



# **REQUEST FOR PROPOSAL**

for

## **Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**

Tender Notification No.:

**Issued by:**

**Office of the**

**Deputy Commissioner,  
Solid Waste Management,  
Pune Municipal Corporation,  
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*Table of Contents*

**Contents**

1) Glossary.....	5
2) Invitation for Proposal.....	6
2.1 RFP Notice .....	6
2.2 Critical Information .....	6
2.3 Introduction & Background.....	7
2.4 About Pune .....	7
2.5 About Pune Municipal Corporation .....	7
2.6 About Pune Smart City Development Corporation .....	7
2.7 Project Background .....	7
2.8 Project Objective .....	9
2.9 Project Beneficiaries.....	10
2.10 Existing Systems.....	11
2.10.1 Existing systems:	11
2.10.2 Upcoming systems:	11
2.10 Project Coverage.....	12
2.11 Bid Document Notice .....	12
2.12 Bid Invitation.....	12
3) Pre-Qualification Criteria .....	13
4) Instructions to Bidder .....	17
4.1 Purpose of Bid Document.....	17
4.2 Cost of Bid document .....	17
4.3 Duration of the Contract Period.....	17
4.4 Bidder Registration and Instructions .....	17
4.5 Proposal Preparation Cost .....	17
4.6 Pre-Bid Meeting .....	17
4.7 Amendment of Bid Document.....	18
4.8 Rights to terminate the Process .....	18
4.9 Site Visit .....	19
4.10 Language of Bids.....	19
4.11 Bid Submission Format .....	19
4.12 Earnest Money Deposit (EMD) and Refund .....	19
4.13 Submissions of Bids .....	20
4.14 Modification or Withdrawal of Bids.....	20
4.15 Evaluation Process.....	21
4.16 Evaluation of Technical Bids .....	21
4.17 Opening of Commercial Bid.....	25
4.18 Award Criteria .....	25
4.19 B) PMCs' Rights to Accept/Reject any or all Proposals.....	26
4.20 Security Deposit .....	26

4.21	Failure to agree with the Terms and Conditions of the Bid/Contract.....	26
4.22	Terms and Conditions of the Bid.....	27
4.23	Consortium .....	27
5)	Scope of Work.....	28
5.1	Overview .....	28
5.2	Implementation of ISWM Solution .....	28
5.2.1	Requirement Gathering	28
5.2.2	System Design	29
5.2.3	Deployment and integration with third party applications and other sub-system(s)	31
5.2.4	Security Requirements	31
5.2.5	TRAINING AND CAPACITY BUILDING	33
5.2.6	SYSTEM DOCUMENTS AND USER-MANUAL	36
5.2.7	ACCEPTANCE TESTING	36
5.2.8	On-site technical Support:	38
5.2.9	Off-site technical Support:	38
5.2.10	HAND-OVER OF THE ISWM SYSTEM	38
5.2.11	OPERATIONS AND MAINTENANCE	39
5.2.12	Incident Management and Crisis Management	41
5.2.13	Problem Management	41
5.2.14	On-site technical Support:	42
5.2.15	Off-site technical Support:	42
5.2.16	IN-FUTURE DEVELOPMENT SUPPORT:	42
5.2.17	ADDITIONAL SUPPORT FROM BIDDER:	43
5.2.18	FUNCTIONAL REQUIREMENTS	43
5.2.19	Households/Public/Markets area sweeping:	50
5.2.20	Hotel, Garden, Slaughterhouse Waste, Bio-waste and any other specialized waste such as e Waste collection:	55
5.2.21	Construction and Demolition (C&D) Waste Collection:	57
5.2.22	Ramp and Processing Plant Operations:	59
5.2.23	End to End Fleet Management:	62
5.2.24	Fine for various offences under the SWM rules	64
5.2.25	Community Toilet (CT) and Public Toilet (PT) cleaning monitoring	65
5.2.26	Contract Management, Billing System and Payroll Module:	66
5.2.27	MIS and Dashboard Requirements:	68
5.2.28	Campaign Movements:	71
5.2.29	Design and Implementation	72
5.3	Technical Specification and Standards.....	73
5.4	Hosting policy.....	76

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

5.5	Change Management & Analytics.....	76
5.5.1	User Training	76
5.5.2	Analytics	77
5.6	Work Completion, Timelines and Payment Terms .....	77
5.7	Payment Terms.....	80
5.8	Service Level Agreements.....	83
5.9	SLA Management.....	84
5.10	SLA measurement and monitoring.....	85
5.11	Warranty .....	85
6)	Annexure I: Instructions for Pre-Qualification Bid .....	93
6.1	Pre-Qualification Cover Letter .....	93
6.2	Check-list for the documents to be included in the Pre-Qualification Folder .....	94
6.3	Bidder's Average turnover, over last 3 FY(17-18, 18-19, 19-20) .....	96
6.4	Details of Implementation of Projects of similar nature in last 3 years.....	97
6.5	Self Declaration – No Blacklisting .....	98
6.6	Consortium Agreement.....	99
6.7	Format for Power of Attorney for Lead bidder of Consortium .....	101
7)	Annexure II: Formats for Technical Bid .....	102
7.1	Format for Authorization Letters from OEMs for COTS product (if applicable) .....	102
7.2	Details of similar work undertaken in last 3 years.....	103
7.3	Summary of Projects (To be provided on the letter head of Bidder).....	104
7.4	Summary of Similar Projects with Government/ULB/PSU sector in multiple locations in India....	105
8)	Annexure III: Commercial Proposal Formats.....	106
8.1	Commercial Proposal Cover Letter .....	106
8.2	Commercial Bid Format and Instructions.....	109
9)	Annexure IV: Device Specifications .....	112

## 1) Glossary

Abbreviation	
TEC	Technical Evaluation Committee
BOM	Bill of Material
BoQ	Bill of Quantity
ISWM	Municipal Solid Waste Management
EMD	Earnest Money Deposit
IT	Information Technology
PMC	Pune Municipal Corporation
TEC	Technical Evaluation Committee
BEC	Bid Evaluation Committee
SLA	Service Level Agreement
POC	Proof of Concept
PMC	Pune Municipal Corporation
SI	System Integrator
SI/DSI	Sanitary Inspector / Divisional Sanitary Inspector
SWM	Solid Waste Management
GIS	Geographical Information System
GPS	Global Positioning System
VTS	Vehicle Tracking System
SFL	Scientific Landfill
GFC	Garbage Free City
SBM	Swachh Bharat Mission

## 2) Invitation for Proposal

### 2.1 RFP Notice

This RFP document is being published by the Commissioner, Pune Municipal Corporation, for the “*Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation*”.

Bidder agencies are advised to study this bid document carefully before submitting their bids in response to the bid Notice. Submission of a bid in response to this notice shall be deemed to have been done after careful study and examination of this document with full understanding of its terms, conditions and implications. This bid document is not transferable.

### 2.2 Critical Information

#	Information	Details
1.	Project Name	<i>Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation</i>
2.	RFP reference No and Date	<RFP Reference No & Date>
3.	Tender Fee	29,679.00
4.	Earnest Money Deposit	INR 10.00 Lakhs
5.	Bid Validity Period	120 days from the Date of Opening the Bid
6.	Last date for submission of written queries for clarifications	Email ID for sending pre-bid queries: <a href="mailto:swmadmin@puneccporporation.org">swmadmin@puneccporporation.org</a>
7.	Date & Time of pre-bid meeting	14/02/2022, 3:00 PM at PMC main Building
8.	Presentation / demo on technical solution by bidders	To be Informed Later
9.	Contact Person for queries	<b>Mr. Ajeet Deshmukh, Dy Commissioner SWM Department, Pune Municipal Corporation, Shivaji Nagar, Pune Email Id: <a href="mailto:swmadmin@puneccporporation.org">swmadmin@puneccporporation.org</a></b>
10.	Submission Type	<b>Open Tender, through Mahatender system</b>

Ajeet Deshmukh,  
Deputy Commissioner  
SWM Department,  
Pune Municipal Corporation

- **Introduction & Background**

### **2.3 About Pune**

Pune is the seventh-most populous city in India and the second largest in the state of Maharashtra. It was known as Punyanagari in earlier times. It is situated 560 meters (1,837 feet) above sea level on the Deccan plateau, on the right bank of the Mutha River. Pune city is the administrative headquarters of Pune district and was once the centre of power of the Maratha Empire. In the 18th century, Pune became the political centre of the Indian subcontinent, as the seat of Peshwas who the prime ministers of the Maratha Empire were. Pune is considered the cultural capital of Maharashtra. Since the 1950s and 1960s, Pune has had traditional old-economy industries which continue to grow today. Further, the city is also known for manufacturing and automobiles, as well as government and private sector research institutes for information technology (IT) education, management and training that attract migrants, students, and professionals from India, South East Asia, the Middle East, and Africa. Pune is also one of the fastest growing cities in the Asia-Pacific region.

### **2.4 About Pune Municipal Corporation**

The Pune Municipal Corporation (PMC) was established on 15 February 1950. The PMC controls the whole administration of Pune. The PMC is in charge of the civic needs and infrastructure of the city. Pune, the Oxford of the East is a historical city in India with a glorious past, an innovative present and a promising future. Since 1950, the Pune Municipal Corporation is administrating the city and serving citizens. Pune Municipal Corporation has taken an initiative for implementing e-Governance. Success of e-governance depends on use of Information Technology in mobilization of Government resources and utilization of these scarce resources with an aim of providing a better service.

### **2.5 About Pune Smart City Development Corporation**

The Pune Smart City proposal (PSCP) was selected for priority financing under Smart City Mission by the MoUD; thereafter, the PSCDCL and Government of Maharashtra (GOM) have incorporated a special purpose vehicle (SPV) company called the Pune Smart City Development Corporation Limited, under the Companies Act 2013, solely for the purpose of implementing their Smart City proposal consisting of several projects and initiatives. This SPV shall carry end to end responsibility for vendor selection, implementation and operationalization of various smart city projects.

### **2.6 Project Background**

Pune Municipal Corporation intends to leverage information technology to modernize Solid Waste Management (SWM) and enable the SWM department, PMC to manage the waste end-to-end across its jurisdiction of Pune City from door-to-door collection to processing plants or a Scientific landfill sites. The SWM Dept., PMC currently employs more than 10000 (including 3000 contract employees) people to take care of the Solid Waste Management for Pune city which is spread across more than 250 square

kilometres. This area is divided into 42 Prabhags each of which is further divided into several Kothis. Solid waste management dept collects, transports and processes ~2000 tons of Solid waste per day; the range of activities majorly include:

- i. Street Cleaning, Toilet cleaning and drainage cleaning
- ii. Primary collection of residential waste
- iii. Collection of hotel, garden and construction & demolition waste
- iv. Clearing chronic spots, markets, etc.
- v. Transferring waste to 7 transfer stations (ramps)
- vi. Secondary transportation of waste (using Bulk Refuse Carriers)
- vii. Final processing of waste at processing plants

The processes for administering all these tasks are manual which involve keeping records in registers. Monitoring such a workforce under multiple streams is a challenging herculean task. Moreover, because of these manual processes, most of the actions of SWM department are reactive as of today. Another challenge of SWM department is the management of collection and transportation vehicles. The vehicle fleet includes Ghantagadis, Bulk Refuse Carriers, Chhota Haathi, Hotel Trucks and Garden Trucks which collect waste from multiple points across the city. SWM department manages the fleet of more than 650 vehicles which travel through multiple touch points in a day. With the absence of IT solutions, the routes of most of these vehicles has to be kept static and any contingency plan in case of breakdown or other situations becomes cumbersome.

SWM department has also outsourced part of its operations to other organizations/operators/vendors. For a tight control over performance of these vendors, a robust IT system is essential. The IT system would help in defining the accountability and bringing rigor across the system. Another very important requirement would be providing role-based MIS systems. Stakeholders across SWM department would require different MIS dashboards as per their KPI's which would help them in decision making. The IT system should provide role-based access control (RBAC) and role-based visibility to all the stakeholders.

Other broad requirements from the integrated ISWM solution would include:

- i. Integration with existing technology systems like PMC Care, Swachhta app, ERP, Document Management System etc
- ii. Bilingual interface (English and Marathi)
- iii. Integration with e-mail and SMS
- iv. Mobile apps for field workers and their supervisors
- v. Workflow Management, approval flows and escalation flows
- vi. GIS based analytics
- vii. Integration with ramp/transfer station systems
- viii. Integration with Processing Plant automation
- ix. Vehicle optimization using VTS

## 2.7 Project Objective

The aim of the ISWM system is to implement IT systems to support the SWM department operations thus improving efficiency and decision making. Broad objectives are:

- i. To monitor waste from source to disposal;
- ii. To leverage novel technologies such as sensors, IOT devices, biometrics, smart wrist watch or similar GPS based location tracking devices for field staff, mobile apps, GIS, Analytics etc.;
- iii. To provide personalized MIS dashboards for office staff, ward office, operators and departmental heads for daily operations and performance monitoring;
- iv. To integrate with the command control centre with real-time data and analytics that support effective decision making;
- v. To integrate with already existing technology platforms which support SWM system
- vi. To communicate effectively with ground staff (safai workers) through basic communication modes like SMS
- vii. To provide role based mobile app for daily operations and workflow management;
- viii. Incident management and grievance handling; and
- ix. To build Manpower management systems, billing systems, asset management systems, contractor management system, payroll systems, vehicle optimization systems, Analytics etc.
- x. Supply, installation and maintenance of hardwares such as RFID tags and readers, GPS devices for VTS, smart wrist watch or similar GPS based location tracking devices for field staff etc. the bidder shall be responsible for the safety of the hardware as well.
- xi. Selected bidder has to setup centralised operations control room with appropriate hardware such as PC (one for each ward), Two Display TV screens, Mobiles for communication and any other device as required appropriate by the Selected SI. PMC will provide space to selected bidder for setting up of operations control room. PMC will also provide internet availability till the operations control room. The selected bidder will ensure the connectivity between the point of supply to each of the hardware within the Operations control room. Selected bidder has to ensure that there should be provision of integration with existing city-wide command and control center called ‘Smart City Operation Centre (SCOC). Integration of same would be the responsibility of the selected bidder, if required. To Manage operations control room of SWM, selected bidder has to deploy 30 resources team for managing a control room in multiple shifts as per SWM operations requirements. The operations control room will carry out data analysis, corrective actions required on site and coordination with various stakeholders for smooth operations using the Integrated ISWM system. In addition to this, selected bidder has to deploy 3 supervisors to lead the Operations control team and also to carry out the analytics related activities for VTS and ISWM data and to prepare actionable insights. This team will also be responsible for vehicle optimization and route planning. The SI will also provide minimum 20 system operators to

operate the Integrated ISWM system at ramps and other locations as decided by PMC. This team will ensure optimal use of the system.

## 2.8 Project Beneficiaries

The beneficiaries of the project include:

- i. **Citizens:** Citizens interact with SWM department using PMC care app as well Swachhata app. Citizens interact with Collection workers almost on daily basis when the collection workers collect waste from households/hotels/gardens.
- ii. **SWM department employees:** Pune City has been divided in 42 Prabhags which are further divided into Kothis. SWM department of PMC employees fall under multiple hierarchies and SWM department also hires people on contract who are not on payroll of PMC. A major part of this manpower works on field which makes manpower management a big challenge for the respective supervisors.
- iii. **Safai Workers:** Safai workers, who are involved in street sweeping toilet cleaning, Drainage system cleaning and other tasks report to Mokadams (~1 per Kothi). These Mokadams report to Sanitary Inspector (SI) who further report to Divisional Sanatory Inspector (DSI).
- iv. **Informal Wastepickers:** Informal wastepickers are responsible for waste collection from households of the city. They use PMC provided push carts to collect waste from households and give it to PMC owned ghantagadis at designated feeder points. These ghantagadis have pre-decided routes to cover all the required feeder points. These Ghantagadis after waste collection go to ramps for offloading the garbage into Bulk Refuse Carrier (BRC).
- v. For household waste, informal wastepickers go for door-to-door/gate-to-gate collection and collect the waste in PMC owned push carts. Informal Waste pickers reports to Prabhag coordinator who further reports to ward coordinator and zonal coordinator
- vi. **Transport Vendor and drivers:** PMC has contracted with transport vendors to take care of the Ghantagadis. Additionally, drivers of all types of vehicles will be major beneficiary of the ISWM system as they are the important elements of the Solid waste supply chain.
- vii. **Transport Department and Maintenance Department, PMC:** These two departments act as critical support functions of PMC. Transport department provides the required vehicles to SWM department, while maintenance department caters to all the on-field maintenance of the vehicles.
- viii. **Builders:** SWM depart collects constructions and demolition waste from building sites. PMC has employed a third-party vendor to collect this type of waste from builders and process at the C&D plant.
- ix. Other employees of SWM department include
  - a) operations manpower at ramps, processing plants, SLF etc.,
  - b) engineers taking decisions on routing of vehicles, creating contracts with third parties
  - c) administration personnel

- x. **Other third-party contractors:** Contracted for additional manpower, vehicles, technology, etc.
- xi. **SCOC employees:** Employees in Smart City operations Center look after the daily operations, escalations and issues at the central level.
- xii. **Processing plants:** SWM dept coordinates with waste processing plants of various capacities spread across Pune. SWM field staff coordinate daily routing of waste to these processing centres from Ramps.

## 2.9 Existing Systems

Following IT systems are already existing (or upcoming) and the vendor's solution should be capable of integrating with these:

### 2.9.1 Existing systems:

- ERP
- Swachhata App
- PMC care app
- GVP App
- Biometric Attendance System
- Document Management System
- Basic GIS

### 2.9.2 Upcoming systems:

- i. Update and integrate smart wrist watches or similar GPS tracking devices for field staff with office based biometric attendance system
- ii. SCADA or IOT sensor automation at processing plants
- iii. Other SAP modules implemented by PMC in the future
- iv. Any other IT systems that comes up during the technology support phase (both on-site and off-site) for this project

In addition to this, PSCDCL has established the city-wide command and control centre with state-of-the-art infrastructure and modular designed with seating capacity of 24 seats. The command and control centre is also known as ‘Smart City Operation Centre (SCOC), which host in-house data center (compute and storage infrastructure) with dedicated power supply, dedicated bandwidth and other facilities.

The centre is also equipped with 24 workstations connected over LAN, and also has the facility of with IP phones, IPABX system and video wall screen (with Video wall controller and Video wall management software) which displays the executive dashboards and runs operational information of all the connected systems.

Apart from above infrastructure, SCOC also deploys the Enterprise Management System (EMS) for efficient management of the whole system, reporting, SLA monitoring and resolution of issues. Various components of the EMS which are implemented as part of the solution are:

- a. Network Monitoring system
- b. Server Monitoring System
- c. Helpdesk system

## **2.10 Project Coverage**

Project will cover supply of a software solution to support the solid waste management operations of SWM Dept, PMC and integrate with all the existing and upcoming smart device, IT hardware and software solutions. The project will also cover supply, Installation and maintenance of hardware such as RFID tags and readers, GPS devices for VTS. The selected vendor will be responsible for customizing the solution with respect to PMC jurisdiction of Pune city, deploy the customized ISWM system and provide full support in integrating the upcoming IT system/hardware for running the end-to-end operation of ISWM system. The selected bidder will also be responsible to carry out user acceptance testing, train all the personnel of SWM department and provide on-site and off-site support to the SWM department as per the terms stated in subsequent sections.

## **2.11 Bid Document Notice**

This Bid Document is being published by the Commissioner, Pune Municipal Corporation, for the Project “*Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation*”.

Bidder agencies are advised to study this Bid Document carefully before submitting their proposals in response to the Bid Document Notice. Submission of a proposal in response to this notice shall be deemed to have been done after careful study and examination of this document with full understanding of its terms, conditions and implications.

This Bid Document is not transferable.

## **2.12 Bid Invitation**

Commissioner, Pune Municipal Corporation invites the bidders to submit their technical proposals and financial offers for the project Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation, in accordance with conditions and manner prescribed in this Bid Document.

### 3) Pre-Qualification Criteria

#	Criteria	Qualification Details	Documentary Evidence	Name for PDF to be uploaded
1.	Legal Entity	<p>The bidder should be a company registered under Indian Companies Act, 1956 or Indian Companies Act, 2013 or a Partnership Firm registered under Indian Partnership Act, 1932.</p>	<p>The certified copy of Certificate of Incorporation/ Registration Certificate.</p> <p>Power of attorney / board resolution to the authorized Signatory of the Bid</p>	PQ_1
2.	Board Resolution / Power of Attorney in favor of Authorized Signatory	<p>A Board Resolution or Power of Attorney, in the name of the person executing the bid, authorizing the signatory to sign on behalf of the Bidding entity.</p> <p>The person issuing the Power of Attorney shall possess Board Resolution in his favour for granting such rights.</p> <p>This is applicable to the sole Bidder or each of the members of the consortium, in case of consortium.</p>	<p>Power of attorney / board resolution to the authorized Signatory of the Bid</p>	PQ_2
3.	Consortium	<p>In the event of a consortium, one of the bidders shall be designated as a "Lead Bidder". <b>Consortium is allowed with up to 3 consortium members including the Lead Bidder.</b></p>	<p>In case of consortium, the bidders shall submit registered consortium agreement valid for complete project duration and power of attorney in favour of the lead bidder clearly mentioning their association and stake for the project and nominating the Lead bidder to participate in the bid. The same shall be signed by the authorized signatory of all the consortium members. The Authorized signatory shall possess Board Resolution in his/her favour for granting such rights and</p>	PQ_3

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

#	Criteria	Qualification Details	Documentary Evidence	Name for PDF to be uploaded
4.	Financials: Lead or Sole Bidder	The Sole bidder or Lead bidder of the consortium, in case of a consortium, should have an average annual turnover of minimum INR 60 crore over the last three financial years (2018-19, 2019-20, 2020-21). The lead member shall have obtained this revenue from project of similar nature that includes System Implementation, Software development, software consultancy, software implementation and support GIS/GPS related projects.	<p>copy of such Board Resolution shall be submitted.</p> <ul style="list-style-type: none"> <li>Certificate from the Statutory Auditor along with extracts from the audited balance sheet and profit &amp; loss statement for financial year FY17-18,FY18-19 and FY 19-20.</li> <li>If financial year is Jan-Dec, bidder shall submit Certificate from the Statutory Auditor along with extracts from the audited balance sheet and profit &amp; loss statement for financial years 17-18,18-19 and 19-20.</li> </ul>	PQ_4
5.	Financials: Consortium Member	In case of consortium, each member of consortium should have an average annual turnover of minimum INR 1 crore over the last three financial years.	<ul style="list-style-type: none"> <li>Certificate from the Statutory Auditor along with extracts from the audited balance sheet and profit &amp; loss statement for financial year financial years 17-18,18-19 and 19-20.</li> <li>If financial year is Jan-Dec, bidder shall submit Certificate from the Statutory Auditor along with extracts from the audited balance sheet and profit &amp; loss statement for financial year financial years 17-18,18-19 and 19-20.</li> </ul>	PQ_5
6.	Net Worth	The Sole bidder or each of the members of the consortium, in case of consortium, should have <b>positive net worth</b> as per the audited consolidated financial statements in each of the last three financial years	<ul style="list-style-type: none"> <li>Certificate from the Statutory Auditor along with extracts from the audited balance sheet and profit &amp; loss statement for financial year financial years 17-18,18-19 and 19-20.</li> </ul>	PQ_6

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

#	Criteria	Qualification Details	Documentary Evidence	Name for PDF to be uploaded
7.	Certification	<p>Following certifications are required to clear Pre-qualification criteria</p> <p>1. CMMI Level 3 or higher OR 2. ISO 9000/9001 OR 3. ISO 27001</p>	<p>Copy of Valid Certificate(s) issued by competent authority. The certification shall be valid on bid submission date</p>	PQ_7
8.	Technical Capability	<p>The Sole Bidder or Any member in case of consortium should have successfully completed or ongoing projects for Supply of hardware and development, deployment, integration and technical support for implementation of a GPS/ GIS based monitoring system. in past 5 years for any Government organization in India of following details:</p> <p>1 project of value more than Rs. 10.00 Crore <b>OR</b> 2 projects of value more than Rs. 6.00 Crore <b>OR</b> 3 projects of value more than Rs. 5.00 Crore</p> <p>In case of ongoing projects, at least 25% of the project fees shall have been paid by the client to the bidder. The bidder shall submit a satisfactory work execution certificate from the client for the completed work as well as payment made to the bidder.</p>	<p>For completed project; all the following (a and b):</p> <p>a) Work order OR Signed Contract b) Completion Certificates from the client OR Go-Live certificate from the client</p> <p>For Substantially completed project (c and d):</p> <p>c) Work order OR Signed Contract d) Phase Completion Certificates from the client OR Phase wise Go-Live certificate from client OR UAT certificates</p>	PQ_8
9.	Self-Declaration on Non-Blacklisting	<p>The Sole Bidder or each of the members of the consortium, in case of consortium, should not have been blacklisted / debarred by any Govt. entity or any PSU in India</p>	<p>As per format given in the bid document</p>	PQ_9

**Notes:**

\* Maximum 3 consortium members are allowed.

