Davanagere Smart City Limited (DSCL)

PB Road, Opposite Railway Station, Davanagere

Sub Project Name: PAN City ICT Project

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DETAILED PROJECT REPORT ON PAN CITY ICT PROJECT

Davanagere Smart City Limited (DSCL)

P.B. Road, Opposite Railway Station, Davanagere

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ABBREVIATIONS

Term	Description
ABD	Area Based Development
AMC	Annual Maintenance Contract
ANPR	Automatic Number Plate Recognition
BoM	Bill of Material
BoQ	Bill of Quantities
CCC	Command & Control Centre
CCTV	Closed-Circuit Television
CeG	Centre for e-Governance, Government of Karnataka
CSC	Common Service Centre
DC	Data Centre
DRC	Disaster Recovery Centre
DPR	Detailed Project Report
DSCL	Davanagere Smart City Limited
DVR	Digital Video Recorder
EDCS	Directorate of Electronic Delivery of Citizen Services
ETA	Estimated Time of Arrival
GIS	Geographic Information System
GPS	Global Positioning System
GSM	Global System for Mobile Communication
ICT	Information and Communication Technology
IOT	Internet of Things
ITS	Intelligent Transportation Systems
ITMS	Intelligent Traffic Management Systems
KMDS	Karnataka Municipal Data Society
KSRTC	Karnataka State Road Transport Corporation
KUIDFC	Karnataka Urban Infrastructure Development and Finance Corporation
LSI	Local System Integrator
MSI	Master System Integrator (To be appointed by KMDS)
PAS	Public Address System
PIS	Passenger Information System
PTZ	Pan-Tilt-Zoom

Term	Description
MoHUA	Ministry of Housing and Urban Affairs
MRC	Municipal Reforms Cell
MSI	Master System Integrator
NIC	National Informatics Centre
OEM	Original Equipment Manufacture
OFC	Optical Fibre Cable
RLVD	Red Light Violation Detection
RFP	Request for Proposal
RTO	Regional Transport Office
SCM	Smart City Mission
SCP	Smart City Proposal
SOP	Standard Operating Procedures
SSDG	State Service Delivery Gateway
SVD	Speed Violation Detection
VMS	Variable Message Signs

1. INTRODUCTION

1.1. Smart City Programme Background

The Ministry of Housing and Urban Affairs (MoHUA), Government of India (GoI) has initiated a Smart Cities Mission (SCM), under which select cities will be developed as smart cities with a focus on improving citizen services. Smart Cities Mission is an urban renewal and retrofitting programme with a mission to develop 100 cities all over the country and making them citizen friendly, sustainable and investment destination. Under the smart city scheme, Government has emphasized to improve the basic civic amenities of the cities on one hand and the provision of modern technological advances for ease of living on the other hand.

Under this programme, Davanagere has been selected among the first lot of cities taken up for implementation under the Phase - 1 of SCM, based on the Smart City Proposal (SCP) submitted by the city. The Smart City Proposal for Davanagere envisions to implement a number of projects divided into Area Based Development (ABD) projects and Pan City components on the following concept:

Area based development: The identified area of the Davanagere city will be developed into a “Smart Area” which will incorporate the features/ elements proposed in its Smart City Proposal including retrofitting of Mandakki Bhatti Area, economic rejuvenation of Mandipet Area (KR Market), redevelopment of Old City Bus Stand as a central transit hub, heritage block around Durgambika Temple Area, roof-top solar panels on various buildings, improved solid waste management, solar powered LED street lights, pedestrian footpaths & cycle track, underground utility corridor, etc.

Pan city components: The Pan city components will benefit entire city through the application of Information and Communication Technology (ICT) and will result in improving city’s administration, service delivery and enhance quality of life of the residents of Davanagere City.

1.2. Report Context

The purpose of this Detailed Project Report (DPR) is to articulate the complete set of components proposed under the Smart Urban Mobility and ICT based e-Governance PAN City Project for Davanagere.

This DPR covers the details of the components and their scope besides the cost estimations and implementation plan for Pan ICT City project implementation in Davanagere.

1.3. Solutions Proposed in the SCP

Details of various ICT related components envisaged in the Davanagere SCP and corresponding solutions proposed as part of Pan City ICT Project are listed in table below.

Table 1-1: SCP and Smart Solutions Mapping

S. No.	Project in the SCP	Corresponding Smart Solutions proposed in this DPR
1	**Smart Urban Mobility (ICT based Mobility Plan & Urban Transport Facility)**	
1.a	Road Network & safety Interventions • Road Network & Safety: ITS System with a central command centre located in the Old City Bus Terminal, upgraded as part of the area-based development. • CCTV Cameras at junctions, main roads and significant areas, monitored and controlled from the command centre. • Traffic sensors on major roads, junctions etc., to procure real-time data on traffic volumes and conditions. • Digital sign boards, with real-time feed to inform citizens on incidents, accidents, traffic status, diversions and safety messages • Intelligent solar street lights with information display boards, street signage, ergonometrically designed lights for pedestrians and vehicles, pollution sensors, traffic sensors, public address system, etc., • Smart Parking - The on-street parking will be regulated with sensors and smart metering systems, providing real-time update on display screens installed at critical locations and to the Command Centre.	• City Surveillance (Ref. Section5.3) • Intelligent Traffic Management System (Ref. Section 0) • Smart Parking (Ref. Section 5.5) • Variable Message Sign (VMS) System (Ref. Section 0) • Public Address System (Ref. Section 0) • City Wi-Fi (Ref. Section 5.7) • Environmental Sensors (Ref. Section 5.8) • Intelligent solar street lights component is being taken up separately, with a provision to integrate it with Centralised Command & Control Centre.
1.b	NMT network Interventions • Bicycle pods with digital information displays – to facilitate ride and share. • Smart Paving Technology: by using the advantage of high pedestrian and traffic volume, these tiles will capture energy from the movement of pedestrians and also transfer real-time data of volumes to the command centre.	• These components are not being taken up, based on discussions with DSCL.
1.c	Public transport network interventions	

S. No.	Project in the SCP	Corresponding Smart Solutions proposed in this DPR
	• ICT upgradation of all bus stops with digital tags & signage, mobile charging stations, digital ad-boards and solar panels. • GIS based mapping & GPS/ GPRS enabling of all city buses, for real-time tracking. This information is then displayed at all bus stops via GIS mapping solutions controlled from the command centre.	• Intelligent Transportation System for City Buses, SWM Vehicles, All police vehicles, Private City Buses and Auto Rickshaws, Ambulances & Fire Tenders (Ref. Section 5.6)
2	**ICT Crowd Mapping (ICT & E-Governance)**	
2.a	Building a real-time online community to *address the city's needs.*	• One City-One Website with Mobile Application (Ref. Section 5.9) • One City-One Number (Ref. Section 5.10) • e-Learning Centres and Self-Service Kiosks (Ref. Section 5.11) • e-Office Suite for DSCL (Ref. Section 5.12) • GIS mapping of the city proposed under ICT solutions of Davanagere will be integrated with the common GIS platform.
2.b	GIS mapping-based recording of complaints, citizen feedback & opinions on civic issues, services and city centric problems, Including real-time tracking on reported issues for the citizen & stake holders	
2.c	Online voting system to prioritize the projects being developed in the city.	
2.d	Integration of one city one website, one city one number, GIS mapping of the city with information on civic services status and location.	

Further three ICT Infrastructure components have been proposed which are essential for all the above solutions to function. These common ICT Infrastructure components are listed below:

i. Centralised Command & Control Centre (CCC) and Satellite Command & Control Centre (Ref. Section 6.1)

ii. Centralized Data Centre at KMDS Bangalore and Disaster Recovery Centre on Cloud (Ref. Section 6.3)

iii. MPLS (Multiprotocol Label Switching) / Leased Line Network (Ref. Section 6.4)

2. PROJECT CONCEPT

2.1. Project Objectives

The key objectives of the Pan City ICT project are to establish an integrated ICT infrastructure in the city in order to:

(i) augment safety and security of citizens and city assets;

(ii) improve mobility conditions in the city;

(iii) enhance quality of governance and citizen services imparted by various departments and agencies;

(iv) make public transport more effective and efficient;

(v) provide a platform for citizen engagement;

(vi) improve incidents' resolution through effective coordination among departments;

(vii) enhance law enforcement through effective city surveillance and automated traffic enforcement;

(viii) support intelligent decision making by making available rich data and information.

2.2. Project Outcomes & Benefits

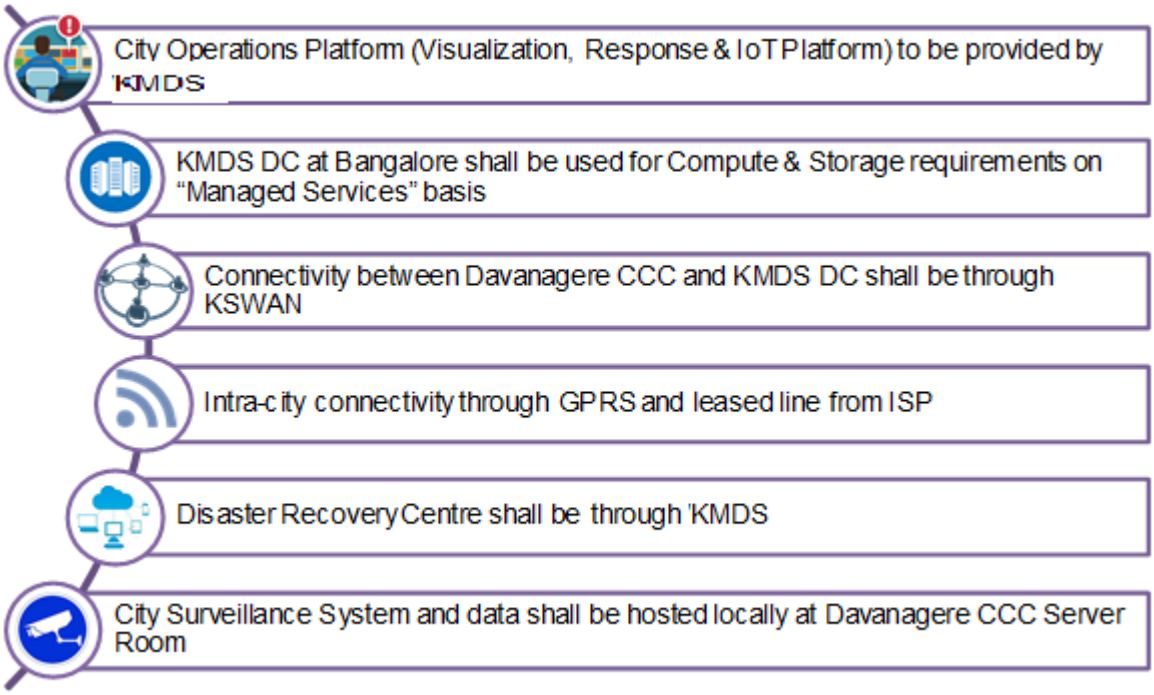
City Administration	• The implementation of Pan City interventions will ensure efficient traffic management, as well as safety and crowd surveillance. • The central command and control will ensure efficient continued working of the field equipment. • Continuous surveillance would help in reducing number of criminal and unlawful activities, number of traffic rule violations, illegal parking, encroachments, etc. • Prompt emergency response in cases of accidents, fires, disasters, epidemics, etc. due to availability of real time data and response mechanisms • Reduction in unscheduled outage of street lights, citizen amenities, etc. due to remote monitoring system • Reduction in costs by adopting a centralized architecture, enabling the platform to be administered and supported from one location

	• Instant MIS reports for planning, budgeting, monitoring & evaluation • Facilitate cross-department collaboration with the help of online systems in compliance with various standard operating procedures and bring transparency in city administration • Instant identification of delay points and enable prompt administrative action
Citizens	• Effective Surveillance helps in enforcing Law and Order and crime prevention (reduction in number of criminal and unlawful activities) • Reduced traffic congestion and waiting time at traffic junctions • Variable messaging displays to display the useful information related to traffic congestion, accidents/incidents, ongoing roadwork zones, speed limits, key notices or messages from city administration • Reduction in unscheduled outage of traffic lights, street lights, citizen amenities, etc. due to remote health monitoring • Real-time parking availability information on-demand through digital sign boards, portal or mobile application to its users • Services such as Wi-Fi, e-Learning Centres to reduce the digital divide among the citizens • Services delivered to citizens, faster, and at a lower operating expense • Single window experience for citizens to apply for various citizen services Birth, Death, Marriage, Income, Caste and Domicile certificates, etc. and get them through a single window mechanism • Improve communication between government administrators and citizens through an interactive Web portal, Mobile app and One City-One Number to disseminate information and submit grievances • Citizen Kiosk would serve as an extended arm of the government and private agencies to provide G2C and B2C services. This would facilitate the citizen for availing various services in their close vicinity and without actually have to visit respective office

3. DESIGN CONSIDERATIONS

3.1. Design Principles for the ICT Projects

The following Design Principles have been adopted based on the ICT Guidelines dated 11th November 2017 and minutes proceedings circulated by KUIDFC.



IoT devices communicate to IoT platform through application layer.

3.2. Guiding Principles for System Design

System and Technical Architecture for the design and development of the project will have the following key aspects as guiding principles:

3.2.1. Scalability

All components of the system architecture will meet scaling requirement to support increase in number of field equipment such as Cameras, Traffic Signals, Wi-Fi spots, parking sites. The system will support horizontal scalability (addition of servers) as well as vertical scalability (ability to augment processing capacity, memory, storage, etc.). This flexibility would help to scale-up the system depending on potential requirements from time to time. Some examples may include -

- Addition of Traffic Signals and related equipment
- Addition of Cameras
- Addition of Vehicles for tracking, bus stops, etc.
- Addition of services

- Higher volume of transactions and data
- Addition of system users

Following provisions, as a minimum, to achieve scalability will be implemented by the solution:

- The networking devices including routers, switches will be procured with sufficient number of ports for addressing the required bandwidth.
- The system will provide for load balancers, at network and application level, facilitating high availability.
- The system to provide for horizontal scalability in such a manner that a new server can be added (or removed) dynamically, as and when required in future, without disturbing the normal functioning of production system.
- Data storage would be planned considering the considering the project phases and potential requirements of data received by the system from field devices.
- The vertical scalability in servers in terms of additional processors and RAM will have to be provided for handling future growth in transactions.

3.2.2. Availability

The system components and architecture design will provide redundancy and ensure that there is no single point of failure in any of the solution components. The system design will make provision for high availability for all the services/components of the system. The architecture will be designed to provide high availability using clustering or similar high availability architecture for all components of solution such as servers, network, storage, etc.

The table below lists the minimum requirements to achieve high availability of the system -

Table 3-1: Solution Components and Requirement

S. No	Solution Component	Availability Requirement
•	Network	Network availability between City Command Center and Data Center at KMDS, Bangalore will be under the scope of MSI managed by KMDS. Network within the city will be under the scope of Local System Integrator (LSI). In both the case provision of redundant connectivity will be provided. Network level redundancy will be will be achieved through two different network service provider ensuring security, high availability.
•	Application Servers	Sufficient redundancy will have to be provided with respect to application i.e. servers to host all the critical components of architecture including web, application, database, and DNS in high-availability mode. The server clusters will be implemented in active-active mode. The size of each server or total number of servers in a cluster implemented for the solution will be

S. No	Solution Component	Availability Requirement
		determined in a manner to ensure that no performance degradation happens, even if a particular server is unavailable.
•	Disaster Recovery (DR) on Cloud	The DRC shall be provided by KMDS for hosting city applications under the scope of MSI, LSI will make the provision for Application, Database and licensing. The DR Setup shall be provided by KMDS. It is assumed that DR for City Operation Platform (COP) is in the scope of MSI. DR for data applications shall be in the scope of MSI.

