Parking Management System Scope of Work

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Glossary

Acronym/Term	Description
1D and 2D	One and Two-Dimensional Bar Code Technology.
ACSA	Airports Company South Africa.
ANPR	Automatic Number (License) Plate Recognition [See LPR]
APS	Automatic Payment Station.
B2B	Bill to Bill.
BFN	Bloemfontein.
Consumables or Spares	This refers to goods or miscellaneous needed by the Parking System that must be replaced regularly because they wear out or are used up. They are required for the operational running of the Parking System.
CPU	Central Processing Unit.
CTIA	Cape Town International Airport.
DP Card	Tenant/Staff Parker Card.
EFT	Electronic Funds transfer.
HDD	Hard Disk Drive.
HOD	Head of Department.
IEEE 802.3	Standard specification for Ethernet, a method of physical communication in a local area network (LAN), which is maintained by the Institute of Electrical and Electronics Engineers (IEEE).
IPsec	Internet Protocol Security.
IP65	IP65 Enclosure - IP rated as "dust tight" and protected against water projected from a nozzle.
IT	Information Technology.
IVERI	Financial Clearing House for POF Credit card and Debit card transactions.

KP Card	Short Parker card.
KSIA	King Shaka International Airport.
LAN	Local Area Network.
LAN KVM	Local Area Network Keyboard Video Mouse Extender.
LED	Light Emitting Diode.
LPR	License plate Recognition. [See ANPR]
OEM	Original Equipment Manufacturer.
OHS	Occupational Health and Safety Act.
OPMS	Zeag specific reference to name of database.
OPMS.mdb	Zeag naming reference of database that keeps record of old information for later reference.
OPMSSS	Zeag naming reference to temporary storage of database.
ORTIA	Oliver Reginald Tambo International Airport.
OS	Operating System
PC	Personal Computer.
POF	Pay on Foot.
PCU	Peripheral Control Unit.
PMS	Parking Management System.
PSU	Power Supply Unit.
PTM	Pocket Terminal.
RSS	Rich Site Summary or Really Simple Syndication.
RCU	Recycling Coin Unit.
RCU05	Version of RCU.
RFID	Radio Frequency Identification.
RFP	Request for Proposal.
SABS	South African Bureau of Standards.
SLA	Service Level Agreement.
SOW	Scope of Work Document.

SQL Server	Structured Query Language Server.
TCP/IP	Transmission Control Protocol/Internet Protocol.
UCD	Universal Card Reader.
UCD02	Universal Card Reader (model 02).
UPS	Uninterruptible Power Supply.
UV	Ultra Violet.
VMS	Variable Message Signage.
VOIP	Voice Over Internet Protocol.
WAN	Wide Area Network.
WIFI	Wireless Fidelity Network

Table 1 : Glossary

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EXECUTIVE SUMMARY

This Parking Management System Scope of Work document is a distillation of Airport assessment visits undertaken last year (2017) between February and March. The visits were dictated and mandated by intermittent technical and operational failures of the Parking Management Systems (PMS) in general at all Airports. Key findings from the assessments were as follows:

1. All Regional Airports did not have a support and maintenance contract in place to ensure Service and Operational continuity;

2. The proliferation of siloed implementation was rife and pervasive without regards or alignment to standards or industry best practice and benchmarks;

3. The Parking Management System was not offered as a consolidated service offering which includes Pay on Foot, License Plate Recognition, Variable Message Signage and Bay Detection as one package that seeks to achieve the same broad objective ie seamless Parking Management; and

4. Most of the Parking Management Systems have reached the end of their useful life span and are no longer reliable;

As a response to the non-existence of Support and maintenance contracts at Regional Airports, urgent Fit gaps for Support and maintenance for a suitable duration inclusive of Parking consumables as a tentative solution was put in place. The rationale for the Support and maintenance Fit gaps is to stabilise operations in order to ensure Service and Operational continuity.

The long term sustainable solution to the preceding challenges is to comprehensively replace all Parking Management Systems at all Airports with state of the art systems under the auspices of one Service Provider and one Contract consistent with the IT Strategy, the new Operating model, the Governance framework and Organisational vision in general. This document is an extensive and elaborate articulation of the Scope of Work for the Parking Management System Replacement Project at all ACSA Airports. It commences with a succinct expression and contextualisation of the business challenge or need, background and objectives to be achieved. It then proceeds to unpack the scope or delimitations of the Project. The current AS IS or baseline situation at ORTIA and KSIA from a Parking Management Systems perspective is established, documented and Airport specific requirements captured. Next is a deployment of transversal or cross cutting functional requirements for all Airports for the Parking Management System encompassing Pay on Foot, License Plate Recognition, Variable Message Signage and Bay Detection. The preceding is trailed by an exposition of infrastructural or enablement specifications including non-functional requirements. The later part of the document is a disintegration and postulation of the support and maintenance requirements, service level agreements and Service Provider performance requirements.

1. INTRODUCTION

1.1. **Background and Problem statement**

Following assessments visits at all ACSA Airports earlier last year (2017) between February and March regarding Parking Management Systems, it was apparent that there are serious operational challenges owing to the age of the systems and also problems of support and maintenance. Support and maintenance is currently non-existent and the Service Providers only support systems that are still under warranty. Furthermore, several systems have reached end of useful life and need to be replaced due to obsolescence. Summarily, the following challenges were uncovered:

1.1.1. No Support and maintenance contracts in place to support the Pay on Foot (POF) system or solution. Support is mainly based on warranty and not all machines qualify for this concession;

1.1.2. No contract for Parking System consumables (spares) in place;

1.1.3. Automatic Pay Stations together with associated or related infrastructure (Intercom, Booms) were plagued with intermittent and frequent operational and technical failures;

1.1.4. With the exception of ORTIA, CTIA and KSIA, there was no License Plate Recognition (LPR) System at other Regional Airports;

1.1.5. Chip and Pin (debit card) as well as Credit card functionality was non-existent or dysfunctional on the POF systems;

1.1.6. Dealing with lost tickets was a daunting challenge. Verifying whether the motorist or customer is truthful regarding parking duration in cases of lost ticket was problematic. Staff depend on manual capturing of car registration numbers to establish the truth. The installation of LPR will circumvent this challenge;

1.1.7. The Service Provider installed the POF system without all related, key or associated functionality eg Credit Card, Chip and Pin, Bill to Bill, Note Safes etc. When these functionalities were later requested, ACSA was quoted separately;

1.1.8. Rejection of some coins and bank notes by some pay stations with no alternative option;

1.1.9. There were accessibility challenges with regards to the POF systems because they were never designed to cater for the disabled or physically challenged individuals; and

1.1.10. Except for KSIA, all airports had one Service Provider for Parking Management Systems with eight different contracts.

1.2. Recommendation

Firstly, against the preceding background just articulated and secondly, mindful of the need to ensure operational continuity, improve service levels, improve customer experience, safe guard ACSA's reputation and parking income, thirdly, aware that Parking revenue constitutes **19%** (third after Retail and Property rental) of non-aeronautical revenue and finally, cognisance of the need to ensure long term sustainability in this regard, the following recommendations have been made and will need to be implemented.

1.2.1. Tentative solution

Implement urgent Fit gaps for support and maintenance for a suitable duration inclusive of parking consumables as a tentative solution. The rationale for the support and maintenance Fit gaps is to stabilise operations given that the National Parking initiative will take some time to be implemented owing to project governance and procurement processes.

1.2.2. Long term sustainable solution

Replace all Parking Management Systems at all ACSA Airports with state of the art systems starting with ORTIA and KSIA as phase one of the project. Furthermore, to ensure alignment with the IT Strategy and new Operating model, radically convert to a new model by standardising all Airport systems as well as consolidating and coalescing all contracts under the umbrella of one Service Provider. Transition to the new dispensation will lead to the following benefits:

1.2.2.1. Improved visibility and better management of contracts;

1.2.2.2. Leverage on economies of scale;

1.2.2.3. A consistent look and feel for all Airport systems; and

1.2.2.4. A platform that is conducive for systems interoperability and scalability will be created that can be leveraged upon.

1.3. Purpose of this document

The purpose of this Scope of Work (SOW) document is to articulate and concisely specify the work activities, material or equipment specifications, deliverables, milestones, quality requirements, support and maintenance requirements as well as performance management and evaluation criteria applicable to a comprehensive replacement of all Parking Management Systems (PMS) at ORTIA and KSIA. This incorporates the replacement of the following sub systems:

1.3.1. Pay on Foot inclusive of Intercom;

1.3.2. License Plate Recognition (LPR);

1.3.3. Variable message signage; and

1.3.4. Bay detection.

2. SCOPE

2.1. In Scope

2.1.1. Comprehensive replacement of Parking Management Systems at OR Tambo International Airport including Cargo parking precinct and King Shaka International Airport;

2.1.2. The Prospective Parking Management System shall be integrated and should work seamlessly with the current ACSA IT landscape;

2.1.3. If in future, ACSA acquires or takes over ownership of another airport for example Mthatha airport, the contract with the current Service Provider will be revised or amended accordingly to incorporate the acquired airport;

2.1.4. All bidders will be required to do a compulsory site inspection and investigation at all airports

prior to submitting their proposals. They must specifically look for structural reconfigurations, dependencies, infrastructural and other relevant requirements that ACSA may have missed. Therefore, ACSA does not assume anything in the environment, and present the environment to the Bidders as is. It is the responsibility of all bidders to ensure that they obtain all necessary information needed to craft a proposal for ACSA;

2.1.5. Inferring from the forgone expression, no negotiations will be entertained post tender award on expansion of scope, or any other factors that were not considered by the successful bidder in proposing the Parking Management System;

2.1.6. All equipment supplied must have a minimum warranty of **5 (five)** years; and

2.1.7. Replacement of the Parking Management System at Regional airports and CTIA will form phase **2 (two)** of the project.

2.2. Scope of replacement

The Scope of the Parking Management System replacement is as follows where applicable:

2.2.1. The entire POF system and its associated components and peripherals;

2.2.2. The entire Intercom system and its associated components and peripherals;

2.2.3. The entire LPR system and all its associated components and peripherals. For ORTIA, the LPR cameras will not be replaced. Only the back-end applications and any supporting infrastructure;

2.2.4. The entire Bay detection system and its associated components and peripherals; and

2.2.5. The entire VMS system and its associated components and peripherals.

2.3. Support and maintenance and Support

2.3.1 The duration of support and maintenance is **5 (five years)** including the provision of Parking System Consumables (spares). Parking consumables to include tickets, receipt rolls, printer ribbons etc and any other spares required to operate parking system.

2.3.2 The Service provider must explicitly articulate the warranty duration on all equipment supplied.

2.3.3 The support and maintenance duration must exclude the time spent supplying and commisioning the system as well applicable warranty period.

2.4. Definition of consumables or spares

This refers to goods or miscellaneous needed by the Parking system that must be replaced regularly because they wear out or are used up. They are required for the operational running of the Parking system.

2.5. Out of scope

2.5.1. Anything not explicitly mentioned herein is out of scope; and

2.5.2. Height restriction or other signage.

2.5.3. Regional airports and CTIA

2.5.4. LPR Camera's in OR Tambo are out of scope including Facial video camera's.

2.6. Document structure

The next sections of this document will broadly position and specify the following:

2.6.1. Functional requirements for airports in scope;

2.6.2. Generic or transversal functional requirements;

2.6.3. Infrastructural requirements;

2.6.4. Non-functional requirements;

2.6.5. Support and maintenance requirements;

2.6.6. Service Level Agreement (SLA) and Performance management requirements;

2.6.7. Transformation requirements and the Solution implementation approach.

3. OR TAMBO INTERNATIONAL AIRPORT

3.1. Current Parking Management Systems landscape at ORTIA

Item #	Pay on foot	Intercom	License plate recognition	Variable message signage	Bay Detection
1.	Yes. Complete replacement required.	Yes. Complete replacement required.	Yes. Partial replacement required.	Yes. Complete replacement required.	Yes. Complete replacement required.