- i. A maximum of three entities may form a consortium (with a registered consortium agreement) for the purpose of submitting a bid among which one member shall be designated as the "Lead member" and the others shall be the "consortium members"
- ii. Each Consortium members including Lead Bidder can't be part of any other consortium.
- iii. Any bid failing to meet all of the above eligibility criteria shall be disqualified and will not be considered for technical evaluation.
- iv. Change in eligibility criteria during bidding stage: It is bidder's responsibility to bring any change to PMC's notice if there is a change in the status of the bidder during bidding stage, with reference to any of the above-mentioned criteria for eligibility.
- v. Note for Criteria 8 (Technical Capability)

If bidders have executed /are executing projects in consortium with some other organization(s). In such case(s), they must clarify their scope of work as a part of the consortium along with percentage of total fees for the said project. The clarification must be backed by adequate proofs in the form of

- a. An Agreement between relevant parties
- b. MoU between relevant parties
- c. Client certification
- d. Certificate from Statutory Auditor
- e. Joint declaration by relevant parties
- f. Any other verifiable document(s)

In case, such documentation is not available, the Authority may ignore the project at their discretion during evaluation of this bid.

*Ajeet Deshmukh*  
Ajeet Deshmukh

*PD* Deputy Commissioner  
SWM Department

Pune Municipal Corporation

*SP*

#### 4) Instructions to Bidder

##### 4.1 Purpose of Bid Document

The purpose of this bid is to " Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation". This document provides information to enable the bidders to understand the broad requirements to submit their 'Bids'.

##### 4.2 Cost of Bid document

The Cost of Tender document shall be available on Mahatender website.

##### 4.3 Duration of the Contract Period

Duration of the project is of 26 weeks implementation from date of work order and 3 years on site and off site support and maintenance for hardware post Go Live. Period for Support and Maintenance is extendable to further 2 years depending on the performance of the bidder with the approval of Hon. Municipal Commissioner Sir.

##### 4.4 Bidder Registration and Instructions

- Bidders shall get themselves registered on Mahatender portal by paying necessary fees to Mahatender by following due Procedure.
- Bidders are advised to study all instructions, forms, terms, requirements and other information in the Bid Documents carefully. Submission of bid shall be deemed to have been done after careful study and examination of the Bid Document with full understanding of its implications. The response to this Bid Document should be full and complete in all respects. Failure to furnish all information required by the Bid Documents or submission of a proposal not substantially responsive to the Bid Documents in every respect will be at the bidder's risk and may result in rejection of its Proposal.

##### 4.5 Proposal Preparation Cost

- The bidder is responsible for all costs incurred in connection with participation in this process, including, but not limited to, costs incurred in conduct of informative and other diligence activities, participation in meetings/discussions/presentations, preparation of proposal, in providing any additional information required by PMC to facilitate the evaluation process, and in negotiating a definitive contract or all such activities related to the bid process. The department will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- This Bid Document does not commit the Corporation to award a contract or to engage in negotiations. Further, no reimbursable cost may be incurred in anticipation of award. All materials submitted by the Bidder shall become the property of PMC and may be returned at its sole discretion.

##### 4.6 Pre-Bid Meeting

- PMC will host a Pre-Bid Meeting for queries (if any) by the prospective bidders. The date, time and place of the meeting are given in Section 2.2. The representatives of the bidders may attend the pre-

bid meeting at their own cost. The purpose of the pre-bid meeting is to provide a forum to the bidders to clarify their doubts / seek clarification or additional information, necessary for them to submit their bid.

- All enquiries from the bidders relating to this Bid Document must be submitted to the designated contact person as mentioned in section 2.2 via email one day prior to Pre-bid meeting date. The queries should necessarily be submitted in the following format in spread sheet software:

Sr. No.	Bid Document Reference (Page No.)	Bid Document Reference (Section Number)	Bid Document Reference (Section Name)	Content of the Bid Document requiring clarification (Original Clause)	Clarification Sought / Query
1					
2					
3					
...					

- Authorization letter in the name of the person attending pre-bid meeting needs to be submitted on the letterhead of the Bidder during the pre-bid meeting in the format specified.
- Queries submitted post the above mentioned deadline or which do not adhere to the above mentioned format may not be responded to. All the responses to the queries (clarifications /corrigendum) shall be made available on the Mahatender Portal (<https://mahatenders.gov.in>). The date, time of receiving pre-bid queries is given in Section 2.2.

#### 4.7 Amendment of Bid Document

- At any time prior to the deadline for submission of bids, the Department, may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bid Document by an amendment. All the amendments made in the document would be informed to all the participating agencies through mail.
- The bidders are advised to visit the website on regular basis for checking necessary updates. The department also reserves the rights to amend the dates mentioned in this Bid Document for bid process. It will be assumed that the amendments have been taken into account by the Bidder in its bid.
- In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the Department may, at its discretion, extend the last date for the receipt of Bids.

#### 4.8 Rights to terminate the Process

- PMC may terminate the Bid Document process at any time and without assigning any reason. PMC makes no commitments, express or implied, that this process will result in a business transaction with anyone.

- This Bid Document does not constitute an offer by PMC. The bidder's participation in this process may result in PMC selecting the bidder to engage in further discussions and negotiations toward execution of a contract. The commencement of such negotiations does not, however, signify a commitment by PMC to execute a contract or to continue negotiations. PMC may terminate negotiations at any time without assigning any reason.

#### **4.9 Site Visit**

- The bidders may visit the site and obtain additional information at their own cost and responsibility. However, a prior appointment needs to be fixed by the bidder for the same.

#### **4.10 Language of Bids**

- The Bids prepared by the Bidder and all correspondence and documents relating to the bids exchanged by the Bidder and PMC, shall be written in English language, provided that any printed literature furnished by the Bidder in another language shall be accompanied by an English translation in which case, for purposes of interpretation of the bid, the English translation shall govern.
- If any supporting documents submitted are in any language other than English, translation of the same in English language is to be duly attested by the bidder.

#### **4.11 Bid Submission Format**

- The entire proposal shall be strictly as per the format specified in this Bid Document. Bids with deviation from this format shall be rejected. Details of the format can be found in Annexure I, II and III of this document.

#### **4.12 Earnest Money Deposit (EMD) and Refund**

- Bidders shall submit, along with their Bids, EMD of amount as specified in Section 2.2 of the document, online through Mahatender portal.
- In case bid is submitted without EMD as mentioned above then the Department reserves the right to reject the bid without providing opportunity for any further correspondence to the bidder concerned.
- Unsuccessful Bidder's EMD will be discharged/ returned as promptly as possible after Signing of the Contract with the Selected Service provider.
- The EMD may be forfeited:
  - If a Bidder withdraws their bid or increases their quoted prices during the period of bid validity or its extended period, if any; or
  - In the case of a successful bidder, if the Bidder fails to sign the Contract or to furnish security deposit within specified time
  - During the bid process, if a Bidder indulges in any such deliberate act as would jeopardize or unnecessarily delay the process of bid evaluation and finalization.
  - During the bid process, if any information found wrong / manipulated / hidden in the bid.

The decision of PMC regarding forfeiture of the EMD and rejection of bid shall be final & shall not be called upon question under any circumstances.

#### 4.13 Submissions of Bids

- Complete bidding process will be online (Mahatender) in 2 folder system.
  - **Folder I should include Pre-qualification related documents and Technical Proposal Documents.**
  - **Folder II should include Commercial Proposal Documents.**
- All the notifications & detailed terms and conditions regarding this tender notice hereafter will be published on line on mahatender website.
- Bidding documents can be seen, downloaded and submitted in electronic format on the website. The deadline for submission of bid is specified in section 2.2 of this document.
- Bids must be accompanied with scanned copies of online payment of the EMD to Pune Municipal Corporation.
- Bid shall be treated as invalid if scanned copies are not submitted online along with the bid.
- The bidders are required to submit screenshot of EMD receipt of payment towards as along with the hardcopy of documents as per timelines specified in Section 2.2 of this document.
- Technical bids will be opened online on the website. The details pertaining to time, date and place can be found in section 2.2 of this document.
- Bidder should submit information & scanned copies in readable PDF format in Pre-Qualification Envelope as mentioned in the Bid Document.
- Bidder should submit original documents (if asked for) along with scanned copies for verification during Technical bids opening.
- Time and date of opening of financial bids will be informed by email to technically qualified bidder.
- An authorized representative of the bidder should have valid class II / III Digital Signature Certificate (DSC) obtained from any Certifying Authority. The authorized representative of the Bidders shall digitally sign the original Technical Proposal and Commercial Bid. Further, all the pages need to bear the official seal and signature of the authorized representative. The authorization shall be in the form of a written power of attorney accompanying the Proposal or in any other form demonstrating that the representative has been duly authorized to sign.
- PMC reserves the right to accept or reject any or all the tenders without assigning any reason. Moreover, if no intimation is provided by PMC then the documents submitted cannot be deemed as accepted.

#### 4.14 Modification or Withdrawal of Bids

- The Bidder may modify or withdraw its bid after submission, prior to the deadline-date and time prescribed for bid submission. In case, the bidder uploads multiple options of specifications for the

products, option with higher / better specifications shall be treated as final offer by the bidder for the rate quoted by the bidder in the commercial bid.

- The Bidder's modifications shall be prepared, digitally signed, marked, and then uploaded as per the process specified above.
- A Bidder wishing to withdraw its bid shall notify PMC by e-mail prior to the deadlines prescribed for bid submission. A withdrawal notice may also be sent by electronic means such as e-mail, but it must be followed by a signed confirmation copy, postmarked no later than the deadline for submission of bids.
- The notice of withdrawal shall be addressed to PMC at the address named in the Bid Data Sheet, and
- Bear the Contract name, the <Title> and < Tender No.>, and the words "Bid Withdrawal Notice." Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid. No bid may be withdrawn in the interval between the bid submission deadline and the expiration of the bid validity period specified in the BDS. Withdrawal of a bid during this interval may result in the forfeiture of the Bidder's bid security.

#### **4.15 Evaluation Process**

1. The Bidder must possess the technical know-how and the financial wherewithal that would be required to successfully provide the services sought by PMC, for the entire period of the contract. The Bidder's Bid must be complete in all respect, conform to all the requirements, terms and conditions and specifications as stipulated in the RFP document.
2. The evaluation process of the RFP proposed to be adopted by PMC is indicated under this clause. The purpose of this clause is only to provide the Bidder an idea of the evaluation process that PMC may adopt. However, PMC reserves the right to modify the evaluation process at any time during the Tender process, without assigning any reason, whatsoever, and without any requirement of intimating the Bidder of any such change.
3. PMC shall appoint a Bidder Evaluation Committee (BEC) to scrutinize and evaluate the technical bids received. The BEC will examine the Bids to determine whether they are complete, response and whether the Bid format confirms to the RFP requirements. PMC may waive any informality or nonconformity in a Bid which does not constitute a material deviation according to PMC.

#### **4.16 Evaluation of Technical Bids**

1. The Technical Bids of only those Bidders, who qualify in the Pre-Qualification stage, shall be considered and will be evaluated as per the evaluation criteria in this clause. The Bid Evaluation Committee may invite each Bidder to make a presentation as part of the technical evaluation.
2. The BEC may require verbal/written clarifications from the Bidders to clarify ambiguities and uncertainties arising out of the evaluation of the Bid documents. In order to qualify technically, a Bid must secure a minimum of 70% of technical marks after summing up and minimum 15 marks in

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

technical presentation to become technically qualified bidder. Even though bidder scores min. 70 marks in total and fails to score min. 15 marks in technical presentation, bidder will not be considered as technically qualified. Only those Bids which have a minimum score of 70% of technical marks in total and min 15 marks in technical presentation will be declared as Technically Qualified and shall be considered for commercial opening

3. Technical Evaluation of the bids would be carried out broad parameters as given below:

#	Technical Evaluation Parameter	Max. Marks	Supporting Document Type	Name to be given to the PDF file
1	<b>Bidder's Average annual turnover</b> during each of the last 3 audited financial years (2018-19, 2019-20, 2020-21): The turnover of The Sole bidder or Lead bidder of the consortium will only be considered for this parameter. The Sole bidder or the lead bidder in case of a consortium shall have obtained this revenue from IT project activities such Software development, software consultancy, software implementation and support etc. Revenue from BPO-call center will not be accepted.	<b>15</b> Average annual turnover >= INR 60 Cr & <70 Cr - 5 marks Average annual turnover >= INR 70 Cr & <80 Cr - 10 marks Average annual turnover >= INR 80 Cr - <b>15 marks</b>	Certificate from the statutory auditor specifying the bidder's turnover & audited financial statements for last 3 financial years	TQ_1
2	<b>Similar Work Experience:</b> The bidder (any member in case of consortium) must have successfully completed or ongoing similar projects in India/globally in last 3 financial years: Note: Definition of similar nature projects is as follows: Project which involves Supply of hardware and development, deployment, integration and technical support for a GPS/GIS based monitoring system. The minimum value of the	<b>30</b> Completed qualifying project >=1 & <=3 - 15 marks Completed qualifying project >2 & <=5 - 20 marks Completed qualifying project >5 - <b>30 marks</b>	For completed project; all the following (a and b): a) Work order OR Signed Contract b) Completion Certificates from the client OR Go-Live certificate from the client  For Substantially completed project (c and d): a) Work order OR Signed Contract b) Phase Completion Certificates from the client OR Phase wise	TQ_2

#	Technical Evaluation Parameter	Max. Marks	Supporting Document Type	Name to be given to the PDF file
	<p>project shall not be less than 6 Crore</p> <p>The projects should have been either completed or an ongoing project where deliverable or milestone has been successfully met with min 25% of O&amp;M period is successfully completed.</p>		Go-Live certificate from client OR UAT certificates	
3	<p><b>Analytics related capabilities</b></p> <p>The bidder (any member in case of consortium) must have successfully completed analytics related projects in India/globally in last 3 years:</p> <p>Note: Definition of Analytics related nature projects is as follows: Project which involves actionable insights derived from GIS based analytics/ Vehicle Data Analytics/ Smart City related analytics solutions.</p>	<p><b>15</b> Completed qualifying project <math>\geq 1 \text{ &amp; } \leq 3</math> – 5 marks</p> <p>Completed qualifying project <math>&gt; 3 \text{ &amp; } \leq 5</math> – 10 marks</p> <p>Completed qualifying project <math>&gt; 5</math> – <b>15 marks</b></p>	<p>For completed project; all the following (a and b):</p> <ul style="list-style-type: none"> <li>a) Work order OR Signed Contract</li> <li>b) Completion Certificates from the client OR Go-Live certificate from the client</li> </ul> <p>For Substantially completed project (c and d):</p> <ul style="list-style-type: none"> <li>a) Work order OR Signed Contract</li> <li>b) Phase Completion Certificates from the client OR Phase wise Go-Live certificate from client OR UAT certificates</li> </ul>	TQ_3
4	<p><b>Certifications:</b> The bidder (or any member of consortium) must have following certifications:</p> <ol style="list-style-type: none"> <li>1) CMMI level 3 (or above)</li> <li>2) ISO 9000/9001</li> <li>3) ISO 27001</li> </ol>	<p><b>10</b></p> <p>1) CMMI level 3 (or above)- <b>4 marks</b></p> <p>2) ISO 9000/9001- <b>3 marks</b></p> <p>3) ISO 27001- <b>3 marks</b></p>	Copy of valid certificates	TQ_4
5	<p><b>Approach &amp; Methodology (A&amp;M) and Presentation:</b> The bidder shall be awarded marks based on the following:</p> <ol style="list-style-type: none"> <li>1) Detailed plan for requirement gathering</li> <li>2) Approach and methodology for implementation and post-</li> </ol>	<b>30</b>	Approach and Methodology Note submitted by the bidder; And Presentation by the bidder	TQ_5

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

#	Technical Evaluation Parameter	Max. Marks	Supporting Document Type	Name to be given to the PDF file
	<p>implementation phases</p> <p>3) Workplan &amp; development schedule and technical presentation.</p> <p>Bidders to present the proposed solution covering following aspects:</p> <ul style="list-style-type: none"> <li>a. Understanding of the objectives of the assignment: The extent to which the Systems Integrator's approach and work plan respond to the objectives indicated in the Statement/Scope of Work</li> <li>b. Completeness and responsiveness: The extent to which the proposal responds exhaustively to all the requirements of all the Terms of Reference</li> <li>c. Demonstration of tools &amp; assets which could be leveraged from the assignment e.g. test case builders, load testing, performance testing, unit testing, integration testing</li> <li>d. Relevant case studies</li> <li>e. Training plan and analytics proposed.</li> </ul> <p>Assessment will be carried on basis of presentation, and answers to the questions asked by panel during evaluation</p>			

#	Technical Evaluation Parameter	Max. Marks	Supporting Document Type	Name to be given to the PDF file
	period			

The bidders who are technically qualified will be required to implement Proof of Concept (PoC) for waste collection, attendance system and vehicle tracking in order to prove the feasibility of proposed system/hardware. Bidder has to incur all the cost of PoC and there will be no reimbursement of the same. Total duration for implementing the PoC and analysing the results would be 30 days.

Bid Evaluation Committee (BEC) or any other party appointed by PMC shall evaluate the PoC and will declare whether PoC is successful or not. It is mandatory for all the technically qualified bidders to pass PoC in order to qualify for commercial bid opening.

PoC shall be evaluated on the following minimum parameters:-

1. Average Battery life of all devices in one day in all types of operational conditions.
2. Robustness and sturdiness of devices.
3. User friendly interface/user acceptability.

PMC may add some more parameters, if required.

#### 4.17 Opening of Commercial Bid

- PMC will open the Commercial Bids of only Technically Qualified Bidders, and results shall be displayed on Mahatender Portal.
- The Commercial Bids will be evaluated by PMC for completeness and accuracy. Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail.
- The amount stated in the proposal form, adjusted in accordance with the above mentioned procedure, shall be considered as binding, unless it causes the overall proposal price to rise, in which case the proposal price shall govern.
- If the bidder does not accept the correction of errors, its bid will be rejected and the bid security may be forfeited.

#### 4.18 Award Criteria

##### A) Criteria for Selection

- The bid will be awarded on L1 basis, which means the bidder with least total cost. No additional cost in any form will be entertained by PSCDCL in the contract period.
- L1 shall be the bidder, who is technically qualified and has quoted the lowest total cost.

- In case there is a tie for L1 due to same lowest total cost quoted by two or more bidders, the bidder which has secured higher marks in the Technical Evaluation shall be considered as L1.

#### **4.19 B) PMCs' Rights to Accept/Reject any or all Proposals**

- PMC reserves the right to accept or reject any proposal, and to annul the bidding process and reject all Bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected bidder or bidders of the grounds for PMCs' action

#### **4.20 Security Deposit**

- The Security Deposit will be 5% of the Project Cost.
- The EMD submitted during bidding will be converted into security deposit and remaining amount of Security deposit will be deducted from first three running bills.
- The security deposit may be discharged/ returned by PMC upon being satisfied that there has been due performance of the obligations of the Bidder under the contract. However, no interest shall be payable on the security deposit.
- In the event of the Bidder being unable to service the contract for whatever reason, PMC would evoke the SD. Notwithstanding and without prejudice to any rights whatsoever of PMC under the Contract in the matter, the proceeds of the SD shall be payable to PMC as compensation for any loss resulting from the Bidder's failure to complete its obligations under the Contract. PMC shall notify the Bidder in writing of the exercise of its right to receive such compensation within 14 days, indicating the contractual obligation(s) for which the Bidder is in default.
- PMC shall also be entitled to make recoveries from the Bidder's bills, security deposit, or from any other amount due to the Bidder, the equivalent value of any payment made to the Bidder due to inadvertence, error, collusion, misconstruction or misstatement.

#### **4.21 Performance Bank Guarantee**

- For due and punctual performance of its obligations related to the project, the successful bidder has to submit a performance bank guarantee issued by a nationalized bank of Rs. 25 lakhs for the tender tenure within 15 days of issuance of work order, which will be released after successful completion of the tender period.

#### **4.22 Mobilization Advance**

- For setting up Command Control Centre and Procurement of Hardware as required in the RfP, mobilization advance payment of 10% will be made by the department on production of Pro-forma Invoice. However successful bidder has to give bank guarantee of exactly same amount of the advance payment made. This Bank Guarantee will be released after successful completion of Go Live stage.

#### **4.23 Failure to agree with the Terms and Conditions of the Bid/Contract**

Failure of the Service provider to agree with the Terms and Conditions of the bid/Contract shall constitute sufficient grounds for the annulment of the selection.

#### 4.22 Terms and Conditions of the Bid

Bidder is required to refer to the draft Contract Agreement, attached as Annexure IV in this bid. Please note that one needs to read the Contract Agreement as a whole document; and the Annexure mentioned there-in may not correspond to the bid Annexure.

