



Ministry of Housing and Urban Affairs
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Deendayal Antyodaya Yojana-National
Urban Livelihoods Mission



Maturity Assessment Framework and Toolkit

Integrated Command and Control Center (ICCC)

Part A- Framework and Toolkit

Ministry of Housing & Urban Affairs (MoHUA)

July, 2020

Maturity Assessment Framework and Toolkit to unlock the potential of Integrated Command and Control Centers (ICCCs)

Maturity Assessment Framework guidance document is a toolkit to assess the maturity of ICCC as an infrastructure. It aims to help Smart Cities self-assess their ICCC capabilities and effectiveness.

Disclaimer: This is confidential working paper and hence it represents work in progress concept framework. It is not meant to represent the position or opinion of Ministry of Housing and Urban Affairs, nor the official position of any staff members. Document is circulated only to seek feedback and industry suggestions over the draft concept framework

Draft for consultation

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1. Foreword

India is urbanizing exponentially with the expected influx of over 400 million people over next 35 years. This rapid urbanization presents a great opportunity for India to leapfrog stages of development, and at the same time address the country's chronic urban challenges. Rate of development of urban infrastructure in India has lagged in comparison to population growth resulting in demand and supply gaps across sectors such as water, waste management, energy, mobility, the built environment, education, healthcare and safety.

Government of India, recognizing these challenges and opportunities, launched the 100 Smart Cities Mission in June 2015. Since the launch of the mission, 100 smart cities have been identified and cities have started executing civic infrastructure and ICT projects as per mission guidelines. Cities have conceptualized projects which enable them to do more with less, enhance their operational efficiency, and deliver timely and quality services to citizens.

In order to do more with less, cities are looking for ground breaking technology interventions to manage the demand of exponentially growing population in cities (also attributed due to migration from rural areas for better economic opportunities) to bring in efficiency and optimization for providing better living environment to its inhabitants.

Integrated Command and Control Centre platform equips cities to do more with less by graduating to real time data driven decision / policy making. It allows cities to develop better situational awareness as compared to traditional, inefficient siloed departmental approach of city administration. Integrated Command Control Centre also reduces the complexity of dealing with multiple systems / application in different technologies using different platform by integrating them to a common platform to leverage the intelligence for making informed decisions. Such effective Integrated Command and

Control Centers will become an integral part of Indian cities by sustainably addressing the need of 400 million urban dwellers who are set to get urbanized over a span of next 35 years.

The Integrated Command and Control Center (ICCC) acts as the “nerve center” for operations management, day-to-day exception handling and disaster management. It also provides insights by processing complex data sets at an aggregated level to derive intelligence for improved planning and policy making. The ICCC is envisaged to aggregate information across multiple applications and sensors deployed across the city, and then provide actionable information with appropriate visualization for decision makers.

While few cities have started deploying ICCC under Smart Cities Mission with the requisite applications, network and sensors, they are at various stages of maturity. As these ICCCs are implemented, it becomes imperative to gauge maturity of effectiveness using a standard methodology across the country so that investments made by cities yield commensurate benefits for cities and citizens in future.

The objective of this assessment framework is to provide cities a self-assessment toolkit to measure maturity and effectiveness of Integrated Command and Control Center in civic operations management, day-to-day exception handling, disaster management, planning and policy making.

Initial assessment cycles will largely focus on system-readiness of our cities. This toolkit intends to assess and enable cities that have invested in Integrated Command and Control Centers to make mid-course amendments to enhance effectiveness. For cities which are yet to commence implementation of ICCC, this maturity assessment will provide a frame of reference for a robust implementation which addresses people, process and technology dimensions of an effective Integrated Command and Control Center.

Core Objectives: ICCC Maturity Assessment Framework

Integrated command and control center maturity assessment framework is conceptualized to achieve the following objectives:

- A) **To assess maturity** of ICCC platform components (functional, technology, governance as well as citizen engagement & outreach)
- B) To create knowledge exchange for **peer to peer learning** for designing innovative impactful use cases over ICCC platform

2. Setting the Context

2.1 Why Integrated Command and Control Center?

The Integrated Command and Control Centers are envisaged to be the **brain** for city operations, handling exceptional scenarios, and disaster management. The sensors and edge devices will capture and generate real time data from various utilities such as water, waste management, energy, mobility, the built environment, education, healthcare and safety. ICCC as a platform through its different layers and components will act as a **Decision Support System (DSS)** for city administration to respond to real time events by consuming data feeds from different data sources and by processing information out of data sets.

The Integrated Command and Control Center, if operationalized and managed successfully, can play a pivotal role in improving the livability of a city by ensuring efficient service delivery and quicker response to emergencies / crisis situations / hazards. It will help the cities enhance the monitoring of city services, data collection and analysis, based on which the ULBs can make informed decisions leading to better quality of life for the citizens.

Efficiency in Operations	Understand efficiency in the way resources are used and consumed over a period
	Understand efficiency of municipal employees / contractual staff deployed for managing city operations
	Understand financial efficiency of other urban interventions through measurement of improvement across urban domains facilitated through availability of data and video evidence pre and post implementation
Improvement in Quality of Life	Improvement in service delivery of municipal services (certificates, licenses) and grievance redressal
	Improvement in urban utilities & services such as water, waste-water treatment and storm water management; waste management; streetlight etc.
	Improvement in civic infrastructure such as housing, roads, bridges, parks, garden, swimming pool and libraries etc.

	Improvement in urban transportation across different modes, and traffic conditions in the city.
	Improvement in safety, health and education facilities in the city.
	Improvement in city environment in terms of quality of air to breathe, quality of water for civic consumption, and pollution free lakes, river and civic open areas.

Hence, it is imperative that the functions and operations of the ICCCs are aligned with key performance indicators as defined under various Assessment Frameworks *vis.* Ease of Living Index, Municipal Performance Index, ClimateSmart Cities, Data Maturity Assessment Framework (DMAF) etc. that capture the extent and quality of infrastructure, service delivery (water supply, SWM services, healthcare, e-Governance, etc.), and emergency response services. **These reference frameworks are available in the Part-C document.**

The ICCC will be used for:

- Increasing the **situational awareness** by providing insights using data for civic officials across urban functions through deployment of sensors/IoT devices across the city.
- **Standardizing response protocol** at city level through institutionalization of standard processes for recurring events, issues and exigency scenarios.
- **Enhancing collaboration** across multiple departments within and outside urban local bodies and government bodies.
- **Institutionalizing data driven** decision making for regular operations and during crisis across levels of city functionaries – right from operators to city administrators.
- **Engaging** with on field support staff to address civic issues and citizen grievances.

- **Centralized integration** of Geographically Distributed Systems. For e.g. Local SCADA at multiple Sewage Pumping Stations can be controlled and monitored from ICCC.

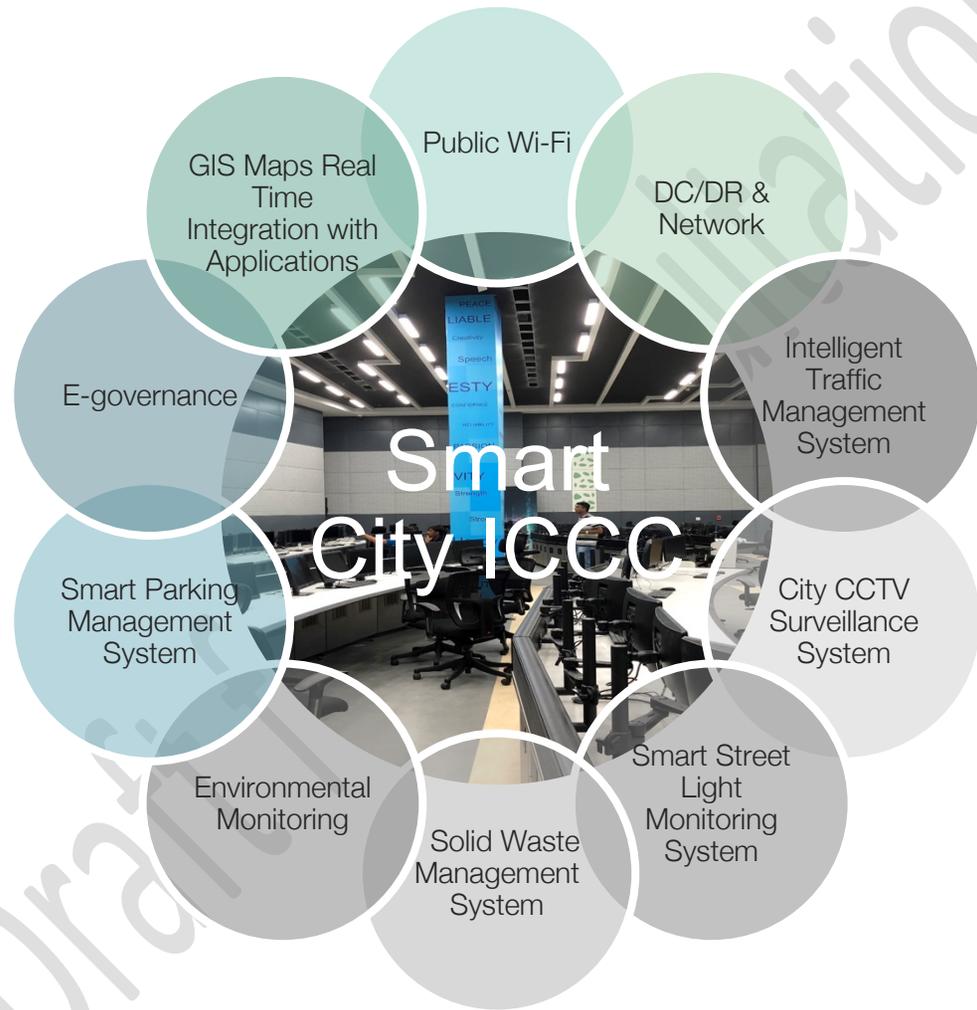


Fig 1. Integrated Command and Control Centre

Case Studies: Integrated Command and Control Center



Rio Operations Center, Rio De Janeiro, Brazil

- The Rio Operations Center's responsibility is to control the city's daily operations, integrating several departments involved in Rio's routine; and to manage crisis and emergency situations. Traffic emergency time response has been reduced significantly with citizens alerted about traffic snarl ups and accidents and redirected to the best routes.



Integrated Centre for Security and Emergency in Madrid

- Because of insight generated by a comprehensive, real-time view of events across the city, emergency managers can better assess needs, prioritize and coordinate actions, and proactively deploy assets to address—and potentially prevent—multiple, complex incidents



Surat SMAC, Gujarat

- This center collects functional information of all the departments and public on a real-time basis. Automated sensors and systems send various data sets to the SMAC, which are analyzed to avail important information to make decisions. All the online applications and mobile applications of SMC for people-centric services would be monitored from one place at the Smart City Centre.

