CONTRACTED TO EME's and/or QSE's.				
#	Pay-item #	Description	Value of work	% Mark-up

Total value of work identified which can be sub-contracted to EME's and/or QSE's.		
Tender sum (excl. contingencies & VAT)		
% of work identified which can be sub-contracted to EME's and/or QSE's to Tender sum		

Add more pages if required.

II. Tenderers shall submit the CV of the person responsible to train, supervise and mentor the sub-contractors together with this Schedule. Also refer to Form RD.D3.

5. Further to the above, you, the Employer, are hereby notified that it is our intention to employ the following Subcontractors for work on this contract.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

Note: The Particular Conditions of Contract prohibit the subcontracting of 50% or more of the whole contract.

	Name and address of proposed subcontractor	Nature and extent of work	Approximate percentage of contract value

).			

(Attach additional pages if more space is required)

6. Total value of work to be sub-contracted to local (residing in Limpopo) entities and/or performed by local labour.

Summarise in the following table all work, sub-contractors, local businesses and/or local labour within the boundaries of Limpopo that will be used in the Contract.

	Name and address of proposed subcontractor/business	**Pay-item #**	**Nature and extent of work**	**Approximate percentage of local content value**

tal % of work by sub-contractors, businesses and/or local labour residing within the Limpopo boundaries.				

For sub-paragraph 3 above, as part of the Stage 2 evaluation scoring will be done as follows:

	Percentage value of local content allocated to businesses or local labour within Limpopo
Very poor (score 0)	0 to 5% of the local content will be performed by businesses and/or local labour within Limpopo
Poor (score 40)	5 to 10% of the local content will be performed by businesses and/or local labour within Limpopo
Satisfactory (score 80)	10 to 15% of the local content will be performed by businesses and/or local labour within Limpopo
Good (score 90)	15 to 20% of the local content will be performed by businesses and/or local labour within Limpopo
Very good (score 100)	20 to 25% of the local content will be performed by businesses and/or local labour within Limpopo

(Note: Sub-paragraphs 1 and 2 above does not form part of the Stage 2 evaluation procedure, but together with sub-paragraph 3 does have Contractual implications as per the General and Particular Conditions of Contract).

(Attach additional pages if more space is required)

FORM RDC 16
COMPLIANCE WITH OHSA
(Act 85 of 1993)

Tenderers are required to satisfy the Employer and the Employer's Representative as to their ability and available resources to comply with the above by answering the following questions and providing the relevant information required below.

1. Is your company familiar with the OHSA (ACT 85 of 1993) and its Regulations ***and*** do you have a copy available?	**YES**	**NO**
2. Who will prepare your company's Health and Safety Plan for this Contract? Provide a copy of the person/s curriculum vitae/s or company profile.		
3. Does your company have a health and safety policy? If YES provide a copy.	**YES**	**NO**
4. How is this policy communicated to your employees? Provide supporting documentation to proof such communication	**YES**	**NO**
5. Does your company keep record of safety aspects of each site where work is performed? If YES, what records are kept?	**YES**	**NO**
6. Does your company conduct monthly safety meetings? If YES, provide copies of the Minutes of the last 2 meetings held.	**YES**	**NO**
7. Does your company have a safety officer in its employment, responsible for overall safety of your company? If YES, explain his/her duties and provide a copy of his/her CV ***(only if not the same person as in question 2 above)*** If NO, indicate who will be appointed as safety officer for this project and provide a copy of his/her CV.	**YES**	**NO**
8. Indicate the total number of employees in the Company.	**……..**	
9. Does your company have trained first aid employees? If YES, indicate who.	**YES**	**NO**
10. Does your company have a safety induction training programme in place? If YES, provide a copy	**YES**	**NO**

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender: .....

FULL NAME (BLOCK LETTERS): .....

SIGNATURE: .....

DATE: .....

FORM RDC 17
ACCEPTANCE OF UNDERTAKING IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 0F 1993)

DEFINITIONS

(a) "Council" means the Polokwane Local Municipality.

(b) "Contractor" means:-

NAME OF COMPANY: **……**

ADDRESS: **……**

UNDERTAKING: **……**

1. Contractor undertakes to comply with the requirements of the Occupational Health and Safety Act, Act number 85 of 1993, the regulations promulgated there under and any reasonable, lawful direction of the Council there under.
2. Council shall at all times have the right to summarily suspend the performance of the Contractor hereunder pending compliance by the Contractor with any requirement, regulation and/or direction referred to in 1 hereof
3. Council shall be entitled to set off against any amount owed by the Council to the Contractor hereunder any loss or damage suffered by it as a result of the suspension of the Contractor's performance in the circumstances envisaged under 2 hereof.
4. This undertaking shall constitute the written agreement between the parties as required in terms of Section 37(2) of the Act referred to in 1 hereof

Signed : _____ **Witness** : _____

Name : _____ **Name** : _____

Capacity: _____ **Date** : _____

FORM RDC 18

PART A: AFC

INDICATIVE IMPLEMENTATION PROGRAMME

Note to tenderer:

The tenderer shall attach a preliminary programme, reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this contract, including operations and maintenance. The programme shall be in accordance with the information provided in forms RDDX.

In compiling the programme tenderers shall take note of constrains which may arise as a result of other works taking place along the routes as described in Part C4.

SIGNED ON BEHALF OF TENDERER: .....

FORM RDC 18

PART B: PTMS

INDICATIVE IMPLEMENTATION PROGRAMME

Note to tenderer:

The tenderer shall attach a preliminary programme, reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this contract, including operations and maintenance. The programme shall be in accordance with the information provided in forms RDDX.

In compiling the programme tenderers shall take note of constrains which may arise as a result of other works taking place along the routes as described in Part C4.

SIGNED ON BEHALF OF TENDERER: .....

FORM RDC 19

SCHEDULE OF ESTIMATED MONTHLY EXPENDITURE

Note to tenderer:
If a tenderer wishes to submit an alternative tender then this form, appropriately completed, shall be attached to the Pricing Schedule for the alternative proposal.

The tenderer shall state his estimated value of the work to be completed every month, based on his preliminary programme and his tendered unit rates, in the table below. Months 1 – 24 represent the design and build phases (subject to bidder's program) and Month 1 – Year 3 the subsequent operations and maintenance period of the Contract.

PART A: AFC

DESIGN AND BUILD PHASE		OPERATIONS AND MAINTENANCE PHASE	
MONTH	VALUE (incl VAT)	MONTH	VALUE (incl VAT)
1	R.....	1	R.....
2	R.....	2	R.....
3	R.....	3	R.....
4	R.....	4	R.....
5	R.....	5	R.....
6	R.....	6	R.....
7	R.....	7	R.....
8	R.....	8	R.....
9	R.....	9	R.....
10	R.....	10	R.....
11	R.....	11	R.....
12	R.....	12	R.....
13	R.....	Year 2	R.....
14	R.....	Year 3	R.....
15	R.....		
16	R.....		
17	R.....		
18	R.....		
19	R.....		
20	R.....		
21	R.....		
22	R.....		
23	R.....		
24	R.....		
FINAL payment at end covers balance of retention and any other outstanding payments		TOTAL	R.....

PART B: PTMS

DESIGN AND BUILD PHASE		MAINTENANCE PHASE	
MONTH	VALUE (incl VAT)	MONTH	VALUE (incl VAT)
1	R.....	1	R.....
2	R.....	2	R.....
3	R.....	3	R.....
4	R.....	4	R.....
5	R.....	5	R.....
6	R.....	6	R.....
7	R.....	7	R.....
8	R.....	8	R.....
9	R.....	9	R.....
10	R.....	10	R.....
11	R.....	11	R.....
12	R.....	12	R.....
13	R.....	13	R.....
14	R.....	14	R.....
15	R.....	15	R.....
16	R.....	16	R.....
17	R.....	17	R.....
18	R.....	18	R.....
19	R.....	19	R.....
20	R.....	20	R.....
21	R.....	21	R.....
22	R.....	22	R.....
23	R.....	23	R.....
24	R.....	24	R.....
25	R.....	25	R.....
26	R.....	26	R.....
27	R.....	27	R.....
28	R.....	28	R.....
29	R.....	29	R.....
30	R.....	30	R.....
31	R.....	31	R.....
32	R.....	32	R.....
33	R.....	33	R.....
34	R.....	34	R.....
35	R.....	35	R.....
36	R.....	36	R.....
FINAL payment at end covers balance of retention and any other outstanding payments			TOTAL R.....

SIGNED ON BEHALF OF TENDERER: .....

RDC 20
TENDERER'S FINANCIAL ABILITY (BANK RATING)

BANK CODE	DESCRIPTION OF BANK CODE
A	Undoubted for the amount of enquiry
B	Good for the amount of enquiry
C	Good for the amount quoted if strictly in the way of business
D	Fair trade risk for amount of enquiry
E	Figures considered too high
F	Financial position unknown
G	Occasional dishonours
H	Frequent dishonours

The Bank Rating is code: ……

…… …….. …….....
Signature: Manager Financial Institution Print Name Date

RUBBER STAMP OF INSTITUTION

N.B If a bank letter is submitted, it should be specific to this contract and not older than 30 days

RDC 21

PART A: AFC

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT

This Municipal Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:201x.

1. General Conditions

1.1. Preferential Procurement Regulations, 2017 (Regulation 9.(1) and 9.(3) make provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Regulation 9.(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

1.5. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.6. The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 201x as follows:

$$LC = 1 - \left(\frac{x}{y}\right) \times 100$$

Where

x imported content
y bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid as required in paragraph 4.1 below.

1.7. A bid will be disqualified if:

- the bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and this declaration certificate is not submitted as part of the bid documentation.

2. Definitions

2.1. **"bid"** includes advertised competitive bids, written price quotations or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"Duly sign** "means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"Sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

3. The stipulated minimum threshold(s) for local production and content for this bid is/are as follows:

Description of services, works or goods	Stipulated minimum threshold

_____ _____%

_____ _____%

_____ _____%

4. Does any portion of the services, works or goods offered

   have any imported content? YES / NO

4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.6 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za.

Indicate the rate(s) of exchange against the appropriate currency in the table below:

Currency	**Rates of exchange**
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No. .....
ISSUED BY: (Procurement Authority / Name of Municipality / Municipal Entity):
.....

NB The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned, ……..... (full names),
do hereby declare, in my capacity as …… ……..
of .....(name of bidder entity), the following:

(a) The facts contained herein are within my own personal knowledge.

(b) I have satisfied myself that the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286.

(c) The local content has been calculated using the formula given in clause 3 of SATS 1286, the rates of exchange indicated in paragraph 4.1 above and the following figures:

Bid price, excluding VAT (y)	R
Imported content (x)	R
Stipulated minimum threshold for Local content (paragraph 3 above)	
Local content % as calculated in terms of SATS 1286	

If the bid is for more than one product, a schedule of the local content by product shall be attached.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

RDC 21

PART B: PTMS

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT

This Municipal Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:201x.

1. General Conditions

1.1. Preferential Procurement Regulations, 2017 (Regulation 9.(1) and 9.(3) make provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Regulation 9.(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

1.5. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.6. The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 201x as follows:

$$LC = 1 - \left(\frac{x}{y}\right) \times 100$$

Where
x imported content
y bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on

the date, one week (7 calendar days) prior to the closing date of the bid as required in paragraph 4.1 below.

1.7. A bid will be disqualified if:

- the bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and this declaration certificate is not submitted as part of the bid documentation.

2. Definitions

2.1. **"bid"** includes advertised competitive bids, written price quotations or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"Duly sign** "means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"Sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

3. The stipulated minimum threshold(s) for local production and content for this bid is/are as follows:

Description of services, works or goods	Stipulated minimum threshold
_____	_____%
_____	_____%
_____	_____%

4. Does any portion of the services, works or goods offered

   have any imported content? YES / NO

4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.6 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za.

Indicate the rate(s) of exchange against the appropriate currency in the table below:

Currency	**Rates of exchange**
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No. .....
ISSUED BY: (Procurement Authority / Name of Municipality / Municipal Entity):
.....

NB The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned, ……..... (full names),
do hereby declare, in my capacity as …… ……..
of .....(name of bidder entity), the following:

(a) The facts contained herein are within my own personal knowledge.

(b) I have satisfied myself that the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286.

(c) The local content has been calculated using the formula given in clause 3 of SATS 1286, the rates of exchange indicated in paragraph 4.1 above and the following figures:

Bid price, excluding VAT (y)	R
Imported content (x)	R
Stipulated minimum threshold for Local content (paragraph 3 above)	
Local content % as calculated in terms of SATS 1286	

If the bid is for more than one product, a schedule of the local content by product shall be attached.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

RDC 22

THE NATIONAL INDUSTRIAL PARTICIPATION PROGRAMME

INTRODUCTION

The National Industrial Participation (NIP) Programme, which is applicable to all government procurement contracts that have an imported content, became effective on the 1 September 1996. The NIP policy and guidelines were fully endorsed by Cabinet on 30 April 1997. In terms of the Cabinet decision, all state and parastatal purchases / lease contracts (for goods, works and services) entered into after this date, are subject to the NIP requirements. NIP is obligatory and therefore must be complied with. The Industrial Participation Secretariat (IPS) of
the Department of Trade and Industry (DTI) is charged with the responsibility of administering
the programme.

1 PILLARS OF THE PROGRAMME

1.1 The NIP obligation is benchmarked on the imported content of the contract. Any contract having an imported content equal to or exceeding US$ 10 million or other currency equivalent to US$ 10 million will have a NIP obligation. This threshold of US$ 10 million can be reached as follows:

(a) Any single contract with imported content exceeding US$10 million.
or

(b) Multiple contracts for the same goods, works or services each with imported content exceeding US$3 million awarded to one seller over a 2 year period which in total exceeds US$10 million. or

(c) A contract with a renewable option clause, where should the option be exercised the total value of the imported content will exceed US$10 million. or

(d) Multiple suppliers of the same goods, works or services under the same contract, where the value of the imported content of each allocation is equal to or exceeds US$ 3 million worth of goods, works or services to the same government institution, which in total over a two (2) year period exceeds US$10 million.

1.2 The NIP obligation applicable to suppliers in respect of sub-paragraphs 1.1 (a) to 1.1 (c) above will amount to 30 % of the imported content whilst suppliers in respect of paragraph 1.1 (d) shall incur 30% of the total NIP obligation on a *pro-rata* basis.

1.3 To satisfy the NIP obligation, the DTI would negotiate and conclude agreements such as investments, joint ventures, sub-contracting, licensee production, export promotion, sourcing arrangements and research and development (R&D) with partners or suppliers A period of seven years has been identified as the time frame within which to discharge the obligation

2. REQUIREMENTS OF THE DEPARTMENT OF TRADE AND INDUSTRY

2.1 In order to ensure effective implementation of the programme, successful bidders (contractors) are required to, immediately after the award of a contract that is in excess of **R10 million** (ten million Rands), submit details of such a contract to the DTI for reporting purposes.

2.2 The purpose for reporting details of contracts in excess of the amount of R10 million (ten million Rands) is to cater for multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same

goods, works or services under the same contract as provided for in paragraphs 1.1.(b) to 1.1. (d) above.

3 BID SUBMISSIONS AND CONTRACT REPORTING REQUIREMENTS OF BIDDERS AND SUCCESSFUL BIDDERS (CONTRACTORS)

3.1 Bidders are required to sign and submit this Standard Bidding Document (SBD 5) together with the bid on the closing date and time.

3.2 In order to accommodate multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same goods, works or services under the same contract as indicated in sub-paragraphs 1.1 (b) to 1.1 (d) above and to enable the DTI in determining the NIP obligation, successful bidders (contractors) are required, immediately after being officially notified about any successful bid with a value in excess of R10 million (ten million Rands), to contact and furnish the **DTI with the following information**:

- Bid / contract number.
- Description of the goods, works or services.
- Date on which the contract was accepted.
- Name, address and contact details of the government institution.
- Value of the contract.
- Imported content of the contract, if possible.

3.3 The information required in paragraph 3.2 above must be sent to the Department of Trade and Industry, Private Bag X 84, Pretoria, 0001 for the attention of Mr Elias Malapane within five (5) working days after award of the contract. Mr Malapane may be contacted on telephone (012) 394 1401, facsimile (012) 394 2401 or e-mail at Elias@thedti.gov.za for further details about the programme.

4 PROCESSES TO SATISFY THE NIP OBLIGATION

4.1 Once the successful bidder (contractor) has made contact with and furnished the DTI with the information required, the following steps will be followed:

a. the contractor and the DTI will determine the NIP obligation;
b. the contractor and the DTI will sign the NIP obligation agreement;
c. the contractor will submit a performance guarantee to the DTI;
d. the contractor will submit a business concept for consideration and approval by the DTI; upon approval of the business concept by the DTI, the contractor will submit detailed business plans outlining the business concepts;
e. the contractor will implement the business plans; and
f. the contractor will submit bi-annual progress reports on approved plans to the DTI.

4.2 The NIP obligation agreement is between the DTI and the successful bidder (contractor) and, therefore, does not involve the purchasing institution.

Bid number …….. **Closing date**:……

Name of bidder……

Postal address ……

……

Signature…….. **Name (in print**) ……..

Date……..

FORM RDD 1
EVALUATION SCHEDULE: EQUIPMENT, DESIGN AND CONTRACTOR REQUIREMENTS

PART A: AFC

The tenderer must respond to the Equipment, design and contractor requirements schedule in accordance with Part C3 Section 2 which shall include a detailed description of the solution as well as a statement of compliance, the general format of which is indicated in the table below.

The Tenderer is to insert the pages necessary for the solution description, supporting documents, diagrams etc.

The Tenderer is complete the table below, indicating the 3rd party Top-up sites as per clause Part C3 Section 2.4.6.4.1

Table 1: 3rd Party Top up sites on TE and Feeder routes

TRUNK EXTENSION ROUTES					
Route TE5					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	7	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
TE5-1	29.398061,-23.850322				0
TE5-2	29.400011,-23.840973				
TE5-3	29.392357,-23.842531				
TE5-4	29.386790,-23.840920				
TE5-5	29.391791,-23.835955				
TE5-6	29.382671,-23.848603				
TE5-7	29.385227,-23.854357				

Route TE6					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	10	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
TE6-1a	29.376576,-23.829225				0
TE6-1b	29.377026,-23.829367				
TE6-2	29.361819,-23.836142				
TE6-3	29.345666,-23.839948				
TE6-4	29.339391,-23.84104				
TE6-5	29.351798,-23.838746				
TE6-6	29.354139,-23.847207				
TE6-7	29.361695,-23.854234				
TE6-8	29.369785,-23.852941				
TE6-9	29.376356,-23.853661				

Route TE7					
Implementation phase	**2**	**GPS (LONG, LAT)**			
QTY Stops	9	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
TE7-1	29.367424,-23.817684				0
TE7-2	29.362421,-23.821266				
TE7-3a	29.352925,-23.824387				
TE7-3b	29.352788,-23.824340				
TE7-4a	29.347674,-23.828388				
TE7-4b	29.347667,-23.828209				
TE7-5	29.337620,-23.831966				
TE7-6	29.362789,-23.827084				
TE7-7	29.367464,-23.831022				

FEEDER ROUTES					
Route F2a					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	14	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F2a-0	29.447852,-23.903115				0
F2a-1	29.454543,-23.901665				
F2a-2	29.458065,-23.896897	F6b-9			
F2a-3	29.467477,23.894451	F6b-8			
F2a-4	29.473384,-23.892186				
F2a-5	29.478992,-23.888872				
F2a-6	29.48466,-23.884575				
F2a-7	29.491852,-23.889578	F2b-11, F2b-6			
F2a-8	29.483809,-23.896192	F2b-12, F2b-5			
F2a-9	29.475772,-23.902361	F2b-13, F2b-4			
F2a-10	29.47195,-23.901213	F2b-14			
F2a-11	29.46514,-23.902111	F2b-15			
F2a-12	29.458319,-23.903474	F2b-16			
F2a-13	29.449118,-23.905319	F4-2, F6b-11, F6a-13, F6c-11			

FEEDER ROUTES					
Route F2a					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	14	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F2a-0	29.447852,-23.903115				0
F2a-1	29.454543,-23.901665				
F2a-2	29.458065,-23.896897	F6b-9			
F2a-3	29.467477,23.894451	F6b-8			
F2a-4	29.473384,-23.892186				
F2a-5	29.478992,-23.888872				
F2a-6	29.48466,-23.884575				
F2a-7	29.491852,-23.889578	F2b-11, F2b-6			
F2a-8	29.483809,-23.896192	F2b-12, F2b-5			
F2a-9	29.475772,-23.902361	F2b-13, F2b-4			
F2a-10	29.47195,-23.901213	F2b-14			
F2a-11	29.46514,-23.902111	F2b-15			
F2a-12	29.458319,-23.903474	F2b-16			
F2a-13	29.449118,-23.905319	F4-2, F6b-11, F6a-13, F6c-11			

Route F2b					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	18	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F2b-0	29.449467,-23.909719	F1-0, F3-0, S-0			0
F2b-1	29.453788,-23.90887	F1-1, F3-1,			
F2b-2	29.458158,-23.908	F1-2, F3-2			
F2b-3	29.468184,-23.906012	F1-3			
F2b-4	29.476265,-23.90209	F2b-13, F2a-9			
F2b-5	29.484116,-23.895646	F2b-12, F2a-8			
F2b-6	29.492475,-23.888791	F2b-11, F2a-7			
F2b-7	29.500704,-23.882114	F2b-10			
F2b-8	29.510208,-23.875808	F2b-9			
F2b-9	29.511897,-23.874944	F2b-8			
F2b-10	29.500677,-23.882421	F2b-7			
F2b-11	29.491778,-23.889625	F2a-7, F2b-6			
F2b-12	29.483831,-23.896167	F2a-8, F2b-5			
F2b-13	29.475726,-23.902363	F2a-9, F2b-4			
F2b-14	29.471948,-23.901217	F2a-10			
F2b-15	29.465109,-23.90214	F2a-11			
F2b-16	29.45832,-23.903471	F2a-12			
F2b-17	29.449106,-23.905319	F2a-13, F6a-13, F6b-11, F6c-11, F4-1			

Route F4					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	13	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F4-0	29.447878,-23.903123	F2a-0			0
F4-1	29.449106,-23.905321	F2a-13, F2b-17, F6b-11, F6c-11			
F4-2	29.443464,-23.906449				
F4-3	29.441191,-23.908434				
F4-4	29.436291,-23.907160				
F4-5	29.435781,-23.911488				
F4-6	29.435293,-23.915843				
F4-7	29.430582,-23.919543				
F4-8	29.428685,-23.91756				
F4-9	29.427212,-23.911777				
F4-10	29.428472,--23.908507				
F4-11	29.430387,-23.904485				
F4-12	29.442775,-23.904123				

The statement of compliance is to be completed as embedded in the requirements document, Part C3 Section 2.

Item	Section Reference in Part C3	Requirement	Comply (C) No Comply (NC) Comply Conditionally (CC)	Qualification
1				
2				
etc				

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

PART B: PTMS

The tenderer must respond to the Equipment, design and contractor requirements schedule in accordance with Part C3 Section 2 which shall include a detailed description of the solution as well as a statement of compliance, the general format of which is indicated in the table below.

The Tenderer is to insert the pages necessary for the solution description, supporting documents, diagrams etc.

The statement of compliance is to be completed as embedded in the requirements document, Part C3 Section 2.

em	Section Reference in Part C3	Requirement	Comply (C) No Comply (NC) Comply Conditionally (CC)	Qualification

1				
2				
etc				

ne undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

erson authorized to sign
ne tender:

Full name (in BLOCK letters): _____

Signature: _____

Date:

FORM RDD 2
EVALUATION SCHEDULE: TENDERER'S RELEVANT PROJECT EXPERIENCE

The tenderer needs to demonstrate the following criteria:

The experience of the tenderer or joint venture partners in the case of an unincorporated joint venture or consortium as opposed to the key staff members / experts in similar projects or similar areas and conditions in relation to the scope of work over the last five years will be evaluated.

Relevant experience must be demonstrated in the field of Automatic Fare Collection Systems (AFC) and (PTMS) as described in the Scope of Works- Part 3.

International experience as well as experience and knowledge of local transportation networks and AFC and PTMS equipment and issues pertinent to the project will be evaluated. Points for the references will be based on the Tenderers work for its clients who have received similar solutions and services;

PART A: AFC *In particular, Tenderers must demonstrate experience in the following areas:*		**PART B: PTMS** *In particular, Tenderers must demonstrate experience in the following areas:*	
1	Implementation of AFC systems in public transport.	1	Implementation of PTMS systems in public transport.
2	Implementation of EMV contactless card based fare collection systems	2	Design of the above systems, including system architecture and detail system design
3	Design of the above systems, including system architecture and detail system design	3	Software development
4	Software development	4	Hardware adaptation / customisation
5	Hardware adaptation / customisation	5	Systems integration
6	Systems integration	6	Setup and configuration of database systems
7	Setup and configuration of database systems	7	Operations and Maintenance of PTMS systems
8	Operations and Maintenance of AFC systems		

Tenderers must complete Form RDD 2: Schedule of Tender's Experience to comply with this schedule.

Current users of the systems (see Form RDD 8: Current Users) should be attached to this schedule:

The scoring of the tenderer's experience will be as follows:

	Tenderer's experience
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in the schedule of experience.
Poor (score 40)	Tenderer has limited experience and limited local knowledge
Satisfactory (score 80)	Tenderer has relevant experience, local knowledge but has not dealt with the critical issues specific to the assignment.

Good (score 90)	Tenderer has extensive experience and a broad knowledge of the local transportation network in relation to the project and has worked previously under similar conditions and circumstances.
Very good (score 100)	Tenderer has outstanding experience in projects of a similar nature.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 2 Continued
SCHEDULE OF TENDERER'S EXPERIENCE

The following is a statement of similar work successfully executed by myself/ourselves.

EMPLOYER, CONTACT PERSON AND TELEPHONE NUMBER.	DESCRIPTION OF CONTRACT	VALUE OF WORK INCLUSIVE OF VAT (RAND)	DATE COMPLETED
1._____ _____ *(Name)* _____ *(Telephone Number)*	_____ _____ _____	_____	_____
2._____ _____ *(Name)* _____ *(Telephone Number)*	_____ _____ _____	_____	_____
3._____ _____ *(Name)* _____ *(Telephone Number)*	_____ _____ _____	_____	_____
4._____ _____ *(Name)* _____ *(Telephone Number)*	_____ _____ _____	_____	_____
5._____ _____ *(Name)* _____ *(Telephone Number)*	_____ _____ _____	_____	_____

Attach additional pages if more space is required)

FORM RDD 3
EVALUATION SCHEDULE: METHODOLOGY AND TECHNICAL APPROACH, PROJECT MANAGEMENT AND PROGRAMME

1) Tenderers shall supply a detailed methodology outlining the system criteria as detailed in the Scope of Works. The approach paper must respond to the scope of work and outline the proposed approach / methodology including that relating to health and safety whilst addressing both design/build and operations phases. The approach paper should articulate what added value the tenderer will provide in achieving the stated objectives for the project.

   The tenderer must as such explain his / her understanding of the objectives of the assignment and the Employer's stated and implied requirements, highlight the issues of importance, and explain the technical approach they would adopt to address them. The approach paper should explain the methodologies which are to be adopted, demonstrate the compatibility of those methodologies with the proposed approach.

   The approach should also include a quality plan which outlines processes, procedures and associated resources, applied by whom and when, to meet the requirements and indicate how risks will be managed and what contribution can be made regarding value management.

2) The detailed Outline System Specification, to include:

PART A: AFC	**PART B: PTMS**
• Detailed information on the proposed system architecture including hardware requirements; software requirements and functionality; and, communication requirements that complies with the Employer's communication system;	• Detailed information on the proposed system architecture including hardware requirements; software requirements and functionality; and, communication requirements that complies with the Employer's communication system;
• Detailed information on the approach taken to integrate all the applications with the AFCS central system;	• Detailed information on the approach taken to integrate all the applications with the PTMS central system;
• Features, capability and flexibility of the proposed AFCS front end, and how other applications can be viewed, controlled and set using the AFCS front end;	• Features, capability and flexibility of the proposed PTMS,
• Approach to supply and installation of equipment and systems;	• Approach to supply and installation of equipment and systems;
• Information on system and communications data security; and	• Information on system and communications data security; and
• Information on the day to day operation of the system.	• Information on the day to day operation of the system.

3) Tenderers shall supply detailed project programme indicating timescales for the system's implementation (showing each phase of implementation); Tenderers should note that the project includes the necessity of working with other Contractors and that this is likely to impact on their project programme.

4) In the project programme, the tenderer shall clearly show the various inception dates as milestones and indicate all systems and equipment to be installed and operational at this date.

5) Tenderers shall provide the timescale of the supply of equipment to the site and installation;

6) Tenderers shall provide details on works that will be carried out by the Tenderer on the Employers premises (if any supply and installation work will be outsourced then all details shall be provided in this Tender submission);

7) Tenderers shall provide information on how the contract will be managed by the Tenderer (details of key personal to be submitted including Curriculum Vitae);Form RDD 7

8) Tenderers shall provide details on how they will work with other Contractors to ensure integrated systems work as specified;

9) Tenderers shall set out a procedure for resolving integrations issues;

10) Tenderers shall provide details on how they will minimise and manage risk.

The tenderer must attach the proposed project programme to this page. At least the following shall be clearly shown on the programme:

- Project implementation phases according to the Sections specified in Part C3 Section 2.2.

(Only complete the table below if any supply and installation work will be outsourced for PART A: AFC)

Name of Supplier	Description of Work	Value of Work

(Only complete the table below if any supply and installation work will be outsourced for PART B: PTMS)

Name of Supplier	Description of Work	Value of Work

The scoring will be as follows:
Marks will be lost if the tenderer does not clearly show what equipment will be installed and which systems will be operational by the inception dates.

	Methodology and Technical Approach, Project Management and Programme
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The technical approach and / or methodology are poor / are unlikely to satisfy project objectives or requirements. The tenderer has misunderstood certain aspects of the scope of work and does not deal with the critical aspects of the project.
Satisfactory (score 80)	The approach addresses the specific project objectives and methodology. The approach identifies the critical characteristics of the project and offers solutions that show an adequate understanding of the systems and services required. The quality plan, manner in which risk is to be managed etc. is adequate.
Good (score 90)	The approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The quality plan and approach to managing risk etc is specifically tailored to the critical characteristics of the project.
Very good (score 100)	Besides meeting the “good” rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches. The approach paper details ways to improve the project outcomes and the quality of the outputs

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.
Person authorized to sign the tender:
Full name (in BLOCK letters):
Signature:
Date:

FORM RDD 4
PART A: AFC
EVALUATION SCHEDULE: OPERATION AND MAINTENANCE PLAN

The tenderer shall display the ability to perform system operation and maintenance as specified in Part C3, Section 3.3.12

The tenderer shall provide his detailed operations and maintenance plan and show how this will meet the Operation Management Requirements, including asset replacement. The operation and maintenance plan shall be attached to this page.

The scoring of the Operational and Maintenance plan will be as follows:

	Operational and Maintenance plan
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The proposed operations and maintenance plan may likely not meet the stated employer's requirements
Satisfactory (score 80)	The proposed operations and maintenance plan may possibly be able to meet the stated employer's requirements
Good (score 90)	The proposed operations and maintenance plan is likely to meet the stated employer's requirements
Very good (score 100)	The proposed operations and maintenance plan is most likely to meet the stated employer's requirements.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 4
PART B: PTMS
EVALUATION SCHEDULE: MAINTENANCE PLAN AND TECHNICAL OPERATIONAL SUPPORT

The tenderer shall display the ability to perform system maintenance and technical operational support as specified in Part C3, Sections 15 to 17.

The tenderer shall provide his detailed maintenance plan and technical operational support and show how this will meet the Operation Management Requirements, including asset replacement. The operation and maintenance plan shall be attached to this page.

The scoring of the Operational and Maintenance plan will be as follows:

	Maintenance plan and technical operational support
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The proposed operations and maintenance plan may likely not meet the stated employer's requirements
Satisfactory (score 80)	The proposed operations and maintenance plan may possibly be able to meet the stated employer's requirements
Good (score 90)	The proposed operations and maintenance plan is likely to meet the stated employer's requirements
Very good (score 100)	The proposed operations and maintenance plan is highly likely to meet the stated employer's requirements.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 5
EVALUATION SCHEDULE: PROPOSED ORGANISATION AND STAFFING

The tenderer should propose the structure and composition of their team i.e. the main disciplines involved, the key staff member / expert responsible for each discipline, and the proposed technical and support staff and site staff. This shall include an organogram. The roles and responsibilities of each key staff member / expert should be set out as job descriptions.

In the case of an association / joint venture / consortium, it should, indicate how the duties and responsibilities are to be shared.

The tenderer must attach his / her organization and staffing proposals to this page. This shall include an organogram showing key roles to address the following:

PART A: AFC		**PART B: PTMS**	
1	Strong Project Management Skills	1	Strong Project Management Skills
2	Contract Management Expertise	2	Contract Management Expertise
3	*AFCS Expertise in NDOT R511 and EMV implementations*	3	*PTMS Expertise in implementations*
4	Software Development Expertise	4	Software Development Expertise
5	Database Expertise	5	Database Expertise
6	Hardware Development Expertise	6	Hardware Development Expertise
7	Training and Skill Transfer Expertise	7	Training and Skill Transfer Expertise
8	Systems Engineering Expertise	8	Systems Engineering Expertise
9	Systems integration expertise, including Network Design and System Integration	9	Systems integration expertise, including Network Design and System Integration
10	Operations and Maintenance expertise	10	Operations and Maintenance expertise

The scoring of the proposed Organization and Staffing will be as follows:

	Proposed Organisation and Staffing
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The organization chart is sketchy, the staffing plan is weak in important areas There is no clarity in allocation of tasks and responsibilities.
Satisfactory (score 80)	The organizational chart is complete and detailed, the technical level and composition of the staffing arrangements are adequate.
Good (score 90)	Besides meeting the “satisfactory” rating, staff are well balanced i.e. they show good co-ordination, complimentary skills, clear and defined duties and responsibilities, and the approach to satisfying local consultants. Some members of the project team have worked together before on limited occasions.
Very good (score 100)	Besides meeting the “good” rating, the proposed team is well integrated and several members have worked together extensively in the past.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 6
EVALUATION SCHEDULE: KEY PERSONNEL AND CURRENT USERS

The experience of assigned staff member in relation to the scope of work will be evaluated from three different points of view:

1) General experience (total duration of professional activity), level of education and training and positions held of each discipline specific team leader.
2) The education, training, skills and experience of the Assigned Staff in the specific sector, field, subject, etc which is directly linked to the scope of work.
3) The key staff members' / experts' knowledge of issues which the tenderer considers pertinent to the project e.g. local conditions, affected communities, legislation, techniques etc.
3) Tenderers shall provide the names and addresses of a minimum of three current users of similar systems provided by the Tenderer. The Employer will approach these users for comments on the performance of these systems and the maintenance and support services offered.

Tenderers must complete Form RDD 6: Key Personnel to comply with this schedule. A CV (see Form RDD 7: Curriculum Vitae Of Key Personnel).

The scoring of the experience of key staff will be as follows:

	Experience of Key Personnel		
	General experience and qualifications	**Adequacy for the assignment**	**Knowledge of issues pertinent to the project**
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule. A score of 0 will also be awarded for any misrepresentation made in the schedule of experience of key personnel.		
Poor (score 40)	Key staff have limited levels of general experience	Key staff have limited levels of project specific education, skills, training and experience	Key staff have limited experience of issues pertinent to the project
Satisfactory (score 80)	Key staff have reasonable levels of general experience	Key staff have reasonable levels of project specific education, skills, training and experience	Key staff have reasonable experience of issues pertinent to the project
Good (score 90)	Key staff have extensive levels of general experience	Key staff have extensive levels of project specific education, skills, training and experience	Key staff have extensive experience of issues pertinent to the project
Very good (score 100)	Key staff have outstanding levels of general experience	Key staff have outstanding levels of project specific education, skills, training and experience	Key staff have outstanding experience of issues pertinent to the project

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 6
KEY PERSONNEL

The tenderer shall list in the table below the key personnel to be engaged for this project. This shall include his proposed Project Manager (PM).

Note: Form RDD 7 must be complete for each person listed below.

	NAME	POSITION/ROLE	LOCAL / NON LOCAL
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

(Attach additional pages if more space is required)

FORM RDD 7
CURRICULUM VITAE OF KEY PERSONNEL

Note: This form should be completed for each key person listed in Form RDD 6

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional membership:	
Name of employer (firm):	
Current position:	**Years with firm:**
Employment record: (list in chronological order starting with earliest work experience)(max 500 words)	
Experience record pertinent to required service: (max 500 words**)**	
Certification: **I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.** _____ _____ *(Signature of person named in schedule)* Date:	

The scoring of form will be conducted as part of and according to RRD6 criteria.

FORM RDD 8
CURRENT USERS OF THE SYSTEM

PART A: AFC

Name and reference contact details	Address	Description of the systems used	Comments on performance of the Systems

PART B: PTMS

Name and reference contact details	Address	Description of the systems used	Comments on performance of the Systems

The scoring of the Current Users of the System will be as follows:

	Current Users of the System
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The tenderer has poor and limited (1-2 projects) experience in the field of AFC/PTMS.
Satisfactory (score 80)	The tenderer has satisfactory and relevant (2-3 projects) experience in the field of AFC/PTMS related projects.
Good (score 90)	The tenderer has good and extensive (3-5 projects) experience in the field of AFC/PTMS related projects.
Very good (score 100)	The tenderer has very good and outstanding (+5 projects) experience in the AFC/PTMS related projects.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date:

FORM RDD 9
EVALUATION SCHEDULE: QUALITY CONTROL PROCEDURES

The quality control practices and procedures which ensure compliance with stated employer's requirements will be evaluated. The Tenderer must include any quality standards certifications such as ISO 9000 and proof of such certification should it exist.

Tenderers must complete and elaborate Form RDD 9: Quality Management Procedures and Systems to comply with this schedule.

	Quality Control Procedures
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The described Quality control procedures are unlikely to ensure compliance with stated employer's requirements
Satisfactory (score 80)	The described Quality control procedures are likely to ensure compliance with stated employer's requirements
Good (score 90)	The described Quality control procedures are very likely to ensure compliance with stated employer's requirements, add to a well-managed project environment and ensure quality deliverables
Very good (score 100)	Quality control procedures are very likely to ensure compliance with stated employer's requirements, add to a well management environment and are highly likely to add value to the project deliverables

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date:

FORM RDD 9
QUALITY MANAGEMENT PROCEDURES AND SYSTEMS

Briefly describe the quality systems incorporated by the tenderer in his organisation, with specific reference to this contract.

TYPE OF WORK (Specify Task or Group of Tasks)	**INTERNAL**	**EXTERNAL**	**NAME OF RESPONSIBLE COMPANY/PERSON** (In case of a person provide qualifications and years of experience)
Factory Testing			
Site Testing			
Materials testing			
Staff accreditation			
Additional quality systems			

FORM RDD 10
EVALUATION SCHEDULE: TRAINING PLAN

1) Tenderers shall provide detail of their proposed training course for the Contractor and the City's staff as defined in this specification document;

2) Tenderers shall provide a training programme including, timescale of implementation, the number of days and hours for training course, the number of sessions proposed and the number of staff to be trained in each session, for implementation and continuing into operations.

Tenderers must complete Form RDD 10: Training Programme to comply with this schedule for Both PART A: AFC and PART B: PTMS .

The scoring of the experience of key staff will be as follows:

	Training Plan
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule.
Poor (score 40)	The training plan proposed may likely not meet the stated employer's requirements
Satisfactory (score 80)	The training plan is likely to meet the stated employer's requirements
Good (score 90)	The training plan is very likely to ensure compliance with stated employer's requirements
Very good (score 100)	The training plan is very likely to ensure compliance with stated employer's requirements and add value to the capability of the operations team.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date: _____

FORM RDD 10
TRAINING PROGRAMME

PART A: AFC

Details of the Proposed Training Course

Name of the Training Course	Timescale of Implementation	Duration of the Training Course	Number of Sessions Proposed	Number of Staff to be trained in each session

FORM RDD 10
TRAINING PROGRAMME

PART B: PTMS

Details of the Proposed Training Course

Name of the Training Course	Timescale of Implementation	Duration of the Training Course	Number of Sessions Proposed	Number of Staff to be trained in each session

FORM RDD 11
SYSTEM COMPATIBILITY AND INTEGRATION

PART A: AFC

The tenderer shall provide detailed information on system compatibility as specified in Part C3 Section 2.4. At least the following shall be addressed in this response:

1. Does the proposed AFCS solution comply with the requirements with NDOT R511. The tenderer shall provide proof of such compliance.
2. Does the AFCS system, sub-systems, database and software use open platforms and standards. List all systems and relevant open platforms/standards.
3. Is the AFCS scalable, so as to accommodate expansion from Phase 1A to that described in Part C4.

PART B: PTMS

The tenderer shall provide detailed information on system compatibility as specified in Part C3 Section 4. At least the following shall be addressed in this response:

1. Does the proposed PTMS solution comply with the requirements of Part C3 Section 4 The tenderer shall provide proof of such compliance.
2. Is the PTMS scalable, so as to accommodate expansion from Phase 1A to Phase 4 as described in Part C4

	Quality Control Procedures
Very poor (score 0)	Very poor response received which does not comply with this evaluation schedule
Poor (score 40)	System compatibility is unlikely to ensure compliance with stated employer's requirements
Satisfactory (score 80)	System compatibility is possibly able to ensure compliance with stated employer's requirements
Good (score 90)	System compatibility is likely to ensure compliance with stated employer's requirements
Very good (score 100)	System compatibility is most likely to ensure compliance with stated employer's requirements

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person authorized to sign the tender:

Full name (in BLOCK letters): _____

Signature: _____

Date:

FORM RDE 1
RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Employer before submission of this tender, amending or amplifying the tender documents, have been taken in account in this tender offer:

	DATE	TITLE OR REFERENCE
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender:

FULL NAME (IN BLOCK LETTERS): .....

SIGNATURE: .....

DATE: .....

FORM RDE 2
PROPOSED AMENDMENTS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in **a covering letter to his tender and reference such letter in this schedule**.

The Tenderer's attention is drawn to clause 3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the Employer's handling of material deviations and qualifications.

PAGE	CLAUSE OR ITEM	PROPOSAL

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

.....

Person Authorized to sign Tender: .....

FULL NAME (IN BLOCK LETTERS): .....

SIGNATURE:

DATE:

FORM RDE 3
COST PRICE ADJUSTMENT (CPA)
LOCAL CONTENT (SEIFSA)

Is/Are the tender price/s firm until the end of contract period?

(YES/NO)

If not, the table below must be completed in respect of local content.

LOCAL CONTENT:

Submit the cost factors which will be taken into account in the event of price increase/decrease, as well as the compilation of the tender price/s, i.e. cost price, transport cost, margin of profit, etc.

The base date shall be 26 days prior to the closing date of the tender.

(Also refer to "Conditions of Contract for Design, Build and Operate Projects" First Edition 2008, published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC): Clause 13.8 AND Part C1, paragraph C1.2.2, Particular conditions, Clause 13.8.)

AND

(Also refer to "*Conditions of Contract for Plant and Design Build for Electrical and Mechanical Plant and for Building and Engineering Works Designed by the Contractor,"* First Edition 1999 (Yellow Book), published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC), published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC): Clause 13.8 AND Part C1, paragraph C1.2.2, Particular conditions, Clause 13.8.)

	MATERIAL RATES (LOCAL CONTENT)				LABOUR RATES (LOCAL CONTENT)			
	WEIGHTING	**INDEX TABLE (E.G., SEIFSA TABLE G)**	**INDEX FIGURE**	**BASE DATE**	**WEIGHTING**	**INDEX TABLE (E.G., SEIFSA TABLE C3)**	**INDEX FIGURE**	**BASE DATE**
Fixed	a = 0.1				a = 0.1			
Material	b = 0.8	SEIFSA Table G: Statistics SA Production Price Index for Electrical Engineering Materials						
Labour					c = 0.75	SEIFSA Table C3: SEIFSA Index: Actual Labour Cost		
Transport	d = 0.1	Fuel Index: Index for diesel oil Coast and Witwatersrand: Statistics SA Statistical Release P0142.1, Table 12			d = 0.15	Fuel Index: Index for diesel oil Coast and Witwatersrand: Statistics SA Statistical Release P0142.1, Table 12		
Total	1.0				1.0			

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender: .....

FULL NAME (BLOCK LETTERS): .....

SIGNATURE: .....

DATE:

FORM RDE 4
COST PRICE ADJUSTMENT (CPA)
IMPORTED CONTENT (FOREX)

Is/Are the tender price/s firm until the end of contract period? (***YES/NO):***

If not:

IMPORTED CONTENT:

When the price/s is/are subject to the rate of exchange, submit the price basis on which the exchange rate will be based (e.g. F.O.B. value, fixed value in respect of foreign exchange, etc.)

(i) exchange rate upon which the bid price is based

.....

1 USD = ZAR .....

1 EUR = ZAR .....

1 GBP = ZAR

(ii) Which items will be affected by variations in the exchange rate? (Tenderers to provide detailed list with foreign currency value (F.O.B). Attach additional pages if required.)

.....

.....

.....

.....

NB: ***Tenderers are also required to submit a bank statement or an auditor's report regarding the actual exchange rate in respect of the transaction value paid to the overseas supplier.***

FORWARD EXCHANGE RATE COVER
In the event of price/prices being based on the exchange rate, the successful tenderer/s will be required to obtain exchange rate cover in order to protect the Municipality against exchange rate variations.
Proof must be provided that forward Exchange Rate cover has been taken out within 14 days after an order has been placed.
If proof that cover was taken out within 14 days after the order has been placed, is not submitted to the Polokwane Local Municipality, with the invoice, the contract price adjustment will not be accepted and the contract may be cancelled.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender:

FULL NAME (BLOCK LETTERS): .....

SIGNATURE: .....

DATE: .....

PORTION 2: CONTRACT

PART C1: AGREEMENTS AND CONTRACT DATA

PART C1: AGREEMENTS AND CONTRACT DATA

C1.1: PART A: AFC: FORM OF OFFER AND ACCEPTANCE

STAMP

OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the following works:

PART A: THE DESIGN, BUILD, OPERATION, MAINTENANCE AND TRANSFER OF THE POLOKWANE INTEGRATED PUBLIC TRANSPORT SYSTEM (IRPTS) AUTOMATIC FARE COLLECTION SYSTEM (AFC) FOR THREE YEARS

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the returnable schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS

R _____ (*in figures*) _____

_____ (*in words*)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the, Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement, between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract, are contained in

Part T1	Tendering Procedures
Part T2	Returnable Documents
Part C1	Agreements and Contract Data, (which includes this Agreement)
Part C2	Pricing Data
Part C3	Scope of Work
Part C4	Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The Tenderer shall within two weeks after receiving a letter of acceptance, contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of guarantees, proof of insurance and any other documentation to be provided in terms of the

Conditions of Contract identified in the Contract Data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties[1].

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.

2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here.

3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.

4. Any change or addition to the tender documents arising from the above agreements and recorded here shall also be incorporated into the final draft of the Contract.

4.1 **Subject** _____

Details _____

4.2 **Subject** _____

Details _____

4.3 **Subject** _____

Details _____

4.4 **Subject** _____

Details _____

4.5 **Subject** _____

Details _____

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from the amendments to the documents listed in the Tender Data and addenda thereto as

listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether, oral communication or implied during the period between the issue of the tender documents and the receipt by the Tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

FOR AND ON BEHALF OF THE **TENDERER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

FOR AND ON BEHALF OF THE **EMPLOYER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

C1.1: PART B: PTMS: FORM OF OFFER AND ACCEPTANCE

OFFER

STAMP

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the following works:

PART B: THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT FOR THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) TENDER FOR THE PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the returnable schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS

R _____ (*in figures*) _____

_____ (*in words*)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the, Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement, between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract, are contained in

Part T1	Tendering Procedures
Part T2	Returnable Documents
Part C1	Agreements and Contract Data, (which includes this Agreement)
Part C2	Pricing Data
Part C3	Scope of Work
Part C4	Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The Tenderer shall within two weeks after receiving a letter of acceptance, contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties[1].

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

SCHEDULE OF DEVIATIONS

Notes:

5. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.

6. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here.

7. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.

8. Any change or addition to the tender documents arising from the above agreements and recorded here shall also be incorporated into the final draft of the Contract.

4.6 **Subject** _____

Details _____

4.7 **Subject** _____

Details _____

4.8 **Subject** _____

Details _____

4.9 **Subject** _____

Details _____

4.10 **Subject** _____

Details _____

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from the amendments to the documents listed in the Tender Data and addenda thereto as

listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether, oral communication or implied during the period between the issue of the tender documents and the receipt by the Tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

FOR AND ON BEHALF OF THE **TENDERER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

FOR AND ON BEHALF OF THE **EMPLOYER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

C1.1: PART C: COMBINED FORM OF OFFER AND ACCEPTANCE

OFFER

STAMP

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the following works:

PARTC: PROVISION OF THE AUTOMATIC FARE COLLECTION SYSTEM (AFCS) AND PUBLIC TRANSPORT MANAGEMENT (PTMS) SYSTEMS FOR THE POLOKWANE IRPTS FOR 3 YEARS

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the returnable schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

1. **THE TOTAL PRICE FOR PART A: AFC INCLUSIVE OF VALUE ADDED TAX IS**

R _____ (*in figures*) _____

_____ (*in words*)

2. **THE TOTAL PRICE FOR PART B: PTMS INCLUSIVE OF VALUE ADDED TAX IS**

3.

R _____ (*in figures*) _____

_____ (*in words*)

4. **THE TOTAL PRICE FOR PART C (SUM OF PART A AND B ABOVE) INCLUSIVE OF VALUE ADDED TAX IS**

R _____ (*in figures*) _____

_____ (*in words*)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the, Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement, between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract, are contained in

Part T1	Tendering Procedures
Part T2	Returnable Documents
Part C1	Agreements and Contract Data, (which includes this Agreement)
Part C2	Pricing Data
Part C3	Scope of Work
Part C4	Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The Tenderer shall within two weeks after receiving a letter of acceptance, contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties[1].

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

SCHEDULE OF DEVIATIONS

Notes:

9. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.

10. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here.

11. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.

12. Any change or addition to the tender documents arising from the above agreements and recorded here shall also be incorporated into the final draft of the Contract.

4.11 **Subject** _____

Details _____

4.12 **Subject** _____

Details _____

4.13 **Subject** _____

Details _____

4.14 **Subject** _____

Details _____

4.15 **Subject** _____

Details _____

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from the amendments to the documents listed in the Tender Data and addenda thereto as

listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether, oral communication or implied during the period between the issue of the tender documents and the receipt by the Tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

FOR AND ON BEHALF OF THE **TENDERER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

FOR AND ON BEHALF OF THE **EMPLOYER:**

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

C1.2 CONTRACT DATA

PART A: AFC

GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract comprise:

A: The "General Conditions", which form part of the "Conditions of Contract for Design, Build and Operate Projects" First Edition 2008, published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC), (FIDIC Gold Book)

The Contractor is deemed to be acquainted with and in possession of the General Conditions which are obtainable, at a cost, from:
CESA, P O Box 68482, Bryanston, 2021.
Tel: (011) 463 2022 Fax: (011) 463 7383, email:general@asaace.co.za.

And

B: The following "Particular Conditions", which include amendments and additions to such General Conditions. The Particular Conditions of Contract are set out in section C1.2.2 below.

In case of any discrepancy or conflict between these documents, the order of precedence shall be B, A.

VARIATIONS AND ADDITIONS TO THE CONDITIONS OF CONTRACT (PARTICULAR CONDITIONS)

The following "Particular Conditions" pertaining to the **"Conditions of Contract for Design-Build-Operate Projects" First Edition 2008, published by the Fédération Internationale des Ingénieurs Conseils (FIDIC)**, shall apply to this Contract:

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
1.1	**Definitions**
1.1.1	**The contract**
1.1.10	**Replace** the contents of this clause with the following: " **"Contract"** means the Form of Offer and Acceptance, Contract Data, these Conditions, the Specifications, the Drawings, the Schedules, and the further documents (if any), which are listed in the Form of Offer and Acceptance, and further includes drawings and documents or parts thereof, which any of the aforesaid documents incorporate by reference."
1.1.14	**Replace** the contents of this clause with the following: "Contract Data" means the completed pages entitled **C1.2.3 - Data provided by the Employer** and **C1.2.4 - Data provided by the Contractor** which form part of the contract data.
1.1.36	**Replace** the contents of this clause with the following: " **"Employer's Requirements"** means that document entitled part C3 - Scope of Work, as included in the Contract, and any additions and modifications to the Scope of Work in accordance with the Contract. Such document specifies the Works."
1.1.47	**"Laws"** In the 1st line, **replace** "(or state)" with "(or other spheres of government)" and in the 2nd line, after "other laws", **insert** "including the South African Common Law". The Contractor is to assume that POPIA is currently enforced.
1.1.48	**Replace** the contents of this clause with the following: " **"Letter of Acceptance"** means the completed Form of Acceptance as contained in part C1.1 of the contract documents."
1.1.49	**Replace** the contents of this clause with the following: " **"Letter of Tender"** means the Form of Offer as contained in part C.1.1 of the contract document."
1.1.62	**Add** the following paragraph: The terms **"equipment"** and **"plant"** will be interchangeable, with due consideration to context.

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
1.1.68	**Replace** the contents of this clause with the following: " **"Schedules"** means the document(s) completed by the Contractor and submitted with his tender offer, as included in the Contract. Such document(s) may include the Bill of Quantities, data lists, schedules of Rates and Prices, Schedules of Payment and Asset Replacement Schedule."
1.1.70	**Replace** the contents of this clause with the following: " **"Section"** means the Works forming Phases 1A, 1B and 2 respectively, as described in the Scope of Work part C3."
1.1.75	**Replace** the contents of this clause with the following: " **"Tender"** means that section of the Form of Offer and Acceptance called 'Offer' and all other documents which the Contractor submitted as Returnable Documents, as included in the Contract."
1.2	**Interpretation**
1.2 (d)	**Replace** the contents of sub-clause (d) with the following: "The expression "written", "in writing", "notify", "the giving of notice", "giving consent", "as instructed" or "at the request of" means communication, either hand-written or printed by whatever means, including transmission by telefax or e-mail, and resulting in a permanent record. However, such notice, instruction, consent or request is not deemed to have been delivered by virtue of its appearance in the minutes of meetings."
1.5	**Priority of Documents** **Replace** sub-paragraphs items (a) to (i) with: "(a) the Contract Agreement (if any); (b) the Offer and Acceptance, (c) the Particular Conditions of Contract, (d) the General Conditions of Contract, (e) the Employer's Requirements, (f) the Schedules, and (i) the Contractor's Proposal and any other documents forming part of the Contract."
1.6	**Contract Agreement** **Replace** the 1st two sentences with the following: "The Parties shall enter into a Contract Agreement when the Employer issues the Letter of Acceptance (see Particular Condition 1.1.48) and the Contractor has fulfilled his obligations as set out in the Letter of Acceptance. The Contract Agreement shall be in the form prescribed in the tender documents"
3.1	**Employer's Representative's Duties and Authority** After the 3rd paragraph **insert** the following: "In addition to the actions stipulated in the General Conditions whereby the

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	Employer's Representative shall first obtain the approval of the Employer, the Employer's approval shall also be obtained before taking any action under Sub-Clauses 9.3, 11.7, 11.9, 13.3 and 20.1 as amended in these Particular Conditions".
4.2	**Performance Security** **Replace** the 3rd paragraph with: "The Contractor shall deliver the Performance Security to the Employer within 14 days of the date of issue of the Letter of Acceptance. The Performance Security shall be issued by a bank or insurance company registered or licensed as a bank or insurance company to do business in the Republic of South Africa and approved by the Employer and having an office or banking facility in the Republic of South Africa. The Performance Security shall be subject to approval by the Employer and shall be in the form prescribed in the tender documents Part C1.3."
4.4	**Subcontractors** **Change** the title to read "**Subcontractors and Suppliers**" **Change** the 1st sentence to read: "The Contractor shall not subcontract 50% or more of the Works." In the 1st line of the 2nd paragraph, after the word "Subcontractor" **replace** the expression "his agents or employees" with ", Supplier, his agents or employees". **Add** the following paragraph: The Contractor shall include provisions in all sub-contracts for the cession of such sub-contracts to the Employer and at the Employer's discretion in the event of Termination for reasons contemplated under clause 15.2.
4.18	**Protection of the Environment** In the 1st paragraph, 1st sentence **add** "and shall ensure compliance with all the environmental requirements indicated in part C3 Scope of Work." **Add** the following paragraph: "The Contractor shall indemnify the Employer against any liability arising from or in relation to any of the above matters."
4.19	**Electricity, Water and Gas** **Delete** the 3rd paragraph.
4.21	**Progress Reports** In the 1st paragraph, 3rd line, **delete** "in one original and five copies".
6.2	**Rates of Wages and Conditions of Labour** **Add** the following: "The contractor shall submit proof that he/she pays labour at least the minimum

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	wage as prescribed by the government. The Contractor shall verify such proof and submit it monthly to the Employer's Representative."
6.5	**Working Hours** **Replace** the 1st sentence with the following: "No work shall be carried out on Site on Sundays or on any special non-working day stated in the Contract Data, unless:"
6.12	*Add the following new sub-clause:* **6.12 Indemnity by Contractor** The Contractor shall indemnify the Employer and the Employer's appointed Bus Operating Contractors against and from all damages, losses and expenses (including legal fees and expenses) resulting from: (a) the loss of output and delay caused by the slowing down or partial or total stoppage of work by all or any of the Contractor's workforce as a result of a dispute between all or any of the Contractor's workforce and the Contractor. (b) any unlawful, riotous or disorderly conduct by or amongst the Contractor's personnel."
8.1	**Commencement Date** *In the 1st paragraph, delete the 1st sentence, and in the 2nd sentence replace "*42 days after the Contractor receives the Letter of Acceptance" *with* "7 days after the date of issue of the Letter of Acceptance."
8.3	**Programme** *Replace the 1st sentence of the 1st paragraph with "*The Contractor shall submit a detailed programme to the Employer's Representative within 14 days of the Commencement Date." *Add to the items to be included in the programme the following sub-paragraph:* "(f) The Contractor's cash flow forecast. *In the 2nd paragraph replace* "21" *with* "14".
9.6	**Delay Damages relating to Design-Build** *Add the following paragraph:* Where stated in the Contract Data, the Contractor shall be subject to a penalty for each day by which section milestones are exceeded. The Section Milestones are defined under C1.2.3 Data Provided by the Employer.
13.3	**Variation Procedure** *Replace the 3rd paragraph with the following:* "Each instruction to execute a Variation, shall be a written instruction presented in the form of a Variation order. The Variation order shall be presented to the

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	Employer, who shall signify his approval before the order is signed by the Employer's Representative and issued to the Contractor, who shall acknowledge his acceptance by signing the order. The Contractor shall not accept a Variation order that is not approved and signed by the Employer".
13.5	**Provisional Sums** *In the 1st line of sub-paragraph (b) after* "services" *insert* "and including items for which a prime cost sum has been provided in the Schedules".
13.9	*Add the following sub-clause:* **"Forward Exchange Rate Cover and Cost Price Adjustment Imported Content** In the event of price/prices being based on a foreign exchange rate, the successful tenderer/s will be required to obtain and maintain foreign exchange rate forward cover in order to protect the Municipality against exchange rate variations. Proof must be provided that forward Exchange Rate cover has been taken out within 14 days after an order has been placed and annually thereafter. If proof that cover was taken out within 14 days after the order has been placed, is not submitted to the Polokwane Local Municipality, with the invoice, the contract price adjustment will not be accepted and the contract may be cancelled. The contractor shall only be entitled to an adjustment for foreign exchange rates (variation between rate at time of tender and rate at which forward cover is obtained) subject to the following limitations: (a) All imported material and labour items are to be listed in **Form RDE4: "COST PRICE ADJUSTMENT IMPORTED CONTENT"** (b) The proven cost in foreign currency (FOB value) shall be indicated in the form RDE4 and attached schedule together with the rate of exchange on which the tender prices were based, which shall be the SARS ruling rate at the date of tender issue. (c) The rates and prices for the listed imported material and labour items shall be adjusted once only in accordance with the ruling exchange rate at which foreign exchange rate forward cover is obtained. The proof of foreign exchange rate forward cover and the rate shall be provided with the claim. (d) No other adjustments will be considered."
14.3	**Application for Interim Payment Certificates** *In the 1st line of the 2nd paragraph, delete* "in six copies." ***add*** *the following as a final paragraph:* "If, as stated in the Contract Data, a Retention Money Guarantee is permitted and

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	the Contractor elects to furnish it, the guarantee shall, at the cost of the Contractor, be executed by an insurance company or bank in a form approved by the Employer. The said company or bank shall be registered or licensed to do business in the Republic of South Africa and shall have an office and banking facility in the Republic of South Africa and shall be subject to approval by the Employer. The aggregate liability under the guarantee shall be the maximum amount of retention monies to be retained by the Employer, which amount shall be as stated in the Contract Data. Other conditions, if any, additional to the above standard conditions shall be as stated in the Contract Data. The guarantee shall expire on the date on which the last of the retention monies (which, but for the guarantee, would have been retained by the Employer) becomes payable to the Contractor. The guarantee shall be returned to the guarantor upon final payment of the aggregate liability or on the date of expiry, whichever is the earlier.”
14.6	**Payment for Plant and Materials intended for the Works** *In the 3rd paragraph, delete sub-paragraphs (b) and (c) (i) and amend sub-paragraph (a) so that (c) (ii) becomes (a) (iii) thus;* “(a) (i) …… are available for inspection; and (a) (ii) …… supported by satisfactory evidence; and (a) (iii) the relevant Plant and Materials have been delivered to and installed or mounted in equipment racks in the TMC, in stations/depots or mounted in vehicles.”
14.8	**Payment** *Delete sub-paragraph (a).* *In sub-paragraphs (b) and (c) of the 1st paragraph replace* “56” *with* “44”. *Delete the 2nd paragraph.*
14.9	**Delayed Payment** *Replace the 2nd paragraph with the following:* “These financing charges shall be at the rate prescribed in terms of the Prescribed Rate of Interest Act, 1975 (Act No 55 of 1975)”.

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
14.11	**Application for Final Payment Certificate Design-Build** *In the 2nd line of the 1st paragraph delete* "and five copies of". *In the 3rd paragraph, add:* "Thereafter, when the dispute is finally resolved, the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement."
15.2	**Termination by the Employer** *Add the following sub-paragraph:* " (i) Misrepresented , whether innocently, negligently or fraudulently, the true facts requested in the tender documents." *Insert the following after the expression f) or g) in the last line of the second paragraph;* "or i)" *Replace the full stop at the end of the third paragraph with a comma and add the following:* *" including the right to terminate any other contract between the Employer and the Contractor and to forbid the Contractor or any employee, partner, shareholder or director of the Contractor to tender on any future projects put out to tender by the Employer for a period of five years from the date of notice of termination, which period may be reduced by application to and at the sole discretion of the Employer. In the case of sub-paragraph i), and in addition to any other remedies available to it, the Employer may recover any costs, losses or damages incurred or sustained by it as a result of having to make less favourable arrangements post termination,"*
19	**Insurance**
Add the following: "19.1	**General Requirements** *Replace the second paragraph with the following:* *'The insurances required to be provided herein are the minimum required by the Employer, and the Contractor may, at his own cost, add such other insurances necessary to adequately cover his insurable obligations under the Contract and shall maintain such insurances for the duration of the Contract. The submission of a tender shall be construed as acknowledgement by the Contractor that he is satisfied that any insurance cover affected by the Employer is adequate to supplement that of the Contractor whether necessary.*

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
19.2 (f)	**Insurances to be provided by the Contractor during the Design-Build Period** *Replace paragraph with the following;* *'Other insurances required by Law and by local practice (if any) shall be provided by the Contractor at his own cost and detailed in the Tender response in returnable document RDC 11.'*
19.3 (e)	**Insurances to be provided by the Contractor during the Operation Service Period** *Replace paragraph with the following;* *'Other optional insurances required (if any) shall be provided by the Contractor at his own cost and detailed in the Tender response in returnable document RDC 11.'*

C1.2.3 DATA PROVIDED BY THE EMPLOYER

<table>
<tr><th colspan="2">Clause/Item</th><th>Entry</th></tr>
<tr><td>1.1.32</td><td>Employer's name and Address</td><td><u>THE POLOKWANE LOCAL MUNICIPALITY:</u>
Directorate Transport Services
cnr. Landdros and Bodenstein street
Polokwane</td></tr>
<tr><td>1.1.35</td><td>Employer's Representative's Name and Address</td><td><u>ITS ENGINEERS</u>
29 De Havilland Crescent
Pro Park, Building 1
Persequor Technopark
Pretoria
0020</td></tr>
<tr><td>1.1.78</td><td>Time for Completion of the Works</td><td>Refer to table of Sections (below)
<table>
<tr><th>Phases</th><th>1A</th></tr>
<tr><td>MILESTONE</td><td>Date</td></tr>
<tr><td>Traffic Management Centre</td><td></td></tr>
<tr><td>Depot</td><td></td></tr>
<tr><td>Station 1</td><td></td></tr>
<tr><td>Trunk Buses</td><td></td></tr>
<tr><td>Midi Buses</td><td></td></tr>
<tr><td>Go-live</td><td></td></tr>
</table></td></tr>
<tr><td>1.4
1.4
1.4</td><td>Governing Law
Ruling Language
Language for communications</td><td>Law of the Republic of South Africa
English
English</td></tr>
<tr><td>2.1</td><td>Time for access to the Site</td><td>X days after commencement Date</td></tr>
<tr><td>4.2</td><td>Amount of Performance Security</td><td>10% of the Accepted Contract Amount, in the currencies and proportions in which the Contract Price is payable. The cost to obtain the surety is carried by the Contractor. (Excluding VAT and Contingencies)</td></tr>
<tr><td>5.1</td><td>Period for notifying unforeseeable errors, faults and defects in the Employer's Requirements</td><td>10 days</td></tr>
<tr><td>5.2</td><td>Contractor's Documents requiring approval</td><td>As per the following clauses of Part C3:
2.3.3.5, 2.3.4.6, 2.3.5.2.1 i), 2.3.5.4, 2.3.6.3.3, 2.3.7.11, 2.3.8.19, 2.3.9.5.4, 2.3.10.4, 2.3.11.10 and 2.3.12.7.4</td></tr>
<tr><td>6.5</td><td>Normal working hours</td><td>7h00 to 17h00</td></tr>
<tr><td>8.1</td><td>Commencement of Works</td><td>Period in which works must commence shall be not later than 14 days after the Commencement Date</td></tr>
</table>

Clause/Item		Entry
8.2	Period of the Operations period	3 years with the option to extend by 12 years
9.6	Delay damages	Penalty of a sum per week of one half per cent of the Contract Price of the Works or such section thereof as the case may be. No penalty in respect of any part of the Works which has put into beneficial use. For the purpose of penalty calculation, the final design, development and qualification and IOM documentation stages are deemed to form part of the "go-live" milestone.
9.6	Maximum amount of Delay damages	Penalty shall not in any case exceed 15 % of the total Contract Price.
13.8	Adjustment for Change in Cost; Table(s) of adjustment data	*Refer to Part T2 Cost price adjustment: Local Content: Form RDE 3*
13.9	Forward Exchange Rate Cover and Cost Price Adjustment Imported Content	*Refer to Part T2 Cost Price Adjustment: Imported Content: Form RDE4*
14.2	Total Advance payment	0% of the Accepted Contract Amount
14.3 (c) 14.3 (c) 14.3 (c)	Percentage of retention Limit of Retention Money Guarantee in Lieu of Retention	10% of the first R 500 000 of the value of work and thereafter 5% of the value of the work (excluding operations costs) *There is no limit to the amount of Retention Money* **No Guarantee in Lieu of Retention will be considered**
14.7(b)	Minimum amount of Interim Payment Certificates	R 500 000 R 200 000 during maintenance period
14.15(b)	Payment of damages	Penalties will apply to the late delivery of the following milestones;

Phases	1A
MILESTONE	**Date**
Traffic Management Centre	
Depot	
Station 1	
Trunk Buses	
Midi Buses	
Go-live	

DATA PROVIDED BY THE TENDERER

CLAUSE / ITEM		ENTRY
1.1.17	Contractor's Legal name and address	Name: _____ Address:_____ _____
1.1.22	The authorised and designated representative of the Contractor is:	Name: _____ Position:_____ _____
1.3	The address for receipt of communications is:	Address:_____ Telephone:_____ e-mail: _____

C1.3 FORM OF PERFORMANCE SECURITY
DEMAND GUARANTEE

TO: POLOKWANE LOCAL MUNICIPALITY:
Directorate Transportation Services
Cnr Landdros Maree and Bodenstein Street
POLOKWANE
0700

Note to Tenderer

This pro forma is for information only. The successful tenderer's guarantor will need to reproduce it without amendment, omission or addition for completion and lodgement with the employer. A separate copy of this pro forma will be issued to the successful tenderer with the letter of acceptance.

CONTRACT NO: PM/69/2017

THE DESIGN, BUILD, OPERATION, MAINTENANCE AND TRANSFER OF THE POLOKWANE INTEGRATED PUBLIC TRANSPORT SYSTEM (IRPTS) AUTOMATIC FARE COLLECTION SYSTEM (AFCS) FOR THREE YEARS

1. I/We_____, the undersigned, and_____

   in our respective capacities as_____and _____

   and as such duly authorised to represent: _____
   (hereinafter referred to as "the Guarantor")(in the case of a company a resolution to be attached)

. do hereby hold at your disposal the amount of _____

. (R_____) for the due fulfilment by_____
   (*insert the name of Contractor)* (hereinafter referred to as "the Contractor") of its obligations to the Polokwane Municipality (hereinafter referred to as "POLOKWANE") in terms of the above stated contract between the Contractor and POLOKWANE.

2. The Guarantor hereby renounces the benefits of the exceptions *non numeratae pecuniae, non causa debiti, excussionis* and *divisionis*, the meanings and effect whereof we declare ourselves to be fully conversant.

3. The Guarantor undertakes and agrees to pay to POLOKWANE the said amount of R_____
   or such portion as may be demanded on receipt of a written demand from POLOKWANE, which demand may be made by POLOKWANE if, (in your opinion and at your sole discretion), the said Contractor fails and/or neglects to commence the work as prescribed in the contract or if he fails and/or neglects to proceed therewith or if, for any reason, he fails and/or neglects to complete the services in accordance with the conditions of contract, or if he fails or neglects to refund to POLOKWANE any amount found to be due and payable to POLOKWANE, or if his estate is sequestrated or if he surrenders his estate in terms of the Insolvency Law in force within the Republic of South Africa.

4. Subject to the above and without in anyway detracting from your rights to adopt any of the procedures set out in the contract, the said demand can be made by you at any stage.

5. The said amount of R _____or such portion as may be demanded may be retained by POLOKWANE on condition that after completion of the service, as stipulated in the contract, POLOKWANE shall account to the Guarantor showing how this amount has been utilised and refund to the Guarantor any balance due.

6. This guarantee is neither negotiable nor transferable and

   (a) must be surrendered to the Guarantor at the time when POLOKWANE accounts to the Guarantor in terms of clause 5 above, or
   (b) shall lapse upon the issue of the Contract Completion Certificate in terms of sub clause 8.6 of the General Conditions of Contract and
   (c) shall not be interpreted as extending the Guarantor's liability to anything more than payment of the amount guaranteed.

7. This guarantee shall be governed by South African Law and subject to the jurisdiction of South African Courts.

This document is not negotiable or transferable.

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

ANNEXURE A

LIST OF INSTITUTIONS FROM WHO CONTRACT/DEPOSIT GUARANTEES CAN BE ACCEPTED (TO BE VERIFIED).

1. ABSA Bank
2. Credit Agricole Indosuez (South Africa Branch)
3. Development Bank of South Africa
4. FirstRand Bank
5. ING Bank N.V. (South Africa Branch)
6. Investec Bank
7. Landbank
8. National Housing Finance Co.
9. Nedcor Bank
10. South African Reserve Bank
11. Standard Bank
12. AIG South Africa
13. Credit Guarantee Insurance Co
14. Emerald Insurance Company
15. Federated Employers Mutual Assurance Co
16. Global Insurance Company
17. Guardrisk Insurance Company
18. Hannover Re:
19. Home Loan Guarantee Company
20. Lion of Africa Insurance Company
21. Metropolitan Life
22. Metropolitan Odyssey Ltd
23. MUA Insurance
24. Mutual & Federal Insurance Company
25. Rand Mutual Assurance Company
26. Regent Insurance Company
27. SA Eagle Insurance Company
28. Lombard Insurance.

C1.4: HEALTH AND SAFETY AGREEMENT

ARTICLE OF AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL SAFETY ACT, 1993 BETWEEN

POLOKWANE LOCAL MUNICIPALITY
(Hereinafter referred to as the "EMPLOYER")
AND

_____

_____

_____

_____

Herein represented by _____in his/her capacity as_____

duly authorised by virtue of a resolution dated_____,

Attached hereto Annexure A, of the said _____

(herein after referred to as the "CONTRACTOR")_____

_____

WHEREAS the CONTRACTOR is the mandatory of the EMPLOYER as contemplated in an agreement in respect of _____

_____

_____

Contract number_____

AND WHEREAS section 37 of the Occupational Health and Safety act, 1993 (Act 85 of 1993, hereinafter referred to as the "ACT"), imposes certain powers and duties upon the EMPLOYER.

AND WHEREAS the parties have agreed to enter into an agreement in terms of section 37(2) of the ACT.

NOW THEREFORE the parties agree as follows:

a) The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.

b) The CONTRACTOR undertakes that all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations will be fully complied with. Provided that should the EMPLOYER prescribe certain arrangements and procedures, that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and

procedures.

c) The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedure, if any, imposed by the ACT and Regulations and the EMPLOYER expressly absolves the EMPLOYER from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedure as the case may be.

d) The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with the undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to inspect any appropriate records held by the CONTRACTOR or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

e) The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigations, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such an investigation, complaint or criminal charge as the case may be.

FOR AND ON BEHALF OF THE **EMPLOYER**:

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

FOR AND ON BEHALF OF THE **CONTRACTOR**:

NAME(s) (in block letters):_____

CAPACITY of authorized agents:_____

SIGNATURE(s) of authorized agents: _____

SIGNED at_____on this _____day of_____

WITNESSES: (Full name – in block letters – and signature)

1._____

2._____

C1.2 CONTRACT DATA

PART B: PTMS

GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract comprise:

A: The "General Conditions", which form part of the ***"Conditions of Contract for Plant and Design Build for Electrical and Mechanical Works and for Building and Engineering Works Designed by the Contractor,"*** First Edition 1999 (Yellow Book), published by the Fédération Internationale des Ingénieurs- Conseils (FIDIC).

The Contractor is deemed to be acquainted with and in possession of the General Conditions which are obtainable, at a cost, from:
CESA, P O Box 68482, Bryanston, 2021.
Tel: (011) 463 2022 Fax: (011) 463 7383, email:general@asaace.co.za.

And

B: The following "Particular Conditions", which include amendments and additions to such General Conditions. The Particular Conditions of Contract are set out in section C1.2.2 below.

In case of any discrepancy or conflict between these documents, the order of precedence shall be B, A.

VARIATIONS AND ADDITIONS TO THE CONDITIONS OF CONTRACT (PARTICULAR CONDITIONS)

The following "Particular Conditions" pertaining to the ***"Conditions of Contract for Plant and Design Build for Electrical and Mechanical Works and for Building and Engineering Works Designed by the Contractor,"*** First Edition 1999 (Yellow Book) shall apply to this Contract:

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
1.1	**Definitions**
1.1.1	**The contract**
1.1.1.1	**Replace** the contents of this clause with the following: " **"Contract"** means the Form of Offer and Acceptance, Contract Data, these Conditions, the Specifications, the Drawings, the Schedules, and the further documents (if any), which are listed in the Form of Offer and Acceptance, and further includes drawings and documents or parts thereof, which any of the aforesaid documents incorporate by reference."
1.1.1.1	**Add** the contents of this clause with the following: "Contract" means the completed pages entitled **C1.2.3 - Data provided by the Employer** and **C1.2.4 - Data provided by the Contractor** which form part of the contract data."
1.1.5.4 1.1.5.8	**Add** the contents of this clause with the following: " **"Permanent Works"** means that document entitled part C3 - Scope of Work, as included in the Contract, and any additions and modifications to the Scope of Work in accordance with the Contract. Such document specifies the Works."
1.1.5.6	**Replace** the contents of this clause with the following: " **"Section"** means the Works forming Phases 1A, 1B and 2 respectively, as described in the Scope of Work part C3." For this Contract only Phase 1A will be implemented.
1.1.6.5	**"Laws"** In the 1st line, **replace** "(or state)" with "(or other spheres of government)" and in the 2nd line, after "other laws", **insert** "including the South African Common Law".
1.1.6	**Add** the contents of this clause with the following: " **"Letter of Acceptance"** means the completed Form of Acceptance as contained in part C1.1 of the contract documents."
1.1.6	**Add** the contents of this clause with the following: " **"Letter of Tender"** means the Form of Offer as contained in part C.1.1 of the contract document."
1.1.6	**Add** the contents of this clause with the following: "**"Schedules"** means the document(s) completed by the Contractor and submitted with his tender offer, as included in the Contract. Such document(s) may include the Bill of Quantities, data lists, schedules of Rates and Prices, Schedules of Payment and Asset Replacement Schedule."