3.2.3. Performance

The system will be designed to support the anticipated transaction volumes at an optimum level of latency. In order to achieve this, the following will be taken into consideration:

- The solution components will be appropriately sized to support the anticipated transaction volume and throughput requirements.
- Throughput at various levels including at the communication network level needs to be managed to achieve optimal latency
- The solution components i.e. servers, storage etc. will be equipped with appropriate resources such as processing power, RAM, cache, clustering, load balancing etc. to meet the performance requirement.
- The average CPU and memory utilization of the environment (application and database servers) must never go beyond 70%. In case a breach in CPU & memory utilization threshold occur, the environment will need to be optimized and / or upgraded to bring the average level of CPU and memory utilization below the threshold.

3.2.4. Security

The system will be designed so as to ensure security of all its sub-systems/ components. The system will be suitably protected from the internal as well as external threats. The system will be protected from the attacks of viruses, malware, etc. Suitable security policies, processes and monitoring will be built-in to detect and prevent unauthorised access, hacking, and denial of service attack, distributed denial of service attacks or other security breaches. KMDS/KSWAN shall provide the security measures as under:

- **Access Control:** To provide suitable authentication system for controlling and managing access to various system components.
- **Network Security:** To deploy firewalls, intrusion prevention system, intrusion detection system, etc.
- **Audit Mechanism:** To maintain audit trail of all system access using log reports.

- **Virus and Threats Protection**: To deploy suitable anti-virus tools and to keep the virus definitions updated.
- **Data Security:** To protect data from unauthorised access and keep the data storage in secure zone.
- Physical security of the assets.

In case of connectivity between KMDS and Davanagere Server Room is through any other ISP, then KMDS to ensure that the data transfer should be encrypted and secured from any intrusion.

3.2.5. Manageability

The system will be designed and deployed to achieve high degree of manageability in order to ensure ease of configuration, maintenance, updates, upgrades, troubleshooting, health monitoring, fault detection, remote monitoring, remote system administration and inventory management.

The solution will comprise of Enterprise Management System (EMS) for manageability of the solution and its support along with proper documentation explaining the entire system in detail for future references.

3.2.6. Interoperability

Interoperability is the ability of applications to work together and share information. The architecture will be defined in a way that the data could be shared with external applications. Web services and XML (Extensible Mark-up Language) will be used for information exchange between different systems.

3.2.7. Flexibility

The design will be flexible to accommodate additional features, services and future requirements. Also, the system will provide flexibility to add external interfaces.

3.2.8. Reliability

The reliability of a system signifies how the system performs its intended functions without failing. A common indicator of reliability is the Mean Time between Failure (MTBF) which means the period of time the system performs without a failure. The system will be designed and deployed to ensure high reliability by providing tools such as enterprise management system, network monitoring system, etc. for early detection of issues that may lead to potential failures.

3.2.9. Interoperability Standards

i. System will be designed to use open standards and protocols to the extent possible. Ministry of Electronics & IT, Government of India's guidelines will be followed in respect of open standards, as applicable.

ii. In addition to above, the proposed solution has to be based on and compliant with industry standards (their latest versions as on date) wherever applicable.

This will apply to all the aspects of solution including but not limited to design, development, security, installation, and testing.

3.2.10. GIS Platform and Application Development

3.2.10.1. *GIS Data creation and Integration*

One of the goals of the smart city initiative is to create a single citizen interface where all data and applications are available on a GIS platform.

The broad scope of LSI shall be:

- Creation of GIS data layers
- Collection of required GIS/CAD data from various line departments and conversion to GIS ready format
- Mapping of ICT related or Smart city assets with detailed attribute details
- Provide the all required GIS data in standard format to MSI for Application Development
- To provide necessary API/Inputs to MSI to integrate various City-wide applications.

3.2.10.2. *GIS database Creation*

The MSI (Master System Integrator) will create standard data formats in coordination with stakeholder and will provide it to City SI in which the data layers are required to develop city specific GIS application. The MSI will develop the GIS application for city using the data provided.

City SI is responsible to collect the required data from concerned departments. The City SI is also responsible for data layer creation or mapping of ICT related assets and sensor systems (like locations of streetlight poles, CCTV cameras, utilities, Smart bus shelters, environment sensors). If this requires field survey, it needs to be done by City SI. If such a data is already available with city, it shall facilitate to provide the same to the MSI.

The LSI has to regularly update the GIS data as per standard formats given by MSI.

For data creation activity, City Level SI will use the advanced ArcGIS Desktop 10.5 software (1 No.) with Extensions (3D Analyst, Spatial Analyst, Network Analyst, Data Interoperability) and it is already available with city.

Using the above said data, the MSI will develop the GIS application for the city.

3.2.10.3. *Integration with State Wide GIS Platform*

City SI shall coordinate with MSI for any integration with GIS platform for Citywide applications which will be developed for different Smart Solutions and are not limited to Intelligent Traffic Management System or Intelligent Transport System, solid waste management system, Smart water, Smart Electricity, Solar, Smart Parking, Smart lighting and Smart Energy Management, Smart UGD and Emergency Management

services. Which will require real time location-based GIS services shall be integrated to state wide GIS platform.

3.3. Other Design Considerations

While designing the PAN city ICT project, the key aspects that also need to be considered are:

- Real time integration with other systems within the CCC and inter-operability with the common applications such as One Touch Website proposed to be developed by KUIDFC
- Interface with systems of other agencies e.g. Police emergency response system
- Handling cross agency scenarios including police, traffic and utilities
- City Management Activities in routine/day to day as well as emergency scenarios
- The ICT solutions will provide effective collaborative monitoring and management of city operations across various agencies.
- Open Standards based interfaces to cater additional requirements, which may emerge in the future. This can be accommodated easily without requiring for a major change in the solution architecture.
- Single window for citizens' interface, wherein citizens' grievances and requests can be registered through various channels including web, smart phone, mobile apps and call centres.
- ICT solutions and their Standard Operating Procedures (SOPs) would be followed for managing and tracking incidents
- Comply with e-Governance standards, frameworks, policies and guidelines available on http://egovstandards.gov.in. The indicative list of Standards is as listed below:
    - Cyber Security Requirement for Smart City - Model Framework by National Security Council Secretariat
    - e-Pramaan: Framework for e-Authentication
    - Quality Assurance Framework for e-Governance Applications
    - Guidelines for Adoption of Electronic Payments and Receipts (EPR)
    - Guidelines for Use of IT Devices on Government Network

4. PROJECT STAKEHOLDERS & THEIR ROLES

4.1. Key Stakeholders

The project requires collaboration between multiple stakeholders for its successful execution. It is therefore important to understand the various stakeholders envisioned to be part of this project and the role that they are expected to play. Following are the critical stakeholders whose involvement will drive the project and enable the establishment of a strong project governance:

Davanagere Smart City Limited	Davanagere City Corporation	Police & Traffic Police	Residents of Davanagere/ Citizens
Internet Service providers	City Bus Operators (KSRTC & Pvt. bus operators)	Regional Transport Office	Karnataka Urban Infrastructure Development and Finance Corporation
Centre for eGovernance	National Informatics Centre	Directorate of Electronic Delivery of Citizen Services	KMDS
Common Service Centres, Karnataka-One Centres	Project Management Consultant	Master Systems Integrator	Local System Integrator

4.2. Stakeholders Roles and Responsibilities

The indicative roles and responsibilities of various stakeholders are listed in the Table below:

Table 4-1: Roles & Responsibilities of Stakeholders

S. No	Stakeholder	Roles and Responsibility for Pan City ICT Project
1.	Davanagere Smart City Limited	• Approve and sanction projects including their technical appraisal. • Take measures to comply with the requirements of MoHUA with respect to implementation of the Smart Cities programme.

S. No	Stakeholder	Roles and Responsibility for Pan City ICT Project
		• Undertake review of activities of the Mission including budget, implementation of projects, and preparation of SCP and co-ordination with other missions / schemes and activities of various ministries • Incorporate joint ventures and subsidiaries and enter into Public Private Partnerships as may be required for the implementation of the smart cities programme • Enter into contracts, partnerships and service delivery arrangements as may be required for the implementation of the Smart Cities Mission.
2.	Davanagere City Corporation	• Principal facilitator and provider of services from the Command and Control Centre • Key stakeholder for providing policy and technical inputs on Pan City initiatives such as Smart Street Lights, Smart Parking, Smart Bus Shelters, etc. • Provide manpower at CCC for operations & management of Street Lights, Smart Street Lights, Smart Parking, Smart Bus Shelters, etc.
3.	Police and Traffic Police	• Key stakeholder for providing policy, strategic, technical inputs on Pan City initiatives such as Intelligent Traffic Management Systems, CCTV surveillance systems, Smart Parking, etc. • Provide manpower at CCC for operations & management of Intelligent Traffic Management Systems, CCTV surveillance systems, etc.
4.	Residents and citizens	• Approximate 4.34 lacs citizens will be beneficiaries of the Smart City Project. • Utilize and realise benefits of the project • Provide feedback on the functioning of the system
5.	Internet Service Providers	• Provide requisite internet bandwidth
6.	KSRTC/ City Bus Operators	• To install the GPS device/ Vehicle Tracking System, as applicable, on the city buses • To ensure that the devices remain operational during all the time when the city buses is deployed in service

S. No	Stakeholder	Roles and Responsibility for Pan City ICT Project
		• To ensure that the devices remain connected to the CCC by way of appropriate wireless connectivity and that they transmit data to the CCC during the times the vehicle is deployed in service
7.	Regional Transport Office	• To mandate private City Bus operator and Auto Rickshaw to install GPS devices and to keep them operational
8.	Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC)	• State Level Nodal Agency (SLNA) for implementation of Smart City Mission (SCM) • Reviewing the DPRs/ proposals prepared by the and to ensure synergy between the SCP and DPR • Project monitoring & closure • Monitoring/reviewing project finance related activities
9.	Centre for e-Governance, NIC, Directorate of Electronic Delivery of Citizen Services, Municipal Reforms Cell	• Provide functional and technical assistance in integrating City Website, Kiosks to the backend systems. • Provide functional and technical assistance in leveraging SSDG system for integrating the One City- One Website with existing service delivery systems
10.	Project Management Consultant	• Assist the DSCL to realise the vision of the City, contemplated in the SCP, by preparing the concept reports, develop project structures, designs, prepare detailed project reports, tender documents and provide bid process management support for selection of implementing agency • Support the DSCL in overall management of Smart City project, including project planning, budgeting, supervision, monitoring & evaluation, reporting and coordination
11.	Karnataka Municipal Data Society (KMDS)	• Provide complete Data Centre infrastructure, compute, storage, backup information, network and physical security on a “Managed Services” basis • Provide City Operations Platform (COP) on a multi tenancy mode and facilitate integration of

S. No	Stakeholder	Roles and Responsibility for Pan City ICT Project
		Davanagere Smart City Applications with the same • Provide DR services for Davanagere City Surveillance Project • Provides network connectivity between Data Center at KMDS and City Command and Control Center. • Assisting in API integration for city level ULBs services.
12.	Local System Integrator (LSI)/ Implementing Agencies	• Design, implement and maintain the systems under the scope. • Train CCC Centre users/operators and other users of the system including MSI
13.	MSI	• MSI will be selected by KMDS. • Design, implement and maintenance of Data Center at KMDS and DR. • Coordinate with LSI for hosting and integration of city level applications.

4.3. Responsibility Matrix for City Operations Platform

S. No	Scope of Work	KMDS/MSI	DSCL	LSI	KUIDFC
City Operations Platform					
1.	City Operations Platform (COP) on Multi-Tenancy Model	✓			
2.	Exposing APIs and Web-Services for Integration with COP	✓			
3.	Integration of City Level Applications with COP	✓		✓	
4.	Ensuring availability of COP and Server Infra as per the SLAs	✓			
5.	Davanagere Command & Control Centre and its		✓	✓	

S. No	Scope of Work	KMDS/MSI	DSCL	LSI	KUIDFC
	associated IT and Non-IT Infrastructure				
Servers/Compute/Storage/Network					
6.	Physical Servers, Storage, Network and Physical Security	✓			
7.	Server OS, System Software etc.			✓	
8.	Network between Davanagere CCC and Server Room and KMDS Data Centre	✓			
9.	City level Network			✓	
10.	Network for DRC Connectivity	✓			
11.	City Level Network Security			✓	
Disaster Recovery Centre					
12.	Setting up DRC on Cloud	✓			
13.	Migration of DR to Other DR location.	✓			
City Surveillance					
14.	Setting up of Server Room (complete IT & Non-IT infra) for City Surveillance			✓	
15.	Setting up of Satellite (Police) Command & Control Room for City Surveillance			✓	
16.	Setting up of DRC on Cloud for City Surveillance			✓	
ICT Applications					
17.	City specific ICT Applications & Mobile Applications			✓	

S. No	Scope of Work	KMDS/MSI	DSCL	LSI	KUIDFC
18.	One Touch App and Website for ULB and e-Governance Services			✓	
19.	Scoping of the ICT Projects for Davanagere		✓		✓
20.	Integration of Kiosk with the One Touch App			✓	
21.	Technical and Operational Manpower for City Level ICT Projects		✓	✓	
Administrative and Financial					
22.	MoU between stakeholder Departments		✓		
23.	Cost of COP and the KMDS DC (including O&M)	✓			

5. PAN-CITY ICT PROJECT COMPONENTS

5.1. Pan City ICT Project Components Overview

An overview of various components that will be implemented as part of the Davanagere Pan City ICT Project and the components that will be integrated with the same is provided in table below:

Table 5-1: Pan City ICT Project Components Overview

S. No	Project Component	Implementation	Integration
1.	City Surveillance System	✓	
2.	Intelligent Traffic Management System	✓	
3.	Smart Parking	✓	
4.	Variable Message Sign (VMS) Boards	✓	
5.	Public Address System	✓	
6.	Intelligent Transport System (ITS) for City Buses, Ambulances, Fire Tenders, and SWM Vehicles	✓	
7.	City Wi-Fi	✓	
8.	Environmental sensors	✓	
9.	One City-One Website with Mobile Application	✓	
10.	Help Desk (One City-One Number)	✓	
11.	e-Learning Centres and Self-Service Kiosks	✓	
12.	e-Office Suite for DSCL and Davanagere City Corporation	✓	
13.	Centralized Command & Control Centre including Satellite Command and Control Centre	✓	
14.	MPLS/Leased Line Network Backbone	✓	
15.	CCTV Surveillance Server Room	✓	
16.	Smart energy/Roof Top Solar System		✓
17.	Solid Waste Management System		✓
18.	Smart Street Lighting		✓
19.	Water supply system(SCADA) and Quality Monitoring System		✓

S. No	Project Component	Implementation	Integration
20.	Underground Drainage (UGD)		✓
21.	Smart Health Management		✓

The above components (Sl. 1 to 12 in above table) identified for implementation under Davanagere Pan City ICT Project are described in following sub-sections. The common infrastructure components (Sl. 13 to 15 in above table) have been described in Chapter 6.