Please refer to the detailed case study section as mentioned in **Part B Document- Annexure I**

2.2 ICCC architecture

A holistic ICCC platform will basically include four layers in the system, as mentioned below:

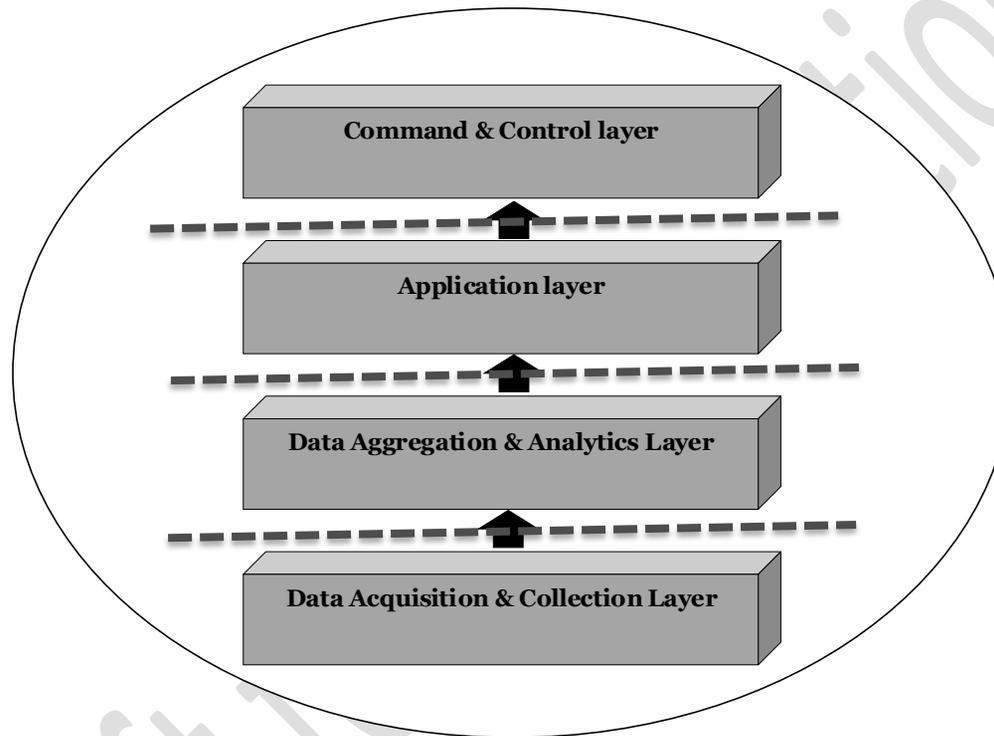


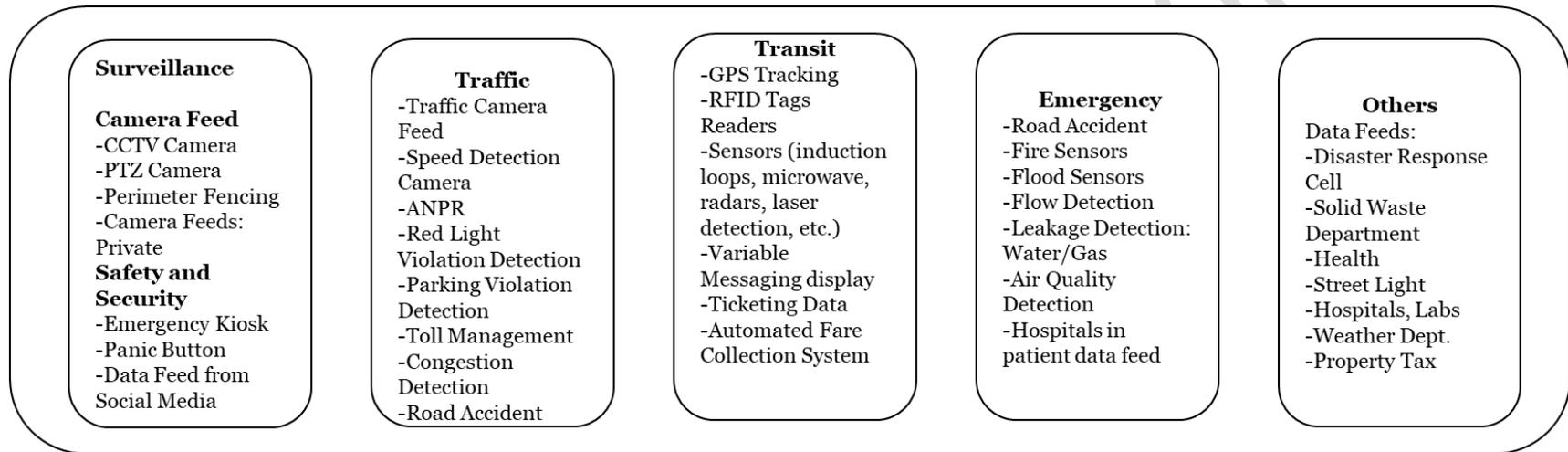
Fig 2. ICCC Layered architecture

a. Data Acquisition and Collection Layer

The **Data Acquisition Layer** consumes real time data from sensors/IoT devices, data sources, static and real time data feeds from different applications, systems and databases etc. These sensors / devices collect data for air and water quality monitoring, ambient light sensors for streetlight management, metering devices, telematics and location-based devices,

proximity sensors, surveillance and safety cameras, sensors for disaster detection, level sensors for solid waste management, traffic sensors etc.

Data Acquisition and Collection Layer: Sensors, Meters, Cameras and Data Feeds



An ICCC can either collect data from sensors or process the same to generate information from the data collected and aggregated through its various components to generate alerts, or it can connect to COTS (Commercial off-the-shelf) and bespoke applications so that alerts are generated by the integrated COTS/bespoke application / systems.

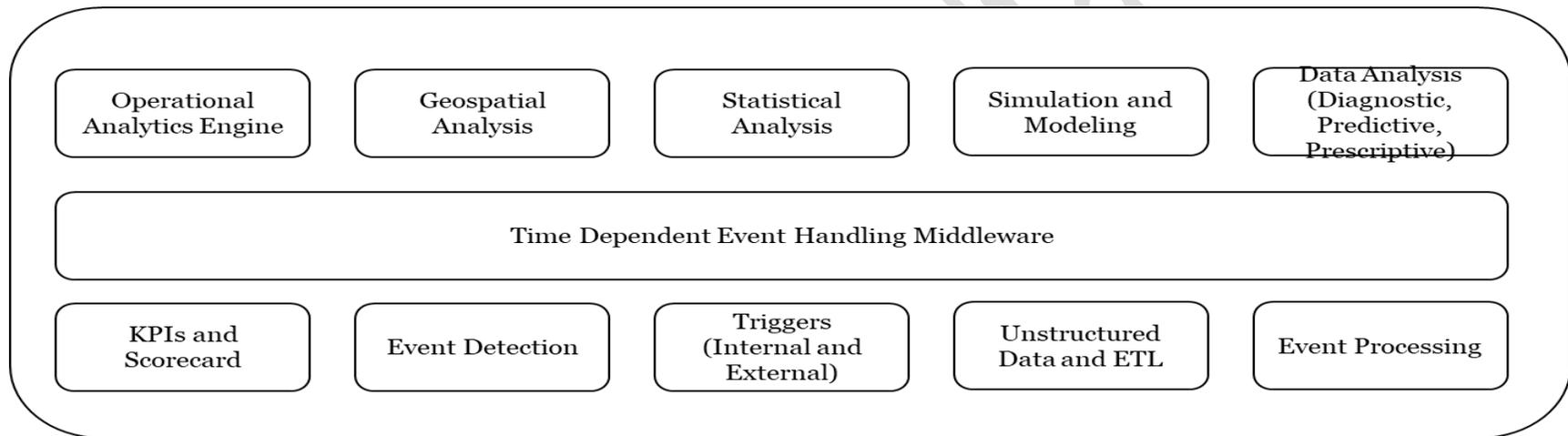
This layer enables other components of ICCC to aggregate, consume and process the data for deriving information.

b. Data Aggregation and Analytics Layer

The **Data Aggregation and Analytics Layer** is responsible for deriving information and intelligence from data captured from various data sources through data acquisition layer. **Data Aggregation and Analysis** comprises components for

extraction and transformation of data from different systems, data sources and different data formats. For e.g. Health records are captured from Integrated Hospital Management System, traffic information is captured from Adaptive Traffic Management System and Ambulance could be tracked using Vehicle Tracking system in different formats. ICCC Data aggregation and Analysis Layer can process the information and allows users to use information from different systems as per requirements.

Data Aggregation and Analytics Layer



This layer should have Data Aggregation, Normalization and Data Models with below capabilities;

- Collects and integrates sensor/IoT devices data from multiple sources
- Normalizes the aggregated data to a common data model to make comparisons more meaningful so that city operators can construct working digital models of their communities
- The ICCC platform exposes APIs through which application developers and vendors can plug in to the city management infrastructure and provide public service capabilities.

The application developers/vendors can use the platform APIs and build applications on top of platform consuming the data model exposed as part of these APIs.

Data Analytics components are used to perform data churning to derive intelligence from different data sets across the domain. This intelligence can then be used for exception handling and visualization in different scenarios through various analysis using ICCC components or third-party tools/applications:

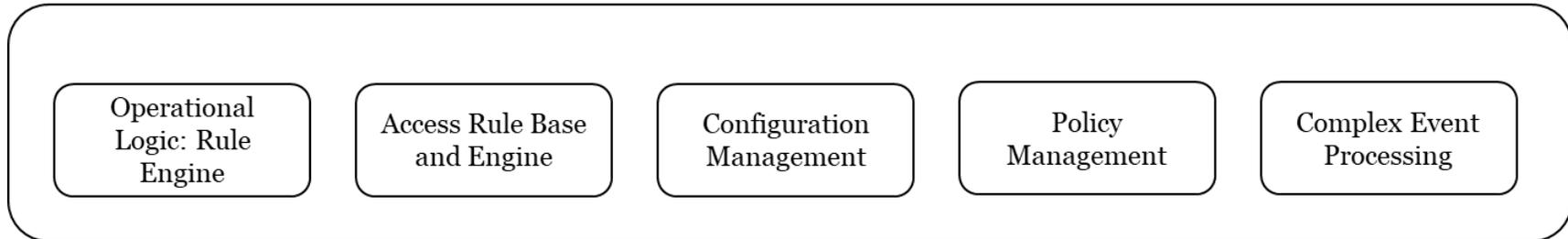
- a) Predictive Analytics
- b) Diagnostic Analytics
- c) Prescriptive Analytics
- d) Sentiment Analytics
- e) Video Analytics

This layer enables ICCC to derive intelligence from the information collected from Data Acquisition and Collection Layer.

c. Business Logic / Application Layer

Business Logic / Application Layer is the core application engine of the ICCC platform which help end user to design and configure Standard Operating Procedure (SOP), manage external and internal trigger, policy implementation, and handling complex events. Application layer also helps ICCC to handle events in real-time complimenting it with intelligence and information from various systems. Application layer also manages the response in different situations as per configured business logic. This layer enables ICCC to handle the events to make real time decisions as per the configured protocol.