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
1.1.6	**Add** the contents of this clause with the following: " **"Tender"** means that section of the Form of Offer and Acceptance called 'Offer' and all other documents which the Contractor submitted as Returnable Documents, as included in the Contract."
1.2	**Interpretation**
1.2 (d)	**Replace** the contents of sub-clause (d) with the following: "The expression "written", "in writing", "notify", "the giving of notice", "giving consent", "as instructed" or "at the request of" means communication, either hand-written or printed by whatever means, including transmission by telefax or e-mail, and resulting in a permanent record. However, such notice, instruction, consent or request is not deemed to have been delivered by virtue of its appearance in the minutes of meetings."
1.5	**Priority of Documents** **Replace** sub-paragraphs items (a) to (i) with: "(a) the Contract Agreement; (b) the Offer and Acceptance, (c) the Particular Conditions of Contract, (d) the General Conditions of Contract, (e) the Employer's Requirements, (f) the Schedules, and (i) the Contractor's Proposal and any other documents forming part of the Contract."
1.6	**Contract Agreement** **Replace** the 1st two sentences with the following: "The Parties shall enter into a Contract Agreement when the Employer issues the Letter of Acceptance (see Particular Condition 1.1.48) and the Contractor has fulfilled his obligations as set out in the Letter of Acceptance. The Contract Agreement shall be in the form prescribed in the tender documents"
3.1	**Engineer's Duties and Authority** After the 3rd paragraph **insert** the following: "In addition to the actions stipulated in the General Conditions whereby the Engineer shall first obtain the approval of the Employer, the Employer's approval shall also be obtained before taking any action under Sub-Clauses 9.3, 11.7, 11.9, 13.3 and 20.1 as amended in these Particular Conditions".
4.2	**Performance Security** **Replace** the 3rd paragraph with: "The Contractor shall deliver the Performance Security to the Employer within 14 days of the date of issue of the Letter of Acceptance. The Performance Security shall be issued by a bank or insurance company registered or licensed as a bank or insurance company to do business in the Republic of South Africa and approved by the Employer and having an office or banking facility in the Republic of South Africa. The Performance Security shall be subject to approval by the Employer and shall be in the form prescribed in the tender documents Part C1.3."

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
4.4	**Subcontractors** **Change** the 1st sentence to read: "The Contractor shall not subcontract 50% or more of the Works." *Add the following at the end of the Clause:* The tenderer shall during the tender stage identify work/materials, etc. that can be subcontracted to an Exempted Micro Enterprise (EME) and/or Qualifying Small Enterprise (QSE) and specify in a separate schedule (see Part T2, Form RDC 15) these items with estimates of the approximate values. Preferably 30% of the local content should be sub-contracted to EME's and/or QSE's. After tender award, the Municipality will make available a list of potential subcontractors registered on a database approved by National Treasury. As far as possible sub-contractors from within the relevant geographical work areas shall be used. Work identified as such, in the opinion of the Tenderer, should exclude items that are considered high risk or requiring specialized skill. The tenderer shall still provide pricing for all these items in their Pricing Schedule as if the Tenderer will carry out the work himself. The tenderer shall in the separate schedule, containing the items to be subcontracted, tender a mark-up in percentage fee per item if these items are subcontracted to as EME and/or QSE. The mark-up tendered should allow for preparing a quotation document to be filled in by potential subcontractors, training of the subcontractors on the specific work, management and supervision of the work of the subcontractors, measurement of the works and submitting payment certificates. The mark-up should allow for a dedicated person that will train, supervise and mentor the subcontractors to allow them to perform their work as good as possible and to develop into more skilled contractors or individuals. The CV of the person responsible for this must be submitted as part of the tender submission indicating relevant experience in training and mentoring of contractors. The process to identify individuals or subcontractors will be supervised by the ER and / or the Municipality. Quotations for pricing will be obtained for the items identified, and selection of subcontractors and individuals will be done in conjunction with the Municipality and / or the ER."
4.18	**Protection of the Environment** In the 1st paragraph, 1st sentence **add** "and shall ensure compliance with all the environmental requirements indicated in part C3 Scope of Work." **Add** the following paragraph: "The Contractor shall indemnify the Employer against any liability arising from or in relation to any of the above matters."
4.19	**Electricity, Water and Gas** **Delete** the 3rd paragraph.
4.21	**Progress Reports** In the 1st paragraph, 2nd line, **delete** "in six copies".

6.2	**Rates of Wages and Conditions of Labour** **Add** the following: "The contractor shall submit proof that he/she pays labour at least the minimum wage

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	as prescribed by the government. The Contractor shall verify such proof and submit it monthly to the Employer's Representative."
6.5	**Working Hours** **Replace** the 1st sentence with the following: "No work shall be carried out on Site on Sundays or on any special non-working day stated in the Contract Data, unless:"
6.12	*Add the following new sub-clause:* **6.12 Indemnity by Contractor** The Contractor shall indemnify the Employer and the Employer's appointed Vehicle Operating Contractors against and from all damages, losses and expenses (including legal fees and expenses) resulting from: (a) the loss of output and delay caused by the slowing down or partial or total stoppage of work by all or any of the Contractor's workforce as a result of a dispute between all or any of the Contractor's workforce and the Contractor. (b) any unlawful, riotous or disorderly conduct by or amongst the Contractor's personnel."
8.1	**Commencement of Work** *In the 1st paragraph, delete the 1st sentence, and in the 2nd sentence replace "*42 days after the Contractor receives the Letter of Acceptance" *with* "7 days after the date of issue of the Letter of Acceptance."
8.2	**Time for Completion** Add the following at the end of this Section. "The Tenderer's attention is drawn to the fact that the contract will be awarded for 3 years, with the intention to amend and extend the maintenance for a longer period, up to an additional 12 years, as allowed for under Section 116 of the Municipal Finance Management Act, Act 56 of 2003 and subject to satisfactory performance by the contractor. The extension of the maintenance period beyond the initial 3 years shall be subject to a review of the contractors performance and the successful completion of the prescribed process to be followed in terms of Section 33 of the municipal finance management act, act 56 of 2003. Polokwane Local Municipality therefore does not guarantee that the contract will extend beyond the initial 3 year period.. In the event of extended maintenance, the Contract shall be subject to review once every 3 years as required by the Municipal Finance Management Act, Act 56 of 2003"
8.3	**Programme** *Replace the 1st sentence of the 1st paragraph with "*The Contractor shall submit a detailed programme to the Employer's Representative within 14 days of the Commencement Date." *Add to the items to be included in the programme the following sub-paragraph:* "(f) The Contractor's cash flow forecast. *In the 2nd paragraph replace* "21" *with* "14".

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
8.7	**Delay Damages** *Add the following paragraph:* Where stated in the Contract Data, the Contractor shall be subject to a penalty for each day by which section milestones are exceeded. The Section Milestones are defined under C1.2.3 Data Provided by the Employer.
10.2	**Taking Over of Parts of the Works** *Delete the 2nd paragraph.* *Between the 3rd and 4th paragraphs insert the following paragraph:* "The Employer may make use of any part of the Permanent Works prior to the issue of a Taking Over-Certificate." *Delete the 5th paragraph.*
13.3	**Variation Procedure** *Replace the 3rd paragraph with the following:* "Each instruction to execute a Variation, shall be a written instruction presented in the form of a Variation order. The Variation order shall be presented to the Employer, who shall signify his approval before the order is signed by the Employer's Representative and issued to the Contractor, who shall acknowledge his acceptance by signing the order. The Contractor shall not accept a Variation order that is not approved and signed by the Employer".
13.5	**Provisional Sums** *In the 1st line of sub-paragraph (b) after* "services" *insert* "and including items for which a prime cost sum has been provided in the Schedules".

13.9	*Add the following sub-clause:* **"Forward Exchange Rate Cover and Cost Price Adjustment Imported Content** In the event of price/prices being based on a foreign exchange rate, the successful tenderer/s will be required to obtain and maintain foreign exchange rate forward cover in order to protect the Municipality against exchange rate variations. Proof must be provided that forward Exchange Rate cover has been taken out within 14 days after an order has been placed and annually thereafter. If proof that cover was taken out within 14 days after the order has been placed, is not submitted to the Polokwane Local Municipality, with the invoice, the contract price adjustment will not be accepted and the contract may be cancelled. The contractor shall only be entitled to an adjustment for foreign exchange rates (variation between rate at time of tender and rate at which forward cover is obtained) subject to the following limitations: (a) All imported material and labour items are to be listed in **Form RDE4: "COST PRICE ADJUSTMENT IMPORTED CONTENT"** (b) The proven cost in foreign currency (FOB value) shall be indicated in the form RDE4 and attached schedule together with the rate of exchange on which the tender

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	prices were based, which shall be the SARS ruling rate at the date of tender issue. (c) The rates and prices for the listed imported material and labour items shall be adjusted once only in accordance with the ruling exchange rate at which foreign exchange rate forward cover is obtained. The proof of foreign exchange rate forward cover and the rate shall be provided with the claim. (d) No other adjustments will be considered."
14.3	**Application for Interim Payment Certificates** *In the 1st line of the 1st paragraph, delete* "in six copies." ***add** the following as a final paragraph:* "If, as stated in the Contract Data, a Retention Money Guarantee is permitted and the Contractor elects to furnish it, the guarantee shall, at the cost of the Contractor, be executed by an insurance company or bank in a form approved by the Employer. The said company or bank shall be registered or licensed to do business in the Republic of South Africa and shall have an office and banking facility in the Republic of South Africa and shall be subject to approval by the Employer. The aggregate liability under the guarantee shall be the maximum amount of retention monies to be retained by the Employer, which amount shall be as stated in the Contract Data. Other conditions, if any, additional to the above standard conditions shall be as stated in the Contract Data. The guarantee shall expire on the date on which the last of the retention monies (which, but for the guarantee, would have been retained by the Employer) becomes payable to the Contractor. The guarantee shall be returned to the guarantor upon final payment of the aggregate liability or on the date of expiry, whichever is the earlier."

14.5	**Plant and Materials intended for the Works** *In the first paragraph delete* "If this Sub-Clause applies". *Delete the 2nd paragraph.* *In the 3rd paragraph:* • *after sub-paragraph (a)(ii), delete the word "*either*"* • *delete the entire sub-paragraph (b) and the word "*or*" following (b)(iii).* *Under sub-paragraph (c), add the word "*and*" at the end of (c)(ii) and add the following:* (iii) " storage is physically separated from any other stock and shall be accessed by a lockable door. A notice shall be posted on the door to clearly show that material is for this Contract. Only one designated person from the Contractor shall have a key to this storage. His name and number shall appear on the notice, and (iv) the Contractor has signed a letter of cession that the stock belongs to PLM, including full asset register with serial numbers, and (v) the Contractor has provided evidence of insurance taken out on the material up to full replacement value against any possible loss of material." *Add the following after paragraph 3:* "The Engineer and/or the Municipality shall have access to the store room / storage space at any reasonable time. The Contractor shall keep the spares stock asset register

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
	up to date and shall re-issue to the Engineer as soon as any stock has been used or replaced. Spares stock, up to the total quantities as per agreed minimum spares list, remaining at the end of Contract will be taken over by PLM. If any excess spares are held by the Contractor, the Contractor can make a proposal to the City to buy back the excess spares. The City however does not guarantee that it will buy back any excess spares over and above that specified in the minimum spares list.”
14.7	**Payment** *Delete sub-paragraph (a).* *In sub-paragraphs (b) and (c) of the 1st paragraph replace* “56” *with* “44”. *Delete the 2nd paragraph.*
14.8	**Delayed Payment** *Replace the 2nd paragraph with the following:* “These financing charges shall be at the rate prescribed in terms of the latest Prescribed Rate of Interest Act”
14.11	**Application for Final Payment Certificate Design-Build** *In the 2nd line of the 1st paragraph delete* “six copies of”. *In the 3rd paragraph, add:* “Thereafter, when the dispute is finally resolved, the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.”
15.2	**Termination by the Employer** *Add the following sub-paragraph:* " (i) Misrepresented , whether innocently, negligently or fraudulently, the true facts requested in the tender documents." *Insert the following after the expression f) or g) in the last line of the second paragraph;* “or i)” *Replace the full stop at the end of the third paragraph with a comma and add the following:* *" including the right to terminate any other contract between the Employer and the Contractor and to forbid the Contractor or any employee, partner, shareholder or director of the Contractor to tender on any future projects put out to tender by the Employer for a period of five years from the date of notice of termination, which period may be reduced by application to and at the sole discretion of the Employer. In the case of sub-paragraph i), and in addition to any other remedies available to it, the Employer may recover any costs, losses or damages incurred or sustained by it as a result of having to make less favourable arrangements post termination,"*
18	**Insurance**

CLAUSE or SUB-CLAUSE	PARTICULAR CONDITION
18.1	**General Requirements for Insurances** Replace this sub-clause with the following: "The Contractor shall effect all insurances to cover all of the Works his insurable obligations under the Contract and shall maintain such insurances for the duration of the Contract. The Employer shall be entitled at his discretion to call for evidence of the scope and validity of such insurance as and when this may be required. The Employer may Instruct the Contractor to take out additional Insurance at his discretion if deemed necessary. This shall be at the cost of the Contractor. If required, the Contractor shall provide proof that he has paid all contributions required in terms of the compensation for Occupational Injuries and Diseases, 1993 (Act No 130 of 1993)."
18.2	**Insurance for Works and Contractor's Equipment** Replace this sub-clause with the following: "The Contractor shall effect all insurances as have been proposed and agreed by the Contractor as being necessary to adequately cover his insurable obligations under the Contract and shall maintain such insurances for the duration of the Contract. The Employer shall be entitled at his discretion to call for evidence of the scope and validity of such insurance as and when this may be required."
18.3	**Insurance against Injury to Persons and Damage to Property** Replace this sub-clause with the following: " The Contractor shall effect all insurances as have been proposed and agreed by the Contractor as being necessary to adequately cover his insurable obligations under the Contract and shall maintain such insurances for the duration of the Contract. The Employer shall be entitled at his discretion to call for evidence of the scope and validity of such insurance as and when this may be required. If required, the Contractor shall provide proof that he has paid all contributions required in terms of the compensation for Occupational Injuries and Diseases, 1993 (Act No 130 of 1993)."
18.4	**Insurance for Contractor's Personnel** Replace this sub-clause with the following: " The Contractor shall effect all insurances as have been proposed and agreed by the Contractor as being necessary to adequately cover his insurable obligations under the Contract and shall maintain such insurances for the duration of the Contract. The Employer shall be entitled at his discretion to call for evidence of the scope and validity of such insurance as and when this may be required. If required, the Contractor shall provide proof that he has paid all contributions required in terms of the compensation for Occupational Injuries and Diseases, 1993 (Act No 130 of 1993)."

Clause/Item		Entry
1.1.2.2 1.1.2.4 & 1.3	Employer's name and Address Employer's Representative's Name and Address	**THE POLOKWANE LOCAL MUNICIPALITY:** Directorate Transport Services cnr. Landros Mare and Bodenstein streets Polokwane **INNOVATIVE TRANSPORT SOLUTIONS (Pty)Ltd** 29 De Havilland Crescent Pro Park, Building 1 Persequor Technopark Pretoria 0020
1.1.3.3	Time for Completion of the Works	"The Contract will be awarded for 3 years, with the intention to amend and extend the maintenance for a longer period, up to an additional 12 years, as allowed for under Section 116 of the Municipal Finance Management Act, Act 56 of 2003 and subject to satisfactory performance by the contractor. The extension of the maintenance period beyond the initial 3 years shall be subject to a review of the Contractors performance and the successful completion of the prescribed process to be followed in terms of Section 33 of the municipal finance management act, act 56 of 2003. Polokwane Local Municipality therefore does not guarantee that the contract will extend beyond the initial 3 year period.."
1.1.3.7	Defects Notification Period	365 days after Taking / Hand-Over
1.1.5.6	Section	Refer to table at the end of C1.2.3.
1.4 1.4 1.4	Governing Law Ruling Language Language for communication	Law of the Republic of South Africa English English
2.1	Time for access to the Site	14 to 28 days after commencement Date, for some of the elements. Access to buses will be phased over a period of 2 to 3 months.
4.2	Amount of Performance Security	10% of the Accepted Contract Amount, in the currencies and proportions in which the Contract Price is payable. The cost to obtain the surety is carried by the Contractor. (Excluding VAT and Contingencies)
5.1	Period for notifying unforeseeable errors, faults and defects in the Employer's Requirements	10 days
5.2	Contractor's Documents requiring	All design documentation as referenced or implied in Part C3. In particular refer to Part C3, Sections 5, 6, 14, 15 or any other document as per the General and/or Particular Conditions of Contract.

Clause/Item		Entry
	approval	
6.5	Normal Working Hours	07h00 to 17h00
8.7 & 14.15(b)	Delay damages	Penalties as indicated for the Section milestones as shown in the definition of Sections (see below). As part of Maintenance, an SLA shall be agreed, including associated maintenance related penalties.
8.7	Maximum amount of Delay damages	Penalty shall not in any case exceed 15 % of the total Contract Price.
13.8	Adjustment for Change in Cost; Table(s) of adjustment data	*Refer to Part T2 Cost price adjustment : Local Content: Form RDE 3*
13.9	Forward Exchange Rate Cover and Cost Price Adjustment Imported Content	*Refer to Part T2 Cost Price Adjustment: Imported Content: Form RDE4*
14.2	Total Advance payment	0% of the Accepted Contract Amount
14.3 (c) 14.3 (c) 14.3 (c)	Percentage of retention Limit of Retention Money Guarantee in Lieu of Retention	10% of the value of the work (excluding maintenance costs) *There is no limit to the amount of Retention Money* **No Guarantee in Lieu of Retention will be considered**
14.15	Currencies of Payment	The currency of payment shall be South African Rand (ZAR)

	Definitions of Sections:		
	Description Sub-clause (1.1.5.6)	**Time for Completion (Sub-clause 1.1.3.3)**	**Delay Damages (Sub-Clause 8.7)**
1.	Control Centre	120 days	R5,000.00 per day
2.	Buses	180 days	R5,000.00 per day
3.	Midi Buses	180 days	R5,000.00 per day
4.	Stations	180 days	R5,000.00 per day
5.	Depot	180 days	R5,000.00 per day
6.	Layover Facility	180 days	R5,000.00 per day

C1.2.4 DATA PROVIDED BY THE CONTRACTOR

CLAUSE / ITEM		**ENTRY**
1.1.17	Contractor's Legal name and address	Name:..... Address:..... .....
1.1.22	The authorised and designated representative of the Contractor is:	Name:..... Position:..... .....
1.3	The address for receipt of communications is:	Address:..... Telephone:..... e-mail:.....

C1.3 FORM OF PERFORMANCE SECURITY

DEMAND GUARANTEE

TO: POLOKWANE LOCAL MUNICIPALITY:
Directorate Transportation Services
Cnr Landros Mare and Bodenstein Street
POLOKWANE
0700

Note to Tenderer

This pro forma is for information only. The successful tenderer's guarantor will need to reproduce it without amendment, omission or addition for completion and lodgement with the employer. A separate copy of this pro forma will be issued to the successful tenderer with the letter of acceptance.

CONTRACT NO: PM/69/2017

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT FOR THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) TENDER FOR THE PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

1. I/We..... , the undersigned, and…….

in our respective capacities as .....and …….

and as such duly authorised to represent: .....
(hereinafter referred to as "the Guarantor")
(in the case of a company a resolution to be attached)

do hereby hold at your disposal the amount of
……
……
……
……

(R……..……) for the due fulfilment by

…….....(*insert the name of Contractor)*

(hereinafter referred to as "the Contractor") of its obligations to the Polokwane Local Municipality (hereinafter referred to as "POLOKWANE") in terms of the above stated contract between the Contractor and POLOKWANE.

2. The Guarantor hereby renounces the benefits of the exceptions *non numeratae pecuniae, non causa debiti, excussionis* and *divisionis*, the meanings and effect whereof we declare ourselves to be fully conversant.

3. The Guarantor undertakes and agrees to pay to POLOKWANE the said amount of

R…….....

or such portion as may be demanded on receipt of a written demand from POLOKWANE, which demand may be made by POLOKWANE if, (in your opinion and at your sole discretion),

the said Contractor fails and/or neglects to commence the work as prescribed in the contract or if he fails and/or neglects to proceed therewith or if, for any reason, he fails and/or neglects to complete the services in accordance with the conditions of contract, or if he fails or neglects to refund to POLOKWANE any amount found to be due and payable to POLOKWANE, or if his estate is sequestrated or if he surrenders his estate in terms of the Insolvency Law in force within the Republic of South Africa.

4. Subject to the above and without in anyway detracting from your rights to adopt any of the procedures set out in the contract, the said demand can be made by you at any stage.

5. The said amount of R ..... or such portion as may be demanded may be retained by POLOKWANE on condition that after completion of the service, as stipulated in the contract, POLOKWANE shall account to the Guarantor showing how this amount has been utilised and refund to the Guarantor any balance due.

6. This guarantee is neither negotiable nor transferable and

   (a) must be surrendered to the Guarantor at the time when POLOKWANE accounts to the Guarantor in terms of clause 5 above, or
   (b) shall lapse upon the issue of the Contract Completion Certificate in terms of sub clause 8.6 of the General Conditions of Contract and
   (c) shall not be interpreted as extending the Guarantor's liability to anything more than payment of the amount guaranteed.

7. This guarantee shall be governed by South African Law and subject to the jurisdiction of South African Courts.

This document is not negotiable or transferable.

NAME(s): (BLOCK LETTERS) _____ _____

CAPACITY of authorized agents: _____ _____

SIGNATURE(s) of authorized agents: _____ _____

SIGNED at _____ on this _____ day of _____

WITNESSE(s): (Full name – in block letters – and signature)

1. ..... _____

2. ..... _____

ANNEXURE A

LIST OF INSTITUTIONS FROM WHO CONTRACT/DEPOSIT GUARANTEES CAN BE ACCEPTED.

1. ABSA Bank
2. Credit Agricole Indosuez (South Africa Branch)
3. Development Bank of South Africa
4. FirstRand Bank
5. ING Bank N.V. (South Africa Branch)
6. Investec Bank
7. Landbank
8. National Housing Finance Co.
9. Nedcor Bank
10. South African Reserve Bank
11. Standard Bank
12. AIG South Africa
13. Credit Guarantee Insurance Co
14. Emerald Insurance Company
15. Federated Employers Mutual Assurance Co
16. Global Insurance Company
17. Guardrisk Insurance Company
18. Hannover Re:
19. Home Loan Guarantee Company
20. Lion of Africa Insurance Company
21. Metropolitan Life
22. Metropolitan Odyssey Ltd
23. MUA Insurance
24. Mutual & Federal Insurance Company
25. Rand Mutual Assurance Company
26. Regent Insurance Company
27. SA Eagle Insurance Company
28. Lombard Insurance.

C1.4: HEALTH AND SAFETY AGREEMENT

ARTICLE OF AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL SAFETY ACT, 1993 BETWEEN

POLOKWANE LOCAL MUNICIPALITY
(Hereinafter referred to as the “EMPLOYER”)
AND

_ _

_ _

_ _

....

Herein represented by .... in his/her capacity as .... duly

authorised by virtue of a resolution dated .... , Attached

hereto Annexure A, of the said ....

.... (herein after referred to as the “CONTRACTOR”)

_ _

WHEREAS the CONTRACTOR is the mandatory of the EMPLOYER as contemplated in an agreement in respect of _

_ _

_ Contract number _ _ _ _ _ _ _ _ _ _ _ _ _

AND WHEREAS section 37 of the Occupational Health and Safety act, 1993 (Act 85 of 1993, hereinafter referred to as the “ACT”), imposes certain powers and duties upon the EMPLOYER.

AND WHEREAS the parties have agreed to enter into an agreement in terms of section 37(2) of the ACT.

NOW THEREFORE the parties agree as follows:

a) The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.

b) The CONTRACTOR undertakes that all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations will be fully complied with. Provided that should the EMPLOYER prescribe certain arrangements and procedures, that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.

c) The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedure, if any, imposed by the ACT and Regulations and the EMPLOYER expressly absolves the EMPLOYER from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedure as the case may be.

d) The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with the undertakings as more fully set out in paragraphs 1 and
2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to inspect any appropriate records held by the CONTRACTOR or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

e) The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigations, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such an investigation, complaint or criminal charge as the case may be.

FOR AND ON BEHALF OF THE **EMPLOYER**:

NAME(s): (BLOCK LETTERS) ----------

CAPACITY of authorized agents: ----------

SIGNATURE(s) of authorized agents: ---------- SIGNED ---------- at

..... on this ..... day of

..... WITNESSES: (Full name – in block letters – and signature)

1. ..... ----------

2. ..... ----------

FOR AND ON BEHALF OF THE **CONTRACTOR**:

NAME(s): (BLOCK LETTERS) ----------

CAPACITY of authorized agents: ----------

SIGNATURE(s) of authorized agents: ---------- SIGNED ---------- at

..... on this ..... day of

..... WITNESSES: (Full name – in block letters – and signature)

1. ..... ----------

2. ..... ----------

PART A: AFC

Part C2: Pricing Data

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS

1. General

1.1 This section provides the tenderer with guidelines and requirements with regard to the completion of the Price Schedule.

1.2 The Price Schedule has been provided in electronic format on the CD as an MS-Excel spreadsheet. The printed sheets have been provided for reference purposes. Tenderers shall not make any changes to the content, format/layout of formulae of the spreadsheet, with the exception of items forming part of the tenderers solution which have not been included in the schedule. Notwithstanding the above the tenderer is responsible for all data provided in the Price Schedule and therefore shall ensure that formulas used in the spreadsheet are correct and that quantities and prices which are calculated are correctly updated. If any errors exist in any of the formulas in the spreadsheet the Unit Price and Rates provided shall take precedence in determining total values. The tenderer may add lines for items not listed in the Price Schedule. The tenderer shall ensure that the line items added shall be provided with Unit Price and Rates as specified above.

1.3 Tenderers shall complete the electronic schedules by inserting all the required rates and lump sums and shall print and sign the completed schedules, and insert them into their tender submissions.

1.4 Tenderers shall ensure that the Pricing Schedule is printed in the same format it appears in this document. In addition to the printed and signed Pricing Schedule, tenderers shall submit an electronic version in MS-Excel format.

1.5 The tenderer is referred to the Tendering Procedures, in regard to the correction of errors. The Price Schedule shall be read with all the documents which form part of this Contract.

1.6 The following words shall have the meanings hereby assigned to them:

1.6.1 Unit: The unit of measurement for each item of work in terms of the Specifications and the Project Specifications.

1.6.2 Quantity: The number of units of work for each item.

1.6.3 Rate: The payment per unit of work at which the tenderer tenders to do the work.

1.6.4 Price: The product of the quantity and the rate tendered for an item.

1.6.5 Lump sum: An amount tendered for an item, the extent of which is described in the

Price Schedule, the Specification and the Scope of Work, but the quantity of work of which is not measured in any units.

1.6.6 Provisional sum: An amount estimated for particular item that is not yet defined in enough detail for tenderers to price.

2. Units of Measurements

2.1. The units of measurement described in the Price Schedule are metric units.

2.2. Abbreviations used in the Price Schedule are as follows:

Abbreviation	Unit
mm	millimetre
h	hour
m	Metre
kg	Kilogram
km	Kilometre
t	Ton
m^2	square metre
no.	number
m^2.pass	square metre pass
sum	lump sum
ha	hectare
MN	meganewton
m^3	cubic metre
MNm	meganewton-metre
m^3.km	cubic metre-kilometre
PC sum	Prime Cost sum
l	litre
Prov. sum	Provisional sum
kl	kilolitre
%	Per cent
MPa	megaspascal
kW	kilowatt

3. Rates

This Price Schedule has columns for unit, quantity, rate and amount for the goods. Entries in these columns are made as follows:

3.1. If the Supplier is to be paid an amount for the goods which is a fixed price for an item or a fixed price for each of a series of items, the tendering supplier enters the amount in the amount column only, the other columns being left blank.

3.2. If the Supplier is to be paid an amount for the goods which is the unit rate for each item multiplied by the quantity of the item supplied, (i.e. a 'Price Schedule' arrangement) - the tendering supplier enters the rate which is then multiplied by the quantity (which has been entered either by him or by the Employer) to produce the amount which is also entered.

3.3. All prices and rates entered in the Price Schedule must be **excluding** VAT. VAT will

be added on the summary page of the Price Schedule

CORRECTION OF ENTRIES MADE BY TENDERER

Any entry made by the Tenderer in the Price Schedule, forms, etc, which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.

C2.2 PREAMBLE TO THE PRICE SCHEDULE

1. General

1.1 All work to be carried out to the relevant COP specifications or as specified in the Scope of Works section C3 and Pricing Instructions section C2.1.

2. Conditions of Contract

2.1 The Price Schedule is to be read in conjunction with the Conditions of Contract and Scope of Work.

3. General Directions and Descriptions

3.1 General direction and descriptions of work and materials are not necessarily repeated in this Price Schedule and reference should be made to the Conditions of Contract and Part C3, Scope of work for this information. Reference's provided in tables are for convenience only.

4. Statutory Obligations

4.1 The rates and prices entered in the Price Schedule shall be deemed to include for compliance with the statutory obligations arising from the appointment and duties of the Contractor.

5. Each Item to be Priced

5.1 Each item of the Price Schedule shall have a rate or price entered against it – such rate or price shall properly reflect the value of the work covered by the item.

5.2 Provisional items must be clearly identified as such, and priced.

5.3 Any major items that the Contractor consider have been omitted from the Schedule must be added by the Contractor in the places provided in the Schedule and described as "...Items not covered elsewhere...".

5.4 Prices for minor items Contractors consider are omitted from the Schedule must be included within prices for appropriate existing Schedule items.

5.5 The Price Schedule provided must be filled in and returned by the Contractor, but the Contractor may include any supplementary or replacement Schedules they wish, provided in full detail.

5.6 Where a quantity is zero, the quantity of the particular item is unknown at the time of tender and may be established prior to the acceptance of the tender or as a variation after contracting, by applying the quoted rate.

6. Prices and Rates to be Inclusive

6.1 The unit costs and total prices inserted in the Price Schedule are to be the full inclusive cost of the work described, including all general risks, liabilities and obligations set forth or implied in the documents.

6.2 The cost of complying with the Conditions of Contract and the requirements set out in Part C3, Scope of work, is to be covered by the prices and rates quoted in the various items of the Price Schedule.

6.3 The following non-exhaustive list of general obligations is to be included in the rates:

- Warranties and extended warranties
- Shipping costs
- Import duties
- Supervision
- Travelling costs, unless where specifically provided for in the Price Schedule
- Insurances

6.4 Un-priced Items

6.4.1 Items against which no price or rate is entered shall be deemed to be covered by the other rates and prices in the Price Schedule.

6.5 Quantities

6.5.1 The Quantities shown in the Price Schedule are indicative.

6.5.2 COP does not guarantee these quantities as minimum or maximum quantities for purchase and reserves the right to re-measure quantities, without limit, if required at the rates provided in the Price Schedule.

6.5.3 However these quantities will be used for evaluation purposes of the total price of the Contractor's Tender.

7. Combined Tender Pricing

7.1 If tenderer submit a combined tender for PART A: AFC and PART B: PTMS the tenderer must submit complete pricing schedules for both Part A and Part B.

C2.3 PRICE SCHEDULES

C2.3.1 Cost Summary

C2.3.1 SUMMARY OF COSTS CARRIED FORWARD FROM PROCEEDING SCHEDULES					
COST TABLE REFERENCE	ITEM	TENDER REF.	REMARKS	UNIT	PHASE 1A AMOUNT
C2.3.1.1	General Items - Design Build	C1 + C3		System wide	
C2.3.1.3	Final Design stage	C3 - 2.3.3		System wide	
C2.3.1.4	Development and Qualification stage	C3 - 2.3.4		System wide	
C2.3.1.5	Installation, Operation and Maintenance Documentation stage	C3 - 2.3.5		System wide	
C2.3.1.6	Production stage	C3 - 2.3.6		System wide	
C2.3.1.7	Installation stage	C3 - 2.3.7		System wide	
C2.3.1.8	Commissioning stage	C3 - 2.3.8,9,10		System wide	
C2.3.1.9	Post-commissioning stage	C3 - 2.3.11,12		System wide	
C2.3.1.10	General Items - Operation Service Period	C1 - 2.3.13		System wide	
C2.3.1.11	Operation Service Period	C3 - 2.3.13		System wide	
	SUB-TOTAL				
	PROVISIONAL CONTINGENCY AT 10% OF THE ABOVE SUB-TOTAL				
	SUB-TOTAL INCLUDING CONTINGENCY PROVISION				
	PROVISIONAL ESCALATION AT 30% OF THE ABOVE SUB-TOTAL				
	SUB-TOTAL (EXCL. VAT, INCLUDING ESCALATION AND CONTINGENCY PROVISION)				
	VAT @ 15%				
	TOTAL (INCL. VAT)				

C2.3.1.1 General Items

C2.3.1.1 General Items - Design Build					PHASE 1A		
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1	Tenderer to specify any general items not already included in the schedules below (lines may be added if necessary).		Care should be taken not to duplicate costs across schedules. Apart from these specified general items, other rates are deemed to be all inclusive.	Specify Unit	Specify qty		
Input 2	All insurances	C1 - 1.2 (19)		Month	12		
Input 3	Project and contract management and administration	C1 + C3, 2		Month	12		
Input 4	Health and safety obligations	C1 + C3		Month	12		
Input 5	Quality assurance	C1 + C3		Month	12		
Input 6	Rights of way and facilities	C1 + C3		Month	12		
Input 7	Environmental protection	C1 + C3		Month	12		
Input 8	Site security	C1 + C3		Month	12		
Input 9	Staff accommodation, subsistence and travel	C1 + C3		Month	12		
Input 10	Office & workshop accommodation	C1 + C3	This refers to facilities specifically used for the project, all other operational requirements of the Contractor are deemed to be covered in the overheads included in the various unit rates.	Month	12		
Input 11	Provision of full performance security, as specified in Part C1	C1		Lump sum	1		
Input 12	Certification of equipment as specified in Part C3	C1 + C3	Cost of all certifications including banking EMV certifications where applicable.	Lump sum	1		
Input 13	Dispute Adjudication Board	C1		Month	12		
Input 14	Software licenses	C3 2.6		Lump sum	1		
Input 15							
Input 16							
Input 17							
SUB-TOTAL EXCL. VAT (Tenderer to check that added items are all included in the sum formula)							

C2.3.1.2 Final Design Stage

C2.3.1.3 Final Design					PHASE 1A		
REF. No.	**ITEM**	**TENDER REF.**	**REMARKS**	**UNIT**	**QTY**	**RATE**	**TOTAL**
Input 1	System wide	C3 - 2.3.3	All inclusive cost of all FD related activities and deliverables, including provision/scalability for all future phases in phase 1A.	Complete system	1		
Input 2							
Input 3							
Input 4							
Input 5							
SUB-TOTAL EXCL. VAT (Tenderer to check that added items are all included in the sum formula)							

C2.3.1.3 Development and Qualification Stage

C2.3.1.4 Development and Qualification					PHASE 1A		
REF. No.	**ITEM**	**TENDER REF.**	**REMARKS**	**UNIT**	**QTY**	**RATE**	**TOTAL**
Input 1	System wide development activities	C3 - 2.3.4	Cost of all D&Q related activities and deliverables, excluding the FAT and PPS, including all software modules, licenses, etc. not specified in other schedules.	Complete system	1		
Input 2	Factory Acceptance Test	C3 - 2.3.4.2.1	All inclusive cost of all FAT related activities and deliverables.	Complete system	1		
Input 3	Pre-production Sample Inspection	C3 - 2.3.4.2.2	All inclusive cost of all PPS related activities and deliverables.	Complete system	1		
Input 4							
Input 5							
Input 6							
SUB-TOTAL EXCL. VAT (Tenderer to check that added items are all included in the sum formula)							

C2.3.1.4 Installation, Operation and Maintenance Documentation stage

C2.3.1.5 Installation, operations and maintenance documentation					PHASE 1A		
REF. No.	**ITEM**	**TENDER REF.**	**REMARKS**	**UNIT**	**QTY**	**RATE**	**TOTAL**
Input 1	Installation documentation	C3 - 2.3.5.1	All inclusive cost of all related activities and deliverables in phase 1A.	Complete system	1		
Input 2	Operations documentation	C3 - 2.3.5.2	All inclusive cost of all related activities and deliverables in phase 1A.	Complete system	1		
Input 3							
Input 4							
Input 5							
Input 6							
SUB-TOTAL EXCL. VAT (Tenderer to check that added items are all included in the sum formula)							

C2.3.1.5 Production Stage

C2.3.1.6 Production						PHASE 1A	
TABLE REF. No	ITEM	TENDER REF.	REMARKS	UNIT	RATE	QTY	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.1	Contactless bank transit cards	C3 - 2.3.6 + C3 - 2.4.6	Supply of card to NDOT specification & branded to IRPTS standard, including logistics and issuing costs.	Each		10 470	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.1	Station with attended ticket sales	C3 - 1.7.2.2.1.2	Carried forward	Complete		1	
	Sales centre						
C2.3.2.4.1	Ticket sales centre	C3 - 1.7.2.2.2		Complete		2	
	On-board Equipment						
C2.3.2.5.1	Trunk buses	C3 - 1.7.2.2.4		Complete		21	
C2.3.2.6.1	Midi Buses	C3 - 1.7.2.2.5		Complete		15	
	Trunk/Feeder Stops						
C2.3.2.7.1	Wayfinding signage	C3 - 1.7.2.2.3.2		Complete		67	
C2.3.2.8.1 - Input 1	3rd Party loading points	C3 - 1.7.2.2.3.1		Complete			
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.1	Depot system	C3 - 1.7.2.3.1		Complete		1	
C2.3.2.9.1	PVU's + docking stations	C3 - 1.7.2.2.4.2		Complete		6	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.1	Central system	C3 - 1.7.2.4.1		Complete		1	
	Disaster recovery centre						
C2.3.2.11.1	Disaster recovery centre	C3 - 1.7.2.4.2		Complete		1	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.1	Banking / Payment System	C3 - 1.7.2.5		Complete		1	
							PHASE 1A

C2.3.1.6 Installation Stage

C2.3.1.7 Installation						PHASE 1A	
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	RATE	QTY	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.2	Contactless bank transit cards	C3 - 2.3.7 + 2.4.6		Each		10 470	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.2	Station with attended ticket sales	C3 - 2.3.7 + 2.4.7.2		Complete		1	
	Sales centre						
C2.3.2.4.2	Ticket sales centre	C3 - 2.3.7 + 2.4.7.4		Complete		2	
	On-board Equipment						
C2.3.2.5.2	Trunk buses	C3 - 2.3.7 + 2.4.7.6		Complete		21	
C2.3.2.6.2	Midi Buses	C3 - 2.3.7 + 2.4.7.6		Complete		15	
	Trunk/Feeder Stops						
C2.3.2.7.2	Wayfinding signage	C3 - 2.3.7 + 2.4.7.5.2		Complete		67	
C2.3.2.8.2 - Input 1	3rd Party loading points	C3 - 2.3.7 + 2.4.7.5.1		Complete			
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.2	Depot system	C3 - 2.3.7 + 2.4.8.1		Complete		1	
C2.3.2.9.2	PVU's + docking stations	C3 - 2.3.7 + 2.4.8.1.7		Complete		6	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.2	Central system	C3 - 2.3.7 + 2.4.9		Complete		1	
	Disaster recovery centre						
C2.3.2.11.2	Disaster recovery centre	C3 - 2.3.7 + 2.4.9		Complete		1	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.2	Banking / Payment System	C3 - 2.3.7 + 2.4.12		Complete		1	
							PHASE 1A

C2.3.1.7 Commissioning Stage

C2.3.1.8 Commissioning						PHASE 1A	
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	RATE	QTY	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.3	Contactless bank transit cards	C3 - 2.3.8,9,10 + 2.4.6		Each		10 470	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.3	Station with attended ticket sales	C3 - 2.3.8,9,10 + 2.4.7.2		Complete		1	
	Sales centre						
C2.3.2.4.3	Ticket sales centre	C3 - 2.3.8,9,10 + 2.4.7.4		Complete		2	
	On-board Equipment						
C2.3.2.5.3	Trunk buses	C3 - 2.3.8,9,10 + 2.4.7.6		Complete		21	
C2.3.2.6.3	Midi Buses	C3 - 2.3.8,9,10 + 2.4.7.6		Complete		15	
	Trunk/Feeder Stops						
C2.3.2.7.3	Wayfinding signage	C3 - 2.3.8,9,10 + 2.4.7.5.2		Complete		67	
C2.3.2.8.3 - Input 1	3rd Party loading points	C3 - 2.3.8,9,10 + 2.4.7.5.1		Complete			
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.3	Depot system	C3 - 2.3.8,9,10 + 2.4.8.1		Complete		1	
C2.3.2.9.3	PVU's and docking stations	C3 - 2.3.8,9,10 + 2.4.8.1.7		Complete		6	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.3	Central system	C3 - 2.3.8,9,10 + 2.4.9		Complete		1	
	Disaster recovery centre						
C2.3.2.11.3	Disaster recovery centre	C3 - 2.3.8,9,10 + 2.4.9		Complete		1	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.3	Banking / Payment System	C3 - 2.3.8,9,10 + 2.4.12		Complete		1	
							PHASE 1A

C2.3.1.8 Post-commissioning Stage

C2.3.1.8 Post-Commissioning						PHASE 1A	
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	RATE	QTY	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.4	Contactless bank transit cards	C3 - 2.3.11 + 2.4.6		Each		10 470	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.4	Station with attended ticket sales	C3 - 2.3.8 + 2.4.7.2		Complete		1	
	Sales centre						
C2.3.2.4.4	Ticket sales centre	C3 - 2.3.8 + 2.4.7.4		Complete		2	
	On-board Equipment						
C2.3.2.5.4	Trunk buses	C3 - 2.3.8 + 2.4.7.6		Complete		21	
C2.3.2.6.4	Midi Buses	C3 - 2.3.8 + 2.4.7.6		Complete		15	
	Trunk/Feeder Stops						
C2.3.2.7.4	Wayfinding signage	C3 - 2.3.8 + 2.4.7.5.2		Complete		67	
C2.3.2.8.4 - Input 1	3rd Party loading points	C3 - 2.3.8 + 2.4.7.5.1		Complete			
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.4	Depot system	C3 - 2.3.8 + 2.4.8.1		Complete		1	
C2.3.2.9.4	PVU's and docking stations	C3 - 2.3.8 + 2.4.8.1.7		Complete		1	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.4	Central system	C3 - 2.3.8 + 2.4.9		Complete		1	
	Disaster recovery centre						
C2.3.2.11.4	Disaster recovery centre	C3 - 2.3.8 + 2.4.9		Complete		1	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.4	Banking / Payment System	C3 - 2.3.8 + 2.4.12		Complete		1	
							PHASE 1A

C2.3.1.9 General Items Operation Service Period

C2.3.1.10 General Items - Operation Service Period					PHASE 1A		
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1	Tenderer to specify any general items not already included in the schedules below (lines may be added if necessary).		Care should be taken not to duplicate costs across schedules. Apart from these specified general items, other rates are deemed to be all inclusive.	Specify Unit	Specify qty		
Input 2	All insurances	C1		Month	36		
Input 3	Project and contract management and administration	C1 + C3		Month	36		
Input 4	Health and safety obligations	C1 + C3		Month	36		
Input 5	Quality assurance	C1 + C3		Month	36		
Input 6	Rights of way and facilities	C1 + C3		Month	36		
Input 7	Environmental protection	C1 + C3		Month	36		
Input 8	Staff accommodation, subsistence and travel	C1 + C3	Where applicable, it is anticipated that the operator will use locally based opertaional staff wherever possible.	Month	36		
Input 9	Office & workshop accommodation	C1 + C3	This refers to facilities specifically used for the project, all other operational requirements of the Contractor are deemed to be covered in the overheads included in the various unit rates.	Month	36		
Input 10	Provision of full performance security, as specified in Part C1	C1		Lump sum	1		
Input 11	Dispute Adjudication Board	C1		Month	36		
Input 12	Independent compliance auditor	C1		Month	36		
Input 13							
Input 14							
Input 15							
SUB-TOTAL EXCL. VAT (Tenderer to check that added items are all included in the sum formula)							

C2.3.1.10 Operational Service Period

C2.3.1.11 Operational Service Period					PHASE 1A	
TABLE REF. No.	**ITEM**	**TENDER REF.**	**REMARKS**	**UNIT**	**QTY**	**TOTAL**
C2.3.1.11.1	Operation	C3 - 2.3.13.4.2		Months	36	
C2.3.1.11.2	Maintenance	C3 - 2.3.13.4.3		Months	36	
C2.3.1.11.3	Banking fees	C3 - 2.3.13 + 2.4.12.8		Months	36	
Input 1	Asset replacement	C3 - 2.3.13.4.3.4 + RDD 4	As detailed in asset replacement schedule	OSP	1	
						PHASE 1A

C2.3.1.10.1 Operation

C2.3.1.11.1 Operation					PHASE 1A		
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	RATE	QTY	OSP	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.5	Contactless bank transit cards	C3 - 2.3.13.4.2.1		R 0,00	4 000	36	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.5	Station with attended ticket sales	C3 - 2.3.13.4.2.2.I		R 0,00	1	36	
	Sales centre						
C2.3.2.4.5	Ticket sales centre	C3 - 2.3.13.4.2.2.II		R 0,00	2	36	
	On-board Equipment						
C2.3.2.5.5	Trunk buses	C3 - 2.3.13.2.2.IV		R 0,00	21	36	
C2.3.2.6.5	Midi Buses	C3 - 2.3.13.2.2.IV		R 0,00	15	36	
	Trunk/Feeder Stops						
C2.3.2.7.5	Wayfinding signage	C3 - 2.3.13.4.2.2.III		R 0,00	67	36	
C2.3.2.8.5 - Input 1	3rd Party loading points	C3 - 2.3.13.4.2.2.III		R 0,00		36	
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.5	Depot system	C3 - 2.3.13.4.2.3		R 0,00	1	36	
C2.3.2.9.5	PVU's and docking stations	C3 - 2.3.13.4.2.3		R 0,00	6	36	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.5	Central system	C3 - 2.3.13.4.2.4		R 0,00	1	36	
	Disaster recovery centre						
C2.3.2.11.5	Disaster recovery centre	C3 - 2.3.13.4.2.4		R 0,00	1	36	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.5	Banking / Payment System	C3 - 2.3.13.4.2.5		R 0,00	1	36	
							PHASE 1A

C2.3.1.10.2 Maintenance

C2.3.1.10.2 Maintenance					PHASE 1A		
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	RATE	QTY	OSP	TOTAL
	LEVEL 0 – FARE MEDIA						
C2.3.2.1.6	Contactless bank transit cards	C3 - 2.3.13.4.3			10 470	36	
	LEVEL 1 – READ/WRITE DEVICES						
	Trunk station system						
C2.3.2.2.6	Station with attended ticket sales	C3 - 2.3.13.4.3			1	36	
	Sales centre						
C2.3.2.4.6	Ticket sales centre	C3 - 2.3.13.4.3			2	36	
	On-board Equipment						
C2.3.2.5.6	Trunk buses	C3 - 2.3.13.4.3			21	36	
C2.3.2.6.6	Midi Buses	C3 - 2.3.13.4.3			15	36	
	Trunk/Feeder Stops						
C2.3.2.7.6	Wayfinding signage	C3 - 2.3.13.4.3			67	36	
C2.3.2.8.6 - Input 1	3rd Party loading points	C3 - 2.3.13.4.3				36	
	LEVEL 2 – DATA COLLECTION & STORAGE						
	Depot system						
C2.3.2.10.6	Depot system	C3 - 2.3.13.4.3			1	36	
C2.3.2.9.6	PVU's and docking stations	C3 - 2.3.13.4.3			6	36	
	LEVEL 3 – DATA CENTRE & DISASTER RECOVERY						
	Central System						
C2.3.2.12.6	Central system	C3 - 2.3.13.4.3			1	36	
	Disaster recovery centre						
C2.3.2.11.6	Disaster recovery centre	C3 - 2.3.13.4.3			1	36	
	LEVEL 4 – BANKING / PAYMENT SYSTEM						
	Banking / Payment System						
C2.3.2.13.6	Banking / Payment System	C3 - 2.3.13.4.3			1	36	
							PHASE 1A

C2.3.1.10.3 Banking Transaction Fees

C2.3.1.11.3 COST OF BANKING TRANSACTION FEES					PHASE 1A					
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	APPROX. ANNUAL REVENUE (ZAR)	YEARS OF OP's	APPROX. TOTAL REVENUE (ZAR)	ESTIMATED No. OF LOADS (<R100)	RATE	TOTAL
Input 1	Banking transaction fees - transit loads		Amount to be carried forward if a % of the transit load value is to be charged	Projected annual sales	R 46 235 520,00	3	R 138 706 560,00	1 633 320,00		
Input 2	Banking transaction fees - transit loads		Amount to be carried forward if a flat fee is to be charged per transit load	Projected annual sales	R 46 235 520,00	3	R 138 706 560,00	1 633 320,00		
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)					Enter 'F' or '%' for type of flat or percentage based fee to be applied					

The Tenderer must complete the above as part of the offer, however the Tenderer may submit a separate schedule with different revenue level values and associated fee rates should these enhance the offer by being of benefit to the Employer, e.g if the Tenderer is able to offer a rate change for a revenue level which falls between those that are provided above.

The above quantities are approximate and cannot therefore be guaranteed

C2.3.2.1 Cost of Fare Media

C2.3.2.1 COST OF FARE MEDIA

C2.3.2.1.1 MEDIA PRODUCTION COST							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Bank issued transit cards	C3 - 2.3.6 + C3 - 2.4.6	Supply of card to NDOT specification & branded to IRPTS standard, including logistics and issuing costs minimum order quantity for pricing purposes 1000.	Each	1		
Input 1.2							
Input 1.3							
Input 1.4							
Input 1.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.1.2 MEDIA - INSTALLATION							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Installation in the system	C3 - 2.3.7 + C3 - 2.4.6	Not applicable, tenderer to insert items if required	Each			
Input 2.2							
Input 2.3							
Input 2.4							
Input 2.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.1.3 MEDIA - COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8 + C3 - 2.4.6	Not applicable, tenderer to insert items if required	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8 + C3 - 2.4.6	Not applicable, tenderer to insert items if required	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8 + C3 - 2.4.6	Not applicable, tenderer to insert items if required	Each	1		
Input 3.4							
Input 3.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.1.4 MEDIA – POST-COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 – 2.3.11 + C3 – 2.4.6	Not applicable, tenderer to insert items if required	Each	1		
Input 4.2							
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.1.5 3RD PARTY LOADING POINTS WITH TICKET SALES CONFIGURATION – OPERATION							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	Card operations	C3 – 2.3.13.1 T2 – RDD4	Supply of replacements cards to NDOT specification & branded to IRPTS standard, including logistics and issuing costs, minimum order quantity for pricing	Each	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.1.6 3RD PARTY LOADING POINTS WITH TICKET SALES CONFIGURATION – MAINTENANCE							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	Card maintenance	C3 – 2.3.13.2 T2 – RDD4	Not applicable, Tenderer to detail maintenance activities if any.	Each	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.2 Cost of Trunk Stations with Ticket Sales

C2.3.2.2 COST OF TRUNK STATION WITH TICKET SALES PRODUCTION, INSTALLATION, COMMISSIONING, POST-COMMISSIONING AND MAINTENANCE

C2.3.2.2.1 TRUNK STATION WITH TICKET SALES CONFIGURATION - PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Ticket office machine	C3 - 2.3.6 + 2.4.13.1	Complete point of sale device with peripherals	Each	1		
Input 1.2	Power cable	C3 - 2.3.6 + 2.4.4	To contractor's specification, including termination accessories	Metre	100		
Input 1.3	Earth cable	C3 - 2.3.6 + 2.4.4	To contractor's specification, including termination accessories	Metre	100		
Input 1.4	Data cable	C3 - 2.3.6 + 2.4.5	To contractor's specification, including termination accessories	Metre	100		
Input 1.5	Signal cable	C3 - 2.3.6 + 2.4.5	To contractor's specification, including termination accessories	Metre	100		
Input 1.6	Power accessories	C3 - 2.3.6 + 2.4.4	Circuit breakers, surge protection, etc.	Lot	1		
Input 1.7							
Input 1.8							
Input 1.9							
Input 1.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.2.2 TRUNK STATION WITH TICKET SALES CONFIGURATION - INSTALLATION

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Ticket office machine	C3 - 2.3.7 + 2.4.13.1	Complete point of sale device with peripherals	Each	1		
Input 2.2	Power cable	C3 - 2.3.7 + 2.4.4	To contractor's specification, including termination accessories	Metre	100		
Input 2.3	Earth cable	C3 - 2.3.7 + 2.4.4	To contractor's specification, including termination accessories	Metre	100		
Input 2.4	Data cable	C3 - 2.3.7 + 2.4.5	To contractor's specification, including termination accessories	Metre	100		
Input 2.5	Signal cable	C3 - 2.3.7 + 2.4.5	To contractor's specification, including termination accessories	Metre	100		
Input 2.6	Power accessories	C3 - 2.3.7 + 2.4.4	Circuit breakers, surge protection, etc.	Lot	1		
Input 2.7	IAT - TOM	C3 - 2.3.7 + 2.4.13.1	Inspection acceptance testing including certificates and test documentation	Each	1		
Input 2.8							
Input 2.9							
Input 2.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.2.3 TRUNK STATION WITH TICKET SALES CONFIGURATION - COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing - TOM	C3 - 2.3.8 + 2.4.13.1	Internal testing in preparation for SAT + SIT	Each	1		
Input 3.2	SAT - TOM	C3 - 2.3.9 + 2.4.6.2.1	System Acceptance Testing with Employer	Each	1		
Input 3.3	SIT - TOM	C3 - 2.3.9 + 2.4.6.2.1	System Integration Testing with Employer	Each	1		
Input 3.5							
Input 3.7							
Input 3.8							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.2.4 TRUNK STATION WITH TICKET SALES CONFIGURATION - POST-COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.9		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.9		Lot	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.2.5 TRUNK STATION WITH TICKET SALES CONFIGURATION - OPERATION							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	Trunk station with attended ticket sales function	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts,	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.2.6 TRUNK STATION WITH TICKET SALES CONFIGURATION - MAINTENANCE							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	Trunk station AFCS equipment with peripherals	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.3 (intentionally blank)

C2.3.2.4 Cost of Sales Centres

C2.3.2.4.1 SALES CENTRES - PRODUCTION COST							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Ticket office machine	C3 - 2.3.6	Complete point of sale device with peripherals	Each	1		
Input 1.2	Network interface	C3 - 2.3.6	Modem if no ethernet port is available	Each	1		
Input 1.3	Power cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	50		
Input 1.4	Earth cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	50		
Input 1.5	Data cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	50		
Input 1.6	Accessories	C3 - 2.3.6	Circuit breakers, connectors, etc.	Lot	1		
Input 1.7	Power accessories	C3 - 2.3.6	Circuit breakers, surge protection, etc.	Lot	1		
Input 1.8	Distribution board	C3 - 2.3.6	Power distribution board for AFCS	Each	1		
Input 1.9							
Input 1.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.4.2 SALES CENTRES - INSTALLATION							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Ticket office machine	C3 - 2.3.7	Includes all installation activities prior to IAT	Each	1		
Input 2.2	Power cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	50		
Input 2.3	Earth cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	50		
Input 2.4	Data cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	50		
Input 2.5	Accessories	C3 - 2.3.7	Circuit breakers, connectors, etc.	Lot	1		
Input 2.6	Distribution board	C3 - 2.3.7	Power distribution board for AFCS	Each	1		
Input 2.7	IAT - TOM	C3 - 2.3.7	Inspection acceptance testing including certificates and test documentation	Each	1		
Input 2.8							
Input 2.9							
Input 2.10							
Input 2.11							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.4.3 SALES CENTRES - COMMISSIONING							
REF. No.	ITEM	ENDER RE	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.4.4 SALES CENTRES - POST-COMMISSIONING							
REF. No.	ITEM	ENDER RE	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.4.5 SALES CENTRE WITH TICKET SALES CONFIGURATION - OPERATION							
REF. No.	ITEM	ENDER RE	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	All AFCS equipment operation	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts,	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.4.6 SALES CENTRE WITH TICKET SALES CONFIGURATION - MAINTENANCE							
REF. No.	ITEM	ENDER RE	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	All AFCS equipment preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts,	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.5 Cost of Bus Onboard Equipment on Trunk Buses

C2.3.2.5 COST OF BUS ON BOARD EQUIPMENT PRODUCTION, INSTALLATION, COMMISSIONING, POST COMMISSIONING AND MAINTENANCE FOR THE TRUNK BUSES

C2.3.2.5.1 ON-BOARD EQUIPMENT FOR A TRUNK BUS – PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Processor	C3 - 2.3.6		Each	1		
Input 1.2	Ticket verification device	C3 - 2.3.6		Each	2		
Input 1.3	Passenger counting device	C3 - 2.3.6		Each	2		
Input 1.4	Power Interface relay	C3 - 2.3.6		Each	1		
Input 1.5	Wireless communication device	C3 - 2.3.6		Each	1		
Input 1.6	GPS	C3 - 2.3.6		Each	1		
Input 1.7	Power cables	C3 - 2.3.6	Provisional 10m	Metre	10		
Input 1.8	Communication cables	C3 - 2.3.6	Provisional 10m	Metre	10		
Input 1.9	Installation accessories	C3 - 2.3.6		Lot	1		
Input 1.10							
Input 1.11							
Input 1.12							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula							

C2.3.2.5.2 ON-BOARD EQUIPMENT FOR A TRUNK BUS – INSTALLATION

TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Installation	C3 - 2.3.7	Includes all installation activities prior to IAT	Each	1		
Input 2.2	Installation Acceptance Test	C3 - 2.3.7	Includes IAT with Employer	Each	1		
Input 2.3							
Input 2.4							
Input 2.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula							

C2.3.2.5.3 ON-BOARD EQUIPMENT FOR A TRUNK BUS - COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.5.4 ON-BOARD EQUIPMENT FOR A TRUNK BUS - POST COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.5.5 ON-BOARD EQUIPMENT FOR A TRUNK BUS - OPERATION							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	BOE operation	C3 - 2.3.13 T2 - RDD4	Not applicable unless tenderer deems necessary. (elaborate below)	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.5.6 ON-BOARD EQUIPMENT FOR A TRUNK BUS - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	BOE preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6Cost of Bus Onboard Equipment Midi Buses

C2.3.2.6 COST OF BUS ON BOARD EQUIPMENT PRODUCTION, INSTALLATION, COMMISSIONING, POST COMMISSIONING AND MAINTENANCE FOR THE MIDI BUSES

C2.3.2.6. 1ON-BOARD EQUIPMENT FOR A MIDI BUS - PRODUCTION COST

TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Processor	C3 - 2.3.6		Each	1		
Input 1.2	Ticket verification device	C3 - 2.3.6		Each	2		
Input 1.3	Passenger counting device	C3 - 2.3.6		Each	2		
Input 1.4	Power Interface relay	C3 - 2.3.6		Each	1		
Input 1.5	Wireless communication device	C3 - 2.3.6		Each	1		
Input 1.6	GPS	C3 - 2.3.6		Each	1		
Input 1.7	Power cables	C3 - 2.3.6	Provisional 10m	Metre	10		
Input 1.8	Communication cables	C3 - 2.3.6	Provisional 10m	Metre	10		
Input 1.9	Installation accessories	C3 - 2.3.6		Lot	1		
Input 1.10							
Input 1.11							
Input 1.12							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6.2 ON-BOARD EQUIPMENT FOR A MIDI BUS- INSTALLATION

TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Installation	C3 - 2.3.7	Includes all installation activities prior to IAT	Each	1		
Input 2.2	Installation Acceptance Test	C3 - 2.3.7	Includes IAT with Employer	Each	1		
Input 2.3							
Input 2.4							
Input 2.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6.3 ON-BOARD EQUIPMENT FOR A MIDI BUS – COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6.4 ON-BOARD EQUIPMENT FOR A MIDI BUS – POST COMMISSIONING							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6.5 ON-BOARD EQUIPMENT FOR A MIDI BUS – OPERATION							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	BOE operation	C3 - 2.3.13 T2 - RDD4	Not applicable unless tenderer deems necessary. (elaborate	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.6.6 ON-BOARD EQUIPMENT FOR A MIDI BUS - MAINTENANCE							
TABLE REF.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	BOE preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.7 Cost of Trunk/Feeder Stops Signage

C2.3.2.7 COST OF TRUNK EXTENSION / FEEDER STOP SIGNAGE PRODUCTION, INSTALLATION, COMMISSIONING, POST-COMMISSIONING AND MAINTENANCE

C2.3.2.7.1 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION – PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Wayfinding signage	C3 - 2.3.6	Specific to each stop	Each	1		
Input 1.2							
Input 1.3							
Input 1.4							
Input 1.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.7.2 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION – INSTALLATION

TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	IAT - Signage	C3 - 2.3.7	Inspection acceptance testing including certificates and test documentation	Each	1		
Input 2.2							
Input 2.3							
Input 2.4							
Input 2.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.7.3 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION – COMMISSIONING

TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Wayfinding signage	C3 - 2.3.8	Not applicable unless tenderer deems necessary.		1		
Input 3.2							
Input 3.3							
Input 3.4							
Input 3.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.7.4 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.7.5 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION - OPERATION							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	Wayfinding signage	C3 - 2.3.13 T2 - RDD4	Not applicable unless tenderer deems necessary. (elaborate below)	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.7.6 TRUNK EXTENSION / FEEDER STOP WITHOUT TICKET SALES CONFIGURATION - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	Wayfinding signage	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.8 Cost of 3rd Party Loading Points

C2.3.2.8 3RD PARTY LOADING POINTS

C2.3.2.8.1 3RD PARTY LOADING POINTS - PRODUCTION COST							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Identification branding signage	C3 - 2.3.6	Branded, load point ID + bus fares and schedules	Each	1		
Input 1.2	Other	C3 - 2.3.6	Tenderer to add other items not identified above	Each	1		
Input 1.3							
Input 1.4							
Input 1.5							
Input 1.6							
Input 1.7							
Input 1.8							
Input 1.9							
Input 1.10							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.8.2 3RD PARTY LOADING POINTS - INSTALLATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Signage	C3 - 2.3.7	Includes all installation activities prior to IAT	Each	1		
Input 2.2	POS	C3 - 2.3.7	AFCS SW on merchant terminal	Each	1		
Input 2.3	Installation Acceptance Test	C3 - 2.3.7	Includes IAT with Employer	Each	1		
Input 2.4							
Input 2.5							
Input 2.6							
Input 2.7							
Input 2.8							
Input 2.9							
Input 2.10							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.8.3 3RD PARTY LOADING POINTS - COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.8.4 3RD PARTY LOADING POINTS - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2							
Input 4.3							
Input 4.4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.8.5 3RD PARTY LOADING POINTS WITH TICKET SALES CONFIGURATION - OPERATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	3rd party sales function	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts, etc.	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.8.6 3RD PARTY LOADING POINTS WITH TICKET SALES CONFIGURATION – MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	All AFCS equipment preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.9 Cost of Portable Validation Units

C2.3.2.9 PORTABLE VALIDATION UNIT

C2.3.2.9.1 PVU - PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Portable Validation Unit	C3 - 2.3.6	Complete	Each	1		
Input 1.2	Replacement Battery Pack	C3 - 2.3.6	Complete	Each	2		
Input 1.3	Docking Station	C3 - 2.3.6	Complete	Each	1		
Input 1.4	Neck Holster	C3 - 2.3.6	Complete	Each	1		
Input 1.5							
Input 1.6							
Input 1.7							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.9.2 PVU – INSTALLATION

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Portable Validation Unit	C3 - 2.3.7	Complete	Each	1		
Input 2.2	Replacement Battery Pack	C3 - 2.3.7	Complete	Each	2		
Input 2.3	Docking Stations	C3 - 2.3.7	Complete	Each	1		
Input 2.4	Neck Holster	C3 - 2.3.7	Complete	Each	1		
Input 2.5							
Input 2.6							
Input 2.7							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.9.3 PVU- COMMISSIONING

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing - PVU	C3 - 2.3.8	Internal testing in preparation for SAT & SIT	Each	1		
Input 3.2	SAT - PVU	C3 - 2.3.8	System Acceptance Testing with Employer	Each	1		
Input 3.3	SIT - PVU	C3 - 2.3.8	System Integration Testing with Employer	Each	1		

C2.3.2.3.4 PVU - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.3.5 PVU - OPERATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	PVU operations / inspection function	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts, etc.	Monthly	1		
Input 5.2							
Input 5.3							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.3.6 PVU - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	PVU Preventative & Corrective Maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.10 Cost of Depot

C2.3.2.10 COST OF DEPOT PRODUCTION, INSTALLATION, COMMISSIONING, POST-COMMISSIONING AND MAINTENANCE							
C2.3.2.10.1 DEPOT - PRODUCTION COST							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Depot Server	C3 - 2.3.6		Complete	1		
Input 1.2	Administration terminal	C3 - 2.3.6		Each	1		
Input 1.3	Wireless Access Point	C3 - 2.3.6		Each	1		
Input 1.4	Antenna	C3 - 2.3.6		Each	1		
Input 1.5	Power cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.6	Earth cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.7	Data cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.8	Signal cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.9	Power accessories	C3 - 2.3.6	Circuit breakers, surge protection, etc.	Lot	1		
Input 1.10	Distribution board	C3 - 2.3.6	Power distribution board for AFCS	Each	1		
Input 1.11							
Input 1.12							
Input 1.13							
Input 1.14							
Input 1.15							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.16.2 DEPOT - INSTALLATION							
TABLE REF. No	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Depot Server	C3 - 2.3.7	Complete unit including peripherals	Complete	1		
Input 2.2	Administration terminal	C3 - 2.3.7	Complete unit including peripherals	Each	1		
Input 2.3	Wireless Access Point	C3 - 2.3.7	Complete unit including peripherals	Complete	1		
Input 2.4	Antenna	C3 - 2.3.7	Complete unit including peripherals	Complete	1		
Input 2.5	Power cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.6	Earth cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.7	Data cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.8	Signal cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.9	Power accessories	C3 - 2.3.7	Circuit breakers, connectors, etc.	Lot	1		
Input 2.10	Distribution board	C3 - 2.3.7	Power distribution board for AFCS	Each	1		
Input 2.11	Installation Acceptance Test	C3 - 2.3.7	Includes any Contractor installation activities including completion of IAT together with the Employer.	Each	1		
Input 2.12							
Input 2.13							
Input 2.14							
Input 2.15							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.16.3 DEPOT - COMMISSIONING							
TABLE REF. No	ITEM	TENDER REF	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing Depot Server	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
Input 3.7							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.10.4 DEPOT - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.10.5 DEPOT - OPERATIONS							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	All AFCS equipment operations	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts,	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.10.6 DEPOT - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	All AFCS equipment preventative and corrective	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts,	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.11 Cost of Disaster Recovery Centre

C2.3.2.11 COST OF DISASTER RECOVERY CENTRE, PRODUCTION, INSTALLATION, COMMISSIONING AND POST-COMMISSIONING

C2.3.2.11.1 DISASTER RECOVERY CENTRE - PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Servers	C3 - 2.3.6	All central system server & rack hardware & operating systems as specified by the Contractor	Complete	1		
Input 1.2	Power cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.3	Earth cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.4	Data cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.5	Signal cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.6	Power accessories	C3 - 2.3.6	Circuit breakers, surge protection, etc.	Lot	1		
Input 1.7	Distribution board	C3 - 2.3.6	Power distribution board for AFCS	Each	1		
Input 1.8							
Input 1.9							
Input 1.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

The above costs are carried forward to the summary cost sheets.

C2.3.1.11.2 DISASTER RECOVERY CENTRE - INSTALLATION

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Install HW	C3 - 2.3.7	Install servers, rack and cabling	Complete	1		
Input 2.2	Power cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.3	Earth cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.4	Data cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.5	Signal cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.6	Power accessories	C3 - 2.3.7	Circuit breakers, surge protection, etc.	Lot	1		
Input 2.7	Distribution board	C3 - 2.3.7	Power distribution board for AFCS	Each	1		
Input 2.8	Installation Acceptance Test	C3 - 2.3.7	Includes any Contractor installation activities including completion of IAT together with the Employer	Complete	1		
Input 2.9							
Input 2.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

The above costs are carried forward to the summary cost sheets.

C2.3.1.11.3 DISASTER RECOVERY CENTRE - COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Includes conducting of testing and acceptance of the server installation with operating system, as well as the installation of the AFCS application	Complete	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Complete	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Complete	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.1.11.4 DISASTER RECOVERY CENTRE - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Lot	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.1.11.5 DRC - OPERATIONS							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	All AFCS equipment operations	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts, etc.	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.1.II.6 DRC - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	All AFCS equipment preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.12 Cost of Central System

C2.3.2.12 COST OF CENTRAL SYSTEM, PRODUCTION, INSTALLATION, COMMISSIONING AND POST-COMMISSIONING							
C2.3.2.12.1 CENTRAL SYSTEM - PRODUCTION COST							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Servers	C3 - 2.3.6	All central system server & rack hardware & operating systems as specified by the Contractor	Complete	1		
Input 1.2	Workstation Admin	C3 - 2.3.6	All workstation hardware & operating systems as specified by the Contractor	Complete	1		
Input 1.3	Workstation operator	C3 - 2.3.6	All workstation hardware & operating systems as specified by the Contractor	Complete	1		
Input 1.4	Power cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.5	Earth cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.6	Data cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.7	Signal cable	C3 - 2.3.6	To contractor's specification, including termination	Metre	100		
Input 1.8	Power accessories	C3 - 2.3.6	Circuit breakers, surge protection, etc.	Lot	1		
Input 1.9	Distribution board	C3 - 2.3.6	Power distribution board for AFCS	Each	1		
Input 1.10							
Input 1.11							
Input 1.12							
Input 1.13							
Input 1.14							
Input 1.15							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets.							

C2.3.2.12.2 CENTRAL SYSTEM - INSTALLATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Install HW	C3 - 2.3.7	Install servers, rack and cabling	Complete	1		
Input 2.2	Power cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.3	Earth cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.4	Data cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.5	Signal cable	C3 - 2.3.7	To contractor's specification, including termination	Metre	100		
Input 2.6	Power accessories	C3 - 2.3.7	Circuit breakers, surge protection, etc.	Lot	1		
Input 2.7	Distribution board	C3 - 2.3.7	Power distribution board for AFCS	Each	1		
Input 2.8	Installation Acceptance Test	C3 - 2.3.7	Includes any Contractor installation activities including completion of IAT together with the Employer.	Complete	1		
Input 2.9							
Input 2.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets.							

C2.3.2.12.3 CENTRAL SYSTEM - COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Includes conducting of testing and acceptance of the server installation with operating system, as well as the installation of the AFCS application	Complete	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Complete	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Complete	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.12.4 CENTRAL SYSTEM - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2	As-built documentation	C3 - 2.3.11		Each	1		
Input 4.3							
Input 4.4							
Input 4.5							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.12.5 CENTRAL SYSTEM - OPERATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	All AFCS equipment operations	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts, etc.	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. ¥AT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.12.6 CENTRAL SYSTEM - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	All AFCS equipment preventative and corrective maintenance	C3 - 2.3.13	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							
The above costs are carried forward to the summary cost sheets							

C2.3.2.13 Cost of Banking / Payment System

C2.3.2.13 COST OF IMPLEMENTING BANKING / PAYMENT SYSTEM

C2.3.2.13.1 BANKING / PAYMENT SYSTEM – PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Banking server	C3 - 2.3.6	If required, e.g. payment gateway, etc	Each	1		
Input 1.2							
Input 1.3							
Input 1.4							
Input 1.5							
Input 1.6							
Input 1.7							
Input 1.8							
Input 1.9							
Input 1.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.13.2 BANKING / PAYMENT SYSTEM – INSTALLATION

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Banking server	C3 - 2.3.7	Includes all installation activities prior to IAT	Each	1		
Input 2.2	Installation Acceptance Test	C3 - 2.3.7	Includes IAT with Employer	Each	1		
Input 2.3							
Input 2.4							
Input 2.5							
Input 2.6							
Input 2.7							
Input 2.8							
Input 2.9							
Input 2.10							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.13.3 BANKING / PAYMENT SYSTEM - COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing	C3 - 2.3.8	Internal testing prior to SAT	Each	1		
Input 3.2	System Acceptance Test	C3 - 2.3.8	Includes all preparation activities required to complete SAT	Each	1		
Input 3.3	System Integration Test	C3 - 2.3.8	Includes all preparation activities required to complete SIT	Each	1		
Input 3.4							
Input 3.5							
Input 3.6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.13.4 BANKING / PAYMENT SYSTEM - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Input 4.2							
Input 4.3							
Input 4.4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.13.5 BANKING / PAYMENT SYSTEM WITH TICKET SALES CONFIGURATION - OPERATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	Operations	C3 - 2.3.13 T2 - RDD4	Investigation and analysis of damaged cards & issues	System wide per month	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.13.6 BANKING / PAYMENT SYSTEM WITH TICKET SALES CONFIGURATION - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	Preventative and corrective maintenance	C3 - 2.3.13 T2 - RDD4	Investigation and analysis of damaged cards	System wide per month	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.14 Labour Rates

C2.3.2.14 LABOUR RATES

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL	UNIT	QTY	RATE	TOTAL	UNIT	QTY	RATE	TOTAL	UNIT	QTY	RATE	TOTAL
Input 1	Project manager		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 2	Quality controller		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 3	Electronics Engineer		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 4	Software developer		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 5	Systems administrator		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 6	Data base adminstrator		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 7	Site supervisor		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 8	Electronics Technician		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 9	Installer		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 10	Electrician		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 11	AFCS Manager		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 12	Technical Manager		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 13	Financial Manager		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 14	Information Manager		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 15	Systems administrator		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 16	Supervisor		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 17	Ticket Sales Clerk		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 18	Inspector		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 19	Maintenance technician		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 20	Systems Monitor		Hourly rate to be used for ad hoc works upon Employers instruction	Hour	1			Day	1			Week	1			Month	1		
Input 21																			
Input 22																			
Input 23																			
Input 24																			
Input 25																			

C2.3.2.15 Spare parts

C2.3.2.15 COST OF SPARE PARTS						
REF. No	ITEM	TENDER REF.	REMARKS	UNIT	RATE	TOTAL
Input 1	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of the FD stage.	Add unit of measure		R -
Input 2						R -
Input 3						R -
Input 4						R -
Input 5						R -
Input 6						R -
Input 7						R -
Input 8						R -
Input 9						R -
Input 10						R -
Input 11						R -
Input 12						R -
Input 13						R -
Input 14						R -
Input 15						R -
Input 16						R -
Input 17						R -
Input 18						R -
Input 19						R -
Input 20						R -

The tenderer is to enter all line replaceable units and spare parts for the system in the above table, with their unit rates. Where spares apply to options quoted for, the Tenderer is to indicate as such

C2.3.2.16 Optional Fare Gates

C2.3.2.16 COST OF OPTIONAL FARE GATES PRODUCTION, INSTALLATION, COMMISSIONING, POST-COMMISSIONING AND MAINTENANCE

C2.3.2.16.1 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION – PRODUCTION COST

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 1.1	Fare gate – Wide lane	C3 – 2.3.6	Complete lane as part of array	Lane	1		
Input 1.2	Fare gate – Narrow lane	C3 – 2.3.6	Complete lane as part of array	Lane	3		
Input 1.3							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.16.2 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION – INSTALLATION

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 2.1	Fare gate – Wide lane	C3 – 2.3.7	Complete lane as part of array	Lane	1		
Input 2.2	Fare gate – Narrow lane	C3 – 2.3.7	Complete lane as part of array	Lane	3		
Input 2.3	IAT – Fare gates	C3 – 2.3.7	Inspection acceptance testing including certificates and test documentation	Each	4		
Input 2.4							
Input 2.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.16.3 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION – COMMISSIONING

TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 3.1	Pre-testing – Fare gates	C3 – 2.3.8	Internal testing in preparation for SAT & SIT	Each	4		
Input 3.2	SAT – Fare gates	C3 – 2.3.8	System Acceptance Testing with Employer	Each	4		
Input 3.3	SIT – Fare gates	C3 – 2.3.8	System Integration Testing with Employer	Each	4		
Input 3.4							
Input 3.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.16.4 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION - POST-COMMISSIONING							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Inout 4.1	Consolidated test book	C3 - 2.3.11		Each	1		
Inout 4.2	As-built documentation	C3 - 2.3.11		Each	1		
Inout 4.3							
Inout 4.4							
Inout 4.5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.16.5 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION - OPERATION							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 5.1	OPTIONAL FARE GATES	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, uniforms, materials, tools, equipment, consumables, training, sub-contracts, etc.	Monthly	1		
Input 5.2							
Input 5.3							
Input 5.4							
Input 5.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.16.6 OPTIONAL FARE GATES WITHOUT TICKET SALES CONFIGURATION - MAINTENANCE							
TABLE REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
Input 6.1	OPTIONAL FARE GATES	C3 - 2.3.13 T2 - RDD4	All inclusive cost of staff, supervision, PPE, materials, tools, equipment, spares, consumables, training, sub-contracts, etc.	Monthly	1		
Input 6.2							
Input 6.3							
Input 6.4							
Input 6.5							
SUB-TOTAL (EXCL. VAT)							

C2.3.2.17 Optional Ticket vending machine (notes only, no change)

C2.3.2.17 TICKET VENDING MACHINE FOR NOTES ONLY WITHOUT CHANGE OPTION

C2.3.2.17.1 TVM – SUPPLY COST

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Ticket vending machine	C3 – 2.3.6 + 2.4.13.2	Complete (Notes only, no change)	Each	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.2 TVM – INSTALLATION

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Ticket vending machine	C3 – 2.3.7 + 2.4.13.2	Complete (Notes only, no change)	Each	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.3 TVM – COMMISSIONING

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Pre-testing – TVM	C3 – 2.3.8 + 2.4.13.2	Internal testing in preparation for SAT & SIT	Each	1		
2	SAT – TVM	C3 – 2.3.8 + 2.4.13.2	System Acceptance Testing with Employer	Each	1		
3	SIT – TVM	C3 – 2.3.8 + 2.4.13.2	System Integration Testing with Employer	Each	1		
4	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
5							
6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.4 TVM - POST-COMMISSIONING							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Consolidated test book	C3 - 2.3.11+ 2.4.13.2		Each	1		
2	As-built documentation	C3 - 2.3.11+ 2.4.13.2		Each	1		
3	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
4							
5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.5 TVM - OPERATION							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	TVM Preventative & Corrective Maintenance	C3 - 2.3.13		Per TVM per month	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.6 TVM - MAINTENANCE							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	TVM Operation	C3 - 2.3.13		Per TVM per month	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.18 Optional Ticket vending machine (notes and coins)

C2.3.2.18 TICKET VENDING MACHINE FOR NOTES AND COINS OPTION

C2.3.2.18.1 TVM – SUPPLY COST

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Ticket vending machine	C3 – 2.3.6 + 2.4.13.2	Complete (Notes only, no change)	Each	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.18.2 TVM – INSTALLATION

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Ticket vending machine	C3 – 2.3.7 + 2.4.13.2	Complete (Notes only, no change)	Each	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.18.3 TVM – COMMISSIONING

REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Pre-testing – TVM	C3 – 2.3.8 + 2.4.13.2	Internal testing in preparation for SAT & SIT	Each	1		
2	SAT – TVM	C3 – 2.3.8 + 2.4.13.2	System Acceptance Testing with Employer	Each	1		
3	SIT – TVM	C3 – 2.3.8 + 2.4.13.2	System Integration Testing with Employer	Each	1		
4	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
5							
6							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.18.4 TVM - POST-COMMISSIONING							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	Consolidated test book	C3 - 2.3.11 + 2.4.13.2		Each	1		
2	As-built documentation	C3 - 2.3.11 + 2.4.13.2		Each	1		
3	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
4							
5							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.18.5 TVM - OPERATION							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	TVM Preventative & Corrective Maintenance	C3 - 2.3.13		Per TVM per month	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

C2.3.2.17.6 TVM - MAINTENANCE							
REF. No.	ITEM	TENDER REF.	REMARKS	UNIT	QTY	RATE	TOTAL
1	TVM Operation	C3 - 2.3.13		Per TVM per month	1		
2	Tenderer specified items (add additional lines if needed)	Add applicable tender ref. no.	The Tenderer may add any items it may wish to specify, forming part of this stage.	Add unit of measure	Add Qty		
3							
4							
SUB-TOTAL (EXCL. VAT) (Tenderer to check that added items are all included in the sum formula)							

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender:

FULL NAME (IN BLOCK LETTERS): _____

SIGNATURE: _____

DATE:_____

PART B: PTMS

Part C2: Pricing Data

C2.1 PRICING INSTRUCTIONS

1. General

1.1. This section provides the tenderer with guidelines and requirements with regard to the completion of the Price Schedule.