5.2. Indicative Scope of the Work for Local System Integrator (LSI)

5.2.1. Overview

The LSI appointed by DSCL shall be responsible for Implementation, Operations and Maintenance of the following systems and components:

ICT Components	IT Infrastructure Components

• Intelligent Traffic Management System (ITMS)
• City Surveillance System
• Intelligent Transportation System (ITS) for City Buses
• Environmental sensors
• Public Address System
• Smart Parking (excluding Parking Attendants)
• Information Kiosk
• Help desk
• One city one Website and Mobile App.
• E-Office Suite
• E-Learning center
	• Centralised Command & Control Centre at Davanagere with complete IT and Non-IT Components
	• Satellite Command and Control Centre with complete IT and Non-IT Components
	• Setting up of Server Room for CCTV Surveillance along with complete Perimeter and Information Security Components along with Cloud based DR
	• MPLS/Leased Line and /or Wireless Network for the following:
	  ○ CCTV Surveillance and Field Level equipment through the licensed ISP
	  ○ Redundant Network Connectivity between Davanagere CCC/Local Server Room and DRC-Cloud Service Provider
	  ○ Redundant Network Connectivity between Server Room and Satellite Command and Control Centre

5.2.2. Indicative SoW related to Site preparation and commissioning of Field Equipment

- Conduct a comprehensive As-Is field study of the existing infrastructure including Roads, Poles, Cantilevers, Traffic Junctions, Traffic Signals (&

controllers), Parking Sites, for buildings, structures, fences, trees, existing installations, etc.

- Study and enlist all existing road signs, street furniture, poles, cantilevers, which are likely to be affected by these works
- Provide a detailed To-Be designs for all field equipment to be commissioned specifying the following:
    - Height and foundation of Cameras, Traffic Signals and Standard Poles for Pedestrian signals, Height and foundation of Poles, cantilevers, gantry and other mounting structures for other field devices
    - Location of Junction Box
    - Location of Network Provider's Point of Presence (PoP)
    - Design of Cables, Ducts routing, digging and trenching
    - Electrical power provisioning
- The LSI shall design, supply, install, commission & maintain all the Junction Boxes, poles and cantilever to mount the field sensors like the cameras, traffic sensors, traffic light aspects, Solar Panels, LED boards, Wi-Fi access points, active network components, controller and UPS at all field locations. LSI shall ensure maximum optimization of network equipment, poles, cantilever, and mounting infrastructures, power supply equipment including, electric meters and junction box.
- Supply, Installation, commissioning and Customization (as required) of various field systems which include Adaptive Traffic Control System (ATCS) at Traffic Junctions, Surveillance Cameras, Traffic Enforcement Cameras, PA System, Variable Message Signs, and other IT infrastructure required for successful operation of the ICT Projects.
- Have an arrangement with BESCOM for provision of mains power supply at all desired locations
- Comply with lightning-protection and anti –interference measures for system structure, equipment type selection, equipment earthing, power, signal cables laying, etc. The MSI shall provide standardized cabling for all devices and subsystems in the field, CCC & Satellite Police Control Room.
- Liaison with the relevant agencies for obtaining all permits and approvals, Clearances necessary to install the field equipment.
- Furnish the Command Control Centre, Satellite Command Control Centre and Server Room, in all aspects such as cutting and chipping, masonry works, false flooring, false ceiling, partitioning, fire proofing, raised flooring, etc.
- Provision of Building Management System, HVAC, Power Backup of the entire CCC Building

5.2.3. Indicative Scope of Work related to ICT Components

- Establish Server Room at Davanagere CCC Building for the purpose of local compute and storage for video surveillance including design, procurement, supply and installation of entire ICT hardware and software Components at the Server Room including:
    - Ensure redundancy for all the key components to ensure that no single point of failure affects the performance of the overall system
    - Installing all networking & security Infrastructure and other associated IT Components
    - Supply and commissioning of all the passive components inside the server room
- Size, Procure, Supply, Install, Commission, Configure, Test, Integrate and Implement all the required hardware and software for the project
- Supply Video Walls, Workstations, IP Phones, Network Cabling, Switches, Printer, VC System, IP Hones and required ICT accessories at CCC & Satellite Police Control Room
- Tie-up with the ISP and procure Network as a Service to establish Network connectivity for field components such as ATCS Controllers, CCTV Cameras, LED Boards, and Information Dissemination Systems, etc. LSI shall also provide required communication sub system including procurement & installation of SIM cards on Field equipment with the required GPRS/GSM communication, for the entire O&M period of five (5) years
- Prepare High Level Design Documents including Application architecture, Logical and physical database design, FRS, for all the ICT Projects under the scope
- Prepare Low Level Design such as, System Requirements Specifications, System Design Documents, GUI design (screen design, navigation, etc.), Database architecture, including defining data structure, data dictionary etc.
- Provide System Integration services to customize and integrate the bespoke applications, COTS products etc.
- Procure Licenses to host applications at KMDS Data Centre
- Build interfaces and integrate with City Operations Platform
- Manage, Maintain and Support all the Hardware and Software supplied and installed for a complete contractual period of Five Years from the Go-live
- Ensure compliances to all the applicable guidelines (Information Security, Application Development etc.) issued by GoI and GoK from time to time
- Keep sufficient quantities of spares equipment to ensure continuity of operations of CCC

5.2.4. Handholding and Training

- LSI shall deploy its technical support staff for the entire duration of the Contract
- LSI shall provide Training Manuals, User Manuals, Troubleshooting guides in English & Kannada for all the ICT Projects
- LSI shall provide classroom training sessions and hand holding support to all the users of ICT Systems deployed on field and CCC.

5.3. City Surveillance System

5.3.1. Overview

Protecting citizens and ensuring public safety is one of the topmost priorities for public authorities. It requires security solutions to monitor, detect, reduce and deter criminal and undesirable activities in the city. CCTV based video surveillance acts as an effective tool to ensure public safety. Under the Davanagere Smart City initiative, DSCL intends to implement a holistic City Surveillance System in Davanagere Police Jurisdiction limits of the city. An overview of the proposed City Surveillance System for Davanagere is given in the diagram below:

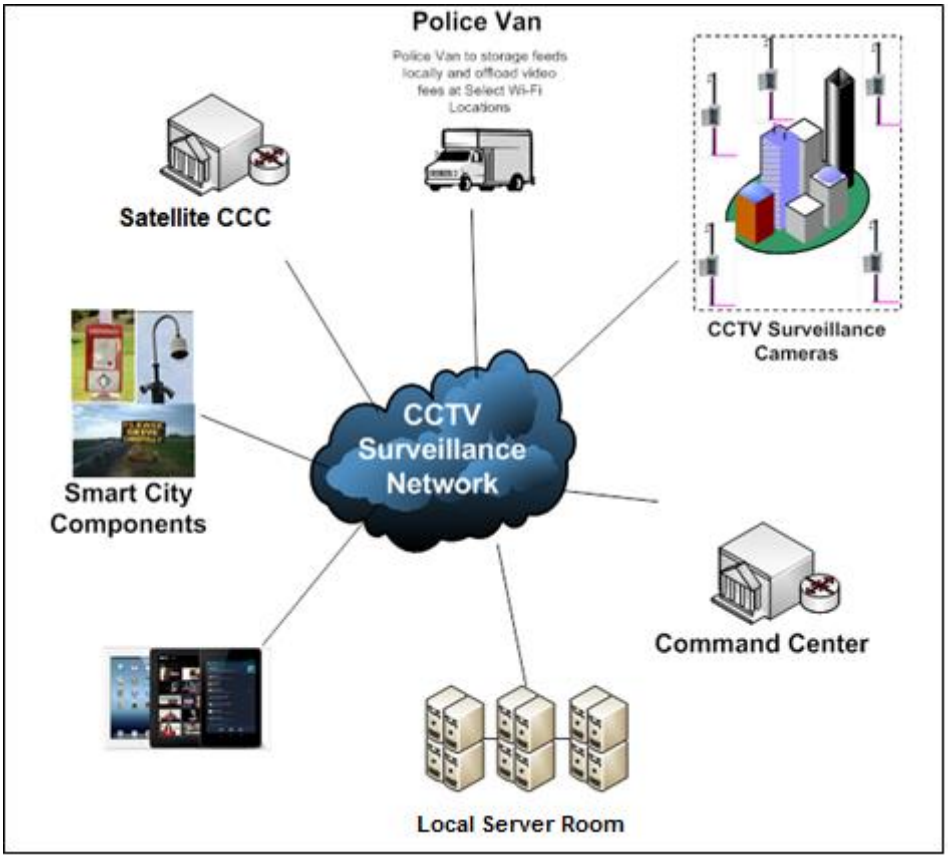


Figure 5-1: City Surveillance System Overview

5.3.2. Current State and Use Cases

Currently, city-wide surveillance system is not in place. Davanagere Police has identified the need to deploy CCTV cameras at all major/sensitive locations in the city.

The use cases for City Surveillance System will include the following:

i. To act as deterrence to criminal and anti-social activities

ii. To provide evidence in order to help in investigation of crimes

iii. To provide real-time feeds and inputs leading to prevention of crimes/incidents

5.3.3. Solution Components/Features

The solution will have the following key components:

5.3.3.1. *CCTV Cameras*

i. The surveillance system will be a combination of Fixed Box and PTZ CCTV cameras.

ii. The CCTV cameras will be installed at major traffic junctions and other sensitive locations including schools, colleges, railway station, bus terminal, bus stops, markets, etc.

iii. At major entry/exit points of the city, Automatic Number Plate Recognition (ANPR) Cameras will be installed to capture registration numbers of vehicles entering and exiting the city.

iv. The video feeds will be recorded, stored and viewed at Full HD Video quality i.e. 1080p (1920 X 1080 resolution).

v. The cameras will work on 24 X 7 basis and transmit quality video feeds to the CCC and Satellite Police Control Room and would capture the video feeds at minimum 15 FPS during entire duration of day.

vi. The proposed cameras will be rugged and weather proof, suitable for outdoor installation and will support day-night vision.

5.3.3.2. *Video Management System*

i. Video Management System (VMS) is the application software of the Surveillance System which will be used to manage the videos received from various cameras. The VMS will be hosted at Data Centre.

ii. The VMS will have the capability for the users to view, modify and configure CCTV cameras parameters such as resolution, frame rate, zoom/tilt/pan (in case of PTZ cameras), clock, IP address, etc.

iii. The VMS will provide the capability to search, view and extract video clips/ images based on any combination of the parameters such as date, time, camera ID/location, etc.

iv. The VMS will have capability to receive, view and store video from the CCTV cameras.

v. The VMS will have capability to export video/images in standard formats (including .avi, .mp4, .bmp, .jpg) with an option to include metadata.

vi. The VMS will allow users to view the video using various modes such as play, fast forward, fast reverse, view single or multiple cameras etc.

vii. VMS will support other requirements including business rules creation, reporting, alert management, user administration, etc.

viii. The videos from CCTV Cameras will be stored for 30 days in live storage at Server Room and flagged data (critical incidents) will be stored for a minimum of 90 days with further permanent storage envisaged on secondary/backup storage.

ix. The Recording Server / System will offer different codec (H.265, H.264, MPEG, MPEG-4, etc.) and resolution (such as VGA, 720HD, SXGA, etc.) options for managing the bandwidth utilisation for live viewing on the client systems.

x. Data on storage would be over-written automatically by newer data after the stipulated time period. If some data is flagged by police officials (or by designated personnel) as important data / evidence data due to some reporting of crime or incident/accident in the area or due to court order or due to suspicious activity, it would need to be stored for longer duration, as per requirements. Such data will be flagged for preservation for 90 days on live storage and on secondary/backup storage for beyond 90 days.

xi. Audit trail/logs will be maintained for 90 days.

5.3.3.3. *Video Analytics*

The CCTV Surveillance system will be supported by advanced Video Analytics comprising the following:

i. Unattended object detection

ii. Suspicious object (such as Gun, knife, etc.) detection

iii. Motion / intrusion detection

iv. Camera vandalism and tamper detection

v. Virtual Fence / Trespassing

vi. People / Mass movement

vii. Vehicle tracking based upon the registration number/colour of the car

viii. Traffic violation detection (through integration with Signalling System)

ix. Facial Recognition System i.e. matching of suspect / criminal photograph with different databases available with Police (at select locations)

5.3.3.4. *User Interface/ Client System*

The User Interface will have the following broad features:

i. Viewing live video from cameras on the surveillance system

ii. Browsing recordings from storage

iii. Creating multiple views and switching between them

iv. Viewing video from selected cameras in greater magnification and/or higher quality in a designated hotspot

v. Controlling PTZ cameras, using zoom feature on live as well as recorded video

vi. Using sound notifications for attracting attention to detected events

vii. Getting quick overview of sequences with detected motion

viii. Getting quick overviews of detected alerts or events

ix. The web-based remote client will offer live view of up to 16 cameras on a single display, including PTZ control and event / output activation.

5.3.3.5. *System Administration*

i. The Surveillance System will offer centralised management of all devices, servers and users.

ii. Various users will have access to the system using single sign on and will be role based. Different roles will include Administrator, Supervisor, Officer, Operator, etc.

iii. It will be possible to integrate the Surveillance System with 3rd-party software, to enable the users to develop customized applications for enhancing the use of video surveillance solution. For e.g., integrating alarm management to initiate SMS, E-Mail, etc.

5.3.4. Scope

The Scope of City Surveillance component is listed in the table below:

Table 5-2: Scope of City Surveillance Component

Category	Project Scope as per Davanagere requirements
City Surveillance	<u>Traffic Junctions (23 Junctions)</u> • 18 PTZ Cameras • 63 Fixed Cameras <u>Other Locations:</u> • 39 PTZ Camera • 100 Fixed Box Camera • ANPR setups at 4 locations • 5 Mobile Surveillance Vehicles fitted with PTZ cameras • Other components: Poles, UPS, LAN switch, passive items, etc. Based on discussions with DSCL, it has been decided to cover 20 traffic junctions in 2nd phase. A list of the proposed locations for CCTV cameras (Fixed, PTZ) is provided in Annexure 1. A list of the proposed locations for ANPR cameras is provided in Annexure 2.

Category	Project Scope as per Davanagere requirements
Network Infrastructure	10 Mbps MPLS / Leased Lines for each of the locations shall be taken from the ISP for sending the video feeds to the Server Room at CCC Building
Surveillance System Applications	• Video Management System (VMS) • Video Analytics (VA)

5.4. Intelligent Traffic Management System

5.4.1. Overview

Intelligent Traffic Management System (ITMS) is essentially the application of computer and communications technologies in management of traffic related aspects of the city. ITMS covers traffic signals, traffic enforcement systems, commuters' information systems and related infrastructure components (Figure 5-2). ITMS results in better traffic flows, reduced traffic congestion, improved energy efficiency, effective enforcement of traffic rules, improved incident response, greater safety, reduced emissions and enhanced economic productivity.