Business Logic / Application Layer



It helps in configuring or automating the operations in different scenarios, for e.g.:

- a) Defining and configuring Event
- b) Defining and configuring External / Internal Trigger
- c) Defining and configuring Event Response
- d) Defining and configuring responsibility matrix
- e) Defining and configuring incidents and change requests
- f) Defining and configuring user access and authorization
- g) Defining and configuring access policy of field assets

Application layer at ICCC allows to communicate with different systems. Few examples are mentioned below:

- i) Configuring Events and Response for Water Supply operations:
 - a. Configuring alerts and notification using Smart metering for water usage / consumption
 - b. Configuring Events and Trigger over data emanating through SCADA system for managing water operations
 - c. Configuring response protocol in case of leakage detection
 - d. Configuring response protocol in case of effluent detection etc.
- ii) Event and Response Management for Waste Water Treatment

- a. Configuring alerts and notification using SCADA for waste water treatment systems for its on-field employees
- b. Configuring alerts and notification using for level detections at treatment plant
- c. Configuring Events and Trigger for managing energy consumptions of pumping control systems for storm water management

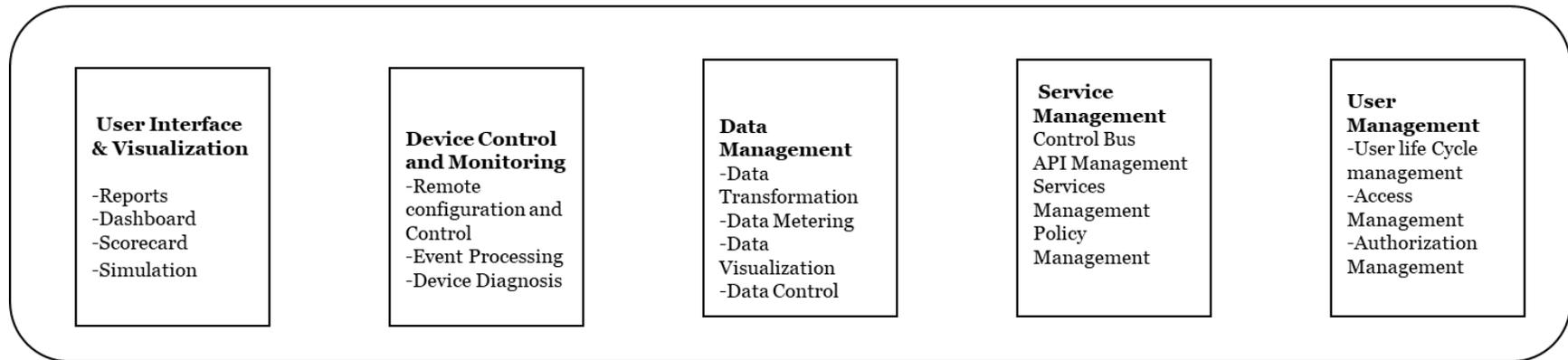
d. Command and Control Layer

Command and Control layer of ICCC is responsible for managing

- a) Communication with Stakeholders
- b) Device Control (asset, access and authorization)
- c) User Interface and Visualization
- d) Complex Real Time Event Handling
- e) Service Management

The **command and control layer** will house the action-oriented SOP's, incident response dispatches and management systems (rules engines, diagnostics systems, control systems, messaging system, events handling system), and reporting / dashboard system to provide actionable information to city administrators and citizens. While this layer will exist in most Integrated Command and Control Centers from inception, it will be flexible to accept inputs from various downstream applications and sensors as and when they get introduced in the city.

Command and Control Layer



In Summary, ICCC layered architecture covers the following layers as its core fundamental elements in order to deliver an effective city operations and governance management services.

- **Data Acquisition Layer:** consumes real time data from sensors/IoT devices, data sources, static and real time data feeds from different applications, systems and databases etc.
- **Data Aggregation and Analytics Layer:** responsible for deriving information and intelligence from data captured from various data sources.
- **Business Logic/ Application Layer:** helps end user to design and configure standard operating procedure, manage external and internal trigger, policy implementation, and handling complex events.
- **Command and Control Layer:** house action-oriented SOP's, incident response dispatches & management systems & reporting / dashboard system to provide actionable information to city administrators and citizens.



3. Need for ICCC maturity assessment

Significant investment has been made for providing ICCC platform in cities. Therefore, it is important to understand how these systems are improving day-to-day urban management functions of the urban local body. However, in the absence of appropriate operational models to look up to and lack of guidance available on service integrations, there seems to be lack

of clarity on the overall effectiveness of the executed ICCC projects in respect of where they stand currently and the goals they had set to achieve.

The assessment model provides a simple form of benchmarking the ICCC ecosystem in Smart cities across the country. These benchmarks will cover the essential aspects of an ICCC that is optimized in terms of utilization of governance, functionality, technology and citizen engagement & outreach framework.

Further, the assessment will allow smart cities to gauge maturity level of the existing ICCCs investment and identify areas where improvements are required. It will also act as a launch pad for the cities which are yet to commence their city operations and system integrations.

We intend to find answers to following questions through assessment activity:

a. Functional Assessment

- How effectively are we managing civic functions / utilities through ICCC platform?
- How effectively are we managing civic mobility through ICCC platform?
- How effectively are we managing safety and security operations / utilities through ICCC platform?
- How effectively are we managing emergency situation through ICCC platform?
- How effectively are we able to ensure convergence of applications / systems / databases through ICCC platform?
- How effectively citizen feedback on ICCC platform is addressed and what corrective actions are being taken?

b. Governance Assessment

- Are we equipped with required Policy framework to manage the civic operations through ICCC?
- Do we have required manpower to man ICCC operations to manage complex events in real time?
- Do we have responsibility matrix in place?

- Do we have Business Continuity plan in place to deal with operation disruptions?

c. Technology Assessment

- What is the maturity level in terms of leveraging key components of ICCC platform?
- Are we leveraging all available components of ICCC Platform / Product?
- Are we able to put technology to use for managing city operations?
- Are we able to effectively customize the platform as per city requirements?

d. Citizen Engagement and Outreach Assessment

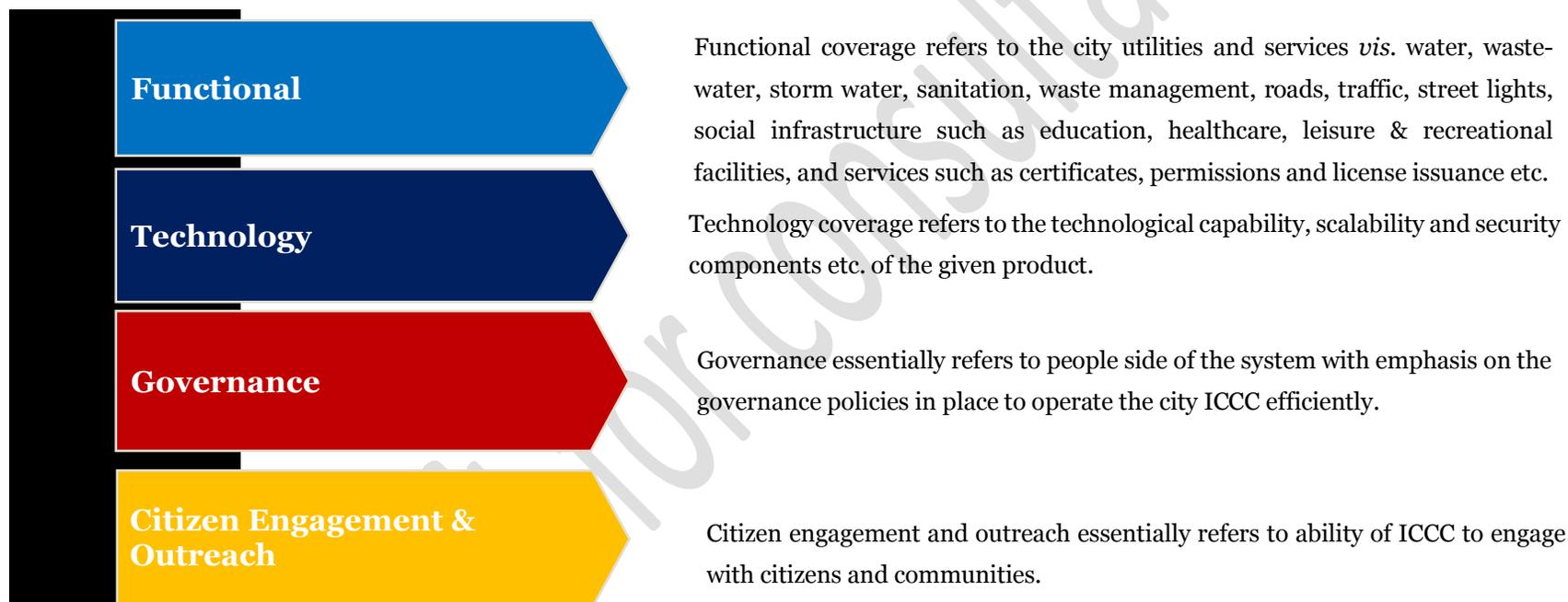
- What is the level of citizen engagement and outreach via ICCC?
- Are we able to effectively communicate with various stakeholders via ICCC?
- Are we able to collect and receive feedback from citizens for effective decision making and policy formulation?
- Are we able to provide response to citizens from all sections of societies in emergency or distress situation?
- Are we able to create awareness among citizens and communicate with them about city operations and drive behavioral change?

ICCC maturity assessment framework and toolkit is explained in the next section.

ICCC Maturity Assessment Framework and Toolkit: Explained

4. ICCC Maturity Assessment Framework

ICCC Maturity Assessment Framework assesses the ICCC ecosystem on following dimensions:



ICCC Maturity Assessment Framework and Toolkit is explained in detail to assess the maturity of ICCC over Functional, Technology, Governance and Citizen engagement & outreach dimensions.

Maturity Framework assesses the level of maturity of above-mentioned components through a detailed questionnaire to understand how effectively the city has leveraged the capabilities of Integrated Command and Control Center. Maturity Framework would also help cities in identifying the implementation, technological and operational gaps under various smart solution projects so that Integrated Command and Control Centre could achieve its true potential.

Maturity Assessment Framework would also expose cities to possibilities of efficient and effective urban governance which impacts day to day life of its citizens and officers managing the infrastructure / utilities operations. ICCC effectiveness would be gauged through functional use cases like Water Supply / Solid Waste / Civic Services / Emergency Management etc. The objective is to focus on functional aspects of governance through ICCC by bringing all civic bodies operations under one roof to achieve efficiency and effectiveness.