1.2. The Price Schedule has been provided in electronic format on the CD as an MS-Excel spreadsheet. The printed sheets have been provided for reference purposes. Tenderers shall not make any changes to the content, format/layout of formulae of the spreadsheet, with the exception of items forming part of the tenderers solution which have not been included in the schedule. Notwithstanding the above the tenderer is responsible for all data provided in the Price Schedule and therefore shall ensure that formulas used in the spreadsheet are correct and that quantities and prices which are calculated are correctly updated. If any errors exist in any of the formulas in the spreadsheet the Unit Price and Rates provided shall take precedence in determining total values. The tenderer may add lines for items not listed in the Price Schedule. The tenderer shall ensure that the line items added shall be provided with Unit Price and Rates as specified above.

1.3. Tenderers shall complete the electronic schedules by inserting all the required rates and lump sums ***and*** shall print and sign the completed schedules, and insert them into their tender submissions.

1.4. Tenderers shall ensure that the Pricing Schedule is printed in the same format it appears in this document. In addition to the printed and signed Pricing Schedule, tenderers shall submit an electronic version in MS-Excel format.

1.5. The tenderer is referred to the Tendering Procedures, in regard to the correction of errors. The Price Schedule shall be read with all the documents which form part of this Contract.

1.6. The following words shall have the meanings hereby assigned to them:

1.6.1. Unit: The unit of measurement for each item of work in terms of the Specifications and the Project Specifications.

1.6.2. Quantity: The number of units of work for each item.

1.6.3. Rate: The payment per unit of work at which the tenderer tenders to do the work.

1.6.4. Price: The product of the quantity and the rate tendered for an item.

1.6.5. Lump sum: An amount tendered for an item, the extent of which is

described in the Price Schedule, the Specification and the Scope of Work, but the quantity of work of which is not measured in any units.

1.6.6. Provisional sum: An allowance, usually estimated by consultants, that is inserted into the tender documents for a specific element of the works that is not yet defined in enough detail for tenderers to price. This, together with a brief description, allows tenderers to apply mark up and attendance cost within their overall tender price and make allowance for the work in the contract programme.

2. Units of Measurements

2.1. The units of measurement described in the Price Schedule are metric units.

2.2. Abbreviations used in the Price Schedule are as follows:

Abbreviation	**Unit**
mm	millimetre
h	hour
m	Metre
kg	Kilogram
km	Kilometre
t	Ton
m^2	square metre
no.	number
m^2.pass	square metre pass
sum	lump sum
ha	hectare
MN	meganewton
m^3	cubic metre
MNm	meganewton-metre
m^3.km	cubic metre-kilometre
PC sum	Prime Cost sum
l	litre
Prov. sum	Provisional sum
kl	kilolitre
%	Per cent
MPa	megaspascal
kW	kilowatt

3. Rates

This Price Schedule has columns for unit, quantity, rate and amount for the goods. Entries in these columns are made as follows:

3.1. If the Supplier is to be paid an amount for the goods which is a fixed price for an item or a fixed price for each of a series of items, the tendering supplier enters the amount in the amount column only, the other columns being left blank.

3.2. If the Supplier is to be paid an amount for the goods which is the unit rate for each item multiplied by the quantity of the item supplied, (i.e. a 'Price Schedule' arrangement) - the tendering supplier enters the rate which is then multiplied by the quantity (which has been entered either by him or by the Employer) to produce the amount which is also entered.

3.3. All prices and rates entered in the Price Schedule must be **excluding** VAT. VAT will be added on the summary page of the Price Schedule

CORRECTION OF ENTRIES MADE BY TENDERER

ny entry made by the Tenderer in the Price Schedule, forms, etc., which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.

C2.2 PREAMBLE TO THE PRICE SCHEDULE

1. General

1.1 All work to be carried out to the relevant COP specifications or as specified in the Scope of Works and Pricing Instructions section C2.1.

2. Conditions of Contract

2.1 The Price Schedule is to be read in conjunction with the Conditions of Contract and Scope of Work.

3. General Directions and Descriptions

3.1 General direction and descriptions of work and materials are not necessarily repeated in this Price Schedule and reference should be made to the Conditions of Contract and Part C3, Scope of work for this information. 'Reference's provided are for convenience only.

4. Statutory Obligations

4.1 The rates and prices entered in the Price Schedule shall be deemed to include for compliance with the statutory obligations arising from the appointment and duties of the Contractor.

5. Each Item to be Priced

5.1 Each item of the Price Schedule shall have a rate or price entered against it – such rate or price shall properly reflect the value of the work covered by the item.

5.2 Provisional items must be clearly identified as such, and priced.

5.3 Any major items that the Contractor consider have been omitted from the Schedule must be added by the Contractor in the places provided in the Schedule and described as "...Items not covered elsewhere...".

5.4 Prices for minor items Contractors consider are omitted from the Schedule must be included within prices for appropriate existing Schedule items.

5.5 The Price Schedule provided must be filled in and returned by the Contractor, but the Contractor may include any supplementary or replacement Schedules they wish, provided in full detail.

5.6 Where a quantity is zero, the quantity of the particular item is unknown at the time of tender and may be established prior to the acceptance of the tender or as a variation after contracting, by applying the quoted rate.

6. Prices and Rates to be Inclusive

6.1 The unit costs and total prices inserted in the Price Schedule are to be the full inclusive cost of the work described, including all general risks, liabilities and obligations set forth or implied in the documents.

6.2 The cost of complying with the Conditions of Contract and the requirements set out in Part C3, Scope of work, is to be covered by the prices and rates quoted in the various items of the Price Schedule.

6.3 The following non exhaustive list of general obligations is to be included in the rates:

- Warranties and extended warranties
- Shipping costs
- Import duties
- Supervision
- Travelling costs, unless where specifically provided for in the Price Schedule
- Insurances

6.4 Un-priced Items

6.4.1 Items against which no price or rate is entered shall be deemed to be covered by the other rates and prices in the Price Schedule.

6.5 Quantities

6.5.1 The Quantities shown in the Price Schedule are indicative.

6.5.2 COP does not guarantee these quantities as minimum or maximum quantities for purchase and reserves the right to re-measure quantities, without limit, if required at the rates provided in the Price Schedule.

6.5.3 However these quantities will be used for evaluation purposes of the total price of the Contractor's Tender.

C2.3 PRICE SCHEDULES

C2.3.1 Summary of Pricing Schedule

CITY OF POLOKWANE **CONTRACT PM/69/2017**

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

Summary of pricing schedule

Section Reference	Description	Amount
0	General obligations and dayworks	
5	Design	
8	Transport Management Centre (TMC)	
9	On-board systems	
10	Trunk stations	
11	Bus depots and layover areas	
13	Testing and commissioning	
14	Training	
15	Maintenance	
17	Technical operational support	
	Contingencies (15%)	
	Sub-total	
	Value-Added Tax (VAT at 15%)	
	TENDER SUM TO FORM OF OFFER	

C2.3.2 General Obligations and Dayworks

CITY OF POLOKWANE **CONTRACT PM/69/2017**

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

					SUPPLY MATERIALS		SUPPLY LABOUR	
ITEM	**REFERENCE**	**DESCRIPTION OF ITEM**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**	**RATE**	**AMOUNT**
The rates to be filled in hereunder must make provision for all items to cover general obligations specified below. All other general obligations as specified in Part C2, Section C2.2 paragraph 1.6.1 shall be included in material and labour rates of all pay items.								
General obligations and dayworks								
1	C1, Section C1.2.2, Clause 18	Insurance	month	36				
2	C3, Section 6.1, 6.2	Project Management	month	36				
3	C3, Section 6.3	Health and Safety obligations	month	36				
4	C3, Section 6.4	Office & Workshop Accommodation	month	36				
5	C1, Section C1.2.2, Clause 4.2	Provision of Full Performance Security		Lump sum				
6	C3, Section 6.2	Quality assurance plan		Lump sum				
7		**Dayworks**						
	These amounts will only be expended on specific instruction by the Engineer to the Contractor for additional tasks that may be required by Personnel during normal working hours (Dayworks).							
a	C3, Section 6.5	Unskilled labour	hour	100				
b	C3, Section 6.5	Electrician	hour	100				
c	C3, Section 6.5	Fibre Optics Technician	hour	100				
d	C3, Section 6.5	Electronics Technician	hour	100				
e	C3, Section 6.5	Communications Network Engineer	hour	100				
f	C3, Section 6.5	Systems Engineer	hour	100				
g	C3, Section 6.5	Systems Integrator	hour	100				
h	C3, Section 6.5 / Section 17	Scheduling Specialist	hour	100				
i	C3, Section 6.5	Dayworks Material		Lump sum				
				Total material				
				Total labour				
General obligations and dayworks: Total carried forward to summary								

C2.3.3 Design Requirements

CITY OF POLOKWANE **CONTRACT PM/69/2017**

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

					SUPPLY MATERIALS		SUPPLY LABOUR	
ITEM	**REFERENCE**	**DESCRIPTION OF ITEM**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**	**RATE**	**AMOUNT**
The rate to be filled in hereunder must make provision for all design work, including documentation, reports, figures, drawings, diagrams or any other relevant material to be submitted to the PLM for approval. The materials rate shall be for design documentation materials only. Software licences are measured under Section 8.								
Section 5: Design Requirements								
1	**C3, Section 5.1**	**High level conceptual design.**		Lump sum				
2	**C3, Section 5.2**	**Detail Design**						
a	C3, Section 5.2.1/6 & Section 8	Transport Management Centre		Lump sum				
b	C3, Section 5.2.2/6 & Section 9	On-Board Equipment		Lump sum				
c	C3, Section 5.2.3/6 & Section 10	Station		Lump sum				
d	C3, Section 5.2.4/6 & Section 11	Depot / Layover Areas		Lump sum				
e	C3, Section 5.2.5/6 & Section 12	GSM APN Communications network		Lump sum				
					Total material			
					Total labour			
					Design: Total carried forward to summary			

C2.3.4 Detailed Specifications: Transport Management Centre (TMC)

CITY OF POLOKWANE CONTRACT PM/69/2017

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

ITEM	REFERENCE	DESCRIPTION OF ITEM	UNIT	QUANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
The rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
Section 8: Detailed Specification: Transport Management Centre (TMC)								
1		**Operator workstations**						
a	C3, Section 8.6.1.	Supply, installation, setup and configuration of operator workstations and monitors incl. software.	No	4				
2		**Servers**						
		Supply, installation, setup and configuration of servers including required software.						
a		**PTMS Database server**						
i	C3, Section 8.6.2.1.	PTMS Database server hardware incl. operating system	No	1				
ii	C3, Section 8.6.2.1.	Setup and configuration of PTMS Database server		Lump sum				
b		**PTMS Applications server**						
i	C3, Section 8.6.2.1.	PTMS Applications server hardware incl. operating system	No	1				
ii	C3, Section 8.6.2.1.	Setup and configuration of PTMS Applications server		Lump sum				
c		**Device Communications server**						
i	C3, Section 8.6.2.1.	Device Communications server hardware incl. operating system	No	1				
ii	C3, Section 8.6.2.1.	Setup and configuration of Device Communications server		Lump sum				
d		**Vehicle Configuration Manager (VCM) server**						
i	C3, Section 8.6.2.1.	Vehicle Configuration Manager (VCM) server hardware incl. operating system	No	1				
ii	C3, Section 8.6.2.1.	Setup and configuration of Vehicle Configuration Manager (VCM) server		Lump sum				
e		**Backup Server**						
i	C3, Section 8.6.2.1. & Section 8.6.3	Backup server hardware incl. operating system	No	1				
ii	C3, Section 8.6.2.1. & Section 8.6.3	Setup and configuration of Backup server		Lump sum				
f		**Virtual Servers**						
i	C3, Section 8.6.2.2.	Virtual server hardware only. Operating system and virtualisation software priced separately below.	No	2				
ii	C3, Section 8.6.2.2.	Virtualisation software with high availability	No	2				
iii	C3, Section 8.6.2.2.	Windows Server 2012 (1 instance required per virtual server)	No	2				
iv	C3, Section 8.6.2.2.	Setup and configuration of virtual servers		Lump sum				
3		**Network Switches**						
a	C3, Section 8.6.4	Supply, installation, setup and configuration of Network Switches.	No	2				
4		**Firewall**						
a	C3, Section 8.6.5	Supply, installation, setup and configuration of Firewall	No	1				
5		**Equipment Racks**						
a	C3, Section 8.6.6	Supply, installation and configuration of Equipment Racks	No	2				
6		**UPS**						
a	C3, Section 8.6.7	Supply, installation, setup and configuration of UPS	No	1				

CITY OF POLOKWANE CONTRACT PM/69/2017

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

ITEM	REFERENCE	DESCRIPTION OF ITEM	UNIT	QUANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
The rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
Section 8: Detailed Specification: Transport Management Centre (TMC)								
7	**C3, Section 8.7 - 8.11**	**Software and licences**						
Supply, installation, setup and configuration of software incl. licences as specified in **Sections 8.7 to 8.11**. The following important points are higlighted: 1. All licences below shall be valid indefinitely. 2. All version upgrades and support for 3 years shall be included in the initial license price. 3. All licences below, unless specified otherwise, shall allow at least 10 clients to connect with the possibility to upgrade to an unlimited amount of clients.								
a	C3, Section 8.7-8.11	Vehicel Configuration Manager (VCM)	No	1				
b	C3, Section 8.7-8.11	Schedule Planning, Publication (optional)	No	1				
c	C3, Section 8.7-8.11	Compliance Monitoring System (CMS)	No	1				
d	C3, Section 8.7-8.11	IP Phone Communications	No	1				
e	C3, Section 8.7-8.11	Backup	No	1				
f	C3, Section 8.7-8.11	Anti-virus (for all servers and desktops)	No	1				
g	C3, Section 8.7-8.11	Passenger Information System	No	1				
h	C3, Section 8.7-8.11	Reporting System	No	1				
i	C3, Section 8.7-8.11	Any other Software and Licences required for PTMS functionality (List):	No	1				
j		1.	No	1				
k		2.	No	1				
l		3.	No	1				
8	C3, Section 8.7-8.11	**Video wall**						
a	C3, Section 8.10.5	Procurement, setup, installation and configuration of a complete video wall system	Prov Sum					
b	C3, Section 8.10.5	Contractors markup on management and administration of nominated sub-contractor. (As a percentage of provisional sum.)	%	2.5				
						Total material		
						Total labour		
						Detailed specification: Transport Management Centre (TMC): Total carried forward to summary		

C2.3.5 Detailed Specifications: On-Board Systems

Y OF POLOKWANE **CONTRACT PM/69/2017**

E DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

ME OF TENDERER:_____

M	ERENCE	DESCRIPTION OF ITEM	UNIT	ANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
ction 9: Detailed specification: On-board systems								
1		**MS On-Board Unit (OBU) for Buses**						
a	Section 9.5	ply, installation, setup and configuration of the Bus PTMS OBU (MDT Integrated)		21				
b	Section 9.5	1 combination Wi-Fi, GSM/UMTS and GPS antenna		21				
2		**MS On-Board Unit (OBU) for Midi Buses**						
a	Section 9.5.6	ply, installation, setup and configuration of the Midi-Buses PTMS OBU (MDT Integrated)		15				
b	Section 9.5.6	1 combination Wi-Fi, GSM/UMTS and GPS antenna		15				
3		**eo Surveillance System (VSS)**						
a	Section 9.6	ply, installation, setup and configuration of the Fixed IP dome CCTV cameras (incl. SD card)		72				
4		**ver panic button**						
a	Section 9.7	nection and integration of driver panic button		36				
5		**ktop Vehicle Simulator**						
a	Section 9.5.5	ply, install, setup and configure the Desktop vehicle simulator.		1				
6		**t stop Annoucements**						
a	Section 9.5.4.2	ording of Voice annouchments at recording studio and loading data on buses.	s	2				
					Total material			
					Total labour			
Detailed specification: On-board systems: Total carried forward to summary								

C2.3.6 Detailed Specifications: Trunk Stations

CITY OF POLOKWANE CONTRACT PM/69/2017

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

ITEM	REFERENCE	DESCRIPTION OF ITEM	UNIT	QUANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
The rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
Section 10: Detailed specification: Trunk stations								
1		**Communications**						
	C3, Section 10.8	Supply, install and setup of an IP Phone at Station manager office	No	2				
	C3, Section 10.9	Backup communication via Cellular APN	No	2				
2		**Passenger Information Display**						
	C3, Section 10.6	Supply, install and configuration of an Outdoor LCD TFT (with LED backlight) PID with 42" (1920 x 1080 pixel Resolution)	No	4				
3		**CCTV**						
	C3, Section 10.7	Supply, Install and Configuration of an fixed IP dome CCTV camera	No	4				
	C3, Section 10.7.2	Supply, Install and Configuration of an NVR	No	2				
4		**PA System**						
	C3, Section 10.6	Supply, Install and Configuration of a Public Address (PA) System	No	1				
5		**CCTV along the Route (optional - rate only)**						
	C3, Section 10.8	Supply, install and configure of Fixed IP CCTV cameras	No	20				
	C3, Section 10.8	Supply, install and configure of PTZ IP dome CCTV cameras	No	20				
	C3, Section 10.8	Network Switch incl. all cabling from switch to CCTV	No	20				
	C3, Section 10.8	Poletop Enclosure	No	20				
	C3, Section 10.8	Pole (to host the CCTV)	No	20				
	C3, Section 10.8	Lightning Protection	No	20				
	C3, Section 10.8	Power Supply (Municipal Connection fees)	No	20				
	C3, Section 10.8	Backup Power Supply	No	20				
						Total material		
						Total labour		
						Detailed specification: Trunk stations: Total carried forward to summary		

C2.3.7 Detailed Specifications: Depots and Layovers

Y OF POLOKWANE **CONTRACT PM/69/2017**

E DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

ME OF TENDERER:_____

M	ERENCE	DESCRIPTION OF ITEM	UNIT	ANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
ction 11: Detailed specification: Depots and layover areas								
1		**rkstation PC**						
a	Section 11.2	ply, installation, setup and configuration of Workstation PC including required software		2				
2		**Phone**						
a	Section 11.3	ply, installation, setup and configuration of IP phone per Depot / Layover area		2				
3		**nmunications**						
a	Section 11.4	kup communication via Cellular APN		2				
					Total material			
					Total labour			
Detailed specification: Depots & layover areas: Total carried forward to summary								

C2.3.8 Detailed Specification: GSM APN

Y OF POLOKWANE **CONTRACT PM/69/2017**

E DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

ME OF TENDERER:_____

					SUPPLY MATERIALS		SUPPLY LABOUR	
M	**ERENCE**	**DESCRIPTION OF ITEM**	**UNIT**	**ANTITY**	**RATE**	**AMOUNT**	**RATE**	**AMOUNT**
rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials in order to handover a complete fully functional installation as specified. Refer to Section 7 for detailed specification: General.								
ction 12: Detailed specification: GSM/UTMS APN								
1		**M/UMTS APN**						
a	Section 12	ply, installation, configuration, testing and commissioning of a dedicated PTMS APN with direct connection to the TMC as specified in Section 12.2		1				
b	Section 12	l & network up-time support contract	nth	36				
2		**Cards and Data Contracts**						
a	Section 12.3 / 5	ply and provisioning of SIM cards and data contracts		41				
b	Section 12.3 / 5	a Usage Contract per card per month		41				
c	Section 12.3	a usage monitoring including monitoring and reporting tool		1				
					Total material			
					Total labour			
Detailed specification: GSM/UTMS APN: Total carried forward to summary								

C2.3.9 Testing and Commissioning

CITY OF POLOKWANE **CONTRACT PM/69/2017**

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

					SUPPLY MATERIALS		SUPPLY LABOUR	
ITEM	**REFERENCE**	**DESCRIPTION OF ITEM**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**	**RATE**	**AMOUNT**
The rate to be filled in hereunder must make provision for all specified tests, equipment and miscellaneous auxiliary materials and documentation in order to all testing and commissioning as specified								
Section 13: Testing & Commissioning								
1		**Testing and Commissioning**						
a	C3, Section 13.1	Development of test plans, per test stage	No	4				
2	**C3, Section 13.3.1**	**Test stage 1: Functional Acceptance Testing (FAT).**						
a	C3, Section 13.3.1.1	PTMS OBU (integrated MDT)	No	1				
3	**C3, Section 13.3.2**	**Test stage 2: System Integration Test (SIT).**						
a		Setup of APN and TMC communications	No	1				
4	**C3, Section 13.3.3**	**Test stage 3: Installation**						
a		**Inspections.** Transport Management	No					
		Centre (TMC) Bus on-board	No	21				
		equipment, per bus		15				
		Midi-bus, per Midi-bus						
		Stations, per						
	C3, Section 13.3.4	station Depots/layovers, per depot/layover						
		Test stage 4: System	No	1				
5		**Acceptance Testing (SAT).**	No	21				
		Transport Management Centre (TMC)		15				
a		Bus on-board equipment, per bus		2				
		Midi-bus, per Midi-bus		2				
	C3, Section 13.4	Stations, per station		Lump sum				
					Total material			
					Total			
					labour Testing & Commissioning: Total carried forward			

C2.3.10 Training

Y OF POLOKWANE **CONTRACT PM/69/2017**

E DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

ME OF TENDERER:_____

M	ERENCE	DESCRIPTION OF ITEM	UNIT	ANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials, all manuals and student guides in order to provide professional and effective training as specified in the relevant sections.								
ction 14: Training								
1		**ning preparation**						
a	Section 14.1	elopment of training course curriculum, including all training manuals, tutorials and other aids to be used by students during course, priced per course and paid after approval from the CoT		10				
b	Section 14.1	el costs for instructors	y sum					100,000.00
c	Section 14.1	vision of DVD video per training course		10				
2		**ning courses**						
a	Section 14.2	board operations course, per class		2				
b	Section 14.2	edule planning system training course, per class		2				
c	Section 14.2	npliance Monitoring (CMS) course, per class		2				
d	Section 14.2	orting System (RS) course, per class		2				
e	Section 14.2	tem administration & IT course, per class		2				
f	Section 14.2	tem maintenance cource, per class		2				
g	Section 14.2	ow-up course, per class		6				
					Total material			
					Total labour			
					Training: Total carried forward to summary			

C2.3.11 Maintenance

Y OF POLOKWANE **CONTRACT PM/69/2017**

E DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

ME OF TENDERER:_____

M	ERENCE	DESCRIPTION OF ITEM	UNIT	ANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
rate to be filled in hereunder must make provision for all specified equipment and miscellaneous auxiliary materials and labour in order to provide maintenance as specified.								
ction 15: Maintenance								
1	**Section 15.1.2**	**ponsive Maintenance**						
a	Section 15.3	ntenance fee priced per station per month	on-month	72				
b	Section 15.3	ntenance fee priced per bus & midi- bus per month	-month	1296				
c	Section 15.3	ntenance fee priced per depot/layover area per month	ot-month	72				
d	Section 15.3	ntenance fee priced for the TMC	ath	36				
2	**Section 15.1.3**	**ventive maintenance**						
a	Section 15.3	ntenance fee priced per station per month	on-month	72				
b	Section 15.3	ntenance fee priced per bus per month	-month	1296				
c	Section 15.3	ntenance fee priced per depot/layover area per month	ot-month	72				
d	Section 15.3	ntenance fee priced for the TMC	ath	36				
3	**Section 15.2.h**	**ntenance spares, (recommended minimum spares list to be provided with tender)**	/ sum			250,000.00		
					Total material			
					Total labour			
					Maintenance: Total carried forward to summary			

C2.3.12 Technical Operational Support

CITY OF POLOKWANE **CONTRACT PM/69/2017**

THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

NAME OF TENDERER:_____

ITEM	REFERENCE	DESCRIPTION OF ITEM	UNIT	QUANTITY	SUPPLY MATERIALS RATE	SUPPLY MATERIALS AMOUNT	SUPPLY LABOUR RATE	SUPPLY LABOUR AMOUNT
The rate to be filled in hereunder must make provision for all costs to provide operation support as specified.								
Section 17: Technical Operational Support								
1		**Operational Support**						
a	C3, Section 17	Technical Operations Specialist	hours	240				
b	C3, Section 17	Off-site Technical Support Specialist	hours	120				
					Total material			
					Total labour			
					Technical operational support: Total carried forward to summary			

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Person Authorized to sign Tender:

FULL NAME (IN BLOCK LETTERS): -

SIGNATURE: -

DATE: -

CITY OF POLOKWANE **CONTRACT PM/69/2017**

PROVISION OF THE AUTOMATIC FARE COLLECTION SYSTEM (AFCS) AND PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THE POLOKWANE IRPTS FOR 3 YEARS

NAME OF TENDERER:_____

PART C: Combined Tender (Both AFC and PTMS) Pricing Schedule Summary

Reference	Description	Amount / Value
Part A	The total price offered for AFC (excluding discount) (excluding VAT)	R
Part A	The percentage discount offered on Part A (AFC)	%
Part A	The total discounted price for Part A: AFC (excluding VAT)	R
Part A	VAT (15%)	R
Part A	**THE TOTAL DISCOUNTED PRICE FOR PART A: AFC (INCLUDING VAT)** (amount to be entered on C1.1 PART C Combined Form of Offer and Acceptance)	R
Part B	The total price offered for PTMS (excluding discount) (excluding VAT)	R
Part B	The percentage discount offered on Part B (PTMS)	%
Part B	The total discounted price for Part B: PTMS (excluding VAT)	R
Part B	VAT (15%)	R
Part B	**THE TOTAL DISCOUNTED PRICE FOR PART B: PTMS (INCLUDING VAT)** (amount to be entered on C1.1 PART C Combined Form of Offer and Acceptance)	R
	TENDER SUM FOR THE TOTAL DISCOUNTED PRICE FOR PART C (SUM OF PART A AND B ABOVE) TO FORM OF OFFER (incl. VAT at 15%)	R

PART A: AFC
Part C3: Statement of Work

PART C3: STATEMENT OF WORK

Content

Table of tables

Table of Figures

1. INTRODUCTION

1.1 Purpose

This document serves to specify the Statement of work and services to be provided by the Contractor for the Design, Supply, Implementation, Warranty, Operation, Maintenance and Transfer of the Automatic Fare Collection System (AFCS) for a Period of 3 years, for the Polokwane Local Municipality (PLM) tender number PM 69/2017.

1.2 Scope

This document covers the intended approach to the acquisition of the AFCS through a Design, Build, Operate, Maintain and Transfer (DBOMT) contract (the Contract) as well as the anticipated major components and their functional, performance, physical, interface and operational requirements and thus constitutes the Employer's Requirements and the Operation Management Requirements contemplated in the FIDIC Conditions of Contract for Design, Build and Operate Projects.

The Contractor shall be responsible for the Design, Build, Operation, Maintenance and Transfer in compliance with the Employers' Requirements of the AFCS and the integration into the IRPTS.

This document is not a design specification but sets out the PLM requirements for the AFCS as input to the Tenderer's design of the proposed solution.

1.3 Definitions

Ref	Term	Definition
1.3.1	City Bus Fleet	Fleet of buses consisting of Trunk-Extension and Midi buses which are yet to be implemented as part of the IRPTS.
1.3.2	Trunk-Extension Bus	Bus with right-hand doors to service Trunk stations and left-hand doors to service curb-side Feeder stops. Capacity 80.
1.3.3	Midi-bus	Bus with left-hand curb side doors to service Feeder stops. Capacity 50.
1.3.4	Feeder Taxis	A fleet of mini-bus taxis serving as feeders to the IRPTS.
1.3.5	Complimentary routes	Trunk-extension and Feeder routes.
1.3.6	Trunk-Extension Routes	Routes which are adjacent to the trunk corridor and will be serviced by Trunk-Extension Buses as an extension to the trunk corridor service on occasion
1.3.7	Kiosk	Attended ticket sales point
1.3.8	Wi-Fi	Any wireless local area network products that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards"

1.4 Abbreviations

REF. No.	ABBREVIATION	DESCRIPTION
1.4.1	AC	Alternating Current
1.4.2	ACL	Access Control List
1.4.3	AES	Advanced Encryption Standard
1.4.4	AFC	Automatic Fare Collection
1.4.5	AFCS	Automatic Fare Collection System
1.4.6	AFCCS	Automatic Fare Collection Central System
1.4.7	BEU	Balance Enquiry Unit
1.4.8	BIOS	Basic Input/Output System
1.4.9	BOP	Bus on-board plant
1.4.10	C	Comply (when applicable to compliance statement)
1.4.11	CBD	Central Business District
1.4.12	CC	Comply Conditionally (when applicable to compliance statement)
1.4.13	CCC	Central Control Centre
1.4.15	CCTV	Closed Circuit Television
1.4.16	CFI	Customer Furnished Item
1.4.17	COC	Certificate Of Compliance
1.4.18	COTS	Commercial Off-The-Shelf
1.4.19	DBMS	Database Management System
1.4.20	DC	Direct Current
1.4.21	DNP	Defects Notification Period
1.4.22	DRC	Disaster Recovery Centre
1.4.23	PLM	Polokwane Local Municipality
1.4.24	EMV	Eurocard, Mastercard, VISA
1.4.25	POD	Plant Operating Data
1.4.26	F #	Feeder route number
1.4.27	FAT	Factory Acceptance Test
1.4.28	FIPS	Federal Information Processing Standard
1.4.29	FO	Fibre Optic
1.4.30	GPS	Global Positioning System
1.4.31	GUI	Graphical User Interface
1.4.32	IAT	Inspection Acceptance Test
1.4.33	ICT	Information Communications Technology
1.4.34	IEC	International Electro technical Committee
1.4.35	IO	Input / Output
1.4.36	IRPTN	Integrated Rapid Public Transport Network
1.4.37	IRPTS	Integrated Rapid Public Transport System
1.4.38	IS	Information Systems
1.4.39	ISO	International Standards Organisation

REF. No.	ABBREVIATION	DESCRIPTION
1.4.40	IT	Information Technology
1.4.41	KVM	Keyboard Video and Mouse
1.4.42	LAN	Local Area Network
1.4.43	LRU	Line Replacement Unit
1.4.44	MAN	Metropolitan Area Network
1.4.45	MCBF	Mean Cycles Between Failures
1.4.46	MIOS	Minimum Interoperability Standards for Information Systems in Government
1.4.47	MTBF	Mean Time Between Failures
1.4.48	NC	No Comply (when applicable to compliance statement)
1.4.49	NDOT	National Department of Transport
1.4.50	NVR	Network Video Recorder
1.4.51	OEM	Original Equipment Manufacturer (Equipment is referenced in this document as Plant in accordance with FIDIC definitions)
1.4.52	OHSA	Occupational Health and Safety Act
1.4.53	OS	Operating System
1.4.54	OSP	Operations Service Period
1.4.55	PCI DSS	Payment Card Industry Data Security Standard
1.4.56	PIA	Polokwane International Airport
1.4.57	PID	Passenger Information Display
1.4.58	PIRPTS	Polokwane Integrated Rapid Public Transport System
1.4.59	PLM	Polokwane Local Municipality
1.4.60	POPIA	Protection of Personal Information Act 4 (2013)
1.4.61	PPS	Pre-production Sample
1.4.62	PVU	Portable Verification Unit
1.4.63	RMS	Root Mean Square
1.4.64	SANS	South African National Standards
1.4.65	SAT	Site Acceptance Test
1.4.66	SCS	Station Control Server
1.4.67	SIT	Site Integration Test
1.4.68	SLA	Service level Agreement
1.4.69	SMS	Short Message Service
1.4.70	SOAP	Simple Object Access Protocol
1.4.71	SOP	Standard Operating Procedures
1.4.72	TBD	To Be Determined
1.4.73	TE #	Trunk Extension number
1.4.74	TMC	Traffic Management Centre
1.4.75	TOM	Ticket Office Machine
1.4.76	TVM	Ticket Vending Machine
1.4.77	UPS	Uninterruptable Power Supply
1.4.78	UV	Ultra Violet

REF. No.	ABBREVIATION	DESCRIPTION
1.4.79	V	Voltage
1.4.80	WAN	Wide Area Network

1.5 LIST OF APPLICABLE STANDARDS AND SPECIFICATIONS

1.5.1 Open Standards in the AFCS.

The AFCS shall comply with and apply open standards, as defined by Minimum Interoperability Standards (MIOS) for Government Information Systems Revision 5.0 (or latest version). These and other standards are relevant to the development, production, operation and interoperability of the AFCS System with third parties.

It is the Contractor's responsibility to ensure that any updates to these standards are adhered to and the Contractor shall provide certificates to prove that the design and final AFCS complies with the applicable standards.

The Tenderer shall provide a list of all standards to which the proposed solution will comply as part of the tender submission, including but not limited to the following;

Table C3 1: AFCS OPEN STANDARDS

Standard	Title
ISO 24014-1:2007	Public transport -- Interoperable fare management system -- Part 1: Architecture
ISO/IEC 14443-1:2008	Identification cards -- Contactless integrated circuit cards -- Proximity cards -- Part 1: Physical characteristics
ISO/IEC 14443-2:2001	Identification cards -- Contactless integrated circuit(s) cards -- Proximity cards -- Part 2: Radio frequency power and signal interface
ISO/IEC 14443-3:2001	Identification cards -- Contactless integrated circuit(s) cards -- Proximity cards -- Part 3: Initialization and anti-collision
ISO/IEC 14443-4:2008	Identification cards -- Contactless integrated circuit cards -- Proximity cards -- Part 4: Transmission protocol
ISO/IEC 7810:2003	Identification cards -- Physical characteristics
BSI BS EN 1545-1	Identification card systems — Surface transport applications — Part 1: Elementary data types, general code lists and general data elements
BSI BS EN 1545-2	Identification card systems Surface transport applications Part 2: Transport and travel payment related data elements and code lists
EMV Standards	Standards and specifications managed and enhanced by EMVCo, which cover elements such as general physical characteristics of terminals, the terminal card interface, including contactless interface for initiating payment transactions, transaction processing, data management and data security
National Department of Transport – R511	Regulations Relating to Integrated Fare Systems, 2011 (Government Notice R511 in Government Gazette 3463 of 17 June 2011)
PCI DSS	The PCI Data Security Standard represents a common set of industry tools and measurements to help ensure the safe handling of sensitive information. This is the set of requirements set forth by the Payment Card Industry Security Standards Council (PCI-SSC) against which compliance is measured.
ISO 7001:2007	Graphical symbols – Public information symbols

Standard	Title
ISO 22727:2007	Graphical symbols – Creation and design of public information symbols – Requirements

1.5.2 Standards applicable for installation and implementation of the AFCS.

The contractor shall ensure during the installation, implementation, maintenance and operation of the AFCS that as a minimum the standards listed below as amended from time to time, are adhered to and implemented. In addition the Contractor shall adhere to Employer's applicable information technology policies and standards.

Table C3 2: INSTALLATION AND IMPLEMENTATION STANDARDS

Standard	Title
SANS 10142-1 2009 Edition 1.7	The Wiring of premises
OHSA Act (No. 85 of 1993)	The Occupational Health and Safety Act aims to provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.
OHS section 14	General Duties of Employees
ISO 9000	Quality management standards

1.6 IRPTS Background

The Public Transport Strategy approved by cabinet in 2007, targeted the Metropolitan Municipalities as well as four large cities, including Polokwane, for the implementation of Integrated Rapid Public Transport Networks.

As a result, The Polokwane Local Municipality (PLM) is considering the implementation of an Integrated Rapid Public Transport System (IRPTS) which is essentially a Bus Rapid Transit System (BRT) comprising a dedicated trunk corridor, trunk extensions and feeder bus routes linking Ramongwana, Komape, Bloodriver and Seshego/Moletji in the North West to the Polokwane Central Business District (CBD) and Mankweng in the East.

The primary trunk corridor is to be serviced by trunk buses, which shall also cover adjacent complimentary trunk extensions and some feeder routes. Other feeder routes will be serviced by dedicated feeder bus services. Trunk stations situated along the trunk corridor will provide commuter handling services to trunk buses with a view to reduced dwell time as well as ticket sales functionality. Feeder and Trunk extension routes shall be provided with bus stops at locations indicated and further elaborated in the Employers Requirements. Dedicated mini-bus taxis may also provide a feeder service to the network, but this is currently beyond the scope of this tender.

An IRPTS control centre or Transport Management Centre (TMC) will be located at the Peter Mokaba Stadium and a central Depot located to the South West of Seshego, will provide a facility for the parking of the bus fleet and the associated infrastructure required for the maintenance, operations and administration thereof.

The IRPTS bus routes and site locations are further elaborated in the site data section Part C4 of this tender document.

The IRPTS includes *inter alia*, an Automatic Public Transport Management System (APTMS) and an Automatic Fare Collection System (AFCS), the latter being the subject of this tender and which will thus be further elaborated upon below.

A data communication network will form part of the IRPTS infrastructure to facilitate communications within and between sub-systems.

The above is a description of the full IPRTS ultimately envisaged for the PLM, however due to ongoing efforts to address funding challenges and improve feasibility through inter alia scope and cost reduction, the network design remains live and will almost certainly undergo further change during the project life cycle.

1.6.1 IRPTS implementation phases

Due to funding and other constraints, the implementation of the IRPTS and thus the AFCS is planned to occur in multiple phases, the first of which is the subject of this tender inquiry referred to as Phase 1A, planned to be launched in March 2019. The Phases will proceed at the sole discretion of the Employer and could be accelerated.

Further detail of the IRPTS roll-out, route and site location mapping is contained in part C4 to the tender document.

1.6.1.1 Phase *1A*

This phase includes one (1) trunk station, namely T7 located on General Joubert Street between Thabo Mbeki Street and Grobler Street in the CBD, and along the primary trunk corridor located from Seshego to the Polokwane CBD as depicted in Figure 1.

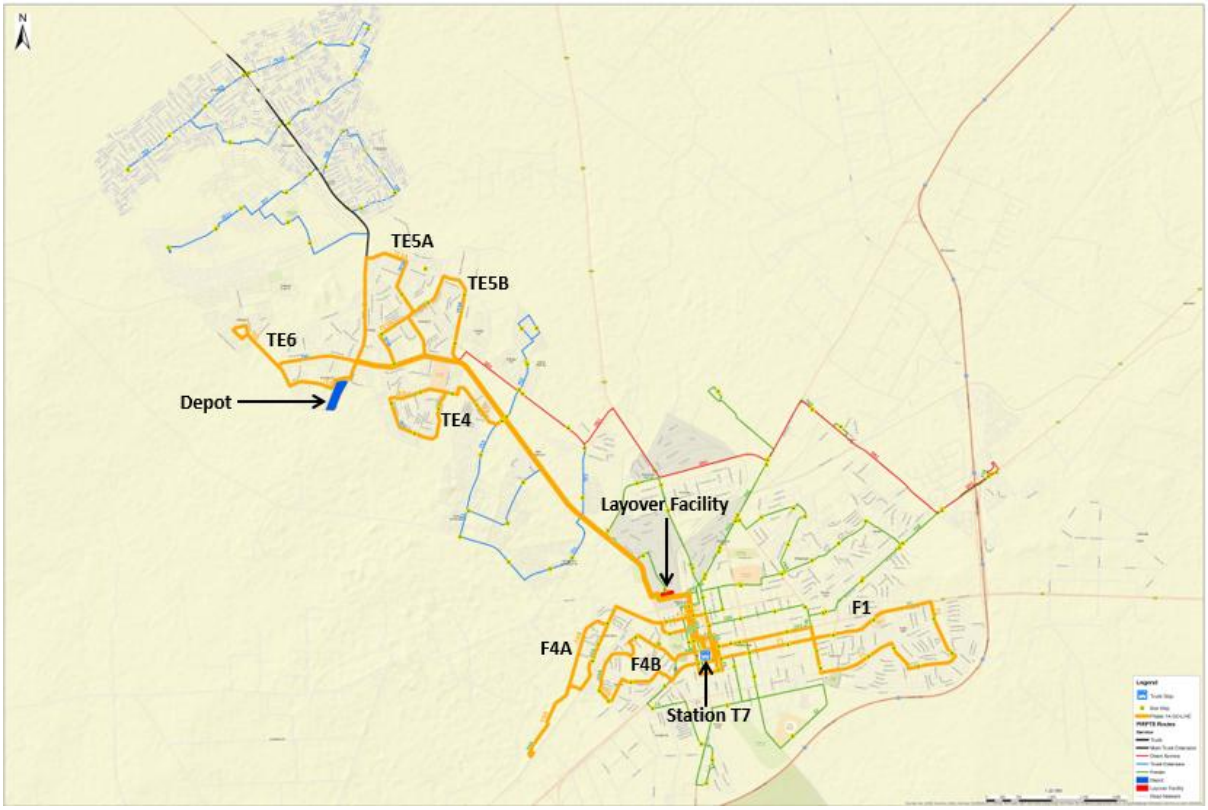


Figure 1

There will be four (4) trunk extension routes linked to the Seshego end of the trunk route, namely TE5a, TE5b, TE4 and TE6, servicing the Moletji and Seshego areas.

There will be three (3) Feeder routes, namely F1, F4a and F4b, linked to the CBD station and servicing the Westernburg, Flora Park and Bendor areas and extending to the Mall of the North.

The service will include twenty-one (21) Trunk-Extension buses with curb side access as well as fifteen (15) Midi-buses as the base scope for this bid.

1.6.1.2 Future *Phases*

The scope of the remaining phases are yet to be determined, however section C4 will provide the Bidder with a general idea of the potential full scope of work. Note that the Employer makes no commitment to proceeding any further than Phase 1A, nor to the full scope of the IRPTS.

Summary tables of IRTPS Implementation Phases

Trunk Stations	**Phase 1A**		**Future Phases (see sec. C4)**	
	T7		T.B.D	
Total	**1**		**T.B.D**	
Trunk Extension and Feeder Routes	**Route ID**	**Qty Stops**	**Route ID**	**Qty Stops**
	F1		T.B.D	T.B.D
	F4a			
	F4b			
	TE4			
	TE5a			
	TE5b			
	TE6			
Total	**7**		**T.B.D**	**T.B.D**
Buses	**Midi**	**Trunk - Extension**	**Feeder**	**Trunk**
	15	21	T.B.D	
Total	**36**		**T.B.D**	

1.7 AUTOMATIC FARE COLLECTION SYSTEM OVERVIEW

Figure C3 1: Level 4 Clearing and Settlement

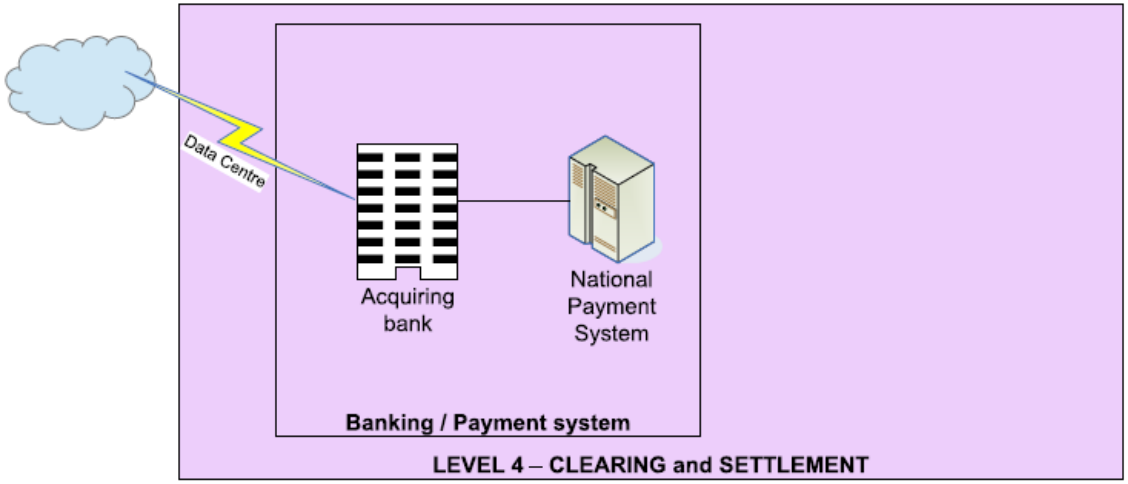


Figure C3 2: Level 3 Central System

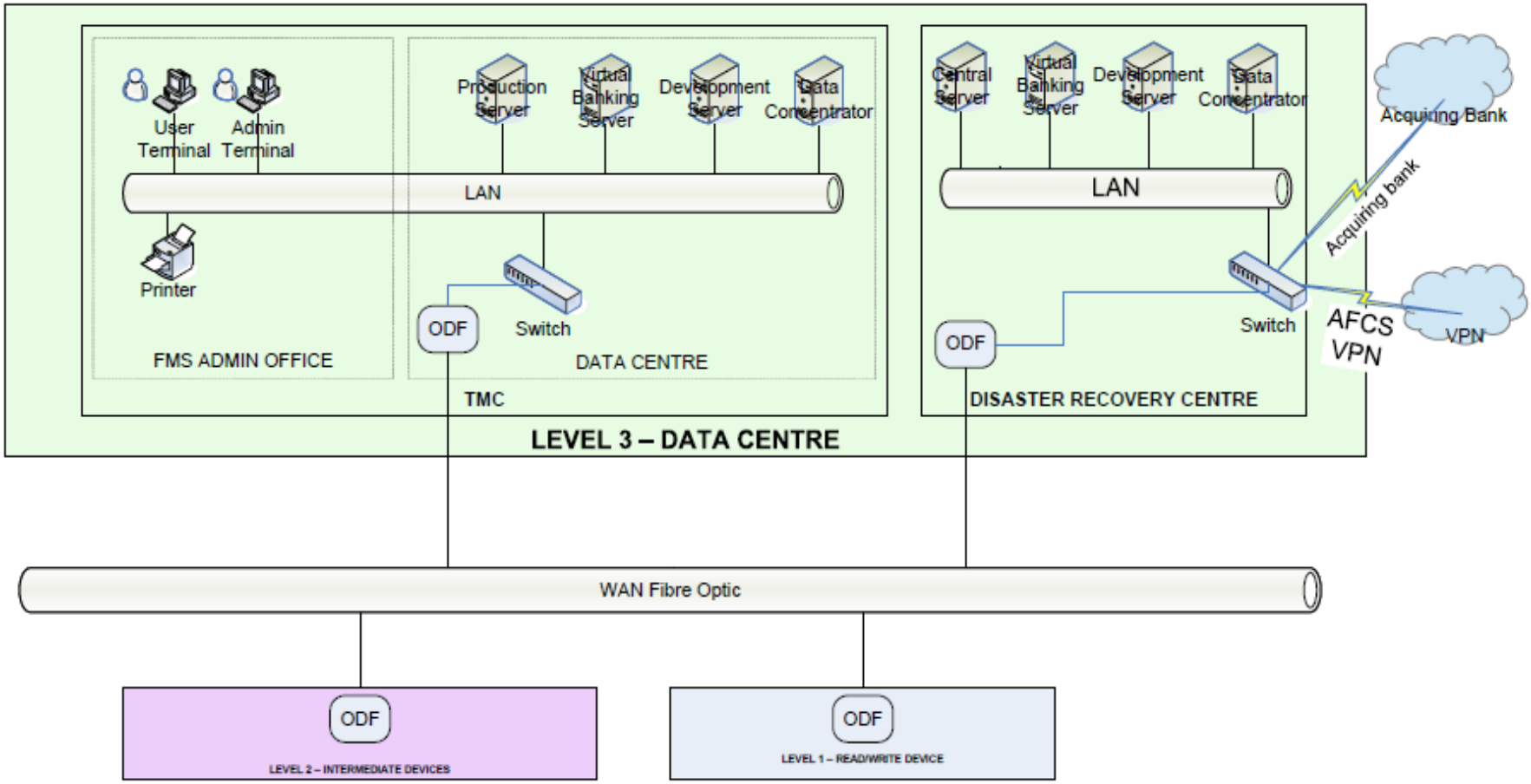


Figure C3 3: Level 2 Intermediate Devices - Depot

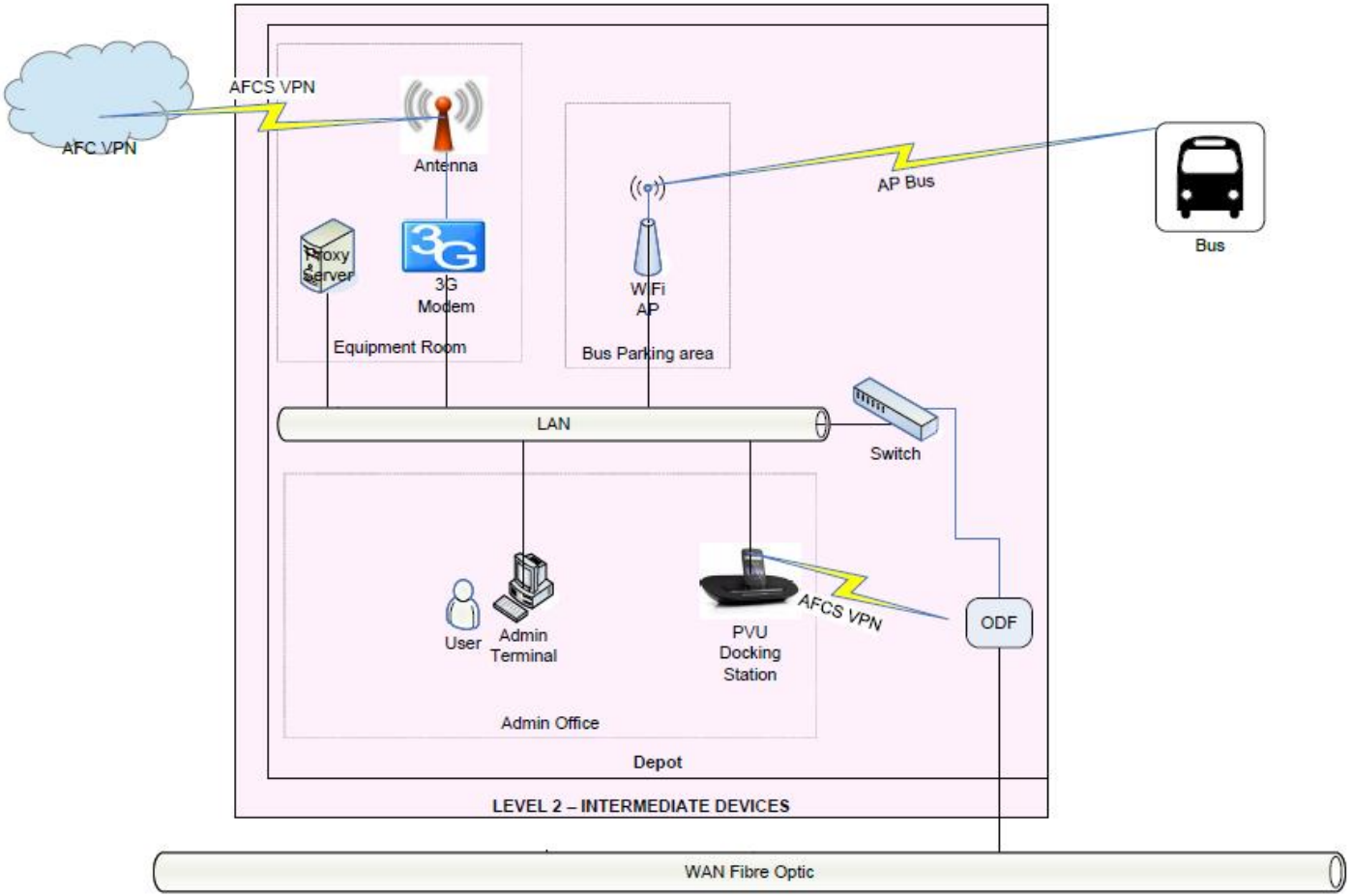


Figure C3 4: Level 1 Trunks Station

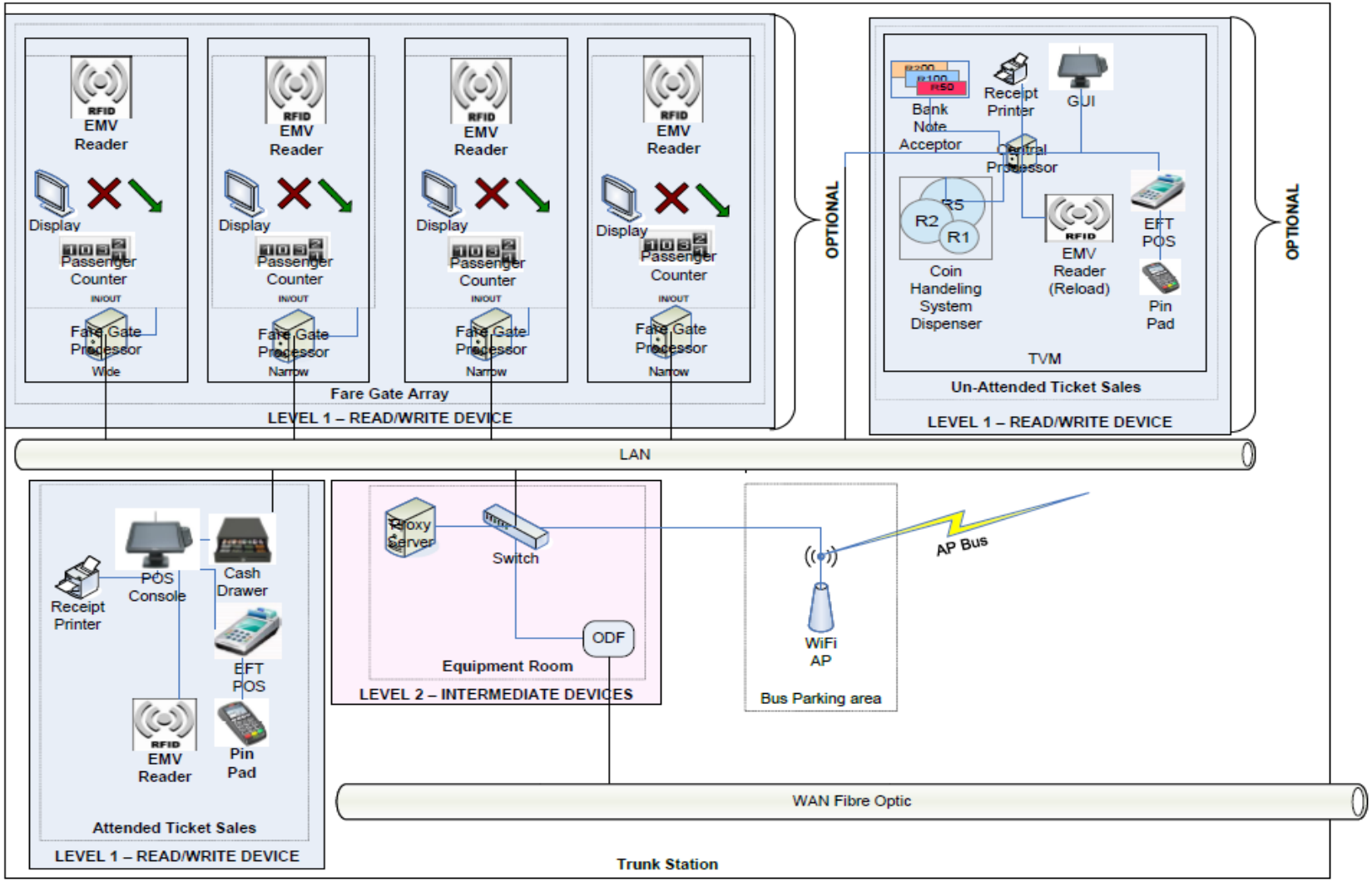
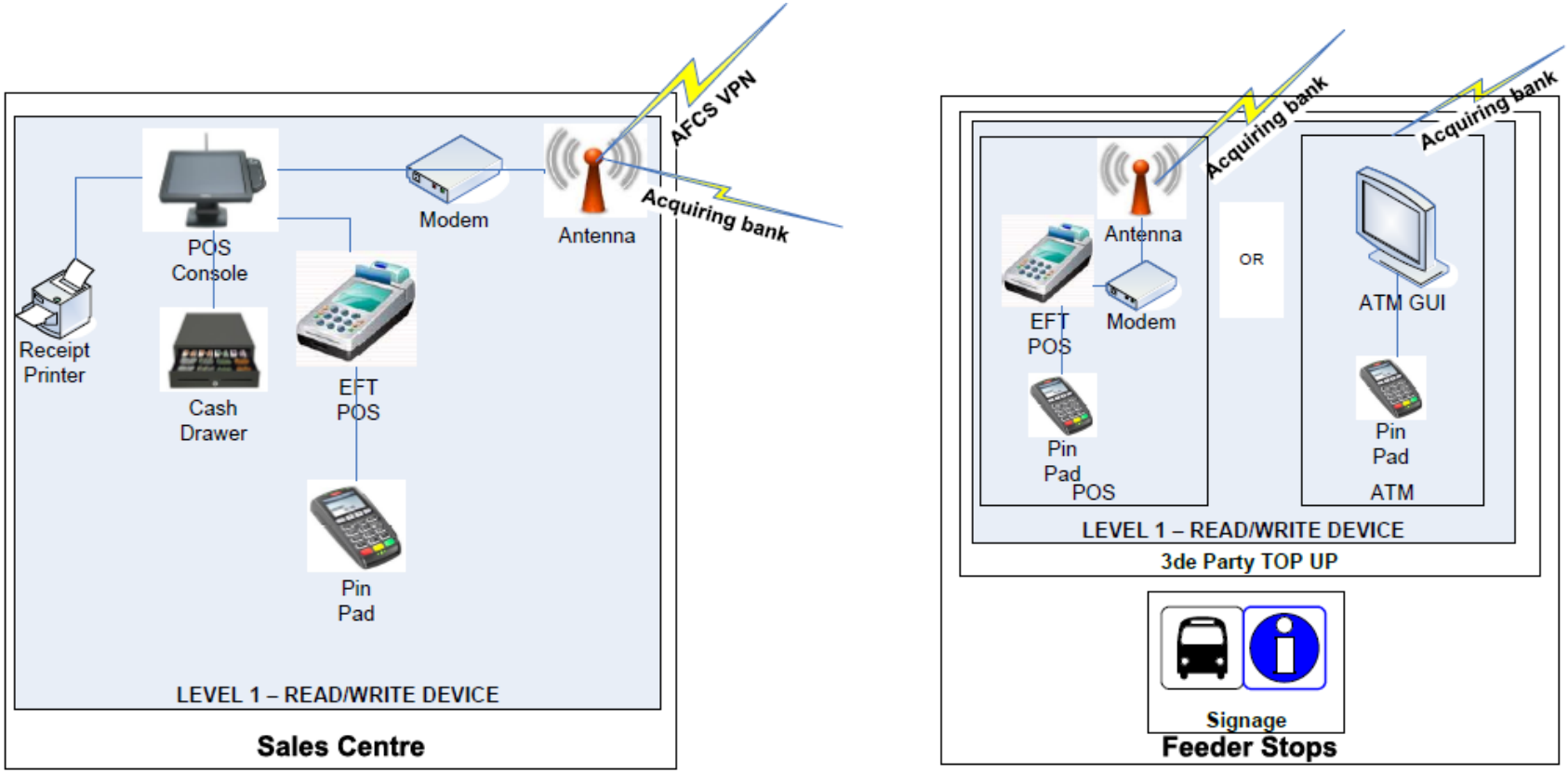


Figure C3 5: Level 1 Read/Write Devices - Sales Centres and Feeder Stops



1.7.1 Objectives

The AFCS system to be implemented is aimed at achieving the following key objectives;

- Interoperability
- Safe and secure transactions
- Social inclusivity
- Commercial inclusivity
- Commercial sustainability
- Regulatory compliance
- Mobility
- Environmental sustainability

The tenderer is to develop the proposed solution with due cognisance to the above.

1.7.2 Description

As required by the National Department of Transport (NDOT), under regulation R511 (gazetted in June 2011), all Automatic Fare Collection Systems (AFCS) in public transport systems, are to make use of a contactless, bank issued, EMV compliant transit card, the requirements of which are further elaborated in the Regulation and its applicable and referenced documents as referred to under Section 2.4 below.

1.7.2.1 Level 0 – Fare media

A bank issued EMV smart card with contactless and contact interfaces which is NDOT R511 compliant will be used as a multi-trip transit and low value retail bank card and will be branded for the IRPTS.

The first issue of a smart card will be free of charge, provided the recipient's identity number is linked to the card number. Alternatively, infrequent travellers can purchase a smart card and receive a refund if the smart card is returned undamaged.

Provision is made for single tickets by loading the value of a single trip product on the smart card. Receipts can be printed on request for the single trip when the value is loaded for the single trip product.

Concession cards will be available for passengers whose profiles meet specific requirements, e.g. pensioners, students and disabled.

A staff profile will be created for the issuance of staff transit cards however staff access and driver cards will not form part of the AFCS.

1.7.2.2 Level 1 – EMV Read/Write devices

These are EMV certified transit card validation devices which will provide contactless and/or contact interfaces with the fare media. The validation devices will be able to read and write to Fare media with the NDOT R511 data structure. The contactless interface will be for the purposes of trip verification, validation and authorisation. While the contact interface (on POS equipment) will be for the product and value load. These devices will be located at distributed sites and equipment.

A TCP/IP Network will form the main communication infrastructure for communication between the Data Centre and distributed fixed locations where AFCS devices are situated. Fibre optics will be the main WAN medium. Switches at distributed locations will serve as interface to the LAN's and WAN.

Wireless networks will also be utilised such as Wi-Fi and 3G/GPRS for communication between buses and depot equipment and POS and Payment System respectively.

All devices will be such that all transactions are securely transmitted and processed and provide enough storage to prevent the loss of data in the event of a loss of communications. In addition, the devices shall also store transactions for sufficient time to perform a back-office recovery in the event of back office failure. This period shall be configurable for each device and updatable via EOD.

1.7.2.2.1 Trunk stations

1.7.2.2.1.1 Ticket sales

The Trunk station will provide an attended pre-boarding ticket sales function at which new cards may be purchased and/or reloaded. As an additional option Trunk stations may also provide for future un attended pre-boarding ticket sales by means of Ticket Vending Machines (TVM).

1.7.2.2.1.2 Ticket office Machine (TOM)

The TOM sales equipment will connect to the Data Centre via the LAN and WAN. POS equipment will connect to the Payment System via a GPRS or VPN network. The TOM consists of Graphical User Interface (GUI), input device, cash drawer, POS devices and receipt printer to be operated by the Ticket Sales attendant to load, reload and Top Up fare media and capture Customers details.

1.7.2.2.1.3 Ticket Vending Machine (TVM)

No provision is made for any Ticket Vending Machines at Trunks stations for Phase 1A. However, Trunk stations may be fitted with TVM's in the future at the Employers sole discretion, so as to allow for a self-help ticket sales function.
The Tenderer must provide a system that can accommodate TVM's in the future in such a way that TVM's can be added by making use of back office configuration set-up.
The Tenderer must provide a costing for the implementation of TVM's that will cover all aspects; Design, build, operate, maintain and training in order to provide the Employer with the necessary information to make an informed decision to implement

or not. The full requirements of the TVM can be found in 2.4.13.2 Ticket Vending Machine (TVM)

1.7.2.2.1.4 Fare gates

No provision is made for any Fare gates at Trunk Stations for Phase 1A. However, Trunk stations may be fitted with fare gates in the future at the Employers sole discretion, so as to allow pre-boarding access control into the station. The fare gates will permit access to patrons with a minimum balance on their cards and will permit exit to patrons with a check in transaction which has occurred within the maximum trip duration (system configurable) or a system configurable minimum time for change of mind.
The Tenderer must provide a system that can accommodate Fare gates in the future in such a way that Fare gates can be added by making use of back office configuration set-up.

1.7.2.2.2 Sales centres

Sales centres may be established at major nodes such as the Mall of the North and Moletji at which Fare media may be collected and registered, purchased or reloaded. The precise demand for this will be determined based on actual commuter demand and commercial viability.
Sales centres will have the same equipment as the Ticket Sales at Trunk stations; however, the connection to the Data Centre might be a VPN over ADSL, GPRS or equivalent mobile network.

1.7.2.2.3 Feeder stops

1.7.2.2.3.1 Ticket sales

The number of feeder/trunk extension stops, and the relatively low boarding and alighting volumes renders it intuitively unfeasible to establish any AFC infrastructure at feeder/trunk extension stops.
3rd party POS' are to be established at merchant and/or bank ATM infrastructure, en-route and within a maximum 1000m radius of feeder/trunk extension stops where feasible.
The 3rd party POS' will utilise their own communications infrastructure. The POS devices will be updated through the participating bank.

1.7.2.2.3.2 Signage

AFCS infrastructure located at the feeder/trunk extension stops will be limited to way finding signage identifying the location of the nearest POS, hours of business, etc.
At 3rd Party POS locations the vendor must display contemporary Fare rates and bus schedules.

1.7.2.2.4 Trunk Buses

1.7.2.2.4.1 Card validator

Trunk buses will provide platform level boarding and alighting at trunk stations, via side doors. As ticket validation will not occur at the fare gates (unless implemented), ticket validation equipment will be required at trunk doors.
As trunk buses will also be servicing complimentary feeder routes, ticket validation equipment will also be required at curb side doors.
Fare evasion reduction will be limited to driver intervention, prior to allowing entry by passengers. A flat fare will be charged for each bus route, thus only check in will be required by passengers.
The card validator will have the capability to communicate with the central server by utilising 3G and Wi-Fi. The mobile and Wi-Fi must be able to be configured as standalone or as a combination where one serves as a fail over.
The card validators will have the capability to process and store transactions on board while not connected to the central server.
Transactions stored on the validator shall be sent to the Back office as soon as a network connection is established. The sending of stored transactions shall be a background process which will not interrupt concurrent ticket validation.
The validators will provide for a user interface which will inform the customer and the bus driver of the status of the transaction.

1.7.2.2.4.2 Portable Verification Devices (PVU's)

Transit card inspectors will be present on selected buses and will use PVU's in order to perform contactless spot checks on commuter cards.
A penalty regime will be applied to defaulters, either in the form of spot fines or by adding the card to a black list which will not allow re-use before payment is made.
The PVU will connect to the Data Centre via one of the following methods; a VPN over GPRS, Wi-Fi or LAN (when placed in the docking station). All three types of interfaces must be available on the device and must have the ability to be configured for use. The GPRS and Wi-Fi interfaces shall operate in a fail over configuration in such a way that if no Wi-Fi coverage is available GPRS will connect. The Contractor shall be responsible for the registration of an APN, the supply of SIM cards and the associated data charges.

1.7.2.2.4.3 Passenger Counting

A passenger counting device will be installed on the buses at each entrance to count the passengers for fare evasion detection and demand distribution planning. The contractor shall provide for the collection of counting and location data as well as the analysis thereof in the system software.

1.7.2.2.4.4 Communication

The verification device will have a network communication unit (embedded or installed and linked) to enable transactions, events and configuration data exchange directly with the central server and/or via the Depot equipment.

1.7.2.2.5 Midi-bus

1.7.2.2.5.1 Card validator

Midi-buses will require the same or similar on-board equipment as the trunk buses to facilitate ticket validation upon boarding and/or alighting. Fare evasion reduction will be limited to driver intervention.
The card validators will have the same capability as the validator specified in par 1.7.2.2.4.1.

1.7.2.3 Level 2 – Intermediate server

1.7.2.3.4 Depot

The Bus Depot will serve as a despatch centre for buses and a docking site for PVU's for recharge and data exchange. This may also serve as a data exchange point between the buses and the central system.

1.7.2.3.1.1 Proxy server

The proxy server will serve as an intermediate server performing functions such as downloading equipment operation data (EOD) and collecting transaction data from buses and taxis.

1.7.2.3.1.2 Administration Terminal Interface

An interface shall be provided through which a Terminal such as a desktop or laptop can be connected, to perform maintenance and administration activities. The terminal must be able to log in remotely to on bus equipment on which general system status information can be viewed and maintenance activities be conducted as well as connect to the back office.

1.7.2.3.1.3 Communication

A Wi-Fi access point (AP) may be provided as an interface with the bus' Wi-Fi units, for the transferring of transaction data and EOD to the Data Centre (or via a proxy server).
A Local Area Network (LAN) including the Wi-Fi AP will provide for interconnection of Depot equipment and devices via a Depot network switch which also interface to the WAN for connectivity to the Data Centre.

1.7.2.4 Level 3 – Data Centre

1.7.2.4.1 Central server(s)

A virtualised central server cluster will be provided to manage, process and store transactions, system configuration data and applications as well as providing central administration, banking reconciliation and settlement and provide data exchange interfaces with other potential participants. This will form part of the TMC and will also provide for a development server for changing and testing of system configurations, parameters, etc in a QA environment.

The AFCS software GUI will be web enabled, allowing authorised users to access the AFCS through web browsers on their desktops and mobile devices, to various access levels and rights to perform system administration, management and reporting. The installation of client applications on terminals is discouraged.

1.7.2.4.2 Disaster Recovery Centre

The DRC will be a mirrored version of the central system for redundancy, located on a remote site yet to be identified.

1.7.2.4.3 Administration terminals

1.7.2.4.3.1 Fixed terminals

Two terminals shall be located at the TMC, for AFCS systems administration and management and reporting respectively.

1.7.2.4.3.2 **Remote terminals**

The system must allow for remote users to connect to the AFC system through a secure VPN.

1.7.2.5 Level 4 – Banking / payment system

1.7.2.5.3 Card issuing and acquiring

The EMV card will be issued by a participating bank which will also perform the acquiring function and process card loading, reconciliation and settlement via a banking Virtual Private Network (VPN).

1.7.2.5.4 Loading

It is anticipated that the banking merchant and ATM infrastructure will be used to establish easily accessible card loading points where feasible (points and value). The participating bank will therefore facilitate distribution of contemporary fare rules to such devices.

1.7.3 AFCS implementation phases

The AFCS Contract includes the design, supply, implementation, operation, warranty and transfer of the AFCS required for the initial first phase, Phase 1A. The initial AFCS shall be scalable to allow for the possible implementation of subsequent phases.

The implementation of the AFCS is to be logically integrated and coordinated with the overall IRPTS phasing.

The decision to proceed with any phases subsequent to Phase 1A, will be entirely at the discretion of the Employer and the Contractor will not be entitled to claim for any losses or damages of any nature in connection therewith.

Should the Employer opt to proceed with any or all subsequent phases, the operation of completed phase/s of the AFC system should not be disturbed during their implementation.

The Tenderer will be required to develop an implementation plan for review and approval by the Employer, which will accommodate seamless implementation of the various phases and any updates/changes to the existing system which may be necessitated by the increased scope of the AFCS.

The desired schedule for the implementation of the AFCS, provides targeted dates for completion, but will be dependent on the Tenderers development and production schedule, as well as the need for the provision of inputs to the IRPTN infrastructure and bus construction teams and their resultant construction schedules.

The infrastructure and bus fleet will be constructed by other contractors and manufacturers appointed by the Employer respectively, and the AFCS contractor will be required to cooperate and exchange relevant technical and scheduling data required for the smooth implementation and integration of the IRPTS.

In addition to the above the Employer will provide network infrastructure as a customer furnished item (CFI) and will install and commission such equipment to a state of readiness for the installation of the Contractors plant. This will require close cooperation between the Contractor and the 3rd party, who will be responsible for the implementation and maintenance of such equipment during operations.

1.7.3.4 Phase 1A

During this phase the AFCS central system and DRC are to be established, with due consideration to scalability to accommodate the future phases of the IRPTS. Similarly, the AFCS software development is to be performed in the context of the complete system requirement, i.e. future stations with Fare gates, TVM's and TOM's, routes, business rules etc, in all phases, eliminating or limiting the need for redevelopment in subsequent phases.

The banking payment solution and associated reconciliation and settlement processes are to be established in this phase in order to provide for future phases without the need for amendment or further certification.

The Depot is to be implemented to provide for data transfer capacity for the current and future bus fleet volume.

An attended ticket sales function is to be established at the trunk station, supplemented by two strategically located, interim and potentially permanent sales centres to accommodate the demand surge anticipated upon launching of the IRPTS.

The precise location of the sales centre is yet to be established, but should be considered to be located in the area of Seshego and Mall of the North respectively.

The fixed ticket sales points are to be supplemented by the use of the banking merchant and ATM infrastructure for the loading of cards. The feeder and trunk extension bus stop signage associated with the sales infrastructure are also to be implemented.

Twenty-one (21) trunk buses and fifteen (15) midi-buses are to be fitted with suitable on-board equipment and PVU's are to be provided for the inspectors.

The fibre optic network communications backbone will be provided by others with designated communication ports provided in a network switch on each site.

1.7.3.5 Future Phases

Yet to be determined, see C4 for envisaged full scope.

1.7.4 Scope Summary Phase 1A

Media
- NDOT compliant bank issued contactless smart card

Ticket sales
- Attended sales points at trunk station in CBD, Mall of the North & Seshego
- Top ups at ATM's
- 3rd party sales points where viable
- No vending machines

Ticket validation
- On board validators at trunk and curb side doors for buses and taxis
- No fare gates
- Flat fare selectable for predefined route
- Passenger counting for fare evasion audits

Ticket verification
- Portable validation units
- Inspectors on buses
- Penalty regime

Data acquisition
- WIFI access point at bus depot
- On-board WIFI routers on buses and taxis for data exchange at depots

Back office
- Central servers and admin terminals at TMC
- Disaster recovery centres

Clearing and settlement
- Acquiring bank with operational NDOT card implementation

Operations
- AFC manager
- Technical manager
- System administrator
- Status monitor
- Financial manager
- Station / sales centre supervisor
- Ticket sales clerks
- Inspectors
- Maintenance technicians
- Combine/share functions where possible

Procurement
- Design, Build, Operate, Maintain, Transfer FIDIC gold book contract
- 3 years of operation following completion of phase 1C
- Alternative offers from tenderers

The following table summarises the scope of the AFCS implementation per phase;

Table C3 3: AFCS implementation per phase

LEVEL	ITEM	Phase 1A		Future Phases (see C4)	
0	Fare Media	12,000		T.B.D	
1	Trunk Stations with Ticket Sales	T7		T.B.D	
	Total	1			
	Trunk Stations without Ticket Sales	0		T.B.D	
	Total	0			
	Trunk Stations with Fare Gates	0		T.B.D	
	Total	0			
	BOP	Midi	Trunk	Feeder	Trunk
		15	21		
	Total	36			
	Feeder stops Signage	79		T.B.D	
	3rd Party Card loading	2			
	Sales centres	1		TBD	
	Depot PVU	4		T.B.D	
2	Depot Intermediate services	1		0	0
3	Data Centre /TMC	1		0	0
	Disaster Recovery Centre	1		0	0
4	Banking Payment System	1		0	0

2 PROJECT REQUIREMENTS

2.7 Project Approach

The AFCS project implementation intends to follow a baseline management approach, in which the project life cycle will be staged, with each stage requiring various baseline inputs to proceed, and in turn providing various baselines as outputs to complete associated milestones.

The dependence on these baseline inputs does not imply that activities may not be performed in parallel, however the purpose of the baseline management approach is to reduce technical risk and planning should therefore be performed with due consideration to this risk.

Notwithstanding the procedural requirements of the Contract under Part C1, an overview of this process is presented in the table below, with preliminary cardinal dates. The tenderer is to use these for the purposes of developing a preliminary high-level project programme to be submitted as part of the tender response in returnable document RDC 21 and RDD 3.