After issuance of the work Order to the Selected Agency, a Non-Disclosure Agreement has to be carried out with PMC and selected Agency.

#### 4.23 Consortium

- a. Three entities may form a Consortium for the purpose of submitting a Bid ("Consortium") among which one member shall be designated as the "Lead Member" and the other shall be the "Consortium Member".
- b. No member of the Consortium may be part of any other consortium or submit a Bid individually.
- c. In the event the Bidder is a Consortium the following additional requirements shall be met:
- d. The Lead Member shall, for the Bidding Process, in all manners, through a power of attorney by the Consortium Member in favour of the Lead Member, represent both members of the Consortium, including signing the Bid on its behalf; The Bidder shall submit with its Bid, the duly executed power of attorney as per the proforma provided in APPENDIX S.
- e. The Consortium members shall enter into a joint bidding cum consortium agreement (Registered Agreement) which inter alia sets out the roles and responsibilities of each of the Consortium's members, with regard to the Project; The Bidder shall submit the duly executed joint bidding cum consortium agreement along with its Bid as per the proforma provided in APPENDIX X.

  
Ajeet Deshmukh

 Deputy Commissioner  
SWM Department

 Pune Municipal Corporation  


## 5) Scope of Work

### 5.1 Overview

The minimum specified scope of work to be undertaken by the bidder for setting up and operating ISWM Project is mentioned below. The Selected Bidder shall develop, deploy, integrate and support the required deliverables as per the scope and schedule of the contract along with the installation of hardware as detailed out in the further sections.

As a part of the technical proposal bidder is expected to submit the proposed systems complete technology stack & architecture.

After signing of the Agreement, the Systems Integrator needs to deploy the team proposed within 15 days of receiving the work order for the Project

and ensure that a Project Inception Report is submitted to PMC which should cover following aspects:

1. Names of the Project Team members, their roles & responsibilities
2. Approach & methodology to be adopted to implement the Project (which should be in line with what has been proposed during bidding stage but may have value additions / learning in the interest of the project).
3. Responsibility matrix for all stakeholders
4. Risks the bidder anticipates and the plans they have towards their mitigation.
5. Detailed Project Plan, specifying dependencies between various project activities/sub-activities and their timelines.

### 5.2 Implementation of ISWM Solution

#### 5.2.1 Requirement Gathering

1. Requirements gathering and business process mapping of existing processes and requirements of the SWM dept, Ward office of PMC
2. Requirement gathering from support functions like contracted operators, service providers, vendors, vehicle maintenance department, SCOC team, etc.
3. Requirement gathering from other functions to understand the requirements for handshake/closure.  
Ex: (i) Finance system: What bill summary is to be generated by ISWM system for contractors, (ii) VTS: Generating a failure report for non-compliance/no response for calls made by ISWM system (iii) Interchange of query & data with PMC's SAP system
4. Preparation of comprehensive system study documents by assessing all non-functional and functional requirements of the system. SI in consultation with PMC (or its representative) shall prepare High Level Design (HLD) document for the proposed system covering functionalities and integration mechanism
5. Finalize the system requirement specifications (SRS) in consultation with PMC (or its representative) based on Functional Requirement Specifications (FRS), Technical solution (Technical Requirements and Technical specifications provided therein), and also based on individual assessment

6. SI shall need to get a formal sign-off from PMC before proceeding with the implementation of the application

### **5.2.2 System Design**

1. Having conducted a comprehensive analysis of the requirements for the ISWM solution, SI shall design the system architecture and specifications for meeting the System Requirement Specifications, finalized by the SI and approved by PMC.
2. The architecture document should give the complete architecture of the proposed ISWM solution. The documents including, but not limited to the following:
  - a. Application Architecture
  - b. User Interface (both app and web)
  - c. Security Architecture
  - d. Data dictionary and definitions
  - e. Database structures
  - f. Operational Architecture
  - g. Access control mechanisms, data security and audit trails to ensure that databases are not tampered with or modified by unauthorized users.
  - h. Format off all reports which would be generated.
3. SI shall ensure that the data models, interface designs and other components are designed as per industry standards and best practices.
4. SI shall ensure that the architecture is scalable and capable of delivering high performance for the entire duration.
5. SI shall build the provision for a complete audit trail of all transactions (for e.g. add, update and delete) using transaction log reports, so that errors in data, intentional or otherwise, can be traced and reversed. Access Controls must be provided to ensure that the databases are not tampered with or modified by the system operators. Based on the requirements analysis conducted above, the SI must develop a comprehensive solution for the ISWM solution.
6. The SI shall be entirely responsible for the architecture of the system implemented to satisfy all features, functions, performance and security as described in this document including sizing of the required hardware.
7. The ISWM portal should be supported by all latest version of common browsers like Internet explorer, Mozilla, Chrome, Firefox, Safari etc. and supported by different devices – desktops, laptops, tabs, & mobile devices.
8. The SI shall consider users' input when they are finalizing all design components including user interfaces, mode of data entry, storage and retrieval, outputs reports, queries and the application design as a whole.

9. SI will provide samples of the concept designs of homepage and at least three templates of inner pages to the PMC for evaluation purpose.
10. The feasibility report of the SI shall also include the detailed Technical Architecture which should take into consideration following guiding principles:
  - a. Scalability - Important technical components of the architecture must support scalability to provide continuous growth to meet the growing demand of the SWM department. The system should also support vertical and horizontal scalability so that depending on changing requirements from time to time, the system may be scaled upwards. There must not be any system-imposed restrictions on the upward scalability on number of users, assets, etc.
  - b. Availability - Components of the architecture must provide redundancy and ensure that there are no single point of failures in the key project components. To take care of remote failure, the systems need to be configured to recover with minimum outage. The bidder shall make the provision for high availability for all the services of the system.
  - c. Interoperability - The system should have capability to take inputs from other third party systems as per situational requirements.
  - d. Security - The architecture must adopt an end-to-end security model that protects data and the infrastructure from malicious attacks. Using Firewalls and Intrusion detection systems such attacks should be controlled and well supported (and implemented) with the security policy. The virus and worm's attacks should be well defended with Gateway level Anti-virus system, along with workstation level Anti-virus mechanism. There should also be an endeavour to make use of the SSL/VPN technologies to have secured communication between Applications and its end users. The objective is to utilise SSL/VPN technologies for secured communication between applications and its end users. SI may choose to achieve this functionality through appropriate technical solution.
11. Furthermore, all the system logs should be properly stored & archived for future analysis and forensics whenever desired. PMC may carry out the Security Audit of the entire system post "Acceptance testing phase" through a CERT IN empanelled Third Party Auditor (TPA), a separate organisation appointed by PMC or its/PMCs existing consultant.
12. The following guidelines need to be observed for security:
  - a. Build a complete audit trail of all activities and operations using log reports, so that errors in system – intentional or otherwise – can be traced and corrected.
  - b. The most appropriate level of security commensurate with the value to that function for which it is deployed must be chosen
  - c. Access Controls must be provided to ensure that the system is not tampered or modified by the system operators.
  - d. Implement data security to allow for changes in technology and business needs.

13. Manageability - Ease of configuration, ongoing health monitoring, and failure detection are vital to the goals of scalability, availability, and security and must be able to match the growth of the environment.
14. Open Standards - System should use open standards and protocols to the extent possible without compromising on the security
15. Inspection – Client reserves the right to appoint any third-party agency during implementation and technical support phases of the project for evaluation, testing and final acceptance

#### **5.2.3 Deployment and integration with third party applications and other sub-system(s)**

1. Deploy ISWM solution as per the function requirement stated in the RFP.
2. Deploy mobile application for Safai workers, waste collection staff, drivers and supervisors (with Role Based Access Control), task allocation & fulfilment, billing system, contract management system, etc.
3. Integrate ISWM solution and Mobile application with internal & external systems like enterprise GIS, Weighbridge systems, VTS, Grievance systems, Swachhata App, Finance ERP, Payroll systems and any other IT systems which come up during the requirement gathering to manage end-to-end workflow.
4. Vendor shall provide data in common machine-readable format for upload to 3rd party systems and accept data for upload from 3rd party systems namely GPS units, Smart devices, IoT sensors, biometric readers, smart car, etc.
5. Provide data to integrate data streams with Smart City Operations Centre (SCOC) and customize dashboards for ISWM SLA violations, Incidents and failures, notifications and alerts etc.
6. System should be able to use any of the following communication channels – SMS/Emails for alert notification
7. Deploy all the use cases listed in section of functional requirements on both mobile app and web.
8. The solution should be available as both web and mobile app (available both for android and iOS) to be developed by SI.

#### **5.2.4 Security Requirements**

1. The bidder must provide an end-to-end security model that protects data and the infrastructure from malicious attacks, theft, natural disasters etc. For server security, the SI shall on an ongoing basis perform Vulnerability Assessment of the server, perform server hardening and provide additional layer of security to applications through Firewalls.
2. The SI will have to establish all the necessary procedures / infrastructure/ technology to ensure that the ISWM solution is not compromised.
3. Security features should be compliant with the e-Governance Security Guidelines (e Gov. Security Standards Framework). Broad Security requirements are:
  - i. All systems should have integrated security features that are configurable by the system administrator to control access to the application, functional modules, transactions, and data.

- ii. The ISWM application(s) should require the use of unique user IDs and passwords for authentication purposes.
- iii. The application should allow for the following:
  - a. The enforcement of password standards
  - b. The establishment of a specified period for password expiration, and
  - c. The prohibition of recent password reuse
- iv. System administrator should be able to define functional access rights and data access rights by assigned user ID, functional role, and owner organization.
- v. The systems should permit the system administrator to assign multiple levels of rights to a single user.
- vi. System administrator should be able to restrict access to sensitive data elements by named user, groups of users, or functional role.
- vii. System should be auditable as per requirements from time to time.
- viii. System should have audit logging capability to record access activity, including the following:
  - a. All log-in/log-out attempts by user and workstation;
  - b. User-submitted transactions;
  - c. Initiated processes;
  - d. System override events; and direct additions, changes, or deletions to application maintained data
- ix. System should provide the ability to query the audit log by type of access, date and time stamp range, user ID, or terminal ID.
- x. All the information assets (information and information systems) should be classified and security should be defined according to criticality of the information asset. All the data / information contained within systems or in hard copies related to this project, are owned by PMC. No information should be made public either directly or indirectly nor allowed to be accessed by an unauthorized person.
- xi. System audit should be enabled for all the information assets to establish detective controls. System should have evidences, like audit trails, logs, registers, proof of background checks, approvals from PMC or its designated agency, support for various decisions, support for accounts etc. for the purpose of third party security audit.
- xii. Should have system development and change control procedures including effective segregation of duties and environment.
- xiii. Proper protection against malicious software should be ensured. This would include implementation of an effective anti-virus solution, scanning viruses at regular intervals or on certain triggers and updating the solution as and when new patch is received from the antivirus solution provider.

- xiv. Should have proper logical access security for all the information assets. Entire network including servers, communication links, database etc., should be logically segregated from rest of the networks.
- xv. Should ensure suitable technical and procedural controls to protect the network.
- xvi. Wherever the ISWM system comes in contact with an untrusted system, additional security measures should be taken like firewall, IDS, DMZ, proxy server, encryption etc.
- xvii. Should have a business continuity plan and a disaster recovery plan that should be implemented before commencement of the operations. Robust backup procedures should be established for the same.
- xviii. Security clearance certificate should be obtained by SI before hosting Mobile App. Security clearance certificate should be provided from certified auditor to address this requirement.

#### **5.2.5 TRAINING AND CAPACITY BUILDING**

- i. Training of SWM staff is a humongous task. SWM department employs more than ~7000 onroll employees, ~3200 on-contract employees and ~3000 informal wastepickers. In addition, people who closely interact with SWM department include vehicle drivers, staff from processing plants and other vendors. Moreover, staff in different ranks and levels of hierarchy will need to be trained on different aspects of ISWM system.
- ii. The successful bidder would need to conduct extensive training programs for these employees using multiple training tools which includes but not limited to class room training, video-based training, etc. The successful bidder should explore the option of training people using mandatory modules which can be accessed on web/app followed by an agreement with user that he is well equipped with the end-to-end process in his scope. Under the scope of capacity building the successful bidder must:
  - a. Prepare a detailed training plan to imbibe the aforesaid training requirements for PMC / PMC. The plan will explicitly mention the above training needs and shall be duly approved by the PMC before execution.
  - b. Provide on-site capacity building training to PMC staff to run the ISWM solution and Mobile application which includes but not limited to workflow management, analytics dashboards and reporting, planning.
  - c. Provide trainer's bandwidth of around 500 hours for class-room training. To complete the capacity building phase in time, trainer will need to deploy 4 parallel trainers for ~1 month, taking four batches each day. This can be further refined by the SI in requirement gathering phase.
  - d. Train SCOC employees for escalation handling and provide escalation metrics for any queries in future.
  - e. Take a sign-off from PMC on the completion of development work as per the functional requirements.

- f. The training needs to be provided to users in two phases:
  - i. Training exercise for limited set of users for UAT\
  - ii. Training exercise for all users of SWM department for FAT\
  - iii. Training of staff from IT department of PMC for basic support and maintenance
- g. Trainings would be of two types for different phases of the Project:
  - i. Functional Training: This training would focus on the use of the software of the various ISWM components so that the users are aware of all the operations of the Integrated ISWM system and are able to implement the overall process defined by the SWM Department for optimum use of the system. The training should be provided at the time of go-live (end of implementation phase) and after including the enhancements in the capacity building phase.
  - ii. Senior Management Training: This training would focus on how to use the ISWM for day to day monitoring by the Sr. Management and access various exception reports. SI shall provide this training at the time of Go-live and after including the enhancements in the capacity building phase.
- iii. The system integrator has to provide necessary training to the departmental staff identified by PMC from time to time on usage of the system. In "Enhancement and capacity building" phase, the system integrator will have two rounds of training for all the users (in gap of three months). Rest of the training will be scheduled as per the project plan agreed with PMC (limited to "Enhancement and capacity building" phase).
- iv. Additional scope of work for conducting trainings of software as well as PMC SWM trainings which includes behavioral change, Standard operating procedure, technical trainings for the entire period of the project.

Training should be provided broadly in following Areas.

#### **Soft Skills**

- Behavioral Training and inculcate pride in their work
- Imparting sense of ownership and responsibility
- Communication skills and how to interact with citizens
- Self-motivation and Teamwork

#### **Domain Specific**

- Best Practices in waste management.
- Hygiene and Safety
- Training for the issuance of fines for violators
- Language of communication should primarily in Marathi language and for Senior executive it should be in English and Marathi.

#### **Training Content**

Extensive use of Multimedia content with Voice Over mainly in Marathi language.

### **Training Delivery**

- Online learning management system (LMS) through Wi Fi connectivity/mobile data to be accessible on laptop/desktop as well as Mobile Phones.
- Physical classroom training. PMC will provide the Physical space in each ward to conduct trainings.

### **Training Assessment and Periodic training**

- The training should be on ongoing processes and periodic assessment should be carried out to see the impact of the Intervention.
- Based on the feedback of the participants/trainees and assessment results, there should be improvement/updation in Training content and refresher training should be there.

### **Train the Master Trainer Module**

Since number of users /trainees are very high, there should be a Train the Master Trainer module which help PMC for in-house capacity building.

PMC SWM department will identify master trainers to trained in different skill sets. Selected bidder has to train them.

### **Indicative list of functionalities of Learning Management System (LMS)**

- Video library.
- Troubleshooting Guide / Frequently Asked Questions (FAQs) for faster resolution of user query for getting instant assistance.
- Assessment Module with a provision for Self-test.
- Multilingual Option English & Marathi.
- Feedback and Interactive Support Module (ISM) for getting support from subject matter expert and also acts as practical guidance for the trainees.
- Mobile App. integration for online update and offline access of content with audio podcast facility. Thus, provide 24x7 access of content. Assessment is also accessible in online mode. Secured Mobile App with content security.
- Ability to access from the Web browser.(web-based application).
- Ability to install on LAN environment.
- Ability to Access portal from a Mobile device (Mobile Compatible)
- Multi-Level access control like Super User, Admin, Trainers & Participants/trainees.
- Secured Multimedia Content.

Note:- As the user group/trainees are from the Age group of 18 years to 60 Years with a varied educational background content has to be prepared in 3 levels

- Basic Level for the Ground level Workers/Sweepers/Drivers in Marathi
- Intermediate Level for the Mukadams/supervisors in Marathi
- Advance level for the Senior Supervisors/ Managers in Marathi and English.

### 5.2.6 SYSTEM DOCUMENTS AND USER-MANUAL

1. The SI shall provide documentation, which follows the ITIL (Information Technology Infrastructure Library) standards or IEEE/ISO Acceptable Documentation Standards. This documentation should be submitted as the project undergoes various stages of implementation and provide all traceability documentation on changes done on the IT components during the course of the implementation of the solution.
2. Indicative list of documents includes:

1	Inception report
2	Technical architecture of the overall system
3	Detailed project plan, Functional specifications, data sheets, SRS, SDD, user acceptance test formats for provisional and final acceptance tests
4	Training manuals for each type of trainings, warranty certificates, system manuals, factory test reports, system configuration for all equipment with serial numbers of equipment, inventory report. All the training manuals should be in both English and Marathi
3. PMC reserves right to add any additional documents those may be required.
4. The documents mentioned above are to be furnished in the form of 2 hard copies printed in original size and in form of 1 soft copy.
5. Training manual is to be provided to all the users of SWM department in both English and Marathi.

### 5.2.7 ACCEPTANCE TESTING

#### 5.2.7.1 5.1. Pre-UAT testing

1. 5.1.1. SI shall provide the user manuals /administration manuals / training material and any other such documents (as a part of deliverables) to the respective stakeholders before the start of UAT.
2. 5.1.2. SI shall provide training to the respective ISWM users (employees) as per the training plan submitted and approved by PMC
3. Load testing to be performed for (mobile app) 20000 user & 8000 concurrent user. Results of applications response should be optimum & less than 2-3 seconds (across the app). For web application load test to be performed on 500 users with 100 concurrent users.
4. Architecture of the application to ensure maximum security.
5. Vulnerability & penetration testing & security audit to be performed by the SI on yearly basis & before going live.

#### 5.2.7.2 5.2. User Acceptance Testing (UAT)

1. 5.2.1. The UAT would be the first stage of testing and will be performed with a limited set of users.
2. The set of users will be mutually agreed between PMC and the vendor.
3. 5.2.2. The SI must ensure deployment of necessary resources and tools during the testing phases. The
4. SI shall perform the testing of the solution based on the approved test plan, document the results and shall fix the bugs found during the testing. It is the responsibility of the SI to ensure

6. that the end product delivered by the SI meets all the requirements specified in the RFP. The SI
7. shall take remedial action based on outcome of the tests.
8. 5.2.3. The SI shall provide test details being carried out during the implementation of the system
9. (including Unit testing, System Integration Tests (SIT) including Performance Tests (PT),
10. Security Testing, and final User Acceptance Tests (UAT) to PMC and/or its designated Third-
11. Party Audit Agency (TPA) and make the necessary changes to the ISWM solution (web-based
12. portal & mobile app) to optimize performance.
13. 5.2.4. The SI would be responsible for making sure that all the above considerations are adequately
14. met and approved by PMC before deploying the application in production environment.

#### **5.2.7.3 5.3. Final Acceptance Testing (FAT)**

1. The UAT would be the first stage of testing and will be performed with a limited set of users.
2. The set of users will be mutually agreed between PMC/PMC and the vendor.
3. The PMC and SWM department shall review and finalize the detailed final acceptance test (FAT) plan proposed by the bidder. The PMC and SWM department would also conduct audit of the process, plan and results of the Acceptance Test carried out by the bidder.
4. The PMC and SWM department would issue certification of completion for which PMC and SWM department shall verify availability of all the defined services as per the contract signed between the SI, PMC and SWM department. The SI shall be required to demonstrate all the services, features, functionalities as mentioned in the agreement and submit internal test report certified by their execution and QA team before offering any module for acceptance testing.
5. All acceptance testing, project review and monitoring shall be enabled through a Third-party audit agency (TPA) nominated by PMC and SWM department prior to certification by PMC and SWM department. Testing shall be carried out with the incorporated enhancement to complete satisfaction of PMC and SWM department before the final commencement of Operations.
6. The final acceptance shall cover 100% of the respective phase deliverables covered under ISWM project, after successful testing by the PMC, SWM department and IT department of PMC; a Final Acceptance Test (FAT) Certificate shall be issued by the PMC and SWM & IT department to the SI.
7. Prerequisite for Carrying out FAT activity:
  - a. Detailed test plan shall be defined by the PMC and SWM department. This shall be submitted by SI before FAT activity to be carried out.
  - b. All documentation related to ISWM Project and relevant acceptance test document should be completed & submitted before the final acceptance test to the PMC and SWM & IT department.
  - c. The training requirements as mentioned should be completed before the final acceptance test.
  - d. The FAT shall include the following:
    - i. All software modules must be deployed and integrated with other supporting systems.
    - ii. Availability of all the defined services shall be verified.

- iii. The SI shall be required to demonstrate all the features / facilities / functionalities as mentioned in the RFP
- iv. The SI shall arrange all test equipment and services required for performance verification, and system acceptance and will also provide documented test results.
- v. The SI shall be responsible for the security audit to be carried out by a Certified third party as agreed by PMC and SWM & IT department.

**5.2.8 On-site technical Support:**

- 1. Provide on-site physical technical support to all the employees (permanent and on-contract) of SWM department and SCOC employees across all the systems implemented by the bidder. The SI employees need to be physically present in Pune and need to visit on-site on need to basis within 2 hours to help pout the users during this phase.
- 2. Provide bug-fixing support (if any) which comes up in this phase as SWM employees start using the customised solution
- 3. Make sure the process becomes smooth and error free by ensuring proper training of all employees
- 4. System Integrator shall be responsible for managing and monitoring the complete architecture of the ISWM solution including all software modules during the entire period of contract

**5.2.9 Off-site technical Support:**

- 1. Provide off-site technical support to all the employees (permanent and on-contract) of SWM department and SCOC employees across all the systems implemented by the bidder. Suring this phase, the SI will provide on-call support. Physical presence of SI employees is not mandatory in this phase.
- 2. System Integrator shall be responsible for managing and monitoring the complete architecture of the ISWM solution including all software modules during the entire period of contract.

**5.2.10 HAND-OVER OF THE ISWM SYSTEM**

- 1. The SI will hand over the ISWM system to PMC at the end of the Full Acceptance Testing phase, however, SI will keep providing on-site and off-site support to PMC as mentioned in project schedule.
- 2. At the end of the off-site technical support phase, SI will submit to PMC and PMC the following before the final payment:
  - a. Information relating to the current services rendered and data relating to the performance of the services; Entire documentation relating to various components of the Project, any other data and confidential information related to the Project;
  - b. All other information (including but not limited to documents, records and agreements) relating to the products & services related to the project to enable PMC and its nominated agencies, or its replacing Successful Bidder to carry out due diligence in order to transition the provision of the Project Services to PMC or its nominated agencies, or its replacing Successful Bidder (as the case may be).