Table 2 : Current Parking Management Systems landscape at ORTIA

3.2. Parking types and number of bays

Item #	Car park	Area	Number of bays
1.	KB	KB1	452
2.	KB	KB2	495
3.	Executive parking	(tenant)	39
4.	MSP1	L0(car hire)	111
5.	MSP1	L0 Pickup	90
6.	MSP1	L1(car hire)	916
7.	MSP1	L2	968
8.	MSP1	L2 Premium	71
9.	MSP1	L2 XXL	42
10.	MSP1	L3	1 013
11.	MSP1	L4	912
12.	MSP1	L4 Exec c/ports	81
13.	MSP2	L-2	805
14.	MSP1	L-1	764
15.	MSP1	L-0	330
16.	MSP1	L-1	500
17.	MSP1	L-2	719
18.	MSP1	L-3	800
19.	MSP1	L-4(tenant)	781
20.	MSP1	L-5 Undercover	518
21.	MSP1	Open	222
22.	Piazza	Open	171
23.	Carports (Shade West)	undercover	442
24.	Carports (Shade West)	open	112
25.	Bus Deck	Bus Deck	15
26.	Shade 1	Shade 1	458
27.	Shade 2	Shade 2	630
28.	Super South	Super South	3 855
29.	**Total**		**16 312**

Table 3 : Parking types and number of bays at ORTIA

3.3. Current site configuration of POF system

Item #	Number of Entries	Number of Exits	Intercom	Number of Automated Pay stations
1.	56	59	192	76

Table 4 : Current site equipment configuration of POF at ORTIA

3.4. Current site equipment configuration of LPR system

Item #	Number of Entry cameras	Number of Exit Cameras
1.	56	59

Table 5 : Site equipment configuration of LPR system at ORTIA

3.5. Current site equipment configuration of VMS system

Item #	Component	Number
1.	Control box	29
2.	Control cards	29
3.	Power supplies	29

Table 6 : Equipment configuration of VMS at ORTIA

3.6. Current site equipment configuration of bay detection system

Item #	Parking Area's	Bay Sensors	Zone Boards (LED)	Control Cards	Power Supply Units
1.	KB 1	464	13	13	13
2.	KB 2	496	15	15	15
3.	MSP 1 L 0	0	0	0	0
4.	MSP 1 L 0 PICK UP	0	0	0	0
5.	MSP 1 L1	979	23	23	23
6.	MSP 1 L 2	1001	23	23	23
7.	MSP 1 L 3	1030	23	23	23
8.	MSP 1 L 4	992	23	23	23
9.	MSP 2 L -2	603	11	11	11
10.	MSP 2 L -1	440	11	11	11
11.	MSP 2 L 0 (GROUND)	403	15	15	15
12.	MSP 2 L 1	722	16	16	13
13.	MSP 2 L 2	721	16	16	13
14.	MSP 2 L 3	723	17	17	17
15.	MSP 2 L 4	683	17	17	17
16.	**Total**	**9257**	**223**	**223**	**217**

Table 7 : Current site equipment configuration of bay detection at ORTIA

3.7. Servers and workstations

Item #	Servers	Workstations	Substations (intermediary Server)
1.	2x POF	13	9
2.	2 x VMS		
3.	2 X LPR		
4.	2 x Credit Card		
5.	1x Intercom Server		

Table 8 : Current Server and workstations infrastructure at ORTIA

3.8. Structural dependencies, reconfigurations and infrastructural requirements

This refers to any civil works and structural reconfigurations that need to be undertaken to implement the solution. None was identified for ORTIA at the time of the assessment. However, the Service Provider will be expected to conduct a compulsory and thorough site assessment and advise whether any structural reconfigurations or civil works within the parking precinct is required.

4. KING SHAKA INTERNATIONAL AIRPORT

4.1. Current Parking Management Systems landscape at King Shaka International Airport (KSIA)

Item #	Pay on foot installed	Intercom	License plate recognition	Variable message signage	Bay Detection
1.	Yes. Complete replacement required.	Yes. Complete replacement required.	Yes. Complete replacement required.	Yes. Complete replacement required.	Yes. Complete replacement required

Table 9 : Current Parking Management Systems landscape at KSIA.

4.2. Current site configuration of POF system

Item #	Number of Entries	Number of Exits	Intercom	Number of Automated Pay stations
1.	16 and 19 required for the new installation.	14 and 17 required for the new installation.	There is an Intercom device at each entry and exit.	17 and 19 required for the new installation.

Table 10 : Current site equipment configuration of POF at KSIA.

4.3. Current site configuration of LPR system

Item #	Number of Entry cameras	Number of Exit Cameras
1.	16 and 19 required for the new installation.	14 and 17 required for the new installation.

Table 11 : Current site equipment configuration of LPR at KSIA

4.4. Current site configuration of VMS system

Item #	Number of displays on gantries	Number of displays on information boards
1.	3 and 5 required for the new installation.	5 and 6 required for the new installation.

Table 12 : Current site equipment configuration of VMS at KSIA

4.5. Current site configuration of bay sensor detection system

Item #	Number of bay detection sensors
1.	58 and 1500 required for the new installation.

Table 13 : Current site equipment configuration of Bay detection at KSIA

4.6. **Servers and workstations**

Item #	Server type and number	Workstations
1.	I x Primary Database Server	1. 2 x cashier workstations including drawer for notes and coins.
2.	1 x Primary Application Server	
3.	1x backup Server for database and Application	2. Additionally, 4 x workstations with Intercoms for the control room will be required.
4.	1x Credit Card Processing Server	

Table 14 : Current Server and workstations infrastructure at KSIA

4.7. **Structural dependencies, reconfigurations and infrastructural requirements**

This refers to any civil works and Structural reconfigurations that need to be undertaken to implement the solution. civil works and structural reconfigurations will need to be performed in the following areas:

4.7.1. Pick-up zone parking facility;

4.7.2. Ground transport staging parking facility;

4.7.3. Ground transport zone parking facility;

4.7.4. Multi-storey entrance 6 of the parking facility.

4.7.5. The IT, mechanical and electrical infrastructure requirements for the above areas are out of scope for this scope of work; and

4.7.6. In addition to the forgone articulation, the Service Provider will be expected to conduct a compulsory and thorough site assessment and advise whether any further structural reconfiguration or civil works within the Parking precinct is required.

4.8. **KSIA specific requirements**

4.8.1. Fibre installation will be required as an infrastructural requirement;

4.8.2. The entrance equipment at the Ground Transport Zone and the Ground Transport Staging area will not require a magnetic stripe ticket dispenser. These areas will only allow entry by means of long and short-range RFID reader incorporating Wi-Fi and Bluetooth functionality, chip and pin card, tap and pay technology and Automatic Licence Plate Recognition (ANPR);

4.8.3. All exit lanes will be equipped with a double barrier arm system to prevent tail-gating with the exception of the Ground transport zone that will be equipped with a single barrier arm;

4.8.4. Two additional pay stations will be added to the multi-storey parking facility ground floor area (level 0);

4.8.5. The ground transport vehicle zone and ground transport staging area entry lanes will only allow access to users registered on the central POF system through wireless contact card (RFID card, MiFare or similar), automatic license plate recognition, debit or credit card, long range and short range RFID tags. The entry stations for the ground transport vehicle zone must be suitable and accessible for buses and minibuses;

4.8.6. The elevated road area has a barrier arm that is in very poor condition. The barrier arm is to be replaced with a new, quick open and closing barrier arm. The barrier arm will be a standalone device and not be connected to the POF central system. The barrier arm will be equipped with a

push button and a remote-control receiver and transmitter with a range of at least 50 m to operate the barrier arm;

4.8.7. The entry and exit stations for the elevated road must be suitable and accessible for buses and minibuses;

4.8.8. The elevated road should have the following equipment linked to the parking management system and allow access to users registered on the central POF system through wireless contact card (RFID card, MiFare or similar), automatic license plate recognition, debit or credit card, long range and short range RFID tags;

    4.8.8.1.   Entry station;

    4.8.8.2.   Entry boom;

    4.8.8.3.   Automatic license plate recognition entry;

    4.8.8.4.   Exit station;

    4.8.8.5.   Exit boom; and

    4.8.8.6.   Automatic license plate recognition exit.

5. AS IS SYSTEM CONTEXT MODEL

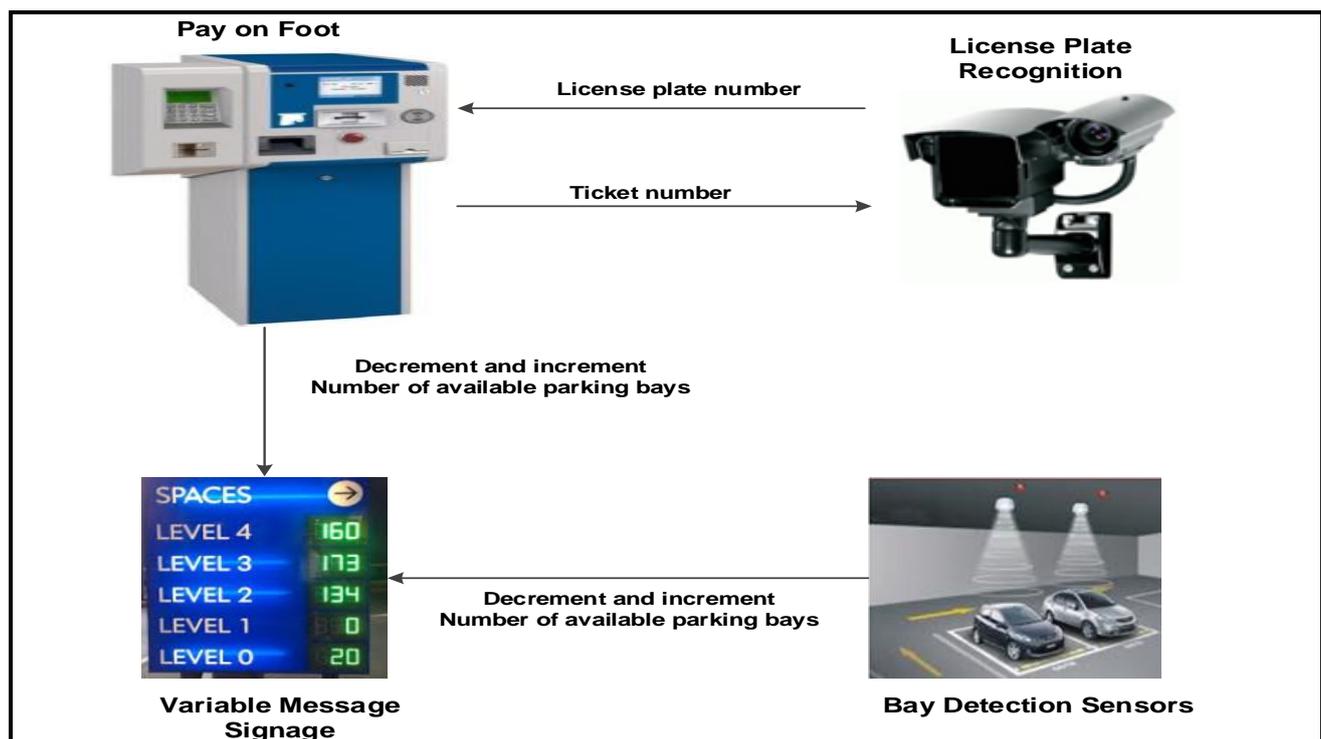Figure 1 is a high-level Parking Management System AS IS system context model.

Figure 1 : High level AS IS system context model

The following paragraphs are a high-level expression how the Parking Management System at ACSA currently functions.

Entry

Step 1

When the motorist presses the button upon entry, a ticket number is generated by the POF system and sent to the LPR system. The LPR system receives the ticket number and combines it with the License plate number (simultaneously captured) of the car sends it back to the POF system via a Serial connection. POF then uses this information (Ticket number + License plate number) and generates a ticket that is time stamped and the boom opens.

Step 2.1 (Parking precinct where there are no bay detection sensors installed)

In parking precincts where there are no bay detection sensors, immediately the boom opens and the car enters the precinct, the POF system sends a message to VMS system to decrement the number of available bays by 1.

Step 2.2 (Parking precinct where bay detection sensors installed)

Motorist enters parking precinct and parks. The Bay detection system sends a message to VMS to decrement the total number of available bays by 1.

Exit

Step 3

When the motorist inserts the ticket upon exit, the POF system checks the following:

- Whether payment has been effected; and
- It communicates with the LPR system to verify whether the credentials on the ticket matches the ones on the system. If there is a match, the boom opens and the motorist leaves the parking precinct.

On the contrary, if there is a mismatch or discrepancy, the system must function as specified in section 7.9.11

Step 4

Immediately the boom opens and the motorist is leaving, the POF system sends a message to VMS to increment the number of available bays by 1.

Spike Grippers

The mechanical and functional dynamics of the spike grippers must allow the car to be able to enter and exit the parking area in cases where there is no exception. Spike grippers are used to enforce one way traffic in a single traffic lane, such as the entrance or exit to a parking lot.

5.1. The Intercom sub-system is an integral part of the Parking Management System even though it is not depicted in figure 1 for simplicity sake. An intercom system is a two-way communication electronic device that contains circuitry for the purpose of transmitting and receiving audio and/or video transmissions. In the case of parking, it provides a medium or platform of communication between the customer or operator and the Control room attendant; and

5.2. The Intercom subsystem must be linked to a cordless phone to allow communication between customers and an Operator and Operator to Operator. Intercoms should have volume controls. Furthermore, they should have call stacking capabilities in order to show and inform customers position in queue. (eg you are number 2 on the list; your call will be answered shortly). Moreover, information should be available to control room regarding the number of calls waiting in queue.