Notwithstanding the above, the Contractor will be required to submit a complete and comprehensive project programme in accordance with the requirements of the Contract under Part C1.

The following dates are indicative with the exception of the targeted cardinal contract award and route taking over dates as well as the subsequent Defects Notification Period (DNP) and maintenance dates which are dependent thereon.

The remaining dates are for the purposes of guidance and may be subject to change, depending of the constraints applicable to the Tenderer, infrastructure contractors, 3rd parties and the bus manufacturers.

Table C3 4: PROJECT STAGES

Stage Number	PROJECT STAGE	INITIATION BASELINE	PRIMARY ACTIVITIES	COMPLETION BASELINE	APPLICABLE PHASES
1	Proposal	Invitation to tender – PM 69/2017	Response to invitation to tender Tender evaluation Clarifications & Negotiations Development of final offer	Contractors final offer	All Phases
2	Contracting	Contractors final offer	Acceptance of contractor's final offer and notification to Contractor	Letter of acceptance DBOM contract	Phase 1A

3	Final Design	Letter of acceptance DBOM contract	• Finalise business rules • Detailed design • Final Design documentation • Final Design review • Final Design revision • Final Design review	Approved Final Design	Phase 1A
4	Development & Qualification	Approved Final Design	• Software development • Factory Acceptance Testing	Approved system factory acceptance	Phase 1A
			• Hardware prototypes • Pre-production sample inspection • Factory Acceptance Testing	Approved pre-production samples and system factory acceptance	Phase 1A
5	Installation, operation and maintenance documentation	Approved pre-production samples and system factory acceptance	Installation documentation Operator manuals Maintenance manuals Documentation review Documentation revision	Approved installation, operation and maintenance documentation	Phase 1A

6	Production	Approved pre-production samples	Manufacture Inspection Acceptance / rejection Preparation & packaging Shipment	Receipt and acceptance of plant in contractor's store	Phase 1A
7	Installation	Receipt and acceptance of plant in contractor's store	Site preparation Site acceptance Delivery to site Equipment installation Acceptance of installation ready for testing	Plant installed and inspection performed on site	Phase 1A
8	Commissioning	Plant installed and inspection performed on site	Testing and commissioning on site Staff training Acceptance for operation	Plant tested and commissioned on site and accepted as operation ready. Commissioning certificates	Phase 1A
			Trial operation Ticket sales drives	Public Launch	Phase 1A

9	Post-commissioning	Equipment tested and commissioned on site	Consolidate & update; Test results Certifications As-built drawings Training and operations manuals	Test results, manuals, as-built documentation, history files, data packs, etc.	Phase 1A
10	Defects Notification Period (DNP) / warranty	Commissioning certificate	Identifying and reporting of defects Rectification of defects	Notice of DNP completion.	Phase 1A
11	Operation service period - Maintenance	Commissioning certificate	Preventative maintenance Corrective maintenance Spares stock management Repairs Warranty repairs	Contract completion certificate	Phase 1A
	Operation service period - Operation		Ticket Sales Station Operation CIT Customer support Reviews Audits		

12	Ongoing	Commissioning certificate	Baseline project program updates Progress reports Change requests Variations Other activities and documents required by FIDIC & SLA	Contract completion certificate	Phase 1A
13	Ongoing items as specified during defects notification period and maintenance	Commissioning certificate	Updated software revisions System configuration status Failure analysis reports Maintenance and support	Contract completion certificate	Phase 1A
14	System Transfer	1 year prior to completion certificate	Joint Inspection Test Procedures Completion of Outstanding Works and Remedying Defects	Contract completion certificate	Phase 1A

2.8 Project Milestones

Shaded dates in the milestone schedule above are cardinal dates around which the Tenderer is required to construct the proposed project program. Remaining dates are indicative and may change subject to the Contractors activity schedule as well as interdependencies with other contractors.

Table C3 5: PROJECT MILESTONES

MLSTN. No.	MILESTONE DESCRIPTION	ANTICIPATED COMPLETION DATE
0	Proposal	01/10/2018
1	Contracting	04/02/2019
2	Final Design	01/04/2019
3a	Factory Acceptance Test	17/06/2019
3b	Pre-Production Sample	20/05/2019
4	Development and qualification	17/06/2019
5	Installation, Operation and Maintenance Documentation	17/06/2019
6	Production – Phase 1A	15/07/2019
7	Installation – Phase 1A	09/09/2019
8	Commissioning (Go live) – Phase 1A	04/11/2019
9	Post-commissioning – Phase 1A	02/12/2019
10	Defects Notification Period – Phase 1A	01/11/2021
11	Maintenance – Phase 1A	31/10/2022
12	Operation - Phase 1A	31/10/2022
13	*System Transfer*	*31/10/2022*

Notwithstanding the requirement for the submission of the Contractors' programme in the conditions of contract, the tenderer is required to submit an indicative project schedule at least to the level of each of the above milestones, based on the assumption that the site infrastructure and buses are ready as and when required under returnable **document RDC** 21 and RDD 3. Dependencies are to be clearly indicated and the programme should be accompanied by a narrative clarifying these where required.

2.9 Statement of work

2.9.2 General

The Contractor shall be responsible for the design, supply, implementation, warranty, maintenance, operation and transfer of the AFCS and its fitness for purpose, as well as the necessary provision of interface information required for integration with other IRPTS stakeholders as well as specifications for customer furnished items (CFI) where applicable.

2.9.3 Proposal stage

2.9.3.4 Notwithstanding the instructions to Tenderers contained in this tender inquiry, the tenderer shall propose the AFCS solution in accordance

with the stated requirements contained herein. Alternative offers are encouraged and may be made once these requirements are satisfied.

2.9.3.5 The Tenderer must confirm or qualify compliance to these requirements by means of a compliance statement in which each and every requirement must be cross referenced and responded to with comply (C), no comply (NC) or comply conditionally (CC) and included in returnable document RDD1.

2.9.3.6 In the event of conditional compliance, the Tenderer must clearly qualify the condition, failing which it will be assumed that the Tenderer is either fully compliant or not compliant at all to the specific requirement, at the discretion of PLM.

2.9.3.7 The Tenderer is to provide details of the proposed solution and the functionalities and products forming the solution as appropriate in returnable documents RDD 1 & 3.

2.9.3.8 The Tenderer must demonstrate an understanding of the AFCS requirements and objectives in the above responses and must also provide a list of reference sites which have been implemented by the Tenderer using the proposed major equipment components in returnable document RDD 2.

2.9.3.9 At least one of the reference sites should include an EMV based contactless card solution that is fully compliant with the NDOT R511. In this regard, the Tenderer may rely on a reference site of one of the members of its consortium or of a sub-contractor and this is to be included in returnable document RDD2 as well as a list of current users of the systems in RDD 8.

2.9.3.10 Returnable documents are listed under Part T2 of this tender inquiry, together with instructions for their completion.

2.9.4 Final design stage

2.9.4.4 The purpose of the final design is to finalise the design of the solution accepted in the Contractor’s proposal to begin with system development and qualification activities.

2.9.4.5 The final design will therefore be conducted to a standard which is suitable for the AFCS software development, hardware manufacturing and/or procurement, installation and site requirements, test and acceptance plans, as well as interface specifications enabling the provision of ancillary interfaces, services, facilities and CFI’s by others.

2.9.4.6 The final design of the AFCS will proceed immediately upon the signature of the DBOM Contract.

2.9.4.7 The final design will also include the finalisation of the AFCS business rules on the basis of the signed DBOM Contract, by the Contractor in conjunction with the Employer’s technical team.

2.9.4.8 The Contractor is therefore cautioned not to proceed with the final design aspects which are dependent upon the completion of the business rules, as no claims will be entertained for sunken costs which may result. Such dependencies are to be clearly shown in the Contractors programme.

2.9.4.9 The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, for joint review by the Employer's technical team, the approval of which will not relieve the Contractor of any obligations under the contract and the purpose of which will be to demonstrate complete compliance of the design to specified requirements;

Ref. No.	Deliverable Documents	Description
FD1	System Design Description – Final Updated	Descriptive information and technical specifications for all plant included in the proposal, including a description of the overall system functionality.
FD2	System Functional Description – Final Updated	Description of the functions of all system, sub-system components to LRU level including use cases, process flow, principle or operations.
FD3	System Architecture – Final Updated	A schematic diagram and narrative showing all system components and interfaces.
FD4	Block diagrams – Final Updated	Block diagrams of each major system component to LRU level.
FD5	Item list – Final Updated	List of all items to be supplied by the contractor under the contract, including part number, description, quantity and unit of measure.
FD6	Hardware documentation – Final Updated	Product specifications, general arrangement drawings, functional and performance specifications, packaging and shipping requirements.
FD7	Cable plan – Final Updated	Cable and wiring specifications for interconnection between plant and termination points, labelling conventions and structure.
FD8	Drawings – Final Updated	Diagrams and schematics required in order to clarify any of the above, to ensure a full understanding of the contractors proposed design.
FD9	Software Description – Final Updated	Functional description of software, modules, sub-system in which to be installed and interfaces internal and external.
FD10	Software User Documentation	User interface descriptions, screen flows, menu functions, etc.
FD11	Interface control document – Updated	Preliminary HW & SW interface specification for distribution to other stakeholders.
FD12	Applicable standards – Final Updated	A list of standards to which the system and components will comply as an updated version of that submitted in the bid.
FD13	Spares list - Final	Updated spares list as included in the initial tender submission.
FD14	Operator manuals – draft	Preliminary manuals for initial review.
FD15	Maintenance manuals - draft	Preliminary manuals for initial review.

Ref. No.	Deliverable Documents	Description
FD16	Inspection and test plan	Test plan including the system FAT, PPS, IAT, SAT and SIT, which may be subject to revision prior to execution.
FD17	Business rules - Final	As documented during joint development sessions.
FD18	Final Design Review	Keep record of Minutes of Final Design Review meetings and Responses to Final Design proposals. Indicate and incorporate agreed changes in Final design. This shall include lists of deficiencies and agreed corrective actions.
FD19	Final Design Approval Certificate	Certificate confirming acceptance of the contractor's final design and approval to proceed with the next stage.

The Contractor may have existing standard documentation which covers the above deliverables as part of one or several documents. The Contractor shall then provide a cross reference table which shows in which of the standard documents the information related to the deliverables above is contained.

2.9.5 Development and qualification stage

2.9.5.4 The purpose of this stage will be to develop the necessary software and hardware in accordance with the detailed and approved final design, so as to assemble a representative AFCS system, inclusive of at least one representative sample of each major component of the system in a factory environment.

2.9.5.5 The purpose of the above system shall be two-fold;

2.9.5.5.3 Factory acceptance testing (FAT)

2.3.4.2.1.1 The FAT shall be performed to demonstrate compliance of the system to all functional, performance and technical requirements including the integration of the existing AFCS.

2.3.4.2.1.2 The above testing shall be conducted in accordance with a test plan to be developed by the contractor and submitted for review and approval of the Employer's technical team in advance of the testing, which shall enable the testing of the system for compliance to all requirements; functional, physical, performance and business rules.

2.3.4.2.1.3 The Contractor will be responsible for providing all testing facilities, equipment, plant etc. required for the successful execution of the tests at the Contractors expense.

2.3.4.2.1.4 Where such compliance cannot be proven in this environment (e.g. standards compliance), certificates are to be obtained from applicable authorities, certifying compliance.

2.3.4.2.1.5 The results of all tests together with supporting certificates of compliance are to be captured in a test book, which will include a

deficiency or non-compliance list which is to be rectified by the contractor by a mutually agreed date.

2.3.4.2.1.6 The Contractor will invite the Employer's representatives to attend a second test session during which the rectified deficiencies are to be proven and cleared from the list if compliant.

2.3.4.2.1.7 The Tenderer is to specify the location and anticipated duration of the testing in order for the Employer to make the appropriate budgetary provision and logistic arrangements to attend the testing.

2.3.4.2.1.8 The approval of the factory acceptance test results will permit the Contractor to proceed with the implementation of the system, subject to the approval of the pre-production samples for production.

2.3.4.2.1.9 The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, for joint review by the Employer's technical team, the approval of which will not relieve the Contractor of any obligations under the contract;

Ref. No.	Deliverable	Description
FAT1	Factory Acceptance Test Plan	Detailed approach to FAT as derived from the Inspection and Test Plan (FD16)
FAT2	Factory Acceptance Test Book	Compilation of test results.
FAT3	Test certificates	3rd party test certificates
FAT4	FAT review	Keep record of Minutes of FAT Review meetings and Responses to FAT's. Indicate and incorporate agreed changes in final FAT. This shall include lists of deficiencies and agreed corrective actions.
FAT5	FAT approval certificate	Certificate confirming acceptance of the contractor's FAT and approval to proceed with the system implementation, subject to PPS approval.

2.3.4.2.2 Pre-production sample (PPS) inspection

The representative samples of each major component of the AFCS forming the subject of the FAT will be inspected for compliance to the final design specifications in fit, form and function, against predetermined checklists to be developed by the Contractor, jointly reviewed and approved by the Employer's authorised representative in advance of the testing.

Where such compliance cannot be proven in this environment (e.g. standards compliance), certificates are to be obtained from applicable authorities or manufacturers, certifying compliance.

2.3.4.2.2.1 Where modifications to previously certified plant and/or software are implemented which invalidates such certification, the plant and/or software must be recertified.

2.3.4.2.2.2 The Contractor will be responsible for providing all testing facilities, equipment, plant etc. required for the successful execution of the tests at the Contractors expense.

2.3.4.2.2.3 The inspection may be performed together with the FAT session with due consideration to time and cost economy however, the results will be captured in a separate report.

2.3.4.2.2.4 The results of all tests together with supporting certificates of compliance are to be captured in a test book, which will include a deficiency or non-compliance list which is to be rectified by the Contractor by an agreed date.

2.3.4.2.2.5 The Contractor will invite the Employer's representatives to attend a second inspection session during which the rectified deficiencies are to be demonstrated and cleared from the list if compliant. This may again be scheduled to occur together with the rectification of the FAT deficiencies for the purposes of economy.

2.3.4.2.2.6 The approval of the test results will permit the Contractor to proceed with the production of units for delivery to site and subsequent implementation.

2.3.4.3 The Tenderer is to specify the location and anticipated duration of the testing in order for the Employer to make the appropriate budgetary provision to attend the testing.

2.3.4.4 Pre-production document deliverables

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, for joint review by the Employer's technical team, the approval of which will not relieve the Contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
PPS1	Pre-production sample test plan	Detailed approach to PPS as derived from the Inspection and Test Plan (FD16)
PPS2	Pre-production sample test book	Compilation of test results.
PPS3	Test certificates	3rd party test certificates
PPS4	PPS review	Keep record of Minutes of PPS Review meetings and Responses to PPS tests. Indicate and incorporate agreed changes in final PPS tests. This shall include lists of deficiencies and agreed corrective actions.
PPS5	PPS approval certificate	Certificate confirming acceptance of the contractor's PPS and approval to proceed with the system procurement and manufacture.

Items that will be supplied 'stock standard' and will therefore not be customised for this application in anyway and have been historically produced by the Contractor, may be excluded from this requirement. However, the Tenderer is to clearly identify these items in the bid response.

2.3.5 Installation, operation and maintenance documentation stage

2.3.5.2 Installation documentation

2.3.5.2.2 The Contractor shall provide documentation, including site layouts, detailing the installation requirements and methods for the hardware and software forming the AFCS and integrated AFCS. This documentation shall be subjected to joint review and approval by the Employer's technical team.

2.3.5.2.3 The installation documentation shall form the basis of method statements which will be provided by the Contractor prior to beginning installation work on each site, for the purposes of technical, activity and safety coordination.

2.3.5.3 Operations documentation

2.3.5.3.2 Operation Plan

2.3.5.2.1.1 The Tenderer shall provide a preliminary operational plan as part of the returnable documents RDD4.

2.3.5.2.1.2 The Contractor shall update the operations Plan during the design stage for the AFCS to ensure the efficient operations of the AFCS during the operational stage of the project.

2.3.5.2.1.3 The Operational Plan is to include inter alia;

a. Operations overview

b. Organisation diagram

c. Interfaces with other organisations and their function

d. Operational Facilities with location and contact information

e. Staffing with roles and responsibility

f. Human Resource management

g. Standard Operating procedures

2.3.5.2.2 Operation Manual

2.3.5.2.2.1 Notwithstanding the requirement for the Contractor to operate the system, the Contractor shall provide operator manuals for the AFCS which will comprise a summary system level manual, referencing individual sub-system manuals, which will provide sufficient instructive information to enable the non-technical staff to operate the AFCS with the intended function and performance.

2.3.5.2.2.2 These manuals will also form the basis for the training of operational staff. These manuals are to include inter alia;

a. A general overview of the system and its functions and features

b. Diagrams or illustrations clearly showing the above

c. Clear indication of the location and interfaces of the sub-system in the context of the overall system

d. Detailed description of the functions, features and control interfaces of the sub-system

e. Detailed step by step procedures for the full operation of the system / sub-system in all modes of operation

f. Troubleshooting and problem diagnosis at first line level

g. Fault reporting procedures

2.3.5.2.3 Maintenance Plan

2.3.5.2.3.1 The Tenderer shall provide a preliminary maintenance plan as part of the returnable documents RDD4.

2.3.5.2.3.2 The Contractor shall provide a maintenance Plan for the AFCS to ensure the efficient maintenance of the AFCS during the operational stage of the project. The Maintenance Plan is to include inter alia;

a. Maintenance overview

b. Organisation diagram

c. Interfaces with other organisations and their function

d. Maintenance Facilities with location and contact information

e. Staffing with roles and responsibility

f. Human Resource management

g. Standard Operating procedures

h. Asset replacement schedule

i. Spares supply

2.3.5.3 Maintenance manuals

2.3.5.3.1 Notwithstanding the requirement for the Contractor to perform the maintenance of the system, the Contractor shall provide maintenance manuals which will provide the technical staff, full insight into the maintenance requirements of the AFCS for the;

a. Overall system
b. Sub-systems
c. Major component equipment items
d. Line replaceable unit (LRU) level.

2.3.5.3.1.1 These manuals are to include inter alia;

a. A detailed system description
b. Block and schematic diagrams supporting the above
c. Reference to technical drawings and wiring diagrams supporting the above
d. Preventative maintenance procedures in step by step detail, as well as frequency of such activities applicable to software and hardware and any tools and materials required
e. Corrective maintenance procedures in step by step detail for troubleshooting, fault diagnosis, repair and replacement to LRU level

2.3.5.3.2 Installation, Operational and Maintenance Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, for joint review by the Employer's technical team, the approval of which will not relieve the contractor of any obligations under the Contract;

Ref. No.	**Deliverable Documents**	**Description**
IOM1	Operational Plan	Updated Operational and Maintenance Plan as included in the initial tender submission.
IOM2	Operator manuals - Final	Operator manuals for the entire system.
IOM3	Maintenance manuals - Final	Maintenance manuals for the entire system.
IOM4	Training manuals - Final	Training manuals for operations and maintenance.
IOM5	Training instructors manuals	Manuals to be used for training of operator and maintenance staff in the future.
IOM6	Installation instructions	Generic installation instructions for hardware and software.
IOM7	Method statements	A generic method statement for the implementation of the system each site configuration which may be adapted prior to approval to proceed with work. This will include safety risk analysis, etc.
IOM8	Site installation drawings	Generic site installation drawings which will form the basis of as-built drawings.
IOM9	Cable schedules	Site specific cable schedules which will form the basis of as-built drawings.
IOM10	Document reviews	Keep record of Minutes of Document Review meetings and Responses to Document Reviews. Indicate and incorporate agreed changes in final Documents. This shall include lists of deficiencies and agreed corrective

		actions.
IOM11	Final approved documents	Documents signed off for use in implementation.

2.3.6 Production stage

2.3.6.1 The successful completion and approval of the FAT and PPS will trigger the start of production of the AFCS hardware and software components for delivery to site and subsequent implementation. In the case of non-customised, proven equipment items, these may be approved for production prior to the completion of the FAT.

2.3.6.2 The Employer reserves the right to identify Commercially Off The Shelf (COTS) items as Customer Furnished Items (CFI's) during the Contracting stage and to procure these under a state procurement contract, in which case the Contract Price will be adjusted on the basis of the rates offered in Part C2 – Pricing Schedule.

2.3.6.3 The Contractor will be responsible for the management of the manufacturing process and for ensuring compliance of the Goods to approved specifications in accordance with the Contractors accepted quality management plan as proposed in returnable tender documents RDD3 and RDD9, and as further elaborated and finalised in the preliminary and final design stages.

2.3.6.4 The Employer reserves the right in accordance the terms and conditions of Contract, to inspection and the witnessing of tests during the production process.

2.3.6.5 The Contractor will be responsible for the maintenance and archiving of quality documentation which will provide traceability from delivery of materials for production to in-process quality control, non-conformances, concessions, test certificates, etc.

2.3.6.6 The Contractor will produce such documentation upon demand.

2.3.6.7 Each major plant component is to be clearly and indelibly serialised to LRU level, supported by a certificate listing the serial numbers of LRU's contained within the assembled unit as well as certifying compliance to specification.

2.3.6.8 The Contractor is to implement a system configuration control process, whereby the serial numbers of any units replaced after delivery, as well as the version numbers of software and firmware, are to be captured and updated on a continuous basis.

2.3.6.9 The Contractor is to propose a process for approval of the Employer's authorised representative, which will provide a contemporary and historical record of the location of all major plant, sub-components and LRU's.

2.3.6.10 The Contractor will be responsible for the appropriate packaging of the plant units for delivery and interim storage until installation and acceptance on site.

2.3.6.11 The Contractor shall provide details of the proposed packaging to the Employer for approval as part of the final design.

2.3.6.12 Production Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition to fulfil the requirements of the Contract, the acceptance and/or approval of which will not relieve the contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
PRD1	Plant conformance certificates	Proof of conformance of all items shipped and delivered to the contractor's store.
PRD2	System configuration record	A record of all part and serial numbers, parent and child.
PRD3	Software certificates	Software conformance certificates.
PRD4	Software licenses	All software licenses required for the legitimate use of the software by Polokwane Local Municipality.

2.3.7 Installation stage

2.3.7.1 The Contractor will be responsible for the delivery to site of all Goods forming part of the AFCS with the exception of the items provided by others and/or CFI's as detailed under the interface sections included in the technical requirements.

2.3.7.2 As part of the final design deliverables, the Contractor is required to provide final interface requirements for the infrastructure and bus construction teams in order for the requisite site preparation activities to be performed prior to installation.

2.3.7.3 Notwithstanding the installation documentation provided by the Contractor, a method statement for each site (including each bus configuration) is to be provided which shall detail the scope of work to be performed, works area, safety and security risks, access routes, materials, plant and equipment to be used, storage areas, potential impacts on adjacent systems and activities, etc.

2.3.7.4 The Employer's representative shall review and approve the method statement prior to any site work beginning.

2.3.7.5 When the requisite site interfaces have been prepared, the Contractor will be called to inspect and accept the site as ready for installation, or to raise deficiencies to be rectified.

2.3.7.6 Once the Contractor accepts that the site is ready, is in possession of an approved method statement and is in compliance with site access procedures which may be implemented by the Employer or its contractors with overall possession of the site, from time to time, work may proceed on site.

2.3.7.7 The Contractor will be responsible for the maintenance of safety standards applicable to the execution of the work in accordance with the Occupational Health and Safety Act no. 85 of 1993 (as amended), OHS Act 14 and the general safety rules implemented on site by the Employer or the prime contractor with overall possession of the site.

2.3.7.8 To the above end, the Contractor is reminded to keep a site diary, access control and attendance register, and will be required to report on safety incidents and risks.

2.3.7.9 The Contractor shall take cognisance of the fact that the stations and buses in particular, constitute public facilities and that all cables and materials installed in these facilities may not pose a hazard to the public, particularly with regard to fire and smoke emissions, and are therefore required to be low smoke, zero halogen and flame retardant.

2.3.7.10 The above is to be considered in the final design process and the Contractor will be required to certify that the system and components forming the AFCS supplied are inherently safe for use within such a public facility thus indemnifying PLM in this regard.

2.3.7.11 Notwithstanding the above, all cabling shall comply with SANS 10142 regulating the wiring of premises.

2.3.7.12 All cables (origin and destination), termination points, circuit breakers, network ports and sockets are to be labelled in accordance with a system wide labelling convention, to be proposed, reviewed and approved by the Employer.

2.3.7.13 Once the Contractor has installed the plant, which shall include mounting, fastening, connections and terminations, the Contractor shall notify the Employer that the plant is ready for inspection.

2.3.7.14 The inspection will be conducted with the plant in a powered down state, in accordance with a test sheet showing the results of agreed tests, visual inspections, cable continuity, etc.

2.3.7.15 The Contractor shall be responsible for ensuring that an electrical Certificate of Compliance (COC) for the electrical installations performed on each site is obtained from the party responsible.

2.3.7.16 The Installation Acceptance Test (IAT) sheets are to be developed by the Contractor and jointly reviewed and approved by the Employer prior to use.

2.3.7.17 Once the IAT is successfully conducted and approved by the Employer's authorised representative, the Contractor will be entitled to partial payment for the Goods in accordance with the contract.

2.3.7.18 The Contractor may not power up the plant until the IAT has been signed by the Employer.

2.3.7.19 Installation stage Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the

Contract, the acceptance and/or approval of which will not relieve the Contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
INS1	Site installation drawings	Drawings of plant installations, building interfaces, wiring schematics, DB layouts, etc.
INS2	Site installation documents	Site instructions
INS3	Method statement	Approved methods statements as derived from the IOM, which may be modified to suit the specific site.
INS4	Installation acceptance test certificate	Approved test results permitting contractor to proceed with power up.
INS5	Electrical certificate of compliance	COC permitting use of power circuits.
INS6	Site attendance register	As maintained during installation by the contractor.
INS7	Site diary with photographic records	As maintained before, during and after installation by the contractor.

2.3.8 Commissioning

2.3.8.1 The installed and powered, Works are to be tested and accepted on site by means of a two-staged testing process;

2.3.8.2 The first stage will be System Acceptance Testing (SAT), which will include the testing of each major plant component on a site or bus, in a stand-alone mode.

2.3.8.3 The Contractor shall develop a SAT test plan for joint review and approval by the Employers authorised representative.

2.3.8.4 The purpose of the SAT shall be to test the functions and features of the installed units on site, without full integration with the remainder of the system.

2.3.8.5 The Contractor shall be responsible for the creation of software applications or routines which may be required to facilitate this.

2.3.8.6 As the implementation of the system requires portions of the works to continue functioning under operational conditions, the SAT of a portion of the system, e.g. as each station or bus is completed, shall not interfere with the parts of the system which are already taken over and in operation.

2.3.8.7 The results of the SAT shall be captured in a SAT test book per site, with sections covering each sub-system.

2.3.8.8 The successful completion of the SAT following the correction of any identified deficiencies will allow approval by the Employers Authorised Representative.

2.3.8.9 The successful completion and approval of the SAT will allow the second stage of testing and acceptance to proceed.

2.3.8.10 The second stage will involve System Integration testing (SIT) in which the site and/or bus will be linked to the rest of the system.

2.3.8.11 The Contractor is to develop and submit a SIT test plan for joint review and approval of the Employer's authorised representative.

2.3.8.12 Again, as the implementation of the system requires portions of the works to continue functioning under operational conditions, the SIT of a portion of the system, e.g. as each station, bus or route is completed, shall not interfere with the parts of the system which are already taken over and in operation.

2.3.8.13 The Contractor shall therefore provide a system test environment, in which a range of test media may be used across a variety of origin and destination stations and across routes and buses, in which all system functionality and rules may be comprehensively tested without contaminating the operational environment.

2.3.8.14 All costs including but not limited to banking fees, related to the above, shall be provided at the Contractor's expense.

2.3.8.15 The results of the SIT shall be captured in an SIT test book per site. The successful completion of the SIT following the correction of any identified deficiencies will allow approval by the Employer's authorised representative, after which the system or portion thereof shall be operation ready.

2.3.9 Training

2.3.9.2 Operator training

2.3.9.2.1 Prior to operation of the AFCS or portions thereof, the Contractor will provide training to the Contractor's and Employer's staff who will be responsible for the operation of the system.

2.3.9.2.2 The Contractor shall ensure that the operational staff receives periodic training throughout the operational service period to maintain competency.

2.3.9.2.3 The operations manuals developed by the Contractor will form the basis of the training however the Contractor will be required to develop presentations, videos and/or other media and materials necessary for the comprehensive training of operational staff, which will include training facilitator's guides to enable future training of staff by the Employer.

2.3.9.2.4 The Contractor shall prepare a training programme with materials for the joint review and approval of the Employer's authorised representative.

2.3.9.2.5 The Contractor will provide a suitable venue for the training of personnel and provide for up to 10 attendees from the Employer per training session.

2.3.9.2.6 Training will comprise a theoretical and practical component.

2.3.9.2.7 The training course will include the testing of attendees and the Contractor's written confirmation that each attendee is competent in the

operation of the system / sub-system or equipment items, as well as the provision of further training to other operators.

2.3.9.2.8 The Contractor shall provide for training sessions as follows and the Tenderer shall provide details of the approach, duration, content and intended outcomes of the proposed training in returnable document RDD 10;

2.3.9.2.9 The above shall include first line maintenance tasks to be performed by operators.

2.3.9.3 Maintenance training

2.3.9.3.1 Prior to the taking over of the works or plant or portions thereof for operation, the Contractor will provide training to the following staff performing maintenance on the system;

a. Contractor's staff
b. Employer's staff
c. Employers facilities management contractor staff

2.3.9.3.2 The Contractor shall ensure that the maintenance staff receives periodic training throughout the operational service period to maintain competency.

2.3.9.3.3 The purpose of this training will be to provide technical staff with in depth knowledge in the maintenance of all aspects of the system, for the purposes of managing the performance of the maintenance by the Contractor and Employer respectively.

2.3.9.3.4 The maintenance manuals developed by the Contractor will form the basis of the training however the Contractor will be required to develop presentations, videos and/or other media and materials necessary for the comprehensive training of maintenance staff, which will include training facilitator's guides to enable future training of staff by the Employer.

2.3.9.3.5 The Contractor shall prepare a training programme with materials for the joint review and approval of the Employer's authorised representative.

2.3.9.3.6 The Contractor will provide a suitable venue for the training of personnel.

2.3.9.3.7 Training will comprise a theoretical and practical component.

2.3.9.3.8 The training course will include the testing of attendees and the Contractor's written confirmation that each attendee is competent in the maintenance of the system / sub-system or equipment items.

2.3.9.3.9 The Contractor shall provide for training sessions as follows and the Tenderer shall provide details of the approach, duration, content and intended outcomes of the proposed training to be included in returnable document RDD 10;

2.3.10 Trial operation

2.3.10.1 Upon completion of the testing, acceptance and training, the system shall be operated in a test environment for a period of 2 months prior to going live.

2.3.10.2 During the trial operation, the Contractor shall provide operating staff in accordance with the operational service plan, as well as additional supporting resources if required in order to assist with the transition to the live environment and the Tenderer is to detail a cost-effective proposal in this regard to be included in returnable document RDD 3.

2.3.10.3 The above resources will assist operational staff and passengers with the transition of the AFCS to the live environment and shall assist in resolving teething problems, in conjunction with the maintenance personnel where appropriate.

2.3.10.4 Trial stage Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, the acceptance and/or approval of which will not relieve the Contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
COM1	SAT test plan	Detailed approach to SAT as derived from the Inspection and Test Plan (FD16)
COM2	SAT test books	Compilation of test results.
COM3	SIT test plan	Detailed approach to SIT as derived from the Inspection and Test Plan
COM4	SIT test books	Compilation of test results.
COM5	Training materials	As per IOM
COM6	Training programme	Programme approved by COP.
COM7	Certificates of competency	Results of training to be provided by contractor
COM8	Trial run test plan	Detailed approach to trial run as derived from the Inspection and Test Plan
COM9	Operation ready certificate	As issued by the Engineer for portions or the whole of the works.
COM10	Taking over certificates	As issued by the Engineer for portions or the whole of the works

2.3.11 Post-commissioning stage

2.3.11.1 The purpose of the post-commissioning stage will be to consolidate and update all test certificates and supporting documentation, specifications, operations and maintenance manuals, drawings, diagrams and layouts, to as-built status.

2.3.11.2 These activities have been specifically included in a separate stage so as to form a specific milestone for delivery, thus accentuating the importance thereof to the PLM.

2.3.11.3 Notwithstanding the project change control procedures specified in the project management plan, once these documents have been submitted to the Employer by the Contractor and accepted, no further changes to the AFCS or portion thereof in operation may be altered without following an agreed change management process.

2.3.11.4 Post Commissioning Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, the acceptance and/or approval of which will not relieve the Contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
PCM1	Test results	All test results for the portion of the works in question, compiled in a history file.
PCM2	Certifications	All certifications, specific to the portion of the works or system wide, added to the history file.
PCM3	As-built drawings	Updated and approved as-built drawings for the portion of the work in hard copy and CAD format.
PCM4	Asset Register	Contemporary Asset Register

2.3.12 Warranty

2.3.12.1 Notwithstanding the obligations of the Contractor under the contract during the defects notification period (DNP), the Contractor shall warrant all materials, plant, workmanship, including hardware, software and all other project deliverables, for a period of 2 years from the date of issuance of the associated commissioning certificates.

2.3.12.2 The Contractor will repair or replace any item which fails to perform as specified in the contract and technical documents, or in accordance with its fitness for purpose.

2.3.12.3 All associated costs of plant, equipment, labour, shipping and any and all ancillary costs shall be borne by the Contractor and is deemed to be included in the warranty line item in the cost schedules unless malicious damage has occurred.

2.3.12.4 The system configuration control process initiated during the production stage is to be maintained until the completion of the maintenance contract and shall be used to track the repairs and replacement of the hardware parts as well as the repair, updating or modification of software during the life cycle of the AFCS in the form of a live Asset register.

2.3.12.5 The above process will include marking such repairs as warranty or non-warranty related.

2.3.12.6 The Contractor shall ensure that OEM warranty agreements are extended where necessary in order to meet the contracted warranty period.

2.3.12.7 The Tenderer shall submit a schedule as part of the tender document, indicating the warranty period for each major component of the system under returnable document RDD 1 and RDD 3 where appropriate.

2.3.12.8 Where LRU warranties differ within a major component, this is to be detailed and in any event may not be less than 2 years from date of readiness for operation.

2.3.12.9 The time period for repair under warranty shall not exceed the maintenance restore turn-around times.

2.3.12.10 Warranty Deliverable documents

The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, the acceptance and/or approval of which will not relieve the contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
WTY1	Warranty schedule	List of items with warranty start and end dates
WTY2	As-built system configuration document	System asset, part and serial numbers, software versions, and locations.
WTY3	Monthly warranty repair report	List of all warranty faults and repair details.
WTY4	Monthly system configuration status report	Update of WTY2 based on any approved changes to the system.

2.3.13 Operation Service Period

The Contractor shall operate the AFCS on behalf of the Employer for a period of 3 years following the issuance of the Commissioning Certificate for Phase 1A. The PLM reserves the right to extend this period entirely at its discretion to accommodate any new phases. The Service will comprise AFCS Operations and Maintenance which are further described below.

2.3.13.1 The operating times

The AFCS shall be operated as follows (may be adjusted subject to demand):

- Weekdays between 05:00 and 19:00
- Saturdays between 05:00 and 19:00
- Sundays and Public Holidays between 05:00 and 19:00

2.3.13.2 Branding and Corporate Identity

The Contractor will be seen by the public as an extension of the PLM and will therefore abide by the IPRTS branding / corporate identity specifications which will

be applied to staff attire and to all equipment and printed materials which are in the public view.

As the corporate identity specification is currently a work in progress, Tenderers are to make provision for the above as part of the equipment supply, as well as in the supply of uniforms to their own specification, and in sufficient quantities to ensure that staff are always presentable and that uniforms are in good order. The Tenderer is to provide a proposed uniform specification upon which their pricing is based and will be expected to incorporate the reasonable requirements of the CI specification to the uniform within the tendered price.

The above will also apply to personal protective equipment for technical staff.

The Contractor will be required to present a high quality image of the IPRTS to the public, both in terms of behaviour and appearance. The Contractor is therefore to select staff with appropriate presentation, educational and skills profiles, with a high degree of integrity and ethical conduct and requisite screening is therefore to be performed prior to employment.

The service is to be provided in the commuter's choice of any of the following languages; English, Afrikaans, Northern Sotho, Tsonga or Venda.

2.3.13.3 Marketing

The PLM will be solely responsible for the marketing of all aspects of the IRPTS. The Contractor may not publicise the IRPTS or the Contractor's participation therein in any way, including but not limited to media interviews, editorials, photographs, articles, etc., without the express written approval of the Employer.

The Contractor may however be called upon to support and participate in marketing campaigns.

2.3.13.4 Operational Service functions

2.3.13.4.1 Administration

a. Management and coordination of all AFCS equipment, resources and activities
b. Participation in and reporting to PLM steering committee
c. Performance monitoring and corrective actions
d. Training and human resource development

2.3.13.4.2 Operations

2.3.13.4.2.1 Level 0 – Ticket media

a. Card stock management
b. Card stock storage and security
c. Card issuing
d. Damaged/lost card reconstruction and replacement
e. Card production and branding

2.3.13.4.2.2 Level 1 – Read / Write Devices

III. Trunk station operation

A. Station supervision

a. A supervisor may be responsible for more than one station, but must be accessible to station staff and the public at all times in the event of an issue
b. Ensure that shifts are started, closed and handed over correctly and according to approved procedure
c. Ensure that required reports and registers are completed and appropriately distributed
d. Ensure that the station facility is operating correctly and that any faults are reported and rectified
e. Manage the cash collection activity
f. Manage keys

B. Attended ticket sales

a. Ensure that correct fare products and rules are downloaded to sales equipment and implemented correctly
b. A transit card sales transaction shall not exceed 1 minute in duration
c. A transit card loading transaction shall not exceed 0.75 minutes in duration
d. The TOM will assist the ticket sales clerk by means of a software application in the provision of IRPTS bus schedules, fare structures and products, to the extent that appropriate advice may be given to commuters regarding;
    - travel routes and cost for specific origin / destination
    - Comparison between products to achieve value for money in transit product purchases
    - providing general information regarding location and service hours of alternative sales/loading points
    - troubleshooting commuter fare/card related issues

e. Cash collection and deposit in PLM account Cash collection is to occur daily, excluding weekends and public holidays
f. Provide daily reports and reconciliation of cash sales vs deposits
g. Generate daily sales reports
h. Manage card stock levels and replenishment such that cards are always available for purchase
i. Verify and ensure that transactions are transferred to the central data base

IV. Unattended ticket sales

This function is optional and will be applicable if TVM's are implemented;

1. Ensure that correct fare products and rules are downloaded to the TVM and implemented correctly
2 Cash collection and deposit in PLM account Cash collection is to occur daily, excluding weekends and public holidays
3 Provide daily reports and reconciliation of cash sales vs deposits
4 Generate daily sales reports
5 Manage card stock levels and replenishment such that cards are always available for purchase
6 Verify and ensure that transactions are transferred to the central data base Managing issuing and return of inspector's PVU's

V.Ticket sales centres

a. The Contractor shall be responsible for the supervision of staff.
b. Have the same functionality as per Attended ticket sales

VI.3rd Party Sales points

a. Ensure implementation of IRPTS Sales point identification branding
b. Ensure that correct fare products and rules are downloaded to sales equipment and implemented at scheduled time.
c. Verify and ensure transaction transfers to central system
d. Generate 3rd party sales reports
e. Provide support to and ensure 3rd party performance

VII.Buses & Midi-buses

a. Verify and ensure transaction transfers to central system

b. Generate daily bus reports

c. Report and verify rectification of bus on-board equipment faults

d. Perform on-board card inspection service using a PVU

2.3.13.4.2.3 Level 2 – Depot

I. Depot administration

a. Systems administration to verify and ensure the transferring of transaction from buses to the central data base

b. Ensure that correct fare products and rules are downloaded to bus on board equipment

c. Report and verify rectification of bus on board equipment faults

d. Generate daily bus transaction reports

e. Managing issuing and return of inspector's PVU's

2.3.13.4.2.4 Level 3 - Back office administration

a. Systems administration
b. Implementation of new fares, products, business rules, etc.
c. Generation of reports
d. Responses to specific queries, investigations and associated data
e. Asset management and fault reporting administration
f. Ensure Back-up and Restore functionality
g. Remote equipment management
h. The back-office operation will include the DRC

2.3.13.4.2.5 Level 4 – Payment system

a. Payment reconciliation, including loads using cash and card payments, as well as usage
b. Payment reconciliation and settlement to PLM account
c. Card issuing
d. Card acquiring
e. Ensure continuous compliance with Bank and Payment Industry standards

2.3.13.4.3 **Maintenance**

2.3.13.4.3.1 **General**

The Tenderer is to provide the maintenance plan in returnable document RDD4 as part of the tender submission, which will meet the following requirements as a minimum;

2.3.13.4.3.1.1 The Contractor is to provide a maintenance service, as part of the Contract for the duration of the Operational Service Period.

2.3.13.4.3.1.2 The maintenance of the AFCS will be activated upon issuance of the relevant Commissioning Certificate

2.3.13.4.3.1.3 The maintenance of the AFCS will end on the same date, 3 years from the date of the phase 1A Commissioning Certificate.

2.3.13.4.3.1.4 The Contractor will be responsible for the provision of all resources; staff, materials, consumables, labour, tools and special tools, and anything else required in order to provide the maintenance service.

2.3.13.4.3.1.5 The scope of the maintenance includes all systems levels (0-4) as described in the system overview

2.3.13.4.3.1.6 The Contractor shall provide monthly reports or information as required, regarding maintenance status including but not limited to, fault rectification statistics, warranty repairs, out of warranty repairs, spares stock levels, spares repair and replenishment status and asset replacement, to an agreed reporting format.

2.3.13.4.3.1.7 The Maintenance Module will be operated by the Contractor at Data Centre this shall include the receiving and capturing of fault reports and corrective action taken.

2.3.13.4.3.2 **Preventative maintenance**

2.3.13.4.3.2.1 This will include routine maintenance activities required in order to preserve the life of the AFCS whilst promoting and achieving the desired availability of an overall 99.5% for the AFCS.

2.3.13.4.3.2.2 The Tenderer is to provide a provisional preventative maintenance (PM) activity list as part of the maintenance plan in RDD4, which is to be further defined during the final design stage.

2.3.13.4.3.2.3 The list is to clearly identify any activities such as cleaning, which are to be conducted by the Employers facilities management contractor as first line maintenance.

2.3.13.4.3.2.4 Preventative maintenance activities may not disturb operations and the Tenderer must therefore identify which activities are to be conducted outside of operating hours (including weekends).

2.3.13.4.3.2.5 The maintenance manual is to contain a preventative maintenance section, detailing the procedures, tools, materials, consumables, etc. required in order to perform these activities.

2.3.13.4.3.3 **Corrective maintenance**

Corrective maintenance (CM) will occur at the following maintenance levels;

2.3.13.4.3.3.1 **Level A – First Line**

This will be performed by the Contractor’s operational staff, based on troubleshooting procedures detailed in the maintenance manuals and will be distinguished by not requiring any hand tools for its performance.

2.3.13.4.3.3.2 **Level B –Second Line**

This will be performed by the Contractor’s maintenance staff and will include the replacement of Line Replace Units (LRU), with minimal service interruption.

The Contractor will ensure that in the event of an LRU replacement that no transactional data is lost, and the Contractor will provide for procedures in the maintenance manual for data recovery and transfer to the central server where applicable.

2.3.13.4.3.3.3 **Level C – Workshop repair**

Workshop repairs below LRU level conducted by the Contractor.

2.3.13.4.3.3.4 **Level D – OEM repair**

Repairs below LRU level conducted by the OEM on behalf of the Contractor.

2.3.13.4.3.4 **Spares supply**

2.3.13.4.3.4.1 The Tenderer is to provide a provisional spares list (priced as provided for in the pricing schedule) from the provisional LRU list, detailing quantities anticipated for the maintenance period, per annum, based on the original equipment manufacturer (OEM's) stated mean time between failures (MTBF) and mean cycles between failures (MCBF) in order to meet the specified system availability and repair times.

2.3.13.4.3.4.2 The spares list is to be developed from the LRU list as provided in the Tender submission and as further elaborated during the preliminary and final design stage.

2.3.13.4.3.4.3 In addition to spares, the Tenderer shall provide a list of software license renewals and asset replacement that will be required for the period of the operation together with costs, where applicable.

2.3.13.4.3.4.4 The Employer will only pay for asset replacement in accordance with the Contract.

2.3.13.4.3.4.5 The spares list and quantities are to be further defined during the preliminary and final design stages, with part numbers and OEM details.

2.3.13.4.3.4.6 The Contractor will be solely responsible for the provision of all spare parts required during the Operational Service Period and associated costs, unless the spares are required as a result of malicious damage to plant.

2.3.13.4.3.4.7 Spares shall be available so as to ensure the desired system availability of 99.5%.

2.3.13.5 Performance management

2.3.13.5.1 Operation

The measurement of the Contractor's performance of its obligations under the Contract shall be conducted by the Auditing Body as contemplated under clause 10.3 of the FIDIC contract, as a penalty and incentive regime, which will be applied for failing to meet or exceeding agreed performance thresholds.

These performance measures are ultimately linked to the contribution to the achievement of the key objectives of the AFCS, and particular attention is drawn to FIDIC clause 13.2, in terms of which the Contractor is encouraged to submit proposals for improvements to the AFCS and operation toward promoting improved performance, efficiency and effectiveness.

a) Safe and secure transactions

The Contractor is to ensure that no breaches of system security occur, and that any attempted breaches are detected and appropriate interventions implemented. In the event of a breach the Employer shall recover damages under the Contract. Although not yet in force, the Contractor is to comply with the requirements for the lawful processing of personal information under the Protection of Personal Information Act (POPIA).

b) Fraud

The Contractor is to ensure that fraudulent activity is limited and where such fraud occurs, that it is identified, reported and addressed before significant losses occur. The Contractor will be liable for a penalty of R10,000.00 plus costs for each proven instance of fraud discovered by the Employer which the Contractor has not reported within one week of occurrence.

c) Fare Evasion Inspection and Detection

The Contractor shall ensure that Inspectors perform routine inspections on buses and taxis in accordance with an agreed bus inspection schedule.

The Inspector shall tap on with his transit card on each bus being inspected.

A minimum of 50% of passengers on a bus shall be inspected for the duration of the inspector's journey, to be verified against the passenger counts of the Bus Validators and passenger counting systems.

The PVU shall keep a log of all cards inspected with the status of the card and cards that were issued penalties. The inspection log shall be date time stamped for each inspection. The log file must be uploaded to the back office for reporting purposes. The log file must also be viewed on the PVU.

In the event of the successful detection of fare evasion and the issuance of a penalty, the Contractor will be entitled to 50% of the penalty collected. Due to procurement policy constrains the Contractor shall not be paid for this but will be entitled to set-off against any performance penalties due.

d) Commercial inclusivity

The Contractor is to demonstrate contributions to agreed socio-economic development targets in employment, sub-contracting and supply contracts.

A penalty of 10% of the amount below the target, measured on the basis of a 3 month aggregate.

e) Ticket Sales Function

The Contractor shall ensure the smooth running of card sales and ticket verification functions so as to limit commuter dwell time.

The average processing time of card sales and loading transactions will be measured on a monthly basis and the Contractor will be charged a penalty equal to the average % over the prescribed processing time of the ticket sales clerks monthly rate.

The Employer shall perform the measurement together with the Contractor at random locations using CCTV footage or physical inspections

f) Environmental sustainability

The Contractor shall be responsible for adherence to the regulations, statutes and bylaws relating to health, safety and environment, and shall submit to annual compliance audits by the Auditing Body.

The Contractor shall be liable for any costs and damages related to non-compliance and will implement the recommendations of the Auditing Body at its own cost, save where such recommendations are proven to constitute a contract variation as contemplated under clause 13 of the FIDIC contract.

2.3.13.5.2 Maintenance

a) Availability

The desired AFCS availability is targeted at an overall 99.5%.

b) Response and Repair Times

SEVERITY CATEGORY	RESPONSE TIME	RESTORE TIME
Minor	24 hrs	32 hrs
Major	4 hrs	8 hrs

Critical	2 hrs	4 hrs
Catastrophic	1 hrs	hrs

c) Failure Severity Categories

The following severity levels are defined for the purpose of failure categorising to define response and repair times which will ensure the efficient and continuous operation of the AFCS with minimum disruption and inconvenience in service.

I. Minor

A failure which has no significant effect on system functionality and/or loss of revenue.

II. Major

A failure which results in a significant loss in system functionality and/or loss of revenue.

III. Critical

A failure which threatens the overall system functionality

IV. Catastrophic

A complete loss of system functionality

d) Performance Damages

The following damages will be due by the Contractor in accordance with the provisions of FIDIC clause 10.7 (b).

VIII. A penalty of R 5,000 per 1% below the targeted availability will be due by the Contractor, calculated monthly. Availability is to be calculated on a monthly basis using the following formula;

$$\text{Availability} = \frac{(\sum WT_a)}{(\sum WT_p)}$$

Where;

WT_a = Actual working time of equipment/plant

WT_p = Planned working time of equipment/plant

The actual working time of plant is to be calculated based on the time of reporting of a fault (excluding minor category faults) until the closing of the fault in the maintenance records.

IX. Alternatively the contractor may include a system based calculation as part of the maintenance management module of the AFCS supplied clause 3.4.14.1.14.e) of the Technical Requirement.

X. A penalty per hour delay in the applicable response and restore times will be charged to the Contractor for each corrective maintenance repair.

SEVERITY CATEGORY	RESPONSE DELAY	RESTORE DELAY
Minor	R 500.00	R 500.00
Major	R 1,000.00	R 1,000.00
Critical	R 5,000.00	R 5,000.00
Catastrophic	R 10,000.00	

The application of performance damages will be at the discretion of the Employer, and failure to do so shall not be considered as a waiver of the Employer's rights.

2.3.13.6 Resources

2.3.13.6.1 General

It is the Contractor's sole responsibility to provide the requisite human resources, sub-contractors, tools, equipment, materials, consumables and any other resources required for the operation of the AFCS in accordance with the Employers Requirements and indeed the entire Contract.

The Tenderer is to provide an Operation and Maintenance Plan as part of the solution proposal to be described in returnable document RDD4, which shall include an organigram showing each resource, including sub-contractors, their roles and responsibilities and reporting lines.

These resources and their quantities are to be listed in the response, including costs under section C2 of the tender document.

2.3.13.6.2 Key Human Resources / Functions

As a minimum, the following key resources are to be employed toward performing the desired operational functions (note that it is not envisaged that all resources will be loaded full time, and the contractor may consider the combination of certain key resources in one resource that is suitably competent);

a) AFCS Manager

The AFCS manager shall perform the role of the Contractor's Representative as contemplated in clause 4.3 of the FIDIC contract, and shall be the primary interface between the Contractor and the Employer for the purposes of managing and coordinating the Contract during the Operations Period.

b) Technical Manager

The technical manager shall be a suitably qualified, skilled and experienced engineer or equivalent, with an in depth knowledge of all aspects of the AFCS, and is to be available for the management and implementation of any changes, enhancements, troubleshooting, root cause analysis and maintenance during the Operations Period.

c) Financial Manager

The financial manager shall be a suitably qualified, skilled and experienced accountant, and will be responsible for financial reporting, reconciliation, settlements and investigations and resolution of anomalies and queries.

d) Systems Administrator / Information manager

The systems administrator shall be a suitably qualified, skilled and experienced information technology systems engineer, and will be responsible for ensuring the continued operation of the AFCS as an information system, primarily by the administration of the back office and data centre as well as the extraction and analysis of data and reports from the AFCS, in conjunction with the Contractor's and Employer's domain experts and upon the request of the Employer's Representative or in the fulfilment of its contractual obligations.. This resource is to be permanently based at the TMC during normal working hours.

e) Status monitor

The AFCS status monitor shall be a suitably trained, qualified, skilled and experienced computer operator, and will be responsible for the monitoring of the AFCS asset management and status monitoring and control terminal. This resource/s will be permanently based at the TMC (during IRPTS operational hours) and will receive, process, action, monitor and close-out fault reports and change equipment modes and states to suit operational conditions in accordance with approved Standard Operating Procedures (SOP's).

f) Supervisors

Supervisors shall be suitably trained, qualified, skilled and experienced in the supervision of ticket sales staff and in dealing with the public, as well as reporting on incidents and decision making within the bounds of their mandates. The supervisors shall be responsible for the management of trunk stations and sales centres. These resources may be shared across multiple sites but must be in attendance during the operational hours of the IRPTS service.

g) Ticket sales clerks

Ticket sales clerks shall be suitably trained, qualified, skilled and experienced in dealing with the public and performing a sales function. The clerk will be responsible for processing card sales, loading and providing travel and product information to commuters as the face of the IRPTS. Clerks will be stationed at trunk stations and sales centres during operational and normal working hours respectively.

h) Ticket inspectors

Ticket inspectors shall be suitably trained, qualified, skilled and experienced in dealing with the public, and in particular shall possess a high degree of integrity and the necessary personality and physical attributes required for the enforcement of the IRPTS fare regime, including the issuing of penalties in accordance with agreed SOP's.

i) Maintenance technicians

Maintenance technicians shall be suitably trained, qualified, skilled and experienced in the performance of corrective and preventative maintenance activities as further elaborated under section 3.3.13.5.3 Maintenance.

2.3.13.6.3 Facilities

Notwithstanding FIDIC clause 4.10 and 4.19, the Employer shall provide office accommodation of staff in the TMC, Trunk stations and Sales Centres as per 3.3.13.6.2 including electricity, water and ablution free of charge exclusively for the purposes of this Contract

The Contractor shall be responsible for the provision of their own facilities such as Offices, workshops and conference facilities other than specified above.

2.3.13.6.4 Deliverables

2.3.13.6.5 The Contractor will be required to produce the following document deliverables as a minimum, or as may be required in addition in order to fulfil the requirements of the Contract, the acceptance and/or approval of which will not relieve the Contractor of any obligations under the Contract;

Ref. No.	Deliverable	Description
OPS1	Monthly Operational report	Summary of reports to be provided under operational scope of work.
OPS2	Operational Performance report	Summary of performance reports as provided under operational scope of work.
MNT1	Monthly maintenance report	PM activities conducted as well as CM with status.
MNT2	Maintenance Performance report	Repair response times, turnaround times and system availability.
MNT3	Monthly system configuration status report	Update of WTY2 based on

Ref. No.	Deliverable	Description
		any approved changes to the system.

2.3.13.7 Transfer

2.3.13.7.1 At the end of the 3 year period from the latest Commissioning Certificate, the Contractor will transfer the system in good order, back to the Employer for continued operation.

2.3.13.7.2 The Contractor must ensure that the issuing bank contract can be ceded or transferred to PLM when operations are transferred to PLM and a bank letter confirming this is to be included in the bid submission.

2.3.13.7.3 The process of Transfer shall begin at least 1 year prior to the Contract Completion Date with a joint inspection as contemplated in FIDC clause 11.8. at this time, the Employer may opt to maintain the status quo and extend the Contractor's operating period by 12 years. The Bidder is to provide the costs of this extended period as an option in the schedule of prices.

2.3.13.7.4 In the event that the Employer opts to take transfer of the system for operation, during the 6 month period prior to the Contract Completion Date, the Contractor shall provide complete training to the Employer's staff as required under 2.3.8.16.

2.3.13.7.5 There shall be a two month period of joint operation by the Contractor and Employer prior to the Contract Completion Date.

2.3.13.7.6 The Employer shall at it's sole discretion, have the right to take over the employment of the Contractor's staff as part of the transfer. To this end, the Contractor shall ensure that this commitment is communicated to and agreed by the Employee as part of the initial employment contract.

2.3.13.7.7 The Employer shall take over the Contractor's employees at the same rate of remuneration and benefits, provided that these are made visible in the schedule of prices.

2.4 SYSTEM REQUIREMENTS

The purpose of this section is to provide the AFCS technical requirement for the design, build, operations and maintenance of the AFCS for the PLM.

2.4.1 System description

The proposed AFCS concept is formed around meeting the stated goals and objectives and with due consideration to the applicable resource and stakeholder constraints.

The system over-view clause 1.7 depicts the typical AFCS concept to be designed, built, operated and maintained by the Contractor. The information contained in the diagram is not prescriptive for design purposes but is intended as a guideline to the

Tenderer. The Tenderer is to provide a similar diagram in the tender response for the proposed solution.

It is also important that Part C4 – Site Data is reviewed for further back ground in terms of the requirements set forth, in order to ensure compatibility and integration with the AFCS, and with due consideration to value for money to the PLM.
The major components or sub-systems of the AFCS are as follows:

2.4.1.1 Level 0 – Media

a. Ticketing Media*;*

2.4.1.2 Level 1 – Read/Write Devices

2.4.1.2.1.1 Trunk Station*;*

a. Ticket Sales;

- Ticket Office Machine (TOM)
- Ticket Vending Machine (TVM) - optional

2.4.1.2.1.2 Sales Centres*;*

a. Ticket Sales – Ticket Office Machine (TOM)

2.4.1.2.1.3 Feeder Stops*;*

a. 3rd Party Top Up Facilities
b. Signage

2.4.1.2.1.4 Trunk Buses and Midi-buses;

a. Bus Onboard Plant (BOP)

2.4.1.2.1.5 Depot;

a. Portable Validator Unit (PVU)

2.4.1.3 Level 2 – Intermediate Services

2.4.1.3.1 Depot;

a. Wi-Fi Access Point (if required)
b. Proxy server (if required)

2.4.1.3.2 Level 3 – Data Centre

a. Central System (CS)
b. Disaster and Recovery (DRC)
c. Administration Terminals

2.4.1.3.3 Level 4 - Banking Payment System

2.4.2 General Environmental specifications

The system and plant shall be designed to continue operating under the following environmental conditions without reducing the operating life span of the plant.

2.4.2.1 Ambient Operating Temperature: -5°C to +50°C. This specification may be depreciated if the operating environments are controlled to values which will not exceed the device operating temperatures.

2.4.2.2 Storage Temperature: -20°C to +70°C

2.4.2.3 Relative non-condensing Humidity: 0% to 90%

2.4.2.4 Shock 30g for milliseconds and up to 5g sustained

2.4.2.5 Operating vibration: 1,5g RMS, 5-150 Hz

2.4.2.6 Solid objects and moisture protection for indoor inside plant rooms shall be a minimum of IP 3X

2.4.2.7 Solid objects and moisture protection for outdoor / public areas shall be a minimum of IP44

2.4.2.8 Equipment shall withstand Ultra Violet (UV) exposure in the place of installation to have a minimum life expectancy of 10 years.

2.4.3 General Electrical and Installation specifications

The system and equipment shall be designed, supplied and installed with the following specifications;

2.4.3.1 All units shall comply with generally accepted Electrical Safety Standard such as IEC 60950, SANS 60950, SANS 62515, SANS 60335-2, SANS 62040-1, SANS 61010-1, etc

2.4.3.2 All equipment shall comply with the Electromagnetic Compatibility (EMC) regulation for RSA, 46 of .2010 (Introduces immunity requirements) which include the following standards, CISPR, IEC (IEC 61000 series) and ETSI.

2.4.3.3 All Radio and Telecommunication equipment or terminals shall be type approved in accordance with the Electronic Communications Act, No 36 of 2005 (ECA)**.**

2.4.3.4 Equipment that requires direct current shall have polarity reversal protection.

2.4.3.5 All cables that are subject to vibration and movement shall be of a multi strand type.

2.4.3.6 All cables shall be labelled with an industry accepted labelling method according to the approved labelling plan contained in the cabling plan. Information on the cable labels shall include inter alia the following;

a. The system the cable belongs to
b. Origin and destination
c. Cable type identifier
d. Cable number

2.4.3.7 At all termination points enough slack shall be left for at least 3 reconnections to be made (approximately 30 cm).

2.4.3.8 The Contractor shall on request of the Employer produce the proof of certification.

2.4.3.9 Notwithstanding the above the Employer reserves the right to request recertification in the event of modifications to equipment or deviation from OEM installation instructions.

2.4.3.10 The Contractor shall record all equipment within the AFCS to LRU level in an asset register and keep it updated for the duration of the Contract. Information captured in the asset register shall include inter alia the following;

a. Serial number
b. Description
c. Part number
d. Location
e. Modification status
f. Date of installation
g. Software description and revision, etc

2.4.3.11 During the Operational Service Period, the above may be performed via the IRPTS asset / maintenance management tool, however the Contractor will remain responsible for the integrity of contemporary system configuration data.

2.4.4 General Interface Requirements

2.4.4.1 Mains and Backup Power

2.4.4.1.1 All plant used at permanent fixed locations shall utilize 220-240V AC, 50 Hz power from a mains dedicated distribution board (DB) located in the site equipment room to be provided by others.

2.4.4.1.2 The Contractor shall supply, install and maintain dedicated AFCS power distribution boards for the distribution of Mains power to AFCS related plant.

2.4.4.1.3 The distribution board shall be of adequate size to accommodate future expansion with regard to fare gates on the Trunk station.

2.4.4.1.4 The Contractor shall supply, install and maintain appropriate circuit breakers and surge protection in the AFCS DB.

2.4.4.1.5 The Contractor shall supply, install and maintain cabling between plant, AFCS socket arrays, AFCS DB’s and power DB’s for the AFCS at their respective locations.

2.4.4.1.6 All plant power socket arrays shall be earthed via a common station equipment earth bar provided by others and located in the site equipment room.

2.4.4.1.7 The Employer will provide all mains power cable containment according to the Contractor's specified requirements in the Final design stage. Cable containment does not include enclosures such as DB boards etc. These shall be supplied and installed by the Contractor.

2.4.4.1.8 Power budgets for plant shall be provided by the Contractor to the Employer for the provisioning of mains and backup power to the whole IRPTN in the Final Design stage.

2.4.4.1.9 The Contractor shall ensure that Plant does not rely on pure sine wave generated mains power for proper operation.

2.4.5 General Communications System

2.4.5.1 The plant shall interface with the site AFCS LAN and AFCS WAN via a network switch located in the station equipment room. The switches shall be supplied, installed and maintained by the Employer.

2.4.5.2 The Employer will supply, install and maintain the WAN network cables between the relevant sites and the network switches. The Contractor must liaise with the Employer and authorised assigns, to ensure that the AFCS subsystems integrate with communications backbone.

2.4.5.3 The Employer will supply, install and maintain all network cable containment according to the Contractor's specified requirements up to the LAN ports of the network switch.

2.4.5.4 The Contractor shall supply, install and maintain AFCS LAN network cabling between plant, and network switches.

2.4.5.5 It is the Contractor's responsibility to provide Network requirements in the Final design to enable successful AFCS implementation. The AFCS network shall allow for any IP address ranges which may be specified by the Employer.

2.4.5.6 The Contractor shall ensure that the network requirements comply with the MIOS.

2.4.5.7 The Contractor shall supply, install and maintain all plant that forms part of AFCS LAN's, BOP, Banking Network, Sales Centres and 3rd Party sales points which includes inter alia ADSL, GPRS, 3G, Wi-Fi etc.

2.4.5.7.1 It is the Contractor's responsibility to ensure the communication channel to the bank complies with banking industry standards and is appropriately certified.

2.4.6 Level 0 - Fare Media- Smart Cards

2.4.6.1 The Fare Media transit travel authorisation shall be as defined by the NDOT Regulation No. R.511.

2.4.6.2 A single ticket solution as per clause 1.7.2.1 par 2 and 3 is to be implemented on the EMV transit card.

2.4.6.3 The processing order of value shall be Product (points) value first and then purse value.

2.4.6.4 Test cards to be used for the testing and setup of AFC plant such as TOM, PVU's, Card Readers and payment devices shall be visually distinguishable from the production card.

2.4.6.5 The Contractor shall provide all required test cards free of charge.

2.4.6.6 All Fare media shall be configured under the strictest control and by authorised staff only.

2.4.6.7 The Contractor shall be responsible for the full certification of fare media and the entire system at the Contractor's expense. Including but not limited to EMV, NDOT, MIOS, Payment Cards Industry (PCI) etc.

2.4.6.8 The Contractor must, via the issuing bank supply the Fare Media. However PLM will supply the branding and graphic designs that the issuing bank must print on the fare media. Any Fare Media design proofs supplied by the issuing bank or Contractor, must be approved by Employer before production.

2.4.6.9 Additional charges to the artwork designs might be required in the future and these shall be supplied without increasing the cards unit price.

2.4.6.10 All personalised information will be stored on the Fare Media as defined by the NDOT AFC Data structure as well as on the Back End (AFCS CS).

2.4.6.11 The first issue of a smart card will be free of charge, provided the recipient's identity number is linked to the card number. Alternatively infrequent travellers (single trip users) can purchase a smart card and receive a refund if the smart card is undamaged. Fare Media shall be available at Sales points, selected Trunk Stations and Sales drives.

2.4.6.12 Passengers will be able to reload Fare Media at Sales points, Selected Trunk stations, ATM's and 3rd party outlets with approved Pay points.

2.4.6.13 Passengers will be able to reload any Fare Media type (personalised, Concession or anonymous) at Sales points and selected Trunk stations, subject to any AFCS business rules such as expiration dates etc.

2.4.6.14 The process for buying Fare Media with concessions must include the verification of the concession status and personal identification.

2.4.6.15 All fare media shall be available without delay.

2.4.6.16 The expected life of Fare media under normal usage conditions shall be more than 5 years. Fare media that fails prior to the 5-year period shall be replaced free of charge. If there are sufficient proof that Fare media was maliciously damaged, the passenger shall replace the fare media at their own expense at a nominal fee.

2.4.7 Level 1 EMV Read/Write devices

2.4.7.1 **General requirements**

2.4.7.1.1 All successful payment transactions at EMV Read/Write devices shall be submitted to the acquiring bank for processing.

2.4.7.1.2 All Fare media processing devices shall be capable of processing the following fare media;

2.4.7.1.2.1 PLM Fare card, which is EMV compliant, VISA/Mastercard certified, Payment Cards Industry (PCI) certified and NDot certified

2.4.7.1.2.2 Other EMV and NDOT R511 compliant transit cards

2.4.7.1.2.3 Bank issued contactless EMV compliant cards (optional – Bidder to state capability and / or any specific cost implication)

2.4.7.1.3 The acquiring bank shall credit the proceeds from the AFCS payments to the Employers bank account within 24 hours of the transaction.

2.4.7.2 **Trunk Station**

2.4.7.2.1 Ticket Sales

2.4.7.2.1.1 Selected Trunk Station as per Table 3 AFCS implementation per phase , shall be provided with an attended ticket sales facility to the public using TOM's as per clause 2.4.13.1.

2.4.7.2.1.2 The attended ticket sales facility shall service the unpaid area of the station, via a secure ticket sales window.

2.4.7.3 Fare Gates

The inclusion of the fare gates in the scope of phase 1A of the Contract is optional and will be subject to financial viability and entirely at the discretion of the Employer, without incurring additional costs. The Tenderer must ensure that the proposed AFCS can accommodate fare gates in the future with the requirements set out below without a new deployment of system software, the software must allow for fare gates to be added and configured without rebuilding and compiling of the system software and it must not influence the operational system negatively or interrupt operations.

The purpose of the fare gates if adopted, will initially be for the purposes of controlling access to the station concourse to people in possession of valid travel tickets. Depending on the future development of the IRPTS and evolution of the business rules, this may change to the primary means of travel validation.

2.4.7.3.1 **Functional requirements**

2.4.7.3.1.1 The fare gates shall provide a secure and vandal resistant barrier between the paid and unpaid areas of all trunk stations.

2.4.7.3.1.2 The fare gate shall possess EMV certified fare media processing devices / card readers.

2.4.7.3.1.3 The fare media processing devices shall be capable of processing the following fare media;

a. EMV and NDOT R511 compliant transit cards
b. Bank issued contactless EMV compliant cards
c. The card readers employed on the fare gates shall be NFC compatible.

2.4.7.3.1.4 The fare gates shall permit entry to passengers to the paid areas who are in possession of a valid travel fare, by presentation of fare media to the validation device. Valid fare means a minimum balance of value or points which will be determined by the business rules. This will not be a complete transaction but merely a check to permit entry as the transaction will be performed on the bus BOP.

2.4.7.3.1.5 The fare gates shall permit exit to passengers to the unpaid areas who are in possession of a valid travel fare or who have entered through the gate within the free exit time limit, by presentation of fare media to the validation device. Valid fare means a record of a bus check in which has occurred within the maximum transfer time which will be determined by the business rules. This will not be a transaction but merely a check to permit exit in the event that the check in is present, alternatively a transaction will be performed equal to the maximum trip cost. In the event that there is insufficient value or points on the fare media, a credit points will be written to the card which must be settled before the patron will be allowed back into the system.

2.4.7.3.1.6 The fare media processing device shall provide a visual and audio signal, confirming that valid or invalid fare is present on the fare media.

2.4.7.3.1.7 The fare gates shall limit passage to a single entry/exit per valid ticket.

2.4.7.3.1.8 The fare gates shall deny entry/exit to passengers to the paid / unpaid areas respectively when using blacklisted/blocked media.

2.4.7.3.1.9 The fare gate fare media processing unit shall capture and store all transaction (valid and invalid) data including but not limited to;

a. Media serial number/Token number
b. Date and time
c. Transaction type
d. Origin / device ID
e. Transaction amount

2.4.7.3.1.10 The fare gate media processing unit shall store the transaction data locally and transfer the data to the central system over the data network. The data shall only be deleted from the fare gate when receipt acknowledgement is received from the back office. The data transfer shall be a background process which will not prevent the concurrent validation of newly presented cards. Data transfer must be real time or must be system configurable to transfer on a regular basis (at least every 5 min), such that the data is available for the purpose of statements or mini statements on the TOM.

2.4.7.3.1.11 The fare gate shall generate fault alarms to line replaceable unit (LRU) level. The fault alarm trigger time shall be system configurable. Alarms to be generated include inter alia the following;

a. Loss of communication
b. Card reader out of service
c. Gate stuck or obstructed

2.4.7.3.1.12 The fare gate shall generate audible intrusion alarms in the event of access to maintenance and service doors as well as transferring a signal to the status monitoring terminal for display on the GUI.

2.4.7.3.1.13 Fault and event alarms shall be passed on to the status monitoring terminal and will be displayed on the graphical user interface (GUI) over the data network.

2.4.7.3.1.14 The fare gate shall store event data locally in the event of LAN failure until such time as communication is restored.

2.4.7.3.1.15 The fare gate barrier shall be capable of opening under passenger crush/stampede conditions.

2.4.7.3.1.16 The fare gate barrier shall open if there is a general power failure.

2.4.7.3.1.17 The fare gates shall possess a general emergency function which when activated will open all barriers. This function must be implemented using a hardwired resettable push button and an emergency over ride in the controlling GUI of the fare gates.

2.4.7.3.1.18 Fare gates shall be safe for use for the intended purpose, which will include, children, the frail, pregnant and the elderly.

2.4.7.3.1.19 Each fare gate shall display the direction of the traffic flow and when the gate is closed, using universally recognised symbols.

2.4.7.3.1.20 Fare gate status and mode shall be controllable primarily from a local computer GUI over the LAN The fare gates shall also be able to be controlled remotely (Central system). This functionality shall also form part of the TOM deployment. The GUI shall be able to perform the following controlling or mode selection functions;

a. Passage closed/open

b. Emergency

c. Passage in

d. Passage out

e. Passage bi-directional

f. Passage override

2.4.7.3.1.21 The control computer is to graphically represent the station fare gate array foot print and its orientation within the station concourse, particularly the paid and unpaid sides of the barrier.

2.4.7.3.1.22 The fare gate shall retain full transactional functionality in off-line mode.

2.4.7.3.1.23 The fare gate shall be available in a wide passage (swing gate) version to accommodate universal access.

2.4.7.3.1.24 The fare gate shall be equipped with lightning and surge protection devices.

2.4.7.3.2 Performance requirements

2.4.7.3.1.1 The fare gate shall accommodate a passenger through put of at least 20 people per minute including ticket processing time.

2.4.7.3.1.2 Replacement of any LRU shall take no longer than 30 minutes.

2.4.7.3.1.3 The fare gate processor shall be capable of retaining at least 96 operational hours of transaction data, including all events.

2.4.7.3.1.4 The fare gate processor shall possess sufficient memory to accommodate a minimum of 5,000 blacklisted/blocked cards, which when depleted will delete records on a first in first out basis.

2.4.7.3.1.5 Blacklisted/blocked cards shall otherwise be removed under the following conditions;

a. When the card is captured from the passenger

b. When a lost card is retrieved

c. When a period (configurable parameter) of time has passed

d. The fare gate should have a minimum useful life span of 15 years.

2.4.7.3.2 Physical requirements

2.4.7.3.2.1 The fare gate will be of the 3-arm waist high turnstile type.

2.4.7.3.2.2 The fare gate shall be constructed from vandal resistant materials with due consideration to the environment conditions.

2.4.7.3.2.3 Flammable materials shall be flame resistant and retardant and shall not produce harmful or toxic fumes or gases in the event of a fire.

2.4.7.3.2.4 Access panels and doors shall be secured by robust locking mechanisms with unit specific keys.

2.4.7.3.2.5 The fare gates shall be minimum IP 32 rating.

2.4.7.3.2.6 The fare gates shall be designed according to universal ergonomic standards, including the positioning of passenger displays and prompts.

2.4.7.3.2.7 Notwithstanding the requirements of ergonomic standards, the minimum fare gate passage widths shall be 500mm and 915mm for narrow and wide passages respectively.

2.4.7.3.2.8 Notwithstanding the Contractor's responsibility to provide a secure barrier, the overall height of the fare gate barrier shall not be less than 1,100mm from floor level.

2.4.7.3.3 **Interface requirements**

2.4.7.3.3.1 The fare gate shall provide in addition to the Emergency push button an input to interface with a station fire alarm panel dry contacts output, to activate the Emergency mode in the event of a fire alarm. The alarm panel shall be located in the station equipment room.

2.4.7.3.3.2 The Contractor shall supply and install the cabling between the gates and the fire panel.

2.4.7.3.3.3 The fare gates shall utilize 220-240V AC power from a dedicated IFMS distribution board (DB) located in the station equipment room.

2.4.7.3.3.4 The Contractor shall supply and install the cabling between the gates and the power DB as well as an appropriate circuit breaker per passage.

2.4.7.3.3.5 The Contractor shall be responsible for providing the necessary transformers and power supplies required to power the fare gates.

2.4.7.3.3.6 Fare gates shall be earthed via a common station equipment earth bar located in the station equipment room.

2.4.7.3.3.7 The fare gates shall interface with the station LAN via a network switch located in the station equipment room, with a port provided for each fare gate passage.

2.4.7.3.3.8 The Contractor will supply and install the network cables between the fare gates and the network switch.

2.4.7.3.3.9 The fare gates will be controllable via a GUI on the admin terminal from the TMC or an authenticated remote access terminal as required.

2.4.7.3.3.10 The fare gate mode, status, condition and alarms are to be displayed on the GUI.

2.4.7.4 Sales Centre

2.4.7.4.1 Sales Centres - Ticket Office Machine (TOM)

2.4.7.4.1.1 The selected Sales Centres as per clause 1.7.2.2.2 and implemented as per Table 3 AFCS implementation per phase shall be provided with TOM's as per clause **Error! Reference source not ound.**

2.4.7.4.1.2 The TOM shall provide an attended ticket sales facility to the public.

2.4.7.4.1.3 The TOM shall service public, via a secure ticket sales window.

2.4.7.4.1.4 The TOM shall interface with the Data Centre and Payment system via ADSL, GPRS, PLM network or other type of network. If it is economically feasible a PLM fibre optic network shall be provided.

2.4.7.4.1.5 The TOM shall provide the sales clerk with information such as travel schedules, fare tables, comparative cost per route (origin/destination) vs various products to achieve value for money, card status etc.

2.4.7.4.1.6 The TOM shall be equipped with a receipt printer to print report and mini statements.

2.4.7.4.1.7 The Contractor shall supply, install, operate and maintain all network devices other than the PLM Fibre optic WAN network.

2.4.7.4.1.8 The Contractor is required to provide the modems and associated cabling, which will be located at an agreed position within the Sales Centre.

2.4.7.4.1.9 Cable containment will be provided between the TOM and the power, earth and data termination points by others, to the Contractor's requirement. The Contractor shall provide the applicable requirements for cable containment.

2.4.7.5 Feeder Stops

2.4.7.5.1 3rd Party Top up facilities

It is required that a fare media top-up load point footprint is established at locations in close proximity of feeder bus stops. The targeted maximum distance from any bus stop to the nearest top-up point is 1000m with due consideration to achieving value for money. The Contractor is to design, build, implement, operate and maintain the top-up load point network services, limiting capital investment and operating costs.

The table below indicate the various Stop points on each route with GPS coordinates and the implementation phase. The Tenderer's are required to complete the table to indicate which stops are to be provided with Top up facilities. The following information is required:

a. A Unique Identifier to identify each Top up facility
b. The GPS coordinates of the Facility
c. The distance from the Facility to the indicated stop

Take note that stops on the various routes are at the same locations and or in close proximity of each other. A column is provided indicating the shared locations and close proximity stops.

For evaluation purposes the following method shall be used to score the response in the table:

*Score = (Qty Top up sites / Qty Stops) * average Distance Top up Site to Stop*,

Where:

Average Distance Top up Site to Stop = Sum of Distances for each Top up Site / Qty Top up sites.