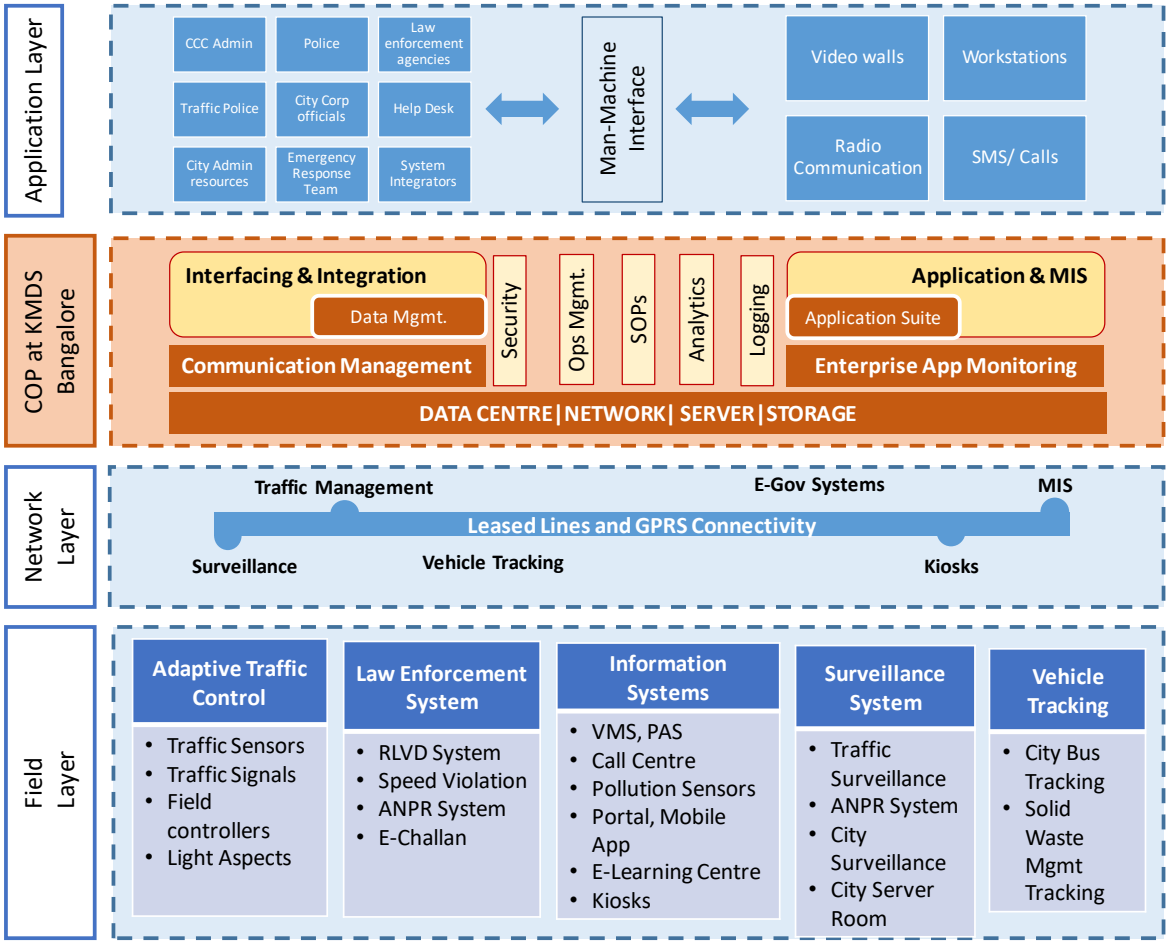


Figure 5-2: ITMS Overview

ITMS integrates various sub systems (such as traffic sensors, Vehicle detection, Variable Message Signs, RLVD, ANPR, Public Announcement Systems etc.) in a coherent single interface that provides real time data on status of traffic for more efficient planning and operations. Thus, ITMS aims to help police and security agencies to take proactive/ reactive measures and ensure safe and smooth environment on roads.

5.4.2. Current Situation and Use Cases for ITMS

In line with its mandated role, Davanagere Police, through its Traffic Police wing, regulates and manages traffic in Davanagere. As part of this, Davanagere Traffic Police installs, maintains, monitors and operates traffic signals in the city. There are 10 signalised intersections in the city all of which are operated and controlled locally through the signal controllers installed at the junctions. There is no centralised traffic control room for monitoring and controlling the traffic signals in the city. The traffic enforcement is based on paper challans issued by traffic police officials.

The ITMS is expected to lead to improved transport asset utilisation, savings in investments required for transport/road infrastructure, enhanced safety, reduction in congestion, better compliance with traffic rules, fuel savings and reduce the negative impacts of traffic and travel thereby mitigate environmental impact.

The DSCL intends to implement a Smart Traffic Management System to address the following use cases:

- Optimize the traffic signal times, in order to reduce waiting times at traffic junctions through adaptive signal control based on actual traffic volumes,
- Improve the uptime of traffic signal equipment, by monitoring their functional status at Command and Control Centre and timely intervention in case of any failure,
- Help in providing faster movement to emergency services vehicles like fire engines, ambulances, police vehicles etc. through intervention from Command and Control Centre,
- Optimizing the traffic flow on roads network through information dissemination about real-time traffic conditions through VMS and other modes,
- Availability of traffic data to conduct analysis and initiate actions to optimize the traffic flow,
- Real time advisory messages to citizens regarding any planned events/ incidents impacting traffic flow,
- Improved traffic rules enforcement through automated and effective enforcement systems and help in reducing manual intervention and enhancing overall traffic discipline.

5.4.3. Solution Components/Features

The ITMS solution will consist of following major components:

- Smart Traffic Signals with hybrid power source (Mains/Solar)

- Traffic Enforcement System (RLVD, ANPR, Speed Violation Detection, e-Challan System)
- Information Dissemination System (VMS, PA System)

5.4.3.1. *Smart Traffic Signals*

The Smart Traffic Signals will be based on area traffic control system (ATCS) and will automatically alter the cycle time depending on the traffic queue on various arms of the junction, using vehicle actuated controllers. The Smart Traffic Signals will also be connected to the Command and Control Centre so that they can be remotely controlled/ configured to alter the signal cycle times, as per requirements.

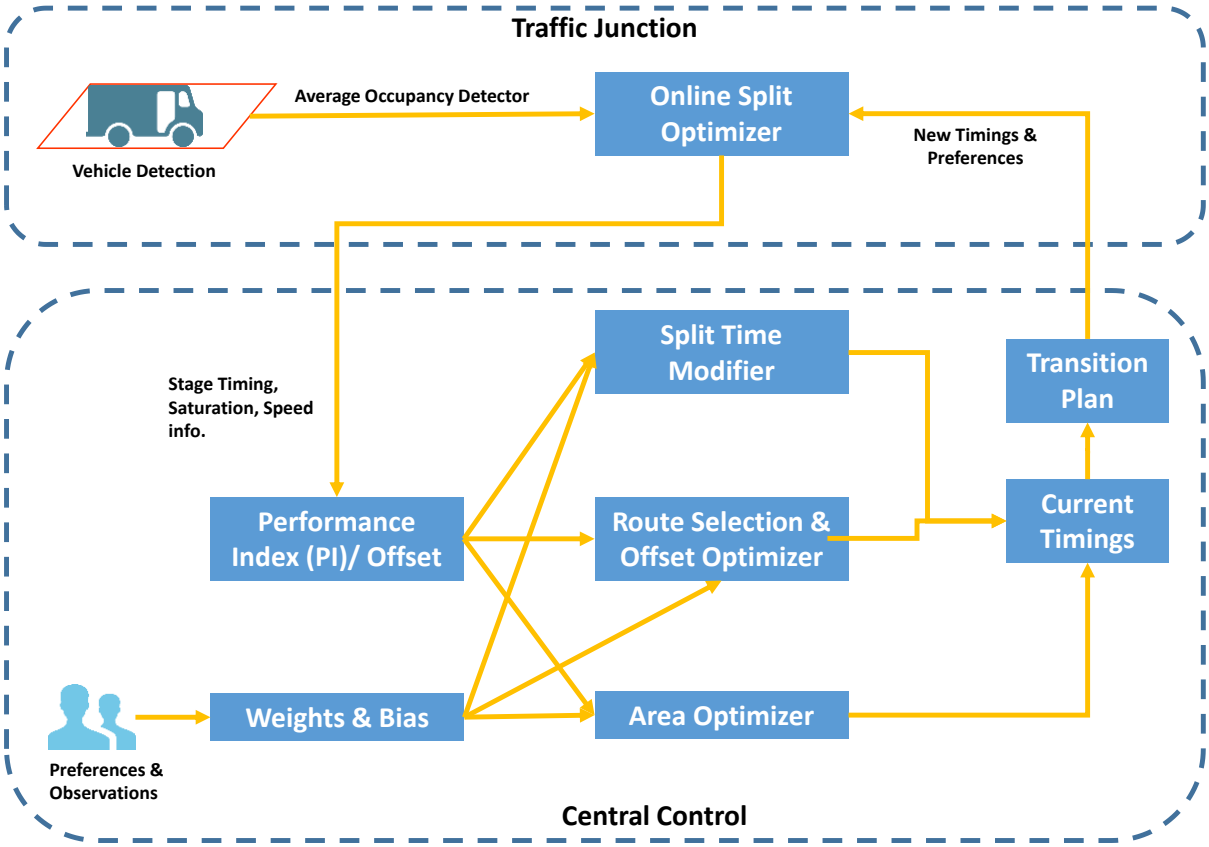


Figure 5-3: Functional Blocks of Vehicle Actuated ATCS

The main components of Area Traffic Control System include: Vehicle Detectors, Signal Controller, Communication Network, Application Software and Command and Control Centre which are described below:

Vehicle Detectors:

Vehicle Detectors are used to detect the presence of vehicles, vehicle density or queue length measurement on various arms of the junction. The output of the detectors is used to dynamically change the signal cycle timing at the junction. Vehicle detectors are essential to enable signals to work in adaptive and vehicle actuated mode. In view of the Indian traffic conditions, which generally consists of Mixed Traffic, it is suggested to use Video based detection to determine traffic density, count, queue length etc.

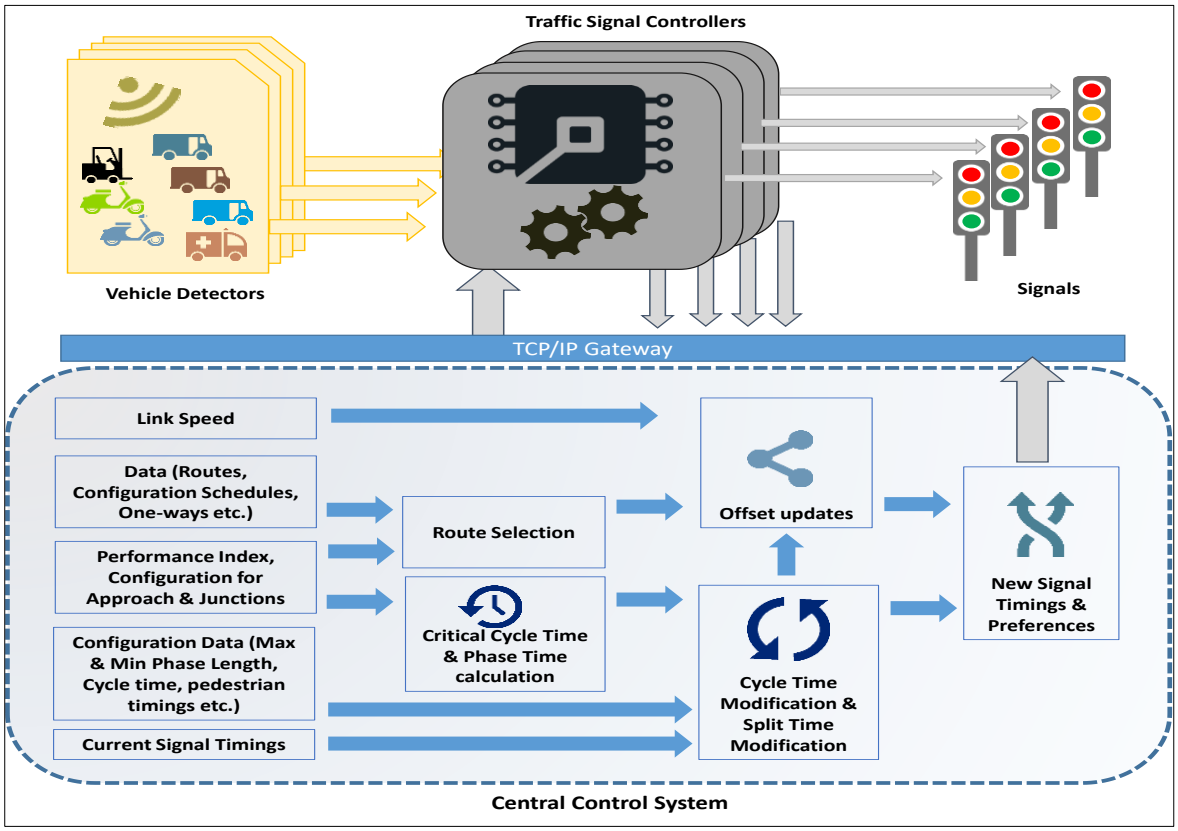


Figure 5-4: ATCS Logical Architecture

Traffic Signal Controller

The traffic signals are operated through Signal Controllers where signal plans are loaded. The controller works on a fixed cycle mode, on adaptive mode (based on inputs from vehicle detectors) as well as can be manually controlled. The controllers are connected to the CCC through two-way communication to manage the signals through CCC. CCC transmits signal plans to the controller and the controller in turn provides the operational health and functional status to the CCC. It is proposed to use the CoSiCoSt based ATCS application software which is designed to cater for heterogeneous traffic conditions in Indian Cities with no lane discipline

Communication Network

The communication network is used to connect the signal controllers to the Command and Control Centre. The communication network is used to configure/update the signal controllers software and parameters and also to monitor the health status of signal controllers and other equipment. The common Communication Network backbone being laid for the city will be used for ITMS also.

Application Software

Application software is the software used behind the ATC system which performs the entire signal management. Application software defines the architecture flows, activities and functions and user services that the operators want to deliver. The application software operates in real time with the capacity to calculate the optimal cycle times, effective green time ratios, and change intervals for all system traffic signal controllers connected to it. These calculations are based on assessments carried out by the ATCS application software running on a central computer based on the data and information gathered by vehicle detectors at strategic locations at the intersections controlled by the system. The basic mode of ATCS operation is plan generation; i.e. the stage time and cycle time based on the real-time traffic demand, and not selecting from a set of pre-set plans.

Central Control System

It is the main control unit of ATCS, housed in the Command and Control Centre (CCC). In this unit, collected traffic data is processed to optimize various traffic parameters like signal timing, phase change, delay, etc. The Central control system consists of ATCS Server, operator consoles, storage device, projection system, operations dashboard, etc.

5.4.3.2. *Traffic Enforcement System*

Traffic Enforcement Systems are automated or semi-automated systems through which traffic violations are captured and challans can be generated. They help in increasing compliance to traffic rules and reduce manual intervention in traffic enforcement activities.

Red Light Violation Detection (RLVD) System

RLVD system will be used to automatically detect and capture vehicles crossing the traffic intersection on red light. It will be integrated with the signal controller to detect red light status and will capture registration number and image of infracting vehicle. This data will be transferred to the E-Challan system for further processing, tracing the ownership details of the infracting vehicle and printing of notices/challans.

Speed Violation Detection (SVD) System

The SVD system will be used to automatically detect and capture vehicles violating the prescribed speed limit for the given road segment. The system will be capable of capturing multiple infracting vehicles simultaneously in different lanes at any point of time with relevant infraction data like speed of the vehicle, notified speed limit, date, time, location and registration number of the vehicle. This data will be transferred to the E-Challan system for further processing, tracing the ownership details of the infracting vehicle and printing of notices/challans.

E-Challan System

i. E-challan system will be a common application which will be used to process data from various field systems such as RLVD, SVD and handheld enforcement devices and for printing of challans and notices. It will be integrated with Vahan and Sarathi software for fetching vehicles and drivers' details.

ii. The handheld enforcement devices with inbuilt printer, camera, GPS, Contact Smart Card Reader, Magstripe reader and GPRS module will be used by traffic police officials to capture the details of traffic violations and issuing on-the-spot challans.

5.4.3.3. *Information Dissemination System*

Information dissemination plays an important role in providing timely, contextual and relevant information to public for example, traffic advisory and social messages can be provided through VMSs, emergency messages can be broadcasted using PA system.