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6. PAY ON FOOT REQUIREMENTS SPECIFICATION

This section is an elaborate exposition of Parking Management System (PMS) requirements and specifications that the solution must comply with. PMS as used in this document refers to the following:

I. Pay on Foot (POF) System and associated components and peripherals;

II. License Plate Recognition (LPR) associated components and peripherals;

III. Variable Message Signage (VMS) associated components and peripherals; and

IV. Bay detection sensors associated components and peripherals.

A Pay on Foot system requires the driver to pay at a payment machine before returning to their vehicle. It is a natural solution for parking facilities such as airports, hospitals, large shopping centres, theatres and cinemas where parking personnel are less frequently available. The POF system must at minimum comply with the following requirements:

6.1. POF system specifications and requirements: Entry and Exit

6.1.1. The entry lanes will require a ticket dispenser, a barrier arm and barrier (single barrier arm), and a LPR camera for each lane. The entry lanes will also be equipped with magnetic loops to sense vehicles in order to ensure correct operation and timing of the entry lane. Pinhole facial cameras are also required for the entries and exits;

6.1.2. Lane exits and lane entries shall be equipped with vehicle barrier systems to prevent unauthorised exits and entries. Vehicle barrier systems shall incorporate electro-mechanical drive units to allow automatic and manual opening and closing of barrier arms. Automatic operation shall be the primary mode of operation for the vehicle barrier system;

6.1.3. The vehicle barrier system shall be a cost-effective solution that caters for high frequencies of vehicular movement yet requiring minimum maintenance;

6.1.4. Electronic control panels are to be positioned within vehicle barrier cabinet at a height that permits easy access to components and therefore allow convenient carrying out of settings and maintenance activities;

6.1.5. All Exits, Entries and Pay stations must have proximity readers. A proximity reader is a contactless smart card which can be read without inserting it into a reader device, as required by earlier magnetic stripe cards such as credit cards and "contact" type smart cards;

6.1.6. The booms must preferably be padded ie covered with a soft material to protect them and make them more comfortable and durable;

6.1.7. It shall be possible to integrate vehicle barrier systems with inductive loop detectors for detection of vehicle presence. Logging of events at each vehicle barrier shall be made possible. Events such as operational failure, tampering, changes in settings, and maintenance activities shall all be reflected in the POF system as a log and accessible by ACSA when required;

6.1.8. All ticket dispensers, exit dispensers and boom housings should be in stainless steel;

6.1.9. The ticket dispensers will require a VOIP intercom system, a magnetic stripe ticket dispenser with ability to print unique 1D and 2D bar codes, chip and pin card readers, tap and pay technology, a pinhole camera, a RFID reader incorporating Wi-Fi and Bluetooth functionality,

and a voice guidance system. An A5 cut-out display area covered in UV protected clear material to accommodate the parking tariff signage. An A4 cut-out display area covered in UV protected clear material to accommodate the entrance disclaimer signage;

    6.1.9.1.   VOIP intercoms are mandatory for communication purposes in the event that the station has either swallowed a ticket, hasn't issued a ticket or for general issues that require communication with the respective control room operations staff;

    6.1.9.2.   Magnetic stripe tickets are mandatory entrance requirement in the absence of any other means discussed below;

    6.1.9.3.   1 and 2D bar code scanners scan bar codes printed either on paper, and/or read off from mobile phones when making pre-bookings;

    6.1.9.4.   Chip n Pin card readers are used to read payment by debit card method;

    6.1.9.5.   Tap 'n Pay technology. This technology provides a wide spectrum of uses ranging from tap Master and VISA cards to future bus cards, city cards that will be accepted on bus/train platforms, suitable for Park 'n Ride solutions;

    6.1.9.6.   Pin-hole cameras already being installed at ORTIA, also called facial cameras will take an image of the driver and compare entry and exit data for authentication upon exit, preventing vehicle theft;

    6.1.9.7.   RFID Readers facilitate entry by prepaid card systems, or RFID tag systems that will allow staff etc to enter and exit;

    6.1.9.8.   Wi-Fi and Bluetooth Technology promote the concept of BOYD [bring your own device] methodologies, eg. Mobile phones. Enter by either placing mobile phone against the readers, or allowing the Wi-Fi signal to lock on and authenticate and enter via ticketless entry;

    6.1.9.9.   Voice guidance system. This is a sound byte that is installed into the intercom server that allows the intercom speaker to address the motorist customer when they activate/arm the entry station as the car drives up to the entry; and

    6.1.9.10.   A5 cut-out is for the purposes of applying tariff advice.

6.1.10. The exit lanes will require a ticket reader, barriers and barrier arms, and a LPR camera for each lane;

6.1.11. The ticket readers at exits will have a VOIP intercom system, a magnetic stripe ticket and 1D and 2D bar code reader, chip and pin card readers, tap and pay technology, a pinhole camera, a RFID reader incorporating Wi-Fi and Bluetooth functionality, and a voice guidance system. An A5 cut-out display area covered in UV protected clear material to accommodate the parking tariff signage;

6.1.12. There must be an Intercom at each entry and exit. The intercom subsystem must have audio recording and playback capabilities;

6.1.13. All exit lanes will be equipped with a double barrier arm with spike grippers system to prevent tail-gating and all automatic barrier arms with will be of the fast-acting type;

6.1.14. Exit stations shall be automatic devices that perform parking ticket validations with a high level

of accuracy and reliability. Exit stations shall perform quick ticket validations and quick ticket jam detections;

6.1.15. Coordination of exit stations with vehicle barrier systems in exit lanes shall prevent vehicles with non-validated parking tickets from exiting the parking facility and only permit vehicles with validated parking tickets to exit. The process of validating parking tickets, offering customer assistance through built-in intercoms and granting permission to vehicles to exit the parking facility shall not introduce hindrances to seamless operation of exit lanes;

6.1.16. Exit stations shall make use of latest applications and component technologies that comply with relevant national and international standards;

6.1.17. The POF system must create and maintain an audit log for instances where the boom was manually opened at the exit;

6.1.18. Audit logs to include log of the name of operator logged in on the parking system when boom was manually opened. All doors to have a sensor to record all manual interventions, removal of ticket jams, etc. Exit and entry equipment to have an alarm. Audit logs to record all and be able to extract information on specific events;

6.1.19. The numbering of tickets for all entries must be sequential;

6.1.20. The front panels of exit stations shall be made of high-quality vandal-resistant material and comprise clear and user friendly interfaces with easy to follow instructions. It shall be possible to transmit exit lane data (e.g. event logs, transactions etc.) to the central server for verification, statistical analysis and storage;

6.1.21. All exit stations shall have local off-line capabilities in the event of a communications failure. The exit stations shall store no less than 50 000 transactions and upload transactional data to the appropriate processing system once communication is restored;

6.1.22. RAM or bollard protection of devices against damages from vehicles at entrance and exit terminals as well as car park barriers shall be provided. The ticket dispensers, exit stations and LPR cameras shall be protected. Protection shall be in the form of a steel post ram protection, surface with durable, weather resistant powder coating installed using stainless steel fitment to prevent corrosion;

6.1.23. The POF field equipment will be provided with UPS backup power, 2KvA minimum installed inside the entry, exit and pay-station device. All server racks to have a managed 1 X 4KvA rack-mount UPS per rack as a minimum requirement;

6.1.24. The contractor will be responsible for all equipment installation including civil works or structural reconfigurations, cabling (fibre, ethernet, and power), etc. as described in this document;

6.1.25. The system will include control computers to be installed in the Airport control centre to monitor activities in the parking in case of emergency and customer issues;

6.1.26. The POF system should have the functionality that facilitates the control room operator to see the content of the pay station eg change availability.

6.1.27. The control room operator should be able to close or reset the entry/exit station and the pay

station from remote.

6.1.28. The interlocking area between the boom or barriers must have two robots that should glow RED by default and should turn GREEN upon entry if the entry transaction is successful. The two exit robots should also be RED by default and should turn GREEN upon exit if the exit transaction is successful;

6.1.29. All entries must have spike grippers and all exits must have double spike grippers to avoid tail gating;

6.1.30. The POF system must accept credit and debit cards, magnetic stripe tickets, and the ability to integrate with standard parking payment application systems and bar coded paraphernalia;

6.1.31. All entry and exit lanes are to cater for License plate recognition and automated vehicle barrier systems;

6.1.32. All entry Ticket dispensers must have a DUAL ticket storage (1 X Active storage and one standby storage) with DUAL feeder technology that will automatically change ticket source when tickets in active box are depleted and commence using the standby box seamlessly without a need for operator intervention. System must report to user when the standby box of tickets has been initiated; and

6.1.33. CCTV to pop up on screen when a specific entry, exit or pay station is activated by the control room operator and

6.1.34. If tickets are unreadable; the exit station should still be able to ingest the ticket before the boom is manually opened by the control room.

6.1.35. Exit station should have the functionality of paying for a parking ticket using the credit card

6.1.36. The POF system should be able to accommodate tap and pay at predetermined parking areas like pre-booking.

6.2. **POF system specifications and requirements: Pay stations**

6.2.1. All pay stations shall be fully automated pay-on-foot machines that offer complete ticket handling capabilities for central cashiering parking operations. The pay stations shall be low-maintenance and reliable with weather-proof cabinets and vandal-resistant faceplates;

6.2.2. The pay stations shall comprise user friendly interfaces with clear instructions for guiding customers through all payment procedures. The exterior operator controls shall be clearly laid out with easy-to-follow instructions, visual displays and push button controls;

6.2.3. The pay-station to have an A5 cut-out display area covered in UV protected clear material to accommodate the parking tariff signage;

6.2.4. Each pay-station to have an active media screen of no less than 15" to provide the customer with updated electronic information using RSS feeds with central advertising capability;

6.2.5. Comprehensive cash audits and revenue management reports shall be captured on-line and off-line to ensure 100% collection of all parking fees. Access to cash handling systems (banknote and coin vaults) shall require electronic password or mechanical keys. Different passwords or access keys shall be used for cash handling units and ticket containers. Each module shall be monitored electronically for maximum security. Any unauthorised access to cash handling

modules and ticket containers modules shall trigger an alarm and reflect immediately in the POF system database;

6.2.6. A pinhole camera is to be installed into each pay-station to record the passengers face when concluding a payment and an image stored with the unique ticket information and accessible on demand;

6.2.7. All transactions processed by pay stations shall reflect immediately in the POF system database. in the event that a customer requires assistance at a pay station, it shall be possible to contact system operator through a built-in VOIP intercom device;

6.2.8. Pay stations shall be equipped with electronic monitoring devices to detect tampering and misuse. Incidents of tampering and misuse shall be automatically logged and reported to the central POF system immediately;

6.2.9. All Pay stations must incorporate Bill to Bill (B2B) functionality. B2B is a component of the pay stations that uses bills paid with by previous customers to pay back change in bills to subsequent customers;

6.2.10. Provision must be made for a spare note and coin safes for each pay station;

6.2.11. All pay stations shall only be opened by authorised personnel using a two-method system of Key and a RFID card releasing a Mag-Lock mechanism. The authority levels are to be set on the main Server and only by an Administrator. Reports indicating opening activity must be available on the system reporting menu;

6.2.12. Each pay station shall be equipped with a static label displaying a message (written in boldface letters) such as 'PAY-HERE'/' PAY STATION'. In addition, the solution must provide APS machines that have engraved signage like for example 'press for receipt', 'INSERT YOUR CREDIT', 'DEBIT CARD HERE';

6.2.13. All pay stations shall have local off-line capabilities in the event of a communications failure The pay stations shall store no less than 50 000 transactions and upload transaction data to the appropriate processing system once communication is restored;

6.2.14. Pay station must be able to issue vouchers if unable to dispense change;

6.2.15. In every cluster of pay-stations, there should be one which is disabled-friendly, with a reduced height. In the event of a single installation, then it must meet the needs of people with disabilities;

6.2.16. All parking pay stations must allow for float refilling externally through either the coin slot for the topping, up of change in the various denominations into the coin hoppers/containers or via the note acceptor for the refilling of the note storage facility;

6.2.17. Regarding note acceptance, the payment stations must accept all notes as released by the South African Reserve Bank and acceptable in South Africa as legal tender. Upon a change of currency notes as may be decided upon by the Governor of the Reserve Bank, such changes must be successfully implemented into the parking payment stations nationally, within a period of 14 days from date of release of the new notes;

6.2.18. Pay stations must be able to dispense change in notes and coins. Notes and coins received

to be recycled to issue change. In addition, provision must be made for coin storage in hoppers or similar device;

6.2.19.   Loss of data or Information should be retrievable on Server if memory is lost due to some malfunction of pay stations;

6.2.20.   It is a mandatory requirement that the system be equipped with functionality that will enable the motorist or customer to be able to pay at the EXIT with a debit or credit card upon leaving the parking precinct;

6.2.21.   **Mobile payment:** The mobile payment functionality should ideally or preferably work as per the following two scenarios:

6.2.21.1 Scenario 1

With this scenario, payment will be effected will by way of a downloadable application to be provided the Service Provider. The application will work in conjunction with ACSA branded cards to be provided by the Service Provider. The trigger of the payment mechanism will be the ACSA cards. Payment will be done online via the application using a debit or credit card and entry and exit via the parking precinct will unfold by via the ACSA cards.

6.2.21.2 Scenario 2

To pay using a phone, motorist scan a quick response (QR) code on their parking ticket using an application to be provided by the Service Provider that can be installed on mobile devices, there after the ticket number or licence plate number is entered and payment concluded via debit or credit card. Upon leaving the parking precinct the motorist presents the ticket at the exit and leave.