### **5.2.11 OPERATIONS AND MAINTENANCE**

#### **5.2.11.1 Technical Support**

The SI will provide the Operations and Support Team for on-site and off-site technical support phase, for supporting the software solution provided by the SI. The SI Support Team shall provide below mentioned services:

Physical Onsite helpdesk to support and facilitate resolution of Incidents and Problems.. Off-site helpdesk to support and facilitate resolution of Incidents and Problems.

The SI will deploy a team providing support for both functional as well as technical issues. The functional and technical issues in the implemented system resulting in disruption of day to day activities of end users shall be referred to as ‘Incidents’. These incidents shall be assigned a ‘priority’ which will be based on the urgency/criticality and impact on ISWM day-to-day operations.

The nature of support would be 24X7. The normal technical support hours would be 5:00AM to 9:00PM every day. However after that time and on Sunday (24X7 hrs ), the nature of support would be on on-call basis only for critical high priority incidents. For on-call support, SI shall nominate two resources and names of these nominated resources should be available with SWM department in advance. Any change in resource should be intimated at least 2 weeks in advance. PMC might conduct formal interview before deployment of resources after stabilization period and/or during change of resource due to any reason after initial deployment.

The onsite and offsite functional/technical support shall be provided by trained and experienced functional and technical experts appointed by SI. The onsite and offsite functional/technical support team shall be bound by a predefined service level agreement (SLA) designed around priority and criticality of reported incidents.

The scope of work during functional and technical support shall entail the following:

1. Providing complete resolution to all incidents reported by the end user at PMC while adhering to the SLA’s as mentioned in 1.
2. Complete configuration requests as and when required.
3. Tuning of the provided solution, databases, and integration with third party software and any other components provided as part of the business solution.
4. SI shall incorporate technological changes and provide enhancements as per the requests made by PMC/PMC. SI shall perform minor changes, bug fixes, error resolutions and minor enhancements that are incidental to proper and complete working of the application.

SI would deploy its support resources along with required logistics like Laptop, Mobile, Data Card, External Hard Disk of minimum 1TB etc. for onsite support. The specific requirements for each of Service Desk, Incident management and Problem management have been defined below:

#### **5.2.11.2 Service Desk**

The SI will provide a Service Desk which will serve as a Single Point of Contact (SPOC) for all incidents, problems, Changes and service requests related to the integrated ISWM solution. The Service desk should function as per ITIL version 4 or latest.

- (i) Minimum no. of personnel and the minimum required qualification for these personnel at the service desk are mentioned below:

Phase	Minimum Qualification
On-site technical support	Minimum Requirements: Educational qualification: B.E/BTech/MCA (b) Experience: At least 5 years of experience in maintenance or developing web-based system along with GIS based analytics and VTS capabilities
Off-site technical support	Minimum Requirements: Educational qualification: B.E/BTech/MCA (b) Experience: At least 3 years of experience in maintenance or developing web-based system

- (ii) SI must provide on call support in fluent English and Marathi with excellent communication skill.
- (iii) These support personnel should be the first point of contact for all the service and support activities.
- (iv) The SI must provide a compliant Service Desk tool (CRM), which will leverage automated mechanism to facilitate ticket logging, ticket tracking, and communication with requestor, ticket follow ups, audit trails, ticket assignation and ticket closure. The option to raise the ticket and the complete workflow of this ticket should be available on worker's app, supervisor app, SCOC and there should be a screen on dashboards to keep the record of all tickets.
- (v) Solution should comprise of a completely automated system of raising issues on a portal through call logging, ticket generation, sending alerts on email and requestors. It must also present and capture the service SLA's along with incident SLAs.
- (vi) SI should provide a ticket logging mechanism through phone, email and a self-help web-based tool.
- (vii) The Service Desk shall log user calls and emails for all in scope services and assign an incident call ID number. Priority shall be assigned to each call as per the agreed SLAs.
- (viii) SI must create an SOP on frequently asked questions to assist in resolving basic issues themselves.

- (ix) SI must track each incident / call to resolution; escalate the calls to the appropriate levels, if necessary as per the escalation matrix agreed between the SI and PMC. The escalation matrix shall be developed by the SI in discussion with PMC during the handover.
- (x) SI must Close the call / incident post confirmation from the user.
- (xi) SI must analyse the incident / call statistics and provide monthly reports including but not limited to:
  - Type of incidents / calls logged
  - Incidents / calls resolved
  - Incidents / calls open

### **5.2.12 Incident Management and Crisis Management**

The functional and technical issues in the implemented system resulting in disruption of day to day activities of end users shall be referred to as '**Incidents**'. Incident Management Services are the activities associated with restoring normal service operation as quickly as possible and to minimize the adverse impact on SWM operations. The SI needs to cover following listed responsibilities as part of this process:

- i. Regular monitoring and reporting of system performance, availability and efficiency
- ii. Monitor lifecycle of incident/service request ticket and follow escalation matrix to ensure SLA compliance.
- iii. Manage end user communication
- iv. Create and use SOP's for common / reoccurring service requests and incidents.
- v. Support to all end user devices available in the current setup for the proposed solution
- vi. Establish Incident Management process and tool to automate the process workflows.
- vii. Interface and coordinate with the PMC and third parties for effective closure of Incidents.
- viii. Establish process / procedures for workflow, escalation, communication and reporting processes that help to achieve and improve SLAs.
- ix. Engage in entire Incident lifecycle support including detection, escalation, diagnosis, status reporting and recovery.

A Crisis Management process shall be defined by the SI to manage Critical and Major incidents, related to integrated ISWM solution.

- (i) This process will include the workflow and escalation matrix that needs to be followed for all major incident.
- (ii) Such incidents need to be dealt with urgency and taken on priority for resolution.
- (iii) All major incident tickets will require a confirmation from PMC for closure.
- (iv) It is a mandate to create a problem ticket for major incidents.

### **5.2.13 Problem Management**

Problem Management is the process responsible for managing the lifecycle of all problems. The primary objectives of problem management are to prevent problems and resulting incidents from happening, to eliminate recurring incidents, and to minimize the impact of incidents. The SI needs to cover following

listed responsibilities as part of this process:

- (i) The SI shall be required to define, implement and follow the Problem Management process.
- (ii) Enable Root Cause Analysis for:
  - All Critical and Major incidents.
  - Incidents repeating more than 3 times.
  - Top 5-10 incidents across all service domains.
- (iii) Provide skilled resources to investigate problems, perform Root Cause Analysis and meet the agreed SLAs.
- (iv) Identify problem mitigation actions and propose solutions to PMC.
- (v) SI must commit to reduction in repeat incidents on a quarterly basis for incidents of all priorities.

#### **5.2.14 On-site technical Support:**

- 5. Provide on-site physical technical support to all the employees (permanent and on-contract) of SWM department and SCOC employees across all the systems implemented by the bidder. The SI employees need to be physically present in Pune and need to visit on-site on need to basis within 2 hours to help pout the users during this phase.
- 6. Provide bug-fixing support (if any) which comes up in this phase as SWM employees start using the customised solution
- 7. Make sure the process becomes smooth and error free by ensuring proper training of all employees
- 8. System Integrator shall be responsible for managing and monitoring the complete architecture of the ISWM solution including all software modules during the entire period of contract

#### **5.2.15 Off-site technical Support:**

- 3. Provide off-site technical support to all the employees (permanent and on-contract) of SWM department and SCOC employees across all the systems implemented by the bidder. Suring this phase, the SI will provide on-call support. Physical presence of SI employees is not mandatory in this phase.
- 4. System Integrator shall be responsible for managing and monitoring the complete architecture of the ISWM solution including all software modules during the entire period of contract.

#### **5.2.16 IN-FUTURE DEVELOPMENT SUPPORT:**

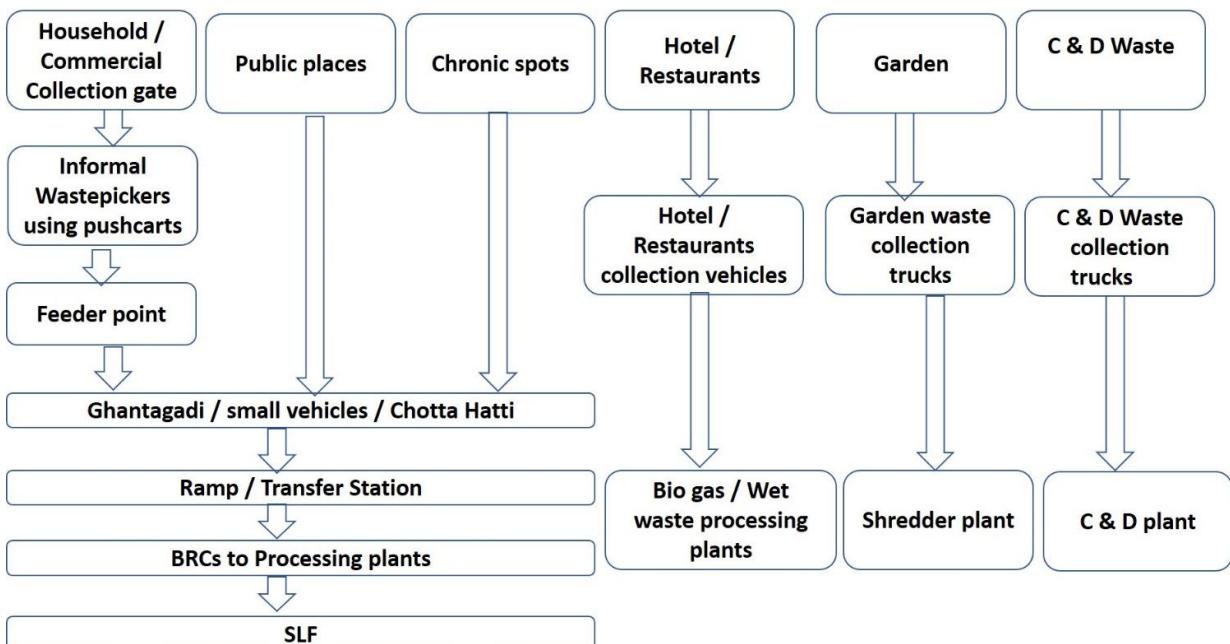
- 1. Integrate upcoming systems (as and when procured) like MI cards with the ISWM solution provided by the bidder.
- 2. The support will be on chargeable basis (bidder will charge the client) as per the man-days required for the change/integration.
- 3. Bidder is requested to propose the per man-day rate as a part of the response. This rate will increase at a rate of 10% every year as compared to the previous year.

#### 5.2.17 ADDITIONAL SUPPORT FROM BIDDER:

1. System Integrator shall be responsible for managing and monitoring the complete architecture of the ISWM solution and Mobile application including all the software modules during the entire period of contract.
2. The ISWM solution and Mobile application shall be managed through a centralized management software. User credentials for MIS access to the software must be shared by SI with PMC.
3. During the duration of the contract, the SI shall be required to conduct periodic checks of the deployed solution for performance, scalability, security, and further perform continuous monitoring of operations on behalf of PMC. The SI shall be required to provide necessary information, support and MIS reports in the desired format to the PMC and/or any of its authorized representatives to carry out forensic analysis at any point during the contract, if required.
4. The System Integrator will have to provide necessary trainings to the departmental staff identified by PMC from time to time on usage of the system. In "Enhancement and capacity building phase" the System Integrator will have two rounds of training for all the users (in a gap of three months). Rest of the trainings will be as and when required by SEM department of PMC (limited to "Enhancement and capacity building phase").

#### 5.2.18 FUNCTIONAL REQUIREMENTS

Pune Municipal Corporation collects waste from multiple sources. The waste from different sources goes through different value chains before it reaches the destination i.e. processing plant or SLF. With lack of technology integrated system, Pune Municipal Corporation is not having enough visibility in the daily operations. Different streams of solid waste in the city are shown below:



The various streams under Solid waste management and challenges associated with them are mentioned below:

**1. Households/Commercial Waste Collection:**

PMC has a system in place for waste collection from households, commercial and of the city. The Door to Door collection workers use PMC provided push carts to collect waste from households and give it to PMC owned ghantagadis at designated feeder points. These ghantagadis have pre-decided routes to cover all the required feeder points. These Ghantagadis after waste collection go to ramps for offloading the garbage into Bulk Refuse Carrier (BRC).

For household waste, the collection workers go for door-to-door/gate-to-gate collection and collect the waste in PMC owned push carts.

Challenges and functional requirements:

S. No.	Theme	Feature/Module	Functional Requirements
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Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

1	Manpower management	Attendance of Collection workers	<p>The System Integrator will provide smart wrist watch or a similar GPS tracking device onsite field staff management as part of its ISWM solution. The solution shall enable location tracking (including geo-tagging and geo-fencing) to make sure that the field staff are on field during their shift. The application shall also have safeguards to ensure that the data entry can not be done by the field staff outside any of the designated geo fenced locations. It shall also enable the attendance and location information in the mobile apps including reporting time. This information needs to be present at Kothi level and Prabhag level for dashboards (both mobile app and web) for DSI and other senior officials.</p>
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Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

2	Collection-Worker Household interface	<p>Every Door to Door collection gates (households / commercial establishments, public places, areas etc. from where the waste is collected) shall be geo-tagged geo fenced. This interaction needs to be recorded using a mobile phone based solution developed by the System Integrator. All The mobile application shall have the facility for data input at the location such as:</p> <ul style="list-style-type: none"><li>a. Waste collected (Yes/No)</li><li>b. Segregated waste collected (Yes/No)</li><li>c. Type of segregated waste collected in four categories (Wet, Dry, Sanitary, Domestic Hazardous)</li></ul> <p>The waste picker collects all the waste from households and takes it to the Feeder Point for handing over to the primary collection vehicle. The app shall have the provision for capturing the approx. weight of the diff types of waste at the feeder point while transferring the waste to the primary collection vehicle.</p>
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Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

3	<b>Coverage by Collection Worker</b>	<p>End of the day route information should be made available to Prabhag coordinator and to SI/DSI in mobile apps. The purpose of this report is to check whether all the workers covered their designated routes on that day. Alerts should be sent to prabhag coordinator in case a route is not completely covered during the morning operations.</p> <p>Note: Most of the collection workers use feature phones and not smart phones. The responsibility of collecting the phone numbers of all stakeholders involved and integrating it with the system is the responsibility of the System Integrator.</p>	
4	<b>Coordination between Ghantagadi &amp; Collection worker</b>	<p>Collection worker should have information on the arrival time of Ghantagadi at their feeder point. ISWM system should trigger SMS (English and Marathi) to the relevant collection worker 15 minutes before the arrival of Ghantagadi (with details like Ghantagadi driver name, number, vehicle number) at a feeder point. For this ISWM system needs to get integrated (integration will be bidder's responsibility) with Vehicle Tracking System on PMC vehicles. All the feeder points should be geo-tagged and geo fenced on the VTS system by the System Integrator and SI/DSI should be trained to do this activity in future This functionality should be made available using ISWM app and web interface.</p> <p>In some cases two separate vehicles come at feeder points for dry and wet waste. In this case SMS for both the vehicles should be sent separately.</p>	
5	<b>Fleet Management</b>	<b>Location access of Ghantagadis with Prabhag coordinators</b>	<p>Prabhag coordinator, at all times, should have access to location of Ghantagadis responsible (with details like Ghantagadi driver name, number, vehicle number) for his areas.. He/she should also have the information about tentative time the Ghantagadi will take to reach to a feeder point in his area</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

6	Rerouting Ghantagadis	SI/DSI/Vehicle vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI) if he is not following the instructions
7	Information about vehicle delays at feeder points	<p>In case of breakdown of any collection vehicle ISWM should trigger SMS to Collection worker about the delay.</p> <p>In case collection vehicle is full then it directly goes to ramp/ transfer station and covers the remaining feeder points in next trip. In this case SMS should be sent to Collection worker and Prabhag coordinator at all the subsequent feeder points regarding the delay.</p> <p>All this information should also be available to SI/DSI and dashboards of the ISWM system</p>
8	Provision for Backup Vehicle	<p>In case of a breakdown Concerned official of vehicle department should be able to assign a new vehicle (replace the original vehicle with a new vehicle).. In case Concerned official of vehicle department assigns a backup vehicle in case of breakdown/shortage, the information should be triggered as SMS to the collection worker with other alerts. Same information is to be sent to Prabhag coordinator as well.</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

9	Coverage of ghantagadis	<p>All the feeder points shall be geofenced and the collection vehicle coverage shall be monitored through the VTS. The collection vehicles shall be identified as it enters the feeder point for collection. The system shall have predefined stoppage times at each of such geo fenced feeder points to ensure that the vehicle stops at these feeder points for collection. A coverage report should be sent to SI/DSI and other stakeholders for all the vehicles. Vehicles not covering all the designated feeder points (As per the route planned in the morning) should be highlighted for further action. The issue to be resolved by the SI/DSI and all unresolved issues shall be escalated to the higher authorities. The ISWM system shall have the provision for such escalation mechanism and incorporate the same in the analytics for identification of recurring defaults etc.</p>
10	Modularity in overall solution	<p>Admin user of ISWM solution should be able to add:</p> <ul style="list-style-type: none"> <li>Type of waste (dry/wet/Hazardous/ Sanitary and more)</li> <li>Type of vehicle</li> <li>Type of user (household/hotel/C&amp;D and more)</li> <li>4) Type of end processing unit (processing plant/biogas plant/landfill and more)</li> <li>New Ramps, depots, processing plants, etc.</li> <li>Collection gates</li> <li>Feeder points</li> <li>SLFs</li> <li>C&amp;D Collection points</li> <li>Ewaste Collection points</li> </ul>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

11	MIS and Dashboard Requirements	Different MIS and dashboards for different stakeholders	<p>Indicative Dashboards and MIS as per area which will change (expand) with the hierarchy level.</p> <p>Dashboard and MIS needs to have information on:</p> <p>Issues and their redressal</p> <ul style="list-style-type: none"> <li>2) Attendance of Collection workers along with their interaction with ghantagadis</li> <li>Areas not covered due to absenteeism</li> <li>4) Adherence of Ghantagadis to schedule and route coverage by these ghantagadis</li> <li>5) Performance of workers in terms of waste collected per day, households covered per day, complaints received for their respective areas</li> <li>6) Citizen complaint resolution through PMC care app and Swachhata App</li> <li>7) GIS map based depiction of areas with low segregation and any GVPs around those areas</li> </ul> <p>Similar dashboards and actionable screens have to be provided for Smart City operations center (SCOC) for the operators to access all this information and take appropriate action after coordination with relevant stakeholder from SWM department</p>
12		Marking the vehicle full	<p>The driver shall be able to mark the vehicle if it is full before completing the scheduled route. The driver shall mark the vehicle full and then take the vehicle to the ramp. The system shall generate alert to the SI/DSI/Vehicle vendor in such cases so that alternate vehicle can be deployed for collection at the rest of the feeder points. The same information shall also be sent to the collection works and the prabhag coordinator.</p> <p>This historical input shall also be used for vehicle route optimization for future vehicle planning through the analytics engine..</p>

#### 5.2.19 Households/Public/Markets area sweeping:

Pune City has been divided in 42 Prabhags which are further divided into Kothis. SWM department of PMC employs more than 7000 people who fall under multiple hierarchies. Additionally, SWM department hires people on contract (~3500+) who are not on payroll of PMC. A major part of this manpower works on field which makes manpower management a big challenge for the respective supervisors.

## Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

Safai workers, who are involved in street sweeping , toilet cleaning, Drainage system cleaning and other tasks report to Mokadam (~1 per Kothi). These Mokadam report to Sanitary Inspector (SI) who further report to Divisional sanitary Inspector (DSI). Safai worker work in shifts as per PMC schedule.

SWM department is also responsible for street cleaning, toilet cleaning, drainage cleaning and waste pickup from bins and markets. The waste collected from these sources are transferred to ramps using multiple types of vehicles including Ghantagadis, Dumper Placer and Small vehicles (like Chhota Haathi for narrow lanes).

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Manpower management	Attendance of Safai workers	<p>The System Integrator will provide smart wrist watch or a similar GPS tracking device for the onsite field staff management as part of its ISWM solution. The solution shall enable location tracking (including geo-tagging and geo- fencing) to make sure that the field staff are on field during their shift. The application shall also have safeguards to ensure that the data entry can not be done by the field staff outside any of the designated geo fenced locations. It shall also enable the attendance and location information in the mobile apps including reporting time. The system shall monitor that the staff are within their designated geo fenced area of work during the working time. The system shall send alerts to the Mokadam/SI/DSI whenever the safai worked is out of their designated geo fenced area for a more than a predefined time.</p> <p>This information needs to be present at Kothi level and Prabhag level for dashboards (both mobile app and web) for DSI and other senior officials.</p>
2		Record Keeping for overtime	<p>Safai workers are sometimes called for emergency duties outside of their shift timings, however, there is no provision of overtime compensation for these workers. These workers can be awarded in terms of compensatory offs by Mokadams. For this, SWM needs a record keeping system (in terms of extra hours worked). With his system, Mokadams and SIs should be able to credit extra hours and award these as compensatory hours to workers.</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

3	Integration of attendance module with Payroll	The Safai workers, as they are on PMC payroll, have some leaves which they can avail monthly/yearly. The attendance record of these workers should be integrated with the payroll system of PMC taking care of their leave balance and loss of pay days.
4	Locating Garbage heaps by Mokadams	Mokadam takes daily rounds of his Kothis to locate the garbage heaps and cleanliness of the area. He keeps a manual record of these locations and informs the Safai worker to clean the same. The Mokadams shall be able to mark these locations in a map and the system shall allocate the work to the respective safai worker. The system shall trigger a SMS on such adhoc cleaning activities assigned to the safai worker.
5	Coverage by Safai Worker	End of the day route information should be made available to SI/DSI in mobile app. The purpose of this report is to check whether all the workers covered their designated routes on that day. Alerts should be sent to Mokadams and SI in case a route is not completely covered during the morning operations. Mokadams and SI should get alerts on their mobile apps whenever a worker goes out of his geo-fence within the shift timings. The system integrator might need to club these alerts based on the frequency of such incidences. The ISWM shall create reporting mechanism for such incidences and escalation mechanisms.
6	Beat Management	Planning and Monitoring Beat Before the morning operations start, Mokadams plan the beat (areas for cleaning/task list) for all the Safai workers. The areas which are not covered in the first half are allotted to a beat in second half to the workers. The integrated ISWM system should have a feature for Mokadams and SI to plan and monitor the beat for all workers on daily basis. Mokadams should be able to verify the GPS coordinates of the worker in his shift and match with the allotted beat. The option of creating and editing beats should be available both on app and web.

