AHMEDABAD MUNICIPAL CORPORATION
AHMEDABAD, GUJARAT, INDIA

REQUEST FOR PROPOSAL

SELECTION OF FINANCIAL INSTITUTION FOR PROVIDING SMART CARD BASED COMMON CITY PAYMENT SYSTEM (CCPS) FOR CITY BASED TRANSPORTATION SYSTEM, RECREATIONAL AND AMUSEMENT AREAS OF AMC, MUNICIPAL BILL PAYMENT, UTILITY PAYMENTS, RETAIL AND OTHER PAYMENTS,

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PART 2 – SCOPE OF SERVICES AND TECHNICAL SPECIFICATIONS

FEBRUARY 2016

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1. *List of abbreviations used in the document*

AMC	Ahmedabad Municipal Corporation
CCPS	Common City Payments System
SP	Service Provider
SC	Smart Card
AFCS	Automated Fare Collection System
HTT	Handheld Ticketing Terminal
BCV	Bus Card Validator
STT	Station Ticket Terminal
SCV	Station Card Validator
CCC	Central Control Centre
MTBF	Mean Time Before Failure
MTTR	Mean Time to Replace
CCHS	Central Clearing House System
GSM	Global System for Mobile communications
GPRS	General Packet Radio Service
GPS	Global Positioning System
POS	Point of Sale System
GIS	Geographical Information System
GPS	Global Positioning System
GPRS	General Packet Radio System
GSM	Global System for Mobile Communications
UMTS	Universal Mobile Telecommunications System

BI	Business Intelligence
SLA	Service Level Agreement
TAT	Turn-Around-Time
PMC	Project Management Consultant
TPA	Third Party Auditor
QA	Quality Assurance
QC	Quality Control
DC	Data Centre
PM	Project Manager

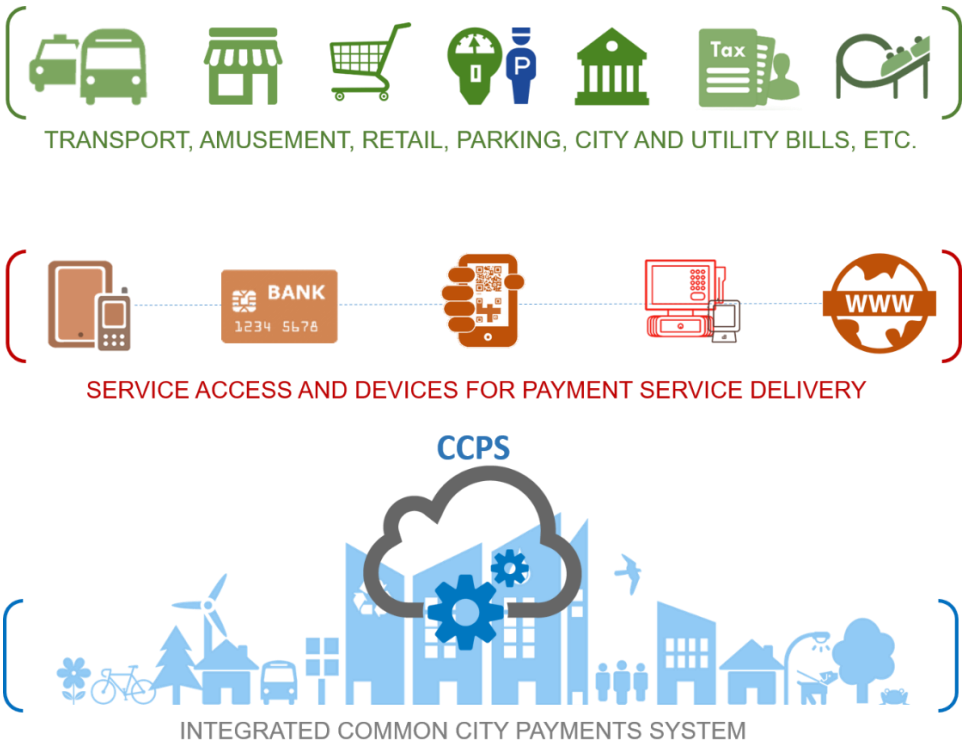
2. *Introduction*

The purpose of this document is to provide guidelines for development, implementation, operation and maintenance of Common City PaymentsSystem (CCPS) for Ahmedabad Municipal Corporation to be implemented within Ahmedabad City. The document underlines all functional, technology and end use requirements related to requirements of AMC to achieve integrated, highly automated and stable environment for integrated city payments system for transportation fare collection and other payments services within city of Ahmedabad.

2.1. Objective of Implementing CCPS

Ahmedabad Municipal Corporation plans to implement **Open Loop basedSmartCard project** (hereunder called **Common City Payment System (CCPS**)) with an aim to offer citizens a common platform of payment facility which would enable them to pay for any services within the city. The system is envisaged to bring about an enormous ease to citizens by way of paying electronically using a smart card for all perceivable services including city transport, municipal services, entertainment and amusement activities, parking, bill payments, utility payments etc. This System will deliver City Payment Gateway which could aid integration of people, business and government on single platform. This will compliment initiatives of AMC for smart services as part of the smart city initiative of Ahmedabad Municipal Corporation.

The overarching idea of a Common City Payment System is to combine all modes of payments using a single payment instrument. Integrated payment schemes aim at facilitating integration of transport systems along with other services thus making payment services as easy and attractive as possible.The integration of tariffs, operators and modes is proved to have a positive impact on transport demand and other collection services. In their electronic version, integrated card schemes could be extended to other applications. Most experts agree that multiple services, such as for purposes of retail or leisure or e-payment, seem to have a considerable attractiveness for the public transport sector, as this means added value for the customers.



Project Goals and Objectives

The procurement and implementation of CCPS is designed to advance anumber of goals.

AMC's fare payment modernization goals include:

- Implement integrated fare management process for transit services within Ahmedabad city
- Introduce Openloop based electronic payments platform
- Integrate with Banking infrastructure for best industry technology, practices and services
- Stimulate growth in electronic payments and their by also augment increased ridership on transport system.
- Simplify fare policy and ability for smart and integrated pricing
- Decrease dwell time on transit systems
- Increase ease of use for customers to promote customer self-service
    - A goal for the new payment system is to improve the payments experience by reducing complexity and giving the user's easier ways to pay that are familiar.
    - The easy acceptance of electronic payments and consequent improvement in payments processes is expected to improve the citizens experience drastically.
- Foster regional transit fare integration

  - It is important for the Authority to implement a solution that meets current needs, and provides a transition path to meet the future needs of the region. The Authority wishes to avoid technologies that are closed, out of date and not scalable.
- Decrease customer calls to the Authority's customer information center to decrease customer service costs
- Reduce current manual fare media and reduce maintenance costs
- Reduce cash and lower cash handling costs
- Integrate with other on-board equipment for single sign on for bus operators.
- Consider integration with regional partners' future ticketing solutions
- Unify the payments experience by integrating mobile payments and ticketing with other applications.
- Provide seamless operation with the AFCS facilities.
- Monitor and manage service adherence and performance
- Integrate, automate and secure ticketing and payments.

2.2. CCPS Requirement Summary

2.2.1. Vision for Common City Payment System (CCPS)

Common City Payment System(CCPS) is intended to support interoperable payment infrastructure within AMC through electronic media like smart cards, mobile phones& e-wallets.The fare media shall be issued by Financial Institution (FI) on behalf of AMC and shall be accepted across different services such as **city buses**, **Bus Rapid Transit System** (**BRTS), pay toll fee, Parking facilities Recreational Services, Municipal Payments, Utility Payments, Retail** etc.The initiative would offer tremendous ease and benefits to users by enabling a single instrument powerful enough to cater to all the transit and other needs. Commuter can use CCPS payment instruments for travelling from one place to another without getting into long queues to buy tickets through cash. This card shall act as electronic money facilitating the travel payment and other payment needs of the users within Ahmedabad City. It also enables access to electronic payment infrastructure services to **all strata of society** and make itself available at every nook and corner of the city. It also aids in **green travel initiative**by enablinglesser travel bycitizens for payment services other than transport services.