ICCC Maturity Assessment comprises two scores namely:

- 1) **PART 1** : ICCC Maturity Assessment Score (Weightage 80%)
- 2) **PART 2** : Data Maturity Assessment Score (Weightage: 20%)

PART 1: ICCC Maturity Assessment Explained

ICCC maturity assessment for functional, technology, governance and citizen engagement & outreach will be as follows:

4.1 Functional Capability Assessment

Table A: Functional Capability Assessment

Parameter	Description	Components
Functional Capability Assessment	<p>Functional capabilities of ICCC would be assessed by measuring the maturity of given functional use cases on ICCC capabilities.</p> <p>For instance – Is ICCC able to activate the pumping station based on increase in water levels?</p>	<p>Use Cases Categories:</p> <ul style="list-style-type: none"> • Civic Utilities <ul style="list-style-type: none"> a) Water b) Solid Waste c) Sewerage & Drainage d) Roads e) Street Light f) E-governance services e.g. Property Tax, license etc. • Mobility Services <ul style="list-style-type: none"> a) Public Transport b) Traffic c) Public Parking d) Public Cycle Sharing • Safety and Surveillance • Emergency and Crisis Management • Convergence <ul style="list-style-type: none"> a) ERP

		<ul style="list-style-type: none"> b) GIS c) Call Center d) Notification Gateway e) Mobile Apps f) Websites g) Messaging Display h) Public Address System
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Assessment approach and scoring for each component are explained below:

Note: Each domain would be assessed over all four capabilities i.e. Data Acquisition and visualization, Data Analytics and Co-relation, Communication and Command & Control.

- **Scoring Assessment: Functional Maturity Assessment**

Functional Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

4.2 Technology Capability Assessment

Table B: Technology Capability Assessment

Parameter	Description	Components
Technology Capability Assessment	Technology Capability of ICCC would be assessed by measuring if given ICCC	<ul style="list-style-type: none"> • Sensor Integration for data acquisition and aggregation from edge network in city. • Network layer

	product platform components are leveraged by given organization.	<ul style="list-style-type: none"> • Data center layer • Application layer • Data Analytics and Co-relation layer • Command Control layer • Service delivery layer • Security layer
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Assessment approach and scoring for each component are explained below:

Note: Each domain would be assessed over all four capabilities i.e. Data Acquisition and visualization, Data Analytics and Co-relation, Communication and Command & Control.

• **Scoring Assessment: Technology Maturity Assessment**

Technology Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

4.3 Governance Capability Assessment

Table C: Governance Capability Assessment

Parameter	Description	Components
Governance Capability Assessment	Governance Capability of ICCC ecosystem would be assessed by measuring the capability of key	<ul style="list-style-type: none"> • Integrated Command and Control Center governance covering etc. • Resourcing and staffing

	parameters to ensure smooth operations of ICCC.	<ul style="list-style-type: none"> • Field force management • Decision making framework
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• **Scoring Assessment: Governance Maturity Assessment**

Governance Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

4.4 Citizen engagement and outreach

Table D: Citizen Engagement and Outreach Capability Assessment

Parameter	Description	Components
Citizen Engagement and Outreach Capability Assessment	Citizen engagement and outreach essentially refers to ability of ICCC to engage with local citizens and communities.	<ul style="list-style-type: none"> • Citizen outreach • Employee outreach • Sentiment analysis

• **Scoring Assessment: Citizen engagement & Outreach Maturity Assessment**

Citizen engagement & Outreach Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

Each Pillar (Functional, Technology, Governance & Citizen engagement & Outreach) and respective components shall be mapped to maturity scores as outlined in the next section.

4.5 Scoring Methodology

Self-assessment evaluation shall be done as outlined below:

1. For functional Assessment, each indicator needs to be mapped with following response *vis.:* Yes/ No.

Note: For each “Yes” response, 1(One) mark shall be allotted and for each “No” response, 0 (zero) mark shall be allotted.

2. For Technology and Governance assessment, each indicator shall be mapped with following responses -Yes, No, and NA (Not Applicable).

Note: For each “Yes” response, 1(One) mark shall be allotted and for each “No” response, 0 (zero) mark shall be allotted. For NA response, mapped indicator shall not be considered for evaluation.

3. For citizen engagement and outreach assessment, respective cities need to submit response against selected criteria for evaluation.

4. Maturity Assessment outcome would categorize the Integrated Command and Control Center into following category:

Maturity Score	Classification	Description
< 40%	Uncertified	ICCC is at a ‘nascent’ stage of development for stakeholders (<i>City Administration/ Department officials/ on field employees/citizens</i>). The ICCC infrastructure is basic and stakeholders are unable to make use of ICCC for decision-making and governance,

		thereby rendering the utility and impact (<i>Social, Economic, Environmental</i>) of ICCC low.
40%-60%	ICCC – L3	ICCC is at a ‘progressive’ stage of development for stakeholders (<i>City Administration / Department official s / on field employees / citizens</i>). The ICCC infrastructure is established and stakeholders are beginning to make use of ICCC for decision-making and governance, although the utility and impact (<i>Social, Economic, Environmental</i>) of the ICCC is not fully known.
>60% - 80%	ICCC - L2	ICCC is at an ‘advanced’ stage of functioning for stakeholders (<i>City Administration / Department officials / on field employees / citizens</i>). The ICCC infrastructure is fully deployed and stakeholders are extensively using the ICCC for day to day operations and management. The City is also using ICCC for decision-making and the utility & impact (<i>Social, Economic, Environmental</i>) of the ICCC is being realized.
>80%-100%	ICCC – L1	ICCC is a ‘lighthouse’ for all stakeholders (<i>City Administration / Department officials / on field employees / citizens</i>) within the eco-system. It is a role-model for functionality and urban governance. Stakeholders are fully using the ICCC for decision-making and governance and the utility & impact (<i>Social, Economic, Environmental</i>) of the ICCC is high.

5. Overall score will be calculated for arriving at the overall maturity score of ICCC.

Illustrative calculation is provided below:

			Illustration
	ICCC Maturity Score	Assessment Score	Maturity Level
ICCC Maturity Score (Weightage: 80%) PART-1	Functional Assessment Score	60%	Medium
	Technology Assessment Score	40%	Low
	Governance Assessment Score	80%	High
	Citizen engagement and outreach Assessment Score	60%	Medium
	ICCC Maturity Assessment (A)	60%	Medium
Data Maturity Score (DMAF) (Weightage: 20%) PART 2 Note: (Refer Data maturity Assessment Framework published by MoHUA)	Data Maturity Assessment (B)	50	Initiator
Overall ICCC Maturity Assessment Score	80%*A+20%*B	58	Advanced (ICCC-L2)

Maturity Assessment would also help cities to identify gaps under design, planning and implementation for respective ICCC projects under smart cities. Lighthouse cities would emerge as mentors for other cities for guidance and handholding on managing ICCC.

Scoring Assessment: Illustrative example

Under functional assessment the city’s overall score would be calculated based on the average of all components score. For example, a city undertaking functional maturity assessment against three use cases in the domains such as Water, Environment & Mobility, achieves 50% maturity score for Water domain, 60% maturity score for Environment domain and 70% maturity score for Mobility domain , then the overall functional assessment score would be $(50\%+60\%+70\%)/3$ i.e. 60% at a functional maturity level “Medium” category.

Similar methodology will be adopted for Technology and Governance Assessment.

In the below table for a sample City, overall ICCC maturity assessment would be calculated as per below methodology: -

Illustration

S. No.	Core Pillars	Use case	Score assigned (Illustrative)	Overall Average Score (%)
1	Functional Assessment	Water	50	60 %
		Environment	60	
		Mobility	70	
2	Technology Assessment	Technology parameters	50	
3	Governance Assessment	Governance indicators	60	
4	Citizen Engagement & Outreach	Engagement indicators	70	
	ICCC Maturity Score (%) (A)		60	
5.	DMAF Score (B)		50	Initiator
	Overall Maturity Level (%) (.8*A+.2*B)		58	Advanced (ICCC-L2)

5. Maturity Assessment Process

Maturity Assessment Process: ICCC Maturity Assessment process is a three-step process which covers the following steps:

Stage I: Self-Assessment Criteria

- Cities would be required to submit Maturity Assessment along with evidence over different components of the framework.
- Time Duration : Within 3 Months



Stage II: Validation Phase

- Evaluation committee to be constituted by MoHUA
- Capability Demonstration by Cities at MoHUA
- Timelines : Within 60 days of submission of Self Assessment



Stage III: Maturity Assessment Certification

- Cities ICCC would be mapped onto following Maturity Levels
 - Uncertified
 - ICCC - L3
 - ICCC - L2
 - ICCC - L1

Under the validation stage II, as mentioned above the qualifying cities are required to showcase the ICCC capability by demonstrating functional use cases. Indicative use cases have been defined and available for reference in **Part B Document- Annexures**.

5.1 Stage I: ICCC Maturity Self- Assessment Toolkit Explained

Under Self-Assessment stage, cities would be required to assess and submit assessment over following components of Integrated Command Control Centre (ICCC):

- a) Functional Capability
- b) Technology Readiness
- c) Governance Capability
- d) Citizen engagement and outreach

Evaluation criteria for above mentioned components are explained below:

I. ICCC Functional Capability Assessment

The first component of the framework is assessing functional capability of ICCC i.e. the civic utilities or services being monitored by either the system or the people deployed at the facility. This shall include services which are supposed to get integrated with the ICCC and covers primary services that are being provided by the cities administration.

- a. **City Utilities and Civic Services:** These primarily include civic services provided by the urban local body (ULB) to cater to daily needs of citizens in general. The framework considers that a city ICCC must integrate & monitor these

services at its facility as any disruption in the services and lack of timely response could lead to poor service delivery.

Few basic utilities managed by ULBs are as follows:

- a. **Water Supply and Waste Water Management:** The water supply and its quality treatment are done by ULBs. Waste water treatment operations are also managed by ULBs.
 - b. **Solid Waste Management:** This includes services like residential garbage collection, construction and debris collection, and recycling of waste collected and disposal on daily basis
 - c. **Smart Street Lighting Management:** This refers to the management of network of street lights installed across city limits to ensure safe streets.
 - d. **Environment:** It refers to the various sensors installed across city to monitor data from sensors like pollution sensors, noise sensors, light sensors, etc.
- b. **City mobility services:** These services refer to connectivity services provided by the city for public to travel from one point to another. It includes provision of connectivity, accessibility and public space for parking of vehicles. The three broad domains can be listed as below:
- a. **Transit Management (connectivity):** It refers to management of public transport vehicles like buses, taxis, and trains etc. which assist public in connecting to various parts of the city.
 - b. **Traffic Management (accessibility):** This refers to the planning & control of transport services across city to manage the traffic flow within the city.
 - c. **City Parking Solutions:** It refers to the management of public parking spaces in terms of usage as well as revenue collection.
- c. **Safety and Security:** Primarily the function of police, these refers to operations to enhance the safety of the public and provide necessary surveillance information to Police for both reactive and predictive policing. CCTV surveillance

has been an important component across multiple cities with increasing usage of video analytics to provide police with timely alerts for action.