TRUNK EXTENSION ROUTES					
Route TE5					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	7	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
TE5-1	29.398061,-23.850322				0
TE5-2	29.400011,-23.840973				
TE5-3	29.392357,-23.842531				
TE5-4	29.386790,-23.840920				
TE5-5	29.391791,-23.835955				
TE5-6	29.382671,-23.848603				
TE5-7	29.385227,-23.854357				

Route TE6					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	10	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
TE6-1a	29.376576,-23.829225				0
TE6-1b	29.377026,-23.829367				
TE6-2	29.361819,-23.836142				
TE6-3	29.345666,-23.839948				
TE6-4	29.339391,-23.84104				
TE6-5	29.351798,-23.838746				
TE6-6	29.354139,-23.847207				
TE6-7	29.361695,-23.854234				
TE6-8	29.369785,-23.852941				
TE6-9	29.376356,-23.853661				

Route TE7					
Implementation phase	**FUTURE PHASE**	**GPS (LONG, LAT)**			
QTY Stops	9	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp	Fare media TopUp Site GPS Coordinates	Distance from Stop to

			Site ID		TopUp site
TE7-1	29.367424,-23.817684				0
TE7-2	29.362421,-23.821266				
TE7-3a	29.352925,-23.824387				
TE7-3b	29.352788,-23.824340				
TE7-4a	29.347674,-23.828388				
TE7-4b	29.347667,-23.828209				
TE7-5	29.337620,-23.831966				
TE7-6	29.362789,-23.827084				
TE7-7	29.367464,-23.831022				

FEEDER ROUTES					
Route F2a					
Implementation phase	**FUTURE PHASE**	**GPS (LONG, LAT)**			
QTY Stops	14	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F2a-0	29.447852,-23.903115				0
F2a-1	29.454543,-23.901665				
F2a-2	29.458065,-23.896897	F6b-9			
F2a-3	29.467477,23.894451	F6b-8			

F2a-4	29.473384,-23.892186				
F2a-5	29.478992,-23.888872				
F2a-6	29.48466,-23.884575				
F2a-7	29.491852,-23.889578	F2b-11, F2b-6			
F2a-8	29.483809,-23.896192	F2b-12, F2b-5			
F2a-9	29.475772,-23.902361	F2b-13, F2b-4			
F2a-10	29.47195,-23.901213	F2b-14			
F2a-11	29.46514,-23.902111	F2b-15			
F2a-12	29.458319,-23.903474	F2b-16			
F2a-13	29.449118,-23.905319	F4-2, F6b-11, F6a-13, F6c-11			

Route F2b					
Implementation phase	**FUTURE PHASE**	**GPS (LONG, LAT)**			
QTY Stops	18	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F2b-0	29.449467,-23.909719	F1-0, F3-0, S-0			0
F2b-1	29.453788,-23.90887	F1-1, F3-1,			
F2b-2	29.458158,-23.908	F1-2, F3-2			
F2b-3	29.468184,-23.906012	F1-3			
F2b-4	29.476265,-23.90209	F2b-13, F2a-9			
F2b-5	29.484116,-23.895646	F2b-12, F2a-8			
F2b-6	29.492475,-23.888791	F2b-11, F2a-7			
F2b-7	29.500704,-23.882114	F2b-10			
F2b-8	29.510208,-23.875808	F2b-9			
F2b-9	29.511897,-23.874944	F2b-8			
F2b-10	29.500677,-23.882421	F2b-7			
F2b-11	29.491778,-23.889625	F2a-7, F2b-6			
F2b-12	29.483831,-23.896167	F2a-8, F2b-5			
F2b-13	29.475726,-23.902363	F2a-9, F2b-4			
F2b-14	29.471948,-23.901217	F2a-10			
F2b-15	29.465109,-23.90214	F2a-11			
F2b-16	29.45832,-23.903471	F2a-12			
F2b-17	29.449106,-23.905319	F2a-13, F6a-13, F6b-11, F6c-11, F4-1			

Route F4					
Implementation phase	**1A**	**GPS (LONG, LAT)**			
QTY Stops	13	Qty TopUp Sites	0	Average Distance Stop to TopUp Site	0
Stop Code	GPS (LONG, LAT)	Same Stop, Close proximity Stops	Fare media TopUp Site ID	Fare media TopUp Site GPS Coordinates	Distance from Stop to TopUp site
F4-0	29.447878,-23.903123	F2a-0			0
F4-1	29.449106,-23.905321	F2a-13, F2b-17, F6b-11, F6c-11			
F4-2	29.443464,-23.906449				
F4-3	29.441191,-23.908434				
F4-4	29.436291,-23.907160				
F4-5	29.435781,-23.911488				
F4-6	29.435293,-23.915843				
F4-7	29.430582,-23.919543				
F4-8	29.428685,-23.91756				
F4-9	29.427212,-23.911777				
F4-10	29.428472,--23.908507				
F4-11	29.430387,-23.904485				
F4-12	29.442775,-23.904123				

2.4.7.5.1.1 The top up facility equipment shall perform the following functions; Loading of transit products and value.

2.4.7.5.1.2 Capture and store load transaction records, containing inter alia the following:

a. Transaction Date and Time
b. Top-up site Identifier or merchant code
c. Transaction ID
d. Value loaded
e. Product or small purse value topped up.

2.4.7.5.1.3 The sales equipment shall be able to receive updated fare products and rules and implement it at the scheduled time.

2.4.7.5.1.4 Transfer Product top-up transactions records to the AFCS Back office via the Payment system for financial reporting and reconciliation purposes, and customer query resolution or provide clearing and settlement reports.

2.4.7.5.1.5 Issue receipts for each transaction to the card holder.

2.4.7.5.1.6 Settle Product top-up transactions within 24 hours.

2.4.7.5.1.7 The Contractor can propose any types of terminals to be used at 3rd party facilities which may include merchant POS, ATM etc.

2.4.7.5.1.8 The 3rd party terminals shall not form part of the Operational Service period. It shall be the Contractors participating acquiring banks responsibility to supply, install and maintain these devices

2.4.7.5.2 **Signage**

2.4.7.5.2.1 Signage are to be designed, build, installed and maintained at each Feeder stop listed above.

2.4.7.5.2.2 The Contractor shall submit the Signage design for approval by the Employer during the Preliminary and Final design stages.

2.4.7.5.2.3 The Signage shall convey the locations of 3rd Party top up facilities closest to each stop.

2.4.7.5.2.4 The Signage shall contain inter alia the following information:

a. Vendor or institution name
b. Type of Top up facility – POS, Sales Centre, Ticket Sales or ATM.
c. Address, directions and distance to facility
d. GPS Coordinates
e. Operating hours

2.4.7.5.2.5 The Signage at stops shall be UV resistant to withstand at least three year's direct sun exposure. The legibility shall not diminish in this period.

2.4.7.5.2.6 The Signage shall be rigid.

2.4.7.5.2.7 The Signage shall have a low trade or resell value.

2.4.7.5.2.8 The signage shall be easily replaceable without causing damage to the supporting structure.

2.4.7.5.2.9 The following Signage shall be provided at 3rd Party top-up facilities:

a. Fare rates

b. Bus schedules.

2.4.7.5.2.10 The Signage shall be placed at an appropriate place visible to customers.

2.4.7.5.2.11 The Contractor shall be responsible for the design, printing and distribution of the Signage media to 3rd Party top-up facilities.

2.4.7.5.2.12 The Contractor shall submit the design for approval by the Employer during the Final design stage.

2.4.7.5.2.13 The Employer shall provide the Fare rates and Bus schedules.

2.4.7.6 Trunk & Midi Buses

Trunk buses will serve both Trunk and Feeder stops. Due to the dual nature of the Trunk buses, they need to accommodate the boarding and alighting at a curb-side feeder door and Trunk door.

2.4.7.6.1 These buses will not perform ticket sales.

2.4.7.6.2 The busses will not have physical access control other than the bus doors.

2.4.7.6.3 It shall require the associated Bus Onboard plant (BOP) as per clause 2.4.13.3 to be supplied, installed and maintained by the Contractor.

2.4.7.6.4 The BOP to be installed is as per Table 3 AFCS implementation per phase .

2.4.7.6.5 The Contractor shall liaise with the coach builder for the correct placements and mounting provisions for antennae and other BOP components.

2.4.7.6.6 The Contractor shall provide a power budget to the Employer/Coach builder as per clause 2.3.3.2 FD11.

2.4.7.6.7 Cableways and containment shall be provided by others

2.4.7.6.8 The Contractor shall provide the detailed installation documents and liaise with the Coach builder to ensure safe and secure installation of BOP's. Details shall include fastening methods, placement position, Safety calculations etc. Any arrangement made by the Contractor with the Coach Builder or any other contractor to perform installation services, shall not relieve the Contractor of responsibility for the compliance and performance of the BOP

2.4.7.6.9 The Contractor shall ensure that there is no interference with other systems and the efficient operation of the BOP's

2.4.7.6.10 Ticket Inspectors shall perform scheduled on-board verification of fare media and the identification of fare evasion on buses.

2.4.7.6.11 Fare media verification shall be performed by means of Portable Verification Units (PVU) as per clause 0

2.4.7.6.11.1 Ticket sales

2.4.7.6.12 The Trunk station will provide an attended pre-boarding ticket sales function at which new cards may be purchased and/or reloaded.

2.4.7.6.13 Ticket Inspectors shall change PVU and batteries at the Depot.

2.4.7.6.14 PVU's and batteries shall be stored and recharged in docking stations located at the Depot.

2.4.8 Level 2 Intermediate services

2.4.8.1 Depot

2.4.8.1.1 A bus depot is envisaged as per clause 1.7.2.3.4, the location of which is in Seshego as per Figure 1 and as per Table 3 AFCS implementation per phase .

2.4.8.1.2 The Plant employed at the Depot will serve as an intermediate level between Fare media Read/Write devices and the Data Centre providing local storage and processing capabilities.

2.4.8.1.3 The AFCS system on the depot shall have the ability to transfer and relay transaction data such as tap on events, Equipment Operating data (EOD), logs etc. to the AFCS CS.

2.4.8.1.4 The AFCS system on the Depot shall have a Wi-Fi Access Point for BOP Wi-Fi stations to wirelessly transfer data and EOD to and from buses entering the Depot precinct for the purpose of further data transfer, exchange and processing.

2.4.8.1.5 The Depot shall have a proxy server to receive and store BOP/ software updates and Equipment Operating Data (EOD) from the Data Centre and manage and perform BOP Updates and downloading to individual or all BOP via the Wi-Fi network.

2.4.8.1.6 The Depot shall have an Administration terminal to provide for the following:

a. The issuing of PVU's to inspectors and logging usage against inspectors

b. To perform maintenance activities

c. Monitor Wi-Fi connections and performance

2.4.8.1.7 The Depot shall house the PVU's, batteries and docking stations.

2.4.8.1.8 The AFCS plant on the depot shall have the ability to operate during power failures to ensure error free transfer and storage of data such that implementation of changes in schedules, Fare prices etc are not influenced and that AFCS system operations are not severely disrupted.

2.4.8.1.9 The Contractor shall perform Wi-Fi signal analyses to determine optimal antenna positioning, signal strength adjustment and channel selection to deploy a Wi-Fi system that is free of interference from other sources.

2.4.8.1.10 All AFCS equipment shall be authenticated and transactions encrypted according to IT security standards and regulations. No unauthorised equipment shall be allowed to communicate, intercept or change information on the communication networks.

2.4.8.1.11 The Contractor shall be responsible for the design, supply, installation, integration, maintenance and operation of the Wireless network on buses and the depot. The Contractor shall be responsible for the provision of all infrastructures such as power cables, data cable, mounting pole, brackets etc for the wireless network. Cable containment (data and power) for the wireless network which extends beyond the buildings shall also be provided by the Contractor.

2.4.8.1.12 The Contractor shall provide Cable containments requirements with regard to the provision of requisite cable containment within buildings and parking area.

2.4.8.1.13 The Contractor shall be responsible for the design, supply, installation, integration, maintenance and operation of the LAN for all AFCS equipment on the depot. The Contractor shall also be responsible to provide requirements, with regard to the provision of requisite cable containment.

2.4.8.1.14 A switch interfacing the Fibre optic Wide Area Network (WAN) to the Depot AFCS LAN to establish a communication link between the AFCS SC and DRC and Depot may be provided by the Employer subject to the location and economic feasibility of providing fibre optics to the site. The switch shall be located in an equipment room. The Contractor shall be responsible to provide requirements with regard to the provision of the requisite cable containment and also provide the Network architecture to be implemented if Fibre optic network is to be implemented.

2.4.8.1.15 In the event that fibre optic WAN will not be implemented, the Contractor shall be responsible for the design supply, installation, maintenance and operation of alternative WAN connection to the Data Centre by means of GPRS, ADSL, radio link, etc. The Contractor shall be responsible for any and all monthly subscriptions, renewal fees etc that relate to the implementation of the WAN connection.

2.4.8.1.16 The Contractor shall be responsible for the design, supply, installation, maintenance and operation of any mobile network that may be required for establishing a connection to the Payment system.

2.4.8.1.17 The Contractor shall provide a complete power budget for all AFCS plant on the Depot's and make it available to the PLM Engineer to arrange for the provision of the services. It shall include the *inter alia* the load of each major component (maximums, normal and idle), the type of power and total power consumption.

2.4.8.1.18 It is the responsibility of the Contractor to provide requirements in terms of all the aspects required for the successful installation of equipment on the Depots infrastructure that shall ensure the proper and efficient operation of the AFCS. It includes the positioning of equipment, dimensions, and the physical interfaces required to perform the installations.

2.4.8.1.19 The Contractor shall ensure that the Depot Wi-Fi AP's have enough users and bandwidth to allow all busses fitted with AFCS on-board plant in the parking area to communicate with the Depot proxy server and equipment. If this is not practically possible or feasible the Contractor shall propose a method to ensure that all uploads and downloads can be accomplished within one period of non-operating hours.

2.4.8.1.20 The Contractor shall ensure that only buses BOP and AFCS related plant may connect to the Wi-Fi network.

2.4.8.1.21 The Administration terminal shall only be accessible by authorised and authenticated AFCS staff.

2.4.9 Level 3 - Central System (CS) and Disaster Recovery Centre (DRC)

2.4.9.1 The data system must comply with the MIOS for Information Systems in Government.

2.4.9.2 The data centre or central system will perform the primary management function of the AFCS system, and will be located at the TMC.

2.4.9.3 The data centre will comprise servers as well as administration terminals with network interfaces allowing communication with the various sub-systems of the AFCS as well as with external parties such as banking institutions and other participating transport operators.

2.4.9.4 The primary function of the CS is to provide the data capturing, authorization, authentication, processing, storage and management unit of the AFCS.

2.4.9.4.1 All transactions shall be stored for a minimum period of Five years.

2.4.9.4.2 Software License keys shall be treated as confidential and the management of license keys shall be contained with system administrator only.

2.4.9.4.3 The sharing of information shall be governed by agreements between PLM and third parties. Data may be shared through the use of an optional Data Concentrator.

2.4.9.4.4 Shall have the capability to change and add business rules, fare structure and AFCS plant configuration data without the need to recompile or reinstall applications.

2.4.9.4.5 Provide for the configuration and version control for all software (OS, applications, firmware and fare media products) under an Industry accepted version control system which shall state at least the following;

2.4.9.4.5.1 Status such as development, testing (alpha, beta, SAT, FAT etc.), release.

2.4.9.4.5.2 The developer, product name, product description, build number, purpose, interfaces, dependencies, versions and revisions and dates for each change in status.

2.4.9.4.5.3 Certification requirements and the verification of certification.

2.4.9.4.6 Have the capability to the publish interfaces to enable others to implement additional functionality and features.

2.4.9.4.7 Perform Fare transactions reconciliation, which shall include *inter alia* the following:

2.4.9.4.7.1 Will calculate daily total revenues and generate reports.

2.4.9.4.7.2 Will prepare batches for settlement by bank according to banking standards

2.4.9.4.8 Provide fraud and error detection in the system, which shall include *inter alia* the following:

2.4.9.4.8.1 The collection system will detect and control fraud on the use of fare media.

2.4.9.4.8.2 Ensure that period product value is spent (zero balance) before activation of next period product. This will be in line with the Fare Structure and business rules.

2.4.9.4.8.3 Ensure that no negative balances occur on cash portion of Fare media. (A negative balance on the transit portion shall be allowable in accordance with the final business rules).

2.4.9.4.8.4 Report and disable Fare Media that are reported stolen or damaged and update validation equipment with blacklisted cards

2.4.9.4.8.5 Manage and distribute card blacklists.

2.4.9.4.9 Provide status monitoring and reporting which shall include *inter alia* the following:

2.4.9.4.9.1 The status of all equipment in the AFCS shall be monitored.

2.4.9.4.9.2 AFCS plant with problems shall generate alarms that need to be acknowledged by an operator.

2.4.9.4.9.3 Maintenance activities resulting from alarms shall be recorded in a maintenance module.

2.4.9.4.9.4 The time to respond and resolve the error or alarm shall be captured and compared with the Service Level Agreement for the purpose of performance monitoring.

2.4.9.4.9.5 The AFCS shall ensure that equipment status update intervals to the AFCS CS will assist in meeting Operational service period requirements.

2.4.9.4.10 Provide Maintenance Management which shall include *inter alia* the following:

2.4.9.4.10.1 The update of the Asset Register, which shall include the part no., serial no., Description, Location and operational status.

2.4.9.4.10.2 The ability to schedule preventive maintenance activities according to OEM's specifications and recommendations.

2.4.9.4.10.3 Shall provide the estimate time for maintenance activities, works authorisation, capture actual activity time, and compare with Service Levels and report.

2.4.9.4.10.4 Shall provide for the capture and logging of all emergency maintenance activities. All activities shall be monitored and compared with service levels and reported.

2.4.9.4.10.5 Shall provide for the calculation of MTBF, MCBF and system availability of all equipment and compared with suppliers specifications. Discrepancies shall be reported for corrective actions.

2.4.9.4.10.6 All AFCS plant shall be monitored and have status indicators. This includes spares that are in store (Serviceable, Repairable, unserviceable and disposable).

2.4.9.4.10.7 The maintenance management module shall be able to generate reports on the status.

2.4.9.4.10.8 The maintenance management module shall be able to perform root cause analysis.

2.4.9.4.10.9 Shall be able to update Asset register with changes.

2.4.9.4.10.10 All changes shall be logged for audit purposes

2.4.9.4.10.11 All maintenance history data shall be kept for a minimum of ten years.

2.4.9.4.11 Provide for Security management as per MIOS and *inter alia* the following:

2.4.9.4.11.1 The security system must permit the administration of user and device access to the system and data according.

2.4.9.4.11.2 All user activities must be logged for audit purposes.

2.4.9.4.11.3 A facility to change the password and generate new passwords for forgotten passwords is required.

2.4.9.4.11.4 Data transmission from unauthorised equipment must be ignored and reported as an alarm.

2.4.9.4.11.5 The security shall include antivirus programs and programs (Firewalls) that will protect the AFCS central control from viruses, malware, adware and any other malicious software.

2.4.9.4.11.6 All information must be protected against loss, modification and/or unauthorized disclosure while stored or in transmission.

2.4.9.4.11.7 Close collaboration between the AFCS Contractor and the Employer are required for the establishment of a secure network, information such as ports (physical and logical), authentication schemes, MAC address filtering, IP address allocations, IP address allocation schemes etc. need to be documented and communicated.

2.4.9.4.12 Provide a facility to design and generate additional reports which may be required from time to time.

2.4.9.4.13 Have export utilities to export information both manually and automatically, so that data from the AFCS CS may be analysed by other database managers.

2.4.9.4.14 Provide for transactional data to be exported into a data warehouse managed by the Employer.

2.4.9.5 The disaster recovery centre (DRC) is essentially a mirrored version of the AFCS central server which will automatically take over the function of the central server in the event of failure. The role of the CS and DRC shall be interchangeable, but at no time will both systems perform the same role simultaneously.

2.4.9.6 The CS and the DRC shall have the same functional and technical requirements with the exception to the location.

2.4.9.7 The default priority for the AFCS shall be the CS Server first and then DRC Server.

2.4.9.8 All central system hardware and software at the AFC Control Centre shall be located, operated and maintained at the designated TMC equipment room.

2.4.9.9 All DRC hardware and software will be located at the designated equipment room at the DRC site, yet to be identified.

2.4.9.10 Operations of the AFCS shall not be influenced or disrupted when implementing and testing subsequent phases until ready for operation.

2.4.9.11 The Graphical User Interface (GUI) Applications for managing the AFCS shall be implemented as web services, web pages or web

servers which can be opened by any web browser. This eliminates the burden of installing applications on workstations and reduces the maintenance cost

2.4.9.12 The Tenderer shall list all applications that are not web enabled such as Operating system configuration applications, Relational Database management Systems (RDBMS), utilities, other configuration utilities etc as part of returnable documents RDDXX.

2.4.9.13 The AFCS CS Server Date and Time settings shall synchronise with a time server and all other equipment in the existing AFCS shall synchronise their Date Time settings with the AFCS CS Server. The Employer may provide a time server to which all Plant must be synchronised.

2.4.9.14 The data centre is envisaged to comprise the following primary elements:

2.4.9.14.1 Central Server: The central server contains the primary AFCS data base and applications as well as the system parameters, data security and authentication management, and equipment operating data (EOD).

2.4.9.14.2 Development Server: A development server will provide an environment for the development and testing of system software enhancements and parameter changes without contaminating the operational environment.

2.4.9.14.3 Banking Server: A virtual banking server/s (could also be physical depending on the specific bank and if required at all) provides a secure banking interface for the processing of PLM/bank transactions and reconciliations.

2.4.9.14.4 Data Concentrator (Not included in current scope of supply): A data concentrator will accommodate a filtered version or versions of the AFCS database which may be accessed by authorized participants to the AFCS such as other transport operators for the purposes of transaction reconciliation and settlement where appropriate, and in terms of data sharing agreements.

2.4.9.14.5 Administration and Development Terminal: The AFCS administration terminal provides a user interface to the AFCS back-end as well as to field equipment by linking to the central server via the TMC AFCS LAN.

2.4.9.14.6 User/Monitoring Terminal: This terminal provides a user interface for the extraction of reports, conducting of data analysis, audits, Event monitoring etc. from the AFCS, and may be in the form of a dedicated local or a general remote terminal.

2.4.9.14.7 The AFCS CS application or services shall administer information of transactions undertaken on the AFCS;

2.4.9.14.7.1 Collect AFCS data pertaining to the usage of the IRPTN to generate reports for planning and changes as well as integrating with the PLM financial system where required.

2.4.9.14.7.2 Collect AFCS data pertaining to the loading of cards.

2.4.9.14.7.3 Store all personalised Fare Media information as defined by the NDOT AFC Data structure in a database.

2.4.9.14.7.4 The Tenderer shall provide a list of standard reports, content and format as part of the solution proposal. As a minimum the following reports must be provided:

2.4.9.14.7.4.1 **Sales Centres Reports**

a. Cash declaration
b. Transit sales per point of sale
c. Sales report per cashier
d. Sales report per location
e. Consolidated transit sales report
f. Transit product and Value sales per Sales Centre operator
g. Transit product and Value sales summary per location
h. Transaction exception report (comparison between transactions processed on the kiosk versus bank system)

2.4.9.14.7.4.2 **3rd Party Top-up sites**

a. Daily Product load or Top-ups per site
b. Daily Product load or Top-up summary.

2.4.9.14.7.4.3 **Usage (on buses) Reports**

a. Summary of passengers per route
b. Devices not updated to BackOffice (Devices not seen)
c. Origin / destination analysis report
d. Route inspectors report
e. Daily inspectors report
f. Bus reconciliation report (all transaction processed on a particular bus)
g. Depot (total all buses) revenue by date
h. Depot (total all buses) revenue by route
i. Summary revenue report by fare type (Transit product / Value)

2.4.9.14.7.4.4 **Card report**

a. Transaction details at Card level – showing card activation date, load and Top-up history (including locations), card usage history, balance of trips or value. Etc

2.4.9.14.8 The Contractor shall supply all equipment specifications and software specifications (including integration and installation) as part of the design documentation for approval.

2.4.9.14.9 The Contractor will collaborate with other contractors and stakeholders to provide and obtain information necessary for the implementation of the AFCS.

2.4.9.14.10 The Contractor shall be responsible for the supply, installation, maintenance and operations of the Hardware, Operating system, software middleware etc.

2.4.9.14.11 All hardware servers shall be of industry standard, reliable and operationally proven.

2.4.9.14.12 All Servers shall be provided with screen, mouse and keyboard. Where more than one physical server is utilised a KVM shall be supplied.

2.4.9.14.13 Servers shall be able to be managed remotely with appropriate Secure log in and authentication.

2.4.9.14.14 The servers shall be scalable to accommodate the City Fleet and Phases to be implemented.

2.4.9.14.15 The Contractor shall ensure that with server deployment the following redundancy options are addressed, specified and implemented:

2.4.9.14.15.1 Power supply redundancy in the form of DC and AC. For AC redundancy a minimum of two UPS's shall be provided and connected to the redundant server PSU's.

2.4.9.14.15.2 The UPS's shall be connected to an electrical distribution board and be protected with the necessary surge protection.

2.4.9.14.15.3 For DC redundancy the server shall be supplied with dual redundant PSU's which shall be hot swappable.

2.4.9.14.15.4 Fan mode redundancy, failure of fans shall trigger alarm events to the AFC operator for acknowledgement and the amount of fans left in the system shall not place the server at risk of overheating.

2.4.9.14.15.5 IO Module redundancy

2.4.9.14.15.6 Network connection redundancy

2.4.9.14.15.7 Management module redundancy

2.4.9.14.15.8 Hard disk redundancy with hot swap. The scheme used shall be indicated by the Contractor. These redundancy options might be different from server type to server type and there may be different configuration options for implementation. It is the Contractors responsibility to indicate to what level the server deployment will be implemented with regard to redundancy.

2.4.9.14.16 Preference shall be given to operating systems that can be proven to be an industry standard, meet the performance criteria, are maintained and supported and comply with the open standards specifications.

2.4.9.14.17 The AFCS CS Servers shall interface with the AFCS CS WAN and LAN via a network switch located in the AFCS CS Sever rack, with ports provided for the AFCS CS Severs.

2.4.9.14.18 The Contractor will supply and install the LAN network cables between the AFCS CS Severs and the network switches.

2.4.9.14.19 The Employer shall be responsible for the fibre optic network design and management. The Contractor shall provide all network requirements to the Employer to ensure the proper integration and implementation of the AFCS.

2.4.9.14.20 The AFCS CS Servers will be controllable from:

a. The administration workstation
b. The operator workstation
c. Rack mount Keyboard, mouse and Screen.
d. Remotely.

2.4.9.14.21 The Contractor shall be responsible to supply, install, configure and maintain any additional network equipment required to connect to the banking network such as GPRS modems, antennas, VPN, APN's etc.

2.4.9.14.22 The Contractor shall liaise with the Employer with regard to installation locations for GPRS equipment and adhere to any special requirements set for installations at the TMC facility.

2.4.10 Central Control Workstations

2.4.10.1 Two workstations shall be supplied as part of the AFCS CS and not at the DRC. The workstations shall be located at the TMC in an AFCS office. The function of the workstations is for an operator and/or an administrator. The Contractor shall provide requirements with regard to the workstations.

2.4.10.2 The requirements of the office in terms of layout, size and furniture need to be specified by the Contractor and supplied by the Employer.

2.4.10.3 No distinction shall be made between the two work stations in terms of their functionality, both shall have the maximum functionality and the function shall only be determined by the user login and user access rights.

2.4.10.4 The workstations shall be provided by the Contractor with a network interface that will be connected to a network point by means of patch leads, which will connect to the AFCS CS LAN.

2.4.10.5 The workstations shall be provided with UPS's in the case of power failure. The UPS's shall provide power for a minimum period of one hour for each work station. The UPS's shall be supplied and installed by the Employer

2.4.10.6 The operator shall perform inter alia the following:

2.4.10.6.1 Have a GUI that report alarm events and need to acknowledge.

2.4.10.6.2 Perform administrative maintenance activities such as the capture of fault reports not generated by the system, the reporting to of fault reports to appropriate department, maintenance follow up and status update.

2.4.10.6.3 Check system status's

2.4.10.6.4 Send and receive e-mails

2.4.10.7 The administrator shall perform inter alia the following:

2.4.10.7.1 Have a GUI that reports alarm events and that need to be acknowledged.

2.4.10.7.2 Perform administrative maintenance activities such as the capture of fault reports not generated by the system, the reporting of fault reports to appropriate department, maintenance follow up and status update.

2.4.10.7.3 Check system status's

2.4.10.7.4 Perform database management task such as repair, compacting etc.

2.4.10.7.5 Perform configuration functions of applications and upload system parameters, set fare structures exporting data, check version control, install applications, setup ACL's etc

2.4.10.7.6 Check equipment statuses and perform diagnostics and download system parameters files.

2.4.10.7.7 Send and receive e-mails

2.4.10.8 Both work stations shall interface to the AFCS CS LAN and the rest of the AFCS. The Contractor shall provide Network requirements to the Employer.

2.4.10.9 Both work stations shall have screens, keyboards and mouse for input.

2.4.10.10 At least one colour printer shall be supplied for printing status reports etc.

2.4.10.11 Network cable containment shall be provided by others and the Contractor shall provide the requirements for cable containment as per clause 2.3.3.2 FD11.

2.4.10.12 The Contractor shall supply, install and maintain the terminals LAN network cabling and terminations.

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2.4.11 Fare Concessions

Fare Concessions are Fare Product offerings that allow for discounted or special travel fares. The following typical concessions are anticipated:

a. Pensioners
b. People with Disabilities
c. Scholars
d. Students
e. The unemployed
f. Staff

2.4.11.1 The AFCS must allow for the creation of concessions and other than those mentioned above in the future.

2.4.11.2 Concession profiles shall be easily configurable by changing parameters and without the need for hard coding. These parameters will be identified during the development of the business rules.

2.4.11.3 Personalised concessions shall be issued at attended ticket sales points only

2.4.11.4 All concessions shall be personalised and information captured shall include inter alia the following:

2.4.11.4.1 South African National ID number

2.4.11.4.2 Name and Surname

2.4.11.4.3 Expiration dates. When the expiration date is reached the card shall be blocked (prevent access) until unblocked by re verifying and extending expiration dates by sales attendant. For the disabled, the South African Social Security Agency disability grant duration may be used.

2.4.11.4.4 Age shall be determined from ID Etc

2.4.11.5 The AFCS shall perform an ID validation against previously issued concession cards to prevent multiple issuances.

2.4.11.6 Concessions shall also include a ‘no travel’ condition. This might apply to Staff and Driver cards to allow access to AFCS components and for log on and log off purposes. Exception reports shall be generated in the event of illegal use.

2.4.11.7 Concessions shall be configurable for any route or combination thereof.

2.4.11.8 Concession shall be able to be configured for any rate with predetermined limits as per business rules and EMV requirements

2.4.11.9 Concessions shall be configurable to be valid for any day, week or month for example scholars are only allowed to travel Mondays to Fridays excluding public holidays.

2.4.11.10 The administration and configuration shall be performed at the administration or ticket sales workstation or remotely with a valid log in.

2.4.11.11 Concession data shall be stored on the AFCS CS and be made available to all attended ticket sales points

2.4.11.12 Invalid data input (according to business rules) shall prevent the issue of concessions such as an age younger than 60 for pensioners, No Name and Surname, etc. Such parameters will be established during the development of the business rules.

2.4.11.13 Fare Media. Personalised information shall be stored on the Fare Media as defined by the NDOT data structure

2.4.11.14 Concession data, data structure, data definitions, business rules, etc shall be stored on the AFCS CS.

2.4.11.15 Any changes, additions and removals of concessions on TOM's or CS shall be updated in real time and downloaded immediately to other ticket sales points.

2.4.12 Level 4 – Banking Payment System

2.4.12.1 The Contractor shall include a bank to be the issuing and acquiring bank for the AFCS. All responsibility shall be borne by the Contractor to implement the AFCS and its payment subsystem which shall be secure and comply with the banking EMV requirements.

2.4.12.2 The PLM banking service provider is currently Standard Bank.

2.4.12.3 The associated bank forms an integral part of the AFCS and the Contractor's role to design, build, supply, install, commission, maintain and operate the AFCS and therefore the associated bank shall not be seen as a separate entity but part of the contracted solution.

2.4.12.4 The Contractor shall supply, install, commission, operate and maintain all network plant required to establish connection to the acquiring bank and National Payment System such as GPRS modems and antennas.

2.4.12.5 The Contractor shall ensure that all sites listed in the Pricing Schedules are provided with the necessary network plant to ensure connections for the payment system. This include;

a. Stations (Sales Centres)
b. Sales Centres
c. AFCS CS
d. DRC
e. Fare media sales drives
f. Third party Ticket sales Agents (Top Up sites)

2.4.12.6 The Contractor shall design a payment, reconciliation and settlement plan which indicates the accounts that need to be created and setup to allow for payment settlement and the efficient operation of the AFCS, as well as the process flow. This should be simple to understand by non-financial / banking people.

2.4.12.7 The Contractor will be required to integrate the above with the PLM financial management system.

2.4.12.8 The Contractor shall stipulate the detailed cost pertaining to the accounts, and Fare Media, it shall include inter alia the following;

a. Accounts registration and administration fees
b. Acquiring, Clearing and settlements fees (percentages and expected totals)
c. Activation of Fare Media
d. Loading of product or small purse value on Fare media
e. Top up of Fare Media

2.4.12.9 Payment terminals conducting online transactions shall be connected to the issuing banks network in order to process passenger initiated transactions and to forward it to the National Payment System for clearing and settlement.

2.4.12.10 Passengers shall be issued with printed receipts for all online payment transactions. Only one printer per pay point shall be allowed.

2.4.12.11 The AFCS shall process online payments through the AFCS issuing bank network to;

a. Activate Fare Media

b. Load Fare Media with products.

c. Load stored value on Fare Media.

d. Top up of Fare Media.

2.4.12.12 Fare Media Validators shall be connected (directly or indirectly) through the PLM Network to the AFCS CS. The AFCS CS shall process all transit transactions and submit valid payment transactions for clearing and settlement through the AFCS issuing bank network connected to the AFCS CS.

2.4.12.13 All transaction transmissions shall be secure (only authenticated devices and encrypted transmission) and where applicable comply with the standards of the Payment Cards Industry (PCI-DSS). It is the Contractor's responsibility to obtain the relevant certifications.

2.4.12.14 All transactions originating at all terminals and validators in the AFCS shall be collated and stored at the AFCS CS.

2.4.12.15 Payment transaction reconciliation shall be done on a daily, weekly and monthly basis and reports shall be generated by the AFCS CS indicating the status. The status shall include inter alia the following;

a. Transmittal receipts

b. Clearing and settlement reports

c. Exception reports

d. Accounts status reports (for each individual account)

2.4.12.16 The Contractor will be responsible for any shortages that occur between the transactions records in the AFCS and the settlement of these transactions into the nominated account.

2.4.12.17 Any invalid or fraudulent transactions will be for the account of the AFCS operator

2.4.12.18 All Bank Issued MasterCard PayPass and Visa PayWave payment cards must be accepted as transit payment at validators, this must include prepaid cards and credit cards.

2.4.12.19 Cash payments for Fare Media, Fare media activation, product load and Top up shall be captured in the AFCS. The contractor shall be responsible for the cash collection and the depositing of payments into a nominated account. Any losses incurred in respect of cash handling shall be carried by the contractor.

2.4.12.20 The Payment system equipment shall be available for use during operating hours.

2.4.12.21 The acquiring bank shall credit the proceeds from the AFCS payments to the Employers bank account within 24 hours of the transaction.

2.4.12.22 Replacement of any LRU shall take no longer than 30 minutes.

2.4.12.23 The Payment system plant should have a minimum useful life span of 10 years.

2.4.12.24 The Payment system equipment shall be fixed permanent installations.

2.4.12.25 The Payment system equipment shall be designed to combat vandalism, theft, impact and high intensity of use.

2.4.12.26 The Payment system plant shall be constructed from vandal resistant materials with due consideration to the corrosive and humid environment.

2.4.12.27 The Payment system plant shall be designed according to universal ergonomic standards, including the GUI displays and prompts.

2.4.12.28 The Payment system plant GUI must be visible under low lighting conditions.

2.4.12.29 The Payment system plant and design shall be certified to the relevant standards such as the NDOT R511, EMV and applicable Banking Standards.

2.4.12.30 The Contractor shall supply and install all cabling and plant for the Payment system which includes inter alia the following:

a. Mains power cable
b. Circuit breakers
c. Network cables
d. Inter connect cables (USB cable, Co-axial cable etc.)
e. Antenna's
f. PIN Pad
g. Payment terminal
h. Power supplies
i. Modem

2.4.12.31 The Contractor shall provide cable containment requirements to the Employer for Payment system at stations.

2.4.12.32 The Contractor shall provide dimensions required for passing a PIN Pad or Payment terminal underneath the secure window as part of the Final design stage.

2.4.12.33 The Payment system plant shall be earthed via a common equipment earth bar located in stations or depots plant rooms if so required by the installation specifications of the manufacturer of the equipment.

2.4.12.34 The contractor shall indicate if Payment system plant on stations needs to be interfaced with the PLM network to establish communication to the CCS, DRC or payment gateway at CCS. If communications to the CCS, DRC is required, the contractor is required to provide requirements to the Employer to provide LAN ports on the stations local network switches, located in the plant rooms.

2.4.12.35 The Contractor shall be responsible for the supply, install and maintenance of Payment system plant at Top up Sites. It is the contractor's responsibility to ensure that sufficient network coverage is provided at identified Top Up sites.

2.4.12.36 The Payment system plant for fare media sales drives that needs to establish a connection to acquiring bank and National Payment System shall be equipped with GPRS equipment to establish the connection. The plant shall be supplied and installed by the Contractor.

2.4.12.37 Cable containment will be provided for the Payment system plant only on stations and depots by others, to the Contractor's specification.

2.4.13 System Components requirements

2.4.13.1 Ticket Office Machine (TOM) requirements

2.4.13.1.1 The TOM shall only be operated by authorised and authenticated staff.

2.4.13.1.2 The TOM shall facilitate the registration of the PLM Fare cards and sale of single trip EMV cards.

2.4.13.1.3 The TOM must be capable of managing refunds for single trip EMV cards.

2.4.13.1.4 The TOM shall facilitate the reloading of cash purse value, transit value (points) or transit products onto the PLM Fare media card.

2.4.13.1.5 The TOM shall accommodate purchases using cash and all major bank credit and debit cards including but not limited to MasterCard and VISA, for payment.

2.4.13.1.6 The TOM shall communicate with the banking institutions and Data Centre via a dual redundant network connection, which may include the PLM network, GSM, ADSL or other radio links.

2.4.13.1.7 The TOM shall facilitate the viewing of the PLM fare media card status;

a. Card validity
b. Card cash balance
c. Card transit product balance
d. Transactions since the last reload
e. Concessions

2.4.13.1.8 The TOM shall facilitate the viewing of single trip ticket validity

2.4.13.1.9 The TOM shall be capable of accepting other future EMV NDOT R511 compliant transit cards for value / product loading and status viewing without hardware modification.

2.4.13.1.10 The TOM shall provide a GUI through which transaction information may be viewed and operator actions may be entered.

2.4.13.1.11 The TOM shall not allow users to delete or alter committed transactions.

2.4.13.1.12 The TOM shall include a passenger information display which will provide transaction information to the passenger during the transaction process.

2.4.13.1.13 The TOM GUI menu will include *inter alia*;

a. Operator log on and off
b. Activation of EMV card
c. Choice of EMV card or single trip EMV card
d. Choice of status view or sales transactions
e. Option to view fare tables
f. Product / value selection
g. Origin / destination selection
h. Display of transaction value
i. Choice of cash or card payment
j. Choice of receipt or not
k. Printing of shift and other reports, Etc.

2.4.13.1.14 The TOM shall print transaction receipts as well as status summaries on demand, selectable from the GUI.

2.4.13.1.15 The TOM shall provide a cash drawer from which cash received and change required from cash transactions in notes and coins may be stored and issued respectively.

2.4.13.1.16 The TOM shall include an ultra-violet light for the visual verification of bank notes.

2.4.13.1.17 The TOM will provide for the tracking of the cash balance in the cash drawer and will provide related reports on demand;

a. Start of shift
b. End of shift
c. Sales report
d. cash sales
e. card sales
f. etc.

2.4.13.1.18 The data displayed on the TOM screen such as fares, origin/destination, etc. shall be configurable in the form of editable parameters, from the central system and downloadable to individual or all TOM's via the PLM network or other network that might be implemented forming connections to the Data Centre and Payment System.

2.4.13.1.19 Notwithstanding the above, any software updates and upgrades shall be downloadable to individual or all TOM's via a network connected to the Data Centre and Payment System. Access to any upgrade and

update functionality shall be protected by authorization and authentication processes.

2.4.13.1.20 The TOM processing unit shall capture and store all transaction data required for back office reconciliation and device management.

2.4.13.1.21 The TOM processing unit shall store the transaction data locally and transfer the data to the Data Centre. The data shall only be deleted from the TOM when receipt acknowledgement is received from the Data Centre that transaction data has been authenticated and transmission verified.

2.4.13.1.22 The TOM shall generate fault alarms to line replaceable unit (LRU) level.

2.4.13.1.23 In addition to fault alarms, the TOM will generate early warning alarms of low stock levels for printer paper and display this on the TOM GUI.

2.4.13.1.24 Fault, event and stock level alarms shall be passed on to the Data Centre and will be stored and displayed on a GUI.

2.4.13.1.25 Notwithstanding that the TOM will be provided with a station standby power supply, the TOM shall have an uninterruptible power supply or battery back-up, which in the event of complete power failure, will support the completion of the current transaction before beginning a safe shut-down procedure automatically.

2.4.13.1.26 In the event of a complete power failure, the TOM is to recover full functionality automatically once power is restored.

2.4.13.1.27 TOM status and mode shall be controllable from a central computer GUI over the LAN or WAN including the following;

a. Closed for use
b. Open for use
c. Remote Interrogation

2.4.13.1.28 The Data Centre Admin Terminal or Monitoring Terminal is to graphically represent the station TOM and indicate the current status such as alarms and warnings to LRU level.

2.4.13.1.29 Only authorised and authenticated staff shall be able to change modes and acknowledge alarms.

2.4.13.1.30 Log event shall be stored for mode changes which shall include *inter alia,* Logged on user, date and time, and change state.

2.4.13.1.31 The TOM shall retain full transactional functionality in PLM network off-line mode.

2.4.13.1.32 The maximum transaction time for any complete transaction shall not exceed 40 seconds utilising a trained operator.

2.4.13.1.33 Replacement of any LRU shall take no longer than 30 minutes.

2.4.13.1.34 The TOM processor shall be capable of retaining at least 96 operational hours of transaction data, including all events.

2.4.13.1.35 The TOM processor shall possess sufficient memory to accommodate 5000 blacklisted/blocked cards, which when used will delete records on a first in first out basis.

2.4.13.1.36 Blacklisted/blocked cards shall otherwise be removed under the following conditions;

a. When the card is captured from the passenger

b. When a lost card is retrieved

c. When a period (configurable parameter) of time has passed

2.4.13.1.37 The TOM should have a minimum useful life span of 10 years.

2.4.13.1.38 The TOM shall be desktop mounted.

2.4.13.1.39 The TOM must service the sales windows efficiently and with full functionality. Particular attention is drawn to the passenger interface in this regard, including PIN entries and PID visibility.

2.4.13.1.40 The TOM shall be designed to combat vandalism, theft and high intensity of use.

2.4.13.1.41 The TOM shall be constructed from vandal resistant materials with due consideration to the corrosive and humid environment.

2.4.13.1.42 Flammable materials shall be flame resistant and retardant and shall not produce harmful or toxic fumes or gases in the event of a fire.

2.4.13.1.43 Cash draws shall be secured by robust locking mechanisms.

2.4.13.1.44 The TOM shall be designed according to universal ergonomic standards, including the positioning of passenger displays and prompts and maintenance activities.

2.4.13.1.45 The GUI must be visible under general office lighting conditions.

2.4.13.1.46 The Contractor will supply, install and maintain all cables between the TOM peripheral devices.

2.4.13.1.47 The Contractor is required to provide the GSM modem and associated cabling, which will be located at an agreed position within the site equipment room.

2.4.13.1.48 In the event that GSM coverage is inadequate within the site equipment room, the Contractor will be responsible to provide a suitable external antenna with mounting bracket and associated cabling.

2.4.13.1.49 The Contractor will be responsible for performing GSM coverage tests as soon as the station superstructure is complete so as to establish a suitable antenna mounting point and to provide the building contractor with cabling containment requirements in order to minimise potential rework.

2.4.13.2 Ticket Vending Machine (TVM)

2.4.13.2.1 Functional requirements

2.4.13.2.1.1 The TVM shall provide an unattended, automatic ticket reloading facility to the public.

2.4.13.2.1.2 TVMs will be installed on trunk stations or sales centres, where the passenger demand on the attended sales kiosk, exceeds its service capacity. Alternatively at 3rd party sales locations where a manned kiosk is not financially viable and there is no alternative infrastructure such as an ATM.

2.4.13.2.1.3 The TVM/s shall be installed in the unpaid area of the station.

2.4.13.2.1.4 The fare media processing devices shall be capable of processing the following fare media;

a) PLM Fare cards, which is EMV Compliant, Mastercard Certified and NDoT certified

b) EMV and NDOT R511 compliant transit cards

c) Bank issued contactless EMV compliant cards

2.4.13.2.1.5 The TVM shall facilitate the reloading of value or transit products onto the PLM Fare cards or EMV and NDoT-R511 compliant transit cards.

2.4.13.2.1.6 The TVM shall accept South African Bank notes as follow:

a) The current R 10, R 20, R 50, R 100 and R 200 notes in all orientations

b) Up to 3 series of the above notes at any one time

c) The Tenderer shall include the upgrading of note sets in the maintenance cost.

d) The TVM is not required to issue change however should provide the functionality to elect to issue change to the Stored Value portion of the EMV card or to print a receipt which may be redeemed at an attended ticket sales point if needed.

2.4.13.2.1.7 The tenderer shall offer an additional option which shall include note and coin payments with coins only change.

The notes and coins to be handled are as follows:

i Coins

a The current R 5, R 2, R 1 & 50c coins

ii Bank Notes

a The current R 10, R 20, R 50, R 100 and R 200 notes in all orientations

b Up to 3 series of the above notes at any one time

c The Tenderer shall include the upgrading of note sets in the maintenance cost.

2.4.13.2.1.8 The TVM shall accept all major bank credit and debit cards including but not limited to MasterCard, VISA, for payment.

2.4.13.2.1.9 The TVM may communicate with the banking institutions via a dual redundant network connection, which could include the PLM network and/or via a GSM modem.

2.4.13.2.1.10 The TVM shall facilitate the selectable viewing of each of the following aspects of the PLM card status;

a) Card validity

b) Card cash balance

c) Card transit product balance

d) Transaction history

2.4.13.2.1.11 The TVM shall facilitate the viewing of single trip ticket validity.

2.4.13.2.1.12 The TVM shall be capable of accepting other NDOT R511 compliant transit cards for status viewing.

2.4.13.2.1.13 The TVM shall provide a GUI in the form of a touch screen through which transaction information may be viewed and user actions may be entered.

2.4.13.2.1.14 The TVM shall offer a selectable option of English or Isizulu as user languages on the initial screen.

2.4.13.2.1.15 The TVM shall offer selectable audio annunciation of prompts, menu selections and transaction results for the visually impaired.

2.4.13.2.1.16 The TVM software shall be configurable to add new text message files without the need for hard coding.

2.4.13.2.1.17 The TVM GUI menu will include inter alia;

a) Prompts to guide the user throughout the transactional process

b) Choice of language

c) Choice of audio prompts and confirmations

d) Choice of EMV card or single trip

e) Choice of status or sales transactions

f) Option to view fare tables

g) Product / value selection

h) Origin / destination selection

i) Display of transaction value

j) Choice of cash or card payment

k) Choice of receipt or not

l) Etc.

2.4.13.2.1.18 The TVM shall print transaction receipts as well as status summaries on demand, selectable from the GUI.

2.4.13.2.1.19 In addition to the receipts, the printer shall print reports for cash stock levels on demand and upon replenishment.

2.4.13.2.1.20 The TVM shall have an internal user management interface for maintenance and operations activities.

2.4.13.2.1.21 The data displayed on the TVM screen such as fares, origin/destination, etc. shall be configurable in the form of editable parameters, from the central system and downloadable to individual, arrays or all TVM's via the PLM network.

2.4.13.2.1.22 Notwithstanding the above, any software updates and upgrades shall be downloadable to individual, arrays or all TVM's via the PLM network.

2.4.13.2.1.23 The TVM processing unit shall capture and store all transaction data required for back office reconciliation and device management.

2.4.13.2.1.24 The TVM processing unit shall store the transaction data locally and transfer the data to the station controller at a configurable frequency via the local area network (LAN). The data shall only be deleted from the TVM when receipt acknowledgement is received from the station controller of authenticated, error free and verified transmission.

2.4.13.2.1.25 The TVM shall generate fault alarms to line replaceable unit (LRU) level.

2.4.13.2.1.26 In addition to fault alarms, the TVM will generate early warning alarms of low stock levels for printer paper, cash storage devices.

2.4.13.2.1.27 The TVM shall generate audible intrusion alarms in the event of unauthorised access to maintenance and service doors as well as transferring a signal to the TMC security terminal.

2.4.13.2.1.28 Internal access to the TVM shall require the use of a biometric reader, for maintenance and operational purposes.

2.4.13.2.1.29 The successful use of the biometric reader will suppress the intrusion alarm.

2.4.13.2.1.30 Fault, event and stock level alarms shall be passed on to the station controller and will be displayed on the graphical user interface (GUI) over the station LAN.

2.4.13.2.1.31 The TVM shall store event data in the event of LAN failure until such time as communication is restored.

2.4.13.2.1.32 Notwithstanding that the TVM will be provided with a station standby power supply, the TVM shall have an uninterruptible power supply, which in the event of complete power failure, will support the completion of the current transaction before immediately beginning a safe shut-down procedure automatically.

2.4.13.2.1.33 In the event of a complete power failure, the TVM is to recover full functionality automatically once power is restored.

2.4.13.2.1.34 TVM's shall be safe for use for the intended purpose, by inter alia children, the frail, pregnant and the elderly.

2.4.13.2.1.35 The TVM's shall have on-screen as well as fixed signage and decals with instructions for use as well as indicating the location of physical interfaces such as slots, keypads, collection trays, etc. using universally recognised symbols.

2.4.13.2.1.36 The above signage and decals shall be in compliance with the PLM corporate identity specifications but will in any event require approval prior to implementation.

2.4.13.2.1.37 TVM status and mode shall be controllable from a station control computer GUI or the Back Office over the LAN/WAN including the following;

a. Closed for use

b. Open for use

2.4.13.2.1.38 The TVM touch screen shall display the above status to the public.

2.4.13.2.1.39 The control computer is to graphically represent the station TVM array foot print (if multiple TVM's are installed) and its orientation within the station concourse, particularly the paid and unpaid sides of the barrier.

2.4.13.2.1.40 The TVM shall retain full transactional functionality in off-line mode.

2.4.13.2.1.41 The TVM shall be designed with a view to low maintenance requirements.

2.4.13.2.2 **Performance requirements**

2.4.13.2.2.1 The maximum transaction time for any complete transaction shall not exceed 40 seconds.

2.4.13.2.2.2 The bank note acceptance device will allow the escrow of up to 15 bank notes in a single transaction.

2.4.13.2.2.3 The bank note box will have a storage capacity of at least 1000 bills.

2.4.13.2.2.4 Replacement of any LRU shall take no longer than 60 minutes.

2.4.13.2.2.5 The TVM processor shall be capable of retaining at least 48 hours of transaction data, including all events.

2.4.13.2.2.6 The TVM processor shall possess sufficient memory to accommodate at minimum of 5,000 blacklisted cards, which when depleted will delete records on a first in first out basis.

2.4.13.2.2.7 Blacklisted cards shall otherwise be removed under the following conditions;

a. When the card is captured from the passenger

b. When a lost card is retrieved

c. When a period (configurable parameter) of time has passed

2.4.13.2.2.8 The TVM should have a minimum useful life span of 10 years.

2.4.13.2.2.9 The TVM shall have a maximum start up cycle time from power off state of 5 minutes.

2.4.13.2.2.10 The TVM and any of its components shall comply with electromagnetic compatibility standards.

2.4.13.2.3 **Physical requirements**

2.4.13.2.3.1 The TVM shall be designed to combat vandalism and theft as well as the ingress of vermin.

2.4.13.2.3.2 The TVM shall be constructed from vandal resistant materials with due consideration to the corrosive and humid environment.

2.4.13.2.3.3 Flammable materials shall be flame resistant and retardant and shall not produce harmful or toxic fumes or gases in the event of a fire.

2.4.13.2.3.4 Access panels and doors shall be secured by robust locking mechanisms with unit specific keys in addition to the biometric access reader.

2.4.13.2.3.5 The TVM's shall be minimum IP 32 rating and adequately ventilated to maintain an operating temperature within product specific limits without compromising security.

2.4.13.2.3.6 The TVM shall be designed according to universal ergonomic standards, including the positioning of passenger displays and prompts and maintenance activities.

2.4.13.2.3.7 The GUI must be visible under any lighting conditions.

2.4.13.2.3.8 The TVM annunciations must be audible to the user during peak passenger traffic conditions within the station.

2.4.13.2.3.9 Notwithstanding the ergonomic requirements, the overall dimensions of the TVM may not exceed;

a. Height – 1,800 mm
b. Width – 900 mm
c. Depth – 700 mm

2.4.13.2.3.10 The TVM shall not exceed 600kg when fully stocked (including coin handling).

2.4.13.2.4 **Interface requirements**

2.4.13.2.4.1 The TVM shall accept 220-240V AC power from a dedicated IFMS distribution board (DB) located in the station equipment room, to be provided by others.

2.4.13.2.4.2 The Contractor shall supply and install the cabling between the TVM/s and the power DB as well as an appropriate circuit breaker and surge protection per TVM.

2.4.13.2.4.3 The Contractor shall be responsible for providing the necessary transformers and power supplies required for powering the TVM's.

2.4.13.2.4.4 The TVM shall be earthed via a common station equipment earth bar (provided by others) located in the station equipment room.

2.4.13.2.4.5 The TVM shall interface with the station LAN via a network switch located in the station equipment room, with a port provided (by others) for each TVM.

2.4.13.2.4.6 The Contractor will supply and install the network cables between the TVM and the network switch.

2.4.13.2.4.7 The Contractor is required to provide the GSM modem and associated cabling, which will be located at an agreed position within the station equipment room.

2.4.13.2.4.8 In the event that GSM coverage is inadequate within the station equipment room, the Contractor will be responsible to provide a suitable external antenna with mounting bracket and associated cabling.

2.4.13.2.4.9 The Contractor will be responsible for performing GSM coverage tests as soon as the station superstructure is complete so as to establish a suitable antenna mounting point and to provide the building contractor with cabling containment requirements in order to minimise potential rework

2.4.13.2.4.10 The TVM will be controllable via a GUI on the TOM from the TMC or an authenticated remote access terminal as required

2.4.13.2.4.11 The TVM mode, status, stock level, condition and alarms are to be displayed on the station controller GUI.

2.4.13.2.4.12 Cable containment will be provided between the TVM and the power, earth and data by others, to the Contractor's requirement.

2.4.13.3 **Bus on-board Plant (BOP)**

2.4.13.3.1 The BOP shall provide an unattended ticket verification facility to the travellers on Busses and Midi-busses at Feeder and Feeder Extension stops and Trunk stations.

2.4.13.3.2 The BOP ticket verification function shall provide for the processing of the following fare media;

a. PLM fare media cards which is EMV compliant, Mastercard certified and NDoT certified

b. Other EMV and NDOT R511 compliant transit cards

c. MasterCard PayPass and Visa PayWave payment cards

2.4.13.3.3 The BOP must provide for the following fare rule options;

a. Flat fare per route (for phase 1A)

The route selection shall either be made automatically as part of the bus driver ‘on duty’ tag in, or manually by the driver entering the route ID via a user interface.

2.4.13.3.4 The BOP must be able to provide for other fare rules without the need to replace any hardware. Optional fare rules include inter alia the following;

a. Distance based

b. Zone based

2.4.13.3.5 Passenger Counting (Optional)

2.4.13.3.6 The Tenderer is to provide the costing for the implementation of a passenger counting device as specified below to detect fare evasion. The implementation of the passenger counting device will be at the sole discretion of the Employer. The BOP shall provide for the counting of passengers boarding and alighting the bus. The counting shall be stored after each stop in a record containing *inter alia* location (GPS coordinates), date and time, total passengers on bus, boarding count and alighting count.

2.4.13.3.7 The BOP shall have dual network connection functionality. A Wi-Fi station which shall automatically make a network connection to the Depot/station Wi-Fi Access Point when in range and a mobile connection (3G). The functionality must be configurable to allow the usage of either of the two or both at the same time where one can be set as a failover.

2.4.13.3.8 With a flat fare option implementation, only checking-in of boarding passengers shall be required.

2.4.13.3.9 The BOP shall include a passenger information display which will provide transaction information to the passenger during the transaction process, which will include confirmation of a successful/failed transaction and remaining transit value.

2.4.13.3.10 The use of EMV transit cards for travel shall be in an offline mode.

2.4.13.3.11 The BOP processing unit shall capture and store all transaction and event data required for back office reconciliation and device management.

2.4.13.3.12 The BOP processing unit shall store the transaction data locally and transfer the data to the Depot controller when within range of the Depot WiFi Access Point or if configured over the 3G mobile network. The transfer of stored transaction shall be a background process which shall not interfere with the processing of Tap in events. The transfer of stored transactions shall be continuous or set to be transferred at regular intervals that are configurable. The data shall only be deleted from the BOE when receipt acknowledgement is received from the Depot controller or CS that transaction data was received error free and authenticated from an authorised device.

2.4.13.3.13 The BOP shall be able to receive software updates and upgrades, downloaded to individual or all BOP's via the Depot Wi-Fi network.

2.4.13.3.14 The BOP shall be able to receive and store Equipment Operational Data (EOD) such as Fare rates and fare rules, downloaded to individual or all BOP's via the Depot Wi-Fi network.

2.4.13.3.15 The BOP shall be able to store and process at least two sets of EOD's, one current and one for future activation.

2.4.13.3.16 The BOP shall be able to implement the valid EOD. Expired EOD's may be removed.

2.4.13.3.17 The BOP shall generate fault alarms to line replaceable unit (LRU) level.

2.4.13.3.18 Fault and event alarms shall be stored locally and passed on to the Depot controller when connected to the communications network.

2.4.13.3.19 In the event that communication cannot be restored due to a fault on the BOE, it shall be possible to recover the transactions, fault and event logs from non-volatile memory.

2.4.13.3.20 The above shall include the completion of data transfer in the event that the bus is powered down in the Depot before data transfer is complete.

2.4.13.3.21 In the event of a complete power failure, the BOP is to recover full functionality automatically once power is restored.

2.4.13.3.22 The BOP shall be provided with a nominal 12Vdc or 24V dc power supply, from the bus power distribution unit and a termination point to be provided by others.

2.4.13.3.23 The Bus power supply may vary between 0Vdc – 35Vdc. All BOP's shall have the capability to withstand such variances.

2.4.13.3.24 Notwithstanding that the BOP will be provided with 12Vdc and 24Vdc from the bus power distribution unit, the BOP shall have an uninterruptible power supply unit typically in the form of a battery backup, which in the event of complete power failure, will support the completion of the current transaction before beginning a safe shut-down procedure automatically.

2.4.13.3.25 The Contractor shall supply and install the cabling between the BOP and the power termination point as well as an appropriate power rail to accommodate all components of the BOP requiring power.

2.4.13.3.26 The BOP power ground rail shall be earthed at the closest fastening point on the chassis or a point identified by the bus manufacturer.

2.4.13.3.27 The Contractor shall provide a power budget for all BOP devices.

2.4.13.3.28 The BOP shall be provided with an on-board battery backed up real time clock (RTC), which will not lose count under power loss conditions. The RTC shall be updated (synchronised) on a regular basis (minimum once a day) with a centralised time server (provided by others).

2.4.13.3.29 All transactions shall use the RTC's data as reference. The data that shall be provided by the RTC includes year, month, day, hour, minute, seconds and tenth of a second.

2.4.13.3.30 The BOP shall be provided with a system check at start up and the reporting of errors via a GUI.

2.4.13.3.31 Part of the above check shall include verifying that the last RTC synchronisation is not older than 24 hours, in which event synchronisation must occur prior to clearing the error message and processing any transactions.

2.4.13.3.32 The maximum transaction time (contactless Fare Media transaction) for any complete transaction shall not exceed 500 milliseconds per product or EMV purse transaction.

2.4.13.3.33 Replacement of any LRU shall take no longer than 30 minutes.

2.4.13.3.34 The BOP processor shall be capable of retaining at least 60 operational hours of transaction data, including all events.

2.4.13.3.35 The BOP processor shall possess sufficient memory to accommodate 5000 blacklisted/blocked cards, which when used will delete records on a first in first out basis.

2.4.13.3.36 Blacklisted/blocked cards shall otherwise be removed when an updated list is received from the Depot server or CS.

2.4.13.3.37 The BOP should have a minimum useful life span of 5 years.

2.4.13.3.38 The BOP shall be mounted in such a position as to allow easy flow of passengers.

2.4.13.3.39 The BOP shall be secured and shall not become loose or damaged due to vibrations on the bus frame or structure.

2.4.13.3.40 The BOP shall not have any sharp or hard corners that might endanger passengers.

2.4.13.3.41 The BOP shall be protected with over current devices which shall not have a rated value of more than 2.1 the maximum operating current supply.

2.4.13.3.42 BOP cables shall have higher current carrying capability than the current protection provided and the insulation shall not deform, change characteristics or burn under current fault condition.

2.4.13.3.43 All BOP connectors shall be such that it can be secured with fasteners or self-locking mechanisms (Screw on, bayonets or friction locking). Non locking push-in connectors are not acceptable.

2.4.13.3.44 The BOP shall be designed to combat vandalism, theft, vibration and high intensity of use.

2.4.13.3.45 Particular care must be taken in the design of equipment and mountings to cater for continuous vibration during operation.

2.4.13.3.46 The BOP shall be constructed from vandal resistant materials with due consideration to corrosive and humid environment and high storage and operational temperatures.

2.4.13.3.47 Materials used shall be flame resistant and retardant and shall not produce harmful or toxic fumes or gases in the event of a fire.

2.4.13.3.48 All cables and cable entries shall be hidden from unauthorised access; it shall not present any danger to driver or passenger.

2.4.13.3.49 All cables shall be stranded and not solid core.

2.4.13.3.50 The BOP shall be designed according to universal ergonomic standards, including the positioning of passenger displays and prompts and maintenance activities.

2.4.13.3.51 The BOP must be visible under general travelling lighting conditions. Displays shall be of a matt finish to prevent glare.

2.4.13.3.52 The Contractor will supply and install the cables between the BOP and other related equipment.

2.4.13.3.53 If the system design includes the provision of GSM/GPRS infrastructure, the Contractor is required to supply, install, integrate and maintain the GSM/GPRS modem, associated plant and cabling, which will be located at an agreed position on the Feeder bus or Midi-bus. The GSM shall provide for and interface to the AFCS CS .

Where parts of the network may include the PLM Network, the Contractor shall provide requirements and cooperate with the Employer for the Network implementation.

2.4.13.3.54 Cable containment will be provided between the BOP and the power, earth and data termination points by others, to the Contractor's requirements.

2.4.13.3.55 The Contractor shall supply, install, integrate and maintain a Wi-Fi station on the applicable buses to connect to the Wi-Fi Access Points at the depots.

2.4.13.3.56 The Contractor shall ensure the proper and efficient connection on the Wi-Fi connection by selecting unoccupied channels.

2.4.13.4 **Portable Verification Unit (PVU)**

2.4.13.4.1 The PVU will possess its own rechargeable power source in a form of a docking station which shall be located at the depot and be connected to the AFCS network.

2.4.13.4.2 The PVU shall read the fare media and display the following *inter alia*, on a display screen;

2.4.13.4.2.1 Card Number

2.4.13.4.2.2 Card status

2.4.13.4.2.3 Last transaction details

2.4.13.4.2.4 Type of product or value

2.4.13.4.2.5 Remaining value / trips

2.4.13.4.2.6 Trip status

2.4.13.4.3 The PVU will have a fare shortfall calculation function based on destination input by the operator.

2.4.13.4.4 The PVU will have an alarm indicating when a Trip is not in progress

2.4.13.4.5 The display screen shall be visible in poor lighting conditions.

2.4.13.4.6 The PVU shall download black list updates wirelessly from the PLM network when within coverage.

2.4.13.4.7 All communication between PVU's and SCS shall be such that no files are deleted or removed until the transfer of files have been authenticated and verified to be correct with no transmission errors.

2.4.13.4.8 The PVU shall be able to receive software updates and upgrades downloaded to individual or all equipment via from the central server.

2.4.13.4.9 Software updates to the PVU shall only be able when logged in as Administrator.

2.4.13.4.10 PVU shall be provided with theft prevention technology to ensure that devices not used in the system are disabled for any use.

2.4.13.4.11 The PVU shall store event / transaction data for later uploading to the central server and continue to operate in a standalone mode in the absence of network connectivity to the AFCS central server.

2.4.13.4.12 The PVU shall upload transactions to the central server wirelessly when within network coverage.

2.4.13.4.13 In the event that the network connection is interrupted during the download, the process shall begin again when connectivity is restored.

2.4.13.4.14 The PVU shall provide a visual and audio alarm in the event of low power.

2.4.13.4.15 The PVU shall automatically and safely shut down in the event of low power.

2.4.13.4.16 The PVU shall be dock able and supplied with a charging station.

2.4.13.4.17 The PVU shall automatically reboot at a configurable time (after hours) and frequency.

2.4.13.4.18 The PVU shall provide for user Log in and Log Out.

2.4.13.4.19 All Transactions shall be logged with a reference to the current user.

2.4.13.4.20 The PVU battery power supply shall be capable of supporting use for a period of the operational hours allowing for one replacement of a back-up battery .

2.4.13.4.21 The PVU may be supplied with software that control the power usage of antennas, display and other peripherals under user selectable conditions to reach the operating hours target.

2.4.13.4.22 Replacement of any LRU shall take no longer than 5 minutes.

2.4.13.4.23 The PVU shall be capable of retaining at least 96 hours of transaction data, including all events.

2.4.13.4.24 The PVU processor shall possess sufficient memory to accommodate 5000 blacklisted cards.

2.4.13.4.25 The PVU should have a minimum useful life span of 5 years.

2.4.13.4.26 The PVU and Batteries shall be fully charged within a maximum time duration not exceeding the non-operating hours.

2.4.13.4.27 Battery capacity shall be monitored and replaced when charge cycle time exceeds the non-operating hours period.

2.4.13.4.28 The PVU shall be held in one hand.

2.4.13.4.29 The PVU shall be designed to combat vandalism, theft, dropping and high intensity of use.

2.4.13.4.30 The PVU shall be constructed from vandal resistant materials with due consideration to the corrosive and humid environment.

2.4.13.4.31 The PVU shall be provided with a holster that can be worn around the neck when the PVU is not in use.

2.4.13.4.32 The PVU shall be designed according to universal ergonomic standards, including the GUI displays and prompts.

2.4.13.4.33 The GUI must be visible under low lighting conditions.

2.4.13.4.34 The PVU will connect to the Data Centre by means of a mobile network. It is the Contractors responsibility to supply, install and maintain all plant to implement and integrate the PVU successfully in to the AFCS, this might include *inter alia;*

a. SIM card registration

b. APN registration

c. Mobile data usage

d. Etc

2.4.13.4.35 The PVU and Batteries shall be charged in PVU docking station

2.4.13.4.36 The PVU docking station shall interface with the Depot LAN.

2.4.13.4.37 The contractor shall supply, install and maintain the cables of the PVU docking stations.

2.4.13.4.38 Cable containment will be provided between the PVU docking station and the power, earth and data termination points by others, to the Contractor's specification.

PART B: PTMS
Part C3: Statement of Work

PART B FOR THE DESIGN, SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND OPERATIONAL SUPPORT OF THE POLOKWANE INTEGRATED RAPID PUBLIC TRANSPORT SYSTEM (IRPTS) PUBLIC TRANSPORT MANAGEMENT SYSTEM (PTMS) FOR THREE YEARS

TECHNICAL SPECIFICATION

CONTENTS

List of Acronyms

ADSL	Asymmetric Digital Subscriber Line
AFC	Automatic Fare Collection
AP	Access Point
APC	Automatic Passenger Counter
API	Application Programming Interfaces
PTMS	Public Transport Management System
ASA	Automatic Stop Annunciation
AVL	Automatic Vehicle Location
BI	Reporting System
BOC	Bus Operating Company
BoQ	Bill of Quantities
BRT	Bus Rapid Transit
CAN	Controller Area Network
CBD	Central Business District
CBP	Current Best Practice
CCTV	Closed Circuit Television
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CoO	Concept of Operations
COTS	Commercial Of The Shelf
CSA	Canadian Standards Association
DB	Database
DSRC	Dedicated Short Range Communications
DVMS	Digital Video Management System
ECCM	Essential Care and Condition Monitoring
EMI	Electromagnetic Interference
EMS	Emergency Medical Services
ESRI	Environmental Systems Research Institute
ETSI	European Telecommunications Standards Institute
FAT	Functional Acceptance Test
FO	Fibre Optic
FOC	Fibre Optic Cable
FTM	Fixed Time Maintenance
GIS	Geographic Information System
GPS	Global Positioning System
GSM	Global System for Mobile Communications
GTFS	General (Google) Transit Feed Specification: defines a common format for public transportation schedules along with geographic data.
HW	Hardware
ICASA	Independent Communications Authority of South Africa
ICT	Information and Communications Technology
ID	Identification
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
iLO	Integrated Light Out
IP	Internet Protocol

IP	Ingress Protection
IRPTN	Integrated Rapid Public Transport Network
IRPTS	Integrated Rapid Public Transport System
ISO	International Organisation for Standardisation
IT	Information Technology
ITS	Intelligent Transport Systems
KPI	Key Performance Indicator
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LOM	Lights Out Management
LTE	Long Term Evolution
MDT	Main Driver Terminal
MS	Microsoft
MTBF	Mean Time Between Failure
MWR	Mobile Wireless Router
NAS	Network Attached Storage
NOPTIS	Nordic Public Transport Interface Standards
NTCIP	National Transportation Communications for ITS Protocol
NVR	Network Video Recorder
OBU	On-Board Unit
ODBC	Open Database Connectivity
OEM	Original Equipment Manufacturer
PA	Public Address
PC	Personal Computer
PDA	Personal Digital Assistant
PID	Passenger Information Display
PIS	Passenger Information System
PM	Preventive Maintenance
POE	Power Over Ethernet
PPE	Personal Protective Equipment
PRG	Priority Request Generator
PRS	Priority Request Server
PT	Public Transport
PTMS	Public Transport Management System
PTZ	Pan Tilt Zoom
QA	Quality Assurance
RAID	Redundant Array of Independent Discs
RAN	Radio Access Network
RF	Radio Frequency
RFI	Radio Frequency Interference
RTIG	Real Time Information Group
RTU	Remote Terminal Unit
SABS	South African Bureau of Standards
CMS	Schedule Adherence and Control
SAE	Society of Automotive Engineers

SAN	Storage Area Network
SANS	South African National Standard
SAPS	South African Police Services
SAT	System Acceptance Test
SIM	Subscriber Identity Module
SIRI	Service Interface for Real Time Information: A European interface standard for exchanging information about the planned, current or projected performance of real-time public transport operations between different computer systems.
SIT	System Integration Test
SMS	Short Message Service
SOAP	Simple Object Access Protocol
SOP	Standard Operating Procedure
SW	Software
TCIP	Transit Communications Interface Profiles
TETRA	Terrestrial Trunked Radio
TFT	Thin Film Transistor
TMC	Transport Management Centre
TMIS	Traffic Management Information System
TOC	Taking Over Certificate
TSP	Traffic Signal Priority
UMTS	Universal Mobile Telecommunications System
UPS	Uninterruptable Power Supply
USSD	Unstructured Supplementary Service Data
UTC	Urban Traffic Control
VCM	Vehicle Configuration Manager
VDM	Vehicle Docking Manager
VDV	Verband Deutscher Verkehrsunternehmen
VLAN	Virtual LAN
VMS	Variable Message Sign
VOC	Vehicle Operating Company
VoIP	Voice over IP
VPN	Virtual Private Network
VSS	Video Surveillance System
VUM	Video Upload Management
WAN	Wide Area Network
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
XHTML	eXtensible Hyper Text Markup Language
XML	Extensible Markup Language

1 Description of works

1.1 *Introduction*

The Polokwane Integrated Rapid Public Transport System (IRPTS) was approved by the Polokwane Local Municipality in 2013. The system will be known as *"Leeto la Polokwane"*, which means the Journey of Polokwane, and forms part of the Technical Operational Plan of the City.

As part of the Polokwane Local Municipality's (PLM) Integrated Rapid Public Transport Network (IRPTN) the Bus Rapid Transit (BRT) Public Transport Management System (PTMS) will be implemented.

The scope of work is given in this section of the tender document (Part C3) and includes a three (3) year contract for the design, supply, installation, commissioning, maintenance and operational support of all BRT PTMS systems and sub-systems forming part of the following high level components:

1. Transport Management Centre (TMC)
2. Vehicles (21 Buses (12m) and 15 Midi-Buses (9m))
3. Trunk stations
4. Bus depot and layover
5. Communications network (only Mobile APN)

According to the Technical Operational Plan of Polokwane Local Municipality the IRPTS will be rolled out in Phases. The objective is to make the system affordable and financially sustainable for the City while enhancing the integrated public transport network and ensuring all operators are included, hereby minimizing competitive behaviour.

The phases of the City of Polokwane BRT include several trunk routes as summarised below in Table 1. The grey highlighted phase 1A forms part of this tender scope of work.

	Phase 1A	Phase 1B	Phase 2
Trunk Stations		T2	
	T7	T1A	T1
		T3	2A/2B
		T4	3A/3B
		T5	
		T6	
TOTAL	**1**	**5**	**3**

	Route ID	Qty Stops	Route ID	Qty Stops	Route ID	Qty Stops
Trunk Extension and Feeder Routes	F2A	13	F1	15	TE8	6
	F2B	18	F3	11	TE9	6
	F4	13	F5	8	TE10	8
	TE5	7	F6a	13	TE11	
	TE6	10	F6b	11	TE12	
	TE7	7	F6c	11		
			DS1	2		
			TE1	7		
			TE2	8		
			TE3	5		
			TE4	7		
TOTAL	**6**	**68**	**11**	**98**	**5**	**20**

	Feeder	Trunk	Feeder	Trunk	Feeder	Trunk
12m Buses		21		33		84
9m Midi-Buses	15		20		20	
Mini-Bus Taxi	TBD		TBD		TBD	
TOTAL	**39**		**53**		**104**	

1. **Table 1: Phases of the envisaged BRT for Polokwane**

Please refer to Part C4 SITE INFORMATION for a detailed geographical representation of phase 1A.

Please take note that City of Polokwane reserves the rights to continue, or not to continue with the phases after Phase 1A.

This PTMS tender will focus on the Leeto la Polokwane for Phase 1A, which are schematically shown in Figure 1, the golden routes.

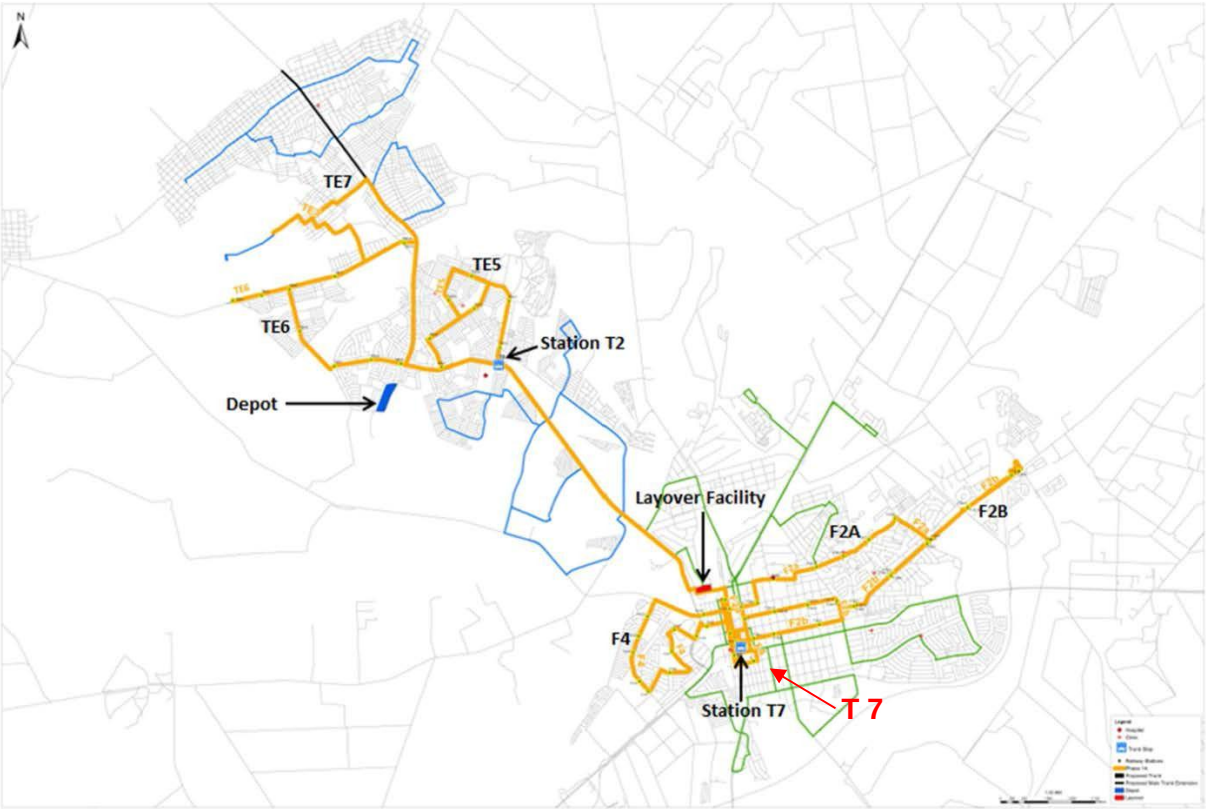


Figure 1: Overview of Leeto la Polokwane Phase 1A

Phase 1A

This phase is aimed at establishing the foundation of the system and therefore includes the construction of the TMC, Depot and the trunk corridor between stations T2 and T7. For Phase 1A, only Stations T2 and T7 will be build. Three trunk extension (TE5, TE6 & TE7) and feeder routes (F2A, F2B & F4) are to be serviced by 21 Trunk Buses and 15 Midi-Buses respectively, with a total of 24 stops along the trunk extensions. Polokwane Local Municipality has the right to confirm the number of stations.