2.2.2. Introduction to Smart Card Based Fare Collection System

AMC intends to implement interoperable payment ecosystem through smart fare media like cards and mobile phones. AMC intends to offers integrated electronic payment services to its users by making common smart card based system available to them. The larger objective is to roll out this model along with all other transit operators (i.e. Ahmedabad Municipal Transport Services and Ahmedabad Janmarg Limited) for the acceptance of CCPS cards on their networks and vice a versa and also allow the CCPS operate at **Parking facilities, Recreational Services, Municipal Payments, Utility Payments, Retail** etc.

To achieve its vision of CCPS, **AMChas shortlisted FI's through EOI process**to manage the following requirement without any direct Capital Expenditure needs from AMC:

1. Issuance and personalization Infrastructure for distribution of smart card to commuters/general public, using public transport systems such as BRTS/City Bus Service/ Private bus/Taxi/Auto rickshaw, Parking and municipal payments, Utility Payments etc.
2. Creation/adoption of acceptance infrastructure for smart card which involves integration with the electronic fare media /card reading terminals at the intended locations. This includes seamless adoption of card on retail payment / EMV /Rupay enabled terminals only
3. Establishment of Smart card host management at FI's location;Operationalization of Central Clearance House (in-case needed to meet project objectives);
4. The service provider of smart card system shall provide all necessary interfaces & protocols for smooth functioning of Automatic Fare Collection (AFC) of City Bus Services run by Ahmedabad Municipal Transport Services (AMTS) and BRTS run by Ahmedabad Janmarg Limited (AJL).

The smart card should cater to all fare media types like daily, weekly, monthly passes and other ticketing. The co-branded SmartCard shall be used as an e-Purse/Validity based product to meet commuters travelling needs. The co-branded Smart Card shall also be used in retail outlets for making payments.

A smart card is a card that is embedded with either a microprocessor and a memory chip or only a memory chip with non-programmable logic. The microprocessor chip can add, delete, and

manipulate information on the card. Smart card would be similar to credit card in it's size and will have gold contacts that would allow other devices to communicate with it. **The Smart Card should be open loop based and EMV /RuPay compliant including contactless interface.**

This card would provide solution to most of the problems faced by the commuters/users as it can be used multiple times, recharged with a selected value online whenever needed. Smart Card can be used in merchant outlets also.

Advantages of using* Common City Payment System (CCPS)*for Payment Services within AMC

1. CCPS card will offer independence to users paying for services within Ahmedabad city.
2. CCPS Card can be operated within AMC services areas or outside as well and hence will aid faster adoption.
3. CCPS Smart card will offer seamless transport payment services and aid cashless travel services for commuters.
4. Since CCPS card shall be designed with open standards data format, it can be easily extended to other modes of transport within city like auto rickshaws, taxis etc. Who follows interoperable data formats.
5. Smart Fare Collection will permit to contribute to the overall improvement of the public transport network level of services, image, accessibility, integration with the main aim to facilitate and/or increase the use of public transport owing to the fact that with CCPS card, Commuters can experience seamless transit experience across transit eco system.
6. CCPS cards are secured, can't be read, copied, manipulated with, counterfeited or duplicated
7. CCPS cards protect privacy where needed
8. CCPS cards are re-writable and can be recharged thousands of times
9. CCPS card can contain digital log with location, date, time, person's stamp to record every transaction
10. CCPS card can contain products like daily, weekly and monthly pass which comes along with an expiry based on the type of product. Smart cards can be configured to work as stored value e-purse and can also be used to define the identity of the commuter and setup up corresponding rules. (For e.g. fares with concession for students or defense personnel's)

11. CCPS cards can contain weekly pass, monthly pass or simply ticket that expires by certain date
12. CCPS card payment system eliminates cash from the payment systems and reduces monetary leakage.
13. Financial Institution manages the entire ecosystem through its CCH.

2.2.3. Tentative Places where CCPS could be deployed

The CCPS shall be deployed initially at following AMC's locations.

- BRTS
- AMTS
- Parking Facilities
- City Civic Centres
- Kankaria Lake Front
- Sabarmati Riverfront

Details of above are placed in Appendix-7 of RFP Part-1.

AMC envisages implementing CCPS as a city wide platform for its transportation & other fare collection needs which include operations BRTS and City bus system The aim of implementing CCPS is to bring in modern and state-of-art payment platform to for its financial and revenue operations capability to ensure services are delivered on consistent basis and in a manner that meets objectives of AMC. CCPS is expected to meet the objectives of enhancing service standards, bring about paradigm shift in service quality and availability, better organization of planning and operations; integration of transit systems and overall improvements in line with service excellence.

CCPS shall enable AMC to automate its revenue management for its transit operations within Ahmedabad city, better insight into operations and hence balance demand & supply issues, perform analytics to offer innovative commuter oriented fare policies and products, bring in service sustainability, and enable forward looking environment which facilitates policy environment meeting corporation and citizen needs on continual basis.

CCPS system shall deliver above mentioned management objectives by integrating technologies and services using latest hardware, software, computing and communications

technologies. The system shall offer relevant revenue management capability to individual transit systems while delivering services through an integrated and intelligent platform which is common to all the services. The system is expected to have capability to cater to diverse end use requirements.CCPSwill play an important role in delivering policy objectives of AMC, improving service accessibility, providing integrated multi-modal transit environment, providing integrated transport solution and making best use of existing infrastructure and resources in delivering service resilience.

The system shall deliver noticeable economic benefits through reduced journey times and increased reliability, increased revenue by way of travel simplification, improvements in safety and reductions in pollution, easier service consumption systems, increased citizen trust in civic services, higher operations management capability to authority and integrated work management and delivery scenarios.

The aim of AMC is to implement CCPS as a city transit revenue management platform which shall be utilized by current and future transit services within Ahmedabad city.The platform will be designed to add services on continual basis and same shall be achieved by establishing system using open protocols and integration capabilities driven by international standards. AMC does envisage that vehicles of all transport types and services like informal transit systems taxis' autos etc. shall be on-boarded on the same platform in phases, so as to offer technologically advanced, integrated, safe and common transit services to citizens with the city.

CCPS Implementation Benefits:

- Making travel within city seamless and more efficient (faster, economical, better informed travel) – increased PT usage;
- Improving access to public transit system by augmenting easier access to service and information
- Improved and scientific decision making;
- Aid multi-modal integration
- Aid policy decision by availability of analytics platform.
- Higher economics within transport service by increased use of electronic fare services.
- Improved communication between operations staff and management resulting in coordinated and managed service environment

- Provide convenience to crew and facilitate connectivity between the driver and control room/ specified officials. Automate ticketing.
- Assist managers to monitor the entire fleet operations efficiently through a web solution through alerts about service non adherence, functioning of equipment's and revenue reports, facilitating follow up action. Provide standard MIS reports, including exception reporting and BI analytical tools (with map, chart and text displays) to support all level of management in decision making.
- Dashboard driven operations and revenue data for the top management to support effective management through dynamic and context based reports, graphs and charts and other standard MIS reports to give a snapshot view to AMC management on daily, weekly, monthly, quarterly, half-yearly and yearly performance.
- Reduction in personal vehicles with better utilization of Public transport infrastructure; positioning AMC as a credible transport to improve general mobility.

In-order to deliver above stated objectives and benefits through technology intervention, AFCS shall comprise of following distinct application areas:

- EMV / Rupay Compliant pre-paid Cards
- Integration with Automated Fare Collection System with necessary API's for data, process and security management.
- Bank hosted Card host system and Central Clearing House
- Integrate with Business Intelligence System
- Integrate with Enterprise Management System
- Integrate with City Transportation Control Centre

2.3. Purpose of Open ITS standards & Architecture

Interoperability: The CCPS Architecture shall be based on standards needed to provide a sound foundation for system interoperability (interfaces and products). Because the CCPS shall serve as the common foundation for ongoing ITS development work for Ahmedabad city, factoring it into current system implementation will facilitate transition to a standard interface definition. Using standard interfaces will provide for regional interoperability and even

interchangeability of some devices used in ITS management, even though they may be from different manufacturers.

