# Integrated Command And Control Center

## Smart & Safe City Initiative

*A unified platform of shared information to ensure a common, coordinated, effective response.*

**CMS**

SIMPLIFYING LIFE

# Brief Profile

CMS
SIMPLIFYING LIFE

Established in 1976, we are one of **earliest IT companies scripting India's Digital Story**

**4500+** people apply insights to create innovative solutions to your business needs

For over **four decades**, we have been successfully integrating people, business and technology to create effective, sustainable business ecosystems

With a footprint across over **100+ locations**, we deliver business consulting, systems integration, IT solutions and Internet of Things (IoT) expertise across industries and business functions

CMS
SIMPLIFYING LIFE

Uninterrupted record of **profitable growth**

Certified **CMMI Level 5, ISO 9001, ISO 20000, ISO 27001, ISO 14000 and ISO 45000**

Continuous track record of innovation. **Dedicated Product Development Centre** since the 90s

TÜV NORD
ISO 9001

TÜV NORD
ISO 27001

TÜV NORD
ISO 20000-1

CMMI DEV/5

# Four Decades of IoT / Smart City Experience

**CMS** SIMPLIFYING LIFE

### 1976
- CMS is born
- Mr. Ramesh Grover starts Computer Maintenance Services

### 1989-1995
- LED based Aspect
- **Synchronized signals at 109 intersections – Bombay**
- **Vehicle Actuated Signals at Delhi**

### 2000-2001
- **Foray into ITMS**
- Introduced Automatic Vehicle Counting, Classification
- **Introduction of VMS**
- GSM based **Solar Emergency Telephone** system for Mumbai-Pune Expressway

### 2005
- **Vehicle Actuated Signals introduced**
- Traffic Signal set up across Chennai, most major Indian cities

### 2008
- **Mumbai ATC**
- Won Asia's single largest Traffic ATC order worth 55 Crores across Mumbai City & parts of suburbs

### 2016-18
- **Vadodara Smart City**
- **India's first Smart City inaugurated by the PM**. CMS technology at work
- **Mumbai City Surveillance**
- **Rajasthan Safe Cities**
- **Vizag Smart City**

**Timeline:** 1976 | 1985 | 1989-95 | 1996-1999 | 2000-2001 | 2002-2004 | 2005 | 2006-2007 | 2008 | 2016-18 | 2019-21

### 1985
- **Set up Product Development**
- R&D unit set up Design in India, Make in India for the Traffic Industry

### 1996-1999
- **First ATC in India**
- Setup India's first ATC in India at Delhi.

### 2002-2004
- **First Public Safety deployment** for MNW project.
- **Electronic Toll Collection automated system** for Mumbai Pune Expressway

### 2006-07
- **Automated Parking system -** Setup at Delhi's Palika Bazaar. Traffic Signals across various countries – Guyana, Bangladesh VMS system across Mumbai for Disaster Management

### 2019-2022
- **EWDS NCRMP Early Warning System for disaster management** across the entire state of Kerala
- **Nashik SC**
- **Kalyan Dombivali SC**
- **Bhagalpur SC**
- **Muzaffarpur SC**

# CMS's Smart City Experience

## Vadodara Smart City

- SITC of ICCC with integrations
- SITC, of citywide video surveillance system
- ANPR System and Video Analytics
- Adaptive Traffic Control System
- VaMS, ECB & IPPA System
- Environment Sensors

## Vizag Smart City

- Adaptive Traffic Control System
- AI based vehicle detection and classification system.

## Kalyan Dombivli Smart City

- Efficient Traffic Management With Adaptive Traffic Control System
- RLVD & Enforcement System
- ANPR at city Entry / Exit roads.
- Variable Message Signs
- Emergency Call Box
- IP based Public Address System

## RajCOMP Info Services Limited

- Crime detection and prevention with city wide surveillance system
- ANPR Cameras
- ITMS Sensor for Counting & Classification
- Emergency Call Box
- Rugged Tablets
- Wireless Communication System

## Nasik Smart City

- Efficient Traffic Management With Adaptive Traffic Control System
- VaMS & IP based PA System

# CMS's Smart City Experience

## Kerala EWDS

- SEOC setup with Command Control (CCC), CAD, Contact Center and Mass Notification Software
- Alert broadcast using High Power Sirens installed on Mobile Towers.
- CAD Software to inform and despatch Emergency Responders

## MCGM Mumbai

- Traffic Management Control Center at Traffic Police HQ
- Satellite Control Room at MCGM
- Up-gradation of Traffic Signal System to Adaptive Control System at 253 intersections in Greater Mumbai.
- Junction Surveillance for efficient Traffic Management.