- d. **Crisis Management:** These services address major disaster-related events which may occur in a city affecting city as a whole (e.g. floods) or a part of the city (e.g. fire accident). The Crisis management operations in a city includes medical services, fire brigade and police which may need to react either together or in any combinations based upon the type of exigency. Being an important aspect of city ICCC, it is imperative that crisis management should be in place and properly implemented covering all possible events which may disrupt either part of or the complete city.
- e. **Convergence:** There are certain enterprise systems / application used by city governments to support city operations. Services like Geographical Information System (GIS) for the city tags all the important functions of a ULB on a map, providing them a holistic view of the city. Service like Enterprise Resource Planning (ERP) is essentially integrated management of core processes across various services providing real-time, digitized information about the system. Such services cut across the length and breadth of the core services and thus must be addressed in the city ICCC as they assist city administrators in visualizing information at pan-service & pan-city level, with functionality to drill-down on specific part of the city or specific service if required.

These services can be assessed in detail on the basis of respective functional use case configured with ICCC platform. In first stage, cities will do the self-assessment of maturity of specific domain as per its readiness at ICCC. Smart City ICCC functional assessment would comprises of following component for each use case mentioned above:

- a) Data Acquisition and Visualization
- b) Data Analytics and Co-relation
- c) Communication

d) Command and Control

Score would be assigned based on maturity of specific use case on these 4 dimensions.

Example,

The cities which have installed water sensors/IoT devices for monitoring of water quality system with integration of water SCADA system at ICCC shall put their response as “Yes”. If it is not implemented, they will fill their response as “No”

The total score shall be calculated based on aggregated score under each component category.

I. Functional Assessment

Component 1: Data Acquisition and Visualization

Functional Maturity Assessment Criteria
<i>Data Acquisition and Visualization Capability Assessment</i>
1.1 Have sensor devices, activators been deployed as a part of field infrastructure?
1.2 Are the sensors deployed on the field geo-referenced?
1.3 Do the sensors provide real-time data?
1.4 Is the sensor data available at ICCC?
1.5 Is domain-specific data available at ICCC?
1.6 Is the sensor data available in a geo-referenced manner at ICCC?
1.7 Is the data from respective domain application/smart solution available in a geo-referenced manner at ICCC?
Overall Maturity Level (High/Medium/Low)

Component 2: Data Analytics and Co-relation

Functional Maturity Assessment Criteria
<i>Data Analytics and Co-relation Capability Assessment</i>
1.8 Does the sensor data generate exceptions based on pre-defined SLA thresholds?
1.9 Are the thresholds automatically refreshed based on ground conditions?
1.10 Is the data from sensor / systems analyzed with data from other sensors / applications based on time of event?
1.11 Is the data from sensor / systems co-related from data from other sensors based on location of event?
1.12 Does the co-relation from multiple sensors / systems result in generation of alerts / exception?
1.13 Does the co-relation offer diagnostic analysis of event?
1.14 Does the co-relation offer prescriptive actions from event?
Overall Maturity Level (High/Medium/Low)

Component 3: Command and Control

Functional Maturity Assessment Criteria
<i>Command & Control Capability Assessment</i>
1.15 Does the system offer standard operating procedures based on alerts?
1.16 Does the system provide real-time view in terms of video, geo-location post generation of alert?

1.17 Are the standard operating procedures (SOP) defined to include point of contact responsible?

1.18 Are the SOPs defined to include action for person responsible?

1.19 Are the SOPs defined to include pre-requisites?

1.20 Are the SOPs defined to include procedures?

1.21 Are the SOPs defined to include on-field/premise assets?

Overall Maturity Level (High/Medium/Low)

Component 4: Communication

Functional Maturity Assessment Criteria

Communication Capability Assessment

1.22 Is the communication protocol (mode, contact details, alternates) included in the SOP?

1.23 Does the system provide for audio communication over multiple channels to **first respondent**?

1.24 Does the system provide for audio communication over multiple channels to **all responders**?

1.25 Does the system provide for video communication to first respondent?

1.26 Does the system provide for video communication to all responders?

1.27 Does the communication channel provide for recording and playback?

Overall Maturity Level (High/Medium/Low)

Note: Maturity level to be calculated as per the scoring mechanism outlined in the section above.

Assuming in component 1 above, out of 10 questions, a city scores 4 marks out of 10. i.e. total score is 40%. As per the matrix, 40% score would lead to “Low” maturity for that particular component.

Overall functional maturity for a particular domain shall be calculated accordingly.

Scoring Assessment: Functional Maturity Assessment

Functional Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

City would be able to assess the gaps under functional maturity based on self-assessment for specific domain. City administration is advised to bring its majority of operations systems from various domain under ICCC and measure the maturity of ICCC functional components to assess if ICCC platform is capable of managing its multiple and complex events on day to day basis.

Important Note: *In order to carry out the Functional assessment, cities should have at least 3 services which are operational, monitored & integrated with ICCC and at least 70% of the procured infrastructure installed for each service.*

Over and above ICCC Functional Maturity, ICCC needs to be assessed over Technology, Governance as well as Citizen engagement and outreach components. In the next section, it is explained in detail.

II. Technology Assessment

Technology assessment score would be assigned based on maturity assessment of individual components of ICCC Platform to gauge ICCC capability to support the functional requirements of city administration

- a) Data Acquisition and Collection Layer includes components for data acquisition and collection from various devices / systems / applications in different formats
- b) Data Analytics and Correlation Layer includes components to aggregate and process the data for analysis on different dimensions in order to derive intelligence out of information collected through different sources.
- c) Application Configuration Layer includes components involved in defining and configuring multiple and complex events and its automated response.
- d) Command and Control Layer includes components to manage the response, assets, devices, on field users and resources to address civic issues.

Technology Assessment Toolkit

Illustrative assessment framework with sample questionnaire is as follows:

A	Data Acquisition	Criteria
2.1	Integration with Sensors	<i>Ability to collect and aggregate data in real time generating from on field sensors/Edge Infrastructure like Bin Sensors, Water Sensors, Environment Sensors, Access Sensors, Actuators Sensors.</i>
2.2	ETL Capability (Extract, Transform, Load)	<i>Ability of ICCC platform to consume raw data feeds from different data sources and ability to prepare information for downstream uses. E.g. Ability to process data coming through online systems, mobile apps, social media, edge sensors, third party applications and tools, data files (EXCEL, GIS etc.) and different data bases for effective interpretation.</i>

2.3	Integration with Video Feeds	<i>Ability to consume video feeds generated from various applications capturing videos like Surveillance, Parking, Traffic etc.</i>
2.4	Integration with Data Feeds and Publishing Data Feeds	<i>Ability to consume real time data feeds from various systems / applications using APIs.</i>
B	Configuration Layer/SOP	Criteria
2.5	Configuration of SOP, Alerts	<i>Ability to configure Standard Operating Procedure using ICCC Platform using data feeds from different systems / applications converging at ICCC.</i>
2.6	Configuration of GIS	<i>Ability of ICCC platform to configure and use GIS application and Open Street Maps for doing GIS analysis of domain specific use cases.</i>
2.7	Configuration of SLAs	<i>Ability to view SLA compliance / non-compliance of various projects and applications using ICCC application.</i>
2.8	Configuration of Data Security Features	<i>Ability to configure user access and authorization control to provide specific set of information / data / application control to designated or authorized set of users.</i>
2.9	Configuration of Network Control	<i>Ability to manage and monitor network performance through ICCC platform using NMS application or third-party application.</i>
2.10	Configuration of User Access Control	<i>Configuration of User Access Control: Ability to configure and manage user access for different applications / facilities through ICCC.</i>
2.11	Configuration of Notification Control	<i>Ability to configure and manage user notification as per configured protocol.</i>
C	Data Analytics and Co-relation Layer	Criteria
2.12	Sentiment Analytics	<i>Ability to provide sentiment analytics of configured key words / accounts through internet crawling through ICCC platform. Ability to categorize key issues / topics / words in real time on social media platform (Twitter, Facebook, Google+, Website Discussion Forums, News Papers) which are contributing to negative / positive perception among citizens.</i>
2.13	Predictive Analytics	<i>Ability to make predictions about future events using past data. Predictive analytics uses many techniques from data mining, statistics, modeling to analyze current data and make predictions about future.</i>
2.14	Prescriptive Analytics	<i>Ability to find best course of action for a given variable situation /scenarios.</i>
2.15	Diagnostics Analytics	<i>Ability to do root cause analysis using data slicing, data aggregation, data mining, data discovery and correlation techniques using ICCC platform.</i>

2.16	Descriptive Analytics	<i>Ability to view insights using historical data for a given data set.</i>
2.17	Video Analytics	<i>Ability to automatically analyze video to detect and determine temporal and spatial events.</i>
D	Command and Control Layer	Criteria
2.18	Operations / Process Control	<i>Ability to provide assistance to city operations in various civic domains namely water, drainage, solid waste, fire etc.</i>
2.19	SOP Control	<i>Ability to manage the SOPs lifecycle configured in ICCC platform.</i>
2.20	Access Control	<i>Ability to provide access or restrict access to user group for any facility or applications in real time.</i>
2.21	Device Control	<i>Ability to provide access or restrict access to user group for any actuators / devices like water supply sensors or edge devices on network in real time.</i>
2.22	Sensors Control	<i>Ability to access control like reboot and control any sensors on network in real time through ICCC platform.</i>
2.23	Field Force Control	<i>Ability to assist field force of city administration by providing requested information and support in real time to manage civic operations.</i>
2.24	Asset Control	<i>Ability to control access to field assets through ICCC platform.</i>

Scoring Assessment: Technology Maturity Assessment

Technology Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

Technology Maturity Assessment will enable cities to assess and identify which components are extensively utilized and which are yet to be utilized to enhance the effectiveness of Integrated Command and Control Centre. Technology Maturity Assessment would push cities to explore the potential of various components of ICCC platform to manage its civic operations.

III. Governance Assessment

A city ICCC will not be able to function to its full potential if it does not have proper governance framework covering people, processes and policy dimensions to support ICCC operations and its sustenance.

- a) **Governance Framework:** Essentially refers to the presence of governance policies as guidelines for ICCC manpower in terms of non-disclosure agreements, privacy policies, knowledge repositories, employment policies etc.
- b) **Action-oriented dashboards for city leadership:** While it is imperative that an ICCC must be able to display information at aggregated level for city-level management, it is equally important that such dashboards must be regularly utilized by concerned officials for their day-to-day or in crisis situations.
- c) **Field force management:** This includes, but not limited to, design & implementation of workforce management plan with well-defined organizational hierarchy, manpower forecasting as well as escalation matrix for the concerned authorities to use and respond to situations in real time.
- d) **Resourcing and staffing:** With operations of ICCC being a specialized job, recruitment policies must be well documented and approved by all the concerned stakeholders. Once the policies are formulated – it is all the more important the right resources are on-boarded, either departmental staff or out-sourced, and that they are available round the clock for ICCC operations.
- e) **Technical capacity building:** The success of a city ICCC depends on the fact that the deployed manpower is regularly trained & re-trained on various technological and functional aspects of the ICCC. Also, a training plan must be in place for both staff as well as executives based upon the functions they need to perform.