Increased competition: By implementing use of open standards (non-proprietary), multiple vendors will be able meet the standards and be able to respond to RFPs. Support and upgrades will also be available from multiple potential sources, avoiding the problems of being locked in to one source.

Future expandability: By designing within a common framework and using open standards, you will create an environment that integrates legacy systems with new ITS applications and allows more functionality to be added as needed.

Lower costs: ITS equipment and device compatibility will create larger total markets attracting more suppliers resulting in more capable products at lower prices. The resulting long-term costs of deployment will be pushed down by these economies of scale for off-the-shelf ITS equipment and products and by competition through open-system enabling of multiple vendors.

Increased transportation system integration: The open nature and structure of the ITS architecture and use of standards-compliant components will make integration of complex transportation management components and regional systems easier. Improved integration of systems operated by different agencies will permit effective information sharing and more effective use of resources. Seamless mobility services across agency lines will become a reality.

Note:*The solution provider shall be required to provide all protocols, API's interfaces etc. to AMC and solutions should be delivered using standard globally accepted protocols and practices.*

3. *Solution Overview*

3.1. Integrated CCPS Overview

The integrated view of CCPS shall enable you to have a detailed understanding of AMC's view on implementing city wide automated payments system. The system being proposed to be implemented will act as a city foundation framework for integrating objectives of implementing integrated transit fare management systemand other services mentioned in the above section withinAhmedabad city. The CCPS is proposed to be utilized by current (BRTS & City Bus) and any other future public transit system that may be implemented within Ahmedabad City and other payment services required by AMC as already mentioned in this document.

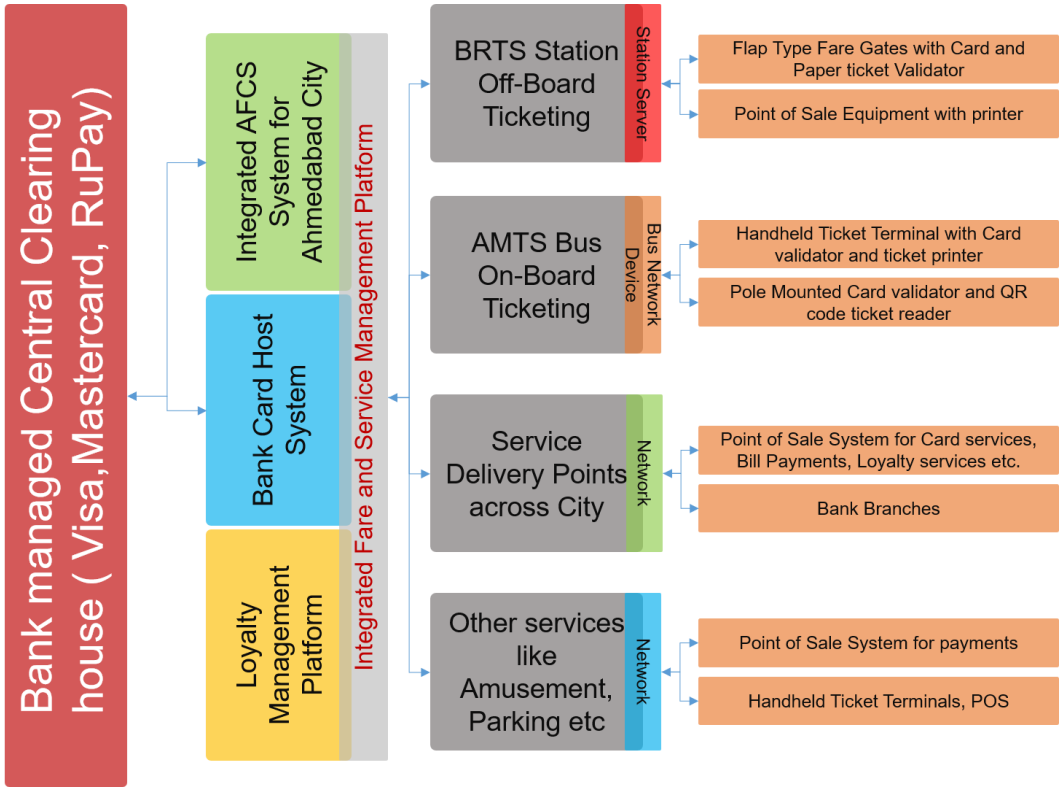


*Figure 1: Conceptual CCPSArchitecture***

***The figure 1 above is indicative and does not include all the activities that would need to be carried out as part of implementation of AFCS. Detailed scope is mentioned in the document below.*

4. ***Functional Specifications for CCPS***

This section describes functional specification and end use requirements for different components within scope of this RFP. The functional specifications shall be the base requirement understanding given to bidders, however AMC expects the service provider to on-board best practices and enable a highly integrated and automated operations environment.

The functional specifications section provides specification for major components for CCPS:

- Fare Collection and Validation Devices API's & necessary kernels etc.
- Integration with CARD management system and Central Clearing and settlement system
- Integrate with Common Transportation Control Centre

The core objective of implementing CCPS is to create an integrated fare collection mechanism using interoperable standards, hence the devices and media thereby has to be complementary in nature. The end state requirement of this implementation shall be that of integrated fare management and collection regime which will render its services to all types of transit system operated within the city in a unified manner. In-order to meet diverse need of commuter and application, following media types shall be offered to users for payment of fare purposes:

- Open loop EMV/RuPay with Contactless Smartcards
- QR code based Paper Tickets
- Mobile application based ticketing using QR code and NFC in future
- Mobile Wallet integrated with pre-paid account

Mobile based ticketing (In scope of AFCS service Provider): Mobile based ticketing shall be used by commuters to book their tickets via mobile phone application. Mobile based tickets shall be based on secure QR code technology & NFC (Future). Mobile Apps shall be integrated with a mobile wallet linked to the pre-paid account. The FI shall provide necessary software and interface to meet this requirement.

Quick Response Code (QR Code) (In scope of AFCS service Provider): The QR codes shall be read by ticketing devices on BRTS bus stations and on bus HTT. QR Code based tickets can be generated on mobile applications and same can be used on ticketing devices for authentication. The paper tickets shall be printed along with QR code for authentication purposes.

The AMC AFCSshall enable AMC to dispense different types of tickets to its user's in-order to ensure all types of user (occasional and daily) needs are catered. The AFCS system shall offer ability to define integrated fare matrix and rules to be used on media and devices to ensure users can avail integrated ticketing facility irrespective of transit type used for commuting. The business rules shall apply to devices, media and integrated central applications deployed to achieve integrated and automated fare collection system.

These AFCS fare media shall be made available to user at several locations such as BRTS stations, Service delivery point's setup within the city, designated branches, Web application, Mobile application, etc.).

Mobile App for Ticketing(In scope of AFCS service Provider)**:** Mobile application (Android/iOS/Windows) shall be developed to enable users to generate secure QR based tickets for use on ticket validation devices. The mobile app shall also be connected to mobile wallet for purposes of app based payments for parking etc.

Service Delivery Points:

The service delivery points (approximately 1000+) shall be located at various locations across the city and may be collocated with corner side stores like grocery stores, medical stores etc. The purpose of providing such touch points is to ensure that all services mentioned as part of this RFP can be availed by citizens at a walkable distance of not more than 500Mts.

Other interfaces with AFC

FI shall provide integration with the Central system of AFC system implemented by AMC with following external systems:

Central Clearing House System (CCHS): The AFCS smart card transactions shall be transmitted to CCHS of bank and the settlement shall be carried out by bank. Necessary communication between the two systems shall be provided to ensure seamless transaction processing.

Banking Interfaces: The banking interfaces shall be required for enabling top-up channels like POS, Mobile banking, Payment Gateway and service delivery points etc. The banking interfaces shall also be used for customer service.

4.1. General Description of CCPS

The objective of this project is to provide open loop smart card system for the purpose of automatic fare collection system and other payments services for AMC as agreed between the bidder and AMC. The Bidder shall be responsible for installation of the end to end open loop smart card based CCPS system at the required locations.