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

7	Creating Default Beats	On the broader level, the beats of all the workers are fixed, however, this needs quick revision in case of absenteeism so that all areas in the Kothi are covered with the available manpower. The system should have an option to create some default beats for all the workers and edit these default beats based on daily requirement.
8	Communication to Safai workers	SMS regarding their allotted beats need to be pushed to workers (in both English and Marathi).
9	twin litter Bins cleaning	All the twin bins / strategic bins are cleared by PMC on daily basis. However, at times, bins get filled in the middle of the day.  The System Integrator to ensure that the bins are geo fenced and waste collection from these bins is planned using the collection vehicles. The system shall monitor the cleaning using the VTS data against the planned route and shall send alerts to the Mokadam/SI for any bins skipped by the collection vehicle. The information of the same is transferred to the dashboard as well as other stakeholders.
10	Location access of vehicles with Prabhag coordinators	SI/DSI, at all time, should have access to location of Ghantagadis responsible (with details like Ghantagadi driver name, number, vehicle number) for his areas. He should also have the information about tentative time the Ghantagadi will take to reach every twin litter bin/ strategic container location located in his area.
11	Rerouting Vehicles	SI/DSI/Vehicle vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI) if he is not following the instructions
12	Provision for Backup Vehicle	In case of a breakdown Concerned official of vehicle department should be able to assign a new vehicle (replace the original vehicle with a new vehicle) using the mobile app and web.

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

13	Coverage of vehicles	A coverage report should be sent to SI/DSI another stakeholders for all the vehicles. Vehicles not covering all the designated feeder points (As per the route planned in the morning) should be highlighted for further action. The issue to be resolved by the SI/DSI and all unresolved issues shall be escalated to the higher authorities. The ISWM system shall have the provision for such escalation mechanism.
14	MIS and Dashboard Requirements	Different MIS and dashboards for different stakeholders  Indicative Dashboards and MIS as per area which will change (expand) with the hierarchy level. Dashboard needs to have information on: Issues and their redressal 2) Attendance of Safai workers along with their interaction with ghantagadis Areas not covered due to absenteeism Bins/ strategic containers not cleared as per the schedule Adherence of vehicles to schedule 6) Performance of workers in terms of area covered, not present in the geo fenced area during work hours etc  Similar dashboards and actionable screens have to be provided for Smart City operations center (SCOC) for the operators to access all this information and take appropriate action after coordination with relevant stakeholder from SWM department
15	Marking the vehicle full	The driver shall be able to mark the vehicle if it is full before completing the scheduled route. The driver shall mark the vehicle full and then take the vehicle to the ramp. The system shall generate alert to the SI/DSI/Vehicle vendor in such cases so that alternate vehicle can be deployed for collection at the rest of the feeder points. The same information shall also be sent to the collection works and the prabhat coordinator.  This historical input shall also be used for vehicle route optimization for future vehicle planning through the analytics engine.

#### **5.2.20 Hotel, Garden, Slaughterhouse Waste, Bio-waste and any other specialized waste such as e Waste collection:**

Hotel and Garden are other sources of waste collected by SWM department. The waste collection from hotels is on daily basis while the waste collection from garden is demand based (ad hoc) and hence the PMC vehicles go to specific garden sites on specified days of the week. In most of the cases, the waste from both hotels and gardens is directly routed to processing plants/shredders without going to ramps.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Ad Hoc and scheduled requests	Raising waste pickup requests	Mokadams should have an option to raise adhoc collection requests with type of waste using the ISWM system. This should be a part of beat planning (in addition to ad-hoc requests) for vehicles as per their schedule. Why other modules like household do not have adhoc
2	Fleet Management	Coordination between vehicles & Hotels/garden authorities	Hotel/Garden authorities should have information on the tentative arrival time of designated waste pickup vehicles at their location both through the mobile app and SMS. (with details like vehicle driver name, number, vehicle number). For this ISWM system needs to get integrated with Vehicle Tracking System of PMC vehicles.
3		Location access of vehicles with SI/DSI	SI/DSI, at all the time, should have access to location of the vehicle responsible (with details like vehicle driver name, number, vehicle number) for his areas. He should also have the information about tentative time the vehicle will take to reach a pick-up spot in his area.
4		Rerouting vehicles	SI/DSI/Vehicle vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI) if he is not following the instructions

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

5	Information about vehicle delays at hotels/gardens	<p>In case of breakdown ISWM system should send an app notification and trigger SMS to Hotel/garden authorities about the delay with the new estimated time of arrival (using integration with VTS).</p> <p>All this information should also be available to SI/DSI in their mobile app and dashboards. SI/DSI/Engineer should be able to geo-tag hotels and gardens using ISWM web and app (enabled by integration with VTS system)</p>
6	Provision for Backup Vehicle	<p>In case of a breakdown the vehicle department official should be able to assign a new vehicle (replace the original vehicle with a new vehicle) using the app. In case SI/DSI assigns a back-up vehicle ISWM system should send an app notification and trigger SMS to Hotel/garden authorities about the delay and updated vehicle details.</p>
7	Coverage of vehicles	<p>A coverage report should be sent to SI/DSI another stakeholders for all the vehicles. Vehicles not covering all the pickup spots (as per the route planned in the morning) should be highlighted for further action. The issue to be resolved by the SI/DSI and all unresolved issues shall be escalated to the higher authorities. The ISWM system shall have the provision for such escalation mechanism.</p>
8	Dashboard Requirements  Different dashboards for different stakeholders	<p>Indicative Dashboards as per area which will change (expand) with the hierarchy level.</p> <p>Dashboard needs to have information on:</p> <ul style="list-style-type: none"> <li>Issues and their redressal</li> <li>Hotels/gardens/ slaughter houses etc not covered by vehicles</li> <li>Adherence of vehicles to schedule</li> <li>eWaste collection drives</li> <li>Similar dashboards and actionable screens have to be provided for Smart City operations center (SCOC) for the operators to access all this information and take appropriate action after coordination with relevant stakeholder from SWM department</li> </ul>

9	Marking the vehicle full	<p>The driver shall be able to mark the vehicle if it is full before completing the scheduled route. The driver shall mark the vehicle full and then take the vehicle to the ramp/ processing plant.</p> <p>The system shall generate alert to the SI/DSI/Vehicle vendor in such cases so that alternate vehicle can be deployed for collection.</p>
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#### 5.2.21 Construction and Demolition (C&D) Waste Collection:

There are primarily four sources of C&D waste:

- (i) Projects under Pune Municipal Corporation
- (ii) Projects under other government agencies (such as BSNL, Pune Metro)
- (iii) Builder projects across city
- (iv) Households

The generation of waste from these sources is not periodic as most of the demand of waste pickup is on ad hoc basis. PMC has totally outsourced the pickup of C&D waste to external contractors. Builders pay a lumpsum amount to PMC in advance on per square feet basis of the project. PMC vendor charges PMC on per ton per KM basis for the waste pickup from construction and demolition sites.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Ad Hoc requests	Raising waste pickup requests	<p>Mokadams should be able to raise waste pickup request using ISWM app. These requests should be mapped to the designated SI and DSI who further allocate a vehicle/vendor for this pickup.</p> <p>These requests will also be raised by the four stakeholders listed above. These stakeholders should have an option to raise this request using the citizen app.</p> <p>Apart from households, all these stakeholders should have a separate login/registration through which they can raise their requests.</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

2	Fleet Management	Provision of vehicles on ad hoc basis to builders	Most of the requests from C&D sites is on ad hoc basis. The builder/PMC personnel/other govt agencies personnel should be able to raise a request on a helpline/app. The request should be communicated to C&D waste pickup vendor using SMS and app notification.
3		Location access of vehicles with vehicle vendor	C&D waste pickup vendor, at all time, should have access to location of vehicles responsible (with details like vehicle driver name, number, vehicle number). He should also have the information about tentative time the vehicle will take to reach a C&D site and back to disposal area.
4		Rerouting vehicles	Vehicle vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI) if he is not following the instructions
5	Charging the builder	Smart Card system	As of today, a fixed charge per sq. ft. of construction is levied on the builder. PMC might come up with a smart card system which will be provided to the builder with credits for waste pickup. These credits can be deducted with every trip of waste pickup (based on weigh/no. of trucks). ISWM system should have the ability to interact with such a system in future.
6	Dashboard Requirements	Different dashboards for different stakeholders	Dashboard needs to have information on: No of pickup requests and pickups per day No of vehicles used and trips per vehicle Turn-around time on requests 4) Escalations by builders regarding late pick-up or no-show Ageing of requests in hours Similar dashboards and actionable screens have to be provided for Smart City operations center (SCOC) for the operators to access all this information and take appropriate action after coordination with relevant stakeholder from SWM department

7	Claim Collection and Integration	As the C&D waste collection is with the outsourced C&D waste processing plant operator, the SI to ensure that the ISWM system shall be integrated with the operator's vehicles and based on that the operator's collection claims shall be monitored through this system.
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### 5.2.22 Ramp and Processing Plant Operations:

The primary vehicles bring segregated waste (dry wet etc). of The waste needs to be transported to different processing plants .All the primary vehicles (Ghantagadis, Dumper-Placer, Chhota Haathi) come to ramp where they transfer their waste into Bulk Refuse Collectors (BRC), high capacity vehicles owned/outsourced by PMC. These BRCs take the waste to processing plants for final processing/disposal. As soon as primary vehicles enter the ramp station, they are weighed on weigh bridge. The System Integrator will develop the weighbridge application, where the vehicle number is identified through the RFID tags or similar identification mechanism and weighbridge automatically shoots the weight information such as (Tare weight ,the weight of the waste such as wet/ dry, waste sent to BRCs or the Bio gas plants located at ramps). PMC has pre-fed the empty weights of these vehicles in system which finally gives the net weight of waste in the vehicle. After this, the vehicle climbs the ramp and dumps the waste in BRC. A transfer can happen at ramp only when both the primary vehicle and BRC are available simultaneously. Once the BRC is full it sent to its designated processing plant. The BRC is also weighed before it leaves the transfer station.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1		Scheduling of primary vehicles and BRC	SI/DSI/Vehicle vendor should be able to schedule all the vehicles with inputs from VTS. There should be an option to create default schedules which can be customized based on daily requirements.
2		Location access of vehicles with vehicle vendor at ramp	Vehicle vendor, at all time, should have access to location of vehicles responsible (with details like vehicle driver name, number, vehicle number) for his areas. He should also have the information about tentative time the vehicle will take to reach back to the ramp.
3	Fleet Management	Rerouting vehicles	Vehicle vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI if he is not following the instructions).

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

4		Status of vehicle	<p>The ISWM system shall automatically capture the vehicle data using the RFID tag and reader as soon as it reaches the ramp. The system shall then capture the weight from the weighbridge application. This will allow that the correct information is captured without any manual intervention for vehicle or weight at the ramp. There should be a process map defined for each type of vehicle in the ramp operations. The status of vehicles should be made available to SIs DSIs and engineers to help them take call on routing of vehicles.</p> <p>Moreover, they should be able to plan the routing of Ghantagadis based on the availability of a BRC on ramps (as of now Ghantagadis keep waiting as there is no BRC to collect the waste from Ghantagadis).</p>
5	Weight Tracking for Waste	Integration with weighbridge application across locations	<p>ISWM system needs to be integrated with weighbridge application to be developed by the System Integrator and there needs to be a centralized system of weight tracking from ramp to processing plant.</p> <p>Stakeholders, like processing plants and C&amp;D waste collectors, are paid/billed as per this weight. Hence, a central weight-based billing system needs to be created.</p> <p>The System Integrator should ensure that the collection vehicles shall also be fitted with RFID tags or similar identification mechanism to identify vehicles at the, ramp, landfill to avoid any manual intervention at these points. Similarly, the ramp and SLF will have to be provided with the RFID reader or similar technology by System Integrator to ensure that the appropriate vehicle has reached its destination and the waste weight management will be handled through the system. The provision of the identification hardware and the functionality in the application will have to be provided by the System Integrator.</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

6	Operations at Processing Plant	Integration with systems at processing plants	<p>The processing plants process the waste and send the process rejects to the SLF. The System Integrator shall ensure that the ISWM system shall have integration with the processing plant systems to automatically capture the daily processing information such as waste received, waste processed, reject generated, reject transferred to SLF, by-products generated, by-products generated and sold etc. for monitoring and visibility into the operations of the plants.</p> <p>The System Integrator should also ensure that the system shall also have provision to capture the daily logbooks of the plants to comply with the SBM requirements as well.</p>
7	SLF /Dumpsite/ Biomining	-	<p>The ISWM system shall have functionality for Plant as well as ramp Master Data Management or integration with the existing systems at the plants/ramp.</p> <p>System integrator should ensure that it should allow creation and Updation of the Master Data and carry out analysis of current operations wrt the Master data and provide insights for performance improvements.</p>
8	SLF /Dumpsite/ Biomining	MIS and Reporting	<p>Indicative dashboard shall have the following:</p> <ul style="list-style-type: none"> <li>a. Leachate treatment plant data</li> <li>b. Air pollution data</li> <li>c. Gas generation data</li> <li>d. Qty of legacy waste treated at Biomining</li> <li>e. Master plan of Dumpsite/ SLF/ Biomining and associated data and current status</li> <li>f. Tracking of all regulatory requirement of MPCB, NGT etc</li> </ul>

9	Ramp, processing plant, SLF master data	The ISWM shall capture all the master data and ward wise mapping of the ramps/ processing plants.
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#### 5.2.23 End to End Fleet Management:

As discussed in the previous sections, SWM department handles multiple vehicles to carry out its daily operations. Management of these vehicles is a humongous task for the engineers and SI/DSI due to the lack of visibility in the location and status of all these vehicles. ISWM system will need tight integration with VTS for multiple use cases related to fleet management. Moreover, ISWM system should have functionalities like routing and re-routing of vehicles based on real-time information from VTS as well as analytics for analyzing the vehicle route data.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Coordination between vehicles & authorities		SI/DSI/vehicle vendor should have information on the tentative arrival time of designated waste pickup vehicles at their location both through the mobile app and SMS. (with details like vehicle driver name, number, vehicle number). For this ISWM system needs to get integrated with existing Vehicle Tracking System of PMC vehicles. The System Integrator shall analyse the existing VTS and ensure that the ISWM is compliant with the existing GPS devices.
2	Route Planning		SI/DSI/Vehicle vendor should be able to plan the route of all the vehicles for a day. There should be an option to create default routes for all these vehicles which can be edited based on daily requirement.
3	Fleet Management	Rerouting vehicles	Vehicle Department official vendor should be able to re-route any vehicle. Vehicle should get the alert about the same and reminders (with alerts to SI/DSI) if he is not following the instructions

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

4	Information about vehicle delays	In case of breakdown ISWM system should send an app notification and trigger SMS to SI/DSI/vehicle vendor of that area about the delay. All this information should be made available in their mobile app and dashboards (to be developed by the System Integrator).
5	Provision for Backup Vehicle	In case of a breakdown Vehicle department official should be able to assign a new vehicle (replace the original vehicle with a new vehicle) using the mobile app. The ISWM system shall have mechanism to ensure supply of the replacement vehicle within a stipulated time and an escalation mechanism for non-adherence with this.
6	Alert Mechanism for authorities	If the vehicle is not following the assigned route an alert needs to be sent to SI/DSI/vehicle vendor who can then take action to course correct. In case the GPS system is tampered alert is sent to SI/DSI/vehicle vendor  The alert generation will be taken care of by VTS system, bidder needs to pull this information by leveraging the integration of ISWM system with VTS system.  The ISWM system shall also have an escalation mechanism to ensure that the issues are addressed.
7	Destination information and guidance	Following information of destination should be provided in the mobile/web app for the stakeholders to take better decision on routing of vehicles:  Queueing time at all feeder points/ ramps/plants/depots/landfills 2) Availability of BRC at ramps 3) Estimated time of arrival to different plants (using VTS)  This information will help SI/DSI/vehicle vendor to take real-time decisions on routing of vehicles.
8	Status of vehicle on field	SI/DSI/Vehicle vendor should also have the access to following information at all times for better fleet management:  State of the vehicle (empty/full) Details about driver (name, phone number) Type of waste being carried (dry/wet/mixed) Source of waste (Household/hotel/garden/C&D)

9	Coverage vehicles	A coverage report should be sent to SI/DSI and other stakeholders for all the vehicles. Vehicles not covering all the spots (as per the route planned in the morning) should be highlighted.
10		<p>The System Integrator should ensure that the collection points, feeder points, ramp, twin bins, Processing plants and SLF shall be geofenced in the application to ensure that the vehicle has visited the collection point.</p> <p>The System Integrator should prove the analytics layer which shall be utilized for the VTS data for more actionable insights on fleet management and operational improvements</p>
11	Vehicle Master Data Management	<p>The ISWM shall have a robust Master data and Transactional data for the vehicles. This shall , at a minimum, include:</p> <ul style="list-style-type: none"> <li>a. Preventive maintenance</li> <li>b. Breakdown maintenance</li> <li>c. RTO passing alerts</li> <li>d. Vehicle history such as purchase year, cost, depreciation, insurance etc</li> <li>e. Painting/ washing/ cleaning schedules and alerts</li> <li>f. Other vehicle related data management</li> <li>g. Fuel data consumption monitoring and analytics for the same</li> <li>h. Daily utilization Data management for Backhoe loaders</li> </ul>
12	Vehicle optimization	The ISWM system shall have a module for analysing the vehicle movement data, optimize the vehicle routing based on actual data, historical data, traffic data etc. The System integrator shall provide a GIS map based interface to analyse the vehicle data for any deviations such as route not followed, movement outside any geofenced areas, unwarranted stops beyond stipulated time etc.

#### 5.2.24 Fine for various offences under the SWM rules

SWM department levies fines for offences such as use on single use plastic, littering, non segregation etc. The fines for each of the offences has been defines for first time offenders as well as repeated offenders. It is important to capture the details of such offenders and also the fine collection data for better fine management.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Fine Management	Offender identification and challan management	<p>SWM department charges fines against various types of offences by citizens. There is also a provision for higher fines for repeated offenders.</p> <p>The ISWM system shall have a module to manage these fines. It shall allow the SI/DSI to capture the particulars of the offender (Name, mobile no), assign a type of fine, capture the details of the paper challan generated and fine collected. The system shall generate the fine amount based on the master data for each type of fine. The system shall also send a SMS to the offender with details of offence and payment made.</p> <p>The system shall have a provision to identify a offender as a repeat offender and the system shall auto populate the fine for such offence based on the prevailing rules of SWM department.</p> <p>There The system shall have provision to create new assets (point and polygon) and monitoring of operation and maintenance of such assets. This may include new plants, new ramps, water bodies, new CT PT etc. The same functionality can also be used to monitor SBM related aspects such as beautification across wards, IEC banners and its management.</p>

#### 5.2.25 Community Toilet (CT) and Public Toilet (PT) cleaning monitoring

SWM department is responsible for regular cleaning of the CT POTs across the city. The CT PTs are to be cleaned as per a predefined schedule. To keep them usable at all times.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
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1	CT PT cleaning and monitoring	As CT PT operation and maintenance is an important part, the System Integrator shall ensure that ISWM shall be useful for this also. The envisaged system shall include attendance, cleaning schedule preparation and monitoring of geofenced CT PTs, grievance redressal mechanism for CT PTs, vendor and contract management, log books management etc.
CT PT cleaning		

#### 5.2.26 Contract Management, Billing System and Payroll Module:

As of today, SWM department needs to deal with multiple vendors (ex: vendor providing processing capacity, vehicle, contract employees and other materials and services) holding different types of contracts. Maintaining these contracts and making payments to these vendors by verifying all the terms is a humongous task. Moreover, the higher-ups in the department have very less visibility in terms of vendor payments.

Challenges and functional requirements:

#	Theme	Feature/Module	Functional Requirements
1	Contract Management	Creating the Contracts on ISWM system	<p>Engineers in SWM department should be able to create all contracts in digital format. Engineers should be able to input all the important elements of the contracts (which include but not limited to):</p> <ul style="list-style-type: none"> <li>Vendor ID (serialized) and Vendor name</li> <li>2) Product/service supplied (should be a dropdown to select)</li> <li>Period of the contract</li> <li>Start and end date</li> <li>Estimates</li> <li>Approved DSRs</li> <li>7) Basis of payment (on tonnage of waste processed, no. of trips, kms travelled, no. of people, etc.)</li> <li>8) Terms of payment (linear, slab-wise, payment frequency, penalties)</li> <li>Other terms and conditions</li> <li>This shall be integrated with the MM Module of the ERP system of PMC</li> </ul>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

	2	Revoking contract	Engineer should have an option to revoke a contract by providing a valid reason
	3	Information capture	The ISWM system should capture all the information about contracts which includes but is not limited to: Payment History Payment delays Breach in terms of contracts (ward-wise, month-wise) Any exception made by any user for approval
4	Billing system	Approval Flow	All the approval flows need to be digitized and the alerts for the same should be available on mobile apps of the designated approver. Approver should be able to approve/reject a bill for payment.
5		Integration with existing ERP system	The System Integrator to ensure that the ISWM system is integrated with the ERP system of PMC.
6	Payroll system	Digitizing payroll	As of now, salaries payment of workers is based on manual records. SI/DSI gives the attendance report to engineer who approve the same and forward it to clerks followed by audit department. After approval from audit departments, the same report goes to payment department and salary is processed. The complete flow with all the approvals needs to be digitized. The clerk should be able to generate and automated report after all the approvals which can directly be submitted to audit department for further approvals and payments
7		Integration with attendance management module	The payroll module needs to be integrated with attendance management module. It should take in account the no of days a worker is absent and reconcile with the leaves available with the workers and generate the salary reports accordingly. The complete hierarchy involved in the approval flow should be able to view these details for every worker.
			Payroll module shall be expanded to include the entire workforce (permanent and contractual) management which shall include attendance, service data, benefits extended and other

		HRMS functionalities. The data integration related to payroll and ERP with ISWM to be shall be ensured by the SI.
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#### 5.2.27 MIS and Dashboard Requirements:

Employees of SWM should have access to various dashboards based on their ranks and designated areas. All the key KPIs should be available in the dashboard for monitoring the performance.