Phase 1B

This phase includes the further development of the service along the trunk corridor by the construction of a further 6 trunk stations (T1A, T3, T4, T5 & T6) as well as the addition of a further 4 trunk extensions (TE1, TE2, TE3 & TE4) and 4 feeder routes (F1, F3, F5 & F6), with

an additional 99 feeder stops. The bus fleet will be increased to cover the extended services by an additional 33 Trunk Buses and about 20 Midi-buses.

Phase 2

This phase includes the extension of the trunk corridor to Seshego and the addition of a trunk station (T1) as well as an additional 4 trunk extensions (TE8, TE9 & TE10) with an additional 31 stops. The bus fleet will be increased to cover the extended services by the addition of 84 trunk buses.

Ownership Model

Polokwane is proposing an industry transition process whereby the four associations does not function alone but will be merged under one company. The four associations will hold the shares of the new company. The new company proposed will be VOC – Vehicle Operating Company.

The difference between the conventional BRT implementation and the Proposed Polokwane IRPTS is the ownership of the operating company model. The VOC will consist of the 4 taxi associations that will be the contracting party and will be responsible for all contractual public transport services for the transport authority.

1.2 Purpose of the project

The purpose of the *Leeto la Polokwane* IRPTS is to provide reliable, efficient, safe and affordable public transport encouraging the entire spectrum of South African commuters to use the system.

The purpose of the PTMS is to support the management of the service and to provide Key Performance Indicator (KPI) data for monitoring service providers. The system shall be capable of providing real time monitoring, schedule management as well as flexible and accurate reporting capabilities for the operators as well as the Vehicle Operating Company (VOC). In addition the system shall provide accurate and easily accessible passenger information to the travelling public.

The Contractor shall implement, maintain under a service level agreement (SLA) and provide operational support such that the system will consistently out-perform Key Performance Indicators (KPI's).

ITS systems (Figure 2) are to be installed through this contract and serve an integral and crucial purpose in the overall operations and management of the BRT systems. Systems integration refers to linking of sub-systems functionally. Shared infrastructure refers to linking of systems physically, or for one entity (contractor) to utilise the infrastructure installed by another.

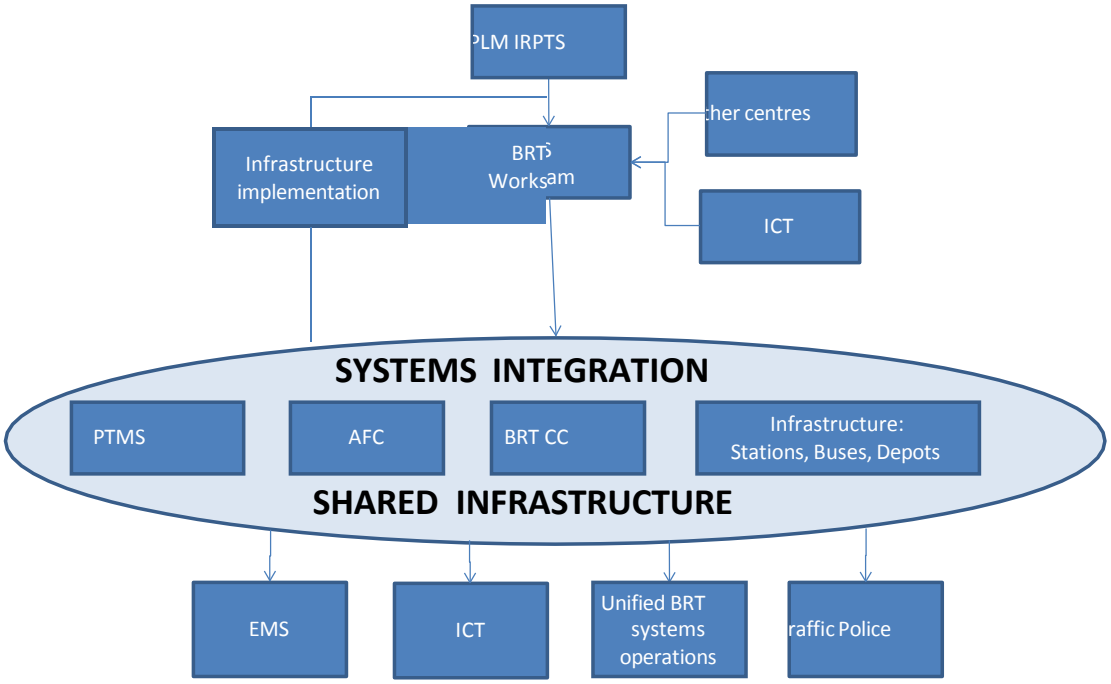


Figure 2: ITS systems, Stake Holders and Systems Integrations

Once implemented, the BRT operations will be managed from the TMC from where inputs from the transport system, including field devices (buses, stations etc.) will be monitored and measured against expected performance indicators for e.g. schedule adherence. According to Standard Operating Procedures (SOP's) action can then be taken by means of advice, control and intervention.

PTMS Process Overview

The PTMS process flow can be viewed as a closed loop feedback system, with the view of optimising system performance. This overview is shown in the Figure 3 below.

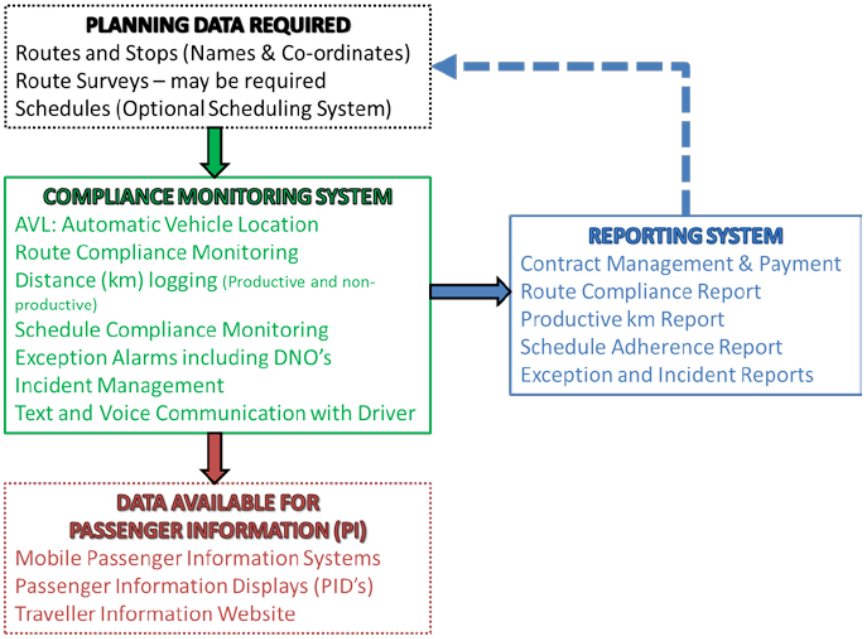


Figure 3: PTMS Process Flow Overview

Each of the processes above impact system operations and performance and must be aligned with the other processes to ensure coherent system performance. Planning provides an input to the Compliance Monitoring System. Information is then exchanged between the Compliance Monitoring System and Passenger Information Systems (PI). Reports can be generated to evaluate system performance against objectives upon which existing planning can be adjusted or new planning initiated.

1.3 Overview of the works

The PTMS works are divided into five main elements:

1. Planning
2. Monitoring and Management
3. Reporting
4. Passenger Information
5. Safety and Security

Each of the elements will be described in brief next and list the various items included in this PTMS Tender.

1.3.1 PTMS Planning elements

Typically the City of Polokwane will be responsible to advise on many of the planning data, as they will dictate bus routes, stops and schedules. It is advised that Polokwane consider the creation of a systems planning group within Polokwane who will be closely involved in the implementation of the scheduling and planning. Ideally Polokwane must have a designated systems scheduler available from PTMS Contract inception and throughout BRT operations.

The PTMS system is designed to receive basic planning data, in order for compliance monitoring to compare real-time data with planned data. This will allow determination of schedule adherence. All planning data must be recorded in a single centralised database.

The schedule and planning system will be included in the PTMS specification as a rate only item. Scheduling will be considered as a source of data and can be provided in a number of formats, for e.g. xls, csv, SIRI or GTFS.

The scheduling can be done as part of fleet operations or provided as a service by a Consultant.

The compliance monitoring systems will be a user of the data and must provide for import of the planning data in various formats, e.g. xls, csv, SIRI or GTFS.

The schedule and planning system may or may not be a specialised software tool developed for this purpose. It is envisaged that to begin with a manual or semi-automated process using third party applications such as MS excel and MS access database (or similar) should be sufficient for Polokwane. If these applications are used a Visual Basic (VB) script can be written to provide a basic structure and interface. As the system grows the schedule and planning component can migrate to a more advanced system.

The benefit of the PTMS model is that schedules and time tables of traditional bus operating companies can be largely adapted to fit the new system. Although training will be required to operate this new schedule and planning system, the methods are simpler to learn compared to a specialised knowledge required for complex software package.

Define routes and stops

Polokwane Local Municipality will be responsible for the route definitions and stop definitions. As part of systems planning stops and bus routes are identified. This information, including stop names, coordinates and distance between stops, route direction and name must be entered into the planning system. Differentiation is required between productive and unproductive links, e.g. depot runs are normally considered as unproductive mileage. Various combinations of routes, productive and unproductive must be grouped together to generate unique blocks to be serviced every day. Polokwane Local Municipality must be closely involved and advise on the requirements so that all necessary data can be captured.

Route surveys

Route surveys are be required to capture accurate data. This involves driving of the planned route to determine stopping point coordinates and driving time between stops under various conditions such as peak periods, week days and weekend days. This will be the responsibility of Polokwane Local Municipality.

Schedules & Timetables

Schedules are normally associated with different day types, such as normal week days, Saturday, Sundays and public holidays. Travel times must be determined and recorded, including times between each stopping point and to/from the depot as required. Stopping times at every stopping point are also required. Travels times will be affected by various factors such as buses operating in dedicated bus lanes, mixed traffic, AM and PM peak times. Polokwane Local Municipality will take ownership and must advise on the requirements so that all necessary data can be captured. In this Tender the contractor is asked to provide scheduling support and advice.

Vehicle Scheduling

A certain number of buses will be required to service all the stops in order to keep to the planned schedules. Every bus is therefore linked to a specific route and must depart from every stop at a predefined time based on the schedule. Layover and layover times are also specified and minimum and maximum layovers can be defined. As optional the system may include basic analysis to warn of possible scheduling errors, for e.g. stop skip or very short departure times between stops, more than one bus on the same block, etc. Vehicle scheduling functionality is used to assign the appropriate number and type (size) of buses in order to keep to the desired schedule adherence times. Depending on the number of routes and fleet size this can be performed manually on a third party application such as MS excel. For larger fleets, >100 buses a specialised software package may be required. As indicated before, considering the number of routes, the preferred option for Polokwane is to keep the solution as cost effective as possible, e.g. MS Excel based. Contractor to provide advice and support for Vehicle scheduling.

Schedule Publication

Schedule publication provides functionality to create a certain layout of timetables for publication purposes. These timetables are normally displayed at stops, can be handed out or distributed electronically, typically as a pdf file. Polokwane Corporate Identify (CI) and marketing must advise on the layout, colours, logo, structure etc. to be used. Contractor to provide advice and support for Schedule publication.

Driver Duty Scheduling

Driver duty scheduling involve creation of shifts, shift types, assignment of driver duties, duties associated with day types and a simulation to check if driver duties fit vehicle schedules. With phase 1A only having 21 buses and 15 Midi-buses, this function can be done using MS Excel. Contractor to provide support and guidance to Polokwane Local Municipality. Contractor to provide motivation if specialized software are offered.

Vehicle and driver dispatching

This functionality assist in creating driver rosters and dispatch sheets which can be used to show specific runs with start and end locations and times. Rosters shows driver work times with route allocations. Contractor to provide support and guidance to Polokwane Local Municipality.

1.3.2 PTMS Compliance Monitoring and Management

Compliance monitoring will be done from the Polokwane TMC, located at Peter Mokaba stadium. Operators, also known as bus controllers, monitor the live tracking of every bus. The controllers are able to communicate with bus drivers and with the Vehicle Operating Company (VOC). Controllers, together with the controller supervisor can intervene by instructing a bus driver to slow down, inform him of an incident along the route, and instruct him to change his route, or in agreement with the BOC dispatch another bus.

Controllers can also update passenger information to inform commuters of incidents or delayed departure times. In summary the PTMS system is designed for bus controllers to have all required real-time information available so that informed decisions can be taken about any required intervention.

Compliance monitoring typically involve a specialised system with uniform interface including different map and incident displays and an interface to log incidents and communicate with bus drivers.

Automatic Vehicle Location (AVL)

Vehicle tracking or AVL is possible via GPS receiver installed on every bus and feeder midi-buses. The accuracy of the GPS receiver may be augmented by additional parameters such as odometer input and dead-reckoning algorithms, but the primary method of location is performed by GPS.

The real-time bus locations are then sent to the control centre via the cellular network. This should be done via a dedicated Access Point Name (APN) connection with sufficient bandwidth. The APN ensures a high quality of service and high levels of security. The Contractor to provide a solution for AVL.

Real time map display

The back-end of the system provides a user interface with map display to show the real time geographic location of every bus. This should also show current schedule adherence per bus. The Contractor to provide a solution for real time map display.

Monitor distance travelled

The distance travelled per bus is shown in the system. This is not shown in real-time, but will be included in the reporting. Separation has to be made between productive vs unproductive kms. Monitor-distance travelled forms part of the scope of this tender.

2. **Monitor Did Not Operate (DNO)**

DNO events will be identified where the BOC fails to send a vehicle to service a particular route, or miss a trip. Monitor did not operate events forms part of the scope of this tender.

Driver communications

Voice communications is possible from the TMC. Voice calls can only be initiate by the control centre. The driver can send a request to the TMC via a Request To Talk (RTT) button. Through voice the control centre can advise drivers of any required action and/or incidents. Driver communications for the 21 buses and 15 Midi-buses forms part of the scope of this tender.

Station communications

Station communications provides the TMC with a link to each station to call and communicate directly with station personnel. Station communications forms part of the scope of this PTMS tender. This will typically be an IPhone installed at the station.

Schedule adherence monitoring

Schedule adherence monitoring is used to compare planned data with real time data. This comparison is available in real-time on the map displays and also as part of the reporting. The contractor to provide a schedule adherence monitoring functionality to Polokwane Local Municipality.

Strip diagram display

Visualisation of bus and stopping point locations presented in a strip diagram for easy reference. This typically also show current schedule adherence per bus. Contractor to provide solution to Polokwane Local Municipality.

Incident monitoring

An incident table will show active incidents to which a bus controller must respond. Typical incidents related to PTMS include RTT and driver panic button events. Contractor to provide solution to Polokwane Local Municipality.

Vehicle Configuration Manager (VCM)

Vehicle Configuration manager provides the TMC operators to update the ODU on the buses with the latest data via the GSM APN network. Contractor to provide a solution.

1.3.3 PTMS Reporting System

All planning and real time system data are logged in one or more databases. Various combinations of reports can be drawn from both sets of data. It is critical that both Polokwane Local Municipality and the VOC must sign-off on report detail since this will be used to manage the Contract between Polokwane and the BOC.

Reports are used to manage the SLA agreements. Reports are used to help with planning and decision making. The reporting system will have no advanced Business Intelligence functionality such as dash board interface.

Mileage report

The mileage report will distinguish between productive and unproductive mileage and can be used to manage the Contract with the VOC. Statistical analysis is possible to look at total and average kms per bus, per route, etc. Mileage reports forms part of the scope of this tender.

Did Not Operate (DNO) report

DNO events will be identified where the BOC fails to send a vehicle to service a particular route, or miss a trip. These events will be available in a report. This forms part of the scope of this tender.

Schedule deviation report

This report will show actual bus arrival and departure times against planned departure and arrival times. This report can be used to manage the Contract between Polokwane Local Municipality and the BOC. Schedule deviation report does form part of the scope of this tender.

Incident and exception report

This report will show any incident over a specified period of time. An incident can be classified broadly as any event, such as driver request to talk, panic button events or accidents, if logged in the system. Incident and exception reports does forms part of the scope of this PTMS tender.

1.3.4 PTMS Passenger Information System

The Passenger Information System provides information to commuters, both real time and for planning purposes. Passenger information, both planned and real-time will be made available in a standard format, e.g. GTFS, SIRI. Additional data feeds can also provide service alerts.

The most effective way to provide passenger information is via mobile device, including legacy and smart phones. Data will be made available to third parties to develop Apps and information services independently. For this purpose a data interface must be provided. This will encourage a competitive environment for different service providers to develop services.

Information displays can also be installed in buses at a relative small cost to provide next stop information or on stations to inform the passengers about the status of the operations.

Vehicle next stop display

An internal next stop display will be installed in the bus which shows the route number and next stop to be updated shortly after a bus departs every stopping point. This is done by an LED matrix sign which can use paging or scrolling text if required. This forms part of the scope of this tender.

Mobile App / USSD

An application for smart phones for commuters to plan their trip and to view real time information will be made available. This must ideally be done by selected third party suppliers to whom data be made available. A USSD interface can provide the same service as the App, for legacy phone users. This forms part of the scope of this PTMS tender.

Data to 3rd party information providers

Real time and planning data should be made available to selected third party suppliers who can develop Apps and USSD services in a competitive environment. Polokwane Local Municipality should avoid signing a Contract with one service provider to develop an App and USSD interface as this will remove any competition. This forms part of the scope of this PTMS tender.

Vehicle destination display

An external display will be installed on the bus which shows the route number and final route destination. This is done by an LED matrix sign which can use paging or scrolling text if required. The vehicle destination display will be part of the bus tender. However, the PTMS contractor Is required to interface with the display control in order to display accurate route data from schedule.

Station Passenger Information Display (PID)

The stations will have two PIDs installed per station which shows the travellers the next bus departure times.

Station voice announcements

Passenger information will be made available at the stations via voice announcements.

Bus next stop announcements

Next stop and other passenger information announcement will be made on the buses (not midi-buses) to inform the passengers.

1.3.5 APMTS Safety and Security Systems

Safety and security systems comprise mostly of cameras installed in buses, stations and along the BRT routes. CCTV cameras are expensive and generate large volumes of data which requires streaming back to the control centre and storage and archiving for later retrieval. All of this adds a significant cost to the implementation of any system. These systems are not an integral part of PTMS and the primary focus is crime prevention and possible analysis of any

incidents. For the purpose of PTMS basic CCTV coverage is still provided but is designed in a way to reduce implementation costs and minimise any additional resources, such as high bandwidth fibre and large amount of storage.

Driver panic button

A covert button will be installed close to the bus driver in every bus. This signal will interface to the PTMS systems and will send a high priority message to the TMC for system controllers to become aware of the incident. Controllers must have a Standard Operating Procedure (SOP) on how to handle such events.

CCTV camera on-board

Two CCTV cameras will be installed on the vehicle, to view the driver and the front entrance with AFC pay point. CCTV cameras will use an SD card as storage.

CCTV recorder on-board

To keep cost down, edge recording (by SD card in the camera itself) will be done. This avoids installation of an expensive Network Video Recorder (NVR). Storage space will be less and recorded CCTV footage will be overwritten within a specified period of time, typically a few days. No network video recorder will be installed on-board.

Station security guards

Polokwane should deploy security guards at the stations to be present 24/7 to ensure a safe environment for commuters.

Kiosk IP phone

An IP phone in the kiosk will allow direct communications with operators in the TMC. The IP phone in the kiosk forms part of the scope of this PTMS tender.

Station CCTV

Two CCTV cameras will be installed per station monitoring the kiosk and platform. Video will be stored on local network video recorder located at the station.

Station CCTV recorder

Each station will have a local network video recorder to store the CCTV footage locally. The NVR will be located at the station in the designated equipment room.

On-Route CCTV (rate only) - optional

The PLM will have the option to add route CCTV on the trunk route in case it is required during the project. The bidder is require to price “rate only” for the element of the on-route CCTV which include: Poles, Lightning protection, Power Supply (connection fees) , backup-up power supply, enclosure, Network Switch and all cabling (excl.. Fibre)

The high level Technical overview of the PTMS elements per location is summarized in the following Figure.

High Level Technical overview

BRT Control Centre:

1. Planning (Scheduling & timetables for Buses and Drivers)
2. Automatic Vehicle Location (AVL) and real time Map Display (Geographical and strip)
3. Control (Distance travelled, did not operate, Schedule adherence, Incident management)
4. Communications (bus driver, station, depot, layover)
5. Communications (Website, Mobile App, USSD)
6. 5x Workstations, Video Wall, Servers
7. Software and Licences

GSM (APN):

1. Dedicated GSM based APN network
2. SIM cards with Data Contracts
3. Monthly Data Monitoring

Buses (On-board) (21x12m Bus + 15x9m Midi-Bus):

1. On-Board Unit (OBU) with antennae
2. Vehicle next stop display / Destination Display
3. Voice Announcements
4. Driver Panic Button
5. 2x CCTV cameras with SD storage
6. GSM (APN) communication (Voice & Messaging)

Stations (1x) (T7):

1. 2x Passenger Information Display (PID)
2. Voice Announcements
3. 2x IP Phone (Manager & Kiosk)
4. 2x CCTV cameras with NVR
5. GSM (APN) Communication (Voice & Data)

Depot (1x):

1. 1x Workstation
2. 1x IP Phone
3. GSM (APN) Communications (Voice & Data)

Layover (1x):

1. 1x Workstation
2. 1x IP Phone
3. GSM (APN) Communications (Voice & Data)

Figure 4: High Level overview of the PTMS elements per location

1.3.6 PTMS General Items

The PTMS system shall be an intuitive, easy to use system, requiring a minimum of development and configuration during implementation.

With an emphasis on simplicity, the following shall be by key features of the PTMS system:

1. It shall be possible to import stop information (co-ordinates) directly from GIS data. It shall not be necessary to carry out route surveys in set up data for the stop locations.
2. The primary location mechanism shall be GPS. Vehicle odometer pulses shall not be a pre-requisite for the system, but if available, shall be used by dead-reckoning algorithms in the event of loss of GPS satellite signals.
3. All data and system configuration shall be centrally managed. Configuration uploads to the vehicles and data downloads from the vehicles shall be exclusively via the cellular 3G/4G/LTE networks.
4. Driver log-on shall not be mandatory, and where a driver does not log on the systems shall operate albeit with reduced functionality.
5. The central system shall be web-based and shall support browser access across multiple workstations.
6. The system shall provide mobile apps for the provision of information to the public.
7. The system shall support the export of public transport information in GTFS and SIRI format.

8. Flexible reporting is a requirement. New reports shall easily be created and configured by operators.

The system shall be capable of importing vehicle schedules from 3rd party public transport vehicle scheduling systems. Tenderers shall provide details of which scheduling systems are supported and the data standards applicable to the imported schedule data. A schedule planning system is included as a pay item, but the client reserves the right to exclude this item. The schedule planning system may be procured under another contract.

The specification below provides a minimum set of requirements, unless otherwise indicated in the text as optional. Failure to clearly explain in the tender that these minimum requirements will be met will result in the bid being deemed non-responsive – refer Special Conditions of tender.

It is important that the Engineer is able to understand fully what is offered to assess the tender and Tenderers must provide full details of their compliance with the clauses below as well as indicating what additional functionality they can provide.

A diverse number of subsystems to be implemented and integrated under this contract to form part of the following high level components:

1. Transport Management Centre (TMC).
2. Vehicles (trunk buses and midi-buses) including on-board PTMS.
3. Trunk stations: Passenger information via passenger information displays and mobile devices.
4. Bus depots and layovers.
5. Cellular APN for communications with vehicles, depot, layover areas and stations.

Communications including the core network switches in the control centre, fibre optic cable along the BRT routes and network switches in the stations will be planned, designed and procured by the ICT department under existing contracts.

Station electronics such as fire detectionand evacuation will be procured under the station superstructure contracts.

Because of the diverse scope of work involved in the deployment of the PTMS Contractor shall be required to cooperate with, liaise with, meet with and share information with other contractors and role players in order to implement a fully integrated PTMS system.

1.3.7 High level scope of work for the PTMS

The high level scope of work for the PTMS project includes but is not limited to the following specific work elements:

1. Deployment of an on-board PTMS on the entire fleet. The Contractor is responsible for the integration of all hardware deployed on the vehicles with the operations in the Transport Management Centre (TMC) at the following levels:
    - Tracking of vehicles in the control centre using GPS coordinates transmitted by all vehicles via GSM/UMTS.
    - Driver voice communications and messaging
    - Managing of the bus fleet in real time utilizing the schedules input or imported
    - On board visual/audio annunciation of route, destination and next stop

    The approach to installation of on-board systems and the close co-operation with vehicle manufacturers and other contractors is described in paragraph 1.3.8.

2. Deployment of a Central PTMS Control System with the necessary software, central data servers and workstations for use by system operators and managers in order to fulfil the following functions:
    - Import of vehicle schedules
    - Driver Voice and Text Communications
    - Public transport operations and management
    - Reporting of monitoring and compliance functionality
    - Passenger Information (see item 4 below)

3. Deployment of information technology and communication systems to integrate the on-board systems and the Central Control System via GSM/UMTS/3G/4G/LTE communications. These systems shall include:
    - Provision of a complete GSM/UTMS/3G/4G/LTE APN solution including service provider APN, routers, link to TMC and securely provisioned SIM cards with voice/data contracts
    - Conclusion and implementation of a service level agreement (SLA) with a cellular service provider to ensure network coverage and uptime

4. Implementation of an Advanced Traveller Information System (ATIS) providing static and real-time public transport information via the following media:
    - Mobile phones
    - Data interface to 3rd party passenger information systems

5. Data Transfer and Interfacing capabilities including but not limited to
    - Import of vehicle schedule data (static timetables and bus schedules)
    - Import of geocoded stop and route mapping data using industry standard file formats.
    - Data interface for third party public transport traveller information systems including next bus arrival information signs at stops, internet-based real-time bus arrival and display systems, and interactive voice response systems keyed to specific stops.

These items shall operate in a fully integrated manner, and shall provide for external interfaces to other systems as described herein. In addition, the deployment shall allow for expansion over time and compatibility with other similar systems, including increases in the number of vehicles, stops, operators, and the addition of enhanced or improved functionality.

Further the scope includes the design, supply, installation, setup, adjusting, configuration, customisation, commissioning, maintenance and operational support of all systems, sub-systems, hardware and software as specified in this document.

It shall be the responsibility of the PTMS Contractor to bid a complete system and provide all equipment, hardware, software, licenses and services necessary to ensure a fully functioning system as described by this specification.

This requirement includes any permits, authorizations, inspections, designs, licenses, wayleaves and/or other activities necessary to install any equipment on vehicles or at Polokwane Municipality facilities. The Polokwane Municipality will reasonably assist the

Contractor in obtaining the required clearances, and approvals but this will not in any way absolve the PTMS Contractor from providing a complete and operational system that meets the requirements given in this document.

1.3.8 Interacting and Interfacing with other contracts

The PTMS Contractor shall be required to cooperate with, liaise with, meet with and share information with other contractors and role players in order to implement one fully integrated PTMS system.

The PTMS contractor shall undertake to engage with all other PTMS contractors in a cooperative manner with the primary objectives to

- Co-ordinate installation
- Identify and define interfaces
- Determine test procedures for all installations and interfaces
- Solve problems timeously

Other PTMS contracts with which there might be dependencies and interfaces are shown in Figure 4 and described below:

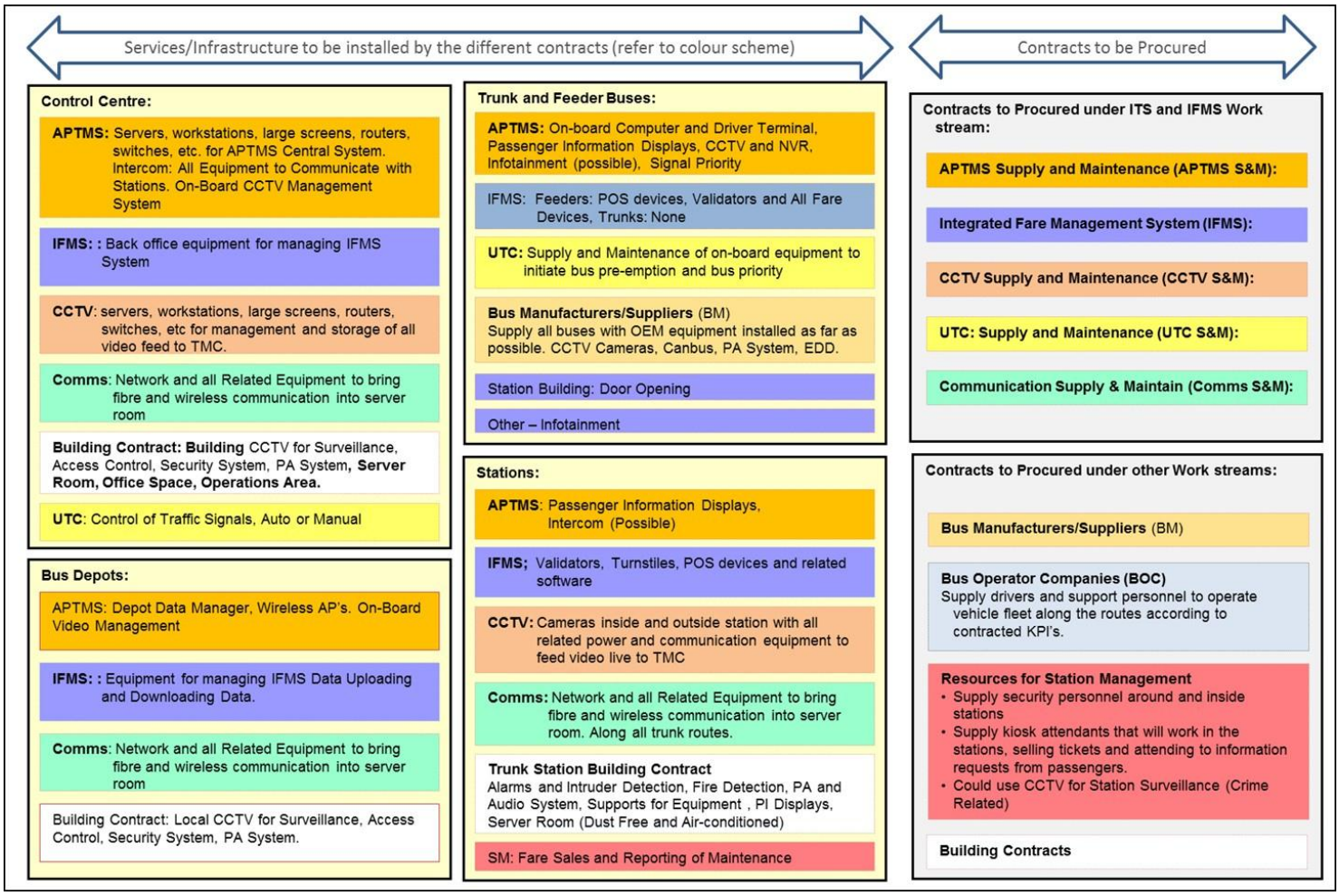


Figure 4: Overview of other related contracts

1.3.8.1 Existing contracts

The network for IRPTN Communications will be installed by contractors employed by Polokwane under existing contracts. This includes fibre optic cables (backbone and last mile) along the IRPTN routes and terminations as well as all network switches in the TMC, depots

and stations. A network management system will also be included. Ducts and manholes for the fibre optic cables will be installed under the route infrastructure contracts.

The communications network will have the following topology:

1. Will follow the IRPTN trunk lines
2. Will terminate in at least the following locations:
    - Equipment room in each trunk station.
    - Depots and layover areas
    - IRPTN TMC
3. A logical redundant ring topology using single mode Fibre Optic.

The network will comprise layer 3 switches at each station and depot as well as dual core at layer 3 switches at the TMC. The dual core will provide redundancy. Physical Route redundancy is required on all fibre routes.

1.3.8.2 IRPTN Vehicles Manufacture Contracts

These contracts will include the manufacture of the new vehicles

The buses will not be part of this tender. This tender will include the on-board systems for the buses. Tenderers should note that for the new vehicles certain of the on-board PTMS and related components will be supplied under the vehicle contracts and installed by the vehicle manufacturer. These components include:

1. Driver Microphone,
2. Speakers,
3. Bus Destination Displays,
4. Vehicle Next Stop Display

Close operation between the PTMS contractor and vehicle manufacturers is required.

Close cooperation between the PTMS contractor and the Vehicle manufacturers will be required particularly with respect to:

- Determination of space, brackets and ventilation requirements for PTMS equipment
- Determination of position and provision of cutouts/access for dash mounted PTMS equipment
- Determination of mounting points and provision of penetrations for roof mounted antenna
- Provision of power supplies to PTMS equipment
- Access and connections to vehicle status and door signals
- Coordination in order that PTMS equipment and wiring is installed at the correct stage on the production line of the new vehicles. It is proposed that the wiring for the PTMS be included in the pre-assembled vehicle wiring looms to be installed on the production line
- OBU and Destination display integration requirements.
- Integration and testing of PTMS equipment in conjunction with equipment supplied and installed by the vehicle manufacturer including:
    - Power supplies and Ignition Switch
    - Odometer
    - Reverse Gear Selector
    - Door Open Switches (Left and Right)
    - Driver duress (covert footswitch)
    - Driver Microphone and Speakers

1.3.8.3 IRPTN Integrated Fare Management System IFMS Contract

This contract will include all the components for card sales, station access control and validation, on-board validation and the fare management back office.

Close cooperation between the PTMS contractor and the IFMS Contractor will be required particularly with respect to:

- Providing Route and Schedule Information to the IFMS Contractor
- Providing geo-referenced stop information to the IFMS Contractor

1.3.8.4 IRPTN Stations Superstructure Contracts

These contracts will include the construction of the complete IRPTN station and will include power distribution (including UPS) and building electronics such as fire detection and evacuation.

Close cooperation between the PTMS contractor and the Stations Superstructure Contractor(s) will be required particularly with respect to:

- Provision of power supplies for the CCTV.
- Cabling route on the station
- Location/space of equipment room

2 Project Programme

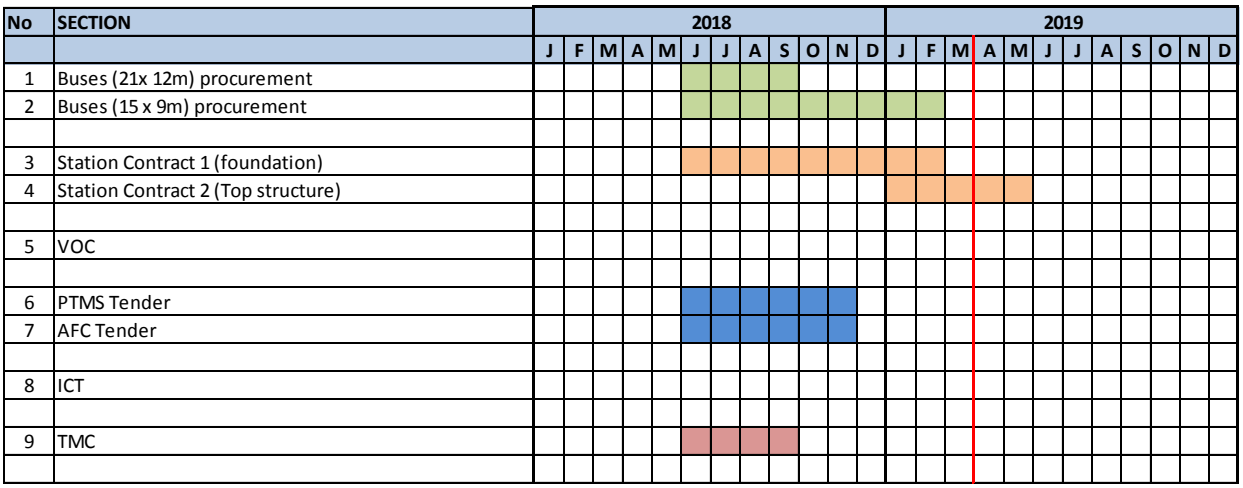
The following shall apply:

1. As part of the works the Contractor shall submit a baseline program within the requirements of the general and particular conditions of contract. This program shall identify each element of the project, including but not limited to the following:
   - Design, development, supply, setup, configuration and installation of equipment and software.
   - Development of Reports.
   - Establishment of acceptance testing routines – Installation inspections, Functional Acceptance Testing (FAT), Systems Integration Testing (SIT), System Acceptance Testing (SAT) & Commissioning.
   - Training
   - Work sections shall be completed as provided in Section C1.2.3 “DATA PROVIDED BY THE EMPLOYER”
   - This program shall tie in with the existing programmes from other contracts where services are used or integration is required.
   - Coordination of different roles and responsibilities shall be considered in the Contractors program.
2. The program shall clearly indicate which systems will be installed and operational by each milestone shown in the Engineers Preliminary Construction Programme. Tenderers shall use these milestones as the basis for their baseline programme.
3. The program (in Microsoft Project) shall show start and end dates, resource allocation, delivery milestones, critical paths, etc.
4. The existing program including key dates related to availability of infrastructure, buses and others can be found in Part C4.

The PTMS Tender documentation will be ready by June 2018. The PTMS tender will open in July 2018. The negotiation and award of contract will happen from August 2018 – September 2018. The PTMS contract will be for a total of 36 months starting in October 2018 (estimate).

Go-Live date is set as March 2019, with 21 buses and 15 midi-buses. Very high level dates for all parties (available) are shown (to be updated with contract signature)

POLOKWANE BRT - OVERALL PROGRAMME AND INTERFACES
Estimate prepared on 12 June 2018



In terms of other contracts, the AFC will follow the same timeline as the PTMS. The procurement of the buses is already underway and it is expect to have the twenty one 12m buses ready and delivered in September 2018 while the fifteen 9m buses will only be ready in February 2019. The station contract is also expected to be finalized in February 2019. The TMC will be finished in September 2018.

3 Existing ICT contracts

The client (PLM) has existing contracts for supplying of certain ICT equipment. This includes personal computers, laptops, servers, wireless access points (APs), network cabling, equipment racks, storage devices, network switches, certain software, CCTV, etc.

Although this tender includes specifications and payment items for such equipment, the client reserves the right to procure from the ICT contractor. These items will also be configured and installed by the existing ICT contractor. Where existing contractors are involved the PTMS Contractor shall liaise and cooperate with them for integration issues.

The PTMS Contractor shall first consult with the client prior to acquiring ICT equipment.

4 System compatibility

In terms of System compatibility:

a. The IRPTN network will be expanded in the future. For this reason it is critical that all hardware and software solutions shall be modular and scalable. Systems shall be compatible with other similar products (also from other vendors, manufacturers or developers) and shall not limit future expansion of any part of the PTMS system due to proprietary hardware, software or protocols.

b. All systems shall be based on open platforms and standards as far as possible. Where this is not the case, the supplier/Contractor shall provide all interfaces, standards and/or protocols, without limitations, to the client such that future interfacing/expansion to other third party products for any part of the system is possible. Furthermore the Contractor shall provide detailed technical information of how integration is possible.

c. Where available the Tenderer shall provide detailed technical information to show how the offered systems have been integrated with other systems (from different vendors, manufacturers or developers) before. Preference will be given to systems where this can be proven.

d. Interfaces between different components of the central control system shall be made available. These interfaces shall be made available, without any limitations, to the client and shall allow third party systems to be integrated with all supplied systems.

e. Standard, commercial-off-the-shelf (COTS) components shall be used wherever possible.

f. All functionally identical modules, assemblies and components shall be fully interchangeable between like modules for all equipment acquired under this contract.

g. System components shall be identical in mounting characteristics and inter-unit cabling across the entire system, so that a replacement piece of equipment is installable without modification.

h. Given the system compatibility requirements above, the international data and information standards shall be considered for all systems, sub-systems, hardware and software as part of this contract. Tenderers shall make it clear in their response as to exactly with which standards all systems and sub-systems comply.

i. Tenderers shall specifically state the standards applicable to the import of vehicle schedules into the PTMS offered.

j. Tenderers shall also state their capability and commitment to provide a fully integrated system which can be expanded in the future with third party hardware and software applications.

Given the reasons above, the following data and information standards shall be considered for all systems, sub-systems, hardware and software as part of this contract.

The Contractor shall make it clear in his response as to exactly which standard all systems and sub-systems comply with to promote and ensure a fully integrated system which can be expanded in the future by third party hardware and software applications as stated in this section.

Preference shall be given to South-African or international standards such as the ones listed below.

The list of standards below shall be considered:

Intelligent Transport Systems (ITS) Standards

1. National Transportation Communications for ITS Protocol (NTCIP) (details at www.ntcip.org)

2. Nordic Public Transport Interface Standard (NOPTIS) (details at www.noptis.org)
3. Verband Deutscher Verkehrsunternehmen (VDV) (details at http://mitglieder.vdv.de/en/wir_ueber_uns/vdv_projekte/index.html)
4. Transit Communications Interface Profiles (TCIP) (details at http://www.aptatcip.com/)
5. Transmodel related standards (details at www.transmodel.org)
6. Real Time Information Group (RTIG) standards (details at www.rtig.org.uk)
7. Institute of Electrical and Electronics Engineers (IEEE) (details at www.ieee.org)

Data – Metadata Standards

1. Apply ISO/ TC211 as the core standards specified for geographic information, methods, tools and services for data management (including definition and description), acquiring and processing, analyzing, accessing, presenting and transferring data in digital / electronic between different users, systems and locations.
2. Adopt ISO metadata standards as the basis for standards.
3. Expand ISO metadata definitions when necessary to include definitions from other standards. For instance, Federal Geographic Data Committee (FGDC) that promotes the coordinated development, use, sharing and dissemination of geospatial data.
4. Provide a clear approach, methodology and tools to define, build and manage a Metadata model utility with insert, update and viewing capabilities in tabulated and readied data into the database.
5. Support Application Programming Interfaces (API) that connects to other applications or services.
6. Support SQL (not SQL spatial) and ArcSDE (Spatial Data Engine).

OGC Spatial Standards

Apply an Open GIS Consortium (OGC) approach to standardised processes. This should cover in particular Geography Markup Language (GML) and GML schema definitions, Web services involving Web Map Service (WMS), World Standards Federation (WSF), Web Coverage Service (WCS) and other services as defined by the OGC.

The City has an ESRI Suite of products platform standard with web based viewers (Map Services) developed on ArcGIS Server 10 software (development in Flex).

Engineering standards

Address prevailing engineering / Web standards and their applicability, for example: Internet Engineering Task force (www.ietf.org) that develops and maintains specifications for many internet related applications, transport, routing and security standards.

Building Information model standards

Assess the applicability of recognised standards by Engineering Societies spatial / engineering object descriptions, symbols and models.

Web Internet Standards

Apply acknowledged international standards provided by the World Wide Web consortium W3C (www.w3.org) for the development of common protocols and specifications for web graphic file formats, XML and metadata and web services, in particular

5 Design requirements

The elements of design and configuration work to be carried out by the PTMS contractor shall include but not be limited to the items specified below.

Pay items for these design and configuration tasks have been included in the pricing schedules. Payment shall be made strictly against receipt of the all the specified deliverables and approval of these by the Engineer.

5.1 High level conceptual design

The primary deliverable of the high level conceptual design shall be a high level system design document including diagrams and drawings issued in both hard copy and electronic format in PDF to the client. The minimum items to be addressed as part of the high level design are listed below:

1. Provide a full compliance traceability matrix showing the extent to which the offered system and design complies with each and every requirement of this specification *i.e clause by clause.* This document shall be updated through the full duration of the project and shall be used as a reference during system acceptance testing. Each of the specified items shall be linked to a test case.
2. An overall system architecture diagram identifying functional blocks and data and information flows.
3. An PTMS central system process flow diagram and software description. The PTMS central system software applications shall be described in detail, especially where customisation is to be provided.
4. Functional and physical descriptions of all proposed hardware elements.
5. Preliminary user interface information and drawings, flow charts, messages and menus.
6. Description of all system security features.
7. Preliminary equipment mounting arrangements, dimensions and installation requirements. The Contractor shall include with this initial estimates of installation time.
8. Hardware and software interfaces with other systems.
9. System backup and recovery procedures.
10. List and outlines of all manuals, training materials and other system and operational documentation.

Within 1 month of the award of contract the Contractor shall produce the high level design as specified above.

The Engineer will review the high level design document and provide feedback to the Contractor within 3 weeks and may request amendments to the design. After this a design review meeting shall be arranged by the Contractor. This shall evaluate the progress and technical competence of the design and any further required amendments after which a final high level design document will be submitted to the client for approval and sign off.

5.2 Detailed design

All detailed design documentation, including reports, drawings, diagrams, schematics or other information shall be submitted to the Engineer and shall be subject to approval by the client.

At time of tender the following items have been identified as requiring direct detail design, integration, customisation and development from the Contractor. These items are the minimum required at time of tender and may vary during the contract period.

5.2.1 Transport Management Centre (TMC)

The Contractor shall customise, design and develop at least the following to cover all design requirements stated or implied in Section 8:

1. Determination of hardware and OS configurations and equipment rack layouts for all workstations and servers. Refer to section 8.7.
2. Setting up, customisation and configuration of Vehicle Configuration Manager (VCM) Refer to Section 8.9.
3. PTMS central system (refer to Section 8.10) architecture design.
4. PTMS schedule planning system (refer to Section 8.10.1) setup and customisation including but not limited to:
    a. Setup and customisation of schedule planning system module.
    b. Setup and customisation of schedule publication and printing module.
    c. Setup and customisation of vehicle scheduling together with the client and/or the Vehicle Operating Company (VOC)
    d. Setup and customisation of duty scheduling together with the client and/or VOC
    e. Setup and customisation of export module together with the client and/or BOC and/or Integrated Fare Management System Agent (IFMSA).

5. PTMS Compliance Monitoring (CMS) system (refer to Section 8.10.2) setup and customisation including but not limited to:
    a. Import from GIS of all required stopping point coordinates and capture of other information required for all routes and stops. If the offered PTMS system requires that physical route surveys be done these shall be priced under this pay item.
    b. Setting up, customisation and configuration of Compliance Monitoring (CMS) system together with the client and/or Vehicle Operating Company (VOC).
    c. Setting up, customisation and configuration of text and voice communications to bus drivers together with the client and/or Vehicle Operating Company (VOC).
    d. Development of interface for CMS system with passenger information systems

6. PTMS Passenger Information System (PI) (refer to Section 8.10.3) setup and customisation including but not limited to:
    a. Setting up, customisation and configuration of a mobile passenger information system as specified in Section 8.10.3.1
    b. Development of data interface for third party public transport passenger information systems as specified in Section 8.10.3.4

7. All activities to obtain the PTMS baseline information required to setup, adjust, customise and configure the supplied systems, sub-systems and software to guarantee optimised system performance.
8. The Contractor shall submit a report to the client identifying all information required from the client to do the work listed in points 1 to 7 above. This shall be submitted 21 days prior to the planned commencement of the work.

5.2.2 On-board equipment

The Contractor shall customise, design and develop at least the following to cover all design requirements stated or implied in Section 9:

1. Bus wiring and interfacing diagram, including interaction with bus manufacturer and obtaining approval from bus manufacturer.
2. Research of antenna type for various bus applications and design of optimum location on bus.
3. Design of layout of equipment on buses and design of brackets for mounting of various kinds of equipment (also refer to Section 9.2, Section 9.3 and Section 9.4).
4. Integration of PTMS OBU with driver microphone and speaker to allow clear audible communication with driver, including interaction with bus suppliers, specified in Section 9.5.4.2.

5.2.3 Stations

The Contractor shall customise, design and develop at least the following to cover all design requirements stated or implied in Section 10:

1. Station wiring and interfacing diagram including interaction with station superstructure contractor.
2. Equipment datasheets.
3. Equipment configuration information.
4. Documentation of software used.

5.2.4 Depots/layover areas

The Contractor shall customise, design and develop at least the following to cover all design requirements stated or implied in Section 11:

1. Determination of hardware and OS configurations for all depot workstations.

5.2.5 Station/Depot/Vehicle Communications networks

The PTMS system shall utilise the communications network (Fibre based) implemented by the clients contractor.

The PTMS Contractor shall provide their detailed requirements and design input in respect of port requirements and MAC addresses of all equipment to be connected.

The PTMS Contractor shall be responsible for the design and integration of the GSM/UTMS APN for cellular wireless communications with vehicles.

The PTMS Contractor shall be responsible for the design and integration of the GSM/UTMS APN for Stations/Depot backup cellular wireless communications.

The GSM/UTMS APN is designed to be the backup communications. If Fibre network is not ready in time, the GSM/UTMS APN will be used.

5.2.6 Detail design deliverables

Deliverables from the detail design shall be indicated in the Contractors programme and shall include as a minimum but not be limited to:

1. Detail design reports
2. Drawings, schematics and diagrams (including Geographical layouts)
3. Calculations
4. Equipment Specification
5. Equipment Data sheets

6. All Software information
7. Any other relevant information

All of the above shall be made available in both hard copy and electronic formats to the client.

6 Project Management, Quality Assurance, Health & Safety and General Obligations

6.1 Project Management

The following shall apply:

1. The Contractor shall provide a nominated Project Manager (PM) for the duration of the design, supply, installation, commissioning, maintenance and operational support of this entire contract.
2. The PM shall have at least 10 years' experience of similar projects.
3. The PM shall be familiar with the FIDIC conditions of contract. At least one of his contracts in the past 10 years shall have been governed by the FIDIC conditions of contract.
4. If the PM does not have the required FIDIC experience, the contractor shall, at his own expense send the PM to a recognised accredited FIDIC course with duration of at least two (2) days within 5 weeks after receiving the Client's Letter of Acceptance.
5. Note that regardless of whether the PM has FIDIC experience or not, it remains a key requirement that he/she shall have at least 10 years' experience on similar projects as stated in point 2 above.
6. The Tenderer shall submit the resume/CV of his proposed PM together with the tender.
7. The PM shall be responsible for the day to day management of the project and shall act as the main interface between the Contractor's project team and the client and/or his representative.
8. Project management shall be an on-going and continuous service provided by the Contractor to ensure that the client requirements are met within program dates and proposed costs.
9. As part of the on-going monitoring of the project's progress a series of regular meetings shall be held.
10. The PM shall be present at all project meetings.
11. The Contractor key technical and training or other staff shall be available in person or by teleconference (if agreed by the Engineer) to discuss specific items as needed.
12. The Contractor shall be required to attend various meetings, including but not limited to the following:
    a. Monthly contractual and progress meetings. To be held in client designated offices. The agenda to be agreed with the client.
    b. For duration of the design period 2-weekly technical and design meetings. The design period will start at contract inception and end on approval of all high-level and detailed design.
    c. After the period in b. above, monthly technical and installation meetings.
    d. Monthly maintenance meetings during the maintenance period
    e. Any other meetings as may become necessary.
13. The Contractor shall submit a monthly progress report the day prior to each contract meeting. This progress report shall include and/or address at least the following:
    a. Milestones achieved
    b. Milestones not achieved
    c. Risk and risk mitigation

   d. Constraints
   e. Imminent activities
   f. Percentage of completion of sections
   g. Program update

14. Other reports shall also be presented as and when may reasonably be requested by the client. This includes but is not limited to:
    a. Design reports
    b. Installation reports
    c. Training reports
    d. Test reports
    e. Health and safety reports
    f. Environmental impact report
    g. Maintenance report
    h. Any other report deemed necessary by the client
15. To assist the Contractor, client will ensure that the Contractor shall have reasonable access to all locations to enable the Contractor to execute his responsibilities.
16. The Contractor is required to liaise with and coordinate with the client and other contractors as and when required to integrate systems, share infrastructure and perform his work timeously, efficiently, with excellent workmanship and without interfering with the work of other contractors.
17. The PM shall not be having non Polokwane IRPTN PTMS business responsibilities,e.g. managing other projects at the same time. The PM shall be 100% of his time be committed to the Polokwane Local Municipality PTMS project.
18. The tendered price shall be a monthly rate to perform all duties listed here.

6.2 Quality Assurance and Quality Management System

1. Tenderers shall indicate if their organisations and any of their subcontractors are ISO 9001:2008 listed.
2. Tenderers shall provide details of their existing Quality Management Systems.
3. These obligations include the appointment of a quality manager for the project.
4. The quality assurance obligations pertain to the main and all subcontractors or all JV partners.
5. The Contractor shall develop and provide a quality assurance plan to the client for approval. This plan shall identify internal processes for the creation and review of deliverables including parties responsible and respective time frames.

   The quality assurance plan shall include procedures with checklists for:

   a. High level conceptual design
   b. Detailed Design
   c. Procurement
   d. Equipment Manufacture and Factory testing
   e. Installation Processes
   f. Software design, development, customisation, configuration and testing
   g. Software version control and traceability

h. Backup and system recovery, including disaster recovery and business continuity

i. Commissioning and Testing including functional, integration and system acceptance testing.

j. Documentation control

k. Software configuration management and upgrade policy

l. Training

m. Maintenance

n. Operational Support

6. These procedures shall include hold points for approval and witness testing by the Engineer.
7. The Contractor shall prepare Quality Assurance Test and Acceptance schedules for all items of equipment and software to be tested. These schedules, completed and signed, shall provide a record of acceptance of the systems.
8. Test and Acceptance Schedules for various test stages including Functional Acceptance Tests (FAT's), System Integration Tests (SIT's), Installations Inspections and System Acceptance Tests (SAT's) shall be prepared by and submitted for approval 28 days prior to commencement of the tests.
9. A test case shall be established for sub-system for each of the test stages defined in the specifications Section 13.3. A test case and traceability matrix (refer Section 5.1 item 1.) shall be set up by the contractor in consultation with the Engineer to link each of these test cases with the relevant specification clauses and the test results. For each test case the test documentation for each test stage shall be dealt with as set out in the preceding paragraph.
10. Successful completion of tests for each test case, and acceptance by the Engineer is a requirement for taking over of the systems.

6.3 Health and Safety Obligations

1. The works shall be carried out in accordance with the requirements of all the relevant Government Acts and Regulations.
2. In particular the Contactor shall comply with the OHS Act (Act 85 of 1993) and its Regulations. Tenderers shall complete form RDC19 (Part T2) and the PTMS Contractor shall sign the Health and Safety Agreement.
3. The Contractor shall be responsible for the safety and security of his personnel during installation, testing and maintenance.
4. The Contractor shall prepare a Health and Safety Plan for the project. The plan shall include a detailed hazard risk assessment with mitigation measures.
5. Specific hazards that could be encountered on this project, in addition to the health and safety hazards normally associated with electrical and electronics construction work, include the following:
   - Lifting and handling heavy equipment
   - Working with open false flooring
   - Working at height
   - Working in operational depots with continuous movement of buses
   - Working on top of or under vehicles
   - Working on a vehicle manufacturing line

- Working on building and infrastructure construction sites
- Construction vehicles operating on the construction sites.
- Working in operational stations with the associated requirement to keep plant and equipment away from pedestrians and children and to safely and securely barricade the works.
- Working in areas of potential criminal activity

6.4 Office and Workshop Accommodation

1. The Contractor shall establish project offices and workshop in close proximity to client for the duration of the contract.
2. The office and workshop shall be safe and secure.

6.5 Dayworks

1. The Contractor shall give hourly rates for the following specific dayworks:
    a. Unskilled labour
    b. Electrician
    c. Fibre Optics Technician
    d. Electronics Technician
    e. Communications Network Engineer
    f. Systems Engineer
    g. Systems Integrator
    h. Scheduling Specialist

2. These amounts will only be expended on specific instruction by the Engineer to the Contractor for additional tasks that may be required by Personnel during normal working hours at tendered rate.

3. Daywork Materials will only be expended on specific instruction by the Engineer to the Contractor for additional material that may be required. Contractor to propose a lump sum value.

7 Detailed specification: General

7.1 Scope of specifications

These specifications define the requirements and technical specifications for the various work elements listed in Section 1.3.1 as applicable to the following high level IRPTN components:

- Transport Management Centre (TMC)
- Vehicles (both buses and midi-buses) on-board PTMS
- Trunk stations PTMS
- Bus depots and Layover areas
- Cellular APN for communications

All equipment shall be designed for use in the transit industry, with specific attention to ergonomics, the environment in which the equipment will be installed, reliability, efficiency, vandal resistance and safety for passengers, operators, maintenance personnel and other system users.

The Contractor shall:

1. Make required site improvements where applicable.
2. Supply and install all required structures, hardware, brackets, ventilation and cooling requirements, cabling, wiring, connectors, terminations, splicing, sealant, all accessories, all sundry material and services for equipment or elements to be installed at all sites.
3. Hand-over a complete and fully functional, fully integrated system.

7.2 Product and installation quality requirements

The following shall apply:

1. Equipment furnished under these specifications shall be the latest model in current production, as offered to commercial trade, and shall conform to quality workmanship standards and shall use materials consistent with public transport industry requirements. The Tenderer shall guarantee that all equipment to be offered under these specifications is new.
2. All components of the PTMS system shall be built in accordance with best commercial and transit operation practice. As a minimum, the design and construction shall provide for:
    a) Reliable and stable operation under conditions of heat, vibration and fluctuating power supply voltage.
    b) Minimum maintenance and alignment procedures.
    c) Minimum number and variety of assemblies and spare parts.
    d) Maximum attention to human engineering.
    e) Simplified design and rapid fault isolation to reduce the requirement for highly skilled maintenance personnel.
    f) Operation under a wide range of and varying supply voltages.
3. All on board systems shall be resistant to continuous vibration with at least the following mitigation measures applied:

   a. Shock mounts for all hard disk drives
   b. Lock nuts for securing of all assemblies, sub-assemblies and components
   c. Secure locking connectors for all plug-in cable connections

4. No self-tapping screws shall be used unless specifically approved. Cable-ties and/or double sided tape are not an acceptable means to fix equipment or any part thereof.
5. Equipment and sub-components shall be identified by a part number and/or serial number, permanently and legibly affixed directly to the surface of the unit.
6. Wherever the Contractor is required to label cabling, components or any other device, numbering schemes shall be agreed with the client.
7. Retro-fitting of equipment shall be avoided as far as possible. In order to mitigate retro- fitting the Contractor shall liaise and cooperate with other contractors to do installations at the most appropriate times. For instance, PTMS equipment and cable looms shall be installed in buses during assembly of the buses.
8. Under exceptional circumstances where retro-fitting cannot be avoided or where a post-delivery change has to be made to one item of one type of equipment. This shall be reviewed with the client and upon approval; changes shall be made identically to all units (except modifications that are clearly understood by the Contractor and the client to be experimental and applied to less than five units).
9. Equipment shall be designed to prevent unauthorized access, and to facilitate authorized access only.
10. The Contractor shall provide a complete, integrated and operational system as measured during real time system operation. The Contractor shall ensure that all the systems in or at the field or on buses are integrated with those in the control centre.

7.3 Technical standards and certification

All equipment shall be certified by recognised certification authorities, including those required by governing South African law. This includes but is not limited to:

1. South African Bureau of Standards (SABS)
2. South African National Standards (SANS)
3. Independent Communications Authority of South Africa (ICASA)
4. Institute of Electrical and Electronics Engineers (IEEE)
5. International Electrotechnical Commission (IEC)
6. European standards including:

- European Committee for Standardization (CEN)
- European Committee for Electrotechnical Standardization (CENELEC)
- European Telecommunications Standards Institute (ETSI)

7. Underwriters Laboratory (UL)
8. Underwriters Laboratory Canada (ULC)
9. Canadian Standards Association (CSA)
10. International Organisation for Standardisation (ISO)
11. Society of Automotive Engineers (SAE)

The Contractor shall be responsible to obtain approval and certification from all parties involved and for all devices that will form part of the PTMS system and for the costs involved. If a device is not certified, or if the current certification is not approved by South African law or

not applicable, it shall be the responsibility of the Contractor to obtain the required relevant certification. The Contractor shall state the type and level of certification of all equipment on offer.

In particular all wireless and GSM communications equipment shall carry the relevant ICASA certifications.

7.4 Electrical Requirements

The following minimum specifications shall apply:

1. All electrical installations shall comply with at least the following SANS standards:
   - SANS 10142-1:2012 (The wiring of premises Part 1: Low-voltage installations)
   - SANS 62305-1 (Protection against lightning Part 1: General principles)
   - SANS 10313 (Protection against lightning - Physical damage to structures and life hazard)
2. All device enclosures shall contain an easily accessible master circuit breaker that will remove power from the equipment when tripped.
3. Circuit breakers shall clearly indicate when they have been tripped.
4. All enclosures, chassis, assemblies, panels, switch boxes, terminal boxes, and similar enclosures or structures shall be grounded.
5. Protective grounding shall be provided to ensure that all exposed metal equipment and metal fixtures are connected to a common ground point in the electrical cabinet.
6. Wire dress shall allow sufficient slack for three additional “re-terminations” without excess tension.
7. Wire splices are not permitted.
8. Wire and cable ties shall not be so tight as to cause indentation and damage to the insulation.
9. Adhesive-mounted bases shall not be used to support wire ties or cable supports.
10. All conductors within each enclosure shall be installed free from metal edges, bolt heads, and other sharp or interfering points.
11. All conductors providing connections between components shall be provided with strain-relief, and be clear of moving objects that could damage either the conductor or the object.
12. All terminations and cables shall be clearly indexed, labelled and schematically identifiable according to the Polokwane Local Municipality’s standard practice.
13. All wire labels shall be non-metallic and shall resist standard lubricants and cleaning solvents.
14. When components must be connected to each other through individual wires, the wiring shall be incorporated into a wiring “harness,” where each branch of each circuit can be separated from others for troubleshooting.
15. Protection shall be provided against Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) emission sources, as well as internal conductive or inductive emissions.
16. The Contractor shall certify through the Contractor’s expense the electromagnetic compatibility of equipment to be furnished.
17. Overvoltage: The Contractor shall provide overvoltage protection for all equipment installed as part of the PTMS System.

18. All devices and installations shall be protected against lightning according to the relevant standards listed above.

7.5 Software requirements

The following shall apply:

1. All the software used for management and surveillance in the control centre will be fully functional via a web interface that is accessible from any remote location.
2. All software shall be written in a common and well-known, modern, high-level, highly structured language.
3. All software shall be the latest release at the time of installation (software versions to be approved by the Polokwane Local Municipality) unless specifically approved otherwise by the City.
4. All software shall contain version control numbers.
5. Features shall be provided to identify the software version on each device, and verify that it is the correct or most recent version for that device.
6. Software shall be organized in a modular, configurable manner to the extent reasonable.
7. It shall be possible to navigate with keystrokes in lieu of mouse action. A library of keystrokes and short cuts shall be provided.
8. Adjustable, Polokwane-specific, and configurable parameters shall not be hard-coded onto the source-code. They shall be user-modifiable.
9. Application software (both user and system) shall not be portable, i.e., the source code shall not be transferable to other computers using the same hardware and operating system without any modifications or use of hardware key.
10. The application software shall be reasonably scale-able to newer, higher performance hardware or operating systems.
11. Applications shall be developed with non-proprietary open standards allowing for future integration by third parties.
12. Applications shall have industry standard open Application Programming Interfaces (API's).
13. All applications shall be supported with off-line tutorials as part of operator training.
14. All application software shall be self-diagnostic.
15. All applications shall utilize typical Windows style graphical user interface conventions such as resizable windows, point and click, right click context menus, drop-down menus, toolbars, colour displays, icons, drag and drop, scroll bars, scroll wheel mouse, status bars, etc.
16. All applications shall include a user interface that is user-friendly, accessible, and intuitive for all users.
17. Passwords shall not be displayed unencrypted on displays.
18. All central system user interfaces shall have online help features.
19. The system date and time shall adjust automatically for possible daylight savings, leap year, and holidays.
20. The system date and time shall provide the same date for service times associated with a complete "Public Transport Day", where number of hours in one day is based on start and end of service regardless of service extending past midnight.

21. The system shall maintain both 24-hour timestamps and 30-hour timestamps matching the 30-hour clock used by some scheduling software if that is proposed by the tenderer.
22. Data transferred from a device or system shall not be purged or written over until at least one successful transfer is confirmed and a record of confirmation is available.
23. Features shall be provided to ensure that all system-created files are uniquely identified, and that no files are lost or missed during data transfer.
24. Verification features shall be provided to confirm that there have been no losses of data at any point in the system.
25. The system shall be capable of remote paging of software alarms, with an escalation process.
26. The Contractor shall provide a comprehensive data backup and recovery plan.
27. The Contractor shall provide a data backup system for data archiving and recovery.
28. The data backup system shall include capabilities for the Polokwane Local Municipality to back up data through network-wide backup.
29. It shall be possible to recover and transfer data files in the event of a primary data storage failure through a secondary standardized PC interface such as an RS-232 port.
30. All software shall be free of defects in design and workmanship, and will perform according to the specifications.
31. All software shall not contain any timers, counters, or pre-programmed devices that will cause the software to be erased, inoperable, or incapable of performing as specified.
32. All software shall contain an appropriate security and control system for protecting the software and the data from unauthorized use.
33. All software shall be free of “back doors” and all other known methods of software access that bypass the normal system security features.

8 Detailed specification: PTMS System

8.1 Transport Management Centre (TMC)

The TMC will accommodate the central system and operators for the PTMS. The TMC is located in the Peter Mokaba stadium Building, floor 1.

Figure 6 below shows the locality of the TMC.

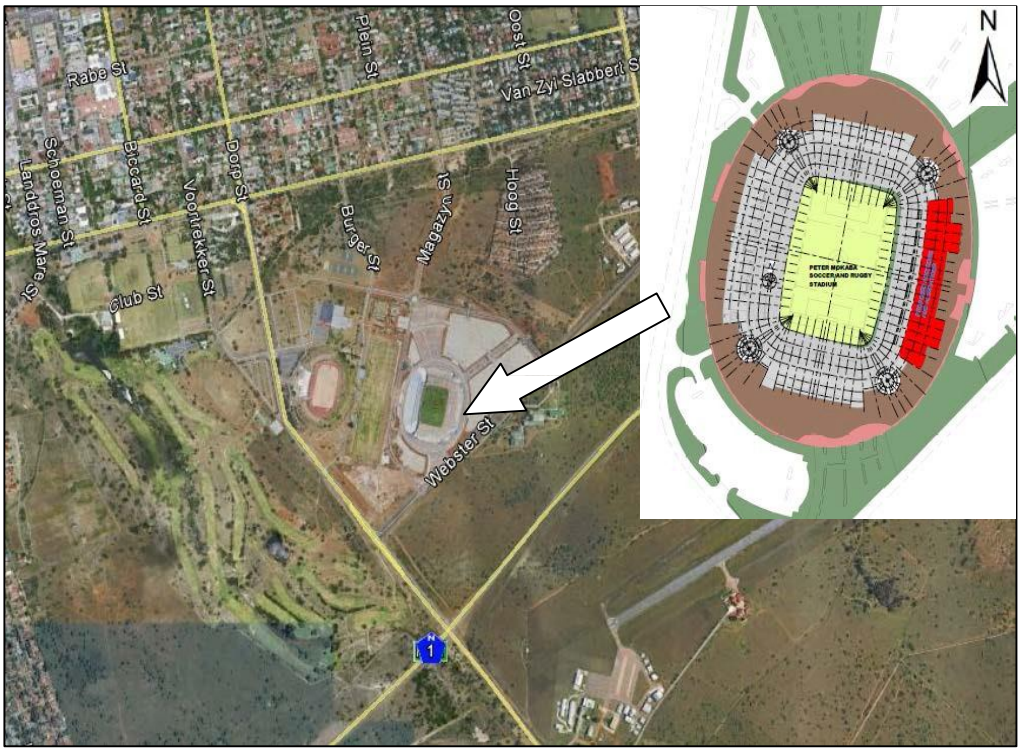


Figure 5: BRT TMC Location- 1st floor Peter Mokaba Stadium

The TMC will provide seating for four PTMS operators in the control room as well as space in the air-conditioned server room for the PTMS racks.

The proposed layout of the TMC control room is shown in Figure 7.

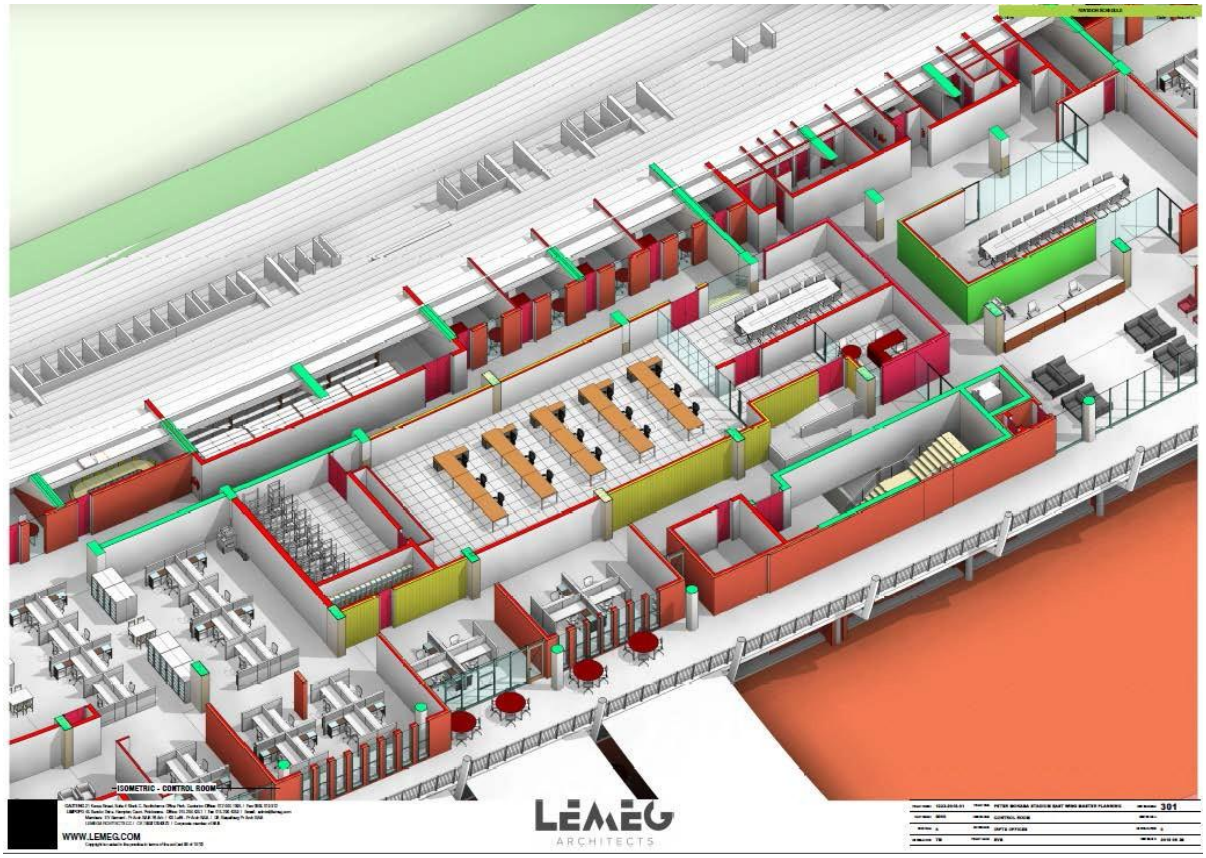


Figure 6: TMC floor layout and Architectural Drawing

8.2 Functional description

The PTMS system will be managed from the Transport Management Centre (TMC).

The tenderer shall ensure that all PTMS systems deployed in the field are fully integrated with the Central PTMS in the TMC. These are the systems described in this document (but may also include other systems not mentioned in this document) and include as a minimum:

1. On-board PTMS systems.
2. Passenger Information available for the Applications.
3. Cellular APN for Communications with vehicles
4. Any other system(s) required in order to achieve a fully functional, integrated and highly efficient PTMS system keeping the purpose and objective given in Section 1.2 in mind.

The figure below shows the high level architecture of the TMC.

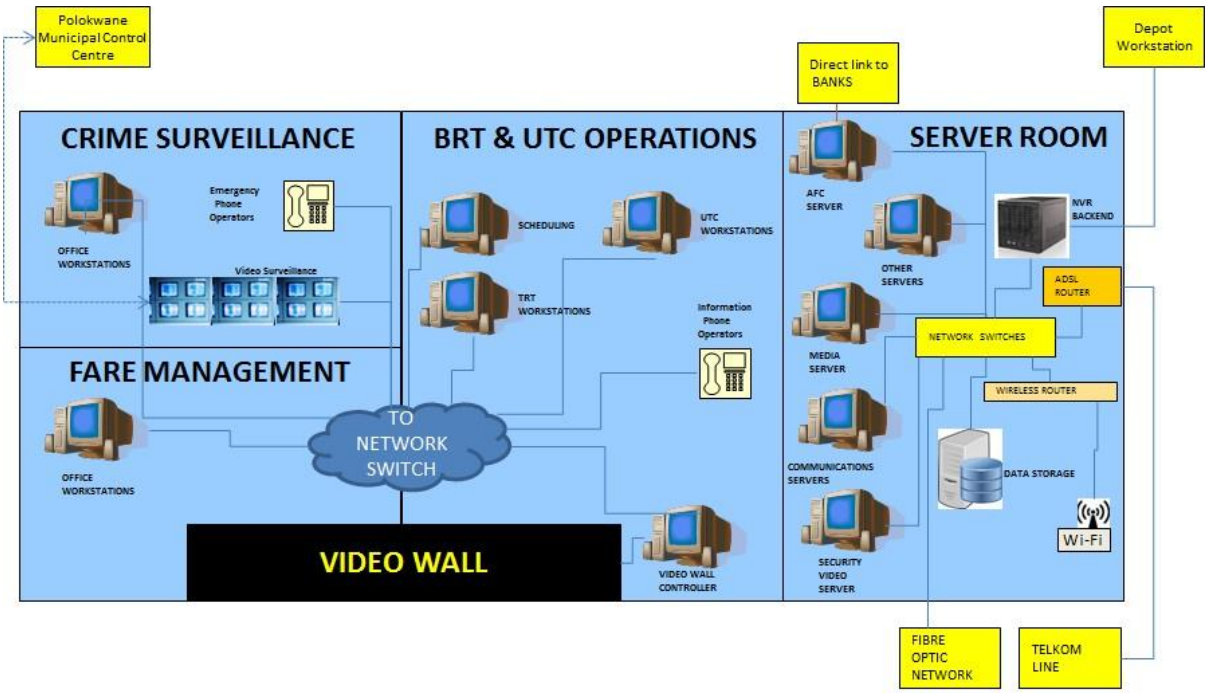


Figure 8: TMC high level architecture

The figure above is intended to aid understanding of systems to be installed which are relevant to the BRT system. Not all systems and/or role players are necessarily represented above. The figure is not prescriptive in terms of quantities, physical locations or required components. The architecture and equipment installed may differ.

The following shall be supplied, installed and configured under this contract:

1. Various server hardware, operating systems and software

2. Database and storage hardware and software

3. Various workstation PC's hardware, operating systems and software

4. All PTMS applications software and hardware including but not limited to:

a. Schedule planning

b. Driver Voice and Text Communications

5. Public Transport Operations and Management including Compliance Monitoring (CMS)
6. Reporting
7. Passenger Information Systems (PI)
8. Complete GSM/UTMS APN solution including service provider APN, routers, link to TMC and securely provisioned SIM cards with voice/data contracts.
9. All related software applications
10. All related software licenses

It is important to note the overall objective of the TMC goes beyond the PTMS system. Other systems and role players directly involved in the TMC include (but are not limited to):

1. Urban Traffic Control (UTC)
2. Integrated Fare Management Systems (IFMS)
3. Vehicle Operating Companies (VOC)
4. IRPTN Station Management Services
5. Information Systems (IS)
6. Metro Police (crime surveillance)
7. Traffic Surveillance
8. Emergency and Medical Services (EMS)

The PTMS Contractor shall liaise with and cooperate with any and all other contractors and/or role players involved in the TMC to guarantee seamless integration of all systems within the respective required programmes.

8.3 General systems requirements

The following shall apply:

1. A server-client architecture shall be implemented in the TMC.
2. All servers/services provided by the Contractor shall be integrated with, and shall be part of existing IT and Security infrastructure.
3. Client will be responsible for all network security management including any new servers provided by the Contractor.
4. Central site servers, client workstations, storage and backup shall be installed in a designated location at the TMC.
5. All systems and devices shall allow only authorized users access.
6. The system shall provide access control based on the establishment of groups, users and roles'
7. Groups, users and roles shall be assigned during system implementation as directed by the client.
8. User access levels shall be configurable such that different people and positions have access only to selected features and data as decided by the client.
9. A minimum of 5 levels of access shall be allowed.
10. A minimum of ten groups shall be provided for.