The system security shall include, as a minimum, protection against, fraud, theft, falsification of data, false accounting, external threats, denial of service, eavesdropping, loss or corruption of information, masquerading (spoofing) and unauthorized access, etc. The system shall adhere to industry recognized International and National standards and practices published.

The Bidder shall design, supply, install, test, commission and maintain the equipment hardware, software, accessories, and interfaces required to complete the ecosystem for CCPS as per the project requirements.

The bidder shall design, develop and maintain the open loop smart card top-Up channels and e-payment services. The bidder shall design, develop and be responsible for the maintenance and management of required systems.

The bidder shall deploy system for AMC to be able to perform day to day monitoring of the operations and the bidder shall provision for the MIS reporting and would be responsible for generation of MIS reports as per the requirements of the AMC till the duration of the contract.

The bidder shall be responsible for the maintenance of the equipment hardware, software, etc. and would be responsible for repairing and replacement in case of failures or defects as part of the defect liability period obligation of the contract for the contract duration. The bidder shall be responsible for hosting the Central CCPS solution at banks premises with interfaces to AMC AFCS system.

The bidder shall be responsible for interfacing with mobile application that shall be integrated mobile application for the purpose of ticketing for commuters and other applications as agreed between AMC and bidder.

The bidder shall at all times comply with the project schedule provided by AMC.

The Bidder shall verify by analysis, testing and system demonstrations, as required, the operability, reliability, availability, maintainability and safety requirements stated in the Specifications.

4.2. Scope of Work

The bidder shall be responsible for successful completion / execution of the activities listed in the following table of requirements to enable AMC's vision of Common City Payment System, as well as maintenance of the solution.

The following table outlines the broad areas of scope of work for bidder.

Sl. No.	Scope of Work
1	Design, Printing/Manufacturing, Supply/Distribution, Marketing of AMC and FI Co-Branded SMART Card
2	Design, develop and maintain Interoperable SMART Card Application and Card Data format & L2 Kernel for Fare Management Devices
3	Card Issuance at banks/merchant outlets and Personalization Management
4	Interfaces with Smart Card based Automatic Fare Collection System in BRTS and AMTS.
5	Design, Develop and maintain Top-Up channels and e-Payment services including service delivery points within Ahmedabad city.
6	Maintenance of Central Clearance house management in FI facility
7	Design, develop and maintain the **interface requirements** with the ITS-ETS system
8	Deployment &Maintenance of Central Smart Card Host Management
9	Security
10	Acceptance Testing of FI System
11	Documentation
12	Transition Management

13	Exit management
14	Support Management including Help Desk
15	SLA Monitoring
16	MIS and Reporting
17	Training

The overview of the scope of works and services include:

- Provide technical interfaces, maintenance and support for the AFC system requirements over the contract period.
- Procurement, Personalization and Issuance of contactless EMV / RuPaysmart cards for ticketing and payment for goods and services outside AMC transit in line with the Reserve Bank of India regulations/approvals.
- Providing transaction clearing, reconciliation of accounts and money settlement functions for all parties participating in the AMC co-branded smart card program.
- In addition to the physical top up of the AMC smart cards from Point of Sale machines and service delivery locations within city as per RFP, setup of web enabled online card money top-up over dedicated web channel with payment gateways and other banking channels.
- Provide card customer support over Phone, Internet and at bank branch level for card issuance, renewal, refunds, customer account management and customer support with payment gateway and authentication services as per RBI requirements.
- Manage the entire smart card life cycle management of open standards card specifications, card applications, payment scheme, card account management and card transactions.
- Develop suitable application for AMC that integrates with the AFCS, Smart card payment system and finance system of AMC including maintenance and support for the application during the contract period.
- Manage and undertake marketing and sales of AMC smart cards, the AMC mobile application and interfaces through web portal with commuters, retailers/ merchants in

Ahmedabad Region and urban agglomeration around with the objective of increasing card penetration, mobile payment and doing e commerce transactions.

- Enable and undertake card usage over multi modal transport, retail merchant, public utility payment, toll, petrol stations etc. with a view to make it the card of choice for citizens and travelers in Ahmedabad as well as to augment the non-fare box income for AMC.
- In this respect also enable installation of systems and processes at such usage points outside AMC transit through independent arrangement directly with the respective organizations.
- The bidder shall follow the schedules of works and supply and shall complete the sections of the works by the key dates set out in the tender document.

4.3. Detailed Requirement Specification CCPS

4.3.1. Design, Printing/Manufacturing, Supply/Distribution, Marketing of AMC and FI Co-Branded EMV/RupaySMART Card

1. Design AMC and FI Co-Branded SMART Card

FI should provide the following:

- Detailed sample look and feel design specification AMC Co-Branded SMART card
- Provide SMART card design

2. FI should consider EMV-compliant cards
3. Characteristics of Smart Cards should be

- The smart card should be compliant with all EMV regulations and should be a dual interface card (contactless also) capable of performing EMV and transit transactions on the relevant terminals.
- The Smart Card to be used with the AFCS shall be ISO 14443/ISO18092 compliant.
- shall have an operating frequency of 13.56 MHz
- The dimensions of the SC shall comply with ISO 7810

- The resistance of the SC to mechanical stress and chemicals shall comply with ISO 10373

4. AMC should approve the card design before proceeding for smart card printing
5. Manufacturing and Printing of AMC and FI Co-Branded SMART Cards
6. FI or its appointed card agency should print, personalization and manufacture Smart Card.
7. FI should maintain AMC Co-Branding Smart card in a secure location and with security guideline as per the PCI guidelines
8. Manufacturing of AMC co-branding of Smart cards based on the demand of cards with commuters.
9. FI should not have any additionally cost to AMC on printing and manufacturing of AMC co-branded Smart cards other than personalization cost.

4.3.2. Supply/ Distribution of AMC and FI Co-Branded SMART Cards

1. FI shall undertake supply/distribution of the co-branded Smart cards to all AMC designated locations.
2. AMC will indent/request no. of AMC co-branded cards to FI for supply and distribution
3. FI should not have any additionally cost to AMC on supply and distribution of AMC co-branded Smart cards other than personalization of cost.
4. FI should supply co-branded Smart cards to AMC without personalization of commuters details for general users other than pass users.
5. FI should maintain the web based inventory management of co-branded Smart cards as AMC locations, FI branches location and FI identified merchant locations.
6. FI should supply only pre-paid Smart card at AMC branches/ counter and AMC franchise
7. Marketing of AMC and FI Co-Branded SMART Cards
8. FI should build marketing strategy to take AMC and FI Co-Branded SMART Cards
9. FI should provide loyalty benefits for users of this card.

4.3.3. Design, Printing/Manufacturing, Supply/Distribution, Marketing of AMC and FI Co-Branded CCPS SMART Card

1. FI should allow usage of this card in transit system, AMC designated areas, parking, merchant outlet, department stores, retail stores etc.

2. FI should review and modify the marketing strategy based on the current need of the commuters and passengers.
3. FI should market the AMC and FI co-branded smart card as common city card.
4. AMC shall review and approve the of FI's marketing strategy before taking to AMC commuters
5. Any change in marketing strategy by FI should be approvedby AMC.
6. FI should market Co-branded card with IEC materials through multiple channels such as (web adds, FM, radio, TV, Posters, brochures) with FI own cost.
7. AMC daily transaction are defined in part-1 of RFP

4.3.4. *Design, develop and maintain Interoperable SMART Card Application and Card Dataformat*

1. Design, develop and maintain Interoperable SMART Card Application
2. FI should design, develop and maintain the SMART card application as per requirement of AMC catering to the transit and EMV applications.
3. Provide L2 EMV Kernel for fare management devices

4.3.5. *SMART card application should be design and developed in interoperable standards.*

SMART card application should be developed using open standards and FI should not use any proprietary standards. SMART card application contain the following information such as:

- Commuters personalization information with unique reference in case of passes.
- Type of card (prepaid, credit, debit or postpaid etc.,)
- Should contain information on Commuter type such as daily pass, monthly pass etc.based on business rules of AMC
- Should contain flag to maintain access on card for use within AMC and outside AMCnetworks
- Any others relevant details that can help AMC to service Commuters.
- Design, develop and maintain Interoperable Card Data format