Public Address System

This system will be used to announce general information and emergency messages to the road users and will be connected to the CCC system application. The PA system will be capable of playing pre-defined audio messages from the CCC as well as manual announcements from CCC. The PAS architecture scheme is as illustrated below

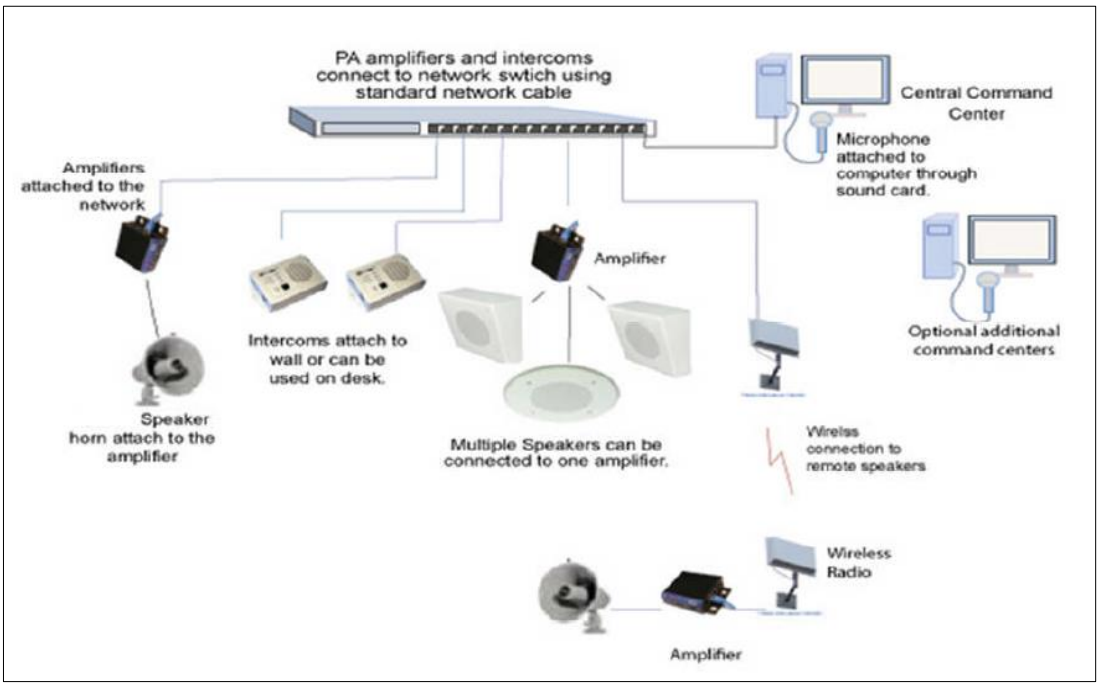


Figure 5-5: PAS Schematic Diagram

System will be implemented on select traffic junctions to make important announcements for the public. It will be able to broadcast messages across all PA systems or specific announcement could be made to a particular location supporting single zone / multi zone operations. The system will also deliver pre-recorded messages to the loud speakers attached to them. The system will consist of an IP based amplifier, speakers and control software.

Variable Message Signs

VMSs are large sized LED Boards (Figure 5-6) which are placed along major roads and are used by CCC for dissemination of traffic and related information. CCC sends traffic messages, commands and configuration details to VMSs and they send the

operational and functional status of the equipment back to the CCC. VMSs help the travellers to avoid congested/closed road and take alternate route.

Figure 5-6: Typical Variable Message Sign

5.4.4. Scope

The ITMS component will include the following scope:

Table 5-3: ITMS Scope

S. No	Component	Quantity
1.	Smart Traffic Signals	23 Junctions as per Davanagere City Specific requirements
2.	Red Light Violation Detection (RLVD) System	1 Junction as a pilot
3.	Speed Violation System	6 locations
4.	Automatic Number Plate Recognition	4 locations
5.	Handheld Enforcement Devices	30 nos.
6.	Public Address System (PAS)	20 Junctions
7.	Variable Message Sign (VMS) Boards	5 Junctions

Based on discussions with DSCL, it has been decided that remaining junctions will be covered under ITMS in later phases.

List of locations for the implementation for ITMS, ANPR, PAS, and VMS is provided in Annexure 3. List of locations for implementation of Speed Violation System has been provided in Annexure 4.

5.5. Smart Parking

5.5.1. Overview

Smart Parking is a system based on use of information and communication technologies in making the parking management in the city more efficient. It helps in reducing congestion through regulated parking that does not block smooth movement of through traffic and also makes available information to the citizens about the real-time availability of parking slots.

5.5.2. Current Status and Use case for Smart Parking lots

Currently, the parking of vehicles is free for public in Davanagere city. The city corporation has designated some parking spaces, where people can park their vehicles, but no charges are collected from users.

The conventional parking system is ridden with the following main challenges:

- High parking search time
- Traffic congestion on roads due haphazard parking
- Poor usage of parking spaces
- Overcrowding of vehicles in parking lots and encroachment of adjacent spaces
- Stress to users & dissatisfaction
- No real-time tracking, data/report for analysis for analysis and future need/expansion

A Smart Parking solution is being proposed to cater to efficient parking management, which the city can use as and when it is decided to make parking chargeable and contractors are engaged for operation of parking lots. The proposed Smart Parking solution is based on use of handheld devices for issuance of Entry tickets and receipts for parking charges. The Handheld devices will be integrated with the CCC and with the Web Portal & Mobile App, to enable real-time availability of parking vacancy information to citizens.

The use cases for Smart Parking solution are the following:

- Reducing congestion through improved capacity utilization of parking lots.
- Real-time parking availability information on-demand through digital sign boards, portal and mobile application to the users.
- Efficient parking management through real-time monitoring of parking operations. At any point of time, the information of the capacity and actual occupancy of vehicles in a parking lot will be available in CCC.
- Availability of parking data for analysis and planning purposes.

5.5.3. Solution Components/Features

The Smart Parking solution will comprise the following:

i. Handheld devices with thermal printer, barcode reader, and GPRS, Magstripe and contact smart card reader (can be an integrated device or a combination of mobile phone and Bluetooth thermal printer): The handheld devices will be used to capture the details of vehicles entering the parking lot, issuing Entry slip, computation of parking charges and issuance of receipt for parking charges.

ii. Two-line small LED displays at entry/exit or ends of parking lots for display of vacancy status of the parking slots,

iii. CCTV cameras (two per parking lot) for monitoring the operation of parking lots from the CCC,

iv. Backend Parking Management System application for receiving and processing the parking data, creation of business rules, configuring the handheld devices, generating parking vacancy information for display through LED boards and Mobile app and generate MIS.

In addition to the above, the parking lots will be demarcated using thermoplastic paint and each slot will also be marked using thermoplastic paint. A display board showing the details of parking charges, contractor name and complaint number/email ID will be installed at each entry of the parking lot.

The Smart Parking solution architecture will be based on open protocols, interoperable and scalable. The same will be able to integrate with Multilevel Car Parking (MLCP) as and when the same are built in the city. Smart Parking architecture scheme is illustrated below:

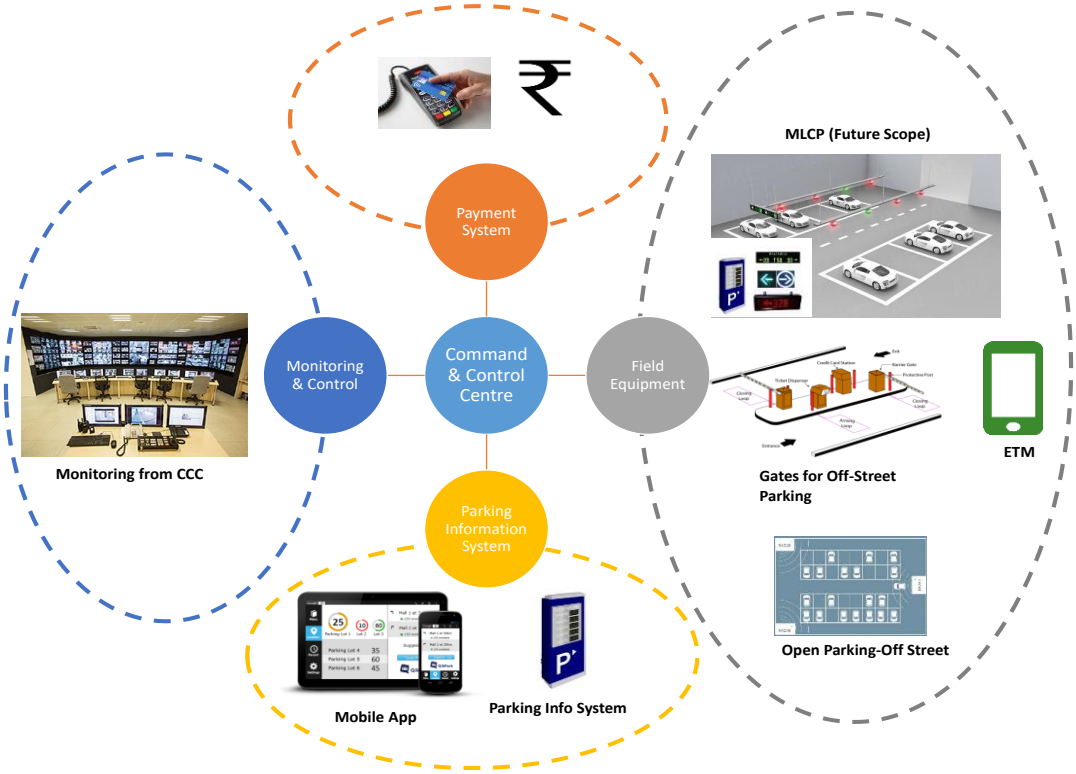


Figure 5-7: Smart Parking Schematic Diagram

5.5.4. Scope of Smart Parking System

The proposed Smart Parking System will cover the existing 11 locations which are currently being used for parking of vehicles.

Table 5-4: Smart Parking Scope

S. No	Component	Quantity
1.	Handheld Devices	24 numbers
2.	LED displays	27 numbers
3.	CCTV Cameras	47 numbers

A list of locations for Smart Parking along with their respective parking capacity of two-wheelers and cars is provided in Annexure 5.

5.6. ITS for City Buses, Ambulances, Fire Tenders, and SWM Vehicles

5.6.1. Overview

Davanagere envisages implementing Intelligent Transport System (ITS) for city buses to provide real-time information to passengers through various modes. The availability of real time information about city buses will enhance convenience for passengers and increase their confidence on public transport. The ITS components for Davanagere city will include Vehicle Location System and Passenger Information System.

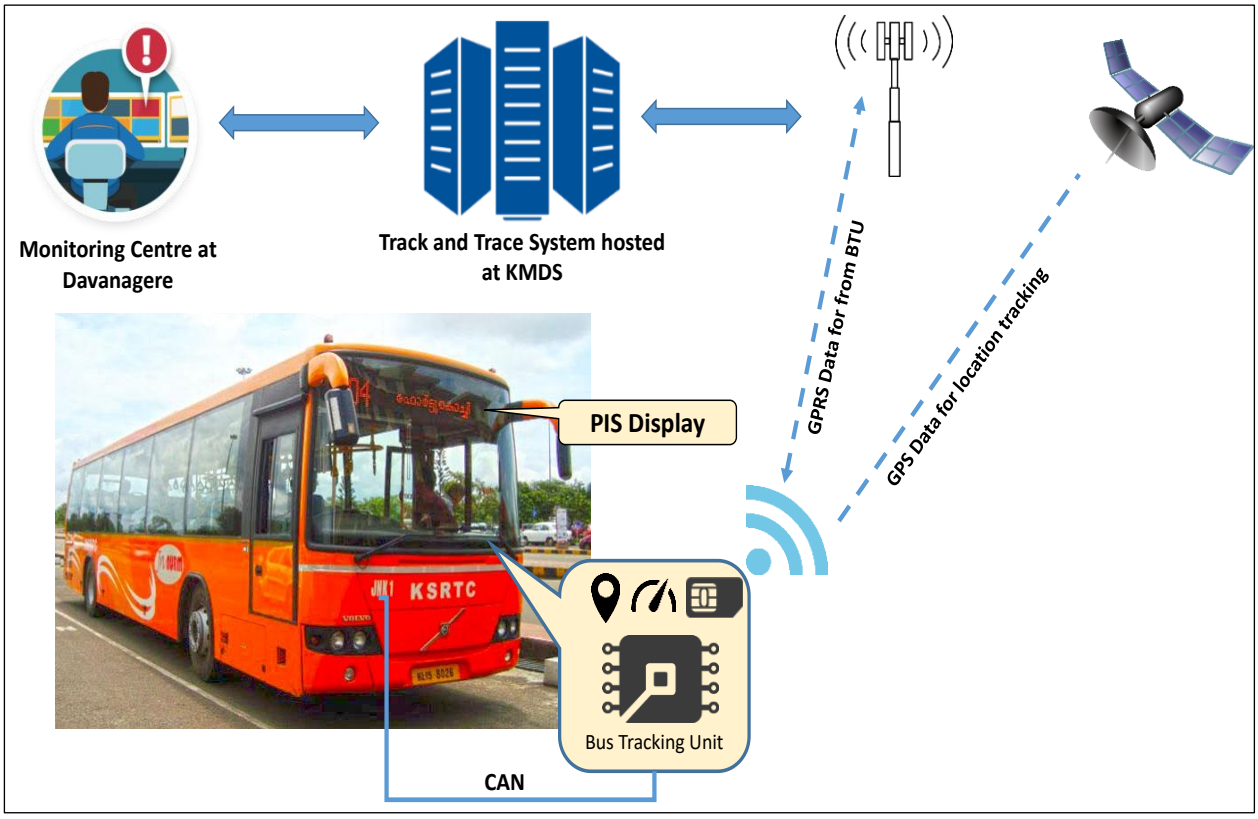


Figure 5-8: Conceptual view of ITS system

5.6.2. Current Situation and Use Cases for ITS

The city buses currently include buses operated by KSRTC and private bus operators. 56 Buses are owned by KSRTC owned and rest private owned.

The KSRTC buses run across seven routes, as below.

Table 5-5: KSRTC City Bus Routes

S. No	Route
1.	Vidyanagar to University
2.	SS Hospital to Shamanur
3.	Davanagere to Harihar
4.	Akthar Raj Circle to Shamanur
5.	RTO Circle to ZP office
6.	BIET College to Aralimar
7.	Ranebennur to Davanagere

Though, the existing KSRTC city buses have vehicle location devices already installed, the same are not functional. Private buses do not have vehicle location devices. Also, there are no display boards installed on bus shelters.

As part of Smart City programme, Davanagere city is planning to upgrade/build 52 smart bus shelters across the city.

The use cases for ITS are:

i. To provide information about bus routes, schedules, timings, fares, etc.

ii. To provide real-time information about Estimated Time of Arrival (ETA).

iii. To disseminate information through various modes including LED boards, Web Portal and Mobile App.

5.6.3. Solution Components/Features

Following are the key components of the ITS project:

- **Vehicle Location System**: The Vehicle Location System will include a vehicle tracking device installed in bus, which will provide real-time location of bus to the ITS application. The location information along with other details such as the speed of the bus, the route followed etc. is used to compute the expected arrival time of the bus at forthcoming bus stops. This information can be then displayed on boards installed at the bus shelters. As part of VLS, a Vehicle Tracking Device (VTD) will be installed in each KSRTC City bus.

  Ministry of Road Transport and Highways (MoRTH) has made it mandatory for all public service vehicles to have Vehicle Tracking Devices with effect from 1st April 2018. As and when, VTDs are installed by private bus operators, these buses will also be covered in the system.

Cost of tracking device for Auto Rickshaw is not under the scope of this DPR. It is assumed that RTO, Davanagere will be responsible for installation and upkeeping of Vehicle Tracking Device (VTD) in all Auto Rickshaw and hardware cost will be collected from respective vehicle owner. It is also supposed that RTO, Davanagere will make necessary guideline for upkeeping of installed Vehicle Tracking Device (VTD) including GPS and GPRS to enabled Vehicle Tracking Auto Rickshaw.

The Vehicle Location System will be integrated with the Smart GIS Map being developed by KUIDFC for all smart cities of Karnataka.