6.3. **POF system specifications and requirements: Ticketing and Printing technology**

6.3.1   The system will use magnetic stripe tickets and have the ability to scan and read bar coded paraphernalia, issued to customers via the entry stations or in the event of bar codes, obtained from various approved sources, payable at the pay stations and used at the exit stations;

6.3.2   The system must accept chip and pin cards, credit cards and tap and pay and RFID technology devices at the entrance and exit stations, with the specific card or device acting as the ticket creating a ticketless environment, payment must be automatically calculated at exit, and the transaction concluded from the card or similar device used upon entry. The exit stations will accept payment at the exit station from a magnetic stripe ticket;

6.3.3   The Parking Management System will allow for the creation of customer accounts. The customers with accounts will be issued with wireless RFID cards. The RFID cards will allow entrance and exit to all parking areas connected to the POF system, with the accounts automatically updated with the associated fees. Customers with created accounts will also be able to add more vehicles and link to their accounts;

6.3.4   Users will be issued with monthly account statements via e-mail. Account holders will be able to make payments to their accounts via EFT, payment at the cash registers, or by means of their RFID cards at the pay stations;

6.3.5   ACSA has entered an agreement with the Republic of South African Parliament of South Africa

to provide the Members of Parliament with ease of access in the use of a 'one-card-all-airports' facility, the technology design in the tender response must be able to fully integrate into the current offering to Parliament without having the need to issue additional cards;

6.3.6 Ticket dispensers shall use the latest components and applications that comply with relevant national and international standards. Components shall be of high quality and be able to withstand severe weather conditions. It shall be possible to integrate ticket dispensers with third-party devices at entry lanes to achieve a fully automated vehicle access control system;

6.3.7 Parking tickets shall be issued at all ticket dispensers located at all entry lanes with the exception of the vehicle staging and the bus lane;

6.3.8 Pay stations and the cashier terminal shall issue replacement parking tickets for lost tickets and for tickets that become unreadable. Furthermore, bidders must provide a process for ticket re-issue that will avoid fraudulent activities and also avoid criminal activities, e.g. aimed at stealing cars;

6.3.9 Printing and reprinting options from the control room of receipts shall be made possible at all designated pay points and exit points;

6.3.10 The minimum information to be printed on the parking tickets shall be the Name of the Airport, Ticket Number, Entry Time, Entry Date and Name of the Entry Point;

6.3.11 Additional information that may be considered mandatory to appear on the tickets shall be accommodated by the Service Provider;

6.3.12 The license plate associated with the ticket shall be printed on the ticket;

6.3.13 The minimum information to be printed on receipts shall be Name of the Airport, Location within the parking facility, Duration, the words 'tax invoice', Receipt date and time; License Plate Number (optional) and Transaction type i.e. cash, credit/debit card or contactless card, the value of the transaction;

6.3.14 Receipts should have a VAT number;

6.3.15 The central control room operator must be able to reprint receipts using a facility on the workstations in the control room to either a pay-station or to an exit station and have the option to e-mail the receipt directly from the workstation; and

6.3.16 There are a lot of system reports that are printed from the POF system to reconcile the revenue and other parking statistics. It would be preferred that the POF system be linked to the ACSA printers to print these reports as the printers supplied by the service provider use up the ink quite quickly and the cartridges are expensive. If the system reports are not linked to the ACSA printers for printing, the POF service provider must include the supply of printer cartridges as part of their monthly consumable list. Reports should be e-mailed via POF to dedicated e-mails and team viewer to remotely dial in and extract them.

6.4. **Customer loyalty programs and discounted parking fees**

Prospective bidder's proposal must incorporate a value proposition of the concept of loyalty and discounts on parking fees. In other words, the proposed parking management solution must be able to

integrate and function seamlessly with existing and envisaged customer loyalty programs at ACSA in a manner that customers and motorist can qualify for discounted parking fees.

6.5. **POF system specifications and requirements: Cashier workstations (Terminals)**

6.5.1 The manual cashier terminal shall offer similar manual car park tolling services. The equipment and software shall be flexible and capable of customisation to meet the specific requirements as detailed in this section;

6.5.2 The cashiering system equipment and software must not operate as stand-alone units. They will be networked to share the POF system central server database. Upon a network failure, only will the cashier station operate on standalone and should be able to hold no less than 50 000 transactions;

6.5.3 The cashier stations will also be equipped with a receipt printer and an A4 printer and a VOIP intercom system;

6.5.4 Cashier work stations must be able to print duplicate receipts for all payments made at exits and Pay stations;

6.5.5 The operating stations will each include a master VOIP intercom station which will be connected to the intercoms located at the entry stations, exit stations, and pay stations.

6.5.6 All computer workstations are to be rack-mounted in a secure IT room and fed through to the control centre by the use of LAN KVM extender technology; and

6.5.7 All computer workstations are to be rack-mounted in a secure IT room and fed through to the control centre by the use of LAN KVM extender technology.

6.6. **Car Charging Stations**

6.6.1 The POF system should have the ability to add on parking power charging stations as and when requested for electric vehicles and be able to transact amounts payable in currency at pay-stations or at the charging station itself;

6.6.2 The solution must be able accommodate 'pay-as -you-go' or similarly, prepaid recharging stations for electric vehicles that is fully integrated with the parking software and hardware; and

6.6.3 The Car battery charging stations should have a variety of connections to meet with international and industry specific requirements.

6.7. **Pre-booking**

6.7.1 The POF system shall be able to accommodate prebooking options into all parking facilities, and maintain an accurate update of bays used versus bays available which will be communicated in real-time to the embedded prebooking portal; and

6.7.2 As an innate requirement, the POF system should have an application through which mobile users will be able to log on remotely to their profiles and prebook a bay in a parking facility and enter the facility by way of their mobile phone RFID, bar coded receipt displayed on their mobile device, or through printed paraphernalia.

7. LICENSE PLATE RECOGNITION REQUIREMENTS SPECIFICATION

The objective of this system is to minimise crime and mitigate the phenomenon of car theft and revenue leakage. LPR is an image processing technology used to identify vehicles by their license plates on entry and at exit time to ensure the car license plate matches the parking ticket. The technology is supported by complimentary processes which match license plate registration, facial image of the motorist and the payment transaction. This makes it difficult for a motorist to drive out of the parking precinct if transaction credentials upon exit do not match the entry ones. In case of a mismatch or discrepancy, the system must function as specified in section 7.20.11. The LPR system must at minimum comply with the following requirements:

7.1. Each parking entry and exit lane at the airport parking facilities shall be equipped with the LPR subsystem;

7.2. The LPR subsystem shall consist of all hardware and software necessary to provide a complete licence plate reading subsystem that does not adversely affect any function of the POF system;

7.3. The Service Provider shall be responsible for providing fully functional LPR subsystem that is fully integrated with the rest of the Parking Management System;

7.4. Processing of license plates by the LPR subsystem shall occur in parallel with other functions occurring at exit and entry lanes. Operation of the LPR subsystem shall not negatively impact the ticket processing time for vehicle entry and vehicle exit;

7.5. All Cameras for the LPR subsystem must be digital and IP based;

7.6. LPR cameras should be in a tamper plate housing to prevent the camera from being bumped and loosing focus;

7.7. The LPR subsystem must have LPR and facial cameras at all entries and exits;

7.8. All information within the LPR database shall be accessible for review on a screen and through the availability of printing of reports. No impediment to the immediate access and retrieval of LPR data shall result from the use of the POF system database or any other system hardware or software;

7.9. The proposed Automated Number Plate Recognition Software (ANPRS) or Automated Licence Plate Recognition System (ALPRS) should be a stand-alone application which should be able to function in the absence of any integration with Pay on Foot/Parking Management/Access control or any State Agency Institutions;

7.10. The proposed system should play a role of an intelligence system when integrated with critical Airports systems (Pay on Foot, Access Control or any other State Agency Systems);

7.11. It should deliver clear license plate images for reliable recognition, in both highest levels of glare and in the darkest hours;

7.12. The system should be able to integrate with any Pay on Foot System/Parking Management System/Pay per parking/Access Control and or State Agency systems;

7.13. The system should be able to determine the car mark and brand;

7.14. It should be able to integrate with multiple with multiple cameras including drive face camera, overview camera and number plate camera;

7.15. When integrated with Pay on Foot, the ANPRS/ALPRS should be able to provide statistics on overstay;

7.16. It should be able to White list or Blacklist so that authorised vehicles can easily pass;

7.17. It should have built in or an alternative monitoring system to detect when there is an offline facial and LPR camera;

7.18. Other system features should include the following:

    7.18.1. Identification of Vehicle make and model;

    7.18.2. Accurate License Plate Recognition;

    7.18.3. Number plate and vehicle mismatch scenario; and

    7.18.4. Drive and vehicle mismatch scenario.

7.19. **LPR Camera specifications:**

    7.19.1. Must be able to capture a vehicle Licence plate at up to 20MPH (32km/hr);

    7.19.2. Must have Supreme anti-glare capabilities/build in illumination/ Capability to read reflective and no reflective license plate;

    7.19.3. Must be open IP standards for plug-and-play integration with 3rd party Automatic Number Plate Recognition Software (ANPR) or Automatic Licence Plate Recognition;

    7.19.4. Must be dust and waterproofed resistant;

    7.19.5. Must Activate detection via software video motion detection or by input/output activation;

    7.19.6. Power: POE/POE+++/802.3AF/12V/24VAC;

    7.19.7. 1080P/2 Megapixel;

    7.19.8. Detection rate must be greater of equal to 99%;

    7.19.9. Reading rate must be greater or equal to 95%;

    7.19.10. Black and White and colour option;

    7.19.11. Optical character recognition (OCR) Engine Onboard;

7.20. In conjunction with the POF system, the LPR subsystem must at minimum be able to work as follows:

Step 1: Entrance to parking precinct

7.20.1. The motorist presses the button on the ticket dispenser, this action activates a process, whereby the facial camera takes the picture of the motorist, simultaneously the LPR camera positioned in front of the boom will decode, read and store the registration number and captures an image of the vehicle license registration plate. In a ticket-less environment or prebooked scenario, the LPR immediately recognises the licence plate via the RFID used by either mobile phone technology or by prebooked and prepaid criteria and opens the boom, sending a string of the information gathered to the database for storage and billing purposes;

7.20.2. The motorist picture and the vehicle license registration plate is matched and stored in the system;

7.20.3. A parking ticket is printed and issued to the motorist, the ticket issued contains the details of the boom/entrance, date, time and registration number printed on it; and

7.20.4. The boom opens and allows the motorist to enter the Parkade.

Step 2: Payment for parking

7.20.5. Before leaving the airport, the visitor/motorist pays for parking time at the automatic payment station (APS) located within the airport precinct which registers the payment;

7.20.6. At the APS, the motorist inserts the parking ticket. The system computes the cost and displays it on the screen; and

7.20.7. A successful transaction is registered on payment and is registered as paid in the system. The parking ticket is validated and re-issued to the motorist;

Step 3: Exit from parking precinct

7.20.8. The motorist inserts the ticket into the ticket acceptor slot and this activates a process whereby the payment, license plate registration is matched via the POF system. In a ticketless environment, the LPR would immediately recognise the licence plate and RFID apparatus, check for available funds or prepayment and evaluate the stay period against the funds and opens the boom to allow exit;

7.20.9. If all the above-mentioned characteristics or variables are matched, the first boom opens allowing the motorist to proceed into the interlocking area between the two booms; and

7.20.10. Once the first boom closes after the motor vehicle has passed through, the second boom will open allowing the motor vehicle to exit from the Parkade. As the ticketless user leaves the parking facility, the POF system will automatically generate a tax invoice for the stay period and send to the user via email.

Exception: Credentials discrepancy

7.20.11. If a mismatch is detected between parking ticket and vehicle license plate number, the following must unfold:

14.9.11.1 The system must raise an alarm;

14.9.11.2 LPR should automatically pop-up both entry and exit pictures of the vehicle registration and the driver (Facial Recognition);

14.9.11.3 LPR should show colour/make of the vehicle without the Control room agents looking at CCTV footage;

14.9.11.4 The vehicle registration (automated pop-up) should be time stamped with date and time as well as entry used.

14.9.11.5 As the above articulated events (14.9.11.1 to 14.9.11.4) are unfolding, the system should maintain a high level of operational ability without any reduction in processing capacity.

7.20.12. Furthermore, in case of exceptions of the above nature, a log must be automatically generated in an incident file and stored for auditing purpose. The LPR process articulated above is depicted in figure 2 at a high-level. The process model does not cover the ticketless scenario.
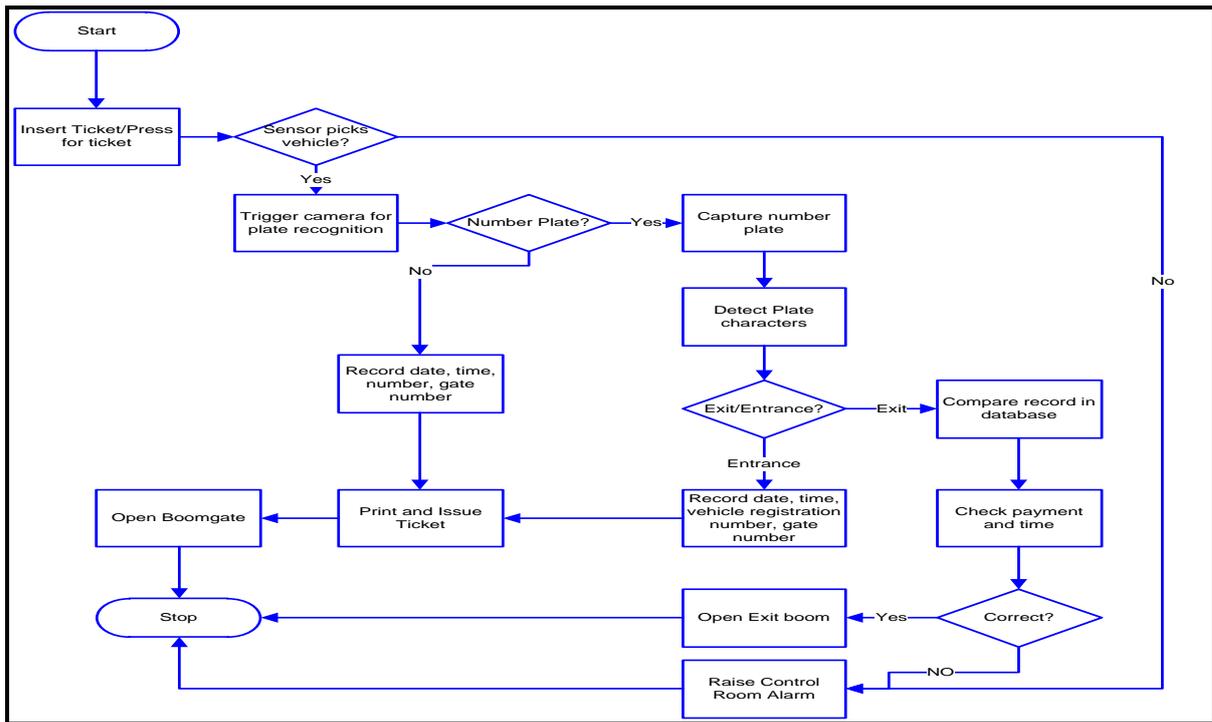
Figure 2 : LPR Process flow

8. VARIABLE MESSAGE SIGNAGE REQUIREMENTS SPECIFICATION

The purpose of the VMS system is to assist motorists driving into the Airport to be able to see, from a distance, how many parking spaces are available at which parking precinct and therefore where parking can be found when they are still out of the parking precinct.