1. FI shall define the Interoperable data format and standards of co-branded cards and terminal interfaces for eg: KEY and SAM management etc.,

2. Design, develop and maintain Interoperable SMART Card Application and Card Dataformat
3. FI shall provide all relevant documentation card specification and terminal interfaces for eg: KEY and SAM management etc.,
4. FI shall provide exclusive Intellectual Property Rights (IPR) of smart card data format and standards to AMC.
5. Inter-operable Data formats should allow passenger to allow to use co-branded cards in any merchant location, other transport operators joining program the standards setup for AMC or and as well as AMC operated locations.
6. FI should design, develop and maintain the interoperable application SMART card.
7. FI shall design the data format and standards for terminal interface.
8. AMC may appoint 3rd party agency to certify the data formats

4.3.6. Co-Branded Smart Card Issuance and Personalization Management

1. FI shall take whole responsibility of Issuance and management of Co-Branded SMART cards
2. AMC facilities the existing AMC counter for issuance of Co-branded SMART cards and FI
3. FI shall provide necessary card personalization service to AMC based out of FI's owned facility.
4. FI can issue pre-paid/credit/debit SMART card with the AMC co-branded smart cards to eligible commuters as guideline of FI and RBI.
5. FI should equip AMC with all the required equipment's at AMC to enable the functioning ofsmart cards
6. FI can issue pre-paid/credit/debit SMART card with the AMC co-branded smart cards to eligible commuters as guideline of FI and RBI guidelines.
7. FI should supply only pre-paid SMART card at AMC branches/ counter and AMC franchise or any other AMC designated locations.
8. FI should define the process and guideline for issuance of different co-branded smart card type such as pre-paid, credit and debit cards.
9. FI should maintain entire life cycle indicative activities of co-branded Smart card such as
    - Issuance of co-branded Smart card
    - Active of co-branded Smart card

- Deactivate of co-branded Smart card
- Block of co-branded Smart card
- Blacklist of co-branded Smart card
- Decommission of co-branded Smart card
- Re-load / Reuse of co-branded Smart card
- Lost of Co-branded Smart card
- Others etc.,

10. FI should maintain dedicated helpdesk /call center to handle call of AMC co-branded smart card.
11. FI should enable web based, mobile based or any other channels to AMC co-branded channels to apply or request for AMC smart card application.

4.3.7. Co-Branded Smart Card Issuance and Personalization Management

1. FI should provide co-branded smart card with personalization such as photo and name on Passes issued by AJL and AMTS.
2. FI shall maintain necessary hardware/software infrastructure to perform personalization on the pre-paid co-branded smart card at FI's owned facility.
3. FI perform pre-paid Smart card personalization should be completed on immediate basis and delivered within 2-3 days.

4.3.8. Design, Develop and maintain Top-Up channels

1. FI should design develop and maintain top-up channels to cater different stakeholder ofAMC commuter to recharge co-branded SMART card.
2. FI should enable different channels to top up the AMC co-branded SMART card by throughweb-based, mobile based or Ticket value machine, merchant outlet channels and any otherchannels suggested by FI.
3. AMC commuter should able to top up prepaid SMART card up to the monetary limits andprocess as regulated by RBI or any other regulating agency.
4. AMC commuter should able to check balance on the pre-paid card via SMS, or web basedchannels, TVM etc.,

4.3.9. e-Payment services for Top up

1. Provide e-Payment gateway for Credit Card and Debit Card transactions
2. Provide Payment Gateway for Visa/MasterCard/Amex/RuPay. Provision of Payment Gateway for Visa and Master Card is mandatory. The Payment Gateway shall be under the control of the Principal Bank.
3. Provide front-end for entry of smart cards details by bidder and additional authenticationrequirements specified by payment gateway service providers.
4. Provide Payment portal for Net Banking

4.3.10. Maintenance of Central Clearance house management (CCHM)

1. FI should maintain Central Clearance house managements(CCHM) asper requirements of AMC Smart card based ticketing.
2. CCHM should be interfaced with ITS ETS system for exchange of usage data on defined
3. periodic intervals between FI and AMC
4. CCHM should track and account the fare deduction based on unique identification of Smartcard.
5. Fund Transfer of the AMC transactions happened in the calendar day i.e., between
6. 00.00Hrs to 24.00 Hrs. should be performed by CCHM to AMC bank account within 24.00Hrs.
7. CCHM should transfer funds of different merchant or any other banks performed using AMCSmart card transaction done by the AMC commuter.
8. CCHM should auto share or upload MIS all payment scroll done by co-branded Smart cardcommuter to AMC AFCS system
9. CCHM should calculate and transfer the AMC revenue share on Non-AMC paymenttransaction charges on smart card.
10. CCHM should share or upload report to AMC ITS system based on the needs defined byAMC during the project design phase. This could include the commercial and technical reports on the ecosystem for the AMC smart card product.

4.3.11. Design, Develop and Maintenance of Central Card Host System (CCHS)

1. System should maintain the inventory of co-branded smart card
2. System should push the information and current status of co-branded smart card to AFCS system
3. This system should maintain the security access management of smart card and pushupdated information to AFCS.
4. The smart card host system should cater to the end to end smart card management

4.3.12. Integration with AFCS System and Reconciliation

1. CCHS should integrate with AMC AFCS to fetch and sync fare deduction on the fare systemor any other information as required by AMC.
2. FI System should integrate with AMC AFCS to sync co-branded Smart card enablement information along with customer details
3. FI System should share the latest card status to AMC AFCS to update on theSmart card
4. FI system should share the latest balance and any other details on the Smart card to AMCAFCS to update on the Smart card.
5. FI system should integrate with AFCS on reconciliation of Fund and Tickets
6. FI system should share necessary integration requirements between Co-Branded Smart cardand ETM machines procured by AMC.
7. FI CCHS should be capable sync more than 10 Millionrecord on daily basis with AFCS
8. FI central Smart card host system should push the card status on defined interval
9. FI central Smart card host system should push security access management to AFCS.
10. Top-ups and New smart card issuance should update with AFCS on realtime basis.
11. Consumption on the Smart card should be updated to AFCS on real-time basis.
12. FI should provide utility to send all transaction of AFCS system.

4.3.13. Security

1. The FI System must allow security categories to be assigned to sensitive records like student data, results etc.
2. The Administrator should be able to determine the highest security category of any record inany class or file by means of one simple enquiry

3. The System should support routine, scheduled, review of security categories
4. Users only have to log onto the System once to be allowed to access all application modulesfor which he/she is authorized to access
5. Security provided at the network, application, and database levels as well as at the clientlevel.

6. Supports standard Internet security including, but not limited to:
   _ Digital Certificates
   _ Various levels of encryption
   _ Secure Socket Layers (SSL)
   _ Secure Hypertext Transfer Protocol (HTTPS)
7. Prevent access to sensitive application data by highly privileged users. Super user should not be able to select, insert, update or delete data from audit.

4.3.14. Acceptance Testing of FI System

The objective of testing is to ensure that the entire system performs as per requirements mentioned in RFP. The testing objectives will have the following dimensions – testing in technical, functional and operational aspects

Testing on Technical Aspects
Testing on Functional Aspects
Testing on Operational Aspects

The testing will be done at the test environment of AMC or the FI as mutually agreed. FI shall provide requisite technical and operational support for the testing. Specifically, FI has to take specific efforts to ensure that all Smart card based ticketing, e-Payment transactions are done in a safe and secured manner as it is the norm for Smart card based Fare Collection,e-Payment transactions

The FI has to complete one round of System Integrated testing in the testing environment before taking the solution for Use Acceptance Testing (UAT). Under this testing the FI has to simulate all the functions including payment transactions, upload of payment scrolls, refunds, MIS generation etc. The Methodology of Simulation and Testing has to be part of the Technical Presentation.

The FI shall obtain the sign-off from AMC or its nominees on testing approach and plan. The FI shall support testing of the solution based on the approved test plan and criteria; document the results and shall fix issues observed during testing

It is the responsibility of the FI to ensure that Smart Card based ticketing, e-Payment services provided by them meet all requirements specified in the RFP. The responsibility of testing thesystem is with the FI.