11. It shall be possible to assign each user a unique identification and password, or assign a unique identification and password for each group, at the client's discretion.
12. The system shall include flexibility to add new groups, roles and users, redefine groups and roles, and reassign access permission as part of normal system operations.
13. Access permission shall be assigned by the System Administrator.
14. All system access shall be logged.
15. All hardware and software supplied under this Contract shall be approved by The client prior to procurement.
16. The system shall have the capability of hardware and software extension to include new or additional features.
17. The system shall be designed to migrate to updated versions of hardware and software operating systems.
18. Any faults or errors that occur during the automatic conversion or transfer of data either within internal subcomponents of the central system, or from external data sources to internal subcomponents, shall be logged and critical operational items automatically emailed to a predefined client email distribution list.
19. The system shall support at least 3 separate displays per workstation.
20. The system shall be designed for continuous operation without the need to manually "reboot" computers or devices. Scheduled automated reboots are acceptable, provided that such reboots shall not be required more than once in a 24 hour period. Such scheduled reboots shall be outside operating hours.
21. System availability shall be 97% or better, measured monthly. For central systems, availability shall be determined by dividing total out-of-service time by total operating time. Out of service time shall include system maintenance that occurs outside of the normal maintenance window.

8.4 Electrical requirements

1. All equipment installed in the TMC shall operate from a nominal line voltage of 230 VAC, within voltage tolerances of +10% to –20%, and a frequency range of 47 Hz to 53 Hz without equipment damage.
2. Electrical supply will be provided by the client. The PTMS Contractor shall liaise and cooperate with the control centre contractor to ensure the provision of electrical supply points. The PTMS contractor shall be responsible for the terminations at these supply points.

8.5 Environmental requirements

The following shall apply:

1. Floor space in the server rooms will be made available to the Contractor for installing the necessary hardware.
2. Equipment shall maintain specified performance while operating in a controlled environment of +5°C to +33°C, relative humidity (non-condensing) less than 90% at 33°C for both intermittent and continuous periods.
3. Equipment shall maintain specified performance after being stored, non-operating, in a temperature environment of –10°C to +50°C and shall maintain

specified performance after storage exposed to a relative humidity of 90%, non-condensing, at +50°C for both intermittent and continuous periods.

4. All computer equipment shall have a minimum 10 000 hours mean time between failures (MTBF).

8.6 Hardware and operating system requirements

8.6.1 Operator workstations

Power efficient operator workstations shall be supplied, installed and configured under this contract.

The final type of operator workstations and their flexibilities will depend on the functionality of the supplier's software and will be determined after approval from the client.

Operator workstations shall be used for at least the following:

1. Schedule planning
2. Public transport operations and management incl.
    a. Vehicle Tracking and Automatic Vehicle Location (AVL)
    b. Compliance Monitoring (CMS)
    c. Text and voice communications
3. Reporting of monitoring and compliance functionality
4. Management of Passenger Information Systems (PI)

For the purpose of tender the workstations shall have the following minimum specifications:

a. Intel Pentium based
b. CPU: Intel I7 or latest available; min. 3 GHz
c. Main memory: min. 32GB
d. HDD: min. 500 GB hard disk
e. Housing: Floorstand
f. Sound card
g. Gigabit LAN Ethernet connection
h. Graphic card for multi-monitor operation (at least 2 monitors shall be accommodated)
i. 2 x 24 inch TFT monitors with LED backlight
j. Wireless keyboard
k. Wireless mouse/navigation devices
l. Cabling and sundry material
m. All other equipment or software for a complete and fully functional system.
n. Operating system: Latest version of Windows for client workstations after approval from the client.
o. Email client: MS Outlook

The Contractor shall supply, install and configure the operating system, email client and standard MS Office components as well.

8.6.2 Servers

All server hardware and software shall be compatible with existing infrastructure. All server hardware and software shall be approved by the client before procurement.

Remote server management shall be supported using Lights Out Management (LOM) tools such as Integrated Lights Out (iLO) equivalent or better.

Setup and configuration of all servers shall be done by the PTMS Contractor and shall include all operating systems and/or relevant software for a fully functional system.

All servers, wiring, network, back-up power/filtering units shall fit within supplied 19 inch racks, and all wiring shall be clearly labelled and physically supported using support devices that are compatible with the supplied racks. Plans for rack layout shall be submitted in advance for approval by client.

Servers shall be at least 3U high.

Server units shall have 1U spacing between servers after installation in the rack.

Virtual servers shall be installed, unless the Contractor specifies that certain servers cannot be virtualised, in which case discreet servers are acceptable.

8.6.2.1 Discrete servers

For tender purposes, it is anticipated that the servers listed in this section cannot be virtualised and discrete servers are required.

At least the following servers shall be supplied, installed, setup and configured under this contract:

1. PTMS database server*
2. PTMS applications server
3. Device communications server
4. Vehicle Configuration Manager (VCM) server
5. Backup server
6. Any other server required for a complete fully functional PTMS system.

* The PTMS DB server shall meet the following minimum requirements:

1. CPU: Intel Xeon; min. 2.5 GHz
2. Main memory: min. 128GB
3. HDD: RAID 5 Configuration with minimum 2TB capacity partitioned for OS and Data (upgradable to 5TB)
4. Dual Gigabit network ports
5. Windows Server 2012, or latest available, with latest service packs
6. VMware vSphere with High Availability (HA) – release 6.0 or later
7. Hot swappable disk drives
8. Hot swappable power supply
9. Hot swappable fan

All other discrete servers shall meet the following minimum requirements:

1. CPU: Intel Xeon; min. 2.5 GHz
2. Main memory: min. 64GB
3. HDD: RAID 5 Configuration with minimum 500GB capacity partitioned for OS and Data (upgradable to 5TB)
4. Dual Gigabit network ports
5. Windows Server 2012 or latest available, with latest service packs (R2)
6. VMware vSphere with High Availability (HA) – release 6.0 or later[#]
7. Hot swappable disk drives
8. Hot swappable power supply
9. Hot swappable fan

[#] VMware vSphere with HA is excluded from the web server and the backup server.

The following servers shall have hot standby servers.

- PTMS database server

- PTMS applications server
- Device communications server
- Vehicle Configuration Manager (VCM) server

8.6.2.2 Virtual servers

Where possible servers shall be virtualised. It is anticipated that the following servers can be virtualised using one or two hardware units.

1. Virtual servers include:
   a. Reporting server
   b. Passenger information server
   c. Scheduling and planning server
   d. Voice over IP (VoIP) server
   e. Intranet server (incl. file server)
   f. Any other virtual server as possible or as may be required

The physical servers for the virtual servers shall meet the following minimum requirements:

1. CPU: Intel I7 or latest available; min. 3.4GHz
2. Main memory: min. 128GB
3. HDD: RAID 5 Configuration with minimum 2TB capacity partitioned for OS and Data (upgradable to 5TB)
4. Dual network ports
5. Windows Server 2012 or latest available, with latest service packs (including number of required instances for every virtual server)
6. VMWare vSphere with High Availability (HA) – release 6.0 or later
7. Hot swappable disk drives
8. Hot swappable power supply
9. Hot swappable fan

The Contractor shall identify any other servers which can be virtualised or not and shall inform the client accordingly.

8.6.3 Data and backup storage

The following shall apply:

1. Backup storage media, drives, and software shall be provided for the servers as listed in 8.6.2
2. Disk mirroring and other techniques shall be utilized to minimize loss of data in the current configuration data.
3. This media shall be Network Attached Storage (NAS) architecture, subject to approval by client.
4. The Contractor shall provide sufficient media to provide server storage and backup capacity as follows: NAS architecture with 20TB storage, upgradable to 200TB.
5. The Contractor shall provide all required hardware and software for accessing archived or backed up data.
6. Permanent archiving of certain data (to be agreed upon with the client) shall be done at an interval to be agreed upon with the client.
7. Disk capacity shall be sufficient to store the applications, maps, data and associated files required for the operation with 100% expansion capacity.
8. Data storage shall be of RAID 5 array configuration or similar approved by the client.

8.6.4 Network Switches

The PTMS contractor shall supply, install and configure two network access switches in the TMC. The core switches in the TMC and in all stations along the route shall be installed by the communications contractor.

These network access switches shall in the final topology be used for the connection of client workstations and IP telephony devices only. However, in the initial phase of the project they shall be used as a dual function interim core and access switch with both servers and workstations connected.

The TMC Network access switches shall be Layer 3 switches and shall support at least:

- IPV4 and IPV6
- Network Access Control (NAC)
- 802.3at (for PoE switches)
- Slots for four uplink (GE or 10GE) Modules
- Dual redundant, modular power supplies and fans
- IPV4 and IPV6 routing, multicast routing, advanced QoS and security features in hardware
- Baseline Enterprise access Layer 3 switching features
- Virtual Routing and Forwarding (support for multiple VPN's with overlapping IP addresses)
- SNMPv1/2/3

Switches shall be approved equivalent to or better than:

- Cisco 3850 (IP Base feature set) with 48 PoE 10/100/1000 Base-T ports and 4 slots for uplink modules.
- GE or 10GE SFP modules as listed in the Pricing Schedules

The contractor shall ensure sufficient port count on the switch and make a recommendation to the client during detail design if the proposed switch does not suffice.

The Contractor shall liaise with the Communications contractor and/or client regarding network design and required switch configuration including VLAN, Port and IP address allocation.

8.6.5 Firewall

A firewall shall be supplied, setup, configured and installed. This shall be of type Fortinet FortiGate-200B or better or equivalent approved. The firewall shall have routing capabilities.

8.6.6 Equipment Racks

The Contractor is reminded that installations shall comply with the requirements set-out in Section 7.2 point number 2.

The exact cabinet to be installed in the TMC shall be determined during the detail design stage. The following cabinets shall be considered and priced by the Contractor.

Patch/Active component racks - 43U 600 x 1 000	43U floor standing - 600mm wide x 1000mm deep. Rack to have 2 x 5 way dedicated power distribution unit with one circuit breaker per unit, 4 fans, a 300mm cable tray installed vertically within rack for cable reticulation. Front and rear doors to be perforated. Plinth & Removable sides
Patch/Active component racks - 43U 600 x 1 200	43U floor standing - 600mm wide x 1200mm deep. Rack to have 2 x 5 way dedicated power distribution unit with one circuit breaker per unit, 4 fans, a 300mm cable tray installed vertically within rack for cable reticulation. Front and rear doors to be perforated. Plinth & Removable sides

Furthermore, the cabinet shall comply with the following:

- Lockable Perforated door
- Lockable swing frame
- Lockable and removable sides
- Integrated cable management system
- All doors of the cabinet shall be able to close after cable installation has been done

The racks shall be equipped with Ethernet-based KVM console switches with sufficient ports to handle all servers supplied. A 1U 19” rack-mount monitor / keyboard shall be supplied in one of the racks to manage the servers.

Additionally one rack shall be equipped with an environment monitoring device (eg NetBotz or equal approved equivalent) allowing at least humidity, temperature and door contacts to be remotely monitored. Other requirements, including but not limited to cabinet placement, layout, patching, labelling, etc. shall be according to the standard specifications of the client.

8.6.7 UPS

The client computer room will have full UPS and generator power backup available, however there are occasions when this equipment is taken down for maintenance purposes. To provide backup during these periods a small UPS shall be installed in the 43U racks to meet the following requirements and specifications:

Item	Specification
Capacity	7.5 kVA single phase 230V AC
Backup time	60 mins
Operating modes	Full on-line with manual bypass
Mounting	Rack mounted
Monitoring	Integrated network port with monitoring, alarm and logging software

8.7 Software requirements

The following minimum software shall be supplied, installed and configured as part of this contract:

1. Operating systems and database
    a. Windows 10 Professional or Linux or equivalent approved (to be included with all workstations)
    b. Windows Server 2016
    c. MS SQL Server (preferably Server 2016) or approved equivalent.
    d. PTMS database (ODBC or OLE-DB compliant relational database engine) or equivalent approved
2. Applications
    a. Vehicle Configuration Manager (VCM)
    b. Schedule planning system (Option)*
    c. Compliance Monitoring (CMS).*
    d. IP Phone Communications
    e. Backup
    f. Antivirus for all servers and desktops
    g. Applications to setup, configure and for real-time interaction with Passenger Information Systems (PI).*
    h. Any other applications required for a fully functional, fully integrated PTMS system.
    i. Standard Windows applications, e.g. MS Office, MS Outlook, Internet Explorer, etc. or equivalent approved (included in Hardware pricing)
    j.

    *As specified in Section 8.10.

8.8 Licenses and software (SW) support

The following shall apply:

1. All Software licences shall be in the name of client such that any proprietary rights in respect of such Software licences vests in the client.
2. All licences shall be once-off licences and shall be valid indefinitely.
3. All version upgrades and support for five (5) years from date of issue of Taking over certificate shall be included in the initial software licence pricing. Software support shall include at least the following:
    a. All SW updates in full and bug fixes.
    b. Major functional updates at substantially discounted prices.
    c. Hotline and support number.
    d. E-mail support.
    e. Online technical forums
4. The license key shall not be node-locked to hardware (i.e. a floating license shall be supplied).
5. A floating license shall provide full functionality of the applications and database to at least 10 clients and shall be upgradable to an unlimited number of clients.
6. All applications shall be supported by a comprehensive software support and management system including change control, bug tracking, priority levels etc. This can be of the type FogBugz, equivalent or better.
7. Major new releases of software applications shall be backwards compatible.
8. Previous releases shall be supported for at least 3 years since date of new software release.
9. All software applications shall be installed automatically through an installer file which will do all required installation and configuration for the SW to operate on the required platform.
10. No manual installation shall be required to install the application such as copying of certain files to certain locations etc. Installation shall be a completely automated process.
11. The Contractor shall place the source code for all custom or purpose developed software and associated design, installation, user and support documentation (the Escrow package) into Escrow, within 30 (thirty) days after the Taking Over Certificate has been issued.

8.9 Vehicle Configuration Manager (VCM)

The following shall apply:

1. The VCM server shall be setup, installed and configured at the TMC.
2. The VCM shall download data from the control centre to the buses (e.g. schedules, announcements, etc.) and shall manage the upload of data from all on-board devices (except CCTV) to the TMC.
3. The VCM-vehicle data download/upload shall take place via the cellular 3G/4G/LTE data network.
4. VCM applications shall allow definition of at least 5 different user groups with configurable privileges.
5. The VCM user interface shall be web based.
6. If the upload or download procedure is interrupted (e.g. if the vehicle modem loses cellular data signal) the upload/download shall pause and resume automatically. In

the event that any upload or download procedure was not successfully completed the operator at the TMC and/or depot shall be notified of this.

7. The VCM shall provide full configuration management of all vehicle OBU's including display of current configuration status and the facility to schedule configuration updates to take place at a future date/time.

8.10 PTMS Central system

The PTMS central system refers to all systems, sub-systems, hardware, software and processes implemented in the TMC to have a fully functional, fully integrated PTMS system according to the scope stated in Section 1. All components of the PTMS central system shall be web based allowing thin clients to exist at various different locations.

The PTMS central system is dynamic and a core requirement is that the system shall be designed for optimisation in the future rollouts, addressing:

1. Schedule planning (Option)
2. Automatic Vehicle Location (AVL)
3. Compliance Monitoring (CMS)
4. Reporting System
5. Passenger Information Systems (PI)

Planning data shall be an input to the Compliance Monitoring System. Information shall be exchanged between the Compliance Monitoring System and Passenger Information Systems (PI). Reports shall be generated to evaluate system performance against objectives upon which existing planning can be adjusted or new planning initiated. Each of the four process elements in the figure above will be described in the following sections.

8.10.1 Schedule planning system functional requirements

A schedule planning system is included in the specification and pay items but tenderers should note that the client reserves the right to exclude this item form the scope of the PTMS contract.

The schedule planning system deals with pre-defined scheduling and system planning.

The Contractor shall cooperate with the client and any other relevant role players to setup and configure the planning system. A minimum list of design and configuration tasks has been specified in Section 5.2.1. The schedule planning system shall include but not be limited to modules for:

1. Setting up and configuration of schedules.
2. Schedule publication to timetables including a schedule documentation configuration and printing module (map and time table module). It shall be possible to issue schedules electronically as both data tables and published schedules in a variety of formats including but not limited to .xls, .pdf.
3. Vehicle scheduling including timetable management, specification of blocks, trips, unproductive trips etc.
4. Duty scheduling. This shall include customisable parameters, for e.g. shift times, break times, preparation times, salary requirements for overtime, public holidays, etc.
5. Duty scheduling optimisation.
6. Bus and driver dispatching.
7. Driver work instruction.
8. Export of schedule, route/stops and planning data to CMS module.
9. Export of schedule, route/stops and planning data to Automated Fare Collection (IFMS) system (IFMS to be provided by others). Close coordination is a key requirement to ensure efficient data exchange between the systems. The following shall apply:

a. The PTMS Contractor shall ensure, to the satisfaction of the Engineer that data is provided to the IFMS system in the data format and/or data standard required by the IFMS system.

b. It is the responsibility of the PTMS Contractor to determine what this format and/or data standard is.

10. Export of schedule, route/stops and planning data to Google Transit.

The schedule planning system shall include a graphical user interface. During setup of schedules, the system shall warn and/or not allow unrealistic scheduling. Some examples are over-scheduling of buses or drivers, assigning one driver to two buses at the same time, scheduling buses which are in service, scheduling drivers which are on leave, etc.

Schedules used on the system should be able to distinguish Weekdays, Saturdays, Sundays and Public Holidays as well as Event days.

A schedule naming convention shall be agreed upon with the client. Such a naming convention shall use version numbers and other information to avoid confusion, ambiguity, duplication, etc.

Before a schedule is issued for operations purposes, it shall be approved by the client. A process for approval shall be agreed upon with the client.

Historic schedules shall be backed-up in an industry standard format, i.e. there shall be a complete record of all historic schedules.

8.10.2 Compliance Monitoring System (CMS)

The system shall be capable of importing vehicle schedules from 3rd party public transport vehicle scheduling systems. Tenderers shall provide details of which scheduling systems are supported and the data standards applicable to the imported schedule data.

All routes shall be identified by a unique number and include start, end and all way points.

The CMS system deals with real-time scheduling, schedule adherence and dispatch changes.

8.10.2.1 Monitoring and Compliance Functionality

The following shall apply:

1. The Compliance Management System (CMS) shall include but not be limited to functionality for:
   a. Import of schedule and planning data from the schedule planning system (batch process)
   b. Automatic Vehicle Location (AVL) - updated every one minute with real time map display
   c. Route and schedule compliance monitoring and management
   d. Exception and deviation alarms and reports
   e. Interface with mobile passenger information systems (refer to clause 8.10.2.7)

2. The Compliance Management System shall aid controllers/dispatchers to manage the fleet and shall include GIS mapping, historical reports and real time alerts.

3. At least the following monitoring and compliance reporting functionality shall be allowed for:

   a. Driver identification by means of driver tag or log on
   b. Measurement and reporting of travelled kilometres – productive and unproductive (dead mileage)
   c. Route compliance monitoring with route deviation alarms and reports

   d. Schedule compliance monitoring with schedule deviation alarms and reports (compliance tolerances to be user configurable)
   e. Identification of Did Not Operate (DNO's).i.e. routes and trips that did not take place based on schedule.
   f. The detection and allocation of a particular vehicle to a particular route and trip shall preferably be automatic, using key way points and time windows and including the detection of alternative vehicles taking over a route after a breakdown. The Tenderer shall fully describe the process where a vehicle is associated with a route.

4. The system shall notify client and/or the BOC automatically of significant service disruptions, such as unusual delays, reroutes, missed trips or alarm activated. The criteria to determine "significant" shall be configurable by client and/or the BOC.
5. The Compliance Management System stop and station database (including stopping points) shall utilize a stop identification numbering system as assigned by client.
6. A single integrated software application is preferred. If different applications are proposed then there shall be complete and simple integration between the applications.
7. The CMS system shall allow for multiple operators, including thin clients at multiple locations over the Local Area Network (LAN)/Wide Area Network (WAN).
8. CMS functional capabilities shall be the same or configured differently based on access privileges across all operator workstations and thin clients provided for the system.
9. The system shall to track/keep record of the actions of each controller automatically and provide a daily, weekly, monthly report that can be send to the client's officials or other interested parties.

8.10.2.2 User interface

1. The CMS shall provide at least the following basic views:
   a. Map displays (allowing for multiple map windows and zoom settings).
   b. Route displays (strip-line type diagrams) indicating vehicles in relation to stops along a route.
   c. Lists & tables of delays, re-routes (for work assigned to operator or bus-specific)
2. The operators shall be able to select and view one or multiple vehicles in real-time. Upon selection the following information shall be available; date, time, speed, direction, route, schedule information (e.g. schedule adherence) and vehicle and driver identification.
3. The CMS shall provide representation and management of fixed route services by the following:
   a. Route - refers to a series of stops with a start and end point
   b. Trip - refers to specific one-way travelling of a bus related to start/end times along a route
   c. Route Variant - refers to the series of points that designate a particular path or paths that define the route variant or pattern.
4. The CMS shall display vehicles via coloured icons displayed in a map view (as well as vehicles indicated in a list).
5. Vehicle icons shall clearly indicate position in relation to the map and direction of travel. A minimum of 5 vehicle icon types shall be available for configuration. Clicking on the icon shall provide additional details relating to the bus & status.
6. Vehicle icons shall allow for the display of vehicle status such as:
   a. In-service and on-schedule (by a configurable period)

b. Behind schedule (by a configurable period)
c. Running early (by a configurable period)
d. Emergency/panic alarm activated
e. Off-route (by a configurable distance)

7. Operators shall be able to call up “flags” noting vehicle IDs, operator name, trip number, bus number, and route number.
8. The CMS shall provide tables displaying all current schedules by route.

8.10.2.3 CMS map display requirements

1. The system shall provide a usable map display (e.g. Google Transit Maps) which will indicate typical background features (boundaries, roads, parks ...etc.) as well as stations, depots, layover areas, transfer points and other required points.
2. The tenderer shall indicate whether the maps are/can be optionally cached on a local server to avoid slow internet problems.
3. The operator shall optionally be able to centre a map view on a vehicle or track a vehicle by:
   a. Selecting the vehicle on the map display
   b. Entering the vehicle, operator ID or trip/route number
   c. Selecting the vehicle from a list of vehicles

8.10.2.4 CMS real-time status

1. The location of each bus shall be updated at the TMC at least once every 30 seconds. It shall be possible to configure this update interval from the TMC. The update period shall not be affected if the number of buses increases.
2. Whenever a bus departs from a stop, the system shall log the departure in the TMC.
3. The CMS system shall allow the operator or dispatch supervisor to adjust the thresholds under which a vehicle is considered:
   a. Running early – by number of minutes
   b. Running late – by number of minutes

   The default criteria for “running late” shall be configurable in minutes behind schedule.

   In addition, the CMS shall provide a separate configurable “late” parameter specifically to support public transport and other needs.
4. The system shall display the average speed of the vehicle along the route.

8.10.2.5 Text and voice communications with driver

The following shall apply:

1. The proposed solution shall offer two-way communication from the client Traffic Management Centre (TMC) and depots to the driver via the OBU (specified in Section 9.5) and driver terminal, microphone and speaker.
2. The functionality proved shall include:
   a. Voice communication – hands-free (request to talk)
   b. Text communication – two-way text messaging shall use GSM data, with SMS as a fallback

c. Driver alerts/messages

d. Driver panic / duress / emergency button (AVL function)

e. Driver schedule assistance – ahead or behind or schedule indicator, route and schedule display

f. Driver navigation assistance – e.g. in case of route deviation (optional requirement)

3. The driver shall not be able to send messages while driving.
4. When an operator receives a text message from a bus driver the system shall display the driver's name, employee number, trip number, bus number, route number, route variant, route direction, vehicle location, and the time of the message.
5. Voice communications shall be initiated by the TMC and/or other locations, but may be requested from the driver through the push of one soft button on the driver device.
6. All voice communication shall be recorded and stored at the TMC for a period of 30 days.

8.10.2.6 Remote access

Authorised personnel shall be provided with remote access to the CMS via web interface. The system shall also support expansion of this functionality to other users as directed by the client.

Remote functionality shall include, at minimum:

a. Text messaging
b. Service summary displays
c. AVL map/vehicle status displays

8.10.2.7 Data transfer and interfacing to other systems

1. The system shall provide data transfer capabilities in order to load schedules and other data required from flat files or web services and to be able to send real time and other data to support systems. Full details shall be provided on the clauses below, with the tender reply.
2. The system shall provide for the import of:

   a. Geo-coded stop and route mapping data using industry standard file formats.

   b. static timetables and bus schedules

3. The Tenderer shall indicate whether his system can interface to other 3rd party tracking systems.
4. The system shall include a data interface for third party public transport passenger information systems including next bus arrival information signs at stops, internet-based real-time bus arrival and display systems, and interactive voice response systems keyed to specific stops.

   The interface shall supply data in an XML format which shall include at a minimum:

   a. Real-time vehicle location information (absolute or relative to stops) along with bus ID, route number, trip number, and trip number

   b. Real-time schedule variance

   c. PT system time

   d. Service changes, re-routes and suspensions

   e. Delays or disruptions noted by operators.

   f. Outputs – real time bus locations, departure details from stations,

5. Tenderers shall confirm compliance with and availability of API's for:

   a. GTFS: General (Google) Transit Feed Specification
   b. SIRI: Service Interface for Real Time Information

6. The successful Tenderer shall make provision to supply an Interface Control Document describing the data and message format, content ranges, the agency which details of the format and structure of this data for integration with other systems. client shall have full rights to release this information to third party contractors including Google Transit.

8.10.3 Passenger Information Systems (PI)

The Passenger Information Systems deal with providing the travelling public with accessible, relevant real-time public transport information and are essential to enhancing the user experience.

The aim of the IRPTN project is to provide PI via mobile devices using smartphone applications and USSD services for legacy devices. The client will initiate website which will provide the public with all travel information relating to the IRPTN.

The following shall apply:

1. The tenderer shall indicate whether his system provides any existing mobile PI apps and provide corresponding details and costs on these. The target devices are Android however the tenderer shall indicate what additional operating systems are supported.
2. A requirement of the system is that data be available for a mobile solution. This shall include at least the following:
   a. dynamic time tables showing departure times of the next three buses updated in real time
   b. alerts e.g. service disruptions
3. A further requirement of the system will be to provide (1) Passenger Information Displays (PID) on the trunk stations showing bus arrivals/departures (2) PID on board the trunk buses indicating next stop.
4. The data transfer requirement to 3rd party passenger information systems is specified in 8.10.2.7 above
5. The PI System shall utilise robust predictive real-time bus arrival and departure time algorithm(s) that continually track, compile and recalculate predicted bus arrival / departure times based on vehicle location, heading (i.e., direction), speed, and other factors such as known causes of recurrent traffic delays along the route.
   a. The system shall monitor each bus on each route independently and calculate arrival times at each stop along the route. The arrival and departure algorithm(s) shall consider real-time conditions and historic average arrival and departure data to improve accuracy in the predictive function.
   b. The PI system shall not be dependent on pre-defined schedules in order to function. e.g. the monitoring and prediction algorithms shall work even if vehicles run headways without schedules loaded into the PI system.
   c. Where schedules are set up and loaded these shall be published via the PI system. Departure times shall be overwritten by the real-time predictions as these are calculated by the algorithm(s).
   d. Fill-in buses (extra buses placed on a route) and special event buses that are without defined schedules shall be monitored by the predictive algorithm and included in the PI data and displays.

8.10.4 Communications to station platforms and buses

Under certain conditions to be determined by the PLM, it shall be possible to:

1. Make live voice announcements to all platforms of any/all stations directly from the control centre.
2. Make live voice announcements to any or all buses directly from the control centre.
3. Make pre-recorded scheduled announcements to all platforms of any/all stations directly from the control centre.
4. Make pre-recorded scheduled announcements to all buses directly from the control centre.
5. It shall be possible to make live and pre-recorded announcements to either one entity at a time or to a selected batch of entities.

8.10.5 Reporting System (RS) requirements

The following minimum general requirements shall be met.

1. The system shall provide a flexible, user configurable, reporting capability with pre-defined reports including:
    a. Daily/monthly bus movement report (departure/arrival times at stops, driving time, driver)
    b. Daily/Monthly driver movement report
    c. Daily/Monthly PT events report
    d. Route compliance report
    e. Km travelled report (including productive Km and unproductive Km)
    f. Schedule compliance report (with filters for vehicle/driver & route)
    g. Contract management and payment report
    h. Did not operate (DNO) report
    i. Reports on text messages developed in and sent through the CMS system.
    j. System fault reports by type, time of day, duration and repairs.
    k. Report on communications activities and interruptions between the CMS system and the vehicles
2. The Reporting System module shall interface and integrate with the Compliance Monitoring (CMS) system.
3. Reporting functions shall be supported from all system workstations for an unlimited number of workstations.
4. The system shall utilize a commercial off-the-shelf reporting utility capable of producing standardized or regular reports, as well as custom reports to be agreed with client. The utility shall include ASCII, delimited text file, XML (eXtensible Markup Language), DBF (dBase file extension) table export capabilities. It shall be possible to generate and/or convert reports to CSV, MS Excel and pdf formats.
5. The RS module shall provide a means for client staff to develop and generate customized reports. It shall be possible for client staff to develop daily, weekly, monthly, quarterly, and annual customized reports. Contractor involvement shall not be required to generate new, customized reports. However, during training on reports development, the Contractor shall assist the client in the development of up to twenty (20) custom reports in addition to the reports listed in 1a. to k. above.
6. All reports shall be easily accessed, viewed, and printed from workstations with reporting software by selecting the reports from a list, menu, or other standard windows method.

7. Reports shall be available in text, xls, doc and pdf format.
8. The Contractor shall indicate in his program when the reports are to be developed, however it is a specific requirement that the Km travelled report is available from the very first trip of each vehicle after the OBU has been installed. Driver log on shall not be mandatory for the recording and reporting of travelled km.
9. All reports shall be submitted to the client and/or others for approval. The client reserves the right to request changes to reports to include all required information, comparisons, etc. as required. Other reports and requirements

Other requirements

1. The system shall provide the capability to query off-route exception data by ranges of dates/times, day of week, route, route variant and trip number, bus operator, etc.
2. The system shall include the ability to record actual bus pull out times compared to the route's scheduled pull out time, and actual bus pull in time (at the end of the route variant and trip) compared to the route's scheduled pull in time. The system shall also document bus number, assigned route/route variant number, trip number, and bus operator name and run linked to the record of pull out and pull in times.
3. The system shall record leaving and entering of depot or layover, and the deviation from the scheduled times.
4. The reporting function for text messages shall summarize and display all fields for all incidents within a selected time period.
5. The reporting function for text messages shall allow separate views and summaries for reports by message types (including emergency calls) noting the start time, end time, and resolution.
6. The reporting function for text messages shall indicate time from initiation of the message by an operator to the response to that message by the operator – separated by operator.

8.10.6 Video wall

Video wall to be procured through a separate process with a nominated sub-contractor to be appointed under this contract. A large video wall will be installed in the control room in order to display information from the PTMS system. The video wall content shall be provided from PTMS client workstations (display clients) via HDMI ports. The video wall will be procured through a separate procurement process and the successful supplier shall be appointed as a nominated sub-contractor by the PTMS Contractor. The PTMS Contractor shall be responsible for management and administration of this nominated subcontractor and shall be paid a percentage (2.5%) under Section 8 in the pricing schedule pay item 8.b. The video wall shall preferably be making use of the HD LED rear projection technology.

8.11 Additional requirements pertaining to software

1. All the software used for management and surveillance in the control centre shall be fully functional via a web interface that is accessible from any remote location.
2. All software shall be written in a common and well-known, modern, high-level, highly structured language.
3. All software shall be the latest release at the time of installation unless specifically approved otherwise by the client.
4. All software shall contain version control numbers and the Contractor shall set-up and use a software configuration management application to manage the configurations on all servers and workstations.

5. Features shall be provided to identify the software version on each device, and verify that it is the correct or most recent version for that device.
6. Software shall be organized in a modular, configurable manner to the extent reasonable.
7. It shall be possible to navigate with keystrokes in lieu of mouse action. A library of keystrokes and short cuts shall be provided.
8. Adjustable, client-specific, and configurable parameters shall not be hard-coded onto the source-code. They shall be user-modifiable.
9. Application software (both user and system) shall be portable, i.e., the source code shall be transferable to other computers using the same hardware and operating system without any modifications or use of hardware key.
10. The application software shall be reasonably scale-able to newer, higher performance hardware or operating systems.
11. Applications shall be developed with non-proprietary open standards allowing for future integration by third parties.
12. Applications shall have industry standard open Application Programming Interfaces (API's).
13. All applications shall be supported with off-line tutorials as part of operator training.
14. All application software shall be self-diagnostic.
15. All applications shall utilize typical Windows style graphical user interface conventions such as resizable windows, point and click, right click context menus, drop-down menus, toolbars, colour displays, icons, drag and drop, scroll bars, scroll wheel mouse, status bars, etc.
16. All applications shall include a user interface that is user-friendly, accessible, and intuitive for all users.
17. Passwords shall not be displayed unencrypted on displays.
18. All central system user interfaces shall have online help features.
19. The system date and time shall adjust automatically for possible daylight savings, leap year, and holidays.
20. The system date and time shall provide the same date for service times associated with a complete "Public Transport Day", where number of hours in one day is based on start and end of service regardless of service extending past midnight.
21. The system shall maintain both 24-hour timestamps and 30-hour timestamps matching the 30-hour clock used by some scheduling software if that is proposed by the tenderer.
22. Data transferred from a device or system shall not be purged or written over until at least one successful transfer is confirmed and a record of confirmation is available.
23. Features shall be provided to ensure that all system-created files are uniquely identified, and that no files are lost or missed during data transfer.
24. Verification features shall be provided to confirm that there have been no losses of data at any point in the system.
25. The system shall be capable of remote paging of software alarms, with an escalation process.
26. The Contractor shall provide a comprehensive data backup and recovery plan.
27. The Contractor shall provide a data backup system for data archiving and recovery.
28. The data backup system shall include capabilities for the client to back up data through network-wide backup.

29. It shall be possible to recover and transfer data files in the event of a primary data storage failure through a secondary standardized PC interface such as an RS-232 port.
30. All software shall be free of defects in design and workmanship, and will perform according to the specifications.
31. All software shall not contain any timers, counters, or pre-programmed devices that will cause the software to be erased, inoperable, or incapable of performing as specified.
32. All software shall contain an appropriate security and control system for protecting the software and the data from unauthorized use.
33. All software shall be free of “back doors” and all other known methods of software access that bypass the normal system security features.
34. All software shall be compatible and be able to seamlessly integrate with “Moonsoft” Software. More details available from PLK ICT department.

8.12 Fleet Management System

In his Tender response, the Contractor shall indicate the ability of his system to be used purely as a stand-alone Fleet Management System (FMS). The Municipality has a fleet of 498 vehicles for which fleet management is required including at least:

- Tracking
- Fuel consumption
- Driver behavior
- Speeding
- Harsh breaking
- Emergency notification
- Interface with control centre and operators
- View and report results
- Analyse performance data

Information to be sent via the 3G cellular network to allow real-time operations

No interfacing with a scheduling system is required and it is anticipated that the above can be achieved with a simplified and cost-effective PTMS installation.

In his Tender response it shall be made clear whether separate hardware and back-office systems are required, or if the same on-board unit will be used and if this can be hosted on the same back-office system.

Any special pre-requisites for an FMS standalone system to be installed shall be clearly stated.

It is not a pre-requisite for the PTSM system to support stand-alone FMS operations, but the Municipality would consider using the same system for both applications if possible.

The Municipality does not guarantee that any FMS implementation will be procured or installed under this Contract.

9 Detailed specification: On-board systems

9.1 Functional description

The main features required of the vehicle on board systems are as follows:

1. GPS Tracking and AVL with dead-reckoning
2. GSM/UMTS APN links to control centre for AVL/tracking and driver communications
3. Communication with driver: text and voice (via driver microphone and speaker – Bluetooth or wired)
4. Driver “panic button"
5. Voice Announcements
6. Next stop display

The following minimum on-board equipment shall be installed on vehicles under this contract.

1. PTMS on-board unit (OBU) integrated with the Main Driver Terminal (MDT)
2. Combination (WLAN, GSM/UMTS and GPS) antennae

The following equipment will be supplied under the Vehicle manufacture contracts. The PTMS Contractor shall take note of the following responsibilities of the vehicle manufacturer specified in the vehicle manufacture tender:

1. Provide space and support for equipment including a lockable, ventilated ITS compartment for PTMS and IFMS equipment
2. Provide sufficient electrical supply (in the form of an additional auxiliary battery) both permanent and switched via ignition.
3. Provide Vehicle status signals including “Ignition on”, “ Reverse gear selected”
4. Provide Odometer pulses
5. Provide interface to Engine Management Computer via CAN bus
6. Provide Door Open Switches (Left and Right) signals
7. Provide Terminal block with signals from bus systems connected to one side of these terminals
8. Provide Driver microphone (without switch) and Driver Speakers wired to terminals or Bluetooth enabled
9. Provide Saloon (passenger) Speakers wired to terminals
10. Provide External route/destination display and Internal next stop displays with controller
11. Provide Cat 6 cabling and mounting for CCTV cameras
12. Install and test all equipment listed above
13. Provide the required mounting brackets complete with the reinforcement for any of the displays that is required for the driver and possible passenger displays. This must include possible sun hoods etc.
14. Facilitate and provide access for installation of other PTMS and IFMS equipment during manufacture of the vehicle.
15. Driver duress button (covert footswitch)

The following figure shows a high level functional architecture of the on-board systems.

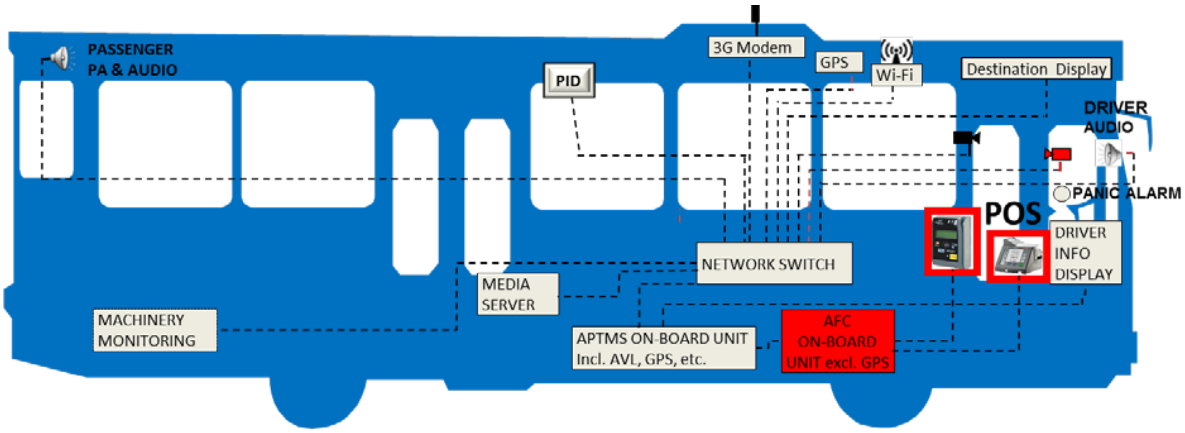


Figure 9: General high level functional architecture of on-board PTMS and AFC equipment.

The figure above is intended to aid understanding of systems to be installed on the vehicles and is not prescriptive in terms of quantities, physical locations or required components such as a separate network switch. The architecture and equipment installed on trunk and feeder buses may differ slightly.

9.2 General requirements

The following shall apply:

1. The design, functionality and layout of on-bus equipment shall consider optimal driver visibility and possible driver distraction. Layout and positioning of equipment shall be optimised by placing it in a position that mitigates driver distraction.
2. The Contractor in liaison with the vehicle manufacturer shall be responsible for determining the final location of all on-board equipment (considering point 1 above) to be supplied under this contract on each different bus type and configuration. Final equipment locations are subject to approval by client.
3. Installation of PTMS on-board systems on new vehicles shall take place on the production line during assembly of the vehicle and will be facilitated by the vehicle manufacture contractors. The PTMS Contractor shall liaise with and fully cooperate with the vehicle manufacture contractors in order to install all equipment seamlessly, efficiently and according to best practice standards and within the programme of the vehicle manufacturers.
4. In the unforeseen event that the installation cannot proceed as stated in point 3 above, the PTMS Contractor shall liaise with the client and Vehicle Operating Company (VOC) as to the best time and place to do the installation.
5. Installation of PTMS on-board systems on existing vehicles shall take place at the depots(s) when the vehicles are not in service and may entail after-hours work. The PTMS Contractor shall liaise with and fully cooperate with the client Fleet department in order to install all equipment seamlessly, efficiently and according to best practice standards and within the operating programme of the vehicles.
6. The installation of any antenna on a vehicle shall be done only after consultation with the antenna manufacturer considering installation requirements to guarantee optimum performance. As a minimum this shall include consideration for:
    a. Ground plane size
    b. Ground plane shape

c. Location of antenna on the ground plane

d. Ground plane feed point.

e. Antenna ground planes for any and all vehicles with fiberglass roofs.

7. In addition to point 5 above, the suppliers of the PTMS OBU shall confirm in writing that their equipment is fully compatible with the proposed antenna. Obtaining this written confirmation shall be the responsibility of the PTMS Contractor.

8. The Contractor shall document and report his investigations from points 6 and 7 above and shall submit the report to the client for approval. A copy of this report shall be given to the BOC. The client reserves the right to approve an antenna or to request further investigation until satisfied.

9. The antenna installation shall be water tight and sealed with a washer and with a sealant from Sika or equivalent reputable products.

10. No water shall leak through any mounting point in any way during vehicle washing or driving rain storms.

9.3 Electrical requirements

The following shall apply:

1. Specific compliance to standards shall include but not be limited to:

- SANS 10142-1:2012 (The wiring of premises Part 1: Low-voltage installations)
- ISO7637-2 Road vehicles -- Electrical disturbances from conduction and coupling -- Part 2: Electrical transient conduction along supply lines only
- SAE J1113 Conducted Immunity, 250 kHz to 400 MHz, Direct Injection of Radio Frequency (RF) Power

2. Wiring and Installation:

- Wiring/installation diagrams for in-vehicle systems shall be provided by the Contractor for all types of vehicles. These shall be submitted to the client for approval by the vehicle manufacturer and client. Installation shall not commence until these have been approved.
- All terminals shall be of the spring-loaded blade type
- Wiring shall be colour coded to assist identification of connections.
- Unless otherwise approved, all devices, cables and connectors shall be shielded and grounded.
- Wire dress shall allow sufficient slack for three additional “re-terminations” without excess tension.
- Wire splices are not permitted.
- Wire and cable ties shall not be so tight as to cause indentation and damage to the insulation.
- Adhesive-mounted bases shall not be used to support wire ties or cable supports.
- All conductors within each enclosure shall be installed free from metal edges, bolt heads, and other sharp or interfering points.
- All conductors providing connections between components shall be provided with strain-relief, and be clear of moving objects that could damage either the conductor or the object.

- All terminations and cables shall be clearly indexed, labelled and schematically identifiable according to the client standard practice.
- All wire labels shall be non-metallic and shall resist standard lubricants and cleaning solvents.
- When components must be connected to each other through individual wires, the wiring shall be incorporated into a wiring "harness," where each branch of each circuit can be separated from others for troubleshooting.

3. Overvoltage and Undervoltage:

- On-board components shall be able to withstand sustained voltage levels of up to 48 VDC for up to ten (10) minutes.
- On-board components shall not suffer corruption of data, failure or damage when the power dips below 9 VDC.
- On-board components shall not be damaged by very high (twenty [20] times nominal voltage) short duration (up to ten [10] milliseconds) peak voltage.
- The Contractor shall provide overvoltage and undervoltage protection for all equipment installed as part of the PTMS System.

4. The Contractor shall provide effective fuses, circuit breakers, power regulators/conditioners/filters and low voltage cut-out relays for all in-vehicle equipment. Fuses and circuit breakers shall clearly indicate when they have been tripped

5. Protective grounding shall be provided to ensure that all exposed metal equipment and metal fixtures are connected to a common ground point in the electrical cabinet.

6. Operation of equipment shall not be affected by electromagnetic effects present during normal public transport operations.

7. Operation of equipment shall not affect or be affected by vehicle components, such as engine ignition, or other on-board equipment including vehicle power supplies, radios, automatic vehicle location systems, fare collection systems, W-Fi communications, and on-board data collection and processing equipment.

8. Data shall not be corrupted as a result of short-term power interruptions (e.g. vehicle startup) or power down.

9. Devices shall not "freeze up" in the event that power is applied in the incorrect order (ignition sense versus continuous power on the load side of the master switch), or power is interrupted/drops during startup (e.g. from activating the vehicle ignition).

9.4 Environmental requirements

On-board equipment shall meet or exceed the following minimum conditions unless otherwise specified for specific components:

1. In general all on-board equipment shall be robust and be able to withstand the vibrations and impacts associated with poor road conditions without losing any data or without affecting normal system operation.

2. Operating Temperatures between -20° and +65°C

3. Storage Temperatures between – 30° and +80°C

4. Humidity: 0 - 98% relative humidity (condensing)

5. Shock: 30g of 6 milliseconds and up to 5g sustained

6. Operating Vibration: 1.5g RMS, 5 to 150 Hz
7. Endurance Vibration: 8g RMS, 100 to 1,100 Hz
8. Dust and Water Ingress Protection to IP 54 for all equipment inside the bus.
9. All exterior equipment shall be sealed and weatherproof to a rating of **IP 67.**
10. Inclination: 0 to 10 deg off vertical.
11. Resistance to water spray on equipment as a result of cleaning activities, industrial solvents, rain, mud, hail, snow and slush, all of which may contain salts that may come into contact with equipment.
12. All equipment mounted on the outside of a bus shall be designed for and suitably protected against exposure conditions prevalent in the area.
13. Enclosures shall include any provisions necessary to maintain the internal equipment at the manufacturer's specified temperature and humidity.
14. All parts shall be made of corrosive resistant material, such as plastic, stainless steel, anodized aluminium or brass. All external screws, bolts, nuts, and locking washers shall be stainless steel or an approved alternate non-corrosive material.
15. All external connectors shall be weather-tight and designed for use in a mobile environment subjected to dirt, water, oil, cleaning solvents and continuous vibrations.
16. The Contractor shall include reasonable provisions to protect all equipment and components from common vandalism and physical abuse as may be expected on buses and at stations in the South African environment.
17. Unless otherwise specified, all on-board equipment shall have a minimum of 25 000 hours MTBF (Mean Time Between Failures).
18. On-board equipment shall be capable of being disassembled to fit through a standard vehicle door.
19. On-board equipment shall be installed in designated compartment(s) as provided by the vehicle manufacturer (new vehicles) or Fleet (existing vehicles). The PTMS Contractor shall check and confirm if these compartments are adequately ventilated to guarantee sufficient cooling of all devices ensuring normal system operations. If not the PTMS contractor shall install additional circulation or extract fans to ensure sufficient cooling.
20. None of the on-board equipment shall experience any defects, data corruption or abnormal behaviour such as shut down, "freezing" or restart conditions due to overheating.

If the Contractor's equipment has been tested to different specifications than those defined above, the Contractor shall identify the environmental testing requirements utilized and results that were obtained. Such alternatives will be considered, but are subject to approval by the client.

9.5 PTMS On-Board Unit (OBU)

9.5.1 General Requirements

The PTMS OBU shall be a modular on-board computer acting as central processing unit with processing power required to control, monitor, and record and oversee all systems installed on the bus in real-time. More specific detail of required functionality is provided throughout this section.

The PTMS on-board unit (OBU) shall include at least the following:

1. Automatic Vehicle Location (AVL)
2. GPS including advanced algorithms such as dead reckoning
3. GSM/UMTS voice communications
4. 3G/4G/LTE modem
5. Wi-Fi subscriber unit (2.4 or 5.8 GHz (5.8 preferred))[#]
6. Ethernet network switch with at least 2 x 10/100 Mbits/sec ports (M12 connectors)
7. Driver text and voice communications with integrated microphone/speaker connections or Bluetooth capability
8. Interface to Bus Destination display controller,
9. Interface to Vehicle next stop Display (internal),
10. Automatic next stop annoucments.

[#] Note that it is a requirement that all configuration downloads to and data uploads from the OBU are to be done via the 3G/4G/LTE modem. The Wi-Fi subscriber unit on the OBU may be used in future only if a depot wireless installation is installed in future.

The PTMS OBU shall be equipped with a lithium battery that shall maintain system time for at least 5 years.

The PTMS OBU shall have a “power-down” timers that will keep the equipment operational for a configurable period of time (0-30 minutes) when the vehicle ignition is turned to “off”, This will allow the equipment to remain operational in order to complete transfer of data during this time period.

9.5.1.1 Antenna requirements

Wireless communications at different frequencies and to different devices to and from buses will require the installation of antennae on buses. For this purpose the following shall apply:

1. A three in one combination WLAN, GSM/UMTS and GPS hi performance outdoor antennae shall be installed and mounted on the bus and connected to the PTMS OBU. The preferred wireless frequency is 5.8 GHz but 2.4 GHz will also be considered.
2. The antennae shall have ingress protection of at least IP67. At least 20dB isolation between antennae is required. This antenna shall be used for all:
    a. WLAN communications
    b. GSM/UMTS communications
    c. GPS communications
3. The antenna shall have a small form factor and be mounted flush on the bus to minimise potential damage from external objects such as tree branches etc.
4. Due care shall be exercised in the installation of the antennae so as not compromise the IP rating of the antennae or the integrity of the vehicle roof. The PTMS Contractor is responsible for the correct installation of the antennae. If arrangements are made by the PTMS Contractor with the vehicle manufacturer to do the antennae installation on their behalf, this will in no way relieve the PTMS Contractor of their obligation to ensure that these antennae are installed correctly and function correctly.

5. The antennae (sample and specification) shall be submitted to the Engineer for approval prior to procurement.
6. The antennae shall comply with ICASA requirements.

9.5.1.2 Real-time requirements, processing and storage

The PTMS on-board unit shall act as the real-time central processor, data storage, and device manager for:

1. Automatic Vehicle Location (AVL) incl.
2. Main Driver Terminal (MDT)
3. Driver voice communications and text messages
4. Integrated interface for driver microphone and speakers

Real-time voice communications shall be via Voice over IP over mobile data, with a fall back to GSM/UMTS voice where no data signal is present.

Real-time data communications shall be via mobile data. The integrated GSM/3G/4G modem chip shall support the following standards and data throughputs:

- UMTS/3G/HSDPA/HSDPA+/4G LTE (850MHz, 1900MHz, 2100MHz)
- GSM, GPRS, EDGE (850MHz, 900MHz, 1800MHz, 1900MHz)
- 4G LTE: 300 Mbps
- HSDPA+: 168 Mbps
- HSDPA: 14 Mbps
- 3G: 3 Mbps
- UMTS: 384Kbps (Downlink/Uplink)
- EDGE: 236.8kbps (Downlink/Uplink

All information shall be stored until it can be transmitted to the TMC.

The PTMS on-board unit shall be configured such that collected route data may be sent via GSM/UMTS communications to the TMC and/or another location. The data reporting rate shall be customisable for both specific time and distance interval. The data shall also be capable of being communicated on an exception basis, including events related to schedule adherence, or component failure. It shall run diagnostics and report any problems with on-board PTMS components (including the unit itself). It shall automatically recognize any system process failure or lock-up and log the problem and attempt a restart.

Real time data exchange between the bus and the TMC and/or other locations is required as follows (but not limited to):

1. AVL data including but not limited to location, mileage (split between productive and unproductive trips) and speed
2. Schedule adherence
3. Text messages and voice calls via IP over GSM/UMTS data
4. Sending of emergency status
5. Device diagnostics

When bus doors close for departure at a stop, the PTMS OBU shall immediately update the departure status to the TMC.

All configuration data shall be transferred from the VCM via the cellular data network.

The PTMS OBU shall include functionality to verify the successful transmission of data to and from the TMC before purging any data records or buffers. It shall include functionality to re-transmit data in the event of an unsuccessful transmission.

9.5.2 Automatic Vehicle Location (AVL) requirements

As part of the PTMS OBU, all buses shall have an Automatic Vehicle Location (AVL) system installed, setup and configured. The following minimum requirements shall apply:

1. The AVL shall be integrated with the PTMS OBU.
2. The AVL shall provide real-time position based on GPS signal (latitude/longitude), bus speed, time and compass direction data and shall be updated on the PTMS OBU every 5 seconds or less.
3. The AVL shall provide positional accuracy of ± 5 meters, 95% of the time or better.
4. In case of lost or weak GPS signal, the AVL shall utilise certain information received from the bus systems, e.g. odometer/tachometer signal and steering direction, to determine the most accurate bus location by means of algorithms such as dead reckoning.
5. Decrease GPS polling intervals when the vehicle is stationary or switched off to save power and bandwidth requirements.
6. Provide GPS time sync to other on-board devices supplied under this Contract. The interval between time synchronisations of all devices shall be configurable.
7. Provide an arrival and departure time each time the bus stops.
8. Be integrated into the remote Compliance Monitoring (CMS) system.
9. Be able to operate as a stand-alone device without the connection of an MDT (i.e. and without driver log-on)

9.5.3 Main Driver Terminal (MDT) requirements

The MDT shall be integrated in the PTMS OBU or separate unit. The MDT shall at least:

1. Act as the user interface between the bus driver and all in-vehicle devices connected to the PTMS OBU and to the TMC and/or another location, including providing the interface for the functions of initialization, operation, and configuration of all devices.
2. Be equipped with a colour, liquid crystal display (LCD) capacitive touchscreen.
3. Have a resolution of VGA 800 x 600 or better
4. Have a screen size of 8 inches. (200 mm) diagonal
5. Have configurable soft keys.
6. Support at least 2 different language options.
7. Include functionality to display different font sizes and styles on the same screen.
8. Display both text and icon-based messages and key labels.
9. Be readable in direct sunlight and shall have a low glare/anti-glare display and be equipped with a suitable cowl to reduce reflections.
10. Have automatic low brightness setting for night time operation.
11. Contain a small speaker and tone generator to be used to provide audio alerts.
12. Shall provide at least the following information to the driver:
    - Schedule adherence information. Incorporate an audible and graphical schedule adherence display including alarms/warnings if the driver is behind or in front of schedule by a configurable period of time in 1 minute resolution.
    - Status of vehicle doors
    - Self-diagnostics and any fault notifications

13. Automatically configure and initialize itself for operation when the power is turned on with the default screen being the operator log-on screen.
14. Initialize all in-vehicle devices integrated with the PTMS OBU in a single action as the operator enters the log-on information.
15. Have a programmable interface and menu structure.
16. Utilize a hierarchical multi-page menu structure. The MDT shall include functionality to scroll through a page and switch between pages.
17. Include default (but configurable) backlight, brightness, contrast, audio and tone settings.
18. Include functionality to set audio tone types, frequencies, volume and duration through configuration data.
19. Have controls to allow the bus operator to adjust backlight, brightness, contrast, and volume settings. In no event shall such controls allow the screen to be set to all bright or all dark such that the text is unreadable.
20. Upon start-up and log-on the system shall revert to default settings for all configurable parameters.
21. Include operator log-on and log-out functions. The log-on function of the MDT shall permit the operator to initialize the system with a driver ID
22. Include functionality to select certain routes and trips.
23. Have a soft key which shall request the TMC and/or other locations to establish voice communications with the driver. For this purpose the unit shall interface to the bus PA system (to be provided by the bus supplier).
24. Provide simple access to at least 20 pre-programmed text messages that are configurable by the operators in the TMC.
25. Indicate that there are unread messages in the incoming message queue and how many messages are in that queue. The MDT shall also indicate when there are no more messages to be read.
26. Move priority messages received to the front of the queue and provide visual and audible indications that a priority message has been received.
27. Include functionality to skip a message in the queue, delete a message from the queue only after it has been displayed, or save a message to memory for long-term storage (until MDT shutdown).
28. Include a minimum three levels of critical messages including:
    a. Overt/Covert Alarm (highest priority - level 0)
    b. Emergency Services Requested (high priority - level 1)
    c. Non-Emergency Assistance Requested (priority - level 2)
29. Be configurable on a system-wide basis to provide non-priority messaging functions to the operator either at any time or only when the vehicle is below a customizable speed threshold.
30. Shall be able to display font sizes in the range of 16 to 30 point.
31. Remain active if no operator logout has occurred, until the expiration of the first power down timer (refer to Section 9.5.1) in the event the vehicle master switch has been turned to “off”, “night run” or “lights”. Once the second power down timer has triggered, the MDT shall automatically logout and shut down.

9.5.4 Automatic Stop Annunciation (ASA) and External Destination Display (EDD)

Automatic Stop Annunciations (ASA) shall be made on all buses. ASA consists of two components, namely audio annunciations and visual annunciations, both are considered in this section. In addition the Route and Destination Displays are also considered in this section.

9.5.4.1 General requirements

The PTMS Contractor shall be responsible for the control logic and communications required on the PTMS OBU and integration of components supplied by others to ensure the proper, integrated operation of all the ASA and EDD components. The PTMS Contractor is further responsible to ensure that all wiring between OBU and ASA components is correct and that the firmware on the ASA/EDD display controllers is correct for operation with the OBU.

The PTMS ASA system functionality shall include as a minimum:

1. Automated operation that requires no interaction by the driver or an operator to trigger announcements (all triggering to be set as configuration data). This shall be required to work as follows:
2. The PTMS OBU shall store bus stop and route information and compare that to the actual GPS coordinates. At predetermined distances from the next stop an announcement shall be triggered. These trigger distances shall be configurable by the back office application in the control centre. If a bus travels off-route the system shall mute all announcements until the bus returns to the route.
3. The PTMS OBU shall store route and destination information and shall update the EDD as soon as the driver logs on to a particular bock/route.
4. Announcement of transfer point and connecting route information at stops where relevant.
5. Both audible and visible messages shall begin playing within one (1) second of being triggered.

9.5.4.2 Audio annunciation

1. The following audio system components have been specified for supply and installation by the vehicle manufacturer:
    - Driver microphone (without key button). Rugged gooseneck analog microphone to be fitted overhead to allow pick up of driver voice whilst not interfering with driver field of view or controls.
    - Driver speaker mounted overhead
    - Saloon speakers (8 minimum) mounted in vehicle ceiling with not more than 3m of saloon length per speaker.

    Each speaker shall be installed a minimum of 500mm from any other electrical or electronic equipment.

    Each speaker shall be fitted with a fine plastic mesh cover plate (colour code with bus ceiling), and an acoustic / dust / drip rear cover. The speakers shall comply with the following minimum specifications:

Size (driver Speaker)	100mm
Size (saloon speaker)	160mm
Impedance	4 ohms
Type	2-way coaxial (Woofer with integrated tweeter)

Power	20W RMS
Frequency Response	55 – 20 000 Hz

The microphone and speakers shall be cabled to terminals in the ITS enclosure using minimum 1mm^2 shielded twisted pair cables or shall be Bluetooth enabled.

2. The above components shall be integrated with the PTMS OBU by the PTMS Contractor. The PTMS OBU shall act as controller and amplifier for the audio system. The PTMS Contractor shall liaise with and cooperate with the vehicle manufacturer to guarantee seamless and efficient system integration within required programme requirements of both contractors.
3. The volume of the internal announcements shall be adjustable to a standard level through configuration data. This level shall be determined during bus operation taking ambient noise into consideration. This level shall be approved by the client. It may be the same for all buses or under special conditions (to be determined by the client) it may be different for certain buses.
4. The system shall include an automatic gain control to automatically adjust interior volumes depending on interior ambient noise levels.
5. The system shall include a manual override including a minimum of five volume level settings that can be selected by the bus operator through the MDT such that the volume can be adjusted in real time by the bus driver if required.
6. The message being played shall be displayed on the MDT.
7. The system shall provide a manual override to allow an operator to cancel or manually activate an announcement.
8. Messages shall be assembled out of sound bites and shall sound like continuous recorded messages. Studio recording and pre-recording of messages shall be the responsibility of the Contractor and shall be approved by the client. The voice artist shall be approved by the client.
9. Once recorded, the Contractor shall arrange prototype messages to be approved by the client before “going live”. System testing will be conducted with computer generated sound bites, prior to the loading of voice recordings.
10. Messages shall be announced in English and at least four other official South African languages to be determined by the client. The four other languages may be different for buses servicing different areas.

9.5.4.3 Visual annunciation

1. The following visual annunciation system components have been specified for supply and installation by the vehicle manufacturer:

	Rigid & Midi bus	Articulated bus
Forward Destination Display	1	1
Side Mounted Destination Display	1	1
Internal Next Stop Display	1	2

The displays shall be controlled and managed by a single display controller which shall allow

- Input, storage and display of predefined text, messages and symbols
- Manual control vis a simple user interface on the controller

- Automatic control via a communications interface to the PTMS OBU

At least 3 portable display configuration data download devices shall be supplied.

The displays shall utilize high brightness, wide viewing angle, amber Light Emitting Diode (LED) technology. LED brightness shall be controlled by photocells installed as part of the sign.

The displays shall consist of a 2-line Amber LED matrix with a minimum sizes

Display	Minimum Character Height	Minimum number of Characters
Forward Destination Display	200mm	18
Side Mounted Destination Display	100mm	16
Internal Next Stop Display	60 mm	16

Messages on the signs shall be legible during any time of day and from any designated passenger position on the bus. If this is not possible another sign shall be installed. An additional sign shall be installed in the rear section of articulated vehicles.

The displays shall be provided with a combined display controller for all signs. The controller shall communicate with the PTMS OBU via Ethernet or serial RS 485 using a standard display control protocol.

For the internal next stop displays, the time display shall be outside of the message display area, and may be provided either through additional dot-width on the display or through a separate display module integrated into the sign housing.

The displays shall be capable of displaying upper and lower case characters with proportional fonts. Characters shall be between three (3) and five (5) dot-width, with an average (mode) of four (4) dot-width.

The display shall be capable of displaying double stroke width (bold) fonts.

The front face of the display shall be designed to minimize glare.

The background shall be black, and the display housing shall include a black border.

The position of the internal next stop display shall not block the viewing area of on-board CCTV cameras.

The signs shall have the functionality to display time and messages in the following modes, set through configuration data:

a. A single, non-scrolling or changing message.
b. A right to left scrolling message.
c. An alternating (between up to four states) message.

LED’s used in the on-board signs shall have a minimum service life of 80 000 hours in their installed configuration.

The data content to be displayed shall include but not be limited to;

- Display of the route number and final destination of the bus.
- Next stop messages giving the location and/or name of the next stop.

- Display of the current time (on a separate line).
- Display of customer service announcements and alerts.

2. The above components shall be integrated with the PTMS OBU by the PTMS Contractor. The PTMS Contractor shall liaise with and cooperate with the vehicle manufacturer to guarantee seamless and efficient system integration within required programme requirements of both contractors.
3. The PTMS Contractor shall be responsible for the communications protocols on the OBU to ensure the proper integrated operation of all the ASA and EDD components. The PTMS Contractor is further responsible to ensure that all wiring between OBU and display components is correct and that the firmware on the display controllers is correct for operation with the OBU. The vehicle manufacturer shall provide his full co-operation and assistance in this regard..
4. The data content to be displayed shall include but not be limited to;
    - Display of the route number and final destination of the bus.
    - Next stop messages giving the location and/or name of the next stop.
    - Display of the current time (shall be shown with scrolling or alternating display).
    - Display of customer service announcements and alerts.
5. All message content shall be configurable by client
6. It shall be possible to display messages in English and at least four other official South African languages to be determined by the client. The four other languages may be different for buses servicing different areas.

9.5.5 Desktop vehicle simulator

A desktop vehicle simulator shall be procured, setup and configured for use in the TMC. The simulator shall provide full on-board PTMS functionality, similar to that of a fully operational bus, but shall be installed in the TMC to test for appropriate configuration and testing of the PTMS central system, specified in Section 8.10. The simulator shall include functionality to simulate movement of one of more buses along preselected routes with variable simulated bus speeds and discreet signals for door opening and closing operations. The simulator shall be configured and connected to the PTMS central system as may be required to test full functionality of the system.

The desktop vehicle simulator shall consist of at least the following:

- PTMS On-board Unit (OBU)
- Main Driver Terminal (MDT)
- Vehicle movement simulator with variable speeds and discreet door signals
- Any test equipment required to verify appropriate output signal from PTMS OBU as necessary

9.6 Video Surveillance System (VSS)

A visual surveillance system shall be installed on all buses to deter crime and vandalism and shall support system operations.

9.6.1 General Requirements

The PTMS Contractor shall supply, configure and install the following components:

1. Two Fixed IP dome on-board CCTV cameras

9.6.2 CCTV camera requirements

The following shall apply:

1. Digital (IP based) dome cameras shall be installed inside the bus.
2. All cameras shall be fixed dome cameras positioned and configured to provide full coverage of the bus interior.
3. Cameras shall comply with the following minimum requirements, subject to approval from the Polokwane Local Municipality.
    - Fixed varifocal lenses
    - Day/night wide dynamic range with dynamic contrast
    - Mini dome enclosure
    - Rugged, high impact, vandal resistant and puncture proof domes
    - IP based with POE
    - On-board video analytics
    - H.264 video compression or equivalent
    - Minimum 1 megapixel
4. Cameras shall be setup, configured and installed to achieve clear and focused images with optimum coverage inside the bus.
5. Clear unobstructed coverage shall be provided with cameras installed in at least but not limited to the following areas:
    - Over driver's head
    - All doors
    - AFC System validators
    - Driving view from front of bus.
    - Front of bus looking towards rear
    - Back of bus looking towards front.
    - Reverse view (reverse camera)
6. All cameras shall be on and record for the full duration of all revenue trips.
7. Under normal circumstances, cameras shall at least record video at 15 frames per second at CIF resolution. Different behaviour (higher frame rate and resolution) shall be required for various event triggers.
8. Cameras will store all video data on SD card physically located on the Camera.

9.7 Driver panic/duress button requirements

For driver safety on the bus a panic button is installed by the bus contractor. This panic button shall be connected to the PTMS system and the following shall apply:

1. A driver duress button will be installed by the vehicle supplier and is specified in that contract as follows:
    - "A driver duress button shall be installed by the bus contractor. This shall be a foot operated switch, installed in the left of the driver footwell, close to the foot rest. It shall be possible for the driver to activate this switch with his left foot in a covert way, so as not to alert anyone on the bus of his action."

2. The driver duress button shall activate an emergency alarm. The PTMS Contractor shall be responsible for the integration of the driver duress button and associated cabling and hardware with the PTMS OBU and other on-board systems as required.
3. In the event of emergency alarm activation, the bus operator and/or TMC shall be notified covertly, such that the emergency signal is identifiable only by a trained operator.
4. Activation of the covert alarm shall give system response to that vehicle the highest possible priority.
5. The driver duress button circuit shall be monitored continuously for continuity, and any faults shall be reported on the MDT and provided to the bus operator and/or BRT CC.
6. The bus operator and/or BRT CC software shall display an alarm activation within 10 seconds maximum.

10 Detailed specification: Trunk stations

10.1 Functional description

The main features of the trunk station can be summarised as follows:

- Open Station
- Ticket Sales at the station at kiosk and/or vending machines (implemented through the IFMS contract). In some cases ticket sales may be located a retail outlets nearby the stations.
- Passenger infotainment displays may be implemented under a separate commercial contract.
- Passenger information displays,
- Passenger announcements.
- CCTV camera and NVR.

The following high level architecture shows typical ITS and IFMS trunk station equipment.

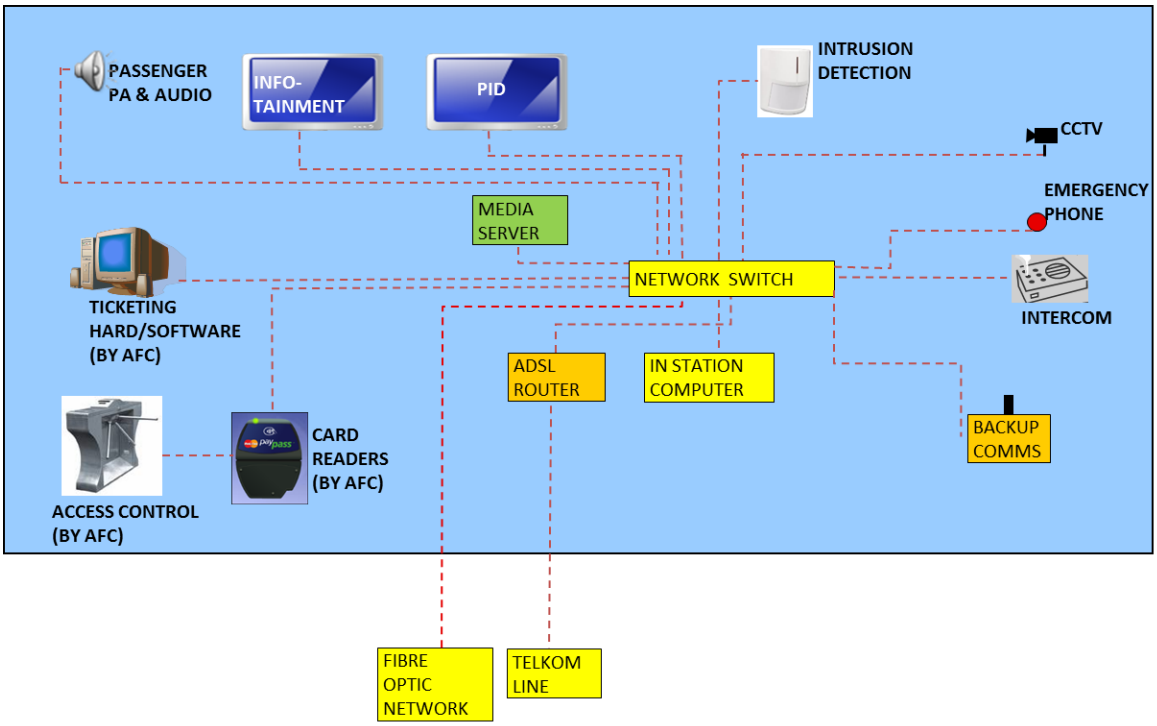


Figure 7: High level ITS systems infrastructure for trunk stations.

The figure above is intended to aid understanding of systems to be installed in the stations under this and various other contracts and is not prescriptive in terms of quantities, physical locations or required components to be installed under this contract. The architecture and equipment installed in different trunk stations may differ slightly. All Integrated Fare Management System (IFMS), ticketing, turnstile and card reader equipment shown above is not part of the scope of this contract and will be implemented through the IFMS contract.

10.2 General requirements

The following shall apply:

1. Installation of equipment in the stations shall commence as soon as access has been granted by the stations infrastructure contractor.

2. The location of all equipment in stations shall be determined after consultation with the Engineer and the client.
3. After approval from the Engineer, equipment shall be installed at optimal positions to suit their respective functionality. Where required, mounting brackets shall be designed and after approval from the Engineer and procured by the PTMS Contractor.
4. The PTMS Contractor shall adhere to any safety regulation on-site and wear Personal Protective Equipment (PPE), as and when required.
5. The trunk stations are located along the major trunk routes and are all closed stations of varying widths and lengths.
6. The tenderer must ensure that all the systems in the trunk stations are integrated and that the systems are integrated with that in the control centre.

10.3 Electrical requirements

The following shall apply:

1. All equipment installed at stations shall operate from a nominal line voltage of 220 VAC, within voltage tolerances of +10% to –20%, and a frequency range of 47 Hz to 53 Hz without equipment damage.
2. Electrical supply including UPS and battery backup will be provided by the stations infrastructure contractor. The PTMS Contractor shall liaise and cooperate with the stations infrastructure contractor to ensure the provision of electrical supply points and connection to the UPS and battery backup where required.

10.4 Environmental requirements

The following shall apply:

1. Operating Temperature: -10°C to +65°C.
2. Storage temperature: -20°C to +70°C.
3. Humidity: 0-90% relative humidity (condensing).
4. Outdoor mounted equipment which is resistant to water and solvents e.g. Water spray on equipment as a result of cleaning activities, industrial solvents, rain, mud, hail, snow and slush, all of which may contain salts that may come into contact with equipment.
5. All outdoor equipment shall be designed for and suitably protected against exposure conditions prevalent in the area, particularly heat and high humidity.
6. Enclosures shall include any provisions necessary to maintain the internal equipment at the manufacturer's specified temperature and humidity.
7. All parts shall be made of corrosive resistant material, such as plastic, stainless steel, anodized aluminium or brass. All external screws, bolts, nuts, and locking washers shall be stainless steel or an approved alternate non-corrosive material.
8. All external connectors shall be weather-tight and designed for use in an outdoor environment subjected to dirt, water, oil, cleaning solvents and vibrations.
9. The Contractor shall include reasonable provisions to protect all equipment and components from common vandalism and physical abuse as may be expected on buses and at stations in the South African environment.
10. Enclosures shall be designed to prevent entry of moisture during a thunder storm and to minimize entry of dust. The Contractor shall indicate if housings do not meet these

requirements, and shall identify any alternative provisions incorporated to protect against moisture and dust, as well as requirements for installation.

11. Unless otherwise specified, all trunk station equipment shall have a minimum 50 000 hours MTBF.

10.5 Backbone communications

The following shall apply:

1. All trunk stations will be connected to the TMC via the fibre optic backbone to be installed by the Client's contractor. (not part of this tender)
2. The Clients communications contractor will also supply a 19" equipment rack, splice the FO into a patch panel and will provide, configure and install a Layer 3 network switch.
3. This switch will support PoE and ports will be allocated for use by the PTMS Contractor. The PTMS Contractor shall liaise with the contractor to ensure there is sufficient port count and that any specific required network configuration or design is taken into consideration.
4. The PTMS Contractor shall be responsible to patch his own equipment to and from the patch panel(s) and network switch.
5. The PTMS Contractor shall provide MAC addresses for the PTMS equipment (IP Phone) and test and commission these connections with the Communications Contractor

10.6 Passenger Information System (PI)

As a minimum the following shall be priced:

1. LCD-TFT Passenger Information Displays (PID) to display bus departure times incident/delay messages, route data, schedules, synchronised time and other information.
2. Close pitch LED matrix Passenger Information Displays (PID) to display bus departure times incident/delay messages, route data, schedules, synchronised time and other information.
3. Integrated audio on demand "bus departure" announcements for the visually impaired. (Priced as a rate only item)

10.6.1 Passenger Information Display (PID) requirements

The PID shall have the following minimum features/properties:

1. Outdoor PID's shall be ruggedized outdoor display suitable for installation in harsh outdoor environments exposed to the elements with an IP rating of at least IP66. Indoor displays shall have an IP rating of at least IP 54.
2. For certain locations indoor display units may also be considered.
3. Shall be vandal resistant.
4. Include embedded computer and storage with controller and internal clock.
5. The following format and type PID's shall be priced as listed in the pricing schedules. The final selection, depending on the station size and layout, and quantities will be confirmed during the detail design stage.
    a. LCD TFT (with LED backlight) in the following sizes:
        i. 42" (1920 x 1080 pixel resolution)

6. Depending on PID location, shall have standard brightness (at least 700 cd/m^2) or high brightness (at least 1500 cd/m^2) with integrated brightness control using ambient light sensing photocell
7. Shall allow continuous operation 24/7 at temperatures of -5 degrees Celsius to 35 degrees Celsius.
8. Anti-glare protective display.
9. Integrated 100 Mbits/s network port.
10. Standard diagnostic software including but not limited to:
    a. Over temperature automatic shutdown
    b. Ambient light control – brightness and contrast adjust
    c. Control of internal voltages, backlight, fans
    d. Shall support SNMP
11. Automatic temperature/fan control.
12. Can be used in both horizontal and vertical orientations.
13. Shall be possible to use for both bus scheduling and other related bus information and infotainment such as general information provided by the client.
14. Depending on the station size and location in the station, different combinations of screens may be installed, like a single display, two back to back displays, row of screens, rows of screens back to back etc.
15. The Contractor shall provide the required brackets and mounting equipment for all possible combinations after approval from the client.
16. The PID shall include functionality to display pre-set messages and/or real-time dynamic information including next bus departures.
17. Screen layout shall be configurable. It shall be possible to define at least various sub areas on the screen with different fonts, different font and background colours, and display different objects in different areas. It shall be possible to page between different screens at a configurable pre-set time period (for e.g. every 10 seconds). Screen configuration shall not be limited to only that listed here.
18. Screen configuration with minimum options as described in point 17 above shall be possible from the TMC to a selected user group with designated privileges.
19. Final screen layout/design shall be agreed upon with the client.
20. The Contractor shall provide the initial layouts for approval by City Branding and Universal Accessibility requirements.
21. The PID's shall receive as input from the central system on an as-required basis:
    a. System management commands (e.g. system status requests, etc.)
    b. Static display information (e.g. hours of operation, bus routes, schedule, etc.)
    c. Real-time display information (e.g. schedule, next bus, etc.)
    d. Ad hoc information (e.g. time clock or advertisements, etc.)
    e. Screen configuration and layout updates (only available to user groups with relevant privileges).
22. It shall be possible to display freeform alert messages entered by operators in the TMC (or, potentially, automatically generated by the PTMS System) to advise passengers of service disruptions or reroutes. Such messages shall alternate or otherwise be displayed in concert with predicted arrival times, and shall not pre-empt

the arrival time display unless there has been a complete disruption in service to the specific station.

23. It shall be possible to display scrolling messages at the bottom of the screen.
24. The system shall have capacity to store static messages.
25. It shall be possible to display the predicted times of the next bus on each route serving the station based on information transmitted from the central system. The display shall indicate from which platform the bus will depart.
26. Clock functionality shall be synchronized to the central system time, and shall be updated on a daily basis (minimum). Between update cycles, the clock shall have a cumulative drift of no more than 10 seconds.
27. It shall be possible to display next bus departure time for at least the next three buses. Bus departures due in less than 1 minute shall be shown with a special character (configurable).
28. The display shall be updated within 10 seconds when a bus departs to clear the old information.
29. Static information or a clock display shall be shown if the communication link is lost.