8.1. **Variable message signage: Signage**

8.1.1. The Variable Message Signage (VMS) shall provide motorists with information they need to choose a parking area and parking product. The information shall help motorists to quickly locate correct parking structures, level and space where they are parked. The static signage to include parking grading requirements to indicate best choice options by virtue of convenience;

8.1.2. The VMS shall conform to applicable design standards with regards to text height, arrow style, colour usage and the use of sign faces;

8.1.3. The VMS shall ensure logical decision making process for both arriving and departing motorists. Information shall be provided instantaneously, at the correct location, with accurate values, and in a format, that is clearly understood by the viewer. The system shall make use of consistent terminology on signage and use of terms most commonly understood by motorists;

8.1.4. The VMS system displays must respond appropriately to ambient light intensities between full sunlight and complete darkness for maximum visibility. The VMS system shall ensure that the luminance output of the display board elements is maintained in accordance with ambient light conditions, especially when there is low sun directly in front of, or low sun directly behind the VMS;

8.1.5. The VMS control unit shall provide information regarding the Power failure, communication

failure, incorrect message displayed, message updated, external luminance level (lux) and luminance settings;

8.1.6. The VMS will be fully networked and configurable through the control centre. The VMS will provide real time parking space availability. Dynamic Information displayed by the VMS will reflect immediately in the POF system. Where necessary, it will be possible to configure to display appropriate messages for special events such as lane closures, special tariff structures etc.to the POF system; and

8.1.7. Real time logging of events will be possible through VMS controls units. Logged data will include dysfunctional units, error messages, changes in settings, maintenance activities etc. Such data will be reflected in the POF system database.

8.2. **Variable message signage: Applications**

8.2.1. Vehicle directional signage: This will provide motorists with directions for ease of navigation at identified locations throughout the parking facility. Directions will be in the form of names of parking areas and arrows next to the names pointing in the direction of the parking area locations. The signage will display parking space availability of parking space by area. Dynamic information relating to parking products such as tariff structures and grace periods will form part of the information provided by vehicular directional signage. Location of vehicular direction signage will be next to identified roadways within and outside the parking facility. Where over-head mounting of signs are unnecessary or impractical, post-mounted signs will be used next to the roadways. Material will be fabricated aluminium with applied retro-reflective graphics and digital LED displays. External over-head light fixtures will be provided for night time illumination of the entire signage display boards. The signs will be attached to galvanized steel/post structures;

8.2.2. Facility identification signage: This will be wall mounted and easy to locate by motorists. Information displayed will be the name of the parking area (e.g. 'MULTI-STOREY PARKADE ENTRANCE 1') at the entrance. Where wall-mounted signage is not possible, free-standing or post-mounted signs will be installed next to the facility entrance. The signage will be made out of fabricated aluminium with applied retro-reflective graphics. External lighting will be provided for night time illumination of the signage boards;

8.2.3. Facility interior signage: Shaded parking facility and the Multi-storey parking facility interior signage will provide directional information to guide motorists through the parking area. The signage will be made out of fabricated aluminium with applied retro-reflective graphics. External lighting will be provided for night time illumination of the signage boards. Displays will be free-standing or post-mounted where applicable;

8.2.4. Pedestrian directional signage: The signs will be freestanding, on fabricated aluminium with applied graphics. Location of signs will be along walkways leading up to various points of service throughout the facility (i.e. pay stations, parking areas, cashier station etc.). Where freestanding signage is not possible, post-mounted/over-head/wall-mounted fixtures will be used;

8.2.5. Pay station identification signage: Pay station identification signage will be located above each

pay station to assist customers/pedestrians in quickly locating nearby pay stations. The material will be internally illuminated sign boxes with applied translucent graphics. The signage will be mounted on facility slabs or physically fixed on the pay station; and

8.2.6. Fitment in areas with ceiling height lower than 2.5m should have a minimum of 100mm characters, areas with ceiling height between 2.5 and 4.0m must have a minimum of 200mm characters and areas with ceiling height exceeding 4m [external] to have a minimum of 300mm characters, all gantries to have 300mm characters as a minimum requirement. All LEDS are to glow AMBER in normal operation when bays are available and to glow RED when indicating FULL.

9. BAY DETECTION SENSORS REQUIREMENTS SPECIFICATION

Parking bay detection sensors indicate available parking bays when the motorist is already within the Parking precinct. If a sensor is green, the bay is available, while red means the bay is occupied. The bay detection system must at minimum comply with the following requirements:

9.1. The bay detection installation will indicate the availability of its dedicated parking space by means of a LED light. The LED indicators will be positioned as to be visible from a distance of at least 30 meter from the specific parking space. In addition, any undercover parking area shall be fitted with the latest car finder technology which must be embedded and integrated into the bay detection system and fully integrated into the Parking Management System;

9.2. The sensors must not detect a trolley or any other object;

9.3. The sensor should detect a motor bike occupying the parking bay;

9.4. The Parking Management System must be able to accommodate online payments via an application.

9.5. The sensor must be able to detect glass and fabric otherwise the car will not be detected if it is parked in a way

that the windscreen is facing the sensor;

9.6. The system must make accommodation for a different colour light for available bays for people with disabilities to park in, preferably blue in keeping with the other airport configurations;

9.7. Each parking space will be fitted with an ultrasonic or radio frequency sensor, with a display light indicating whether the parking space is available or occupied.;

9.8. The Service Provider will be responsible for installing cable trays, as required, for the bay detection installation. The bay detection installation will include electronic signage that indicates the number of open parking spaces for a given aisle; and

9.9. The bay detection will be connected to the POF network, and information including abandoned vehicles, statistical parking usage information, etc. will be obtainable from the POF central server.

9.10. Car finder integration will allow a user to locate his/her vehicle through licence plate input into the parking pay-station or on standalone units strategically placed to provide users with ease of use.

10. GENERIC REQUIREMENTS SPECIFICATION

This section is an articulation of requirements applicable to the entire Parking Management System. The solution must comply to the following requirements:

10.1. **Generic requirements specification: Equipment**

10.2. The Service Provider shall provide, install, commission, support and maintain all the required equipment;

10.3. All material housing metals must be weather and rust proof (especially for coastal airports ie Port Elizabeth, George, King Shaka and Cape Town) and non-corrosive (IP65 rated);

10.4. Provision must be made for UPSs for all electrical equipment or installations;

10.5. Provision must be made for lightening and surge protection for all electrical equipment or installations;

10.6. Provision must be made for designated staff to be able to authorise and set amount limits for off line credit card payments to facilitate payments at exits and pay stations in cases where the POF system is unable to facilitate credit card payments; and

10.7. A notification must be sent to system users in cases where the main power is down and the system is running on UPS.Miminum required uptime for UPS is 2 hours;

10.8. Owing to the fast pace at which technology evolves, all prospective service providers submitting proposal for the tender should declare all relevant Technology that ACSA has not specifically requested, but could have a significant impact on improving customer service and operating costs;

10.9. From time to time, ACSA may require the Service Provider to perform new Installations, Moves, Additions, Change and De-installation ("IMACD") as well as tagging of asset as follows

    10.9.1. Request installations, change, de-installation or moves of components of the Parking Management System.

    10.9.2. Maintain an asset register indicating the location of all installed equipment;

    10.9.3. Asset tagging of all newly installed equipment as well as current equipment that the Service Provider will be maintaining. Asset tagging shall be done as per instructions from ACSA;

10.10. **Generic requirements specification: Software and equipment installation, start-up and testing**

10.11. The Service Provider shall install all the required equipment, perform on-site inspection of installation work, perform initial start-up of equipment and software (including customised equipment and software programming) and test all equipment and software to ensure proper operation;

10.12. All installations shall be complete in all respects and the Service Provider shall allow for the completion and successful operation of the complete installation, irrespective of whether every separate item is specified or not;

10.13. Equipment installation shall include all mounting hardware and all low voltage electrical, fibre optic or other cable or wiring connection required to make the equipment operable;

10.14. The Service Provider shall work with the airport electrician/personnel to direct what necessary low/high voltage hook-ups are necessary;

10.15. If any software is required to be installed on any airport-owned computers, such installation shall be done in coordination with the relevant airport's Information Technology Department as necessary.

10.16. The Service Provider shall make available user and maintenance manuals for all equipment and software to the airport at the time of equipment start-up;

10.17. **Generic requirements specification: Standards**

10.18. Any deviations from the standard specifications, drawings and/or equipment specified shall be listed together with the alternatives offered and shall be submitted as part of the tender. If no deviations are listed, it will be assumed that the Tenderer complies with all the relevant technical parts of this specification;

10.19. The solution must at minimum comply with the current ACSA IT Architectural principles;

10.20. **Generic requirements specification: Removal of existing equipment and transition plan**

10.21. All POF equipment removed from site will be handed over to ACSA immediately after removal. Existing asset management tags must remain on the equipment at all times. Equipment removed will be boxed and transported to a pre-determined location on the airport premises according to ACSA requirements. It is recommended that the supplier keeps a record with serial number information of existing equipment removed and handed over to ACSA;

10.22. All decommissioning of old equipment should follow proper asset decommissioning procedures (for IT equipment) as instructed by ACSA from time to time;

10.23. Care must be taken to minimise the impact of this undertaking to on-going operations in the facility. The bidder will include the change-over methodology in detail with a total projected plan as part of the overall project execution methodology, bearing in mind that all tickets extracted from the old system must be able to be paid for at a pay-station and able to exit without any hindrance to the customer A cut-over plan and method statement must be included in the document to accommodate the preceding;

10.24. A comprehensive change management and training plan will be put in place to address the changes brought about by deploying the solution. The forgone will be mediated by ACSA and effected by the Service Provider. Furthermore, a risk assessment needs to be conducted to identify probable risks associated with this deployment. The risks should be logged with IT Risk Management in IT Governance and Resilience. There should be evidence of risk mitigation measures put in place in the form of a risk management plan;

10.25. A Factory Acceptance Test pack will be drafted and the solution will be tested against the requirements articulated in this document Specification. Any defects will be corrected, and a Factory Acceptance Testing (FAT) report will need to be signed off by the relevant stakeholders prior to the solution going operational; and

10.26. A thorough system impact assessment will need to be conducted prior to deployment.

11. SERVER SPECIFICATIONS

11.1. The system shall to the greatest extent possible use commercial off-the-shelf systems (software and hardware components) marketed and installed by revenue control service providers and manufacturers and shall embrace system technologies that have been successfully implemented;

11.2. The Service Provider shall utilize premium grade equipment designed to operate reliably within the specified environmental and operating circumstances. All equipment shall be installed and tested by system provider's technicians/personnel complying with manufacturers' recommendations;

11.3. To the greatest extent possible and available open architecture shall be utilized for operational and maintenance support subsystems;

11.4. The Severs shall provide capability to expand and upgrade the system to meet future parking requirements without having to replace major components;

11.5. The system or solution must be connected to ACSA' network;

11.6. ACSA standards for Severs is Virtual especially for ORTIA, KSIA and CTIA. Physical servers are not recommended. ACSA's IT Infrastructure team will review Regional sites and make a recommendation whether to deploy Virtual or Physical Servers. Furthermore, the Servers will be provided by ACSA's IT Infrastructural team but the Specifications will be furnished by the Service Provider. This is also applicable to all Cashier workstations;

11.7. The system will be web accessible and allow Operators and Managers access to the operation and reporting of the system through operator and manager accounts over the internet;

11.8. All functions of the POF must be accessible via web interface including the VMS, bay detection information, LPR and facial cameras;

11.9. The system must be flexible and adaptable in order to allow for customisation according ACSA's changing parking requirements;

11.10. All central servers shall operate using internationally adopted operating system(s). The database shall be robust, proven, and commercially available (Oracle and Microsoft SQL Server) are examples of such database management systems (DBMS);

11.11. Interoperability, Industry standard SQL databases, commercially available solutions, integrated through open communications protocols, TCP/IP compliant, Hardware and Software reliability and system supportability are the main features, functions and essential requirements for this solution;

11.12. All data from the various sub-systems will be maintained in the main database on the central servers by unique data fields. The transaction data is to be accessed by Ticket number or transaction number or Date and Time or Equipment identification or Location within the parking facility or License plate number or a combination of the aforementioned fields;

11.13. All system transactions shall be recorded in such a manner as to allow an audit to be conducted on all transactions, customer, and facility levels. The intent is to allow all transactions to be linked back to the master records for reporting, analysis, data retrieval, and legal purposes;

11.14. The system shall be an open system where all interfaces (hardware and software) conform to recognised national and international standards published from organisations such as International Standards Organisation (ISO);

11.15. The POF system database server shall use open system standards (e.g., IEEE 802.3 – defines the Ethernet communication protocol);

11.16. The POF revenue control network shall be managed centrally and support standalone operations.

11.17. The system shall use point-to-point communication between field devices and fibre optic connectivity shall be provided in each field equipment component;

11.18. All central servers and log on systems shall have secured access. An appropriate password system shall be supplied by the Service Provider that is based upon a "need-to-know" decision. The car park management staff shall have complete control to add to, delete from, or revise the passwords that are established by the Applications Administrator. The passwords must be compliant to the ACSA password standards and security policy;