FI shall ensure all systems are appropriately tested in the staging area and are applied on live instance only after such comprehensive testing

4.3.15. Documentation

The Bank shall prepare/update the documents including that of Co-branded card design, SMART card application design, Integration documentation with AFCS, CCHS, System Requirement Specification, Test Cases & Results, Security Policydocument, etc. as per acceptable standards(should not only limited to)
The Bank shall maintain log of the internal reviews of all the deliverables submitted to AMC. The logs shall be submitted to the AMC or designated agency on request.
The Bank shall obtain the sign-off from AMC or its nominee for all the documents submitted for this Project and shall make necessary changes as recommended by AMC before submitting the final version of the documents.
All the specifications or documentations created for the project would be owned and used by AMC for future rollouts with other transit operators and Financial Institution to ensureinteroperability and mitigate the risk of getting locked with any specific stakeholder

4.3.16. Transition Management

Facilitate smooth transition of operations from existing system through proper understanding of various processes and technical requirements.
Deploy FI system services on test environment of AMC prior to go-live.
Support testing of all the modes of SMART Card based payment/Top up, SMART Card issuance management on the testing environment of the AMC
The Bank to launch FI services for all modes of payments at a single point of time or in a

phased manner as required by the AMC

4.3.17. Exit management

The exit process would start at the beginning of the last two quarter of seventh year (i.e. from thedate of signing of the contract) in case contract not extended further.At the beginning of the last quarter of the end of the contract period or in the event oftermination of contract, the FI is required to provide necessary handholding and transitionsupport, which shall include but not limited to, conducting detailed walkthrough anddemos/drills for FI Services system, project documentation, etc., and addressing thequeries/clarifications of new FI selected by AMC.

The incumbent FI shall prepare proper books of accounts for all transactions and specifically provide clear details of pending to be fund transfer.

The ownership of the data generated upon usage of the system, at any point of time during the contract or expiry or termination of the contract, shall vest with AMC.

During the contract period, the Bank shall ensure that all the documentation including policies, procedures, etc are kept up to date and the same are handed over to the AMC during theExit management process

4.3.18. Support Management including Help Desk

During the contract period, the FI shall be completely responsible for defect free functioning ofthe FI Services and the related software applications deployed by the Bank

The FI shall resolve any issues that include bug fixing, improvements in presentation, ad hoc reports with existing data and/or functionality and others at no additional cost during the support & contract period

AMC foresees the need for implementing changes during the contract period (e.g. generation of new MIS reports, provision to upload additional formats, modify reconciliation logic, etc.). This may also include incorporation of new modes of payment (e.g., mobile payment, electronic, etc.) along with the current modes of payment. The FI has to provide the above with no additional cost to AMC

Business Hours of the Office

The Offices of the AMC will be operational from 9:00 AM to 9:00 PM or as notified by AMC. Working Days will be those as identified by AMC. All second Saturdays, Sundays and public holidays declared by Government of Gujarat shall be non-working days.
In case of emergencies or on need basis, maintenance and support services shall be provided by the FI before/after the normal working hours or on non-working days. No additional costs shall be borne by AMC for the work performed by the FI beyond the business hours of Office

4.3.19. Provision, Deployment and supervision of personnel

The FI would be required to recruit, train and deploy personnel for ensuring compliance to SLA requirements. The personnel deployed should be appropriately trained and should be adequate in number to meet all support, technical, functional and other requirements of the application and processes. The personnel deployed for maintenance and support should be regular full-time employees of the FI.

The Project Manager shall be a named resource and the resource shall comply with the qualifications as mentioned in this RFP

AMC will require the FI to meet the implementation timelines as specified in the RFP. The Project Manager is viewed as Single point of contact (SPOC) for the engagement, assigned to keep AMC team abreast of all the developments and also ensure that the SLA's are maintained. During the contract duration, the Project Manager shall inter alia, attend scheduled project meetings, provide directions to the FI team and ensure timely resolution of faults / disruptions.

AMC envisages active involvement of the senior resources from the FI during the initial transition period until operations are stabilized

4.3.20. Support Management including Help Desk

Helpdesk Support

The FI would be required to provide Helpdesk services to enable effective support to the users for technical issues regarding provision of FI Services (Smart card, Personalization machines, Ticket vending machine, etc.,)

The FI shall provide the following services –

Provision of persons for the support and maintenance. The Helpdesk Team should be conversant with Smart Card Fare Collection operations in general and FI services in particular.

All grievances will be assigned a ticket number and the number will be made available to the user along with the identification of the staff without the user having to make a request in this regard, at the beginning of the interaction.

Help Desk shall provide direct support for the technical queries and other software related issues arising during the day to day operations or assign the call to the respective executive.

The Help Desk team contact numbers shall be shared to the AMC.

Bank shall adhere to the service level agreement with respect to the resolution of issues at various levels

The interactions will be recorded (i.e. logs about the calls and call resolutions) and the records maintained for reference for a period of 6 months.
All complaints/ grievances of users will be recorded and followed up for resolution. Escalation matrix should be developed for any delay in resolution.

Portal interface: AMC will provide limited access of its AMC ITS portal to Helpdesk for the purpose of querying related information

The FI should provide the following helpdesk performance monitoring reports –

a. Details of Calls logged on weekly, monthly or any other duration as specified by AMC.
b. Numeric and graphical representation of calls logged at Helpdesk

4.3.21. SLA Monitoring

Service Levels shall be decided in consultation with the successful FI. Service levels agreed with the FI shall be measured by the FI by using automated tools. The SLA reports will be monitored by the AMC regularly. FI shall calculate the total penalties arising due to non-compliance of the SLA on quarterly basis.

The FI shall develop an SLA Measurement and Monitoring System (SMMS) for measuring and reporting the SLAs. All SLA measurement and calculation of penalties shall be automated. Manual intervention for measurement of SLAs shall be after prior approval of AMC.

The SI shall ensure that proposed SMMS address all the SLA measurement requirements and calculation of applicable penalties.

All data related to SLAs shall be made available to AMC for audit

It would be the responsibility of the FI to generate appropriate MIS reports both in hard and soft copies to ensure accurate capturing of the work carried out during the month

MIS and Reporting

MIS and Reporting - – Indicative reports but not limited to below

FI should have the following indicative report on FI portal or any FI provided applications
FI should push the below to ITS-ETS system on agreed intervals.
Payment Scrolls - The payment scroll MIS shall be available through FI website during custom specified dates, mode of payments and value of payments

- Date of Transaction
- Mode of Transaction
- Value of Transaction
- SMART Card Identity
- Name of Remitter
- Amount
- AFCS AMC Payment Reference no
- Account No (Last 4 digits in case of Credit Card / Debit Card)
- Remarks as entered

MIS of FI Statement - The FI website shall provide MIS view of Bank Statements without any limitation on the period. The following shall be provided

- Date of Realization
- Bank Transaction Remarks
- Date of Transaction
- Credit Amount
- Debit Amount
- Merchant details – AMC or other merchants
- ON US/OFF US transaction indicator

Bank Statements - The Bank website shall provide a view of Bank Statements, in their own format, without any limitation on the period
Unique Reference No. MIS - The Bank shall provide an MIS report providing necessary details linking collection accounts with unique reference nos. The following shall be provided

- Date of Transaction
- Date of Realization
- Amount
- Name of Remitter
- Unique Reference no
- Bank Statement Remarks

Upload of Payment Scrolls - The Bank shall provide the details of Time and Date of upload of payment scrolls based on duration of days as selected. The MIS report may be in the following format

- Scroll Details
- Date and Time of Upload
- Penalties, if applicable

MIS Dashboard - The Bank shall provide MIS dashboard displaying the following

- Closing Balance in each Account
- Amount eligible to be withdrawn
- No. of Transactions + Value of transactions (mode-wise) for last 7 days
- No. of EMDs refunded + total value for last 7 days
- Status of Payment Scrolls

4.3.22. Training

FI should provide training to AMC employees on usage of Co-Branding Smart Card personalization management.

FI should provide training material and user manuals on usage of Smart card validator, Ticket vending machines, and Ticket Value machines.