- **Passenger Information System:** Passenger Information System (PIS) will comprise website, mobile app and LED displays at bus shelters for providing information to the passengers about city buses. The website and mobile app will provide details of routes, schedules, fares, as well as estimated time of arrival (ETA) of buses on various bus stops, whereas LED displays at bus shelters will be used to display ETA and other small messages. Each Smart Bus Shelters will have two LED displays.

5.6.4. Scope

Table 5-6: Number of VTD and PIS Required for ITS

S. No	Component	Quantity
1.	GPS and GPRS enabled Bus Tracking Units (BTU)	56 (1 in each KSRTC bus)
2.	GPS and GPRS enabled Vehicle Tracking Unit	SWM Vehicles: 120 Ambulances: 23 Fire Tenders: 09 Police vehicle:70 Private city buses:250 (To be installed through RTO) Auto Rickshaw: 9000 (To be installed through RTO)
3.	LED Displays on Smart Bus Shelters	104 (2 each at 52 bus shelters)

5.7. City Wi-Fi

5.7.1. Overview

In the present times of digital connectivity, there is an increasing demand for public Wi Fi services for the citizens, even in public places. In view of this demand, DSCL intends to provide public Wi-Fi services at identified public locations across the City. These locations will include Market Places, e-Learning Centres, Recreation and Tourist Spots, bus stand, bus stops, etc.

The City-wide Wi Fi connectivity will leverage Davanagere City Network Backbone (which will be made available across the City). The last mile connectivity will be laid

from Davanagere city Network Backbone to Wi Fi locations over fibre. Access points will be installed at identified locations to provide public Wi-Fi.

5.7.2. Current Status and Use Cases

Currently, there is no city wide public Wi-Fi facility being provided in the Davanagere city.

The use cases for the City Wi-Fi will include making available public Wi-Fi at select locations and help in bringing down the digital divide.

5.7.3. Solution Components/Features

The City Wi-Fi components will include Communication Network Backbone, routers, switches and access points. The Communication Network Backbone will be the common network being laid for the city, which will be used for City Wi-Fi also.

Key features of the system will include:

- Ability to configure the system with respect to the following:
  - Allowing time-based free access over a specified duration
  - Allowing data volume based free access over a specified duration
  - Allowing for restricting specified content such as video streaming, high data applications, etc.
  - Allowing for restricting bandwidth based on policy
- Ability to create billing plans and allowing users to pay for paid access beyond free usage
- Configure and manage access points (APs) remotely
- Allow data communication in encrypted form to ensure end-to-end security of user information/ data with requisite security standards and authentication mechanisms.
- Provision to stream forced advertisements at specified time intervals as well as on part of the display.
- Support for features such as user authentication, access etc. through OTP (One Time Password) on mobile number/ e-mail.
- Initially up to 25 concurrent users per Wi-Fi router may be considered for 30 minutes or 200 MB of Data of free usage per user per day based on the successful OTP confirmation from Mobile of user. There will be restrictions for accessing, Videos, Social Media and other restricted sites. In later stage Wi-fi may also be taken as a standalone PPP project with potential to generate revenue.
- The proposed solution will be fully secured and as per WPC regulations/guidelines. A complete log of users will be maintained including minimum required information like Phone No, MAC & IP addresses, access time, duration, data consumed etc.

5.7.4. Scope

It is proposed to cover 10 locations under City Wi-Fi, as per the list provided in Annexure 6, to be taken in the initial phase.

5.8. Environment Sensors

5.8.1. Overview

Environmental pollution, particularly the air pollution, is nowadays an alarming problem in most of the Indian cities. It is important to monitor the air quality at multiple points in the city as well as to provide real-time information about the air quality to the citizens, which will help in creating an awareness towards the pollution related problems among the citizens. As part of the Davanagere Smart City programme, it has been decided that the air quality in the city will be monitored at select identified locations.

5.8.2. Current Status and Use Cases

Currently, there is no environment sensors installed in the city.

The use cases for the environment sensors include:

- Capturing of pollutants at different locations and at different time slots
- Monitoring and facilitating temporal analysis of various parameters.
- Helping authorities in taking corrective actions.
- Creating awareness about the pollution levels supported with real data

5.8.3. Components/Features of Environment Sensors

The system will have following components:

- Environment sensors (monitoring stations)
- LED Display at identified location

The system will have following features:

- Will capture temperature, humidity, levels of pollutants like SOx, NOx, COx, PM2.5, PM10 and noise level
- Will send the data to the CCC where the data will be processed, analysed and stored.
- Dissemination of real-time status of air quality parameters through city Web portal, Mobile app and LED display. Ability to display data in easy to understand manner using text, colour coded graphs/images, etc.
- Configure the sensors remotely from CCC.
- The central processing system will provide analysis and reports on trends of various parameters of air quality.
- Capability to share data with third parties to integrate the same with their systems/apps.

5.8.4. Scope

It is proposed to install the Environment Sensors at the following five locations:

- K R Market
- SS Layout
- Shamanur road near Laxmi Floor Mill Circle
- Ward no -41
- Gandhi Circle (Dr Modhi Circle)

It is proposed to install one LED display near the Davanagere City Corporation office.

5.9. One City-One Website with Mobile Application

5.9.1. Overview

This component will comprise of a common Web Portal & Mobile Application for the city which will be the unified interface for specified citizens' services. It will serve as a common platform of information dissemination about Davanagere City and to deliver services online including payment of bills.

The common Web Portal & Mobile Application will also allow Davanagere administration to engage with citizens through the use of social media and blogs, online voting platform, etc.

In addition, there will also be Self Service Kiosks installed at select locations in the city to enable citizens to access information and services available through Web Portal.

5.9.2. Current Status and Use Cases

Government of Karnataka has taken a number of initiatives for delivery of various citizen services in cities across the state. The services under these initiatives are being delivered through various online and offline channels. Some of such initiatives include the following:

i. e-District project under which 346 state/central level citizen services have been identified out of which 279 services have already been computerised. The e-District services are planned to be provided through CSCs, Karnataka-One Centres and Website.

ii. Karnataka Municipal Reforms Cell, which has been entrusted with computerization of all ULBs and make available their services to citizens. Currently, Birth and Death registration, Trade license, Building license, Water connection, Property Tax calculator, search property details and Grievance registration are available through MRC website (http://www.mrc.gov.in).

iii. Karnataka One, which is an initiative of Directorate of Electronic Delivery of Citizen Services (EDCS), Karnataka, through which various central/state/city and B2C level services are provided through centres specifically created for the same.

The following key channels are available to citizens to avail various services:

i. **Government Department window:** Citizens can directly approach concerned official at the Department/Agency for availing the services.

ii. **Karnataka One/ Davanagere One Centres:** Karnataka One Centres provide services of multiple Government Departments and Private Companies available under one roof. At present there are three Karnataka One Centres operational at Davanagere.

Figure 5-9: Karnataka-One Centre at Davanagere

Figure 5-10: Citizen Availing Services at K-One Centre

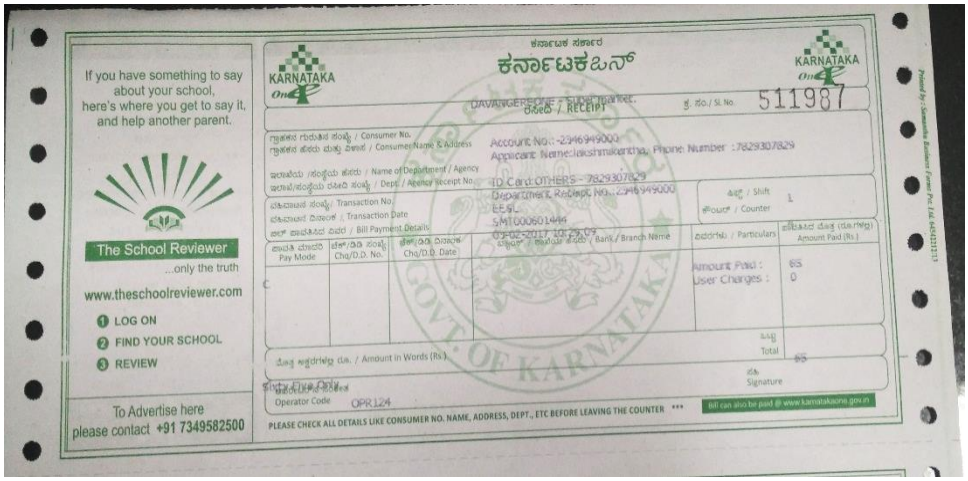


Figure 5-11: Acknowledgement Slip issued by K-One Centre

iii. **Common Service Centre (CSC):** These are the access points for delivery of various electronic services to citizens set up under Government of India's Digital India initiative, through which various services like Aadhaar enrolment, print & updation, insurance, Passport, LIC, e-Nagrik and e-District services can be availed.

Figure 5-12: View of a CSC Located in Davanagere

iv. **MRC Website (http://davanagerecity.mrc.gov.in/):** At present 8 citizen services are **being** provided through this website. Citizen can avail the services directly through the website. The website is maintained by Karnataka Municipal Data Society (Municipal Reforms Cell).

Karnataka Government under the Karnataka Guarantee of Services to Citizens Act, 2011 has provided guarantee of services to citizens in the State of Karnataka within the stipulated time limit. Information kiosks have been set up for the citizens to provide information about services and to check the status of their applications.

Figure 5-13: Self Service Kiosk to CHECK status of SAKALA Application

The use case for One City One Website are:

i. To provide a unified platform for the citizens to access all relevant information about the city, relevant officers, departments/agencies, services, etc.

ii. To provide detailed processes, rules, soft copies of application forms and documents required, etc. for various services.

iii. To provide a unified interface for citizens to avail various services.

iv. To provide a platform for citizen engagement.

v. To provide an alternate delivery channel through Information Kiosks

5.9.3. Solution Component/Features

There will be a common Website and accompanied Mobile Application for the city, with the following key features/functions:

City wide Collaboration

- Citizens of Davanagere can collaborate and provide inputs/ opinions on various policy related aspects, local governance aspects, feedback on specific issues etc.
- Enables citizens to get information of various activities & events in the city.
- Enables city to solicit citizen responses on various topics through polls/ surveys.
- Enables city to seek participation from city residents for various activities and volunteer for events, causes etc.

Citizen Services

- Provisioning of identified citizen services through the proposed Web portal and Mobile app.
- The portal/mobile app will have the feature for Aadhaar based authentication for applicable services.
- Proposed portal/mobile app will have provision for making online payment using bank payment gateway, UPI payment, other payment APIs for the services offered through the portal/mobile app.
- Enable citizen centric B2C services and payments such as school/college fees.

City Dashboard

- Creation of formats for online monitoring of citizen service delivery.
- The dashboard will summarize activities processed through the portal/mobile app, trends on citizen participation and service delivery and grievance.

Grievance Redressal

- The Web portal will have an integrated grievance redressal framework.
- The grievance module will be able to categorize the grievances and will have a built-in escalation framework.
- The portal will interface with backend grievance redressal mechanism.
- Citizens will be able to check the status of their grievances.

Mobile Application

- The mobile application will be available on Android and iOS platforms.
- The mobile application will be optimized for use on mobile devices, including display, bandwidth, etc.

Information Kiosks

- The Information Kiosk will provide access to all the services and information provided through Web Portal.
- The kiosks will have an interactive touch-based interface with contextual help.
- The Information Kiosks will be capable of uploading pictures of supporting documents.
- The Information Kiosks will be capable of printing receipts and documents.

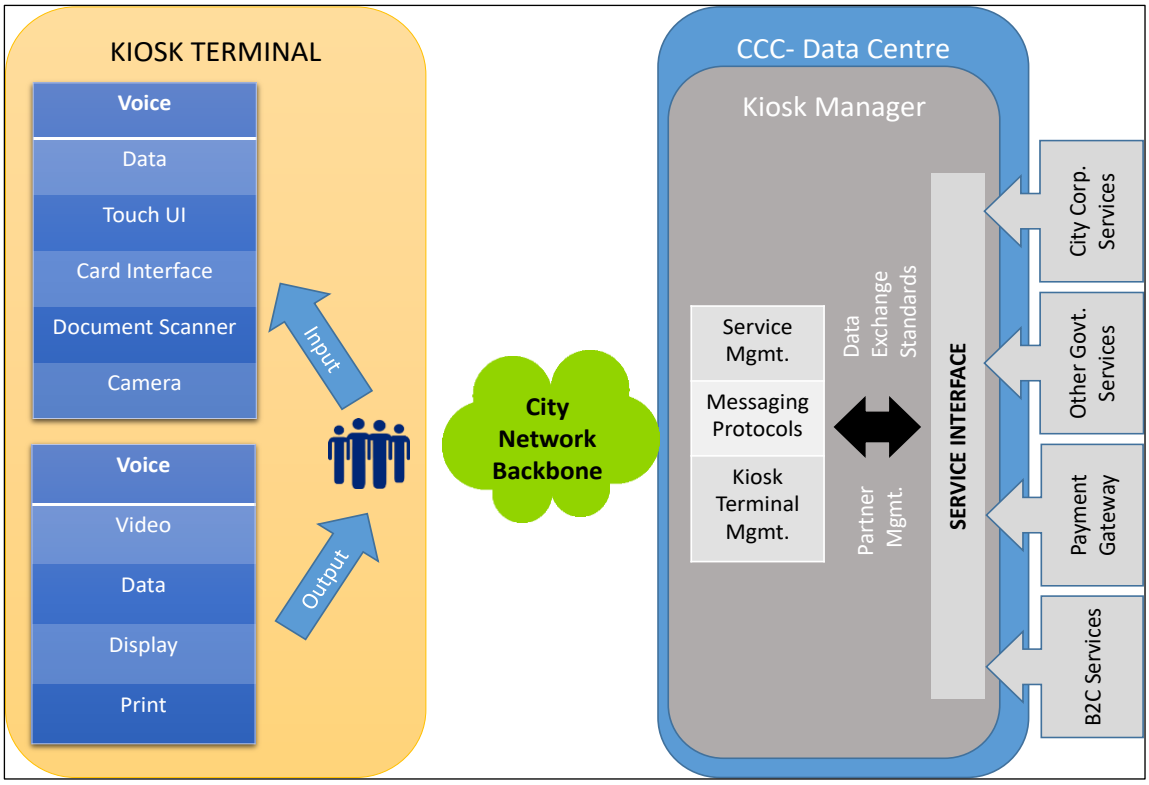


Figure 5-14: Kiosk Concept

General Features

- City portal and Mobile app will support multilingual versions in Kannada and English.
- The solution will support integration with external email server/ gateway and SMS gateway.
- The solution will enable integration with social media and forums/blogs, etc.

API Integration:

- City portal and Mobile app will be integrated with the existing services for citizens.
- City level LSI will coordinate with respective department for API integration.
- City level LSI will provide required API for the application developed to other department for integration as and when required
- It is assumed that, for API integration with the existing applications, concurrence from the respective stakeholder is to be sought on availability of APIs in order to specify in the RFP for LSI, the mode of integration. In case of availability of APIs, it should be mentioned in the LSI RFP (as a separate table).
- In the proposed Application Programming Interface (API) integration with the existing applications including MRC applications of KMDS, flexible and robust way to integrate existing different software applications shall be considered. It

is assumed that concurrence from the respective stakeholder on availability of APIs in order to ensure the mode/level of integration will be provided.

- In case the APIs are available with respective stakeholder, it should be mentioned in the LSI RFP (in a separate table), specifying the details of OS, Database, architecture of the existing API (server, scripting, language, programming language, concurrent users, etc.,)
- In case the AP Is are not available, the mode of achieving the inter-operability is to be ensured. LSI shall design the API for proper integration with the proposed system.
- In case of proposed new application development, it shall be ensured that the API (developed by LSI) shall be integrated into respective stakeholder's system, in order to ensure necessary integration and to avoid replication in future.