11.19. The system will be fitted with a grey list and black list database. Operators will be able to add and remove vehicles to the lists manually. The system will also automatically identify vehicles tailgating and repeatedly entering the Pickup and Go area and add them to the lists. In the event that a vehicle that is on either the grey list or the black list attempts to enter the parking area, the system will alert the operators of this event. The operator will then be able to deny access or deny exit to the vehicle;

11.20. The Service Provider will use a payment gateway to process all card transactions. On the contrary, ACSA needs to conclude an agreement with the clearing house and all transactional costs or commissions and charges are to be paid for by ACSA/debited by the clearing house. If it is permissible, then we need to prescribe that only the clearing house named IVERI be used, which is a Nedbank supported gateway;

11.21. All central servers' on-line databases shall be fault tolerant for all operational functions. There shall be no data loss upon failure of any single component or associated interface. The servers shall be configured at a minimum to:

11.21.1. Maintain twenty-five (25) months of on-line data of all transactions – entry date/time, exit date/time; parking facility entry and exit lane identification, parking length of stay calculation, parking fee due, parking fee paid, payment method, credit card details including credit card type, and authorization code, and other information considered as part of the transaction;

11.21.2. Archive all summary reports for up to sixty (60) months on electronic media with simple retrieval capability. The Service Provider shall provide a backup/archiving system whereby reports are properly catalogued, such that historical data can be retrieved, added to new reports, or printed;

11.21.3. Keep operational data on-line for the prior twenty-five (25) months. Operational data includes: Lane closure date/time with cause for closure and equipment failures; The failed equipment component shall be identified by functional name, model number and serial number; Daily

event log of exception transactions including date, time, parking area, lane, complaint or problem identification, and resolution;

11.21.4. Detailed event data shall be maintained for twenty-five (25) months. The complaint or exception information shall be easily retrievable and software provided to assist an operator in building and maintaining a report/database of complaints and/or problem incidents;

11.21.5. The Service Provider shall size the fault tolerant POF system Central Servers' hard-disk capacity to have twenty-five (25) months active data on hard disk along with software and other programs required to operate the system. Provide from the workstation "Real-time Revenue and Ticket Query" - immediate access by a Supervisor of any cashier, card exit reader, and entry lane or exit lane to monitor their current balance, number of transactions, and ticket count;

11.21.6. A backup, offsite data storage system will be provided. The backup storage system will be installed at one of the POF equipment/power buildings. The backup storage system will shave capacity to store twenty-five (25) months of detailed event data and will automatically update/synchronise with the main storage system; and

11.21.7. At minimum, the following Servers will be required:

11.21.7.1. One Sever and a backup for the POF subsystem;

11.21.7.2. One Server and a backup for the POF subsystem credit card functionality;

11.21.7.3. One Server and a backup for the LPR subsystem;

11.21.7.4. One Server and a backup for the Intercom subsystem;

11.21.7.5. One Server and a backup for VMS and Bay detection subsystems;

11.21.7.6. One Time server; and

11.21.7.7. One server and a backup for CCTV.

12. WORKSTATION OR CASHIER TERMINAL SPECIFICATIONS

As already alluded to in the preceding section. The Servers and Workstations will be Provided by ACSA IT's Infrastructural Team but the System specification (Hardware and Software) will be provided by the service provider. The Operator in conjunction with the Parking System must comply to the minimum Workstation requirements expressed in the following paragraphs:

12.1. Manual tolling of parking fees;

12.2. A RFID Card reader must be an integral part of the system;

12.3. Issuing of change in the form of coins and banknotes;

12.4. Perform parking ticket validations;

12.5. Printing of receipts and duplicate receipts at customer's request;

12.6. Processing of lost and damaged ticket transactions;

12.7. Generation of tariff structures;

12.8. Offer customer assistance through the voice service provided by intercom system throughout the parking facility;

12.9. Keep track of all transactional activities at all field devices;

12.10. Generate historical data reports and financial reports for all field devices and for each cashier unit. financial reports shall be for any shift (i.e. daily/weekly/monthly). Field devices shall include: exit stations and pay stations;

12.11. Ticket technology: Magnetic stripe paper ticket and 1D and 2D bar code:

12.12. Ticket validation speed: maximum of 1 second per ticket;

12.13. Cash handling: 1 cash drawer per cashier unit;

12.14. Compatible with Ethernet communication (TCP/IP); and

12.15. High brightness fee display Point of Sale printer.

13. TICKET VALIDATORS

The Parking Management System must be bundled or packaged with parking ticket validators. Validators are used to validate VIP tickets and other persons permitted by ACSA in a way that payment at a pay station prior to exiting the parking arena will not be necessary. At a minimum, all International Airports (ORTIA, KSIA and CTIA should have 5 (five) validating machines and all Regional Airports should have 3 (three) validating machines.

14. FIBRE OPTIC CABLING SPECIFICATIONS

14.1. Installation Specifications

a. No installation of any fibre cable older than one year from date of manufacturing shall be done or allowed. The fibre specification must be single mode 9/125 microns as this is fastest and most reliable;

b. The cabling specifications and installation must comply to ACSA IT Physical Infrastructure Caballing Standards and Guidelines;

c. Branding: All products installed shall be branded indicating the manufacturer's name and the product code;

d. Cables: Fibre patch cables are to be factory assembled, terminated and certified to the relevant standards;

e. Joints: Only approved dome joints are to be used and shall be waterproof, have wall mount brackets, have splice organiser, have sealed unused inlets with lugs, have heat shrink for cables and screw type brackets to seal the lead; and

f. All manholes and leading sleeves in and out of the manholes must be fitted with rodent proofing produced in stainless steel.

14.2. **Installation Specifications**

a. <u>Cables</u>: Indoor fibre optic cables shall have a minimum bend radius of 10 times the cable outside diameter when under no load and 15 times the cables diameter when being pulled;

b. <u>Vertical Optic Fibre Cables</u>: Use tight buffer cables in buildings where the vertical rise of an optic fibre cable exceeds 20m. Use cable strain relieve at the top of each vertical rise and thereafter at 1m intervals;

c. <u>Cable Drums</u>: Cable drums will be supported with an axle on trestles. All cables will be provided in standard drum lengths;

d. <u>Twisting</u>: Twisting of cables is forbidden;

e. <u>Manholes</u>: No slack is required at intermediate manholes unless there will be a joint introduced for future developments. Planning will indicate this;

f. <u>Cable Slack</u>: Cable slack will be a minimum of 15 m on both cables to enable splicing to take place outside of manhole inside the splicing vehicle. Cable slack at termination points will be 4 m and 15 m at splicing manhole;

g. <u>Hauling</u>: Cables will be hauled at a constant speed so as not to be subjected to unnecessary stress;

h. <u>Termination</u>: The optic fibre cable will be terminated in rack mountable fibre splicing termination trays on mid-couplers or spliced onto unjacketed pigtails connected to mid-couplets. The position of the splice tray in cabinet will be established before the installation commences;

i. <u>Splice Tray</u>: The splice tray will house sufficient organisers;

j. <u>Cores</u>: All cores in a cable will be terminated at both ends;

k. <u>Slots</u>: Unused slots will be blanked off in the front and back of the splice tray;

l. <u>Patch leads</u>: Fibre optic patch lead will have duplex patch leads used for connection of the single mode or multimode fibre optic cables to equipment. The length of patch lead will be as required;

m. <u>Connectors</u>: The connector is to be fitted on the patch leads will match the connectors on the equipment / termination devices; and

n. <u>Cable Support</u>: Cables will be supported with cantle levers or equivalent in manholes to prevent damage.

14.3. **Marking specification**

The marking method of the fibre optic cable shall be by means a Critsley Carrier Strip-on method, black characters on yellow background.

a. <u>Position of marking</u>: the cable shall be marked at each end of the cable as close as possible to a termination point, in each manhole / draw pit, at each point where a cable enters or exits a building, and in cable shafts where a cable is routed between two (2) or more floors; and

b. <u>Warning tags</u>: Fibre warning tags shall be attached to the cable in the same position as the cable identifier. The warning tag shall at least be printed with the following: "CAUTION: Fibre optic cable". The tag shall be clearly visible. Secure label and warning tag on fibre cable with cable ties.

14.4. **Fibre optic cabling testing**

a. <u>Acceptance testing</u>: on completion of a fibre link an acceptance testing of a fibre link with an Optical Time Domain Reflectometer (OTDR) or a light source and power meter shall be performed from both ends. The readings shall then be recorded and the bi-bidirectional event and average link lost shall be calculated;

b. <u>Results</u>: the results shall be stored in both hard and soft copies for the acceptance documentation; and

c. <u>Inspection</u>: The Service Provider shall inspect and complete an inspection certificate, certifying that: The installed products are approved by ACSA and that a certificate certifying such approval and the delivery note for the installed items are available on request; The splice trays are installed in the correct positions in the cabinet; splice trays are labelled correctly; Fibre cable are labelled correctly (fibre identifier and warning tags); That the above specifications are adhered to and that such adherence is verified and that an inspection report to that extent is available; All relevant documentation is presented and such documents are correct and complete.

15. REPORT SPECIFICATIONS

The entire Parking Management System must be able to generate the following minimum report specifications:

15.1. Payments by time range;

15.2. Daily statistics for pay stations: number of notes in safe, number of coins in safe, amount of notes removed etc;

15.3. Current pay station statistics: number of notes in safe, number of coins in safe, etc;

15.4. Wireless card and automatic licence plate transactions;

15.5. Account holders with vehicles registered and cards issued;

15.6. Number of entries and exits per day per entrance and exit area;

15.7. Number of total entries and exits by hour, by week and by month;

15.8. Failed entries and exits by hour, by week and by month;

15.9. Lost entry tickets sold;

15.10. Lost entry tickets usage;

15.11. Manual boom openings indicating the boom that was opened;

15.12. Midnight money statistics;

15.13. Net fees by ticket dispenser station;

15.14. Net fees by pay station;

15.15. Park time by day (Occupancy), by day, by week, by month and by facility;

15.16. Parker movement report;

15.17. Ticket statistics;

15.18. Validation by types: pay station, credit/debit card, cashier station, wireless access card etc;

15.19. Cash audits;

15.20. Note recycling and coin recycling removal report with content values;

15.21. Payments by Chip and Pin, Tap and Pay, cash etc;

15.22. Exception transaction reports. Exception transactions include but
are not limited to:

    15.22.1.1.   Lost ticket;

    15.22.1.2.   Unreadable ticket;

    15.22.1.3.   Stolen ticket;

    15.22.1.4.   Backout ticket;

    15.22.1.5.   Handicap parking;

    15.22.1.6.   Validations (must be sortable by type);

    15.22.1.7.   Voids/Cancelled transactions;

    15.22.1.8.   Towed and Impound vehicles;

    15.22.1.9.   Non-revenue badges; and

    15.22.1.10. Disputed.

15.23. Communication statistics summary by date by device (this key performance indicator indicates
the overall health of the communication system;

15.24. Communications statistics by date by device;

15.25. Operator activity by date (an operator audit trail report);

15.26. Current Operators;

15.27. Offline history by device by date;

15.28. Sensor errors by device by date;

15.29. Current parking utilisation by zone;

15.30. Parking utilisation summary by zone by date;

15.31. Parking utilisation detail by zone by day, week, month, year;

15.32. Current overstay violations by zone;

15.33. Overstay violation by zone by date;

15.34. Current reservations by zone;

15.35. Parking duration by registration number;

15.36. Current reservation overstay violation by zone;

15.37. Estimated parking revenue;

15.38. Average time bays are occupied by day, week, month, year;

15.39. Bay stay reporting;

15.40. Sensor failures;

15.41. Event logs for User and Admin accounts;

15.42. User verification list;

15.43. List of expired accounts;

15.44. System, user or application Changes;

15.45. Attempt of unauthorised access on user accounts;

15.46. Standard reports can be filtered and sorted based on field data contained within the report including but not limited to:

    15.46.1.1.   Parking facility;

    15.46.1.2.   User type;

    15.46.1.3.   Lane(s);

    15.46.1.4.   Device type;

    15.46.1.5.   Device ID;

    15.46.1.6.   User ID;

    15.46.1.7.   Transaction type;

    15.46.1.8.   Payment method; and

    15.46.1.9.   Date.

15.47. Report Output Options:

    15.47.1.1.   Screen/Monitor;

    15.47.1.2.   Printer; and

    15.47.1.3.   Converted to a file for export.

15.48. The System must lend itself to customisation of reports according to ACSA requirements. A minimum of fifty (50) additional customised reports during the 5-year period must be provided for;

15.49. All reports generated to must be time stamped to correspond to shift patterns;

15.50. A Consolidated reporting pack of key reports for all 9 (nine) airports shall be provided along with a dashboard format for easy visual and presentation requirements, based on multiple airport viewability and based on selection criteria for comparative purposes;

15.51. The POF system credit card Service Provider must furnish ACSA with monthly or on demand detailed credit card reports for reconciliation and customer query purposes.