FI should provide training on the FI related MIS report and fund reconciliation.

4.4. CCPS Implementation Services

The Services to be performed by the bidder shall include, but not limited to, the following:

Design, manufacture, delivery, installation, testing, commissioning and assurance of integrated AFC Central system of AMC.

Installation, interfacing, testing and commissioning of the AFC system for all defined stations in the RFP.

Presentations, meetings, review and audit support as specified in the RFP.

The bidder shall provide, as a minimum, the following for Project management and during implementation of the system:

- Quality management, provision of reliability and maintainability demonstration test;
- Overall site supervision and management;
- Decommissioning, removal and disposal of temporary works, if any;
- Efficient management of bidder's spares during the defects liability period;
- Presentations, meetings, reviews and audit support as specified in the Specification;
- Interface management;
- Configuration control;
- Asset management;
- Set up bidder's premises such as project office and storage space;
- Any other work to meet AMC's requirement.

Operation and maintenance support services during contract period.

Contractor shall ensure system security from fraud possibilities, falsification of data, computer virus etc. during contract period.

Preparation and submission of documentation (hard / soft copy). Bidder shall prepare, update and submit all design, functional and technical documentation supporting the AFC system setup as well as interfaces with external systems.

Liaison with various other service providers:

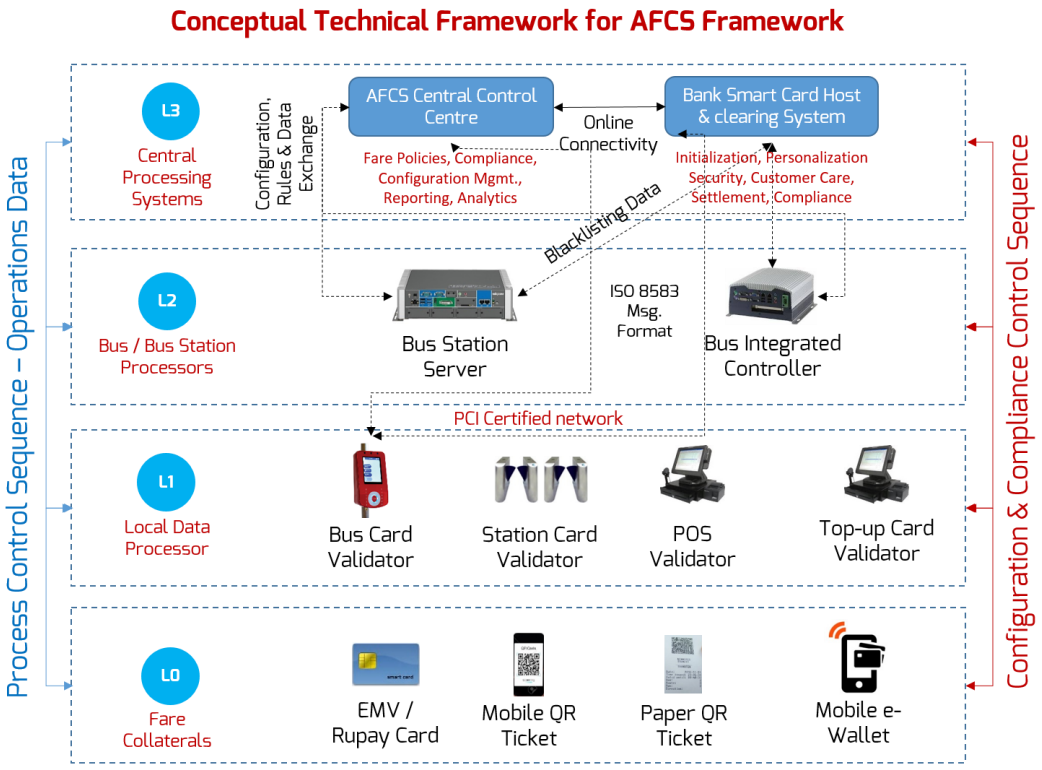
Positioning of AFC equipment in relation to other station infrastructure and signage;

Review followed by receipt of 'Notice of no Objection' of the designs, installation and, where appropriate, testing work supplied and/or performed by the nominated project Bidders.

Any other work to meet the Works requirements.

5. *Central Monitoring Environment*

The technical specifications section provides detailed specifications for software, hardware, communication and interfaces required to achieve the objectives of the CCPS project.



Technical Architecture of CCPS Network – Conceptual

5.1. Central Control Centre (CCC)

The central control centre represents the operational centre of the transport service where AFCS application system shall be used to manage inputs from the field devices, the fare management systems, fare matrix/tables database etc. Information retrieved by the control centre from the field AFCS devices shall be processed by central AFCS application for consolidation and settlement purposes. The centre will also act as central payments management centre for the purpose of administrative and process controls and information delivery.

The central control centre shall act as a nerve centre for the purposes of revenue operations management for the city related to services connected to CCPS services. The systems implemented as part of CCPS allow variety of technical and operations profiles to be deployed to manage management needs on real-time basis. Some of the profile types are such as fare controllers, incident managers, back office reconciliation and reporting etc. including the technical staff ensure business services are delivered as expected and in-event of exceptions, the same are managed to reduce any impact on operations and business.

The job involves monitoring and maintaining operational functions of an electronic reporting facility requiring the ability to monitor and maintain a range of electronic & software services, security and telecommunications systems, receive, interpret and transmit information and determine responses to incidents and;monitoring the security of persons and infrastructure from a control room perspective requiring the ability to effectively operate security systems to monitor activities, co-ordinate appropriate responses to incidents and organise relevant procedures via stand operating procedures.

Some of the common functions carried out at CCC are:

- Monitor and maintain electronic & software systems
- Process and organise data
- Respond to incident
- Prepare for operations
- Monitor security activities
- Maintain systems and information

Integration with bank

The CCC has to interface with Bank Server and with Bank Payment Gateway for recharging of smart card through different Banking Channels. The solution shall be capable of interacting with multiple banks using specifications of a particular scheme (Visa, MasterCard, RuPay).

Smart Card Host (SCH):

The Smart Card Host system shall is required for Issuance and life cycle management of the smart fare media. The Smart card host would as a minimum perform the following card management functions:

a. Cardholder management

b. Media Stock Management;
c. Smart Media Tracking Management;
d. Transaction Management;
e. Key management
f. Terminal management

Cardholder Management

The Smart Card host (SCH) shall be equipped with facilities to manage the database of users who have personalized smart media. The SCH should have provision to keep documentation as required related to personalization.

The Bidder shall propose the commuter data, which the SCH shall store during the design phase. The SCH shall automatically manage the commuter's information according to the status of the smart media it is associated with. When a Contactless Smart Media record is removed from the database, due to expiry or refund, the SCH shall remove the commuter's record as well by capturing the history at relevant database.

Transaction Management

The SCH shall acquire the transactions from the fare media acceptance infrastructure and authenticate the fare media as and when required. The smart card host shall actively update its contactless smart media blacklist table by removing contactless smart media IDs when the smart media has been blocked physically from further usage and top-up.

It shall be possible for operators at POS Machines in stations to unblock certain blacklisted smart media's upon meeting certain pre-defined criteria.

Under such circumstances, the bidder shall provide suitable mechanisms and advice a suitable solution in its response, whereby the unblocked smart media is available for immediate use throughout the smart card based AFCS

Key Management

The SCH shall provide key management system for management of keys and certificates throughout the lifetime of the AFCS. The Key Management System shall be responsible for the

generation, maintenance, secures storage and distribution of all cryptographic keys, system key materials and security variables.

The Key Management System shall also perform the initialization, including key injections, of security components in the system such as the Secure Access Module (SAM) through a remote system without the need to make any hardware or onsite upgrades through Remote Key Loading. A facility shall be provided to upgrade keys through the network and to change keys periodically, or when keys are compromised.

The SCH shall allow the AMC to manually transfer security keys and certificates to other Bidders or Operators through the CCHS network. Hardware Security Module (HSM) shall be provided that securely manages the encryption and transmission of data. All secured data and algorithms shall be kept securely

The Key Management System shall preferably comprise a standalone subsystem located within a physically secured area. The Bidder shall submit a detailed Key Management Strategy proposal for the AMC's approval during the design phase. The initialization of all new SAM chips shall be done securely before they are deployed to the Contactless Smart Card equipment.

