**Integrated Command**

**And**

**Control Center**

**Functional Requirement Specification**

Ver 0.1

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# **Purpose**

**Centralized Monitoring & Decision-Making**

* Single platform for multiple city services.
* Real-time data analysis for quick decision-making.

**Smart Waste & Resource Management**

* Optimized waste collection routes.
* Timely waste disposal and bin level monitoring.
* Prevents waste overflow and maintains cleanliness.

**Disaster & Emergency Response**

* Real-time flood, fire, and accident detection.
* Quick emergency alerts to authorities and citizens.
* Efficient coordination of police, fire, and medical teams.

**Traffic & Transport Management**

* Real-time traffic congestion monitoring.
* Smart public transport route optimization.
* Road safety improvement through violation detection.

**Public Safety & Surveillance**

* CCTV integration for crime monitoring.
* AI-based suspicious activity detection.
* Enhanced security with emergency response integration.

**Environmental & Energy Monitoring**

* Tracking air pollution, water quality, and weather.
* Optimizing electricity and water consumption.
* Sustainable resource management.

**Citizen Engagement & Governance**

* Grievance redressal system for public complaints.
* Transparent governance with real-time updates.
* Public announcements and emergency alerts.

**Data-Driven Urban Planning**

* AI and Big Data analytics for city development.
* Identifying pollution and accident-prone areas.
* Smart infrastructure planning.

# **Project Scope**

Outline scope of project

**Inclusions:**

Detail what software features the software will include

1. **Centralized Command & Control System**

* A single dashboard that provides real-time monitoring and analytics.

1. **Smart Waste Management**

* Bin level monitoring, optimized collection routes, and a waste overflow prevention system.

1. **Disaster & Emergency Response**

* A system for fire, flood, and accident detection, along with real-time alerts.

1. **Traffic & Transport Management**

* Smart traffic monitoring, violation detection, and public transport optimization.

1. **Public Safety & Surveillance**

* CCTV integration, AI-based activity detection, and automated alerts.

1. **Environmental Monitoring**

* Air pollution tracking, water quality analysis, weather monitoring, and sustainable resource management.

1. **Citizen Engagement & Governance**

* Grievance redressal system, real-time updates, and public announcements.

1. **AI & Data-Driven Urban Planning**

* Big Data analytics for identifying pollution-prone areas and accident hotspots.

1. **Role-Based Access Control (RBAC)**

* Secure user roles and permissions for different stakeholders.

**Exclusion:**

Clearly state what is not included in software

1. **Hardware Procurement & Maintenance**

* The purchase and maintenance of sensors, CCTVs, and IoT devices will not be part of the software.

1. **Third-Party Private Security Integration**

* Only government-approved security systems will be integrated; private security systems are not included.

1. **Offline Data Processing**

* ICCC is designed for real-time monitoring, so offline mode or manual data entry is not included.

1. **Personal Data Storage**

* The system will comply with GDPR & privacy laws and will not store sensitive personal data.

1. **Direct Public Access to ICCC Dashboard**

* Access will be restricted to authorized government officials and stakeholders; citizens will not have access.

# **Overview**

The **ICCC** is a centralized digital platform designed to monitor, manage, and optimize multiple smart city services in real time. It integrates data from various city departments, sensors, and surveillance systems to enable data-driven decision-making and improve urban governance.

# **Project Objective**

The **ICCC** aims to address the inefficiencies in traditional urban management by providing a centralized, real-time monitoring system. The current challenges that the ICCC seeks to overcome include.

1. **Lack of Centralized Monitoring**

* City services operate in silos, leading to inefficient coordination and delayed responses.

1. **Inefficient Waste Management**

* Manual and unoptimized waste collection results in overflowing bins and unclean surroundings.

1. **Delayed Emergency Response**

* Lack of real-time data delays disaster and emergency response coordination.

1. **Traffic Congestion & Violations**

* Inefficient traffic monitoring leads to congestion, accidents, and road safety issues.

1. **Limited Public Safety Measures**

* Inadequate surveillance and manual monitoring make crime detection and response inefficient.

1. **Environmental Degradation**

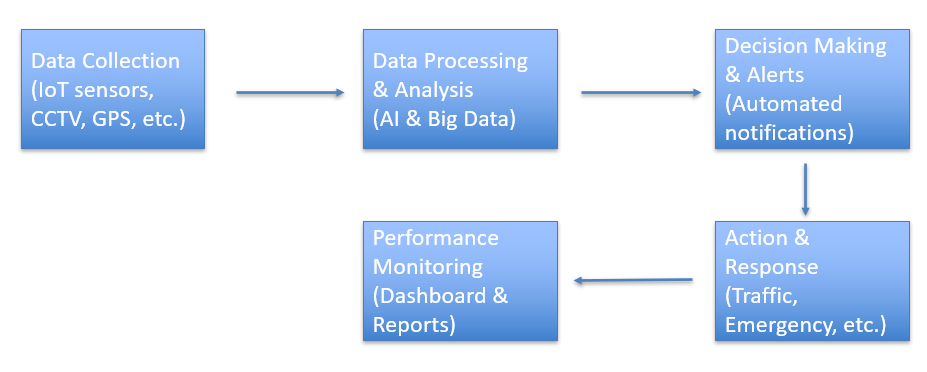
* Absence of real-time air quality and water monitoring affects sustainable urban planning.