## Chennai

- Traffic Management System for Chennai Traffic Police
- Delivery of 392 Citizen Services across Tamil Nadu
- Port Operations Control Center at KPL

## Bhagalpur Smart City

- ICCC Application with Integrations
- Adaptive Traffic Control System
- RLVD & Enforcement System
- Variable Message Signs
- Emergency Call Box
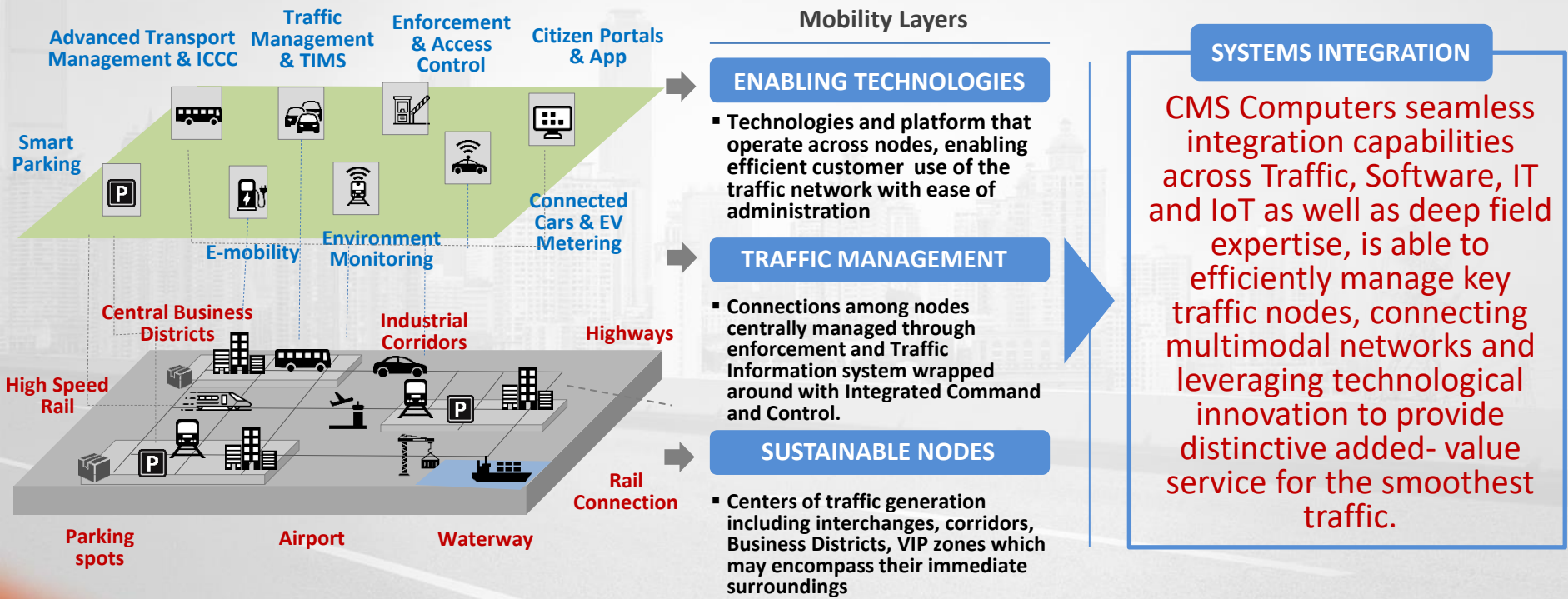- IP based Public Address System
- ERP, eGov & Web Portal

## Muzaffarpur Smart City

- ICCC Application with Integrations
- Adaptive Traffic Control System
- RLVD & Enforcement System
- Variable Message Signs
- Emergency Call Box
- IP based Public Address System
- ERP, eGov & Web Portal

# Engineering + IoT + Software + IT Infra
## CMS has the capability for Seamless Integration across the Ecosystem



**Mobility Layers**

Advanced Transport Management & ICCC

Traffic Management & TIMS

Enforcement & Access Control

Citizen Portals & App

Smart Parking

E-mobility

Environment Monitoring

Connected Cars & EV Metering

Central Business Districts

Industrial Corridors

Highways

High Speed Rail

Parking spots

Airport

Waterway

Rail Connection

### ENABLING TECHNOLOGIES
- Technologies and platform that operate across nodes, enabling efficient customer use of the traffic network with ease of administration

### TRAFFIC MANAGEMENT
- Connections among nodes centrally managed through enforcement and Traffic Information system wrapped around with Integrated Command and Control.