Challenges and functional requirements:

#	Theme	Feature	Functional Requirements
1	MIS and dashboarding Requirements	Role Based Access Control	<p>The dashboard and MIS should have different set of information for people of different ranks.</p> <p>1) Master dashboard and MIS for HOD which provides high level information like total vehicles deployed, total manpower deployed, total garbage collected (wet/dry/Hazardous/sanitary etc.), , total grievances reported and resolved, ranking of wards based on certain KPIs</p>
			<p>2) Area-wise dashboard and MIS showing the above information ward-wise and Prabhag-wise.</p> <p>3) The operators should be able to get drilled down information on these parameters (vehicle-wise, area-wise, nature of grievances, type of resolution, etc.)</p>
2	Processing unit's performance	Vehicle performance	<p>Following information will be required under this section of the dashboard and MIS:</p> <ol style="list-style-type: none"> <li>1. No. of trips</li> <li>2. Amount of waste picked up</li> <li>3. Percentage coverage in the designated routes</li> <li>4. Live Locations</li> <li>5. Unloading stations</li> <li>6. Vehicle performance analytics</li> </ol>
			<p>Following information will be required under this section of the dashboard and MIS:</p>

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

3	module	<ul style="list-style-type: none"> <li>1) Working status of ramps, processing plants and SLF</li> <li>2) Waste processed by these units on daily, weekly &amp; Monthly basis</li> <li>3) Average waiting/queuing time for these sites.</li> <li>4) Data related to input waste, out put generated and reject generated</li> <li>5) Data related to by products generated and sold</li> </ul>
4	Workforce Management Module	<p>Following information will be required under this section of the dashboard and MIS:</p> <ul style="list-style-type: none"> <li>1) Ward-wise reports on absenteeism</li> <li>2) No. of permanent employees and contracted employees</li> <li>3) Route coverage by these employees</li> <li>4) Defaults and frauds on attendance by workers</li> </ul>
5	Ranking of wards and employees	<p>Performance management dashboard and MIS will be required to rank various wards and employees. This will be used by SWM department to create healthy competition among the wards by generating cleanliness scores based on parameters like timely pickup, grievances reported and resolved, percentage coverage for waste pickup, etc.</p>
6	Contracts, Billing, Payment and Payroll	<p>Following information will be required under this section of the dashboard and MIS:</p> <ul style="list-style-type: none"> <li>1) Payment made (with drill down on terms &amp; conditions of contracts)</li> <li>2) Bills raised</li> <li>3) Payments delayed (with reason, bottlenecks)</li> <li>4) Salaries paid (with drill down on attendance)</li> <li>5) History (payments, vendors, salaries)</li> <li>6) Performance of vendors (based on SLA breach, coverage)</li> <li>7) Age of pending approvals at any stage</li> <li>8) A comprehensive analytics engine with visualization module shall be provided by the SI.</li> <li>9) The ad hoc analysis based on various data points.</li> </ul>

7

Overall analytics for Decision Support

The system shall allow the user to use the data to arrive at useful insights. Thus, the requirement is to have a system level big data analytics engine with capability to handle large, complex and real time data. The alert management can be used where alerts can be sent based on the requirements and has an escalation mechanism.

The system shall have provision to mark building/ institutes as BWGs and also to monitor if collection is done at these BWGs. The system shall be used to stop waste collection at the BWGs as these BWGs are supposed to process their own wastes.

The system shall have provision to create ward/ prabhag on a GIS maps and a provision to analyze the data at the ward/ prabhag level.

The system shall also have a provision to create various areas such as public areas, gardens, Commercial areas etc as per the Swach Survekshan requirements, be integrated into the cleaning schedule and data available for analysis based on parameters such as frequency of cleaning, time of cleaning etc

The fleet management shall also include the Desludging vehicles and the operations of these vehicles such as scheduling, monitoring and fee collection.

The system shall also have provision to geocode/ geofence HH as home composting HH and the system shall have provision to analyse waste collection from these HHs.

		<p>The system shall have a GIS based interface for management of such assets and an asset management system. The system shall have provision to analyse GVPs based on historical data. It shall also allow to import any new GVPs in the system and allow monitoring of these GVPs over a period of time. The system shall have the capability to integrate with PMC's Document Management System that can handle various documentation associated with each asset. The assets may include Vehicles, Processing plants, Ramps/Transfer stations, SLF, CT PTs etc. The PMC's DMS shall be used for all the data management and to comply with regulatory requirements such as MPCB compliances, Swach Survekshan, NGT etc.</p>
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#### 5.2.28 Campaign Movements:

PMC, under various programs, runs campaigns in Pune focused on solid waste management. This module should help stakeholders create campaigns across the city and rank different wards and personnel based on the performance in their area.

Challenges and functional requirements:

1	Campaign Management	Creating Campaigns	<p>Engineers/HOD should be able to create campaigns on ISWM system based on the requirements. They should be able to post awards, chose/create key success metrics, define timelines, select wards/areas in which the campaign is to be launched and post awards for these campaigns.</p> <p>The creator should be able to modify the campaigns, send notifications on completed, current and upcoming campaigns.</p>
2		Accessing Campaigns	<p>SI/DSI and Mokadams should get these campaigns (like anti-spit, plastic ban etc) on their system/mobile app if their area is a part of the campaign. They should be able to input information with an option of attachment and text.</p> <p>Ex: They should be able to upload information like fines issued, offenders confiscated, etc.</p> <p>These users should be able to record their daily/weekly achievements through the campaign. Also, users should be able to see the performance of other wards to analyse how are they performing with respect to others.</p>

## Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

3	Rewards and Recognitions	Leader-board	Ranks of different ward people in a campaign should be displayed. Campaign creator and other selected users in his rank should be able to see the leader-board of on-going and completed campaigns.
4	Declaration of winners		There should be a functionality to declare winners for a campaign based on the pre-decided metrics or otherwise.
5	Dashboarding and MIS requirement	Availability of information	All the information related to campaigns should be available on live dashboards and MIS. Dashboards should have a list of all campaigns (completed, ongoing and upcoming) and user should be able to drill down for details.

### 5.2.29 Design and Implementation

The selected Systems Imtegrator shall be responsible for the following:

Design, develop and Implement the Software Solution as per the requirements of PMC. The Bidder will ensure that the good practices and GoI (Government of India) guidelines for Software Development listed below as well as localization are used during the software design, development/customization and implementation phase. In case, if Business Process Re-engineering (BPR) is required to for value addition like process simplification or cost saving, then the details of BPR shall be approved by PMC before implementation.

Sr. No	Name of guideline	Description	Requirement
1	Localization & Language Technology Standard	Best Practices For Localization of e-Governance applications in Marathi and English Languages for web and mobile applications and software must support Unicode for data entry in Marathi language.	Mandatory
2	Policy on Adoption of Open Source Software for Government of India	Adoption of Open Source Software in all e-Governance systems implemented by various Government organizations, as a preferred option in comparison to Closed Source Software	Mandatory
3	Guidelines for Indian Government Websites (GIGW)	These Guidelines address the entire lifecycle of a website, web portal/application right from its conceptualization to design, development, maintenance and management	Mandatory
4	Web Content Accessibility Guidelines (WCAG) 2.0	The WCAG documents explain how to make web content more accessible to people with disabilities	Mandatory
5	Cloud computing policy	State departments shall explore cloud computing as a preferred way for implementing all e-Governance project(s)	Mandatory
6	eGovernance Standards	Website should be in compliance with eGovernance Standards of Government of India	Mandatory

7	Interoperability Framework for e-Governance (IFEG)	Technical Standards for Interoperability Framework for e-Governance (IFEG) in India Version 1.0 or higher	Mandatory
8	MDDS	Demographic Standards ,Character Encoding, Font Standard, eGov.BIDS	Mandatory
9	eSAFE	eSAFE-ISF01, eSAFE Framework (and associated documents) or higher	Mandatory
10	Digital Signatures	Digital Signatures in e-Governance software	Optional
11	Open standard Framework	Open Standards for e-Governance, Framework for Mobile Governance	Mandatory
12	e-Governance policies	e-Governance policies of Government of Maharashtra	Mandatory
13	Other e-Governance standards	Other e-Governance standards of Government of India (egovstandards.gov.in)	Mandatory
14	Technology stack	Details of the website such as Operating System, Database used, Web Servers used, Data Storage required, architecture, functionality, framework used etc. needs to be provided to DIT/SDC for due scrutiny as and when asked for by DIT	Mandatory
15	Security Audit	Security audit to be performed through CERT-IN empaneled agency.	Mandatory

5.2.30. SI has to conduct the complete GIS survey of all the Points of Interest (POIs) for PMC.

POIs are as follows:

1. Sweeping Points or clusters
2. Routes of Vehicles – Primary & Secondary
3. Routes Covered by Sanitation Workers – Collectors & Sweepers
4. CT/PT, GVPs, Bins, Wards Boundaries & Prabhag Boundaries

After Survey, SI will be responsible for providing the shape files of the collected GIS Data to PMC and integrate the same with the ICT based SWM Web Application.

### 5.3 Technical Specification and Standards

#### 1. Data Ownership

- (i) All the data created as a part of the project shall be owned by PMC. The SI shall take utmost care in maintaining security, confidentiality and backup, as required, of this data. Access to the data / systems shall be given by the SI only as per the IT Security Policy, approved by PMC, as amended from time to time. PMC's authorized representative(s) shall be entitled to conduct periodic / surprise security reviews and audits, to ensure the compliance by the SI's vendor to data / system security and SI must provide reasonable assistance to PMC in conducting such reviews or audits.
- (ii) SI undertakes that any data of users or the system or of any parameters that is collected in the process of implementation and/or operation of the project shall not be used for any purpose

other than bona fide requirements for implementation and operation, for which PMC may grant a prior written permission to undertake the same.

- (iii) SI undertakes to take the permission of any user of the service for sharing with PMC and its affiliates and associates, any data collected electronically including sensitive information as contemplated under the Information Technology Act 2000

2.

### **Cloud Service Specifications**

The infrastructure of the application should be cloud & related services agnostic. Standard protocols will be followed by CSP (Cloud service provider) as per the Industry Standards and MeitY / GoM Cloud guidelines for the following:

- Computer
- Networking
- Storage – Block Storage
- Storage – Object Storage
- Storage – File Storage
- Relational Database
- Non-Relational Database
- Security and administration
- Deployment and Management
- Application Services
- Hybrid Integration

Minimum Support that will be required from CSP

S. No	Requirement	Description
.	Monitoring tools	Monitoring tools that will enable collection and tracking me collection and monitoring log files, set alarms, and automatically react to changes in the provisioned resources. The monitoring tools should be able to monitor resources such as compute and other resources to gain system-wide visibility into resource utilization, application performance, and operational health.

Governance & Compliance	Able to define guidelines for provisioning and configuring cloud resources and then continuously monitor compliance with those guidelines. Ability to choose from a set of pre-built rules based on common best practices or custom rules (e.g., ensure Storage volumes are encrypted, Compute instances are properly tagged, and Elastic IP addresses (EIPs are attached to instances and continuously monitor configuration changes to the cloud resources and provides a new dashboard to track compliance status.
Audit Trail	Provide Audit Trail of the account activity to enable security analysis, resource change tracking, and compliance auditing
Service health dashboard & SLA history	& Cloud service provider should offer 365 days' worth of Service Health Dashboard (SHD) history and SLA monitoring reports
Service to compare Resource usage to best practices	Cloud service provider should offer a service acts like a customized cloud expert and helps provision resources by following best practices.
Performance Management	Cloud service provider shall provide the required tools to monitor the service level KPIs as indicated in the RFP

### 3. Deployment of IT Infrastructure

The Primary data and disaster recovery for the data should be hosted at cloud data centre. SI can

- propose to host at ESDS cloud (<https://www.esds.co.in>), who is currently providing colocation, managed hosting and cloud services to PMC and is empanelled by MeitY / GoM Cloud .

Hosting Model adopted by SI	Primary data (DC)	Primary data (DR)
ISWM solution hosted at Cloud environment (MeitY / GoM Cloud empanelled)	At hosted cloud environment	Alternative cloud environment from same CSP (complied with MeitY / GoM Cloud guidelines) other than ISWM solution hosted on the cloud environment

- SI shall provide the sustainability plan for each of the subsystems and solution provided as part of his scope of work. The format of the data transmitted from the cloud service provider to the SCOC / Cloud should leverage standard data formats (e.g., OVF...). The format will be finalized by the PMC. The duration for which the data shall be stored in the operational data store would be 6 months. However, the data storage in the back-up would be 3 years (till project contract period). Data shall be made available and accessible by SI at any point of time through the data recovery process.

#### 5.4 Hosting policy

1. The Bidder shall host the complete solution on Maharashtra Government Cloud as per guidelines issued by DIT GRs at their own cost
2. The Bidder shall notify the client for new Cloud server and other system software patch updates; Client / application provider has to test the patches for application compatibility and intimate Bidder to roll-out the same. Major patching / update which requires system downtime has to be informed well in advance and should be undertaken only after PMC confirmation.
3. The Bidder should provide adequate security framework to ensure the security of the application hosted in DC and DR.
4. The Bidder should have a governance structure in place to report to PMC's team on daily, weekly and monthly basis and the solution should allow downloading of standard and custom reports on the monitoring status and provide web-based monitoring tools for system user hits, traffic, bandwidth etc.
5. The managed services provider shall provide monitoring alerts on real-time basis on web-based console via SMS and via email for firewall / Bandwidth usage
6. All Security Requirements like HTML/ SQL Injections, application of Stored Procedures etc. should be taken care of.

#### 5.5 Change Management & Analytics

The success of the project depends on the proper project planning and management. At the onset, the Service Provider shall plan the project implementation in detail and shall provide a micro level view of the tasks and activities that it is going to undertake in consultation with PMC. An indicative list of planning related documentation that the Service Provider should make at the onset is as follows:

- **Project Schedule:** A detailed week-wise timeline indicating various activities to be performed along with completion dates and resources required for the same.
- **Manpower Deployment List:** List and number of all manpower that will be with the task assigned to each. Roles and Responsibilities of every type of manpower should be mentioned.
- **Progress Monitoring Plan:** Detailed Daily, Weekly, Monthly Progress Report formats along with issue escalation format. The format will be approved by the Corporation to the successful Bidder before start of the project.
- **Escalation Matrix and Incident Management:** A detailed list of key contact persons with contact details with escalation hierarchy for resolution of issues and problems. This has to be via an Incident Management system.

##### 5.5.1 User Training

The service provider shall conduct training sessions, explaining the DMS system and its features. The training material will be provided by the Service Provider. Hands on training sessions should be of about half-day Issued by Pune Municipal Corporation

duration and shall be conducted at locations across PMC. The training should be at no extra cost to PMC. The service provider shall also provide searchable help content to all the users. All training materials, videos, help content shall be provided in hard copy as well as soft copy (per user copy for department of municipal secretary) and shall be provided in both English and Marathi language only. Training is expected to be imparted only once to the identified participants.

- Training could have multiple sessions as per the need and requirement of the PWC. Hence, the Bidder shall conduct Training Needs Analysis of all the concerned staff and drawing up a systematic training plan.
- The Bidder shall provide “Train the Trainer” training to the core group of PMC team. They will also involve core group members through process of SRS preparation, testing phase and implementation phase.
- The Bidder shall provide training to all staff of PMC team at own cost. They will also involve core group members through process of SRS preparation, testing phase and implementation phase.
- The bidder shall also plan out for Annual Refresher Trainings for key training programs, which shall require additional knowledge of key changes in the existing system from time-to-time as required by PMC.
- The space and requisite training infrastructure like seminar hall/computer lab, projector with screen shall be provided by PMC. The training shall be conducted at all offices of PMC.
- The Bidder shall be responsible to arrange laptops (for presentation and demo), hotspots, dongle for connectivity (if required) and transportation at his own cost.
- The Bidder should provide training literature in the form of manual and audio-visuals.

Note: *Approximate number of trainees per session shall be 20 which is subjectable to change.*

#### **5.5.2 Analytics**

The service provider shall provide personnel for performing analytics on the collected dataset for a period of 1 year from the date of work order. The provided resource or personnel shall be capable of providing analytical reports as mentioned and required in the RFP.

### **5.6 Work Completion, Timelines and Payment Terms**

List of the broad activities to be carried out by the Systems Integrator and the timelines from the date of Work Order are given in the table below. “T” stands for the date of issue of the Work Order, “T1” stands for date of completion of 'on-site technical support' phase.

Modules to be prepared:

1	Households/ Commercial waste collection
2	HHs/ Public and Market areas sweeping
3	Hotel, Garden, Slaughterhouse Waste, Bio-waste and any other specialized waste such as e Waste collection
4	Construction and Demolition (C&D) Waste Collection:

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

5	Ramp and Processing Plant Operations:
6	End to End Fleet Management
7	Fine for various offences under the SWM rules
8	Community Toilet (CT) and Public Toilet (PT) cleaning monitoring
9	Contract Management, Billing System and Payroll Module:
10	MIS and Dashboard Requirements
11	Campaign Movements:

No.	Activities	Timelines
1.	<ul style="list-style-type: none"> <li>Mobilization of resources, Preparation of detailed Project plan and Inception report</li> </ul>	T + 2 weeks
2.	<ul style="list-style-type: none"> <li>Requirement gathering analysis; (Only for ABB area)</li> <li>Study of existing processes, integrations, current system Architecture;</li> </ul>	T + 4 weeks
3.	<ul style="list-style-type: none"> <li>Install and set up the Command Control Center</li> <li>Finalize functional requirements, Finalize reporting formats / Base Rules</li> <li>Define To-Be Architecture, integrations &amp; processes</li> <li>Procurement of Hardware for ABB area</li> </ul>	T + 6 weeks
4.	<ul style="list-style-type: none"> <li>Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Aundh Baner Balewadi (ABB) area with modules 1 to 6 (Pilot Project)</li> <li>Requirement gathering for remaining Zone 2 (Ghole Road and Kothrud Ward Office)</li> </ul>	T + 8 weeks
5.	<ul style="list-style-type: none"> <li>Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP for Ghole road and Kothrud wardoffice(Zone 2) with modules 1 to 6</li> <li>Requirement gathering for Zone 1 (Yerwada, Nagar Road and Dhole Patil Ward Office)</li> </ul>	T + 10 weeks

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

6.	<ul style="list-style-type: none"> <li>• Complete Module 7</li> <li>• Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP for Zone 1 with modules 1 to 6</li> <li>• Requirement gathering for Zone 3 (Warje, Sinhagad Road and Dhankavadi Ward Office)</li> </ul>	T + 12 weeks
7	<ul style="list-style-type: none"> <li>• Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP for Zone 3 with modules 1 to 6</li> <li>• Requirement gathering for Zone 4 (Kondhwa Yevalewadi, Wanavadi and Hadapsar Ward Office)</li> </ul>	T + 14 weeks
8	<ul style="list-style-type: none"> <li>• Complete Module 8</li> <li>• Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP for Zone 4 with modules 1 to 6</li> <li>• Requirement gathering for Zone 5 (Kasba Vishram, Bhavani Peth and Bibwewadi Ward Office)</li> </ul>	T + 16 weeks
9.	<ul style="list-style-type: none"> <li>• Complete Module 9</li> <li>• Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP for Zone 5 with modules 1 to 6</li> </ul>	T + 18 Weeks
10.	<ul style="list-style-type: none"> <li>• Complete Module 10 &amp; 11</li> </ul>	T + 20 weeks
11.	<ul style="list-style-type: none"> <li>• Capacity Building for remaining users</li> </ul>	T + 22 weeks
12.	<ul style="list-style-type: none"> <li>• Final Acceptance Testing which includes Beta-testing (including but not limited to performance, security and functional testing) for 28 days</li> </ul>	T + 26 weeks
13.	<ul style="list-style-type: none"> <li>• Go Live</li> </ul>	T1 (T + 26 weeks)

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

14.	On-site technical support (T1)	T1+ 1 Year
15.	Off-site technical support	T1+3 years

### 5.7 Payment Terms

Payment schedule towards the project implementation and post implementation shall be as follows and will be done in INR:

The total fees quoted by the bidder will be divided into parts as below:

No.	Milestone	Payment in pre-implementation period (% in Bidder's Estimate)	Payment in post-Go Live (% in Bidder's Estimate)
1	Mobilization advance against equal amount of Bank guarantee from Nationalized Bank	10% of Serial No. 2 & 3A of Commercial Bid	
2	ABB Pilot project implementation and Setting up of Command Control Center	15% of Serial No. 1A & 75% of Serial No. 3A of Commercial Bid	Nil
3	Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Zone 2	75% of Serial No. 2 of Commercial Bid (for quantities of zone 2) 20% of Serial No. 5 of Commercial Bid	Nil
	Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Zone 1	15% of Serial No. 1A and 75% of Serial No. 2 of Commercial Bid (for quantities of zone 1) 20% of Serial No. 5 of Commercial Bid	

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

4.	Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Zone 3	15% of Serial No. 1A and 75% of serial No. 2 of Commercial Bid (for quantities of zone 3) 20% of Serial No. 5 of Commercial Bid		Nil
	Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Zone 4	15% of Serial No. 1A and 75% of 2 of Commercial Bid (for quantities of zone 4) 20% of Serial No. 5 of Commercial Bid		
	Implementation of ISWMS - Supply, installation and commissioning of Hardware and training as per the scope of the RFP in Zone 5	15% of Serial No. 1A and 75% of Serial No. 2 of Commercial Bid (for quantities of zone 5)		
5.	Go Live as per Milestone No. 13 from Section 5.6	Remaining 15% of 3A of Commercial bid		NIL
6.	Capacity Building of Remaining users	Remaining 10% of Serial No. 5 of Commercial Bid		
	During Off-site technical support as per Milestone No. 14 & 15 from Section 5.6 (for duration of 12 quarters)	NIL	Commercial bid Serial No. 1B, 3B, 4 and Remaining 15% of Sr. No. 2, 25% of 1A and 10% of 5 of Commercial Bid, Equally divided in	



**Notes**

1. The above payments are subject to meeting of pre-implementation and post-implementation SLA's, failing which the appropriate deductions as mentioned in the SLA criteria of this RFP.
2. Only complete calendar month will be considered for claim of post implementation payment. Schedule of the payment will be quarterly basis ending last day of 3rd month.
3. Payment under respective milestones will be on the basis of completion of entire scope of work and no payment will be made on partial work completion. However partial payment may be considered at discretion of PMC if the project timeline is extended beyond the schedule implementation & roll-out plan under Appendix D due to non-availability of facility from PMC/ PMC side. The Systems Integrator shall not be paid for any unforeseen or unintended costs or expenses
4. Definition of System up and running: All software, services under the scope are developed, supplied, installed, commissioned, integrated with IT system and hardware equipment at the limited facilities shortlisted by PMC/PMC , Further, all the users who are the part of limited user groups are trained by the SI and all the bugs identified as a part of UAT are resolved
5. Definition of Go-live: All software, services, Hardware under the scope are developed, supplied, installed, commissioned, integrated with IT system and hardware equipment at each facility, calibrated, configured, integrated with third party systems as applicable, tested, demonstrated and accepted to PMC, PMC, and third-party audit agency. All points under AT are rectified and re-demonstrated to PMC, PMC, TPA for their completion satisfaction. All documentation submission including as -built drawings, revised documentation including changes if any, source code, licenses, user and operational manuals and training is completed as per RFP. Go-Live shall occur in respect of the System when,
  - (a) the Final Acceptance Tests, as specified in the agreed and finalized project plan have been successfully completed; or
  - (b) the Final Acceptance Tests have not been successfully completed or have not been carried out for reasons that are attributable to the Purchaser within a period of fifteen (15) days from the date of installation or any other agreed-upon period; or
  - (c) the Purchaser has put the System into production or use for 60 consecutive days. If the System input into production or use in this manner, the System Integrator shall notify the Purchaser and document such use.
6. At any time after any of the events set out in Clause above have occurred, the System Integrator may give a notice to the Purchaser requesting the issue of a Final Acceptance Certificate.