1. **Lack of Citizen Engagement**

* Limited transparency and slow grievance redressal reduce public trust in governance.

# **Product Functions**

Summarize major functionality of system. Flow chart/ Activity Diagram to represent the product functions.



# **User Classes and Characteristics**

Describe different types of users who will interact with the system

1. **Government Officials**

* **Role -** Monitor and manage city operations through the ICCC dashboard.
* **Access Level -** Full access to reports, alerts, and analytics.
* **Technical Expertise -** Moderate (basic training required for dashboard usage).

1. **Emergency Response Teams**

* **Role -** Respond to incidents such as accidents, fires, and law enforcement situations.
* **Access Level -** Limited access to emergency alerts and live feeds.
* **Technical Expertise -** Low (mobile and web-based alert system).

1. **Traffic Management Personnel**

* **Role -** Monitor and control traffic flow, detect violations, and optimize routes.
* **Access Level -** Access to traffic cameras, congestion alerts, and signal control.
* **Technical Expertise -** Moderate (familiarity with GIS and traffic monitoring software).

1. **Waste Management Teams**

* **Role -** Track waste collection schedules, optimize routes, and monitor cleanliness.
* **Access Level -** Real-time waste collection data, route optimization tools.
* **Technical Expertise -** Low (mobile application for task management).

1. **Administrative Staff**

* **Role -** Manage user permissions, maintain system logs, and handle reports.
* **Access Level -** User management, system settings, and report generation.
* **Technical Expertise -** High (trained in system configuration and data management).

1. **IT Support & Maintenance Team**

* **Role -** Ensure system uptime, troubleshoot issues, and perform maintenance.
* **Access Level -** Full access to system logs, error reports, and configuration settings.
* **Technical Expertise -** High (expertise in database management, networking, and system security).

1. **Citizens (Indirect Users)**

* **Role -** Provide feedback via mobile applications and web portals.
* **Access Level -** Limited access to public information (e.g., traffic updates, alerts).
* **Technical Expertise -** Basic (user-friendly interfaces for reporting issues).

# **Assumptions and Dependencies**

1. **Assumptions**

* **Stable Internet Connection -** The system will function properly if continuous internet connectivity is available.
* **Hardware Compatibility -** Devices such as surveillance cameras, sensors, and servers should be compatible with the system.
* **User Training -** Government officials, emergency teams, and other users will receive basic training to operate the system.
* **Data Accuracy -** The data received from sensors and cameras will be accurate and timely.
* **System Scalability -** There should be flexibility to add new modules or features in the future.
* **Regulatory Compliance -** The system is designed in accordance with local government regulations and data privacy laws.

1. **Product Dependencies**

* **Third-Party APIs -** Integration with third-party APIs will be required for weather updates, GPS tracking, and payment gateways.
* **Database Server -** The system's data will be stored in a centralized SQL/NoSQL database.
* **Cloud Services -** Some parts of the system may be cloud-based, such as backups and remote access.
* **IoT Devices -** Smart sensors, traffic cameras, and GPS trackers are integral components of the system.
* **Operating System Compatibility -** The web-based dashboard and mobile applications should be compatible with Windows, Android, and iOS.
* **Security Protocols -** The system should support SSL encryption, role-based access, and authentication mechanisms.

# **Functional Requirements**

The section should contain detailed description of each business requirement.

Each functional requirement should ideally contain:

1. **Unique** **Requirement Name**:
   1. **Description**: Detailed description of the functionality.
   2. **Priority**: The importance of the requirement
   3. **Inputs**: What data or actions trigger the functionality
   4. **Fields/Data Elements**: Details of the fields along with data types, length, format, Description, Mandatory (Yes/No)
   5. **Validations**: Validation check to be implemented for every field
   6. **Business Rules**: Detailed Business Rules for the Requirement.
   7. **Acceptance Criteria**: Detailed Acceptance Criteria. The conditions that must be met for the function to be considered complete and correct.
   8. **Outputs**: What the system produces as a result

<<Screen Shot/ Screen Prototype>>

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<<Screen Shot/ Screen Prototype>>

# **Non-Functional Requirements**

### **Performance –**

Specify Performance Requirements

### **Security –**

Specify Security Requirements

### **Usability –**

Specify Usability Requirements

### **Availability –**

Specify Availability Requirements