Governance Maturity Assessment Toolkit

Illustrative assessment framework with sample questionnaire is as follows:

A	Governance Framework
3.1	Is the approved Data Governance Policy in place?
3.2	Is the approved ICCC Management Structure in place?
3.3	Is the approved ICCC Resourcing Policy in place?
3.4	Is 100% ICCC Seat occupancy SLA monitoring in place?
3.5	Is Intern on-boarding policy in place?
3.6	Is the ICCC Training and Capacity annual budget in place?
B	Support to Field Force (Vendors, Contractors, Officers, Employees etc.)
3.7	Field Force uses mobile app connected with ICCC?
3.8	Field Force uses ICCC Geospatial Information Systems (GIS) service for day to day operations?
3.9	Field Force can communicate two way with City ICCC?
3.10	Field Force SLA monitoring is in place?
3.11	Scientific Work / area allocation through ICCC analysis?
C	Decision Making Framework
3.12	Is the City Leadership making decisions on a weekly or daily basis using ICCC analytics?
3.13	Are City Officers able to make decisions on a weekly and daily basis using ICCC analytics?

3.14	Have Area wise / Department wise KPIs been configured in the ICCC?
3.15	City Leadership is able to assess performance of its officers / employees through KPI compliance using ICCC?
D	Knowledge Management
3.16	Is Knowledge Management application / services operational for improved management?
3.17	Can stakeholders update any piece of information or intelligence in knowledge base using ICCC interface?
3.18	Are FAQs for services, processes and utilities made available to citizens?
E	Cyber Security
3.19	Have Cybersecurity policy, data privacy policy, security procedures and minimum baseline security guidelines been designed to protect edge devices, network and applications integrated with ICCC from different cyber-attacks?
3.20	Are periodic assessments done to assess security for ICCC?
3.21	Has a Security Operations Centre (SOC) been setup to detect and protect the ICCC from cyber-attacks?
3.22	Are regular training programs being conducted for creating awareness about cyber security amongst stakeholders managing ICCC?

Scoring Assessment: Governance Maturity Assessment

Governance Maturity	Low	Medium	High
Score	< 50%	51%-80%	>80%

Governance Maturity Assessment would help cities to assess its readiness from people, processes, and governance policies to manage Integrated Command and Control Centre.

IV. Citizen engagement and outreach

Citizen engagement and outreach assessment would be carried out by the cities based on following parameters as:

S.No.	Indicators
1	Percentage (%) of unique citizens interacted with ICCC w.r.t overall city population?
	i. 0-1 %
	ii. 1-5%
	iii. 5-10%
	iv. 10-15%
	v. 15 % above
2	Percentage (%) of city corporation employee connected with ICCC with overall strength?
	i. 0-10%
	ii. 10-20%
	iii. 20-30%
	iv. 30-40%
	v. 40-50%

	vi. 50% above
3	City ability to do sentimental analysis at citizen level through ICCC?
	a. percentage (%) of feedback received from citizen connected with ICCC?
	i. 0-10%
	ii. 10-20%
	iii. 20-30%
	iv. 30-40%
	v. 40-50%
	vi. 50% above

ICCC Maturity Assessment:

ICCC Maturity	Functional	Technology	Governance	Citizen Engagement and Outreach
Score (for example)	65% (Medium)	45% (Low)	60% (Medium)	60 % (Medium)
Overall Score	57.5%			

Illustrative: ICCC Maturity Assessment

These four components (Functional, Technology, Governance as well as Citizen Engagement & Outreach) combined with DMAF score together form the crux of the ICCC maturity assessment framework and will enable the assessment-taker to evaluate a city ICCC in terms of its current maturity.

ICCC Maturity Assessment: Analysis and City Ranking

To assess a city ICCC on the above-defined parameters, it is required that the assessment-taker evaluates all the given use-cases for all the 4 parameters i.e. Functional maturity, Technology maturity, Governance, and Citizen engagement & outreach maturity. For each use-case, an assessment-taker will review all the four attributes of the maturity model i.e. Visualization, Correlation, Communication, and Command & control capabilities. ICCC Maturity Assessment Framework comprises 4 broad assessment categories to gauge the maturity of ICCC. Cities can compare the capability score *vis-a-vis* other cities and identify the gap areas.

ICCC Maturity Ranking

Based on scores obtained by cities, dynamic ranking could be published in order to instill sense of competitiveness among cities to improve the ICCC infrastructure.

- a) City ranking over ICCC
 - 1) Overall Functional Maturity
 - 2) Overall Technology Maturity
 - 3) Overall Governance Maturity
 - 4) Overall Citizen engagement and outreach

- b) City Ranking over ICCC Functional Maturity Components

- 1) Civic Utilities
- 2) Mobility Services
- 3) Safety & Surveillance
- 4) Emergency Response
- 5) Convergence

c) City Ranking over ICCC Technology Components

- 1) Data Collection & Aggregation Capability
- 2) SOP's Configuration Capability
- 3) Data Analytics Capability
- 4) Command & Control Capability
- 5) Data Security Capability

d) City Ranking over ICCC Governance Components

- 1) Governance Capability
- 2) Field Force Capability
- 3) Decision Making Capability
- 4) Knowledge Management Capability

d) Citizen Engagement and Outreach

- 1) Citizen Outreach
- 2) Employee outreach
- 3) Sentiment analysis

Securing Integrated Command and Control Center Ecosystem

ICCC cyber security reference assessment dimensions are indicated in **Part B document -Annexure-IV**.

The cities are advised to refer the same to strengthen their IT and physical ICCc infrastructure including field devices, networks, systems, applications and other resources and carry out periodic assessment to comply with cyber security guidelines released by MoHUA as well as in-line with industry best practices.

6. Way Forward

Assessing the maturity of the ICCC must be done with a motive to understand the growth capability and to showcase the efficiency of the organization's implementation processes. There are many more ICCCs planned for the future . With the guidance received from a robust assessment framework, the established units can work towards improving their in-house service operations by improving their maturity across functional, technological and governance aspect, and at the same time establish a citizen connect. Hence, ICCCs can be meaningfully used to improve the city's livability through efficient urban services rendering, incidents and disaster planning and management from one location.

This assessment framework shall act as a base to assist the budding ventures in their operations and system integrations. With best examples identified from around the country, the learnings from case studies and success stories can be replicated in other cities as well.

Annexure A: ICCC Maturity Assessment Analysis

1. Functional Maturity Assessment Analysis

Functional Maturity assessment is designed to assess the functional aspects of ICCC i.e. city utilities and operations are categorized under various domains *vis.*

- a) Civic Utilities and Services (water supply, Solid waste, drainage etc.)
- b) Mobility Services (traffic, transport and parking)
- c) Safety and Surveillance (Security)
- d) Crises and Emergency Management
- e) Convergence (Integration with Common Enterprise Systems)

Category | Functional Maturity Assessment

Sub-category | Data Acquisition and Visualization



1.1	Indicator	Have sensor devices, activators been deployed as a part of field infrastructure?
	Explanation	<i>The city should have deployed sensors/devices (including IoT sensors) in the field locations to capture the required information. For example, whether environmental sensors are deployed to provide information on PM 2.5, PM 10, Co2 etc.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	- PO/WO copy mentioning the details of sensors / devices procured - Latest report from ICCC System mentioning required details

1.2	Indicator	Are the sensors deployed on the field geo-referenced?
	Description	<i>The sensors should be geo-tagged with Latitude / Longitude details.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	The screen shot of GIS map with geo-tag attributes

1.3	Indicator	Do the sensors provide real-time data?
	Explanation	<i>The sensors deployed in the field locations should be able to provide real time data such as asset ID, Latitude / longitude, last reported time, device status (on / off) etc. <u>(Real time data is data that is immediately updated in the ICCC as sensor values change. Manual data transfer should not be considered as real time)</u></i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Screenshots from the system describing the functionality

1.4	Indicator	Is the sensor data available at ICCC?
	Explanation	<i>The sensors/devices data should be visible and tracked at ICCC video wall.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	ICCC Dashboard report

1.5	Indicator	Is domain-specific data available at ICCC?
	Explanation	<i>The domain specific data should be digitally available at ICCC for further analysis and decision-making. For example, CCTV surveillance domain application video data should be stored & available at ICCC digitally.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	ICCC Dashboard report with domain-specific data

1.6	Indicator	Is the sensor data available in a geo-referenced manner at ICCC?
	Explanation	<i>The sensors / devices data should be available with geo-tagging (Latitude / Longitude details). For example, environmental sensors deployed at location A with its geo-reference co-ordinates should be available at ICCC for processing and decision making.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Real time ICCC dashboard report for all devices / sensors connected on the network

1.7	Indicator	Is the data from respective domain application / smart solution available in a geo-referenced manner at ICCC?
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	Explanation	<i>The sensors deployed in the field locations should be able to provide domain specific application data along with asset ID, Latitude / longitude details etc. at ICCC.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Real time ICCC dashboard report for all devices / sensors connected on the network

Sub-category | Data Analytics and Co-relation

1.8	Indicator	Does the sensor data generate exceptions based on pre-defined SLA thresholds?
	Explanation	<i>The ICCC should have functionality for advanced data analytics and visualization to prioritize the work by use of sensor data for improved service delivery through pre-defined SLAs.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SLA report of minimum 30 days from the system

1.9	Indicator	Are the thresholds automatically refreshed based on ground conditions?
	Explanation	<i>ICCC should have functionality to dynamically monitor various parameters</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Screen shorts of the functionality from ICCC

1.10	Indicator	Is the data from sensor / systems analyzed with data from other sensors/applications based on time of event?
	Explanation	<i>ICCC should be able to provide multidimensional analysis for data captured through systems / sensors. For example, the environmental data about a particular time can help in analyzing the traffic data.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Output report of the analysis

1.11	Indicator	Is the data from sensor / systems co-related from data from other sensors based on location of event?
	Explanation	<i>ICCC should be able to provide functionality for multidimensional correlation analysis for data captured through systems / sensors. For example, correlation drawn from the environmental data and traffic data can help in improving ambient air quality.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Output report from the system

1.12	Indicator	Does the co-relation from multiple sensors / systems result in generation of alerts / exception?
	Explanation	<i>ICCC should be able to corelate multiple sensors / systems data in providing the alerts / exception based on event. For example, street light data should be able to corelate with crime data in a particular area to provide alerts / notification to take action.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Output report from the system

1.13	Indicator	Does the co-relation offer diagnostic analysis of event?
	Explanation	<i>ICCC should be able to corelate multiple sensors / systems data for diagnostic analysis. For example, the streetlight operation data along with pedestrian footfalls data can help to spot the structural deficiencies that lead to increased / decreased crime rate in an area.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Output report of the analysis done from the system

	Indicator	Does the co-relation offer prescriptive actions from event?
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1.14	Explanation	<i>ICCC should be able to correlate multiple sensors / systems data for prescriptive analysis. For example, to reduce the citizen inconvenience during road maintenance the ICCC should be able to provide status of all ongoing road projects (up to ward level) and allocated budget so that priority can be assigned to the field staff / contractors.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Output report of the analysis done from the system