5.9.4. Scope

- Web Portal
- Mobile Application
- Information Kiosks – 20 numbers

The Information Kiosks will be installed at the following locations:

- E-Learning Centres – 10 nos. (2 each at 5 centres)
- KSRTC Bus Stand – 2 nos.
- Railway Station – 2 nos.
- DC Office – 2 nos.
- City Corporation Office – 2 nos.
- DSCL Office – 2 nos.

5.10. Help Desk (One City-One Number)

5.10.1. Overview

One City-One Number is proposed as a unified ICT enabled telephonic helpline facility for Davanagere that will act as an interface between citizens and City Authorities to enable effective telephonic interaction.

An IVRS based call centre backed 4-digit unique number for citizens to access and communicate with any Government Official gets required information, register and track complaints

The aim to setup a centralized call centre for the Davanagere city is to meet the requirement of information dissemination and grievance handing to cater to the needs of people. One City-One Number aims to provide all the services in a 24x7 fashion. The calls will be answered by multi lingual Interactive Voice Response System (IVRS),

and will be forwarded to operators on need basis, who will be experienced and skilled operators. In addition to general enquiry, One City-One Number will also accept complaints and grievances. The helpline operators will be stationed at the proposed Command and Control facility in Davanagere.

5.10.2. Current Status and Use cases

Currently, the City Corporation has a helpline no. 08192234444 and email id: commissioner_davanagere@yahoo.com through which the citizens can register their complaints.

The use cases for the One City-One Number will be:

- Provide a simple and accessible platform for various segments of citizens to access information and register grievances. Will be especially useful for citizens who do not use internet services or are not in a position to access information from Web Portal/Mobile App.
- Minimize the time spent on repeated visits to government offices, by accessing status of their requests through this number.
- Citizen Collaboration: Citizens can provide their feedback/suggestions/opinion etc. on various aspects for government departments services through the contact number.

5.10.3. Solution Component/Features

The solution will include a unified telephone number backed by an IVRS based call centre, housed in CCC.

The solution will have following key features:

i. The telephone number will support Kannada and English languages

ii. The solution will support automated response through IVRS

iii. There will be option to access human based support for the required services

iv. It will work in two shifts (from 6 AM to 9 PM) initially and could be extended in future if required.

v. Initially, two operators per shift will be deployed in the call centre which can be increased in future based on call volumes, if required.

vi. The call centre will maintain complete statistics and logs of all calls/requests.

5.10.4. Scope

The scope of the solution will be:

- Telephone number
- IVR System

- Call Centre operators – 6 numbers (2 each in two shifts and 2 backups for 7 days operation)
- Integration with the existing Tollfree number (Police, Health, Child, Women)

5.11. e-Learning Centres

5.11.1. Overview

e-Learning Centres will be the centres where citizens can access digital and print content for self-learning. They will be set up with the required infrastructure and will provide access to knowledgebase of digital library that can be utilized for learning, competitive exam preparations, personality development, capacity building, general knowledge, financial and digital literacy, language skills etc.

5.11.2. Current Status and Use Cases

Currently, there are about 14 community libraries in the Davanagere city where citizens can spend time and access newspapers and periodicals.

The use cases for setting up of E-Learning Centres are:

- To provide facilities for citizens to access knowledgebase on a variety of subjects
- To create a conducive environment and nice ambience for self-study
- To enable access to knowledge resources during extended hours.
- To make available access to the knowledge resources, related facilities and amenities at reasonable prices.

5.11.3. Solution Component/Features

The e-Learning Centres will have following components and facilities:

Learning Centre (paid zone)

- Desktop Computers (or tablets), one local server and one colour Laser printer
- Access e-Learning content
- Access subscription or e-Books, Digital Lectures, Webinars etc.
- Free Wi-Fi

Vending Zone

- Stationery, Printing, scanning, photocopying
- Beverages (coffee, tea, cold drinks, packaged water)
- Basic snacks

Kiosks & ATM

- Self Service kiosks for information dissemination, service requests, status check, grievances and feedback,
- Payment of utility bills
- Receipt printing
- ATM

Free Reading Area

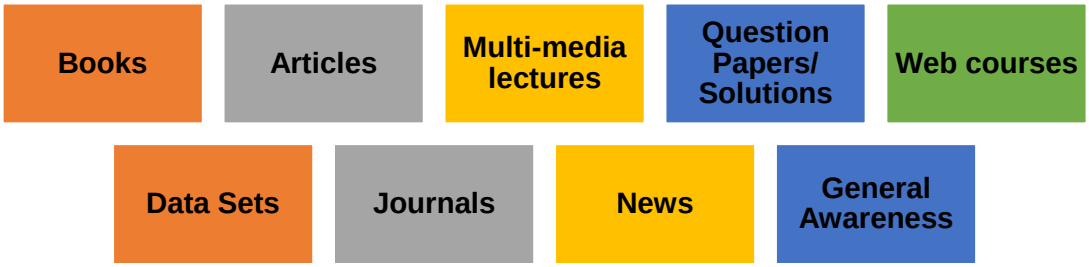
- Free seating area with access to W-Fi and News Papers
- Shall also act as a waiting area
- Can be used to display advertisement

In addition to above, there will be following common facilities in the e-Learning Centres:

a. Air-conditioned premises
b. Power backup through Inverter
c. Washrooms
d. Drinking water

Digital library software application and eBooks will be stored in a local server that will allow multi-device access to eBooks, multi-media content and assessment modules through LAN.

Digital library software application will make available access contents including the following:



The content will be available in multiple languages including Kannada, English, Hindi etc.

The system will have the capability to operate with or without internet allowing multiple device connectivity with browser view functionality for library application.

5.11.4. Scope

Five e-Learning Centres are proposed to be setup in Davanagere Smart City, DSCL will provide the space and LSI will be responsible for IT and Non-IT infrastructure. The tentative locations identified by the City Corporation for e-Learning Centres are as follows:

i. Davanagere Main Library
ii. Devraj Urs Layout
iii. Nijalingappa Badavane
iv. Anjaneya Badavane
v. Stadium

5.12. e-Office Suite for DSCL and Davanagere City Corporation

5.12.1. Overview

DSCL intends to implement e-Office suite in order to introduce ICT based internal systems and processes. DSCL requires the automation of office administrative processes which will be used by company officials for their day to day activities as well as for monitoring and management of various smart city projects.

It will help in ensuring transparency and efficiency to internal (Office Administrative) & external functions of DSCL, which will be automated as part of e-Office suite.

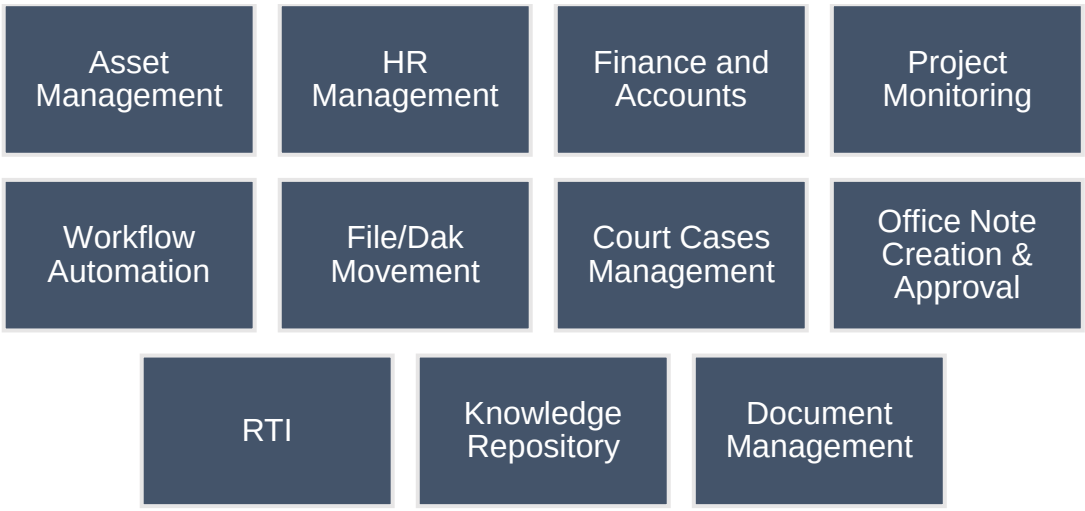
5.12.2. Current Status and Use Cases

Currently, there is no office automation system in DSCL and Davanagere City Corporation

The use cases for e-Office will include DAK/File Management, RTI Management, Court Case Management, HR, Finance, Payrolls, project monitoring, asset management, etc.

5.12.3. Solution Components/Features

The key components of e-Office suite are provided in the figure below:



The key features of the solution will include the following:

i. The solution will enable monitoring and management of various smart city and other projects undertaken by DSCL such as tracking target dates and deliverables, project details, payments due and paid, etc.

ii. The solution will be used to manage service records, employees' particulars, leaves, payrolls, etc. of DSCL employees.

iii. The solution will be used to manage accounts receivables and payables and generating various statutory financial statements.

iv. It will enable tracking and recording of movement of files, dak and project documents/deliverables, both soft copies and hard copies.

v. It will enable management of RTI and court cases and will help in keeping track of key dates.

vi. The solution will help in achieving less-paper work flow through initiating and processing work flows.

vii. It will provide for a knowledge repository which will allow for storage of knowledge resources and their indexing and search based on key-words/metadata.

5.12.4. Scope

The scope of this solution will be e-Office Suite for DSCL office, including all above mentioned components.

6. ICT INFRASTRUCTURE

6.1. Common ICT Infrastructure

The following common ICT Infrastructure components will be required to support various solutions identified as part of Davanagere Pan City ICT Project:

i. Centralised Command & Control Centre (CCC) and Satellite Command & Control Centre

ii. Data Centre and Disaster Recovery Centre (under the scope of KMDS's MSI)

iii. Network Backbone

   a. Between KMDS and City Command and Control Center under the scope of KMDS's MSI

   b. Network within the City under the scope of LSI

These components are described in below sections.

6.2. Command & Control Centre and Satellite Command & Control Centre

6.2.1. Overview

The Centralized Command & Control Centre will serve as a unified facility from where various Pan City ICT solutions will be operated and monitored.

The key objectives for establishing the Centralized Command & Control Centre are as below:

- Monitoring and managing traffic flows in the city and various other systems related to traffic management.
- Monitoring of live video feeds from surveillance cameras and performing analytics, post event analysis, etc.
- Monitoring of dashboards for the following functions:
  - Traffic flows across various junctions
  - Traffic enforcement statistics and analysis
  - Performance of buses vis-à-vis schedules, etc.
  - Occupancy status of parking lots
  - Overview of citizen services applications and delivery status
  - Summary of citizen grievances and resolution status
  - Environmental parameters across various locations
  - Results of citizen polls/surveys, feedback, opinion
- Managing the interaction with citizens through call centre
- Initiating/managing citizen polls, surveys, etc.

- Monitoring functional/health status of various equipment/systems installed in the city.
- Monitoring and managing street lights, solid waste management system, water quality monitoring system etc., through integration with the respective systems.
- Coordinate with other agencies/departments/stakeholders for seeking their interventions, as required.

A Satellite Command and Control Centre will also be established at the Office of Inspector General of Police for providing dedicated access to police officials for their relevant systems such as City Surveillance, ITMS and Traffic Enforcement. The Satellite Command and Control Centre will also serve as interim facility till the time the building for CCC is constructed at the DC Office premises.

6.2.2. Location of CCC and SCC

It has been decided that the Centralized Command & Control Centre (CCC) will be set-up at DC Office premises. A separate building is planned to be constructed for the purpose of CCC and the Data Centre.

The Satellite Command and Control Centre will be set up at the Office of Inspector General of Police, Davanagere.

The engineering aspects of the CCC building and SCC are being covered under a separate DPR.

6.2.3. CCC Logical Architecture

A logical architecture of Centralised Command and Control Centre and its interfaces with other layers of the project is provided in figure below.

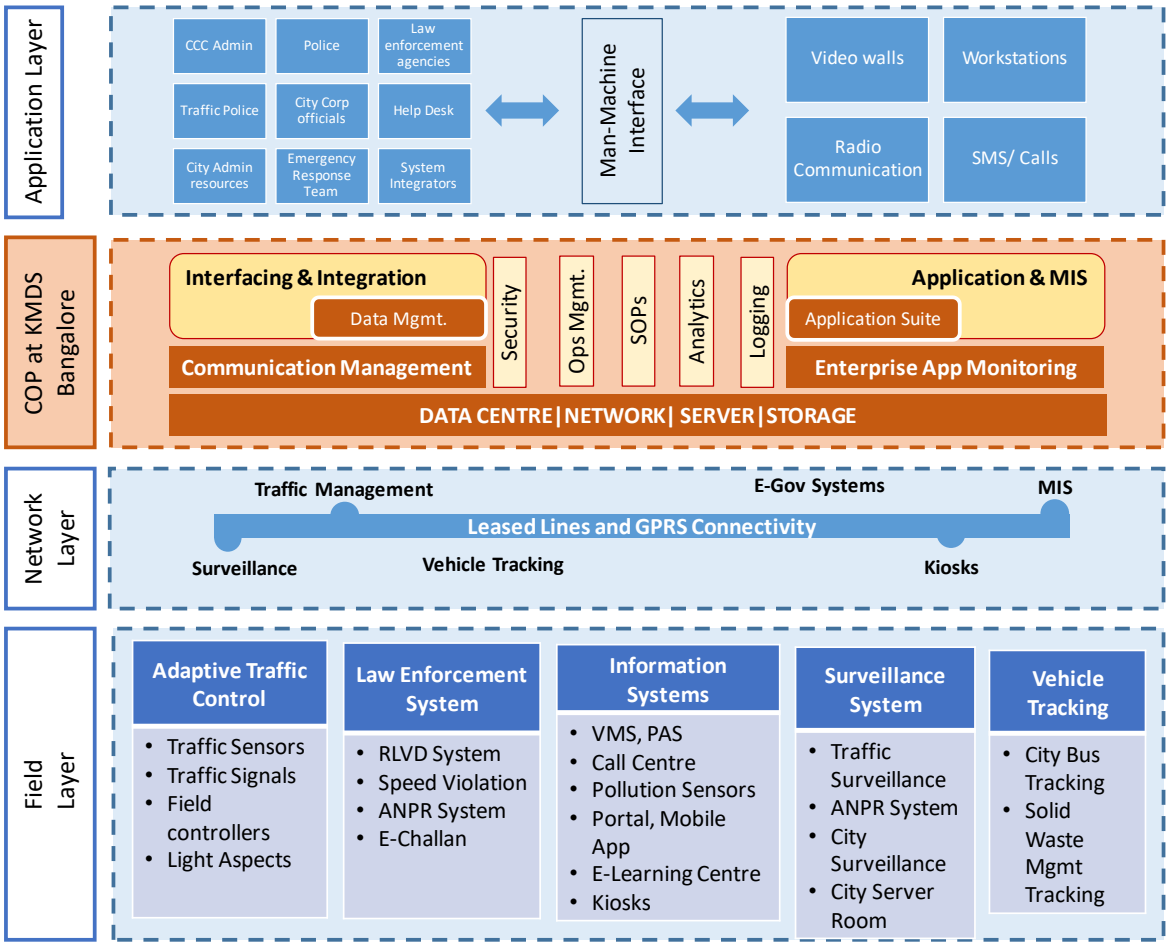


Figure 6-1: CCC Logical Architecture

Field Layer

The Field layer will capture information from the edge level devices like intelligent traffic signals, traffic enforcement equipment, cameras, environment sensors, VTD, parking devices, information kiosks, etc. and will transmit the same to Data Centre through the Network Layer. The Field layer will also disseminate information to the citizens through LED displays, VMS, information kiosks, etc. and provide services through Wi-Fi hotspots, kiosks, etc.