### SUSTAINABLE NODES
- Centers of traffic generation including interchanges, corridors, Business Districts, VIP zones which may encompass their immediate surroundings

### SYSTEMS INTEGRATION

CMS Computers seamless integration capabilities across Traffic, Software, IT and IoT as well as deep field expertise, is able to efficiently manage key traffic nodes, connecting multimodal networks and leveraging technological innovation to provide distinctive added- value service for the smoothest traffic.

# CMS Point of View: ICCC

- **ICCC** acts as the **"Nerve Centre"** for operations management, capable of processing complex and large pool of data.

- Initially aimed at **controlling and monitoring** water, power supply, sanitation, traffic movement, integrated building management, city connectivity and Internet infrastructure, these centres have since evolved to monitor various other parameters**.**
  - Environment Sensors
  - Crime and Criminal Tracking Networks and Systems
  - CCTV Surveillance & Video Analytics Systems
  - eGovernance Solutions And Asset Management Systems

- ICCC is used for increasing the **Situational Awareness** by providing insights using data for civic officials across urban functions through deployment of sensors across the city.

- ICCC **Standardizes Response Protocol** at city level by defining standard processes for recurring events, issues, incidents, etc.

- ICCC **Enables Collaboration** across multiple departments within and outside urban local bodies and other government and semi-government organizations.

- **Institutionalizes data driven** decision making for regular operations and during crisis situation across levels of city functionaries – right from operators to city administrators.

# ICCC Overview



**1** Multi-industry ICCC/IoT/device management platform

**2** Vendor Agnostic device and data connectivity Cross Platform and Cross Database architecture

**3** Edge computing capabilities to extend the power of the cloud to mobile and IoT devices

**4** Standard Communication protocols to build the device drivers for any devices to be onboarded

**5** Multi-cloud management and enables end-user to exchange between different platforms.

**6** Deployment Flexibility – On Premises, On Cloud and Hybrid

**7** Integration with other enterprise systems for exposing data integration.

**8** API and data management for B2C and B2B business application.

Anytime Any Context

Anything Any device

Any place Anywhere

ICCC Platform

Anyone Anybody

Any Path Any Network

Any Service Any Business

ICCC provides a rich set of features for managing / monitoring device networks, processing and visualizing collected data and integrating with other enterprise systems using open-source APIs.
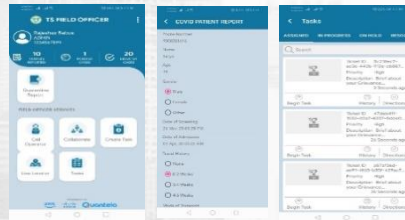
# ICCC Key Components

## Command & Control Center

- Real-time Dashboards
- Video Analytics
- Standard Operating Procedures
- Alerts & Notifications

- AI based Recommendations
- Orchestration and Integration of multiple data sources
- Bi-directional communication
- Business Intelligence

## Field Officer

- Real-time interactions with command center
- Incident handling
- Workflows & Standard Operating Procedures

- Collaborate
- Receive Alerts & Notifications
- Ground situation report
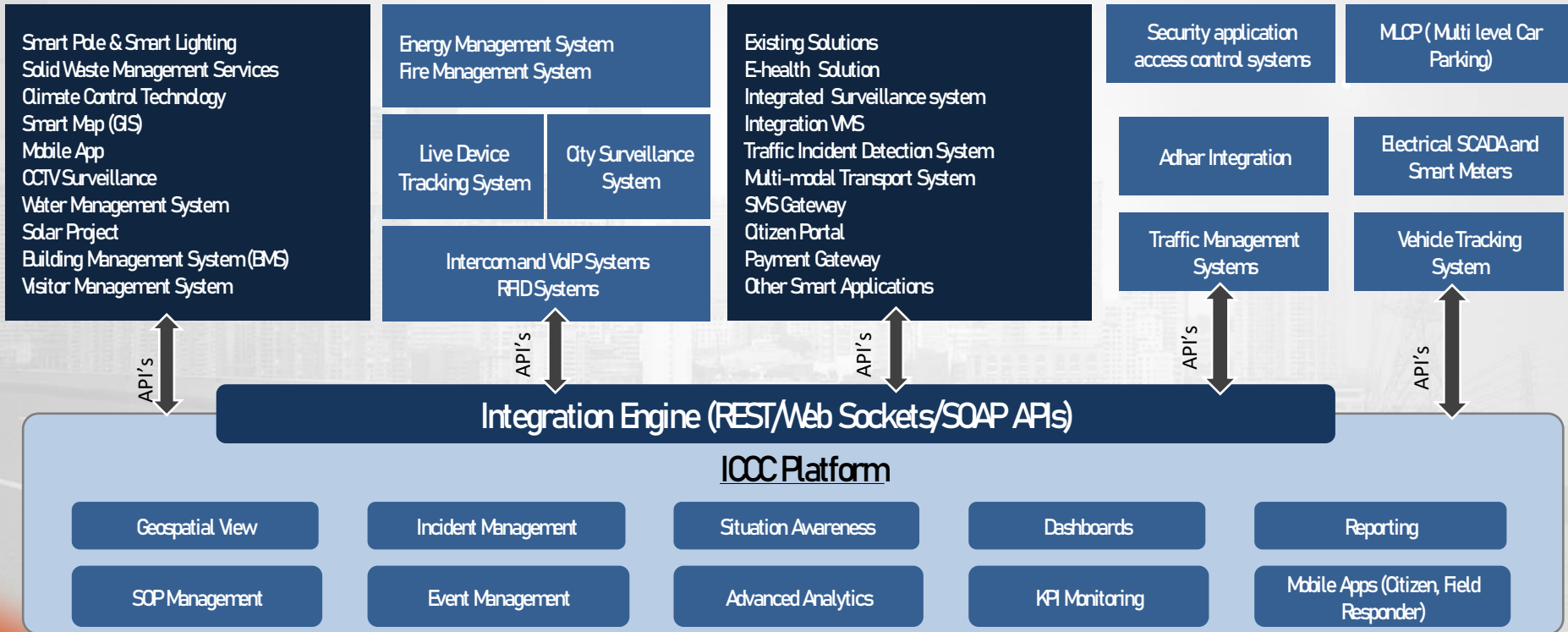- Collect Data offline and online