Sub-category | Command Control Capability Assessment

1.15	Indicator	Does the system offer standard operating procedures based on alerts?
	Explanation	<i>The ICCC system should offer standard operating procedures based on alerts, notifications generated through sensors / devices.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

	Indicator	Does the system provide real-time view in terms of video, geo-location post generation of alert?
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1.16	Explanation	<i>ICCC system should provide dashboard with real-time view of video, geo-location. For example, in a surveillance domain, the real time video and asset location should be available at all time on the ICCC video wall for addressing the alarms.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	ICCC Dashboard Report

1.17	Indicator	Are the standard operating procedures (SOP) defined to include point of contact responsible?
	Explanation	<i>ICCC should have well defined standard operating procedures (SOP) with names and details of relevant stakeholders point of contact responsible for managing a particular activity / service.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

	Indicator	Are the standard operating procedures defined to include action for person responsible?
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1.18	Explanation	<i>ICCC should have well defined standard operating procedures (SOP) mentioning the roles and responsibilities of identified stakeholders including communication methodology.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

1.19	Indicator	Are the standard operating procedures defined to include action for person responsible?
	Explanation	<i>ICCC should have well defined standard operating procedures (SOP) mentioning the roles and responsibilities of identified stakeholders including communication methodology.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

1.20	Indicator	Are the standard operating procedures defined to include procedures?
	Explanation	<i>ICCC should have well defined standard operating procedures (SOP) approved by the competent authority mentioning step-by-step activities to provide clarity to relevant stakeholders.</i>

	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

1.21	Indicator	Are the standard operating procedures defined to include on-field/premise assets?
	Explanation	<i>ICCC should have well defined standard operating procedures (SOP) approved by the competent authority covering entire ICCC functions in including field assets.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

Sub-category | Communication Capability Assessment

1.22	Indicator	Is the communication protocol (mode, contact details, alternates) included in the SOP?
	Explanation	<i>ICCC should have an up to date SOP document capturing required details.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	SOP Document

1.23	Indicator	Does the system provide for audio communication over multiple channels to first respondent ?
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	Explanation	<i>ICCC should have more than one method of audio communication. For example, multiple channels may include PA system, Call Centre facility, ECB, phone / mobile calls etc.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	10-30 sec audio recording on min 2 channels at ICCC

1.24	Indicator	Does the system provide for audio communication over multiple channels to all responders ?
	Explanation	<i>ICCC should have more than one method of audio communication. For example, in case of an accident or emergency situation ICCC helpdesk team may communicate with multiple stakeholders (such as ULB, Police, Fire dept, Health etc.) over multiple channels (phone / emails / video call etc.)</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	10-30 sec audio recording on min 2 channels at ICCC

1.25	Indicator	Does the system provide for video communication to first respondent?
	Explanation	<i>ICCC should have facility for Video communication. For example, these channels may include Tele-conference, WhatsApp, etc.</i>

	City Response (Yes/No)	City to enter applicable option
	Supporting document	10-30 sec video/screen recording.

1.26	Indicator	Does the system provide for video communication to all responders?
	Explanation	<i>ICCC should have facility for video communication. For example, in case of an accident or emergency situation ICCC helpdesk team may communicate with multiple stakeholders (such as ULB, Police, Fire dept, Health etc.) over various video channels such as Telepresence, WhatsApp etc.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	10-30 sec video/screen recording

1.27	Indicator	Does the communication channel provide for recording and playback?
	Explanation	<i>ICCC should have provision for recording and playback options in case of any event / notification. For example, in case of any traffic violation / accident, video data captured through CCTV cameras could be used for analysis.</i>
	City Response (Yes/No)	City to enter applicable option
	Supporting document	Video/Audio recording of past duration

2. Technology Maturity Assessment

Technology Maturity assessment is designed to assess the product maturity i.e. product features and components used by ICCC which are categorized as follows:

- a) Data Acquisition and Visualization Components
- b) Configuration Layer Components
- c) Data Analytics and Co-relation Layer
- d) Command and Control Layer

Category | Technology Maturity Assessment

Sub-category | Data Acquisition

City Response Options:

1. **Yes:** Implemented and component capability could be demonstrated with various functional use cases.
2. **No:** Not Implemented but product component is available to City Administration.
3. **Not Applicable (NA):** If component was not part of product specs at the time procurement thus not implemented at ICCC.

2.1	Indicator	Integration with Sensors: Ability to collect and aggregate data in real time generated from on field sensors / Edge Infrastructure like Bin Sensors, Water Sensors, Environment Sensors, Access Sensors, Actuators Sensors.
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	Explanation	<i>ICCC should have integrated view of field sensors to collect, process and aggregate data in real time.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Dashboard report including the PO copy

2.2	Indicator	ETL Capability: Ability of ICCC platform to consume raw data feeds from different data sources and ability to prepare information for downstream uses. E.g. Ability to process data coming through online systems, mobile apps, social media, edge sensors, third party applications and tools, data files (EXCEL, GIS etc.) and different data bases for effective interpretation.
	Explanation	<i>ICCC should have ability to process and analyze multi-dimensional data coming from various systems / applications for effective decision making. The data fetched through these systems / applications should be extracted, transform (removing inconsistencies/redundancies etc.) and processed with improved quality for analysis/reporting. E.g. Ability to process data coming through online systems, mobile apps, social media, edge sensors, third party applications and tools, data files (EXCEL, GIS etc.) and different data bases for effective interpretation.</i>

	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Dashboard report from the ICCC system

2.3	Indicator	Integration with Video Feeds: Ability to consume video feeds generating from various application capturing videos like Surveillance, Parking, Traffic etc.
	Explanation	<i>Self-explanatory.</i> <i>ICCC should able to consume, process and analyze video feeds being captured by Surveillance / Parking sensor camera installed at field locations.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- Dashboard report from the ICCC system - At least one (1) use case with screen shots

2.4	Indicator	Integration with Data Feeds and Publishing Data Feeds: Ability to consume real time data feeds from various systems/applications using APIs.
	Explanation	<i>Self-explanatory.</i> <i>ICCC should be able to consume, process and analyze video feeds being captured by ANPR/RLVD/ other sensor devices installed at field locations for traffic management and improve congestion problem in the city.</i>

	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Dashboard report from the ICCC system

Sub-category | Configuration Layer/SOP

2.5	Indicator	Configuration of SoP, Alerts: Ability to configure Standard Operating Procedure using ICCC Platform using data feeds from different systems/applications converging at ICCC.
	Explanation	<i>ICCC should have Ability to configure Standard Operating Procedure using ICCC Platform and be able to demonstrate. E.g. Allocating compliant no. / docket no. to field engineer of road department when ICCC receives potholes complaint. Or Generating Alert to Hospitals and Police Station in an event of Fire break out.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Dashboard report from the ICCC system with configured SOPs

2.6	Indicator	Configuration of GIS: Ability of ICCC platform to configure and use GIS application and Open Street Maps for doing GIS analysis of domain specific use cases.
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	Explanation	<i>ICCC platform should have the ability to demonstrate and use GIS for spatial analytics specific use cases as per their requirements. e.g. ability to analyze Civic Utilities like Fire Hydrant across city on City Map. Or ability to analyze city slum pockets on city map.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- Dashboard report from the ICCC system integrated with GIS application - Screenshot of at least one (1) use case

2.7	Indicator	Configuration of SLAs: Ability to view SLA compliance / non-compliance of various projects and applications using ICCC application.
	Explanation	<i>ICCC platform should have ability to configure based on configured SLAs for various services & applications. For e.g. Garbage Collection SLA, Water Quality, Network Operations SLA etc.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	SLA report from the ICCC system for services configured

2.8	Indicator	Configuration of Data Security Features: Ability to configure user access and authorization control to provide specific set of information/data/application control to designated or authorized set of users.
	Explanation	<i>ICCC platform should have data security feature configurable through role-based user access and authorization mechanism. E.g. Ability to restrict water department operation team to view water billing data (if not authorized).</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Details of user modules and configured authorization details

2.9	Indicator	Configuration of Network Control: Ability to manage and monitor network performance through ICCC platform using NMS application or third-party application.
	Explanation	<i>ICCC platform should be able to manage and monitor network performance. For example, EMS/NMS application installed should be able to provide health status of services / device running on the network.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	ICCC system report with all devices / asset health status report

2.10	Indicator	Configuration of User Access Control: Ability to configure and manage user access to different application / facilities through ICCC.
	Explanation	<i>Please refer to the serial no. 2.8 of this section.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Details of user modules and configured authorization details

2.11	Indicator	Configuration of Notification Control: Ability to configure and manage user notification as per configured protocol.
	Explanation	<i>ICCC system should have a facility to configure multiple notifications for e.g., on case of SLA breach or alert, notification should be generated to configured user to take required action.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	<ul style="list-style-type: none"> - SLA report with details of notification control module - Last one-month alert / notification audit trail report

Sub-category | Data Analytics and Correlation Layer

2.12	Indicator	Sentiment Analytics: Ability to provide sentiment analytics of configured key words / accounts through internet crawling through ICCC platform. Ability to categorize key issues / topics / words in real time on social media platform (Twitter, Facebook, Website Discussion Forums, News Papers) which are contributing to negative / positive perception among citizens.
	Explanation	<i>Self-explanatory.</i> <i>For example, ICCC should be able to demonstrate this functionality as per the service configured and other third-party data sources by the city.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

2.13	Indicator	Predictive Analytics: Ability to make predictions about future events using historical data. Predictive analytics uses many techniques from data mining, statistics, modeling to analyze current data to make predictions about future.
	Explanation	<i>Self-explanatory.</i>

		<i>For example, predicting key areas of civic concerns in specific areas using past and current data from city compliant management application / social media etc. or Predicting Bill projections of property tax using collection trends in past year.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

2.14	Indicator	Prescriptive Analytics: Ability to find best course of action for a given variable situation/scenarios.
	Explanation	<i>ICCC should have the functionality to demonstrate action for situational analysis. For e.g. Choosing shortest routes or number of vehicles to collect garbage in given time slot in a day based on various factors like traffic congestion, proximity to transfer stations etc. Or planning best traffic planning with objective to reduce congestion during festivals at different point of time in a day.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

2.15	Indicator	Diagnostics Analytics: Ability to do root cause analysis using data slicing, data aggregation, data mining, data discovery and correlation techniques using ICCC platform.
	Explanation	<i>Self-explanatory.</i> <i>For example: Identifying key reasons for mosquito borne diseases: Monsoon or poor cleaning of drainage or specific patterns of temperature in given season.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

2.16	Indicator	Descriptive Analytics: Ability to view insights using past data for given data set.
	Explanation	<i>ICCC system should have built-in functionality to develop insights.</i> <i>For example, viewing property tax Collection through different channels in a given month based on past three years data.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