16. NON-FUNCTIONAL SPECIFICATIONS

This section is a high-level exposition of nonfunctional requirements that the system must comply with. Non-functional requirements define the criteria that can be used to judge the operation of a system, in contrast to functional requirements that define specific behavior or functions. Categories of non-functional requirements for the purpose of this solution include the following:

16.1. **Configurability and Flexibility**: The solution must have the ability to handle a wide variety of system configuration sizes. On the other hand, flexibility is applied when the software intends to increase or extend the functionality after its deployment. The solution must able to comply with the later;

16.2. **Performance**: The performance constraints specify the timing characteristics of the software. efficiency specifies how well the software utilizes scarce resources: CPU cycles, disk space, memory, bandwidth, etc. System response times must be benchmarked and adhered to;

16.3. **Reliability and Robustness:** Reliability specifies the capability of the software to maintain its

performance over time. A robust system is able to handle error conditions gracefully, without failure. This includes a tolerance of invalid data, software defects, and unexpected operating conditions. The system must have a minimum operational and useful life span of **10 (ten) years**;

16.4. **Availability:** A system's availability or" uptime" is the amount of time that it is operational and available for use. Expected system availability Standards at ACSA is **99.8%** that the solution must comply with the exception of planned maintenance;

16.5. **Portability:** Portability specifies the ease with which the software can be installed on all necessary platforms and the platforms on which it is expected to run;

16.6. **Usability**: Ease-of-use requirements address the factors that constitute the capacity of the software to be understood, learned, and used by its intended users. The system must be easy to learn and operated by users with minimal training.it must also conform to usability standards for graphical user interfaces;

16.7. **Maintainability**: Refers to the probability of performing a successful repair action within a given time. In other words, maintainability measures the ease and speed with which a system can be restored to operational status after a failure occurs. The solution must comply with the maintainability and supportability requirements specified in section 23;

16.8. **Operational and environmental:** Refers to wider environmental and operating requirements. The entire solution especially the mechanical dynamics of the booms and other associate components must be able to work within extreme temperature conditions and variations. The systems (POF, LPR, VMS and Bay detection must interface and works seamlessly together where necessary;

16.9. **Security**: Describes functional and non-functional requirements that need to be satisfied in order to achieve the security attributes of an IT system. Security has been further disintegrated into the following requirements:

16.9.1. **Authorisation**: The solution must restrict the performance of all system use cases to persons who are currently designated as users;

16.9.2. I**dentification**: The solution must always identify any of its actors before permitting him or her to access the system otherwise access must be denied;

16.9.3. **Integrity:** The solution must protect of its communications from unauthorised intentional corruption during transit including communications between its users. It must also protect its persistent data from unauthorised intentional corruption;

16.9.4. **Privacy:** The system shall restrict access to confidential user information, whether communicated or stored to its rightful users and administrators;

16.9.5. **Repeated authentication failure**: The solution must notify and administrator within one minute if it cannot successfully verify the identity of any user in less than three attempts within any one-hour period. In addition, the system should hide unauthorized functionality to users according to their user profiles;

16.9.6. **Encryption:** All data/information transmitted between the various components of the system must be in an encrypted channel. Specifically, all transmitted data must use IPsec-encryption

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(using a crypto coprocessor) that meets international regulations or standards;

16.9.7. **Non-repudiation:** All times that a user performs any updates or changes to profile information, the system shall audit trail the transaction and record the following information:

 a. Name of the user;

 b. Date and time; and

 c. Update or change performed.

Furthermore, the system must maintain an audit log of all security events;

16.10. **Personalisation:** Refers to customisation of the system according to user personal preferences. The system must lend itself to all ACSA customisation requirements eg currency language etc;

16.11. **Compliance:** The solution must comply with all statutory and legislative requirements in the Republic of South Africa;

16.12. **Accessibility:** Refers to the accessibility of a system to all people, regardless of disability type or severity of impairment. The Pay stations and associated equipment must include those designed to cater for the physically challenged; and

16.13. **Innovativeness**: The solution must be a state of the art system surpassing its predecessor in many novel and innovative aspects and must provide a platform and springboard for innovation and scalability. Furthermore, the system or solution must include innovative features like pay to wait booking, bay specific parking, parking status checking, predictive revenue analytics and real time revenue analytics.

17. MAINTENANCE SCOPE OF SERVICES

This section is an enunciation of Support and maintenance Requirements. The following specifications shall apply to maintenance and support services:

17.1. The Service Provider must provide a detailed proposal and costing on how it will perform this critical function for ACSA;

17.2. The Service Provider is expected to work in conjunction with ACSA IT and other Service Providers within ACSA when performing preventative and corrective maintenance;

17.3. The Service Provider will be responsible for the entire Parking Management System including hardware, software and all associated applications running on the units as well as adhoc installations;

17.4. The operating hours will be from Sunday to Friday, 6:00am to 6:00pm. The bidder must make provision for a resource to be available at all hours as stipulated in table 45 as well as in the SLA and contract document to be signed with the Service provider;

17.5. The Operating hours for technicians in first month of operation will be 05h00 to 22h00 for ORTIA, KSIA and CTIA to insure no down time. Otherwise they must confirm that all parking systems and associated components and peripherals are fully operational/functional. Furthermore, provision should be made to extend the operating hours of support technicians in the service contract that will be signed between ACSA and the successful service provider;

17.6. The Service Provider must ensure that all relevant resources and subject matter experts are available during the entire project duration ie from compulsory site inspections, investigations and assessment all the way through to implementation and support.

Coverage parameters are expressed in table 15.

Coverage parameters:

#	Days	Time from	Time to	Standby Times
1.	Monday	06h00	18h00	18h00-06h00
2.	Tuesday	06h00	18h00	18h00-06h00
3.	Wednesday	06h00	18h00	18h00-06h00
4.	Thursday	06h00	18h00	18h00-06h00
5.	Friday	06h00	18h00	18h00-06h00
6.	Saturday	-	-	24 Hours
7.	Sunday (restricted only to ORTIA, CTIA and KSIA)	06hoo	18h00	18h00 -06h00
8.	Public Holiday	-	-	24 Hours

Table 15 : Maintenance timeframe coverage parameters

17.7. The bidder's proposal must make provision for after hours, weekends and public holidays support on a callout basis;

17.8. The proposal must include after hours' telephone numbers, where support personnel are reachable;

17.9. The number of resources allocated for the system should take into account the SLA requirements;

17.10. **Preventative and corrective maintenance requirements**

17.10.1. Preventative maintenance includes planned overhauls, replacements, inspections, tests and any activity aimed at preventing failures and defects through maintaining the condition of the infrastructure or assessing its condition for the purposes of corrective maintenance. Corrective maintenance includes all activities following a preventative maintenance inspection;

17.10.2. Breakdown maintenance includes maintenance that is unforeseen and is necessary to restore the serviceability of the infrastructure and functionality of the System. Some of this break down maintenance could be requested after hours on weekend and Public holiday. Bidders will be expected to respond and attend to all the faults;

17.10.3. The Service Provider will be held liable for any failure of the System that should have been prevented during preventative maintenance. Therefore, the Service Provider should include any further preventative maintenance recommendations, which in its opinion are necessary for the specific and other failure prevention;

17.10.4. The Service Provider's proposal must make provision for enough personnel at each Airport during normal working hours (Sunday – Friday: 07h00-17h00) to perform maintenance and support of the Parking Systems. The number of resources allocated should take into account

the Service Level Agreement ("SLA") requirements as stipulated in Section 4 to ensure that SLA targets are met;

17.10.5. The Bidder's proposal must make provision for after hours, weekends and public holidays support on a callout basis for incidents that impacts the systems. Hourly rates and call-out fees if applicable must be provided in the pricing schedule;

17.10.6. The Service Provider's proposal must also cater for short notice call-out in an emergency situation where the supported system may be affected by other interruptions or change processes within the airport (e.g. power). This Bidders must provide a call-out basis and hour rate at the specific site. For planned activities, advance notice will be given to the service provider. In addition, ACSA will require the Service Provider to be part of disaster recovery efforts and teams in the event of a declared disaster where the Parking Management System is also impacted;

17.10.7. As part of bidder's proposals, ACSA expects the Service Provider to put in place a business continuity plan to ensure that if operations are disrupted, services provided to ACSA will not be adversely disrupted. This is over and above disaster recovery/redundancy arrangements; and

17.10.8. The Bidders' proposal must include after-hours telephone numbers, where support personnel are reachable. It is the responsibility of the Service Providers to ensure their resources are available and reachable at all times and the Services shall be delivered in terms of SABS standards, OHS Act, manufacturer's specifications and other statutory regulations.

17.11. **Preventative maintenance services**

This sub section is an articulation of preventative maintenance services/activities that will be required and they are non-exhaustive. The Bidders must provide a detailed list of maintenance procedures and checks to be performed (Maintenance plan) in addition to the ones listed below and the frequency of such checks or procedures on all the supplied items where applicable. Bidders must provide the maintenance schedule with resource allocation per Airport.

17.11.1. **PC (Sub stations and work stations) activities**

17.11.2. Clean PC and brush out PC PSU (external);

17.11.3. Do windows maintenance e.g. scandisk, defragment etc;

17.11.4. Clean keyboard and mouse;

17.11.5. Check and test UPS; report to ACSA IT service desk if it is not operational;

17.11.6. Do OPMS.mdb backup and repair. This is the database that keeps record of old information for later reference. If this backup is not done properly, the system will lose all the information which was not backed up, or when the computer is replaced, information from the previous computer will be lost;

17.11.7. Perform OPMS and Parameter backup;

17.11.8. Check that scheduled backups are performed daily between 01h00 and 03h00;

17.11.9. Check for sufficient disk space on PC and keep records of status. Notify upfront if space is approaching minimum required by the Operating System; and

17.11.10.Check system date and time (using a time server). Adjust if necessary and record when and why they were out of sync.

17.12. **Server activities**

17.12.1. Check and make sure all servers are operational. If not, log a call with IT service desk;

17.12.2. Check server's performance (CPU, Memory and HDD space) is within acceptable level.

17.12.3. If not log a call with IT service desk;

17.12.4. Make sure that servers are patched (OS patches), if not log a call with IT service desk;

17.12.5. Make sure that the latest Antivirus is loaded on all systems and if not log a call with IT service desk;

17.12.6. Perform regular backups of the server databases and critical data files which are (OPMS, OPMSSS, E-counting and text); and

17.12.7. Ensure that all servers and associated equipment are monitored by ACSA service desk team on ACSA monitoring tool.

17.12.8. **Common: lane station and cashiers**

17.12.8.1.Remove loose tickets from stations;

17.12.8.2.Clean dirt, cob webs etc. from station using a blower or mini vacuum;

17.12.8.3.Test if housing is loose and re-secure;

17.12.8.4.Clean extractor fan filter (replace if necessary);

17.12.8.5.Test extractor fan and heater and adjust thermostat to suit local conditions. Make sure no tickets etc. obstruct fan/heater;

17.12.8.6.Check the door locking mechanism and lubricate if necessary;

17.12.8.7.Check ticket low switch for correct operation and adjust if necessary;

17.12.8.8.Clean dust from display and Perspex with anti-static spray;

17.12.8.9.Check if the display is readable and replace if necessary;

17.12.8.10. Check all cables for noticeable damage and replace as needed;

17.12.8.11. Check PCU battery, if under 3V DC, replace;

17.12.8.12. Check if incoming mains power is secure and safe. Test PSU switches and report what cannot be repaired; and

17.12.8.13. Check and test UPS (if fitted), and report results in the monthly report.

17.12.9. **Common: UCD's Feeders and Escrows (including validators)**

17.12.9.1.Check transport rollers for damage and replace if necessary;

17.12.9.2.Clean transport rollers;

17.12.9.3.Clean and check mag head and replace if necessary;

17.12.9.4.Clean printer and check print quality and replace where quality is poor;

17.12.9.5.Check shaft on the solenoid for wear/damage; Repair/replace damaged one;

17.12.9.6.Check and clean transport belt, if worn, replace;

17.12.9.7.Clean non-toothed gears, check if all grub screws are present and tighten;

17.12.9.8.Clean guide plates and straighten/replace any bent guides;

17.12.9.9. Replace optics on UCD and feeder escrow;

17.12.9.10. Check the tension of the plastic transport rollers and replace the ones worn.

17.12.9.11. Ensure that all cover screws are replaced and properly tightened;

17.12.9.12. Ensure the correct head gap is present or UCS 99 and UCD02;

17.12.9.13. Check the pins that connect UCD and Feeder for damage. Repair the damaged pins;

17.12.9.14. Remove feeder cover plate with hex key to remove dirt under plate;

17.12.9.15. Check tension on feeder/escrow rollers and replace if needed;

17.12.9.16. Check the guillotine operation and make sure it operational;

17.12.9.17. Check the feeder escrow as per vision of UCD;

17.12.9.18. Use PTM do 5 read/ write tests with both paper ticket and DP card.

17.12.9.19. Make sure that the plastic card holder is in place behind the UCD on entries and Automatic Pay Stations (APS) and If they are not put them in the correct place; and

17.12.9.20. Replace all critical parts and list them in the monthly report and the machines that were replaced from them.