10.6.2 Public Address (PA) system

The following shall apply:

1. An IP based PA system shall be installed at every station such that passengers anywhere in a station shall hear announcements clearly.
2. The PA system software in the CCC shall allow for remote monitoring, alarm reporting, configuration and remote announcements.
3. Automatic volume control shall be possible based on ambient noise detection.
4. It shall be possible to override and set the volume, base and tone of the speakers directly at the station.
5. The following shall be supplied and installed under this contract:
    a. Microphone
    b. Speakers as and where required
    c. PA amplifier
6. The PTMS Contractor shall liaise and cooperate with the Stations contractor to ensure integration of all components of the PA system.
7. It shall be possible to make an announcement in the following ways:
    a. Announcements made from the microphone in the sales kiosk.
    b. Announcements made directly from the CCC.
    c. Automatic announcements made through the APTMS system.
8. It shall be possible to configure priorities for the various announcements as specified in point 7 above.
9. It shall be possible to configure announcements to be either:
    a. Voice announcements.
    b. A sound to play indicating bus arrival.
    c. A combination of both of the above.

10.7 Safety and security systems

The PTMS Contractor shall supply, configure, install and be responsible for the following:

1. The CCTV cameras inside the sales kiosks
2. All wiring to/from cameras to/from network switch
3. All wiring to/from digital CCTV display unit to/from control units and to/from cameras

4. All safety and security devices shall be connected to the UPS and battery backup power supply. The PTMS Contractor shall liaise with the Stations contractor (who is responsible for the backup power supply) to ensure that this requirement is fulfilled.

10.7.1 CCTV camera requirements

The following shall apply:

1. Cameras shall comply with the following, subject to approval from the PLM.
   - Fixed varifocal lenses
   - Day/night wide dynamic range with dynamic contrast
   - Mini dome enclosure
   - Rugged, high impact, vandal resistant and puncture proof domes
   - IP based with Power Over Ethernet (POE)
   - Alarms and video analytics
   - H.264 video compression
   - At least 3 megapixel
   - Streaming video to the BRT CC
2. Cameras shall be setup, configured and installed to achieve clear and focused images with optimum full coverage inside the station. Clear unobstructed coverage shall be provided with cameras installed in at least but not limited to the following areas:
   - Inside every sales kiosk with view of every sales point
   - Outside every sales kiosk with view of every sales point

10.8 CCTV along the Route (optional)

10.8.1 Functional description

CCTV cameras shall be installed along the trunk route.

1. The following minimum equipment shall be supplied, installed and configured along trunk routes under this contract:
   a. *CCTV fixed IP cameras* along the entire trunk route (streaming video to control centre, recording and storage of CCTV footage at CCC).
   b. CCTV PTZ IP dome cameras with coverage of outside of stations.
   c. Miniature network switches installed at every CCTV camera.
   d. Pole top enclosure box.
   e. Camera poles will be installed along the route
   f. CCTV Cameras shall be connected to the backbone fibre optic.
   g. Spare fibres from the FO backbone cable (to be installed by the ICT contractor) shall be used.
   h. CCTV images shall be streamed to the control centre for viewing, recording and storage and archiving.

10.8.2 Electrical requirements

In addition to the requirements given, the following shall apply:

1. All equipment installed along routes shall operate from a nominal line voltage of 220 VAC, within voltage tolerances of +10% to –20%, and a frequency range of 47 Hz to 53 Hz without equipment damage.
2. The Contractor shall be responsible to find the closest power supply point, apply for connectivity, way-leaves and install cabling to every pole as and where required.
3. A backup battery supply shall be installed at every camera with at least 4 hours backup

time.

10.8.3 Environmental requirements

The following shall apply:

1. Operating Temperature: -10°C to +65°C.
2. Storage temperature: -20°C to +70°C.
3. Humidity: 0-90% relative humidity (condensing).
4. Outdoor mounted equipment, water and solvents: Water spray on equipment as a result of cleaning activities, industrial solvents, rain, mud, hail, snow and slush, all of which may contain salts that may come into contact with equipment.
5. All outdoor equipment shall be designed for and suitably protected against exposure conditions prevalent in the City.
6. Enclosures shall include any provisions necessary to maintain the internal equipment at the manufacturer's specified temperature and humidity.
7. All parts shall be made of corrosive resistant material, such as plastic, stainless steel, anodized aluminium or brass. All external screws, bolts, nuts, and locking washers shall be stainless steel or an approved alternate non-corrosive material.
8. All external connectors shall be weather-tight and designed for use in a mobile environment subjected to dirt, water, oil, cleaning solvents and continuous vibrations.
9. The Contractor shall include reasonable provisions to protect all equipment and components from common vandalism and physical abuse as may be expected on buses and at stations in the South African environment.
10. Enclosures shall be designed to prevent entry of moisture during a thunder storm and to minimize entry of dust. The Contractor shall indicate if housings do not meet these requirements, and shall identify any alternative provisions incorporated to protect against moisture and dust, as well as requirements for installation.
11. Unless otherwise specified, all equipment along the routes shall have a minimum 50 000 hours MTBF.

10.8.4 CCTV requirements

CCTV cameras requirements

1. *The fixed CCTV cameras shall comply with the following minimum specifications:*
    a. *Fixed day-night IP camera with wide dynamic range and dynamic contrast*
    b. *Outdoor ready, rugged, high impact, vandal resistant enclosure*
    c. *Alarms and video analytics.*
    d. *H.264 video compression*
    e. At least 3 megapixel
    f. *Varifocal 10 x optical zoom*
2. The PTZ cameras shall comply with the following minimum specifications
    a. IP based
    b. PTZ motorised zoom, 35x optical lens
    c. Day/night wide dynamic range with dynamic contrast
    d. Mini dome enclosure
    e. Rugged, high impact, vandal resistant and puncture proof domes
    f. Alarms and video analytics
    g. Include stored pre-set positions for quick navigation.
    h. H.264 video compression
    i. At least 3 megapixel
    j. Streaming video to the CCC

3. CCTV shall be streaming video to the CCC where footage shall be recorded, stored, archived and analysed. No Network Video Recorder (NVR) shall be required at the camera.
4. Cameras shall be setup, configured and installed to achieve clear and focused images with optimum coverage along the routes and outside the stations. Clear unobstructed coverage shall be provided with cameras installed in at least but not limited to the following areas:
    a. Approximately every 500m along the route
    b. On both sides of every station
    c. Any other area deemed critical for TRT operations or safety and security.
5. All cameras shall be on and stream video 24 hours every day.
6. Under normal circumstances, cameras shall stream video with at least 25 frames per second at HD resolution (1920x1080).

10.8.5 Video analytics and event based response requirements

The following shall apply.

1. The video analytics shall provide alarms including but not limited to the following:
    a. Loitering
    b. Human presence
    c. Each of the functions shall be configurable for multiple zones per camera
2. When an incident triggers an alarm cameras shall stream video footage at maximum frame rate and resolution.
3. During the alarm state, recording shall be at an increased frame rate and resolution (to be agreed with the City). Alarm recording shall continue for a configurable time period after which it shall revert back to a lower frame rate and resolution (to be agreed with the City).
4. An event shall cause the system to protect a customisable time segment before and after the event from automatic overwriting until a systems administrator overwrites it.

10.8.6 Pole mounted electrical/electronic enclosure, power supplies and accessories

The following shall apply:

1. The pole mounted CCTV electrical/electronic enclosures shall house the battery charger, battery, inverter/power supplies, fibre splice/patch box and all communications equipment associated with the cameras. The enclosure shall be sized to accommodate all the equipment.
2. The enclosures shall be tested to Ingress Protection Rating IP44.
3. The colour of the enclosures for the poles shall be agreed upon with the City.
4. The Contractor shall submit a sample for approval prior to manufacture.
5. The enclosure shall be fitted with a 6.3 x 50 x 200mm Cu earth bar, predrilled with holes of 6mm diameter. The door and mounting plate of each enclosure shall be bonded to the enclosure by flat Cu straps at at least 2 points.
6. All components and circuits shall be labelled. The door of the enclosure shall be labelled with the name and number of the CCTV site. The label detail shall be agreed upon with the City.
7. These enclosures shall be fitted with circuit breakers, surge arrestors (power supply, IP), terminals, wiring, brackets and sundry material to provide a complete and fully functional system.
8. All equipment and material for these enclosures not measured elsewhere shall be costed into the rate tendered for the enclosures.
9. These enclosures shall be fitted with a filtered fan, panel heater and combined hygrostat/thermostat of the type Pfanenberg or equal approved. The panel heater shall

be mains powered before the battery charger.

10. The Contractor shall design a backup power supply which will give backup power to a camera site for at least 2 days.
11. The Contractor shall supply workshop manufacturing and wiring schematic drawings for the pole mounted enclosures within 15 days of the award of the contract. Manufacturing of these enclosures shall commence only on approval of the workshop drawings by the Engineer.
12. All pole top enclosures are subject to approval from the City.

10.8.7 Pole top network switches requirements

A network switch shall be installed in the pole top enclosure and the following shall apply:

1. Miniature Gigabit network switch.
2. The switch shall be Moxa EDS P510A-4PoE approved equivalent or better.
3. 2 x Gigabit ports
4. 10 x 10/100 MB ports

10.8.8 Splicing requirements

The following shall apply:

1. All the fibres of an optical fibre cable shall be spliced to fibre tails in a Patch Panel. Only fusion splicing shall be used to splicing in the fibre panel.
2. Every fibre optic cabling link in the installation shall be tested using Fluke or Equivalent testing equipment in accordance with the field test Specifications defined by the CENELEC (Comité Européen de Normalisation Electro technique), Standard ISO/IEC 11801 or as determined by the CoT or the appropriate network application standard(s) whichever is more demanding.
3. All testing shall be documented and reported to the City.
4. Any failing link must be documented, diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements.
5. The final and passing result of the tests for all links shall be provided in the test results documentation

- All AFC vending machines
- View from inside the station towards every/all AFC gates
- All AFC System validators
- All doors
- All Platform panic and information buttons
- All Infotainment displays
- Any other area deemed critical for safety and security or BRT operations

4. All cameras shall be on and stream video 24 hours every day.
5. Under normal circumstances, cameras shall stream video at 25 frames per second at HD resolution (1920x1080).

10.8.1 CCTV Network Video Recorder requirements

The following shall be supplied, configured and installed:

1. CCTV Network Video Recorder

The above shall be installed in the station equipment room.

10.8 Communications systems

The PTMS Contractor shall supply, configure, install and be responsible for the following:

1. IP Phone at the stations

The IP Phone will be connected to the main fibre communications network.
The IP Phone will also be connected to the Wireless backup communications.

10.9 Wireless backup communications

10.9.1 General requirements

The following shall apply:

1. Wireless backup communications shall be installed at every station. This shall be of one of the following types of communications, or a combination of them:
   - GSM/UMTS (incl. all South African service providers. The City reserves the right to use an existing service provider.)
   - Existing TETRA network of the Polokwane Local Municipality, in coordination with the Polokwane Local Municipality.
   - New wireless network to be installed by the the UTC contractor (must be negotiated and confirmed in coordination with the Polokwane Local Municipality and the UTC contractor).
   - Any other to be investigated/proposed by the Contractor.
2. All of the above shall be investigated by the Contractor for wireless backup communications at every station. The Contractor shall submit a report, including cost proposal to the Polokwane Local Municipality addressing the following issues for each technology listed above:
   - Availability at stations.
   - Availability of bandwidth and potential data limitations.

- Bit rate up and download speeds and consistency of connection.
- Will a separate integrated antenna at a suitable location (it may be outside the station) improve reception.
- Unit cost for data transfer.
- Besides data costs, any and all other running costs.
- Estimated capital expenditure considering expansion of coverage, procurement of new devices, etc.
- Equipment supported. Are any special devices required which may inflate capital expenditure.

3. For GSM/UMTS the following are acceptable (ordered in preference of technology, pending the investigation in point 2 above):
   - LTE
   - HSDPA/HSUPA
   - 3G
   - EDGE
   - GPRS
4. Before any final system and service is procured the City shall approve of it. The City reserves the right to request further investigation to address specific issues required to make a final decision.
5. The wireless backup communications shall be used for the following:
   - Voice data from IP intercoms, phones and emergency systems.
   - Management data to installed devices.
   - Data to be displayed on information screens.
   - Other data as required.
6. Based on the report the Polokwane Local Municipality reserves the right to choose any technology and to limit required bandwidth to reduce operating costs. In such an instance some of the requirements above will be omitted.
7. The communications system shall have an interface that supports common IP protocols such as UDP/IP and TCP/IP.
8. The default state of the backup communications shall be “off”. The backup communications shall only be activated once the primary communications is disrupted for a configurable period of time. The backup communications shall then be activated and operational within 10 seconds.
9. In case of GSM/UMTS, the Mobile Wireless Router (MWR) to be supplied shall be a cellular access platform designed to transport mixed generation Radio Access Network (RAN) traffic. This includes
   - UMTS: LTE, HSPDA/HSUPA and 3G
   - GSM: GPRS and EDGE
10. The GSM/UMTS MWR shall have the following minimum specifications.

Quantity of the Mobile Wireless Router (MWR) Minimum Specifications:

- 2x Ethernet Port
- 2x RS232 Port
- 2x SIM slots

- 3dBi Dual Band Antenna GSM 900 and GSM 1800
- 10 to 30V power connection
- DIN Rail mounted
- Power and communications status LED's
- Built in VPN client and firewall
- Supports SNMP
- Layer 3 Routing
- DHCP Server/Client
- NTP time server
- Firmware upgradeable via FTP or serial
- ICASA Certified
- Password protected
- Multiple simultaneous connections
- Real Time Clock (RTC)
- IP Masquerading (NAT)

Port forwarding

- Device management via a web interface

10.9.2 SIM card provisioning

In case of GSM/UMTS communications, the Contractor shall be responsible for SIM card provisioning based on the following requirements. These requirements shall be finalised with the Polokwane Local Municipality before procurement of any GSM/UMTS technology.

1. All different mobile service providers shall be considered for this solution. The City reserves the right to use an existing service provider.
2. The Contractor shall investigate data costs from all service providers and submit a report on this to the Polokwane Local Municipality.
3. Based on data costs a comprehensive data management solution shall be implemented to limit the amount of cost/data to be sent. This may include a data cap to be set. It is anticipated that this will be a dynamic process to be refined over time as specific operational needs are known.
4. The wireless backup communications shall be bi-directional unless specified otherwise for certain actions and certain data.
5. Only incoming voice calls shall be allowed, to be agreed with Polokwane Local Municipality.
6. No SMS messages shall be allowed in either direction, to or from the router.
7. A data cap shall be set after agreed upon with the Polokwane Local Municipality.
8. No wildcard allowed (i.e. no internet access allowed).

11 Detailed specification: Bus depots and layover areas

11.1 Functional description

Bus depots and layover areas are located at strategic locations based on access to the transport corridors and available space.

Bus depots serve as the storage facility for buses not in operation.

Each depot shall be equipped with a PTMS workstation from which the vehicle operator can plan, monitor and control his portion of the vehicle fleet.

The depot workstation shall also provide facility for text and voice communications with the drivers as specified in section 8.10.2.5. All depot – driver communications shall be visible to the TMC.

11.2 Workstation PC

Client workstations shall be procured, setup, installed and configured at depots and layover areas.

The client workstations shall have at least the following specifications:

a. Intel Pentium based
b. CPU: Intel I7 or latest available; min. 3 GHz
c. Main memory: min. 16GB
d. HDD: min. 500 GB hard disk
e. Housing: Floorstanding tower or rack mount depending on application
f. Sound card
g. Graphic card for multi-monitor operation (at least 2 monitors shall be accommodated)
h. 3 x 20 inch TFT monitors with LED backlight
i. Wireless keyboard
j. Wireless mouse/navigation devices
k. Cabling and sundry material
l. Operating system: Latest version of Windows for client workstations after approval from the client.
m. Email client: MS Outlook

11.3 IP Phone

An IP Phone will be supplied and installed and configured at each of the depot and layover areas. The IP Phone will use the Fibre communications backbone as main connection. The IP Phone will use the GSM/ APN for the backup connection.

11.4 APN Communications

Communications to the Depot and Layover area will be supplied with an GSM APN as backup. It will be used until Fibre Connectivity is available. Refer to Section 12 for detailed specifications.

12 Detailed specification: GSM/UTMS APN

12.1 Functional description

The scope of work under this contract includes provision of a complete GSM/UTMS APN solution including service provider APN, radius server, routers, link to TMC and securely provisioned SIM cards with voice/data contracts.

Tenderers shall engage with and include Cellular network/service providers in their tenders and confirm that the SP will enter into a SLA to provide network coverage and uptime.

Tenderers shall confirm the extent of the cellular data coverage that will be provided and guaranteed by their selected network for each of

- GPRS/Edge
- 3G
- 3.5G: HSDPA/HSUPA
- 4G/LTE

12.2 Role and responsibilities of Cellular Service Provider

The roles and responsibilities of the cellular service provider shall include but not be limited to:

a. Supply, installation, configuration, testing and commissioning of a dedicated IRPTN APN with direct connection to the TMC. This shall include radius server, routers, switches, patch leads and cabling necessary for a complete installation
b. Testing of network coverage/signal strength and implementation of improvements where required
c. SIM Card Provisioning
d. Provision of data contracts and a data usage monitoring and reporting facility
e. Provision of support to ensure APN uptime

Tenderers shall include a statement of intent from the Cellular SP in their tenders and confirm that they will enter into SLA's to provide network coverage and uptime.

Tenderers should note that some SP's use the existing Metro Connect network and may have connectivity to the existing TMC.

12.3 SIM Cards and data contracts

The SIM cards shall be supplied and provisioned by the SP as follows:

a. The real-time communications shall be bi-directional unless specified otherwise for certain actions and certain data.
b. Only incoming voice calls shall be allowed.
c. No SMS messages shall be allowed in either direction
d. Communications with only certain configurable IP addresses shall be allowed.
e. No wildcard allowed (i.e. no internet access allowed).

The PTMS Contractor shall set up and pay the monthly data contracts for the SIMs.

Based on data costs a comprehensive data management solution shall be implemented to limit the amount and cost of data to be sent/received. This shall include data usage monitoring and reporting using a tool to be provided by the SP.

This may also include a data cap to be set with only critical data to be transferred once the cap is reached. It is anticipated that this will be a dynamic process to be refined over time as specific operational needs are known.

12.4 Responsibilities of PTMS Contractor

The PTMS Contractor shall be responsible to implement GSM/UMTS real-time communications to/from buses. The following shall apply and shall be the responsibility of the PTMS Contractor:

1. Include Cellular network/service provider(s) in their tenders and provide a letter of intent that the SP will enter into a SLA to provide network coverage and uptime.
2. Ensure that the SP sets up the APN and provisions the SIMs in accordance with this specification and the Contractor's programme
3. Facilitate route coverage and signal strength testing with the SP. Monitoring of coverage via the BI reporting system and resolution of problems with the SP.
4. Confirmation and testing that the GSM/UTMS modems in PTMS OBU are fully compatible with the SP's network equipment
5. Set up and pay the monthly data contracts for the SIMs.
6. Implement a data management solution as specified above and report monthly to the client on data usage
7. Implement a trusted caller identification function (either in PTMS OBU software or on the SIM/APN). This shall block all calls other than those from pre-configured trusted caller ID's. The outgoing lines from the control room shall be listed as trusted callers.

12.5 GSM/UTMS APN Locations

The GSM/UTMS APN will be installed at the following locations:

1. All buses (21)
2. All Midi-buses (15)
3. All stations (2)
4. Depot and Lay-over areas (2)
5. TMC (1)

13 Testing and commissioning

13.1 General requirements

The Contractor shall be responsible for conducting all testing as described herein. Work under this section shall include all labour, materials, setup, modification, configuration and support services required to completely test all hardware and software, systems and sub-systems.

If testing reveals that a type of equipment does not meet the specifications or requirements as stated in these Specifications (Part C3), it shall be the Contractor's responsibility to correct the problem in all units of that equipment furnished, at no additional cost to client.

The Contractor shall be responsible for the performance of all of the tests described below to satisfy the objectives of each testing phase as determined by client.

Client and/or their representative shall have the right to witness any and all tests. This may include any number from 1 to more than 5 persons.

Detailed test plans, for every test stage, shall be submitted to client a minimum twenty-eight (28) days prior to the planned start of testing. Testing shall not commence until the plans have been approved.

Unless otherwise specified, all test plans shall include at a minimum the following:

(1) Overview of test including test objectives

(2) Pass/fail criteria

(3) Traceability matrix listing of all requirements and specifications from the Contract that are included/to be verified in the test and their cross-reference to the specifications (Part C3).

(4) Test setup and test measuring equipment (including descriptive diagrams)

(5) Listing of tools, test applications, simulators, etc. required to perform the test

(6) Entry/start-up conditions

(7) Exit/closing conditions

(8) Test procedures and scripts to be executed (if required)

(9) Test recording form

(10) Test comments form

(11) Signatures and verification form

Client reserves the right to direct, at no additional cost, the following changes to the test plans:

(1) The addition of procedural changes and other reasonable tests to reasonably assure system performance and conformance to the contract specifications;

(2) Investigation into any apparent troubles or anomalies with respect to the System;

(3) An audit of all test reports and verification of any or all previous tests and Measurements.

(4) Include any system or sub-system supplied under this contract to be subjected to testing.

Upon successful completion of any test, the Contractor shall prepare and submit within two (2) weeks a report summarizing the results with relevant test records appended. All such test reports will be reviewed by client and will become the property of client.

13.2 Test suspension criteria and defects resolution

The following shall apply:

a. The Contractor shall, prior to requesting a representative from the client to witness testing perform his own testing to confirm that all equipment comply with all test requirements and present proof of this.
b. After the Contractor is satisfied that the equipment passed all tests and the system is stable then the Contractor shall provide written notification of readiness to test for all required test stages a minimum of two (2) weeks in advance of the testing.
c. In case the Contractor calls the client or his representative to witness testing without having performed verification tests himself as stated in point a. above, the client or his representative reserves the right to call an immediate stop to the test in which case paragraphs a. and b. above shall be performed in that order.

All test failures, system defects, system errors, missing functionality, missing components/equipment, sub-standard workmanship (refer to, inter alia, the entire Section7) shall be recorded by the Contractor and assigned a “Defect Severity” rating as follows:

(1) Severity 1: Required functionality is substantially not available; normal in-service operation of the device or subsystem cannot be maintained; or client IRPTN operations are disrupted.

(2) Severity 2: Functionality is substantially available however one or more sub-functions are not operating as specified; full functionality is available but performance is not within specifications. Normal in-service operation can be maintained via a workaround.

(3) Severity 3: Minor software defect or usability problem for which there is a workaround. Substandard installation practice (for e.g. loose bracket, use of cable ties, etc.) that requires rectification.

The Contractor shall maintain a database of and shall track the status of all defects.

Client reserves the right to re-classify a defect severity based on the impact to system operation or IRPTN operations.

Test continuation, suspension or restart shall be as follows:

(1) Severity 1 Defect: Applicable test(s) shall be halted and restarted from time zero upon rectification of the Severity 1 defect. In the event that IRPTN operations are disrupted, all testing shall be suspended until the defect can be rectified.

(2) Severity 2 Defect: Applicable test(s) shall be suspended and restarted upon rectification of the Severity 2 defect.

(3) Severity 3 Defect: Testing may continue. Defect shall be noted in the comments section of the report and form part of a snag list.

All Severity 1 and 2 defects shall be corrected prior to completion of the stage of testing where they were identified. Test results for that stage shall not be accepted until such time as the Contractor demonstrates that all Severity 1 and 2 defects have been resolved and tested.

Severity 3 defects may be carried forward into software or system modifications in the next stage of the project, and shall be demonstrated to be corrected in the next planned testing stage.

The Contractor shall develop and maintain a standard set of regression tests for each device or subsystem. Regression testing shall be performed in the event of system modifications or changes to guarantee that the said changes do not introduce any defects.

At the completion of every test stage the Contractor shall submit a test completion report documenting the complete procedure with summarised results. This is over and above any defects or snag lists which shall be setup, managed and maintained by the Contractor.

13.3 Inspections and test stages

13.3.1 Testing stage 1: Functional Acceptance Testing (FAT)

Functional Acceptance Testing shall be performed to ensure that tendered equipment meets all the functional and operational requirements provided in this specification (Part C3). An client representative will be present during the FAT. All FAT's shall be performed prior to ordering any of the equipment undergoing FAT, except as may be required for the FAT itself.

The Contractor shall develop a comprehensive FAT program consisting, at a minimum, of the following individual test programs:

(1) Hardware test to test the operating parameters of all equipment are per the Specifications of this contract and Original Equipment Manufacturer (OEM) specifications.

(2) Functional test to demonstrate that all functional and operational requirements and specifications applicable to the device/subsystem have been delivered.

(3) Environmental, electrical and electromagnetic tests demonstrating compliance with contract and regulating agency requirements, or existing valid test certificates proving the same.

(4) Human factors test for all devices/subsystems with a user interface.

A minimum of one (1) unit of each equipment type listed in the section below unless specified otherwise, identically configured to all other units of that same equipment type, shall be subject to the FAT unless waived by the client.

Any device certifications required by regulatory agencies shall be the responsibility of the Contractor.

All required certifications shall be submitted with each shipment of devices or subsystems.

Any changes to the hardware configuration shall require a FAT retest.

Tests shall be performed in at the factory or in South Africa as may be required.

Rate including setup and configuration of equipment and contractors own pre-inspections, followed by subsequent inspection by the CoT, including setup and management of snag lists and test completion reports

13.3.1.1 Equipment requiring FAT

None of the equipment below shall be ordered before the FAT has been conducted and passed by the relevant equipment.

At least the following equipment shall be subject to FAT:

- GSM/UTMS APN hardware
- PTMS OBU set up with MDT, door open simulation switch, variable speed simulator switch and tested with the installed CMS system software.

The client reserves the right to add any other equipment deemed necessary for testing, and/or to waive some of the equipment listed above from testing.

13.3.2 Testing stage 2: System Integration Test (SIT)

A System Integration Test (SIT) shall be conducted to verify that subsystem components, when integrated together, meet the system level functional requirements and specifications.

The Contractor shall be responsible for the provision of any SIT test beds or bench test facilities, including any power supplies, hardware and/or software simulators, measurement equipment or other components and software required to conduct the tests.

The SIT configuration shall include all test equipment required to simulate data signals to and from devices noted in this Contract such as wheelchair lift/ramps, destination sign, emergency alarm, etc.

The Contractor shall develop a comprehensive SIT program consisting, at a minimum, of the following individual test programs:

(1) System configuration

(2) Integrated operation of all devices and subsystems

(3) End-to-end connectivity and correct processing/handling of data and messages

(4) Scenario or use-case testing to demonstrate that all system-level functional and operational requirements and specifications have been delivered.

(5) As applicable, environmental, electrical and electromagnetic tests demonstrating compliance with Contract and regulating agency requirement in the integrated form of the system or existing valid test certificates proving the same.

Rate including setup and configuration of equipment and contractors own pre-inspections, followed by subsequent inspection by the CoT, including setup and management of snag lists and test completion reports

13.3.2.1 Equipment requiring SIT

SIT shall be completed prior to onsite installation of the relevant systems. At least the following equipment shall be subject to SIT:

- One complete set of integrated PTMS systems as required.
- GSM/UTMS APN communications to TMC
- The client reserves the right to add any other systems deemed necessary for SIT, and/or to waive some of the systems listed above from testing.

13.3.3 Testing stage 3: Installation inspections

All installations in buses, stations, depots, in the TMC and along the route or any other place shall be checked for installation completeness and quality. The purpose of these inspections is to confirm that the correct equipment has been installed, to check completeness of installation and to check installation quality. Basic functionality checks may also be included as part of the inspection. An client representative will be present during the inspections.

The Contractor shall develop a checklist of everything to be checked for all devices, systems and sub-systems including as a minimum:

- Quality of workmanship
- Equipment power on-test
- Screen setup and configuration of PID’s or any other screen to fulfil client requirements. (rate only)

- Completeness of installation, for e.g. are ground wires installed and connected/bonded properly, are there any loose brackets or screws, labelling, etc.
- Compliance to any general installation requirement specified in this document.
- Any other requirement as deemed necessary by the client.
- Refer to Section 7 for a minimum set of requirements. Note: The installation inspections shall not be limited to the requirements listed in Section 7.

The inspection checklist shall be submitted to the client for approval. The client reserves the right to amend the submitted document as required until it is satisfied that the inspections cover all points of installation sufficiently.

Rate including contractors own pre-inspections, followed by subsequent inspection by the CoT, including setup and management of snag lists and test completion reports.

13.3.4 Testing stage 4: System Acceptance Testing (SAT)

The SAT is the final test to be completed and can only be initiated once all of the system elements have been installed and configured and all other tests have been successfully completed. The SAT looks at the entire system, and tests are completed to ensure that the overall functional requirements are met and that the system act as one integrated whole.

System reliability is a key requirement and random system behaviour shall prompt investigation by the Contractor with a written report as to the reason and proposed remedy to the random action(s).

The Contractor shall develop a System Acceptance Testing plan, which shall be submitted to client for review and acceptance at least twenty one (21) days prior to commencement of System Acceptance Testing. The acceptance plan shall include any tests necessary to document that the system is performing in compliance with the specified requirements. The test plan shall include a traceability matrix to show that all requirements of this specification will be tested. Full functionality, compliance and integration of all systems and components shall be demonstrated as a minimum.

The acceptance test plan shall include all equipment and services placed into service to demonstrate the performance of the system as a whole. Where necessary, full system functionality shall be tested based on real time operations and actual time-tables, for instance to demonstrate that bus scheduling has been configured correctly.

The Contractor shall, as part of the SAT's, demonstrate the accuracy, reliability, consistency and usability of the data and reports for:

- Mileage tracking, split between productive and unproductive trips for user selectable time intervals and vehicles
- Schedule adherence and deviation
- Vehicle speeds and alarms above user definable thresholds
- GSM/UTMS APN network coverage, signal strength and communications loss

System Acceptance Testing shall be conducted over a minimum four month period, but may be staggered. During the system acceptance testing period, the Contractor shall measure and report system and subsystem performance, defects and failures, and report the same on a weekly basis.

Rate including setup and configuration of equipment and contractors own pre-inspections, followed by subsequent inspection by the CoT, including setup and management of snag lists and test completion reports

13.3.4.1 Equipment requiring SAT

At least the following equipment shall be subject to SAT:

- The entire PTMS system as specified in this contract, including all hardware, software, systems and sub-systems.

13.4 Commissioning

As-built documentation for the entire system shall be handed over to the client according to the FIDIC conditions of contract.

All documentation to be provided under this Contract shall be in English.

As-built documentation shall include as a minimum:

All schematics, diagrams, drawings, charts, design reports, installation reports, test reports, equipment user manuals, training material, any other relevant as-built information for the entire PTMS system as specified in this document including software, hardware, systems, sub-systems and any other item which may be required for a fully functional PTMS system as specified.

At least 2 hard copies of the entire as-built documentation shall be handed over together with one full electronic copy. This shall be done prior to testing or as agreed with the client.

Once the system has passed the SAT it shall be offered for commissioning.

System Acceptance will be granted when:

(1) All System Acceptance Testing requirements have been met.

(2) All training (as specified in Section 14) has been completed and accepted.

(3) All as-built and final documentation has been delivered and accepted.

(4) Subsequent to the above, once the system has been operational and stable for 5 days without fault (excluding failure outside its scope, for e.g. power failure, etc.) it shall be deemed as having passed commissioning and accepted.

System acceptance implies that the Taking Over Certificate (TOC) will be issued by the client in accordance with the FIDIC conditions of contract relevant to this work after which the Defects Liability period will commence in accordance with the FIDIC conditions of contract.

14 Training

14.1 Training preparation

The Contractor shall be responsible to train client-designated personnel according to the requirements specified herein.

Training dates shall be agreed upon with the client. The client shall be given at least 2 weeks' notice before commencement of any training session.

A detailed training programme per course shall be submitted to the client for approval at least 28 days prior to commencement of every course. No training shall commence until the training program has been approved by the client. The training programme shall include as a minimum the following information:

1. The detailed curriculum including proposed number of classes per course and class duration.
2. It shall map the curriculum to the installed PTMS system.
3. The course goals and objectives for trainees.
4. Tutorials and student guides
5. An evaluation plan, including criteria for success of the course, based upon the goals and objectives, and evaluation steps.
6. Resumes of personnel proposed to be trainers for each course, demonstrating that they are experienced, effective training professionals. The Contractor shall provide experienced and qualified instructors to conduct all training sessions. The instructor shall understand and be proficient with the use of all software and technical systems.

The client will provide an appropriate training facility. It shall be the responsibility of the Contractor to provide, setup and configure, as a minimum, all relevant training aids and training materials as listed below at least one week prior to commencement of training.

1. Computers with relevant software installed and ready to use. Every attendee of every class shall have his own computer.
2. Conference room projector with DLP technology or similar approved including appropriate display sheet/screen/wall
3. Installation, setup and configuration of any network connection to have access to any of the relevant servers installed under this contract if required. For this purpose tenderers are to assume that the building which houses the training facility will have access to the client network, but that the training room itself may require installation of network points.
4. Student guides in hard copy (one guide per attendee required)
5. Tutorials with step by step instructions to demonstrate system operation
6. All manuals including, equipment manuals and any other manual necessary
7. Training presentations.
8. Any other training hand-outs as required
9. Interactive videos or demonstrations (if available)

All training sessions and any related training material shall be in English.

At least one session of each different training course shall be videotaped by the Contractor onto a DVD. All training materials, hard and soft copies, are to become the property of client at the conclusion of every training course.

14.2 Training Courses

The Contractor shall assume up to ten (10) persons per training class. The number of attendees shall be finalised with the client. The following minimum training courses shall be provided by the Contractor:

	Course/Module	**Number of Classes**	**Subject of training**
1	On-board operations	X	Train-the-trainer on the operation of on-board equipment, including MDT, PTMS-OBU, etc. as specified in Section 9.
2	Schedule planning system training (Rate only)	X	Scheduling, vehicle scheduling, duty scheduling, schedule publication, etc. Training to cover all items specified in Section 8.10.1
3	Compliance Monitoring (CMS) training	X	Monitor and track buses, route and schedule compliance, communications with bus drivers, etc. Training to cover all items specified in Section 8.10.2
4	Reporting System (RS) training	X	Setup, configuration, customisation of BI reports, etc. Training to cover all items specified in Section 8.10.4
5	System Administration and IT Training	X	Train client staff on the configuration and administration of the system including all applications, database and communications.
6	Follow-up	X	Follow-up training and consultation between 30 and 60 days after the initial training to ensure best use of the systems by the users
	Total training sessions	XX	

Table 2: Summary of minimum requirements for training sessions.

The client reserves the right to increase or decrease the number of training sessions if required. Repeat sessions of the above training courses may be required. These shall be provided at tendered rates.

15 Maintenance

15.1 Definitions for Maintenance

All maintenance on the system shall be based on the definitions and methodologies specified in this section.

15.1.1 Key terms

a) **Maintenance Plan:** A documented plan defining a detailed approach to system maintenance. It describes application of the maintenance program to a specific system or set of systems. It typically identifies the maintenance activities, priorities, timetables, and resource commitments and expenditures.

b) **Maintenance Activity:** The sequence of actions needed to conduct preventive, periodic, or repair maintenance on a device or subsystem. Typically refers to a specific component (e.g., camera) or subsystem (e.g., network infrastructure).

c) **Responsive Maintenance:** The repair or replacement of failed equipment and its restoration to safe, normal operation. Typically unscheduled, it is in response to an unexpected failure or damage.

d) **Preventive Maintenance:** Also called "routine" maintenance, it is the activity performed at regularly scheduled intervals for the upkeep of equipment. It includes but is not limited to checking, testing and inspecting, recordkeeping, cleaning, and periodic replacement when called for in the preventive maintenance schedule.

e) **Emergency Maintenance:** Emergency maintenance is similar to responsive maintenance in that it is initiated by a fault or trouble report. However, in this case, the fault is more serious and requires immediate action. Events such as traffic accidents, exposed electrical wires, network interruptions, theft or damaged equipment etc. are examples of event reports that may require emergency maintenance.

15.1.2 Responsive Maintenance

a) **Responsive Maintenance** refers to operations that are initiated by a fault or trouble report. The report can come from either:

- a person or
- software monitoring parts of the system.

b) Most general faults fall into the responsive maintenance category. Most of these calls are responded to by the maintenance crews within the parameters of the applicable service level agreement.

c) Responsive Maintenance is generally performed to correct a breakdown (when equipment ceases to function) or failure (when equipment condition reaches an unacceptable level, even though it may be functioning).

d) For failure modes which lend themselves to condition monitoring (see section below), Responsive Maintenance should be the result of a regular inspection which identifies the failure in time for Responsive maintenance to be planned and scheduled.

e) When Responsive Maintenance is done, the equipment shall be inspected to identify the reason for the failure and to allow action to be taken to eliminate or reduce the frequency of future similar failures. These inspections shall be documented and included as part of Responsive Maintenance.

15.1.3 Preventive Maintenance

a. Preventive Maintenance consists of scheduled operations performed to keep systems operating. This includes simple operations, such as cleaning camera housing faces or adjusting the field of view, etc, but also more sophisticated operations such as testing wireless communications integrity, etc.

b. Preventive Maintenance is initiated by a schedule.

c. Preventive Maintenance is also defined as the care and servicing by personnel for the purpose of maintaining equipment in satisfactory operating condition by providing for systematic inspection and detection, and correction of incipient failures either before they occur or before they develop into major defects.

d. The purpose of Preventive Maintenance is to ensure peak efficiency of equipment and minimize deterioration. Preventive Maintenance shall be a planned and controlled program of systematic inspection, adjustment and replacement of components, software, databases and include performance testing and analysis.

e. PM consists of three components:

- Essential Care
- Fixed Time Maintenance
- Condition Monitoring.

15.1.3.1 Essential Care

Essential Care shall include but is not limited to the following items:

a) **Detailed cleaning:** Filters, screens, enclosures, housings

b) **Replace/renew:** labelling of enclosures and cabling

c) **Adjustments:** Camera inside housing, wireless antenna

d) **Operating practices:** From historical data determine better operating practices

e) **Installation practices:** From historical data determine better installation practices

15.1.3.2 Fixed Time Maintenance (FTM) / Predictable Failures

Fixed Time Maintenance (FTM)/Predictable Failures shall include but is not limited to the following items:

a) **Manufacturer Recommendations:** Take into account specified Mean Time Between Failures (MTBF) and any other specified recommendations according to the installation/user manual.

b) **Component History:** Anticipate component failure from **recorded** history

15.1.3.3 Condition Monitoring

a) A full record of all condition monitoring carried out shall be kept and recorded, both as a hard copy and electronically for future reference.

15.2 Maintenance Scope

The scope of the maintenance contract is for the maintenance as defined in Section 16.1 above for all equipment, hardware and software to be installed under this contract.

Maintenance on the installed systems shall be for periods of 5 years from the dates of issue of each of the Partial Taking-Over Certificates for the sections of the works as defined in Part C1 Cl C1.2.3 Data Provided by Employer. This may mean that the different maintenance periods will end on different dates. The client may extend one or more of the maintenance periods to end concurrently with the maintenance period for the section for which the last Partial Taking-Over Certificate is issued, but no later than December 2021.

Maintenance shall be carried out under a Service level Agreement (SLA) as set out in Section in 16.4 below.

Once a partial taking-over certificate has been issued the insurance risk for the works in that section pass to the Employer. The client may request the Contractor to obtain quotations for and insure the works for the defects liability period and the maintenance period.

The scope of maintenance and repair under the SLA shall include but not be limited to:

a. Responsive maintenance, performed to correct a component breakdown.

b. Preventive maintenance or routine maintenance, including setting up and implementation of procedures to service and inspect all components of the system systematically and according to a fixed schedule.

c. Setup of complete maintenance plan. This shall include a list of recommended spare parts with rate only prices. After initial setup the maintenance plan shall be continuously updated to reflect the most recent maintenance procedures and status.

d. The maintenance procedures shall be based on manufacturers' guidelines and installers' maintenance experience. Note that preventive maintenance shall not interfere with normal operations. The maintenance plan shall show how this will be managed.

e. Set up and implementation of a PTMS Computerised Maintenance Management System (CMMS) for fault reporting, logging, repair and job card tracking.

   This system shall provide at least features for the following:

   - Reporting of the fault via phone, radio, e-mail, website or fax
   - Acknowledgement of receipt and expected response time via e-mail and/or SMS
   - Feedback on initial assessment by e-mail
   - Feedback on repair work carried out and close-out of the fault report
   - Initiation, tracking and close-out a job card for the repair
   - Escalation of problem when response times are exceeded
   - Automatic opening of fault reports in instances of alarms generated by the system e.g. PTMS OBU fault
   - Monthly fault reports shall be submitted to the client and/or others.
   - Monthly maintenance performance reports shall be submitted to the client and/or others.
   - Set up of an equipment register database, and tracking of all equipment removed for repair and spares used. Cables and electrical and electronics equipment shall be captured in this database. The tracking of equipment used shall extend to all equipment sent to the manufacturers for repair. This shall be part of the responsive maintenance.

- Serial and part numbers of all equipment shall be recorded in the system and shall be linked to the following minimum status indicators:
  - New – installed – installation date
  - New – spares stock
  - Faulty – description and date of fault, fault report and required action
  - Repaired – description and date of repair – installed/in stock – date of installation
- The system shall be based on a commercially available maintenance management software package and user access shall be given to at least 5 client users.
- The contractor shall provide training to client designated personnel on the use of the CMMS.

f. Client Fault Reporting System:

The client plans to procure a departmental fault management system to deal with faults/damage repair on all of its assets. This will be done under a separate tender process. The PTMS contractor shall be responsible for interfacing the PTMS CMMS to the client fault management system to allow them to interact so receive fault reports can be exchanged between the two systems.

g. Repair facilities:

The PTMS Contractor (in conjunction with their suppliers) shall establish repair facilities in the area for on board equipment including the PTMS OBU, and MDT. These facilities shall be staffed with technicians trained and certified by the supplier of the equipment.

h. Minimum spares stock:

This includes the supply of spares stock and the replenishment of the spares stock as these are used, as well as management of the return of repaired items to the spares stock. The spares stock shall provide for change out of failed items to be sent for repair. The Tenderer shall propose for consideration by client a list of spare parts (Spare Parts List) to be provided. This list (to be provided with tenders as part of the proposed maintenance plan, See Part T2, Form RDD 4) shall include replacement parts, components or sub-assemblies for all items of equipment provided, in sufficient quantities to meet the requirements of the proposed Service Level Agreement (SLA) specified in Section 15.4. The Spare Parts List shall contain all specialized tools and equipment necessary to install, calibrate, test and maintain the system. All wiring, cabling and adapters shall also be provided.

The Contractor shall ensure that the spares stock is sufficient to cover all equipment replacement necessitated by responsive maintenance, preventative maintenance and vandalism/theft.

It shall be the responsibility of the Contractor to store the spares and insure the same. The client shall have the right to audit the spares stock.

The Contractor shall procure and pay for the initial spares stock as part of the tendered maintenance rates. During the 3 year maintenance period replenishment of the spares stock will be for the cost of the Contractor as part of the tendered

maintenance rates. Where the Contractor can provide clear evidence of theft or vandalism (e.g. CCTV footage) replenishment of the spares stock will paid for under the contract at tendered rates plus escalation.

At the end of the maintenance period the Contractor shall hand over the entire spares stock to client in good working order, at a price to be agreed, together with the asset register/database set up for the CMMS.

15.3 Pricing and Payment

Pricing shall be provided for maintenance and repair as follows:

1. A maintenance contract Service Level Agreement (SLA) shall be setup based on the requirements specified in Section 16.4 and shall come into effect starting with the client's taking over of the works or part thereof.
2. Maintenance shall be provided to meet the requirements of the proposed SLA specified in Section 16.4 at the rates provided in the Pricing Schedules
3. Responsive Maintenance and Preventive Maintenance Rates: The rates provided in the Schedules shall be fully inclusive rates for all responsive maintenance, preventative maintenance and continuous improvement as follows:
   a. Materials: Spares (initial stock and replenishment), small materials, consumables, tool and equipment as well as any extended warranties
   b. Labour: Staff costs, transport and fuel
4. These rates shall include setting up of the maintenance plan and procedures, set up and operation of the CMMS and asset and spares stock control.
5. The monthly rates shall be for all PTMS related systems, hardware and software per defined entity (such as the TMC, a depot or bus) per month, e.g. per bus per month and shall have the unit of payment "bus-month"' meaning the maintenance of one bus for one month. The same applies for other entities such as depots, station etc.
6. Any proven incidents of theft, vandalism or accidents will be covered by insurance (refer to Part C1, Section C1.2.2, Clause 18.1). Replacement and repairs performed under insurance shall still meet the requirements of the SLA and shall not be dependent upon payment or any other condition of an insurance claim. Labour to repair and replenishment of the spares stock will paid for under the contract at tendered rates plus escalation. The Contractor shall however provide all information and documentation to client to facilitate the insurance claim.

15.4 Maintenance Service Level Agreement (SLA)

As part of the maintenance contract, an SLA shall be agreed upon between the client and the Contractor.
The contract shall enter into SLA for which the minimum requirements are set out in Appendix F. The Contractor shall prepare the SLA based on the draft in Appendix F and shall submit the SLA to the client for approval.

The SLA shall provide for the maintenance of include all systems, sub-systems, components, hardware and software provided under this contract. This includes but is not limited to:

- Central Control System, workstations, servers, database, schedule planning system, Compliance Monitoring (CMS), Passenger Information Systems (PI), and Reporting System (BI), data storage and backup.
- All On-Board Systems including PTMS On-Board Unit (OBU) and MDT.

- Passenger Information System including station Passenger Information Displays (PID's) (rate only), web/mobile passenger information systems and PI data feeds to 3rd parties.
- PTMS Vehicle Configuration systems at depots
- Wireless network equipment at depots & layover areas
- GSM/UTMS APN and SIM cards
- Network access switches at TMC and depots
- Any other equipment, systems or software installed under this contract.

Maintenance shall be measured against Key Performance Indicators (KPI's) with a demerit points system related to penalties as set out in the SLA.

16 Equipment warranties

For all equipment and software supplied under this contract the following shall apply:

1. All equipment supplied under this contract shall carry a warranty of at least 365 days starting from the date of issue of the respective taking over certificates. (or partial taking over certificates for sections of the work).
2. Considering point 1. above the Contractor is advised to negotiate with the product suppliers that the warranty to come into effect at the appropriate time or to take out an extended warranty on equipment in order that all equipment are covered under warranty for the entire defects notification period of 365 days.
3. Any warranties extending beyond the defects notification period shall carry over into the maintenance period which will be managed under the Service Level Agreement. In order to meet the obligations under the SLA the Contractor is advised to enter into extended warranties to cover the full 5 year maintenance period.
4. The Contractor shall guarantee that the proposed technologies will be supported for at least 5 years after installation and that spare parts will be available for at least 10 years.
5. All equipment shall be designed to provide a usable life of not less than 15 years.
6. The Contractor/Suppliers shall repair all equipment that faults within the warranty period free of charge, unless the fault is caused by conditions outside the Contractor's control, such as vandalism, accidental damage etc.
7. The Contractor/Suppliers shall make a repair by replacing faulty components with new items. Repaired or refurbished components shall not be acceptable.
8. The Contractor warrants that it has good title to the system and the right to sell to client free of any proprietary rights of any manufacturer (if the Contractor is not the manufacturer) or other party, and free of any lien or encumbrance.
9. The Contractor warrants that it has good title to all system software or that it has the right to license the use of such software, or both, free of any proprietary rights of any other party and free of any other lien or encumbrance.
10. The Contractor shall also warrant that all installation work and system hardware shall perform according to the specifications given in this document for the warranty period.
11. All warranties and guarantees of subcontractors, suppliers and manufacturers with respect to any such work and system hardware shall be obtained by the Contractor for the benefit of the client regardless of whether or not such warranties and guarantees have been assigned or transferred to the client by separate agreement. The Contractor shall fully enforce such warranties and guarantees on behalf of the client.
12. During the Warranty Period, the Contractor using stock from the spare parts inventory will replace defective hardware. For each defective part, the Contractor shall provide new replacement units to replenish the spare parts inventory. The replacement units shall be fully tested and certified compliant with the original part.
13. The cost of all transportation and insurance charges for shipping defective and replacement parts to and from the Contractor shall be borne by the Contractor.

17 Technical Operations Support

The Contractor shall provide software and hardware technical support related to operation of the systems installed under this contract. Technical support shall be available in the period of the issue of the partial taking-over certificate until end of 3-year contract.

The Contractor to provide a hourly rate for a Technical Operations Specialist. It is estimated that 240 hours (approximately one month) of operational Support will be required. This will not be one day after the other but will be on demand as required during the 36 months of the contract.

The technical support shall include off-site support on all systems, including scheduling and any other systems installed under this contract. Off-site support shall be in the forms of both email and phone calls. Off-site support shall be governed by an SLA to be agreed with the client and Contractor, but at least the following is anticipated.

1. Support requests shall be managed by a project management system such as FogBugz or equivalent approved, including bug and issue tracking, assignment to support staff, prioritisation, etc.
2. Once a support request has been received, the Contractor shall acknowledge receipt of the request within 4 hours.
3. The Contractor shall supply a solution to the request within 48 hours. If a complete solution is not possible within this time-frame, he shall provide full feedback why no solution has been proposed and what is done to find an appropriate solution and when such a solution is feasible.
4. Solutions shall as a minimum:
    a. Be clear and concise
    b. Use screen-capture software to illustrate configuration of certain software settings or to make any concept clear.
5. If any replacement parts are required, provision thereof shall be governed by the maintenance agreement.
6. If any software upgrades and/or patches are required it shall be governed by the software support agreement.

The Tenderer shall submit minimum SLA conditions with his tender, for which his tendered price is valid, considering all requirements as specified in points 1 to 4 above.

PART C4: SITE INFORMATION

PART C4: SITE DATA

CONTENTS

List of Tables

List of Figures

1. BACKGROUND

The Public Transport Strategy approved by Cabinet in 2007 has two thrusts namely Accelerated Modal Upgrading and Integrated Rapid Public Transport Systems (IRPTS). Apart from the Metropolitan municipalities, four large cities including Polokwane were also mandated to implement high quality integrated public transport services or so-called IRPTS.

IRPTS typically consist of a main corridor or trunk with trunk extensions or feeders that feed into the main corridor. The main corridor can be a rail or road based mass transit system or a combination of both. Rail based mass transit can include heavy or light rail while road based mass transit includes BRT or IRT (Bus Rapid Transit or Integrated Rapid Transit).

The preferred option for Leeto La Polokwane Integrated Rapid Public Transport System (IRPTS) includes a trunk with segregated bus lanes on Church Street and Nelson Mandela Drive. Church Street will in future be converted to a public transport mall where no private vehicles will be allowed. A multi-module IRT station in General Joubert Street will provide sufficient capacity for the high passenger demand.

In addition to the 3 trunk stations in the CBD, there will also be stations in Hospital Street at the bus rank, in Nelson Mandela Drive at the industrial area and the Seshego circle as well as at the end of the trunk in Moletji, making up a total of 7 trunk stations.

Apart from the trunk line, the system also incorporates 10 trunk extensions into the residential areas of Seshego and Perskebult. In these residential areas passengers will board at bus stops which are spaced at approximately 1 km intervals, keeping walking distances to approximately 500m.

In the CBD, feeders running on 6 routes will distribute passengers from the trunk stations' final destinations such as the industrial areas, regional shopping centres, the hospital and surrounding residential areas. Passengers from Seshego / Moletji on route to further destinations such as Turfloop, Mokopane or Lebowakgomo will transfer in the CBD to other modes such as taxis and buses which will continue to operate on existing routes.

The Department of Transport's vision for implementing IRPTNs places particular emphasis on walking and cycling as important feeders to public transport. The ease and convenience with which non-motorised transport (NMT) users can access the public transport system will promote and enhance the usage of both modes at the same time. NMT access and its integration with public transport is therefore an important component of the proposed system. Apart from walkways and other NMT infrastructure, other infrastructure components of the system include the depot, control centre and the new intermodal transfer facility.

The control centre is to be established at the Peter Mokaba stadium, whilst the the depot will be located in Seshego on the vacant land west of New Era Drive Street and south of Komape Street (as indicated in Figure 6: Location of Depot Site).

The implementation plan allows for a phased implementation of the system in order to accommodate possible budget limitations during the implementation phase.

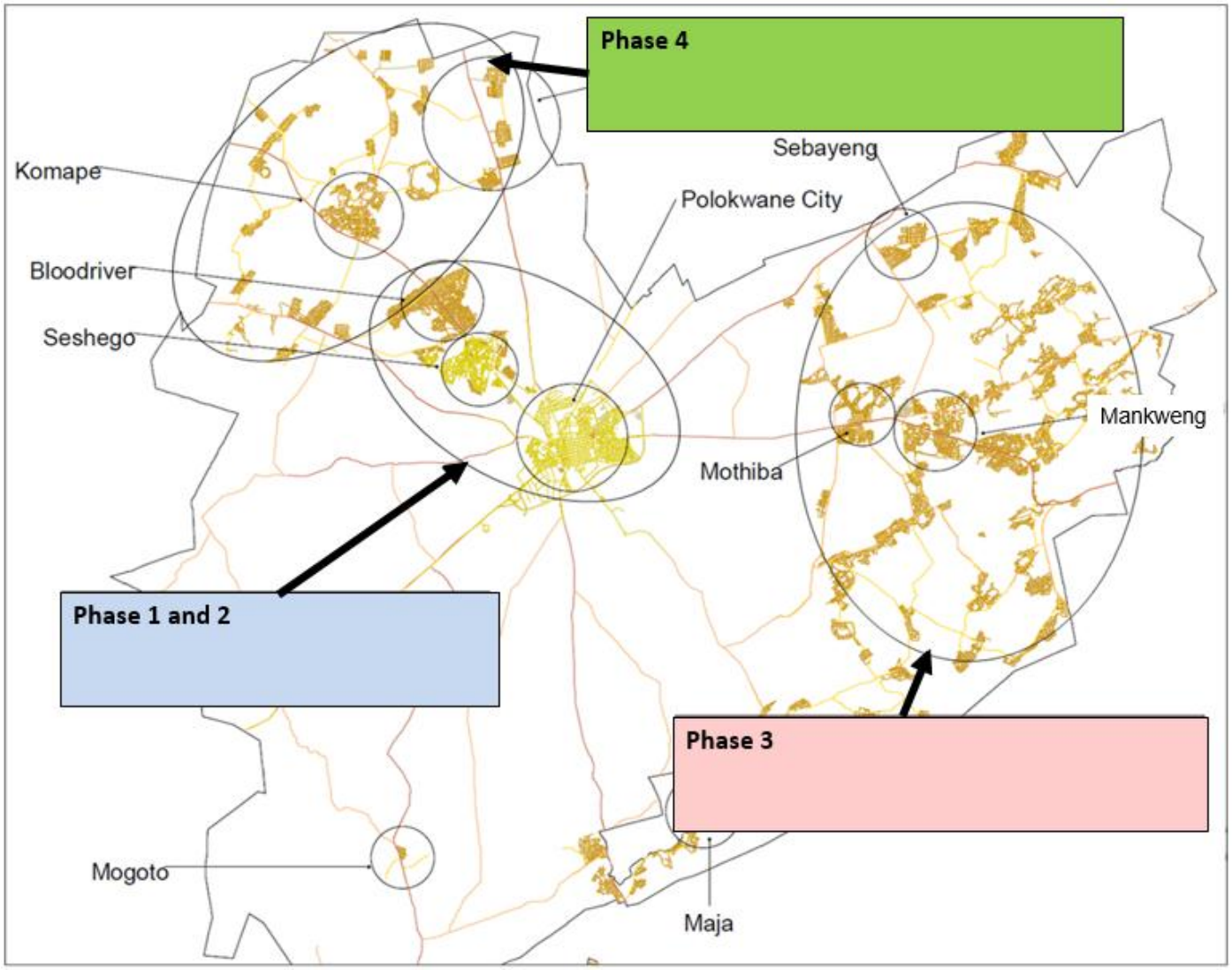
Phase 1A which is referred to as the go-live phase, will extend only up to the Seshego circle and will include one trunk station; T7 on General Joubert Street between Thabo Mbeki Street and Grobler Street.

Extensive community engagement was initiated in October 2014 and the anticipated roll out of services communicated to all stakeholders was July 2016. Constraints in Polokwane's budget allocation of the Public Transport Infrastructure Grant prevented the

City from building the full gamut of dedicated public transport infrastructure planned to support Leeto La Polokwane by July 2016.

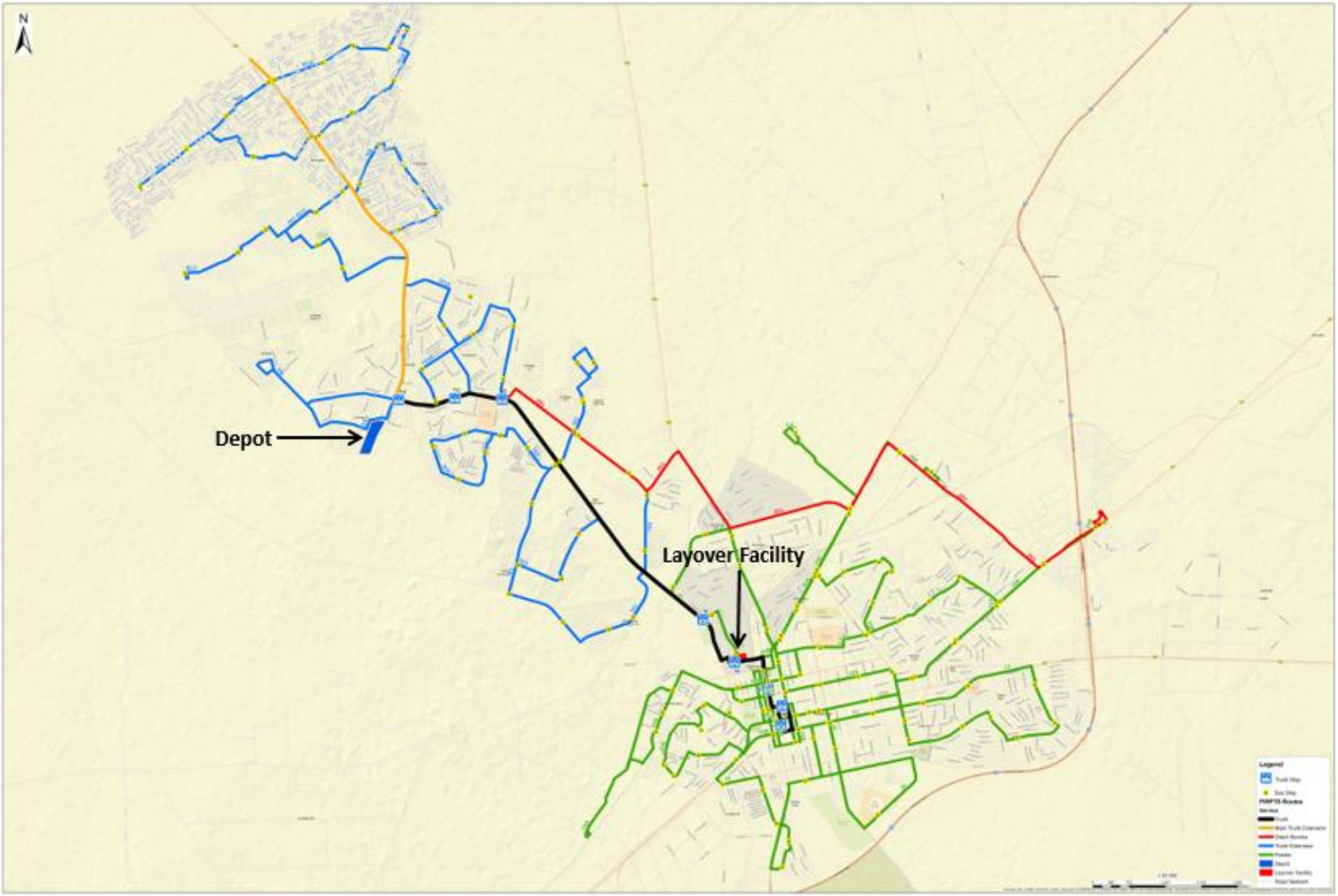
However, the Municipality is committed to phasing in public transport services as promised, while continuing to implement supporting infrastructure in subsequent years. This first phase of Leeto La Polokwane is Phase 1A which is planned to be launched in October 2018.

Figure 1: High level PIRPTS Routes and Phases



C4.2 IRPTS ROUTES

Figure 2: Routes to be included in phases 1A, 1B and 2.



The following are the routes to be implemented per phase;

Table C4 1: Routes to be implemented in phases

ROUTE ID	TYPE	PHASE 1A	PHASE 1B	PHASE 2
Trunk Route				
T	Trunk	√		
Trunk Extension Routes				
TE1	Trunk Ext.		√	
TE2	Trunk Ext.		√	
TE3	Trunk Ext.		√	
TE4	Trunk Ext.	√		
TE5a and TE5b	Trunk Ext.	√		
TE6	Trunk Ext.	√		
TE7	Trunk Ext.			√
TE8	Trunk Ext.			√
TE9	Trunk Ext.			√
TE10	Trunk Ext.			√
Feeder Routes				
F1	Feeder	√		
F2	Feeder		√	
F3	Feeder		√	
F4a and F4b	Feeder	√		
F5	Feeder		√	
F6	Feeder		√	
Direct Service Routes				
DS1	Direct Service		√	
Stadium Service				
S1	Stadium Service		√	

The following are the sites to be implemented per phase;

Table C4 2: Sites to be implemented in phases

SITE ID	TYPE	FUNCTION	PHASE 1A	PHASE 1B	PHASE 2
TMC	Control centre	Control Centre & Disaster Recovery	√		
DRC	Disaster Recovery Centre	Disaster Recovery & Control Centre	√		
DP	Depot	Up and Down load to buses. PVU Docking	√		
PIA	Polokwane International Airport	Sales Centre		√	
T1	Trunk station	Bus Service & Sales Centre		√	
T2	Trunk station	Bus Service & Sales Centre		√	

SITE ID	TYPE	FUNCTION	PHASE 1A	PHASE 1B	PHASE 2
T3	Trunk station	Bus Service		√	
T4	Trunk station	Bus Service & Sales Centre		√	
T5	Trunk station	Bus Service		√	
T6	Trunk station	Bus Service		√	
T7	Trunk station	Bus Service & Sales Centre	√		

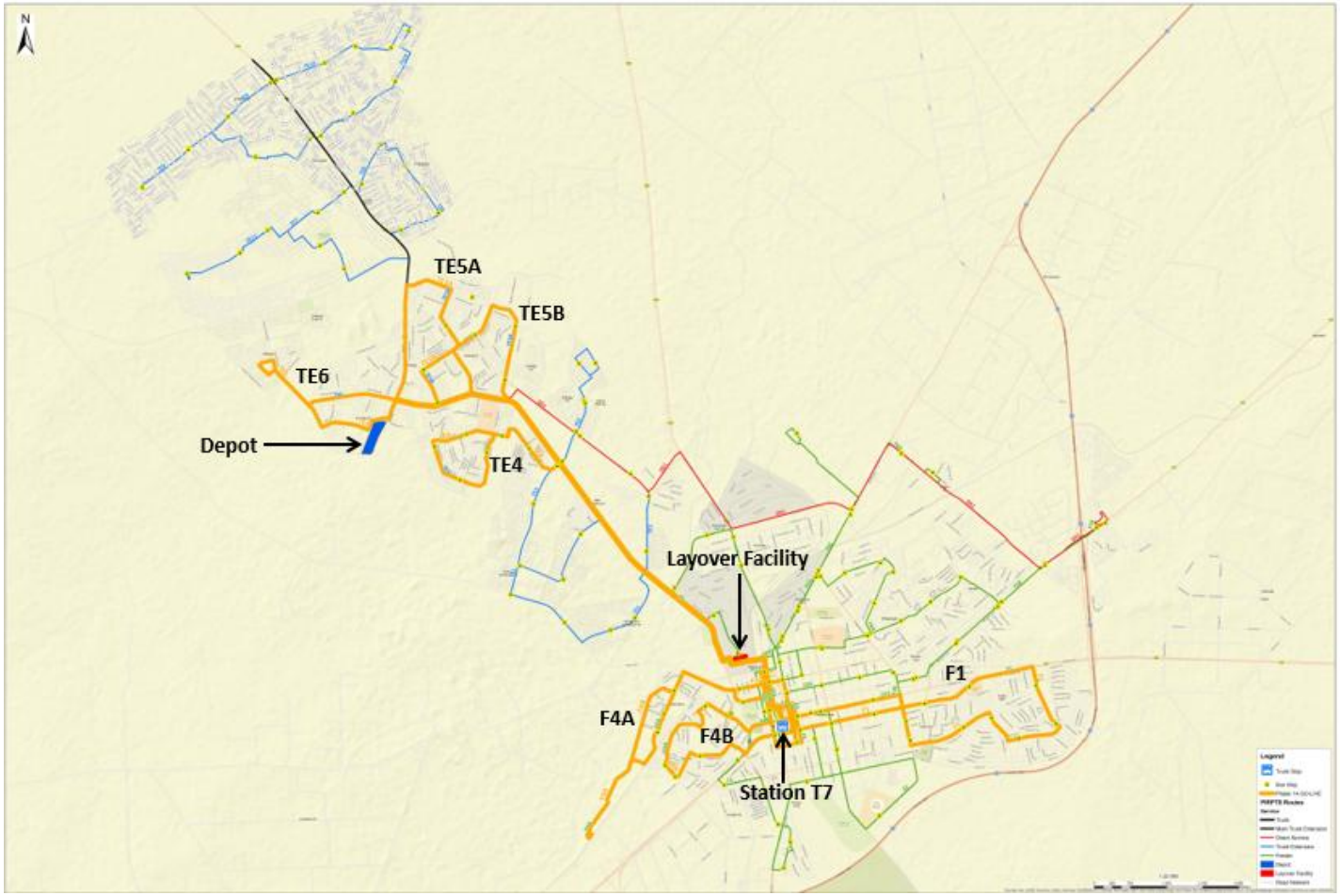
The following are the vehicles to be implemented per phase;

Table C4 3: Vehicles to be implemented in phases

TYPE	QUANTITY TOTAL	QUANTITY PHASE 1A	QUANTITY PHASE 1B	QUANTITY PHASE 2
Trunk-Extension: 80 capacity buses	T.B.D	21	T.B.D	T.B.D
Feeder Taxis	T.B.D	15	T.B.D	T.B.D

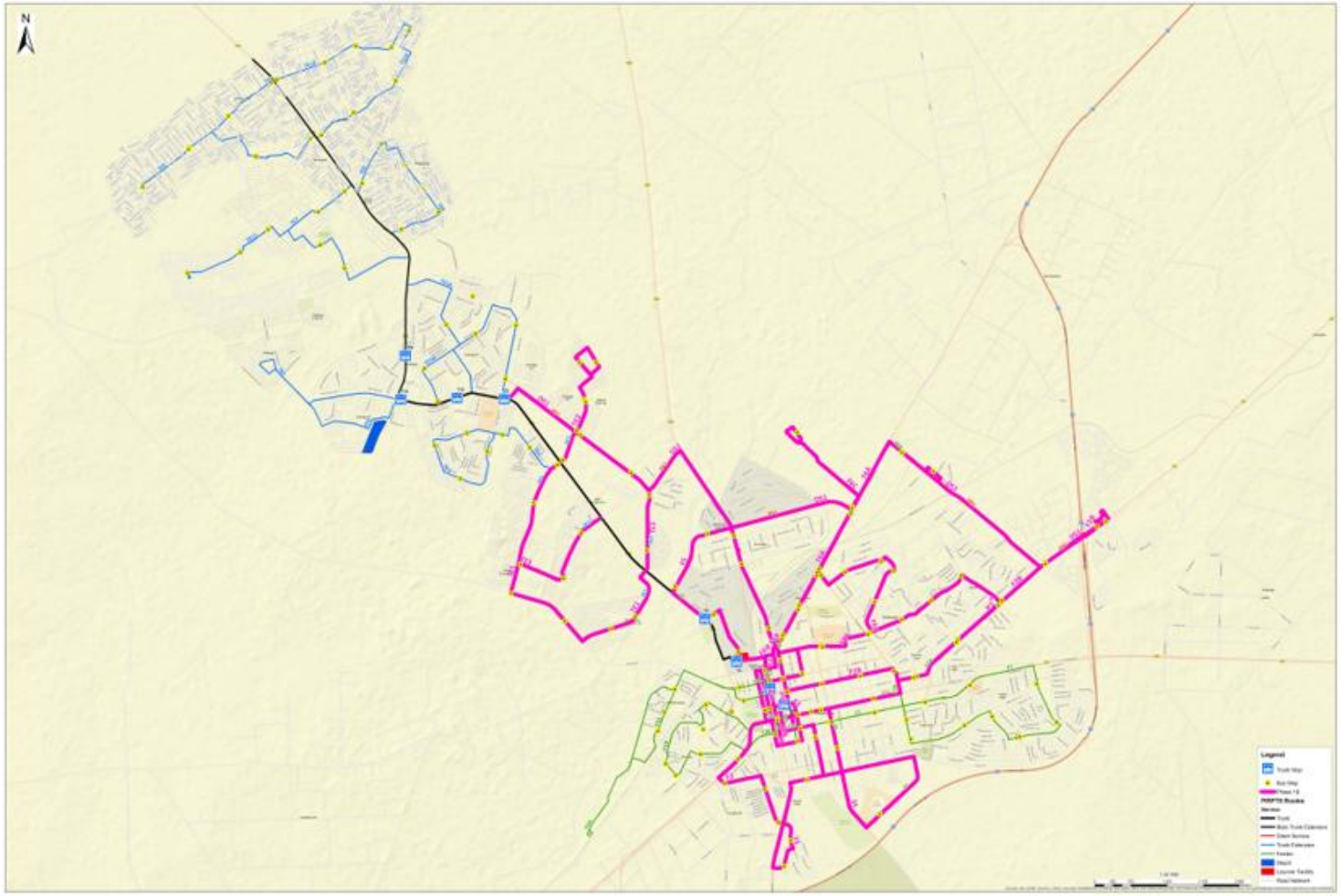
PHASE 1A ROUTE MAP

Figure 3: Phase 1A Stops, Routes and Stations



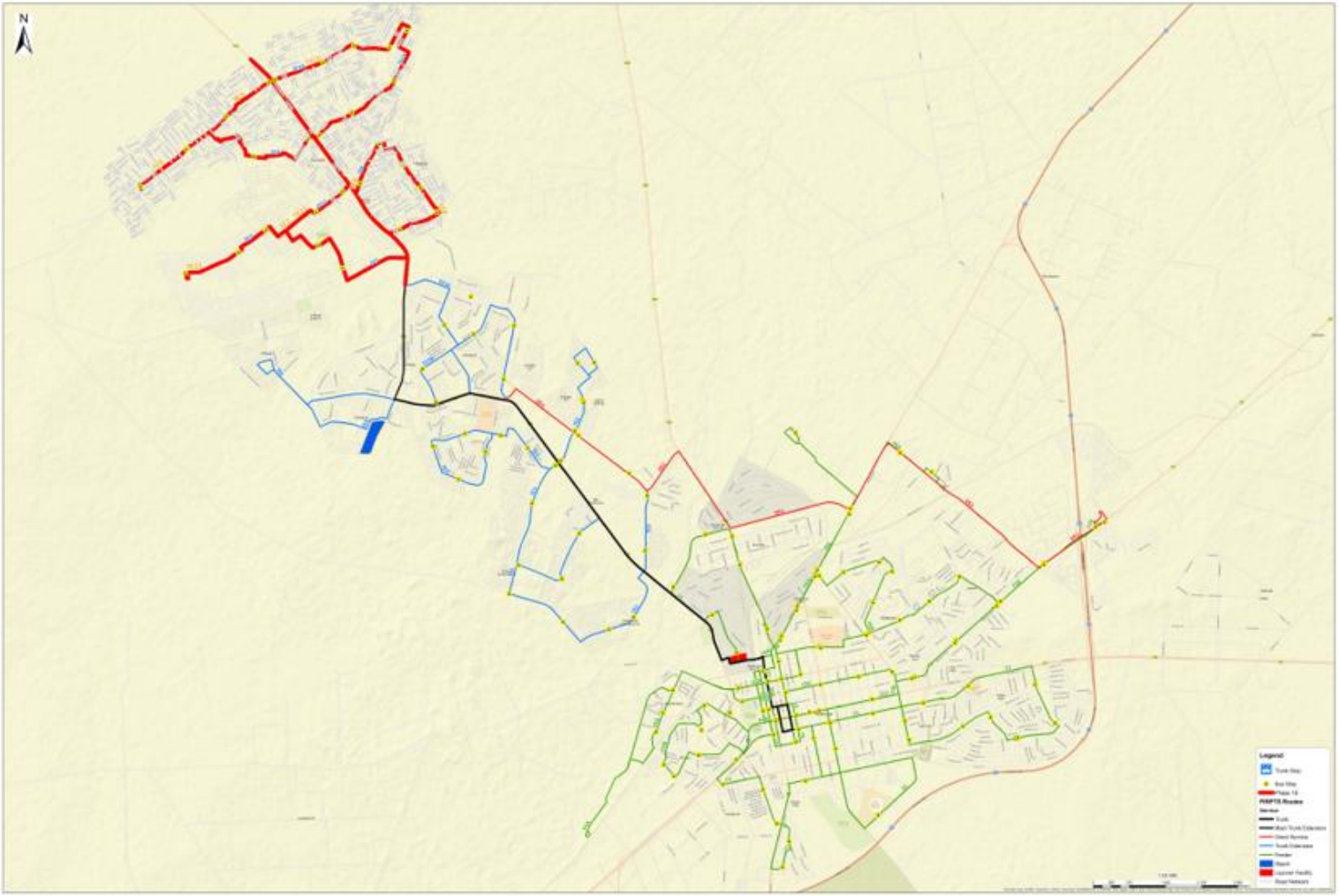
PHASE 1B ROUTE MAP

Figure 4: Phase 1B Stops, Routes and Stations



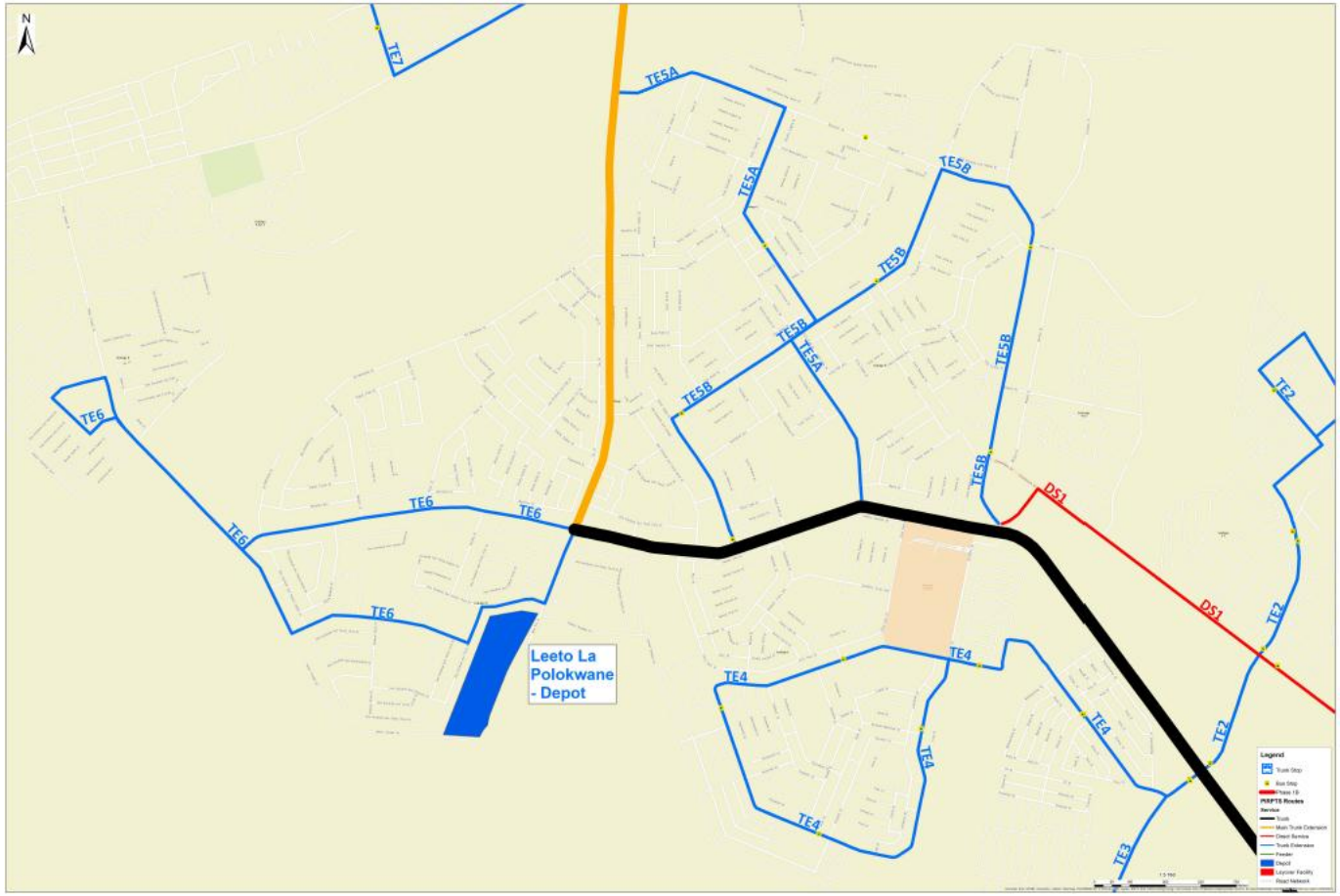
PHASE 2 ROUTE MAP

Figure 5: Phase 2 Stops, Routes and Stations



DEPOT SITES

Figure 6: Location of Depot Site



C4.5 GENERIC STATION LAYOUT DRAWINGS

The following generic station layout drawings are attached, which are subject to change. Tenderers are to rely on the quantities contained within the price schedules rather than what is displayed on the drawings.

TITLE	DRAWING No.