2.17	Indicator	Video Analytics: Ability to automatically analyzing video to detect and determine temporal and spatial events.
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	Explanation	<i>ICCC should be the functionality for advanced video analytics. For example, identifying number plates of vehicles in parking zone to levy penalty for defaulters.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

Sub-category | Command and Control Layer

2.18	Indicator	Operations/Process Control: Ability to provide assistance to city operations in various civic domains namely water, drainage, solid waste, fire etc.
	Explanation	<i>ICCC platform should be able to aid in improved coordination for different city operations including management & control of multiple stakeholders. For example, in case of hazardous chemical gas leakage situation, Metrological dept along with Health dept. can collaborate with ICCC central helpdesk to extend support to at-risk citizens as well as field staff.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	At least one (1) use case with screen shots showcasing the functionality

	Indicator	SOP Control: Ability to manage the SOPs lifecycle configured in ICCC platform.
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2.19	Explanation	<i>ICCC platform should manage the life cycle of incidents and related entities via pre-defined workflows which cut across multiple systems via the interfacing modules.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	SOP document

2.20	Indicator	Access Control: Ability to provide access or restrict access to user group for any facility or applications in real time.
	Explanation	<i>ICCC platform should have built-in user access and authorization mechanism. For example, the water billing data can't be accessed by operation team but can be accessed by water dept. head.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Details of user modules and configured authorization details

2.21	Indicator	Device Control: Ability to provide access or restrict access to user group for any actuators / devices like water supply sensors or edge devices on network in real time.
	Explanation	<i>Self-explanatory.</i>

		<i>ICCC should be able to control devices / sensors access rights or system privileges based on defined SOPs & role-based access mechanism.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Details of user modules and configured authorization details for actuators/ devices

2.22	Indicator	Sensors Control: Ability to access control like reboot and control any sensors on network in real time through ICCC platform.
	Explanation	<i>Self-explanatory.</i> <i>ICCC should be able to control sensors on network based on access rights or system privileges as per defined SOPs.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

2.23	Indicator	Field Force Control: Ability to assist field force of city administration by providing requested information and support in real time to manage civic operations.
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	Explanation	<i>ICCC should be able to provide field force control on real time to manage civic operations. For example, workflow for operational field alerts and escalations should be triggered without human intervention. Standard Operating Procedures (SoPs) must be adhered, in case of any incident.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

	Indicator	Asset Control: Ability to control the access to field assets through ICCC platform.
2.24	Explanation	<i>Self-explanatory. ICCC platform should be able to do asset control with an integrated view of all field assets (such as sensors / devices etc.) accessible and managed through a console application.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

3. Governance Maturity Assessment

Governance Maturity assessment is designed to assess the governance dimension i.e. organization governance features which are categorized as follows:

- a) Governance Framework
- b) Field Force Governance Framework
- c) Decision Making Framework
- d) Knowledge Management
- e) Cyber security

Category | Governance Maturity Assessment

Sub-category | Governance Framework

3.1	Indicator	Is the approved Data Governance Policy in place?
	Explanation	<i>The city should have approved Data Governance policy in place for data management (data sharing, privacy, security and ownership), implementation along with key responsibilities mentioned for all stakeholders.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	City Data Governance Policy duly approved by the dept committee managing the operations at ICCC

Indicator	Is the approved ICCC Management Structure in place?
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3.2	Explanation	<i>The city should have approved ICCC Management structure including organogram, stakeholder's roles and responsibilities for managing day to day operations, decision-making.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Organogram mentioning management structure

3.3	Indicator	Is the approved ICCC Resourcing Policy in place?
	Explanation	<i>The city should have approved ICCC resourcing policy in place to facilitate hiring the right people when and where they are needed.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	ICCC resourcing Policy duly approved by the dept committee managing the operations at ICCC

3.4	Indicator	Is 100% ICCC Seat occupancy SLA monitoring in place?
	Explanation	<i>The city should have 100% ICCC seat occupancy SLA monitoring for various citizen services being offered and monitored through ICCC. e.g. tracking of field force, garbage collection issue in an area for management and resolution.</i>
	City Response (Yes/No/NA)	City to enter applicable option

	Supporting document	Monthly SLA Report
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3.5	Indicator	Is Intern on-boarding policy in place?
	Explanation	<i>This could be a section in the ICCC Resourcing Policy framed by the city in their document.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	ICCC On-boarding policy document

3.6	Indicator	Is the ICCC Training and Capacity annual budget in place?
	Explanation	<i>To help appropriate human resource placed at ICCC adapt to changing technologies and benefit from data analytics efforts of the City and provisioning for the same in their annual budget.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Copy of internal circular with amount of the budget allocated

Sub-category | Support to Field Force/Vendors

	Indicator	Field Force uses mobile app connected with ICCC?
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3.7	Explanation	<i>Field forces include on-ground surveyors, ULB ground force etc. to improve efficiency in data collection efforts and helps standardize datasets for quick analysis</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

3.8	Indicator	Field Force uses ICCC Geospatial Information Systems (GIS) service for day to day operations?
	Explanation	<i>Improved spatial understanding and analytics will help in decision-making and city field force should use GIS service for handling day-to-day operations.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

3.9	Indicator	Field Force can communicate two way with City ICCC?
	Explanation	<i>ICCC system should enable effective coordination to help on-ground field force in improved service delivery to citizens.</i>

	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

3.10	Indicator	Field Force SLA monitoring is in place?
	Explanation	<i>ICCC system should have SLA monitoring in place to support various citizen and municipal services being monitored at ICCC.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Monthly SLA report

3.11	Indicator	Scientific Work/area allocation through ICCC analysis?
	Explanation	<i>ICCC system should have provision to analyze the type of work to be assigned based on skills and / or location.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP Document - At least one (1) use case with screen shots showcasing the functionality

Sub-category | Decision-making Framework

3.12	Indicator	Is the City Leadership making decisions on a weekly or daily basis using ICCC analytics?
	Explanation	<i>This will validate the utility of the ICCC infrastructure. City Leadership includes Municipal Commissioners, Additional Municipal Commissioner, ULB HODS etc. for effective decision making and improve citizen services.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- Daily/weekly dashboard - Action taken report

3.13	Indicator	Are City Officers able to make decisions on a weekly and daily basis using ICCC analytics?
	Explanation	<i>City Data Officers should be able to make decisions based on available / configured ICCC analytics and inform respective line department to look into the issue for faster resolution.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- Daily / weekly dashboard - Action taken report

3.14	Indicator	Have Area wise/Department wise KPIs configured in the ICCC?
	Explanation	<i>The ICCC system should have the functionality of configuring KPIs based on the city requirements. For example, in case of solid waste management area-wise route planning should be possible to configure.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- SOP document - Dashboard report

3.15	Indicator	Is KPI compliance monitored on-line
	Explanation	City Leadership should be able to assess performance of its officers/employees on KPI compliance using ICCC?
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Monthly Report from e-governance module, compliant redressal module / Field officer app + weightage of Municipal performance index score of the city

Sub-category | Knowledge Management

3.16	Indicator	Is Knowledge Management application / services operational for improved management?
	Explanation	<i>These application/service include capacity building modules, case studies, data repository, ICCC system documents including SLA, FAQ, local knowledge and solutions, citizen feedbacks & responses, with proper classification / cataloguing, and UPDATED for improved operations and transition management.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Snapshot of the knowledge management module with report of at least 3 months on above specified components.

3.17	Indicator	Can stakeholders update any piece of information or intelligence in knowledge base using ICCC interface?
	Explanation	<i>The ICCC system should provide the functionality to configure knowledge management module for update and control of the information.</i>
	City Response (Yes/No/NA)	City to enter applicable option

	Supporting document	Screen shots for role-based access rights and at least 5 updates report in last 3 months.
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3.18	Indicator	Are FAQs for services, processes and utilities made available to citizens?
	Explanation	<i>The city should provide a portal or access to various FAQs on citizen services, processes and utilities along with helpdesk details.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Screen shots of last 3 months providing details of the functionality.

Sub-category | Cyber Security

3.19	Indicator	Have Cybersecurity policy, data privacy policy, security procedures and minimum baseline security guidelines been designed to protect edge devices, network and applications integrated with ICCC from different cyber-attacks?
	Explanation	<i>The city should have their cyber security policy in place to manage, protect and monitor various assets, system and applications, network including ICCC infrastructure.</i>
	City Response (Yes/No/NA)	City to enter applicable option

	Supporting document	Copy of City cyber security Policy duly approved by the dept committee
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3.20	Indicator	Are periodic assessments done to assess security for ICCC?
	Explanation	<i>A periodic assessment needs to be performed for ICCC on a regular basis to ensure that security is continuously maintained during the operations.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	Cyber security assessment report

3.21	Indicator	Has a Security Operations Centre (SOC) been setup to detect and protect the ICCC from cyber-attacks?
	Explanation	<i>The city should have established security operations centre (SOC) to set, detect, and protect the ICCC and associated infrastructure, applications as well as network from cyber-attacks.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	- Details of the purchase order - User acceptance Test Document

3.22	Indicator	Are regular training programs being conducted for creating awareness about cyber security amongst stakeholders managing ICCC?
	Explanation	<i>The city should have designed regular training programs for creating awareness about cyber security.</i>
	City Response (Yes/No/NA)	City to enter applicable option
	Supporting document	-Training Calendar - Attendance sheet with feedback form

4. Citizen Engagement and Outreach

Citizen engagement and outreach Maturity assessment is designed to assess the dimension features which are categorized as follows:

- a) Citizen outreach
- b) Employee outreach
- c) Sentiment Analysis

Category | Citizen Engagement and Outreach Maturity Assessment

4.1	Indicator	Percentage (%) of unique citizens interacted with ICCC w.r.t overall city population?
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	Explanation	<i>The ICCC should provide report for citizen contacts made through various channels for example, phone / email / chat etc.</i>
	City Response (Marking System)	0-1 % Marks-0, 1-5% Marks-5, 5-10% Marks-10, 10-15% Marks-15, 15 % above Marks-20
	Supporting document	Past 3 months consolidated report supported by individual system report.

4.2	Indicator	Percentage (%) of city corporation employee connected with ICCC with overall strength?
	Explanation	<i>The ICCC should provide report for corporation employee contacts made through various channels for example, phone / email / chat etc.</i>
	City Response (Marking System)	0-10% Marks- 5, 10-20% Marks- 10, 20-30% Marks- 15, 30-40% Marks- 20,40-50% Marks-25, 50% above Marks- 30
	Supporting document	Past 3 months consolidated report supported by individual system report.

4.3	Indicator	Percentage (%) of feedback received from citizen connected with ICCC?
	Explanation	<i>The ICCC should provide report for citizen feedback received through various channels for example, phone / email / chat etc.</i>

City Response (Marking System)	0-10% Marks-5,10-20% Marks-10, 20-30% Marks-15, 30-40% Marks-20, 40-50% Marks-25
Supporting document	Past 3 months consolidated report supported by individual system report.

Draft for consultation

This is the last page of the document