17.12.10. **Barriers: Entry, Exit, Pass by**

17.12.10.1. Align arms;

17.12.10.2. Check and tighten al bolts and nuts;

17.12.10.3. Ensure barrier housing is not loose and tighten if necessary;

17.12.10.4. Ensure the spring is tensioned correctly i.e. arm opens and closes at the same Speed;

17.12.10.5. Check the crank arm is securely fitted to motor shaft and the rest of the crank Mechanism;

17.12.10.6. Replace all worn rubber stoppers;

17.12.10.7. Clean barrier inside;

17.12.10.8. Check loop detectors inserted correctly with the correct frequency settings;

17.12.10.9. Check the cross talks between lanes and adjust if necessary;

17.12.10.10. Check barrier logic e.g. inserted correctly;

17.12.10.11. Checks relay e.g. inserted correctly;

17.12.10.12. Secure incoming mains;

17.12.10.13. Check barrier drive cable is securely inserted and there are no loose wires; fix all loose wires and report in the monthly report;

17.12.10.14. Check condition of road surface where loops are and check loop condition; report all findings on the monthly report;

17.12.10.15. Check barrier arm condition, jack knife kits, barrier arm brackets and sheer plates and report all conditions on the monthly report;

17.12.10.16. Check barrier door locks and secure all locks; and

17.12.10.17. Clean spike grippers and ensure smooth movement;

17.12.11. **APS: Money handling Systems**

17.12.11.1. Clean discriminator and optics;

17.12.11.2. Ensure that all coin paddles are working;

17.12.11.3. Ensure all tubes are fully functional;

17.12.11.4. Clean plastic transport rollers of note readers and all excess dust from the Units;

17.12.11.5. Clean scanners of the note readers;

17.12.11.6. B2B clean optics and plastic transport rollers;

17.12.11.7. B2B clean and check contacts of both cassettes and recycling unit;

17.12.11.8. Check and clean the contact switches of both note and coin safes;

17.12.11.9. Clean and lubricate the coin safe lid mechanisms;

17.12.11.10. Clean RCU acceptors and hoppers;

17.12.11.11. Check coin deflector plate is straight on RCU05;

17.12.11.12. Check the solenoid and refill switch for correct operation;

17.12.11.13. MK4 hoppers, check both male and female plugs;

17.12.11.14. Reconcile APS if requested;

17.12.11.15. Reconcile APS note and coin contents at minimum monthly and each time that the unit is serviced or repairs are carried out to the note and/or coin hopper;

17.12.11.16. Check change tray flap moves freely and returns to close position after use; and

17.12.11.17. Check and repair damage to safe.

17.12.12. **VMS External LEDS and Parking Area Zone Board LEDS**

17.12.12.1. Clean all LED's for dust and dirt;

17.12.12.2. Inspect all external VMS boards for pixel or PCB failures;

17.12.12.3. Inspect all Zone boards for pixel and PCB failures;

17.12.12.4. Inspect all intersection boards for pixel and PCB failures;

17.12.12.5. Check general condition of each module box and housing doors;

17.12.12.6. Test if housing is loose and re-secure;

17.12.12.7. Check all cables for noticeable damage and replace as needed; and

17.12.12.8. Make sure all cables are secured and running in cable trays/conduits.

17.12.13. **Parking Bay Ultra Sensors**

17.12.13.1. Do a physical check and inspection on sensors for damage and replace if necessary;

17.12.13.2. Check sensors for LED failures and replace where necessary;

17.12.13.3. Check sensors for ultrasonic failures (false greens);

17.12.13.4. Clean all sensors for dust and dirt; and

17.12.13.5. Check for zone updates.

17.12.14. **LPR Cameras**

17.12.14.1. Check picture availability and picture quality, repair where necessary and report all findings in the monthly report;

17.12.14.2. Check and tighten all bolts and nuts on brackets;

17.12.14.3. Ensure camera housing and bracket is not loose and tighten if necessary;

17.12.14.4. Check and adjust camera position for proper picture capturing;

17.12.14.5. Clean lens, covers and housings;

17.12.14.6. Check the cross talk between lanes and adjust if necessary;

17.12.14.7. Secure incoming mains; and

17.12.14.8. Check camera PSU for correct voltage, rectify where necessary and report findings in the monthly report.

17.12.15. **Facial Cameras: Entry and Exit**

17.12.15.1. Check for positioning. Rectify where necessary and report in the monthly report;

17.12.15.2. Check for picture quality, rectify where required and report findings in the monthly report;

17.12.15.3. Clean camera lens and housing;

17.12.15.4. Check and tighten all bolts and nuts; and

17.12.15.5. Check the cross talk between lanes and adjust if necessary.

17.12.16. **Power Supply Units**

17.12.16.1. Clean units for dust and dirt;

17.12.16.2. Check for any ventilation obstructions; and

17.12.16.3. Check voltage and test for potential overloads.

17.12.16.4. Check and test UPS and report monthly

17.12.17. **All Other Parking Management System Related Devices**

17.12.17.1. Clean units for dust and dirt; and

17.12.17.2. Do visual inspections and correct/report irregularities; and

17.12.18. **Consumables or Spares Holding**

17.12.18.1. The Service Provider will be required to maintain sufficient spares, equipment and materials to respond to all calls without compromising response and resolution times;

17.12.18.2. The Bidder must provide a proposed spares list needed to maintain all systems and costing for all items. i.e. Provide a list of all critical spares required and the price list covering each device or equipment where applicable);

17.12.18.3. As part of the spares holding, a list of equipment with pricing must be provided where the supply, installation of parts and systems will be included;

17.12.18.4. Consumables provisions to be included in SLA. Price list to be included as well;

17.12.18.5. Locally sourced or and time frame to order to be given on commencement of contract;

17.12.18.6. Consumables to be included for first 6 Month/1 year/2 years of operation;

18. SUPPORT SERVICES

18.1. Support services refers to day to day support activities performed to resolve incidents that are logged by users of the system or logged by the monitoring tools or alarm and error logs generated by the system's internal monitoring;

18.2. The Service Provider will be required to attend to and resolve all incidents in line with ACSA incident management processes;

18.3. All incidents will be logged on the IT service desk systems. The response and resolution times depicted in times must be adhered to;

18.4. This will form part of the SLAs that will be agreed to between the Service Provider and ACSA; and

18.5. Penalties will be incurred by the Service Provider if the agreed SLA times are not met.

18.6. Incident logging procedure

18.6.1. All incidents must be logged with ACSA service desk via email, telephone or on the self-service web portal;

18.6.2. The incident status must be updated regularly depending on the priority of the incidents until resolution; and

18.6.3. All incidents must be updated with a detailed resolution before closure. The Service Provider must notify the service desk immediately on resolution of the incident.

18.7. Definition of incident priority

Table 16 is a disintegration and definition of incident priority levels.

Item #	Priority	Description	Impact
1.	**P1**	Total systems failure/server down or complete loss of system functionality in one or more areas of the airport. The failure has a negative impact to the airports operation.	Critical
2.	**P2**	Multiple devices are down simultaneously however with minimum functionality in the area.	High
3.	**P3**	Failure of single device or components of the systems.	Medium
4.	**P4**	Non-critical fault/failure logged at night or over the weekend. It has no impact on the operations of the airport.	Low

Table 16 : Incident priority definitions

Applicable incident management response as well as resolution times are articulated in table 17.

Incident management response and resolution times (Office hours, After Hours, Weekends and Public Holidays)				
Incident Priority	Response	Restoration	Update Feedback	Resolution (permanent fix)
P1	15min	2hrs	15min	Within 6 hours
P2	30min	4hrs	30min	Within 12 hours
P3	60min	4hrs	2hrs	Within 24 hours
P4	4hours	24hrs	6hrs	Within 48 hours

Table 17 : Incident Response and Resolution times

18.8. Availability requirements

An ACSA availability requirement for Parking Systems is **99.8%** per month. The Service Provider must ensure that the availability targets are met every month. In an event that the target is not met ACSA will impose penalties. The formula for calculation will be provided to the successful Bidder.

18.9. Penalties

The Service Provider shall repair all faulty equipment within the times specified in the SLA. The Service Provider will be allowed a grace period of three (3) months to familiarize itself with the operations at all airports before the implementation of penalties can commence.

The following penalties shall apply for failure to resolve incident within the agreed timeline:

Item #	SLA breach	Penalty
1.	P1 Incidents are resolved within one hour after SLA time lapsed for two consecutive times in a measuring period.	20 % of the monthly fee will be deducted per invoice up to 60% in one contractual year thereafter termination procedures will be implemented.
2.	Incidents are resolved within two hours and beyond after SLA time lapsed for three consecutive times.	30 % of the monthly fee will be deducted up to 60% in one contractual year thereafter termination procedures will be implemented.
3.	If a Service Provider misses SLA's in any 3 consecutive months.	50 % of the monthly fee will be deducted.
4.	Fourth missed SLA in one month– will be deemed as a material breach, and the contract will be referred for performance management and termination procedures.	50 % of the monthly fee will be deducted.

Table 18 : SLA breach and penalty rates

18.9.1. Failure to perform preventative maintenance according to schedule dates shall result in the following penalties

SLA breach	Penalty
Maintenance not done or proof not submitted.	No payment

Table 19 : SLA Breach and Penalty for Maintenance

19. MEETING AND REPORTING REQUIREMENTS

19.1. **Meetings**

19.1.1. As part of ongoing performance management, ACSA requires that the Supplier provides the reports Articulated in table 50 and attend periodic meetings. These meetings will be held weekly (every Wednesday), and/or on demand for the duration of the project and arranged by the ACSA Project Management to discuss the following, but not limited to: Project progress delays, risks, issues, financials and all other requirements related to the project.

19.1.2. The meetings must be attended by Service Provider's Project Manager as well as ACSA Project Manager;

19.1.3. These meetings will be held monthly (during the last week of the month). Purpose of these meetings is to provide the Service Provider a platform to report on their performance for the current month; and

19.1.4. If the Service Provider fails to attend any of the scheduled meetings, ACSA will withhold invoice payment for the month.

Table 20 is an articulation of meetings schedule. The project management portion of these meetings will become redundant once the system or solution has been commissioned and handed over to operations. Therefore, the Project board meetings expressed in table 20 will be applicable during the execution part of the project and not during the operational stage.

#	Frequency	Meeting Name	Standing Agenda	Participants and Roles	Documents to be submitted prior to meeting	Documents to be produced after meeting
1.	Monthly (27th or next working day).	SLA meeting.	1. Consumables Usage. 2. Calendar month Incidents (System Availability). 3. Payment. 4. Monthly services deliverables. 5. Discuss SLA Report. 6. Discuss SLA improvement plan. 7. Discuss penalties.	1. Service Provider account manager. 2. ACSA representatives. 3. ACSA will chair the meeting.	Maintenance Report.	1. Minutes of meeting. 2. Action items. 3. Penalties. 4. Acceptance of deliverables. 5. Payment status. 6. Deliverables for the upcoming month. 7. ACSA will produce minutes and action items.

2.	Monthly - As required.	Project Board meeting.	1. Status. 2. Risks / Issues. 3. Next milestones. 4. Monthly services deliverables.	1. Service Provider account manager. 2. ACSA representatives.	Project Report	1. Minutes of meeting. 2. Action items 3. Acceptance of deliverable. 4. Payment status. 5. Deliverables for the upcoming month.
3.	Adhoc.	Adhoc.	Adhoc.	As and when required.	Either party	Lync (Online) or in Person (Physical).

Table 20 : Meetings schedule

19.2. **Reporting**

Table 21 is an articulation of reports schedule.

#	Frequency	Meeting Name	Standing Agenda	Participants and Roles	Documents to be submitted prior to meeting	Documents to be produced after meeting
1.	Monthly (27th or next working day or date agreed upon by both parties).	SLA meeting.	1. Consumables Usage 2. Calendar month Incidents (System Availability). 3. Payment. 4. Monthly services deliverables. 5. Discuss SLA Report. 6. Discuss SLA improvement plan. 7. Discuss penalties.	1. Service Provider account manager. 2. ACSA representatives. 3. ACSA will chair the meeting.	Maintenance Report.	1. Minutes of meeting. 2. Action items. 3. Penalties. 4. Acceptance of deliverables. 5. Payment status 6. Deliverables for the upcoming month 7. ACSA will produce minutes and action items.
2.	Monthly - As required.	Project Board meeting	1. Status 2. Risks / Issues. 3. Next milestones.	1. Service Provider account manager.	Project Report.	1. Minutes of meeting. 2. Action items.

			4. Monthly services deliverables.	2. ACSA representatives.		3. Acceptance of deliverables. 4. Payment status 5. Deliverables for the upcoming month.
3.	Adhoc.	Adhoc.	Adhoc.	As and when required.	Either party.	Lync (Online) or in Person (Physical).

Table 21 : Reports schedule

19.2.1. All reports must be submitted three days prior to the meeting day. The meeting will be attended by the Service Provider's account manager, Technical lead, Project manager and ACSA's IT contract management, procurement and end users; and

19.2.2. If reports are not delivered within the stipulated times, ACSA will withhold invoice payment for the month until the reports are submitted and reviewed.

20. DOCUMENTATION

20.1. The successful Service Provider is expected to keep detailed and updated documentation of including but not limited to the following.

20.1.1. Technical architecture diagrams incorporating all architecture domains ie Business, Information Systems and Technology);

20.1.2. List of all equipment installed;

20.1.3. Inventory list of spares on hold;

20.1.4. List of decommissioned or old equipment;

20.1.5. Maintenance report template and schedules;

20.1.6. Training manual;

20.1.7. System manual

20.1.8. Cable route drawings;

20.1.9. Certifications (electrical, Mechanical and civil)

20.1.10. Standard operating procedure;

20.1.11. Daily check list;

20.1.12. Equipment manuals; and

20.1.13. Any other relevant documentation

20.2. Prior to the solution going live, the relevant Operational department must ensure that an Operational handover checklist has been duly completed and signed by all relevant stakeholders (Service Provider, Project Team and the applicable Operations department; and

20.3. Accreditation and partnership of OEM.The successful Service Provider is expected to provide written

proof of their partnership status with the OEM or any form of accreditation that certifies that the supplier has the necessary resources and skills to work on the specific technologies or devices.

21. AIRPORT LAYOUTS AND SYSTEM ARCHITECTURAL MODELS

21.1. Owning to size and space, all maps for Airports layouts and current system Architectural models have been dropped on the IT Projects repository. To access them, Click here.

21.2. Note that logical access to this folder is needed otherwise log a call with the IT Service desk. Also, note that these maps or models were not available for some airports.

22. IMPLEMENTATION APPROACH

The two Airports in scope for phase 1 are ORTIA and KSIA.The implementation must unfold concurrently.