Secure Access Module (SAM) management

The Secure Access Module is a cryptographic smart media that provides security protection functions, such as authentication and cryptogram for transaction. The security keys shall be stored within this SAM. External applications shall have no direct access to the keys thus effectively protecting the system integrity. The transfer of the keys shall be by SAM(s) whereby the recipient shall load the SAM(s) in its own key management facility for downloading or transfer of keys within its network of computers and equipment.

The AMC shall be furnished with sufficient documentation and information to independently guide future bidders or operators in interfacing with the SAM. When introducing a new bidder or service provider to the system, the CHS Security Manager shall be able to generate new development key sets for their software development works, and transfer the key set to the service provider or bidder in a SAM via SCH. To interface with the development SAM, the developer shall be required to obtain a development SAM Authentication Key from the SCH.

Equipment Management

The SCH shall provide equipment management functions which shall allow the AMC to define new equipment types and new owners for the system. The SCH shall manage and initialize all equipment and associated Secure Access Modules for both BRTS and Non-Brts application.

Equipment shall be configurable in accordance with any one of the following categories:

- Add and Deduct Value;
- Deduct Value only;
- Read only;
- Initialization.

The SCH shall be able to support the current key files and be able to create new ones without any software modification.

Media Related Functions

The SCH shall make provisions for interoperability which shall include, as a minimum the following:

- Contactless Smart Media data structure provided shall permit other transit Service Providers to process the Contactless Smart Media for transactions with a common transit purse;
- Contactless Smart Media data structure shall permits other non-transit Service Providers to process the Contactless Smart Media for e-purse transactions;
- Provisions to facilitate the issue of Contactless Smart Media from off-site locations;
- Provisions to implement fare promotion and loyalty schemes for multi-mode transit and other common uses of Contactless Smart Media.

Smart Media Tracking Management

- The SCH shall contain the master database of smart cards and other media as applicable.
- Each individual Smart Media shall have a unique identity and shall be tracked from its initialization till its termination.
- On termination the unique identity shall be purged automatically from the database.

- The SCH shall create the master record upon initialization and shall update the status of the Smart Media including the purse value and status and other information using transactions that is uploaded to it.
- Amongst other data, the remaining trips, transaction sequence number, last date and time used, etc. shall be updated.
- Upon expiry or refund of the Smart Media, the record shall be purged taking into account the period allowed for refund for expired Smart Medias and the archiving period to meet any government or other regulations.
- Full details of the data fields to be included in the database needed to support the system shall be defined during the design stage and approved by the AMC.
- The system shall also be designed to reflect the latest status of the Smart Media bearing in mind that transactions received by the SCH/ may not be in chronological order.
- The SCH shall also support the current Smart Media replacement In accordance with the Business Rules.
- A new Smart Media shall be reconstructed from data obtained from the SCH to replace the defective, lost or stolen Smart Media.
- This replacement facility shall be available at the SCH site, POS locations etc.
- The SCH shall also detect anomalies in the use of Contactless Smart Media.
- The Bidder shall propose the full and complete anomaly checks during the design stage for the AMC's approval.
- The SCH shall manage the removal of retired Smart Media records after the remaining value in each Smart Media has been accounted for during expiry as revenue.

Media Stock Management

- The SCH shall be equipped with a stock management utility which shall enable the AMC to track Contactless Smart Media stock movements in the system covering the lifecycle of the Contactless Smart Media commencing from the date of purchase from the supplier until the time that the Smart Media has been removed from the system.
- The SCH shall also track returned Contactless Smart Medias due to refund, corruption, replacement, etc. and disposal.

- The SCH shall allow users to input to the system information when introducing new media to the system, editing information of existing media in the system, viewing information of existing media and removing retired media from the system.
- The SCH shall allow the AMC to configure new media types to the system without changes to the application software.
- The SCH shall also allow useful information such as Smart Media vendor, issuer, batch number, date and time, etc. to be tracked in the system.
- The SCH shall actively monitor and update its stock information categorized by location (e.g. POS ID, etc.) according to the usage transactions such as initialization, issue, replacement, etc. and physical stock replenishment.
- Upon expiry of media, the SCH shall also adjust the stock management information accordingly.

The SCH System shall include the following, as a minimum:

- Total un-initialized stock of each media type;
- Total initialized stock of each media type at each station;
- Total issued for each media type;
- Total retired from use for each media type.

The SCH shall provide reports that shall provide immediate information on any discrepancies in the stock accounting figures.

The Bidder may propose in its bid submission other means of tracking the media stock that achieves equivalent results and shall provide detailed descriptions of their proposed Media Stock Management.

Smart Card Host Data Base Management

- The Host shall maintain database of Cards, Cardholder, Audited and Unaudited Transactions data base as in a typical smart card host.
- From the Card Initialization System, unique serial number and initialized date of every card will be sent to the AFC Card Issuer Host, which stores the data in the Card Database.
- Upon card issuance, the card will be loaded with cardholder information, e.g. cardholder name, gender, age, which will be submitted to the Card Database in the AFC Card

Issuer Host. The Card Database will transfer the cardholder information into the Cardholder Database.

- Transactions from the frontend terminals will be submitted to the AFC Acquirer Host. The records will first be collected and stored in the Unaudited Card Transaction Database. After the card balance audit process, the transactions with no issue will be stored in the Audited Card Transaction Database which links with the Card Database. Those exception transactions will be put in the exception handling in the Unaudited Card Transaction Database. Investigation by operator/issuer will be needed.

5.1.1. AFCS Integration Requirements

AMCwill utilise AFCS and other payments data for integration with other sub-systems for the purpose of operational use by authority. The data from CCPS will be required to be shared with other sub-system (AVLS/Intelligent Transit Management System or other sub-systems) and the data from other sub-systems may need to be automatically updated into AFCS and other systems as part of CCPS (like new user login, route details, fare details, bus-stops addition, etc. from AVLS / Intelligent Transit Management System or other sub-systems).

- Predefined and agreed data shall be shared between two sub-systems, AFCS and AVLS/ITMS etc. and can be exchanged using appropriate formats.
- The structure of exchange files / data can be agreed upon in a pre-defined format;
- The encryption / Decryption details shall be provided to AMC for data integration requirements.
- The process of data sharing can be scheduled to run at pre-defined or need-basis intervals.
- The required data exchange formats, data fields and inter-linkages shall be discussed in detail with AMC during design stage and shall be incorporated accordingly.

5.2. Service Delivery Points in Ahmedabad City

The bidder shall be required to setup service delivery points within Ahmedabad city to provide services like smart card dispensing, card recharge, bill payments (municipal, utilities, telecom etc.) and other value added services. The service delivery points shall available to citizens at approximately 450mts of walkable distance. The service delivery points shall augment the objective of CCPS of making easier service availability and augment higher utilization of service. The system shall provide a POS machine with a dual screen interface for the purpose of service

provider and customer interaction. The system should have printer and barcode scanner integrated with it to ensure service deliver as described in this RFP. The system should additionally allow consumers to have access to loyalty program and be able to avail loyalty benefits using POS terminal. The system should provide printing facility of loyalty coupons to the users. This system shall be connected via wireless or wired network connectivity to be able to communicate to CCC, utility services providers, card host and other external required interfaces to deliver services.

5.3. Business Continuity Plan

The service provider has to design control centre system in high availability mode to mitigate risk of any outages on account of Hardware /Software / Connectivity failure. The service provider has to guarantee up time of 99.9%.

The Business Continuity Plan will be based upon Backup and Restore strategy. The devices (such as SCU) will be able to retain usage data up to a period of 7 days.

Nevertheless, our backend solution will be able to support the replication/hot redundancy if it is needed in a later phase of the implementation.

5.4. Application and System Audit

AMC shall at its discretion appoint a third party auditor capable of auditing IT systems envisaged as part of CCPS implementation. The service provider shall be required to provide necessary information to the third party auditor to facilitate testing and audit of hardware, software and processes related to CCPS.