7. After consultation with the Purchaser, and within fourteen (14) days after receipt of the System Integrator's notice, the Purchaser shall: issue a Final Acceptance Certificate; or notify the SI in writing of any defect or deficiencies or other reason for the failure of the Final Acceptance Tests; or
8. The SI shall use reasonable endeavours to promptly remedy any defect and/or deficiencies and/or other reasons for the failure of the Final Acceptance Test that the Purchaser has notified the SI of. Once such remedies have been made by the SI the SI shall notify the Purchaser, and the Purchaser, with the full cooperation of the SI shall use reasonable endeavours to promptly carry out retesting of the System or Subsystem. Upon the successful conclusion of the Final Acceptance Tests, the SI shall notify the Purchaser of its request for Final Acceptance Certification, in accordance with sub clause (b). The Purchaser shall then issue to the SI the Final Acceptance Certification in accordance with sub clause (c), or shall notify the SI of further defects deficiencies or other reasons for the failure of the Final Acceptance Test. The procedure set out in this sub-clause (d) shall be repeated, as necessary, until a Final Acceptance Certificate is issued.
9. If the System or Subsystem fails to pass the Final Acceptance Test(s) in accordance with these provisions Clause referred above in RFP, then either:  
the Purchaser may consider terminating the Contract, pursuant to termination provisions;  
or  
if the failure to achieve Final Acceptance within the specified time period is a result of the failure of the Purchaser to fulfil its obligations under the Contract, then the SI shall be deemed to have fulfilled its obligations with respect to the relevant technical and functional aspects of the Agreement.

## 5.8 Service Level Agreements

Service Level Agreement (SLA) shall become the part of Agreement between PMC and the SI. SLA defines the terms of the SI's responsibility in ensuring the timely delivery of the deliverables and the correctness of the same based on the agreed Performance Indicators as detailed in this section. The SI must comply with Service Levels requirements to ensure adherence to Project timelines, quality and availability of services.

PMC reserves right to amend SLA matrices on basis of change of scope at the time of award, signing of contract or during implementation phase.

The SI has to provide required software and automated tool without extra cost for the measure all the parameters under SLA performance. Bidder to propose the details as a part of technical proposal. The proposed software and tool should be usable independently by PMC

## Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

Note: Liquidated Damages shall not be levied on the SI in the following cases:

- (i) There is a Force Majeure event effecting the SLA which is beyond the control of the SI.
- (ii) The non-compliance to the SLA has been due to reasons beyond the control of the SI.

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service which shall be provided by the System Integrator to PMC for the duration of this Agreement.

### 5.9 SLA Management

- i. The Bidder shall provide proper plan, resources and escalation procedure for the purchaser to report problem case or support request during the warranty periods.
- ii. The Bidder shall act as a single point of contact and follow-through with the principals of any third-party providers until the successful resolution of the case.
- iii. The support hours for the software shall be:

Mondays to Friday: 08.00am to 08.00pm

(Excluding Sunday and Public Holidays)

- iv. The Bidder's key personnel shall be contactable at all times via phone. The Bidder's key personnel shall be on-site to handle severity level 1 problems.
- v. Upon notification of the problem, the Bidder's personnel must respond within the required time specified in this tender during the support hours of the systems.
- vi. The definition of the Priority level is as follows:

Priority Level	Description	Phone/E mail Response Time <sup>1</sup>	Resolution Time <sup>3</sup>
P1	Causes severe loss of service. Affect the business operation continuity or unable to process critical functions	1 hour	Within four (4) hours on report of problem
P2	Causes minor loss of service. Affect a particular work area, but can continue to use for the other work areas using temporary work around solution	2 hours	Within one (1) working day on report of problem

P3	Causes no loss of service.  The impact is an inconvenience, which may require a workaround to restore the functionality.	4 hours	Within three (3) working days on report of problem
----	--	---------	--

### 5.10 SLA measurement and monitoring

The users of the system shall report the identified bug / problem/ non-functional component to the successful Bidder through telephone / email / letter / verbally/ SLA monitoring tool. Resolution time expected for various IT Components is given in the table below. Penalty shall be considered for the official working hours only (i.e. 8:00am to 8:00 pm). Vendor need to either fully repair or replace the component by temporary substitute (of equivalent configuration) and make it functional (from the entire system perspective) within the expected resolution time. The following table defines the SLA requirements for all project components as per the services:

The total outage minutes shall exclude all planned maintenance activities.

### 5.11 Warranty

The Bidder should provide warranty for a period of 12 months after operational acceptance. Operational acceptance would be provided by the project committee. As part of the warranty services the Bidder shall provide:

- i. All upgrades and updates to the software and related components (version update, security patch, etc.) (Standard as well as product) earliest possible and not later than 3 months from release of new version at no additional cost during the entire contract period.
- ii. The Bidder further warrants that the software supplied under this Contract shall be free from all defects/faults arising from design, development or from any act or omission of the Bidder.
- iii. The Purchaser shall promptly notify the Bidder of any bugs arising under the warranty period.
- iv. Support in smooth functioning of the applications.
- v. E-mail based / Telephonic support on the usage / issues of the system.
- vi. The Bidder shall maintain data regarding entitlement for software upgrades, enhancements, refreshes, replacements and maintenance.
- vii. Bugs fixing shall be done without any extra charge.
- viii. Free onsite Technical Support as and when required.

## 1. DEFINITIONS

1.1. For the purposes of this service level agreement, the definitions and terms are specified in the contract along with the following terms shall have the meanings set forth below:

1.1.1. "Uptime" shall mean the time period for the specified services / software systems with the Issued by Pune Municipal Corporation

specified technical service standards are available to the user department. Uptime, in percentage, of any service / software system can be calculated as:

$$\text{Uptime} = \{1 - [(\text{Downtime}) / (\text{Total Time} - \text{Maintenance Time})]\} * 100$$

1.1.2. "Downtime" shall mean the time period for which the specified services / components with specified technical and service standards are not available to the user department and excludes downtime owing to Force Majeure & Reasons beyond control of SI.

1.1.3. "Incident" refers to any event / abnormalities in the functioning of the Services specified as part of the Scope of Work of the Systems Integrator that may lead to disruption in normal operations of the Surveillance System.

1.1.4. "Helpdesk Support" shall mean the 24x7x365 based support centre which shall handle Fault reporting, Trouble Ticketing and related enquiries during this contract.

1.1.5. "Resolution Time" shall mean the time taken (after the incident has been reported at the helpdesk), in resolving (diagnosing, troubleshooting and fixing) or escalating (to the second level or to respective vendors, getting the confirmatory details about the same from the vendor and conveying the same to the end user), the services related troubles during the first level escalation.

1.1.6. For the ISWM system, SLA would be measure along following parameters:

- (i) Incident Management – SLA\_1
- (ii) Configuration Changes – SLA\_2
- (iii) Uptime of the application – SLA\_3
- (iv) Response time of the ISWM application – SLA4

## 2. MEASUREMENT OF SLA

The key service level requirements for the MWSM system availability need to be ensured by the SI during the warranty period as well as during the operations and maintenance support period. All complaints shall be lodged with the service desk, which will allot ticket number for each complaint indicating location, function, time of registration and severity of the complaint. The performance of the SI in terms of SLA compliance will be measured as per the following:

- (i) The performance of the support shall be tracked on a monthly basis as per the SLA service levels detailed in this section.
- (ii) In case of slip in SLA percentage or service levels for any category of incidents for any month, the SI shall be subjected to liquidated damages as defined in this RFP document.
- (iii) In case of continued low performance of the maintenance & support in terms of meeting the defined SLAs, PMC at its own discretion may consider termination of the support contract.

### 2.1 Categorization, Response and Resolution timelines (SLA\_1 and SLA\_2)

SLA\_1: The incidents are categorized as per the table below:

Level	Criteria	Expected Response and Resolution Time
-------	----------	---------------------------------------

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

Critical	<ul style="list-style-type: none"> <li>• Complete system crash or;</li> <li>• Any incident due to which 50 or more users are impacted or cannot access/use the application software component that is part of proposed solution</li> </ul>	<ul style="list-style-type: none"> <li>• Response Time: During business hours – Within 30 minutes</li> <li>• Resolution Time: During business hours - Within 4 Hours</li> <li>• Response Time: Outside business hours - Within 1 hours or (earlier as per business hours if business hours begin)</li> <li>• Resolution Time: Outside business hours - Within 8 hours or (earlier as per business hours if business hours begin)</li> </ul>
Major	<ul style="list-style-type: none"> <li>• Any incident due to which 5 to 49 users are impacted or cannot access/use the application software component that is part of proposed solution</li> <li>• Any incident which is classified as “Critical” for which an acceptable (as per PMC/SWM/PMC) workaround has been provided by SI</li> </ul>	<ul style="list-style-type: none"> <li>• Response Time: During business hours – Within 1 hour</li> <li>• Resolution Time: During business hours - Within 12 hours</li> <li>• Response Time: Outside business hours - Within 1 hours or (earlier as per business hours if business hours begin)</li> <li>• Resolution Time: Outside business hours - Within 24 hours or (earlier as per business hours if business hours begin)</li> </ul>
Minor	<p>Any incident due to which less than 5 users are impacted or cannot access/use the application software component that is part of proposed solution</p> <ul style="list-style-type: none"> <li>• Any incident which is classified as “Critical”/ "Major" for which an acceptable (as per PMC/SWM/PMC) workaround has been provided by SI.</li> </ul>	<p>Response Time: During business hours – Within 3 hours</p> <p>Resolution Time: During business hours - Within 24 hours</p> <ul style="list-style-type: none"> <li>• Not supported during non-business hours</li> </ul>

## Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

**SLA\_2:** The configuration changes are categorized as below:

<b>Level</b>	<b>Criteria</b>	<b>Expected Response and Resolution Time</b>
Critical	<p>Configuration changes which are critical to day to day operations and requires immediate change. Below mentioned are examples of configuration change at critical level</p> <ul style="list-style-type: none"> <li>● Addition or deletion of an authority level.</li> <li>● Change in tax, payment logic, etc.</li> <li>● Change in SOP with critical (criticality level as defined in categorization of incidents) effect.</li> <li>● Generation of reports from master database</li> </ul>	<ul style="list-style-type: none"> <li>● Response Time: During business hours – Within 30 minutes</li> <li>● Resolution Time: During business hours - Within 12 Hours</li> <li>● Response Time: Outside business hours - Within 12 hours or (earlier as per business hours if business hours begin)</li> <li>● Resolution Time: Outside business hours - Within 24 hours or (earlier as per business hours if business hours begin)</li> </ul>
Major	<p>Configuration changes which are major but not critical to day to day operations and requires immediate change. Below mentioned are examples of configuration change at major level</p> <ul style="list-style-type: none"> <li>● Change in SOP with major (criticality level as defined in categorization of incidents) effect.</li> <li>● Joining of new employee</li> </ul>	<ul style="list-style-type: none"> <li>● Response Time: During business hours – Within 1 hour</li> <li>● Resolution Time: During business hours - Within 12 hours</li> <li>● Response Time: Outside business hours - Within 12 hours or (earlier as per business hours if business hours begin)</li> <li>● Resolution Time: Outside business hours - Within 48 hours or (earlier as per business hours if business hours begin)</li> </ul>
Minor	<p>Configuration changes other than critical and major for day to day operations.</p>	<ul style="list-style-type: none"> <li>● Response Time: During business hours – Within 3 hours</li> <li>● Resolution Time: During business hours - Within 72 hours</li> <li>● Not supported during non-business hours</li> </ul>

In the event of PMC/PMC users not defining the severity for incident, the SI team will analyse the problem and will set appropriate severity to the problem. In case the SI support team does not agree with severity defined by PMC/PMC user then all such disagreements will be discussed with PMC/PMC. In such cases, decision of PMC/PMC shall be final.

### **4.2 Application Availability/Uptime SLA'S (SLA\_3) Following are the requirements for the ISWM application uptime:**

<b>Domain</b>	<b>Minimum Service Level</b>
Integrated ISWM Solution Availability	99%

Application availability/Uptime is defined as:  $\{( \text{Scheduled operation time} - \text{Application downtime}) / (\text{scheduled operation time})\} * 100\%$

Where:

1. "Scheduled operation time" means the scheduled operating hours of the Application for the month. All planned downtime on the system would be deducted from the total operation time for the month to give the scheduled operation time.
2. "Application downtime" subject to the SLA, means accumulated time during which the Application is not available to the PMC's users or external users due to in-scope system or infrastructure failure, and measured from the time PMC/PMC or its personnel or a call with the Vendor help desk of the failure or the failure is known to the Vendor from the availability measurement tools to the time when the Application is returned to proper operation.
3. The business hours are 5 AM to 9 PM on any calendar day the PMC office is operational. The vendor however recognizes the fact that the vendor might require working beyond the business hours and holidays on need basis.
4. Uptime will be computed based on availability of the applications to the PMC's users irrespective of availability of servers either individual servers/clusters. Also, noncompliance with performance parameters and system / service degradation will be considered for downtime calculation.
5. Service Levels should be complied with irrespective of the customizations that the applications would undergo during the entire contract period.

### 2.3 Performance SLA'S (SLA\_4)

Below is the set of Performance SLAs applicable to the integrated ISWM solution:

Measurement	Minimum Service Level
End to end response time should be < 2 seconds (end user to core application and back)	99%
End to end response time should be < 4 seconds (end user to core application to and integrated system and back) Ex 1: A user transaction which involves ISWM system talking to an external system like VTS Ex 2: A user transaction which requires ISWM system to exchange information from Swachhata app	99%
Support 500 concurrent users for access to the M SWM application	99%

### 2.4 Liquidated Damages

The SI shall be subjected to the following damages in case of inability to meet the requirements. The total liquidated damages shall be subject to a ceiling of 10% of the quarterly payment. If the total liquidated damages across all SLA's (SLA\_1, SLA\_2, SLA\_3 and SLA\_4) comes out to be more than 10% in a quarter, PMC and PMC reserve the right to terminate the contract with the SI.

Non-adherence to overall Project timelines: If the SI fails to achieve the completion of project up to the enhancement and capacity building phase within defined duration, the payment to SI will be liable for deduction @0.5% of the payable amount for the "enhancement and capacity building phase" for each week thereof. Additionally, same damages are applicable if the SI is not able to complete the implementation in the

**Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**

designated time for implementation phase which covers all the functional requirements stated in this RFP and the Functionalities which come up during the requirement gathering phase.

Penalties for Incident Support and configuration changes (SLA 1 and SLA2) SI would publish monthly, and quarterly report of measurements listed above. Penalties would be imposed for not meeting minimum service level of SLA as per the table below:

<b>Level</b>	<b>Minimum Service Level of SLA's</b>	<b>Penalty as a percentage of quarterly support fee</b>		
Critical	SLA compliance between 98% to 95% against total tickets received for this service level	5%	of the payment	quarterly
	SLA compliance Below 95% against total tickets received for this service level	10%	of the payment	quarterly
Major	SLA compliance between 95% to 90% against total tickets received for this service level	3%	of the payment	quarterly
	SLA compliance Below 90% against total tickets received for this service level	5%	of the payment	quarterly
Minor	SLA compliance between 90% to 85% against total tickets received for this service level	2%	of the payment	quarterly
	SLA compliance Below 85% against total tickets received for this service level	5%	of the payment	quarterly

Service Level shall be measured on a monthly basis, but liquidated damages shall be computed and charged at the end of each quarter.

Penalties for Application Availability measurements (SLA3): SI would publish monthly and quarterly reports capturing measurements listed for the ISWM integrated solution availability requirements after the enhancement and capacity building phase. The reports will be vetted by the PMC/PMC staff for their accuracy. Penalties would be imposed for not meeting minimum service level of SLA as per the table below:

<b>Minimum Service Level of SLA's</b>	<b>Penalty as a percentage of quarterly payment</b>
Between 99% to 98%	5% of the quarterly payment
Between 98% to 95%	10% of the quarterly payment

Penalties for performance of integrated ISWM application, dashboards, web application and mobile applications (SLA4):

- (i)      Penalties for breach of response time for user-core application interaction: These are the liquidated damages applicable when ISWM application does not need to interact with a third part application (deployed by PMC) for completing a transaction.

<b>Target</b>	<b>Penalty as a percentage of quarterly payment</b>
<99% and >=95% of the transactions take less than or equal to 2 seconds	2% of the quarterly payment
<95% and >=90% of the transactions take less than or equal to 2 seconds	5% of the quarterly payment
<90% and >=85% of the transactions take less than or equal to 2 seconds	10% of the quarterly payment

(ii) Penalties for breach of response time for user-core application-third party system interaction:

These are the liquidated damages applicable when ISWM application needs to interact with a third part application (deployed by PMC) for completing a transaction.

<b>Target</b>	<b>Penalty as a percentage of quarterly payment</b>
<99% and >=95% of the transactions take less than or equal to 4 seconds	2% of the quarterly payment
<95% and >=90% of the transactions take less than or equal to 4 seconds	5% of the quarterly payment
<90% and >=85% of the transactions take less than or equal to 4 seconds	10% of the quarterly payment

### 3. Planned Downtime

Any planned application / server downtime would not be included in the calculation of application / server availability. However, the SI should take at least 10 days prior approval from PMC/PMC in writing for the planned outage, which should not be for more than 3 hours, would be in non-business hours and limited to maximum two outages in a quarter. In case of planned outages at Data Centre level, services of other Data Centre services to be used to service the clients, while there would be no planned outages for field services.

### 4. PRE-IMPLEMENTATION SLA

Timely delivery of the Scope of Work

<b>Definition</b>	<b>Timely delivery of deliverables would comprise entire bill of material and the application systems, and as per successful UAT of the same.</b>
<b>Service Requirement</b>	All the deliverables defined in the contract has to be submitted On-time as per the timelines mentioned in project schedule.

<b>Measurement of Service</b>	To be measured in Number of weeks of delay from the timelines mentioned in project schedule.
<b>Level Parameter</b>	

## 5. LIQUIDATED DAMAGES

If the stipulated schedule for completion of the Project has been extended by the Client then the Liquidated Damages imposed, if any, shall be returned to the Systems Integrator without any interest payment. In the event the total amount of damages payable by the Systems Integrator to the Client exceeds the Maximum LD Amount, then the Performance Bank Guarantee / Security Deposit paid by the Systems

Integrator shall be forfeited by the Systems Integrator to the extent of amount payable towards Liquidated Damages over the Maximum LD Amount.

The Bidders, Selected Bidder, Systems Integrator as the case may be acknowledges that the Liquidated Damages which are payable under this Section are in the nature of Liquidated Damages and (a) are not a penalty, (b) are fair and reasonable, and (c) represent a reasonable and genuine pre-estimate of the losses that would be incurred by the Client from such delay.

Ajeet deshmukh  
8/2/22

Ajeet Deshmukh

Deputy Commissioner

SWM Department,

Pune Municipal Corporation

SD

**6) Annexure I: Instructions for Pre-Qualification Bid**

**6.1 Pre-Qualification Cover Letter**

(To be provided on the letter head of Bidder)

Date: dd/mm/yyyy

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

**Sub:** Selection of Service Provider for the Project "*Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation*"

**Ref:** Bid No: <No> Dated <DD/MM/YYYY>

Dear Sir, Having examined the bid, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide the professional services as required and outlined in the bid for the Appointment of Provider for the Project "*Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation*".

We attach hereto our responses to pre-qualification requirements and technical and commercial bids as required by the bid. We confirm that the information contained in these responses or any part thereof, including the exhibits, and other documents and instruments delivered or to be delivered to PMC is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead PMC in its short-listing process.

We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the selection process, we are liable to be dismissed from the selection process or termination of the contract during the project, if selected to do so.

We agree for unconditional acceptance of all the terms and conditions set out in the bid document and also agree to abide by this bid response for the bid validity period as mentioned in the RFP. We hereby declare that in case the contract is awarded to us, we shall submit the contract security deposit bond in the form prescribed in the bid.

We agree that you are not bound to accept any bid response you may receive. We also agree that you reserve the right in absolute sense to reject all or any of the products/ services specified in the bid response.

It is hereby confirmed that I/We are entitled to act on behalf of our company/ corporation/ firm/ organization and empowered to sign this document as well as such other documents, which may be required in this connection.

---

Signature of Authorized Signatory (with official seal)

Name : \_\_\_\_\_

Designation : \_\_\_\_\_

Address : \_\_\_\_\_

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

Telephone & Fax : \_\_\_\_\_

E-mail address : \_\_\_\_\_

**6.2 Check-list for the documents to be included in the Pre-Qualification Folder**

#	Pre-Qualification Criteria	Submitted (Y / N)	Documentary Proof (Page No.)
1	Bid Covering Letter		
2	Power of attorney / board resolution to the authorized Signatory of the Bid.		
3	Screen shot of the EMD and RFP fee submitted.		
4	Copy of Certificate of Incorporation.		
5	Copy of the audited financial Statement of the company annual turnover of last three years.		
6	Copy of the audited total turnover, turnover over last 3 FY (2017-18, 2018-19, 2019-20)		
7	Copy of Work Order & Work Completion certificate.		
8	Integrity Pact		
9	Valid Copy of CMMI3 or above Certificate (Or) Valid Copy of ISO 9001:2008 / ISO 9001:2015 Certificate.		
10	Documental proof of GSTN registration.		
11	Declaration regarding blacklisting		

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

**6.3 Bidder's Average turnover, over last 3 FY(17-18, 18-19, 19-20)**

(To be provided on the letter head of Bidder)

Date: dd/mm/yyyy

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for the Project "Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation".

I hereby declare that below are the details regarding Average Turnover, of our company in last three FY.

#	Details	FY 2017-18 (in lacs)	FY 2018-19 (in lacs)	FY 2019-20 (in lacs)
1	Annual Turnover			
2	Net Worth			

Contact Details of officials for future correspondence regarding the bid process:

Details	Authorized Signatory	Secondary Contact
Name		
Title		
Company Address		
Phone		
Mobile		
Fax		
E-mail		

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

Issued by Pune Municipal Corporation

Page 96 of 115

**6.4 Details of Implementation of Projects of similar nature in last 3 years**

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for the Project “Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation”

I hereby declare that below are the details regarding relevant work that has been taken up by our company.