## Citizens
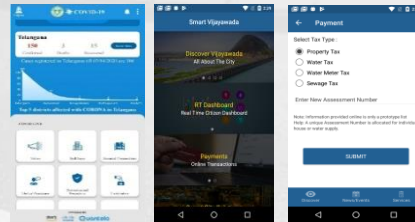
- Emergency helplines
- Complaints and grievances
- Utilities payment
- City Announcements
- News and Events

- City Tourist Guides
- Smart Solutions
- Government Services
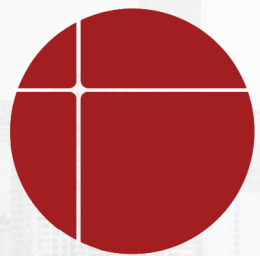- Offers and Deals
- Notifications

# ICCC Integration Architecture

## ICCC Platform – Integration Architecture

| Smart Pole & Smart Lighting | Energy Management System | Existing Solutions | Security application | MLCP ( Multi level Car |
|---|---|---|---|---|

Smart Pole & Smart Lighting
Solid Waste Management Services
Climate Control Technology
Smart Map (GIS)
Mobile App
CCTV Surveillance
Water Management System
Solar Project
Building Management System (BMS)
Visitor Management System

Energy Management System
Fire Management System

Live Device Tracking System | City Surveillance System

Intercom and VoIP Systems
RFID Systems

Existing Solutions
E-health Solution
Integrated Surveillance system
Integration VMS
Traffic Incident Detection System
Multi-modal Transport System
SMS Gateway
Citizen Portal
Payment Gateway
Other Smart Applications

Security application access control systems

MLCP ( Multi level Car Parking)

Adhar Integration

Electrical SCADA and Smart Meters

Traffic Management Systems

Vehicle Tracking System

API's

**Integration Engine (REST/Web Sockets/SOAP APIs)**

## ICCC Platform

| Geospatial View | Incident Management | Situation Awareness | Dashboards | Reporting |
|---|---|---|---|---|
| SOP Management | Event Management | Advanced Analytics | KPI Monitoring | Mobile Apps (Citizen, Field Responder) |

# ICCC Screens & Dashboards

# ICCC Analytics Dashboards



Predictive Analytics – Traffic Signal Congestion



Social Media Analytics



Covid Active Cases Heatmap including the Trends – to aid in Decision Making



Ward-wise Grievances Analysis

# What's Next for Command Control Centers?

- **More Integration:** Leverage information across departments, service delivery engines.

- Anticipate Problems: **Build a Data Aggregation Layer and building a Predictive Cognitive model.**

- **Co-ordinate Resources:** Event Correlations and linking KPI's for rapid co-ordinated response.

- **Service Management Focus:** Integration of Multi channel service desks, Voice & Chat bots leveraging Contextual technologies and Microservices.

- **Leveraging Cloud:** Build a Hybrid Cloud infrastructure connecting Corridors, Intersections and Highways across cities and suburbs.

- **Security integrated into the architecture:** IT & OT security management built from design phase.