**NOTE: To be filled separately for each project undertaken**

S.No	Name of the Project	Details
1	General Information	
2	Client for which the project was executed	
3	Name & Designation of the client contact person(s)	
4	Contact details of the client contact person(s)	
5	Description of the project	
6	Deliverables of the Bidder	
7	Scanner & Technologies used	
8	Total cost of the project	
9	Duration of the project (number of months, start date, completion date, current status)	
10	Other Relevant Information	
11	Mandatory Supporting Documents:	
12	· Work order / Purchase order / Contract for the project	

13

- Client Certificate giving present status of the project and view of the quality of services by the Bidder

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

**6.5 Self Declaration – No Blacklisting**

(To be provided on the letter head of Bidder)

Date: dd/mm/yyyy

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

In response to the Tender Ref. No. \_\_\_\_\_ dated \_\_\_\_\_ for Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation as an owner/ partner/ Director of \_\_\_\_\_, I/ We hereby declare that presently our Company/ firm \_\_\_\_\_ is having unblemished record and is not declared ineligible for corrupt and fraudulent practices either indefinitely or for a particular period of time by any State/ Central Government/ PSU.

We further declare that presently our Company/ firm \_\_\_\_\_ is not blacklisted and not declared ineligible for reasons other than corrupt and fraudulent practices by any State/ Central Government/ PSU on the date of Bid Submission.

If this declaration is found to be incorrect then without prejudice to any other action that may be taken, my/ our security may be forfeited in full and the tender if any to the extent accepted may be cancelled.

Thanking you,

Name of the Bidder: -

Authorized Signatory: -

Seal of the Organization: -

## 6.6 Consortium Agreement

### DRAFT MEMORANDUM OF UNDERSTANDING EXECUTED BY MEMBERS OF THE CONSORTIUM

*[On Non-judicial stamp paper of INR 500 duly attested by notary public]*

This Memorandum of Understanding (MoU) entered into this day of [Date] [Month] 2021 at [Place] among \_\_\_\_\_ (hereinafter referred to as "\_\_\_\_") and having office at [Address], India, as Party of the First Part and \_\_\_\_\_ (hereinafter referred as "\_\_\_\_") and having office at [Address], as Party of the Second Part and \_\_\_\_\_ (hereinafter referred as "\_\_\_\_") and having office at [Address], as Party of the Third Part.

The parties are individually referred to as Party and collectively as Parties.

WHEREAS Pune Municipal Corporation, PURCHASER, has issued a **Request for Proposal for Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation dated [Date] (RFP)** from the interested Bidders:

AND WHEREAS the Parties have had discussions for formation of a Consortium for bidding for the said Project and have reached an understanding on the following points with respect to the Parties' rights and obligations towards each other and their working relationship.

AS MUTUAL UNDERSTANDING OF THE PARTIES, IT IS HEREBY AGREED AND DECLARED AS FOLLOWS:

1. The purpose of this Agreement is to define the principles of collaboration among the Parties to:
  - a. Submit a response jointly to Bid for the "**Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**" dated [Date] (RFP)" as a Consortium.
  - b. Sign Contract in case of award
  - c. Provide and perform the supplies and services which would be ordered by the Purchaser pursuant to the Contract.
    - o This Agreement shall not be construed as establishing or giving effect to any legal entity such as, but not limited to, a company, a partnership, etc. It shall relate solely towards the Purchaser for "Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation" dated [Date] (RFP)" for and related execution works to be performed pursuant to the Contract and shall not extend to any other activities.
    - o The Lead bidder shall be severally responsible and bound towards the Purchaser for the performance of the works in totality and in accordance with the terms and conditions of the BID document and Contract.
    - o ----- (Name of Party) shall act as Lead Partner of the Consortium. As such, it shall act as the coordinator of the Party's combined activities and shall carry out the following functions:

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

1. To ensure the technical, commercial and administrative co-ordination of the work package
2. To lead the contract negotiations of the work package with the Purchaser.
3. The Lead partner is authorized to receive instructions and incur liabilities for and on behalf of all Parties.
4. In case of an award, act as channel of communication between the Purchaser and the Parties to execute the Contract
  - o That the Parties shall carry out all responsibilities as Developer in terms of the Project Agreement.
  - o That the broad roles and the responsibilities of each Party at each stage of the Bidding shall be as below:

Party A: \_\_\_\_\_

Party B: \_\_\_\_\_

Party C: \_\_\_\_\_

- o That the Parties affirm that they shall implement the Project in good faith and shall take all necessary steps to see the Project through expeditiously.
- o That this MoU shall be governed in accordance with the laws of India and courts in Maharashtra shall have exclusive jurisdiction to adjudicate disputes arising from the terms herein.

In witness whereof the Parties affirm that the information provided is accurate and true and have caused this MoU duly executed on the date and year above mentioned.

(Party of the first part)

(Party of the second part)

(Party of the third part)

Witness:

i. \_\_\_\_\_

ii. \_\_\_\_\_

#### **6.7 Format for Power of Attorney for Lead bidder of Consortium**

*[To be executed on non-judicial stamp paper of the appropriate value in accordance with relevant Stamp Act. The stamp paper to be in the name of the company who is issuing the power of attorney]*

Whereas \_\_\_\_\_ has invited RFP response for \_\_\_\_\_ (Name of the Project)

Whereas, the Members of the Consortium comprising of M/s.\_\_\_\_\_, M/s.\_\_\_\_\_, M/s.\_\_\_\_\_ and M/s.\_\_\_\_\_ (the respective names and addresses of the registered offices to be given) are interested in bidding for the Project and implementing the same in accordance with the terms and conditions contained in the RFP Documents.

Whereas, it is necessary for the members of the Consortium to designate one of them as the lead member with all necessary power and authority to do, for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's RFP response for the Project.

NOW THIS POWER OF ATTORNEY WITNESSETH THAT

We, M/s.\_\_\_\_\_ and M/s.\_\_\_\_\_ and M/s.\_\_\_\_\_ hereby designate M/s.\_\_\_\_\_ being one of the members of the Consortium, as the lead member of the Consortium, to do on behalf of the Consortium, all or any of the acts, deeds or things necessary or incidental to the Consortium's RFP response for the Project, including submission of the RFP response, participating in meetings, responding to queries, submission of information or documents and generally to represent the Consortium in all its dealings with Client or any other Government Agency or any person, in connection with the Project until culmination of the process of bidding till the Project Agreement is entered into with Client and thereafter till the expiry of the Project Agreement.

We hereby agree to ratify all acts, deeds and things lawfully done by our said Attorney pursuant to this power of attorney and that all acts, deeds and things done by our aforesaid Attorney shall and shall always be deemed to have been done by us or Consortium.

Dated this the \_\_\_\_\_ day of \_\_\_\_\_ 2021

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Name in Block Letter of Executant) *[Seal of Company]*

Witness 1

Witness 2

*Notes:*

*To be executed by all the members individually, in case of a Consortium.*

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

*The Mode of execution of the power of attorney should be in accordance with the procedure, if any laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure*

**7) Annexure II: Formats for Technical Bid**

**7.1 Format for Authorization Letters from OEMs for COTS product (if applicable)**

Date: dd/mm/yyyy

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

**Sub:** Authorization Letter to M/s. ----- for the participation in the bid for “**Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**”

**Ref :**Bid No: <No> dated <DD/MM/YYYY>

Sir,

We \_\_\_\_\_, (name and address of the manufacturer) who are established and reputed manufacturers of \_\_\_\_\_ having factories at \_\_\_\_\_ (addresses of manufacturing / development locations) do hereby authorize M/s \_\_\_\_\_ (name and address of the Bidder) to bid, negotiate and conclude the contract with you against the above mentioned bid for the above equipment / software manufactured / developed by us.

We herewith certify that the abovementioned equipment's / software products are not end of the life and we hereby undertake to support these equipment / software for the duration of minimum 3 years from the date of Submission of the bid.

For and on behalf of M/s \_\_\_\_\_ (Name of the manufacturer)

**Signature:**

**Name:**

**Designation:**

**Address:**

**Date:**

Note: This letter of authority should be on the letterhead of the concerned manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer.

**7.2 Details of similar work undertaken in last 3 years**

(To be provided on the letter head of Bidder)

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for the Project “Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation”

I hereby declare that below are the details regarding relevant work that has been taken up by our company.

**NOTE: To be filled for separately for each project undertaken**

<b>Name of the Project</b>	
<b>General Information</b>	
<b>Client for which the project was executed</b>	
<b>Name of the client contact person(s)</b>	
<b>Designation of client contact person(s)</b>	
<b>Contact details of the client contact person(s)</b>	
<b>Description of the project</b>	
<b>Scope of work of the Bidder</b>	
<b>Deliverables of the Bidder</b>	
<b>Outcomes of the project</b>	
<b>Other Details</b>	
<b>Total cost of the project</b>	

<b>Total cost of the services provided by the Bidder</b>	
<b>Duration of the project (number of months, start date, completion date, current status)</b>	
<b>Mandatory Supporting Documents:</b>	
· <b>Work order / Purchase order / Contract for the project</b>	
· <b>Client Certificate giving present status of the project and view of the quality of services by the Bidder</b>	

I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

### 7.3 Summary of Projects (To be provided on the letter head of Bidder)

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for the Project “Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation”.

I hereby declare that my company <name has to specified by bidder> has undertaken the following projects in the technologies mentioned against them as on bid submission date.

Sr. No	Name of the project	Client	Brief Scope	Details of Volume of Pages scanned	Value of Project	Current Status with Start Date and End Date

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation


I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

**7.4 Summary of Similar Projects with Government/ULB/PSU sector in multiple locations in India**  
(To be provided on the letter head of Bidder)

To,  
The Commissioner  
Pune Municipal Corporation  
Pune

Sir/Madam,

I have carefully gone through the Terms & Conditions contained in the RFP Document for the Project “Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation”.

I hereby declare that my company <name has to specified by bidder> has undertaken the following projects in the technologies mentioned against them as on bid submission date.

Sr. No	Name of the project	Client and its location	Brief Scope	Technology Stack	Value of Project	Current Status with Start Date and End Date

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation


I further certify that I am competent officer in my company to make this declaration.

Yours Sincerely,

## 8) Annexure III: Commercial Proposal Formats

### 8.1 Commercial Proposal Cover Letter

Date: dd/mm/yyyy

To  
The Commissioner  
Pune Municipal Corporation  
Pune

**Sub:** Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

**Ref:** Tender No: <No>      Dated <DD/MM/YYYY>

Dear Sir,

Having examined the RFP, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide the professional services as required and outlined in the RFP of " Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation"

**Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**

**1. PRICE AND VALIDITY**

- All the prices mentioned in our Tender are in accordance with the terms as specified in the Tender documents. All the prices and other terms and conditions of this Tender are valid for a period of 120 calendar days from the date of opening of the Tenders.
- We hereby confirm that our Tender prices include all taxes. Taxes are quoted separately under relevant sections, as specified in the RFP formats.
- We have studied the clause relating to Indian Income Tax and hereby declare that if any income tax, surcharge on Income Tax, Professional and any other corporate Tax in altered under the law, we shall pay the same.

**2. UNIT RATES**

We have indicated in the relevant schedules enclosed, the unit rates for the purpose of on account of payment as well as for price adjustment in case of any increase to / decrease from the scope of work under the contract.

**3. DEVIATIONS**

We declare that all the services shall be performed strictly in accordance with the RFP documents and there are no deviations except for those mentioned in Pre-Qualification Envelope, irrespective of whatever has been stated to the contrary anywhere else in our bid.

Further we agree that additional conditions, if any, found in our bid documents, other than those stated in the deviation schedule in Pre-Qualification Envelope, shall not be given effect to.

**4. QUALIFYING DATA**

We confirm having submitted the information as required by you in your Instruction to Bidders. In case you require any other further information/documentary proof in this regard before evaluation of our Tender, we agree to furnish the same in time to your satisfaction.

**5. BID PRICE**

We declare that our Bid Price is for the entire scope of the work as specified in the RFP document. These prices are indicated in the subsequent sub-sections of this Section.

**6. CONTRACT SECURITY DEPOSIT BOND**

We hereby declare that in case the contract is awarded to us, we shall submit the contract security deposit in the form prescribed in the RFP.

We hereby declare that our Tender is made in good faith, without collusion or fraud and the information contained in the Tender is true and correct to the best of our knowledge and belief.

We understand that our Tender is binding on us and that you are not bound to accept a Tender you receive. We confirm that no Technical deviations are attached here with this commercial offer.

Thanking you,

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

Yours faithfully,

(Signature of the Authorised Signatory)

Name

Designation

Seal.

Date:

Place:

Business Address:

## 8.2 Commercial Bid Format and Instructions

### (TO BE SUBMITTED ONLINE ONLY)

Details to be filled up for price bid are as below.

S.No	Item	Qty	Unit Rate	Total price	GST	Total price + GST
1	Software					
A	End-to-end ISWM system as per the scope and functional requirements including integration with existing application as mentioned in the RFP and formation of GIS layers as per 5.2.30	Lump Sum				
B	Hosting services for 3 years as per scope of RFP	Lump Sum				
2	Hardware					
2A	RFID Readers (Supply, Installation and Commissioning)	25				
2B	RFID Passive Tags (Supply, Installation and Commissioning)	1000				
2C	GPS devices(Supply, Installation and Commissioning) for the Vehicle Tracking System (Inclusive of Communication cost for the project duration)	1000				
2D	Supply & Operationalization of Smartphones/Tablets having GPS functionality for tracking of vehicles (Inclusive of Communication cost for the project duration)	1000				
2E	Supply & Operationalization of Smart Wrist Watch or Similar GPS/Bluetooth/RFID tracking devices for on field staff (inclusive of communication cost for the project duration) and supply of a power bank for additional power supply.	15000				
2F	Supply & Operationalization of Smart phones for tracking on field staff with GPS based tracking and two-way communication for project purpose (inclusive of communication cost for the project duration) and supply of a power bank for additional power supply.	15000				
3	Command Control Center					
3A	Setting up Command Control Centre with appropriate hardware such as PCs (one for each ward), Display TV Screens, Mobiles for communication and any other devices as required appropriate.	Lumpsum				
3B	Operation & Maintenance of the Command	36 months				

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

	control centre for a period of three years (Bidder has to deploy 30 resources team and 3 supervisors for managing Centre in multiple shifts, carry out analysis, corrective actions, prepare actionable insights etc.				
4	Operation & Maintenance of the Software and Hardware for 3 years from Go Live (20 system operators to be provided to operate ISWMS at ramps and other locations as decided by PMC to ensure optimal use of the system)	36 months			
5	Training, Capacity Building and technical Support as per scope of RFP	Lump sum			
	<b>Total cost</b>				

All the figures in the above table have to be quoted in INR. The bidder is expected to quote the rate for all the line items mentioned. However, line items out of Sr. No. 2C, 2E & 2D, 2F would be considered for calculating the commercial bid depending on the items used by the bidder during Proof of Concept Stage.

For example :- If Sr No. 2C & 2E were proposed by the bidder and PoC was successful. In this case, only Sr. no. 2C & 2E would be considered for this bidder to calculate the commercial quote instead of Sr. no. 2D & 2F and similarly if bidder proposes 2D & 2F for PoC then 2D & 2F will be considered for calculation.

Bidders may choose a combination of Sr. No. 2C & Sr. No. 2E or Sr No. 2D & 2F for PoC, accordingly, commercial line item would be considered for calculating total commercial quote. It is mandatory for all the technical qualified bidders to pass PoC stage to be considered for commercial opening.

Commercial bids of those bidders would be compared who will successfully pass the PoC stage and the total estimate provided by the bidder would be used to calculate the final cost for the L1 selection method.

In addition PMC might procure new hardware/software systems for better management of the SWM workflows. Bidder needs to provide the quote for the base rate of this additional support (both in terms of man-days and man-months) required during the in-future development support of 36 months.

Particular	Base rate (in INR)
Base rate for 1 man-day for in-future development support phase	
Base rate for 1 man-month for in-future development support phase	

**Note:**

- Bidder should provide all prices as per the prescribed format under this Annexure.
- All the prices are to be entered in Indian Rupees (INR) only
- Bidder should provide breakup of all Taxes, Duties and Levies as applicable.
- PMC reserves the right to ask the bidder to submit proof of payment against any of the taxes, duties, levies indicated.
- PMC shall take into account all Taxes, Duties & Levies for the purpose of evaluation.
- Should there be any change in applicable taxes / levies / duties, the actual taxes / levies / duties on the date of billing would prevail.
- The SI needs to account for all Out of Pocket expenses due to Boarding, Lodging and other related items.

- Bidders to furnish detailed break-up of each item under commercial bid schedule. PMC reserves right to reduce or change any line item scope during implementation phase or remove the scope completely on the basis of re-usability report, change in requirements, availability of proposed sub component or any other reason. In case of non-furnishing detailed break-up by the bidder, corresponding complete line items will be considered for reduced scope deductions.
- All items provided should be under Insurance. The Insurance should be for entire duration of the Project (including 3 Years of O&M). This includes damages due to Theft, Fire, Natural Calamities & Riots.
- As regards the work which is not covered in the scope of the RFP tender and for such work the rates are not available in the contract, the successful bidder who has been awarded the contract may within 15 days of receiving of order of occurrence of such work submit its claim supported by proper details / analysis for such work on the basis of cost of materials / man power involved in such work, the PMC shall within 6 weeks of the receiving of aforesaid claim supported with details / analyses of the claim, after giving consideration to the analysis of rates / details submitted by the successful bidder, determine the rates / cost of such work, on the basis of market rates of the components involved in the opinion of PMC in such work and successful bidder shall be paid in accordance with rates / cost so determined by PMC.
- In the event that the aforesaid change involves omission of part of the work or results in saving of the project, the cost of such saving shall be no less than the amount (if any) worked out by PMC in accordance with this clause as aforesaid.
- Line items mentioned in the Commercial Formats are for representation purpose and SI may propose alternate technology / solution (with proper justification). Bidders are required to suitably add line items / merge the cost components depending upon their proposed solution. The bidder to ensure all required items as per the RFP scope and as per the bidder's technical bid are included in commercial bid and if not mentioned separately, it is assumed that same is included on lumpsum basis.
- No escalations of prices will be considered under any circumstances.

### 9) Annexure IV: Device Specifications

#### RFID Tag Specifications:

Parameter	Specification
Type	ABS, High Quality Engineering Plastic
Supported Transponders	ISO18000-6C EPC Class 1 GEN2
Frequency Range	ISM865~928MHz
Operation Mode	Fixed Frequency or FHSS Software Programmable
Memory capacity	The tag should support ISO18000-6C protocol standard 2K Bits storage capacity, 1728 Bits (216bytes) writable user area; MR6730B metal supports EPC C1 GEN2 (ISO18000-6C), with 96Bits writable EPC Code area, 512Bits writable user area, and 32Bits password area, EPC 128 bit user 512 bit TID 96 bits.
Reading Rate	Software Programmable, Average Reading per 64Bits <10ms
Tags material	Metal material
Reading Range	Should be able to be calibrated. (to be kept as 2-4m max) based on the site visit.
Operation Temp	-35°C to 85°C
IP Classification	IP 68
Weather	Heat, dust proof, UV resistant & sea water resistant.
Chemical Resistance	No physical or performance changes in 168 hour Motor oil exposure 168 hour Salt water exposure (salinity 10%) 5 hrs Sulfuric acid (10 %Ph 2) 1 h NaOH (10 % Ph 14 ) exposure

#### RFID Reader Specifications:

Parameter	Specification
Protocol	ISO18000-6C EPC GEN2 Configurable for mixed or single tag-type operation. Air interface software on IV7 is downloadable to add Gen 2 and Class 1 air interfaces and to “future-proof” the product as standards evolve and new features become available.
Frequency Range	Standard ISM 902 928MHz or 915 MHz (US FCC), 865 MHz (ETSI 302-

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

<b>Parameter</b>	<b>Specification</b>
	208), and 869 MHz (ETSI 300-220)
Operation Mode	FHSS
RF Power	0~30dBm, software adjustable
Reading Speed	Software Programmable Average Reading per 64Bits <6ms
Reading Mode	Timing or Touch, Software Programmable (reading should be such that the reader does reads two tags at a time)
Communication Mode with central server	TCP/IP and GPRS or higher
Data Input Port	Trigger input one time
Reading Range	Max 12 m(able to calibrate)
Communication Interface	RS232
Accessories	Vehicle-mount DC power cable kit Antennas, and antenna cables
Environmental Rating	IP65
Humidity	10% - 90%
Shock and Vibration Protection	Withstands standard material handling vehicle environments. Meets or exceeds MIL STD 810F
Operating Temperature:	-25°C to 55°C (-13°F to 131°F)
Storage Temperature:	-30°C to 75°C (-22°F to 167°F)
Humidity	10% to 90%
Power Supply	Vehicle DC power 12 to 60V, 4.5 A maximum

**GPS base tracking device Specifications:**

Sr. No.	Part	Parameter	Details
1	Connectivity	GSM/GPRS or Higher Modem – Transmitting power Class 4 (2W) at GSM 850 and EGSM 900 Class 1 (1W) at DCS 1800 and PCS 1900 with IMEI	Quad-band GSM/GPRS Modem or higher, Downlink max. Speed 85.6 kbps & Uplink max. speed 42.8 kbps
		Number	IMEI
		Frequency	GSM 850, EGSM 900, DCS 1800, PCS 1900
		Transmitting power	Class 4 (2W) at GSM 850 and EGSM 900 Class 1 (1W) at DCS 1800 and

**Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation**

Sr. No.	Part	Parameter	Details
1			PCS 1900
		Connectivity	GPRS or higher multi-slot class 10
		Coding scheme	CS-1, CS-2, CS-3 and CS-4
		SIM interface	External SIM card: 1.8V, 3V with
2	GPS Navigation	Receiver	42 Channels
		Frequency	1575.42MHz
		Acquisition Time	Hot Start – 1 sec, Open Sky, Cold Start - 30 Sec, Open Sky
		Horizontal Position Accuracy	2.5 meter
		Tracking Sensitivity	160 dBm
		Output	NMEA Protocol
		Antenna	Active GPS Antenna
3	Power	Operating Voltage	8V – 32V
		Operating current	@24V Ideal Mode: 80m GPRS or higher trans/rec:- 160mA
		Battery Reverse	Integrated Protection
4	Environment	Operating Temperature	-25 to 80 degree Celsius (without LCD) -20 to 70 degree Celsius (with LCD)
5	Memory		16 MB
6	Weight		100-200 gm

**Smart Mobile device specifications**

- Ram – Minimum 2GB
- Storage/ROM – Minimum 8GB
- Primary Camera – Minimum 5 Mega pixel with flash
- Front Camera – 3 Mega pixels.
- Battery – minimum 2700 mAh
- Screen size – minimum 5inch
- GPS – Mandatory.

**Note :-**

Selection of System Integrator for Municipal Solid Waste Management System for Pune Municipal Corporation

- a) The battery and the battery backup for the Mobile devices should last for at least minimum 12 hours of continuous operation
- b) Mobile devices should have lock mechanism so that user should be able to install only Solid Waste Management related applications or any other mechanism to restrict user to install third party applications.
- c) The mobile device shall have native security software as mentioned below:  
Software shall support allow/disallow device features, such as use of camera, screen capture , browser and connectivity settings. Limit phone usages such as voice call, SMS/MMS. Control system level of device features such as factory reset, power off, multiple user and accessing developer mode, safe mode etc.