Network Layer

The Network layer will serve as the communication backbone for the project and provide connectivity between the field layer and Data Centre/CCC. The Network layer will be based on high bandwidth optical fibre network.

City Operations Platform (COP)

The COP will comprise Data Centre at KMDS, and Integrated Application software and ICT infrastructure. It will be used to receive data from Field Layer, process and store it

and to provide user interfaces for managing various solutions. The COP will contain data aggregation and management systems (rules engines, alerting systems, diagnostics systems, control systems, messaging system, events handling system).

Application Layer

The Application Layer will enable DSCL and other users to render services using the ICT solutions deployed. It will also be used to maintain the upkeep of the edge devices and other components of the solutions.

IoT devices communicate to IoT platform through application layer.

6.2.4. Key ICT Infrastructure at CCC and SCC

Video Wall

Video Wall will be an important component of CCC and SCC. It will be used by the operators to monitor the feeds being received from various field equipment, network and other components of the system.

Monitoring Workstations

The CCC and SCC will have monitoring workstations for the operators. The monitor workstations will be connected on the local area network.

Network Printers

The CCC and SCC will have printers for printing of reports and other documents as required. The printers will be network, colour, multi-function, laser printers, supporting printing, copying and scanning functions for up to A3 paper sizes. The printers will be connected on the local area network, so that all the operators are able to use the same.

Local Area Network (LAN) Connectivity

All the IT components in CCC and SCC will be connected in a local area network so that the same can share the common resources such as internet connectivity, network printer, etc.

Video Conferencing Facility

The CCC will have video conferencing facility, which will be used for meetings with remote locations and remote training of users, etc.

Figure 6-2: Indicative Video Conferencing Room

The video conferencing equipment will include video conferencing unit, HD camera, speakers, microphones and two LED displays.

Building Management System (BMS)

A building management system (BMS), or building automation system (BAS) proposed for CCC building Controls and monitors the building's mechanical and electrical equipment such as ventilation, Lighting, Main Power Distribution Systems, Fire systems, CCTV, Access Control, Car Parking, UPS status, PA system, Plumbing and other engineering systems also. A BMS consists of software and hardware; the software program, usually configured in a hierarchical manner, can be proprietary, using such protocols as C-Bus, Profibus, and hardwires also. System Integrators offers BMS solutions that integrates the use of Internet protocols and open standards such as Device Net, SOAP, XML, BACnet, LonWorks and Modbus.

BMS comes out with the benefit of Possibility of individual room control, increased staff productivity, effective monitoring and targeting of energy consumption, improved plant reliability and life, effective response to HVAC-related complaints, save time and money during the maintenance.

Effective control and monitoring of BMS results in the following advantages.

- Data is consolidated onto a single system to improve reporting, information management and decision-making. Integrating and managing the HVAC, energy, security, digital video and life safety applications from a single workstation allows facility-wide insight and control for better performance.
- Increased operational savings – Efficient resource deployment can result in reduced operational costs, empowering operators, simplifying training and decreasing false alarms.
- Energy efficient – Real-time view into facility operations and deep trend analysis provide data-driven insight to optimize your energy management strategies and minimize operational costs.
- Flexibility to grow and expand – The powerful combination of open systems protocols and a scalable platform means the BMS can help support growth and expansion of the system in the future.
- Reduced risk – Strategic mobile or desktop control, exceptional alarm management and integrated security solutions helps to see the big picture, helping to speed up response time and mitigate risks for the property, people and business.
- Intelligent reporting – Comprehensive reporting with functionality for customizable reports delivers greater transparency into system history and promotes compliance.

6.2.5. Non-ICT Infrastructure at CCC and SCC

Non-ICT infrastructure at CCC and SCC will include the following:

- Fire Detection and Suppression System with Alarm
- Access Control System (Proximity based RFID for staff)
- Rodent repellent/control system
- CCTV surveillance for local surveillance

6.3. Centralized Data Centre (DC) at KMDS and Disaster Recovery Centre (DRC) on Cloud

6.3.1. Overview of DC and DRC

The Data Centre (DC) at KMDS will host all the applications and infrastructure comprising servers, storage, networking equipment, system software, etc. required for the Pan City Solutions. The DC will receive data from the field equipment and devices that will be connected to the DC over fibre/cable and wireless network, process and store it.

The DRC on the Cloud will provide a replica of Data centre in order to ensure continuity of services in case of failure of DC. Only the DRC for CCTV Surveillance Project shall under the responsibility of DSCL and its LSI.

As per Data retention policy the data will be retained for one year.

6.3.2. Location of DC and DRC

Keeping in view the construction cost and Operation and maintenance cost of Tier 3 data centre at the city level, it is proposed to have the Data Centre at Karnataka Municipal Data Society (KMDS). The proposed data centre shall be for hosting the compute and storage. Keeping in view the fact that CCTV Surveillance feed would require high bandwidth for data transfer, it is proposed to have the local Server Room for compute and storage for the CCTV Surveillance and other applications running locally at Davanagere.

The Disaster Recovery Centre for CCTV Surveillance will be set up on cloud at a Government owned data centre/service provider as per guidelines issued by MEITY, in a seismic zone different from Davanagere city.

6.3.2.1. *DR for data applications with LSI*

DR for applications hosted at KMDS, shall be in the scope of MSI. It is assumed that Application and database, managed by LSI, shall be replicated in DR by LSI in coordination with the cloud service provider of MSI. The Same shall be reflected in the RFP of MSI and LSI. Considering the above, the RFP of MS! and LSI shall be finalized. In case, any major concern is experienced during the pre-bid meetings, a suitable decision shall be taken, if required.

6.3.3. Compute and Storage Requirements for Davanagere ICT Projects

The indicative compute and storage requirements which is required to run the Davanagere City level applications, hosted at KMDS Bangalore is listed in the table below:

Table 6-1: Compute Requirements

S.No	Project Component	CPU Cores	Storage for Application (GB)	Recurring Storage per Month (GB)	RAM (GB)	Bandwidth Requirement (Mbps)	Number of concurrent user
1	Information Dissemination System: Public Address System	8	5	1	2	1	2
2	Environment Sensors	4	2	1	2	1	1
3	ITMS: Smart Signals	16	5	10	8	2	2
4	Information Dissemination System: Variable Message Signs	4	2	1	2	1	2
5	City Wi-Fi	8	2	1	8	2	2
6	Smart Parking	8	5	1	2	2	10
7	Intelligent Transport System (ITS)	16	10	5	8	4	20
8	Enterprise Management System (EMS) Software for City Level Applications	8	8	10	8	2	4
9	Testing Server	16	10	5	16	2	2
10	e-Office	16	5	40	8	4	75
11	Kiosk Application	8	2	2	8	4	25
	Total	**112**	**56**	**77**	**72**	**25**	**145**

6.3.4. Connectivity for DC and City Operation Centre

An indicative Architecture diagram for the Data Centre and CCC Building (Server room) is shown below.

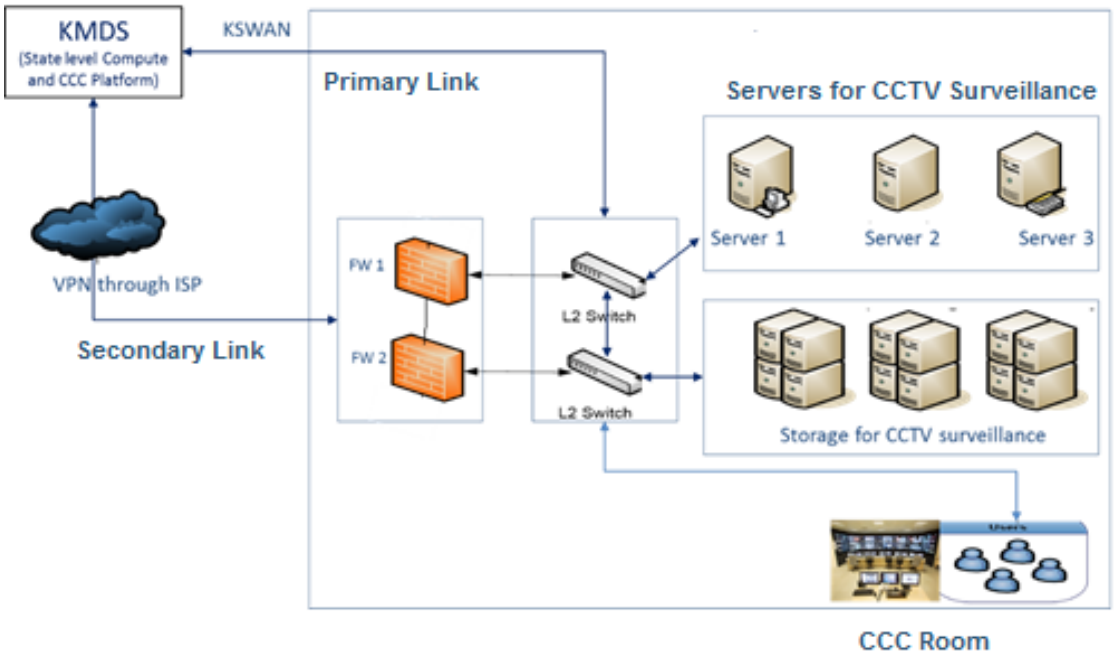


Figure 6-3: Connectivity diagram for DC and City Operation Centre

The Server Room at city level will have following components:

- Hardware Components smart racks, blade enclosures/chassis, servers, storage, SAN,
- Networking and Communication Infrastructure such as routers, switches, firewall, etc.
- System Software such as Operating Systems, RDBMS, analytics application, reporting tools, EMS, NMS, backup software, etc.
- Applications such as, RLVD, SVD, e-Challan, Video Management/Analytics, etc.

6.4. MPLS/Leased Line Network connectivity:

Keeping in view the network connectivity requirement within city for CCTV surveillance and other field instruments, it is proposed to have bandwidth from ISP provider (such as BSNL, Airtel, Vodafone or any other) who will provide required connectivity as part of the Pan City ICT Project. In such a case there could be a tripartite agreement among Local System Integrator, DSCL and Internet Service Provider.

It is assumed that KSWAN shall be used for network connectivity between KMDS and CCCC. Moreover, MPLS connectivity of KSWAN shall be procured.

It is also assumed that, KSWAN shall be obtained for 10 MBPS per city (10 MBPS uplink and 10 MBPS downlink) and 60 MBPS at KMDS. However, for internet

connectivity, 10 MBPS per city and 30 MBPS at KMDS shall be confirmed, subject to provisioning to increase in future based on city specific requirement.

A large number of edge devices (including CCTV cameras, traffic signal equipment, traffic enforcement devices, sensors, LED displays and other equipment) are deployed across the city, which need to communicate with the Data Centre in real time. This has following requirement from any ISP provider in city:

- Long term availability, as the solutions deployed as part of the project are essential facilities for the city that will be required on permanent basis.
- Future scalability: Own network will give flexibility to increase the number of devices and add more solutions in future, without necessitating the corresponding increase in the network costs.

6.5. Software license

Software license for Databases and Operating System license will be in the scope of LSI. As per GoI policy, open source software shall be preferred.

7. FINANCIAL OUTLAY AND IMPLEMENTATION APPROACH

7.1. Capital and Operations Costs for Pan City ICT Project

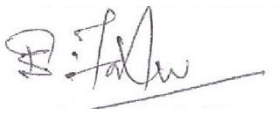
A summary of the capital and operations & maintenance costs for the Pan City ICT Project (as described in this DPR) is provided in Table 7-1 below. The detailed breakdown of the costs is provided in Annexure 8.

Table 7-1: Summary of Capital and O&M Costs for Pan City ICT Project

Revised DPR Cost				
S.No.	**Project Component**	**Capital Cost (Rs. Crores)**	**O&M Costs for 5 years (Rs. Crores)**	**Total Cost (Rs. Crores)**
Pan City ICT Project Components				
1 #	City Surveillance System #	6.54	2.75	9.28
2.a	ITMS: Smart Signals	6.25	2.34	8.59
2.b	ITMS: Traffic Enforcement System	2.33	1.15	3.47
3.a	Information Dissemination System: Public Address System	0.16	0.09	0.24
3.b	Information Dissemination System: Variable Message Signs	0.90	0.45	1.35
4	Smart Parking	0.76	0.37	1.13
5	Intelligent Transport System (ITS)	1.17	0.77	1.94
6	City Wi-Fi	1.76	0.84	2.60
7	Environment Sensors	1.05	0.43	1.48
8	Citizen Kiosks	0.54	0.26	0.80
9	Help Desk (One City-One Number) #	0.97	0.53	1.50
10	e-Learning Centres	0.61	0.34	0.95
11	e-Office Suite for DSCL and City Corp	1.20	0.72	1.92
12 #	Server Licenses at KMDS #	0.40	1.60	2.00
14	Portal & Mobile App	0.65	0.37	1.02

ICT Infrastructure				
14	Command & Control Centre (CCC) #	4.21	1.83	6.04
15	Satellite Command & Control Centre #	1.39	0.52	1.92
16	Server Room for City Surveillance #	4.21	2.46	6.66
17	Disaster Recovery Center for CCTV Considered #	1.35	7.00	8.35
18	Network Backbone for CCTV Surveillance, CCC and Satellite CCC. #	0.76	15.58	16.34
Other Cost Components				
19	Operations Cost	0.00	9.41	9.41
20	Misc. Expenditure @ 5%	1.86	2.49	4.35
	Pre-Tax Total	**39.06**	**52.31**	**91.37**
21	Tax @ 18%	7.03	9.42	16.45
	Net Project Cost	**46.09**	**61.73**	**107.81**

Data Center CCC will be established by KMDS and this will be under the MSI scope.
It is assumed that Share of Davanagere (Lump-Sum) towards Data Center CCC established by KMDS will be around 25 Cr. (Capex Cost 20 Cr and Opex Cost 5 Cr for O&M of 5 Years).
Change in costing incorporated as per comparative assessment suggested by KUIDFC.



7.2. Revenue Streams

There will be a number of potential revenue streams which can be utilized for monetization of the assets being created under Davanagere Pan City ICT Project, as listed below:

i. City Wi-Fi – Usage beyond free access and advertisements

ii. LED Boards and VMS - advertisements

There are certain aspects which need to be taken into account while working out the monetization model for the above assets:

i. Revenue generation from such assets is highly unpredictable over a period of time due to large number of external factors such as similar services being offered by competing modes, overall economic conditions, etc.

ii. Limited capability with city authorities to market and realise revenues

iii. Impact on core functions of the assets

iv. Compliance to the regulatory requirements such as ISP license requirement

In view of the above, it is proposed that LSI may be given responsibility to enable commercial use of the above listed assets with the following conditions:

a. LSI will be responsible for marketing the assets and coordination with the customers/third parties for their commercial use.

b. Any commercial use of assets for monetization will be initiated with prior written permission of DSCL.

c. LSI will have to ensure that the core functions/SLAs of the assets are not impacted by commercial use.

d. LSI will bear all the costs associated with enabling commercial use of the assets.

e. The entire revenue so generated through such commercial use will be directly deposited in DSCL's account.

f. LSI will be paid revenue share as per the following:

   i. City Wi-Fi (advertisement and user charges) – 30%

   ii. LED Boards – 30%

7.3. Implementation Approach

A Local Systems Integrator (LSI) will be selected for implementation, operations and maintenance of the Pan City ICT project. Based on discussions with DSCL and other stakeholders, it has been decided that the LSI will be selected on Least Cost Based Selection (LCBS) basis. However, to ensure the desired level of quality, the minimum marks against the technical qualification criteria shall be 80.

During the implementation of overall solutions, the platform should be configured in such a way that the solutions available in city and upcoming solutions in future, to be integrated with the CCC platform without any customization and additional cost.

7.4. Implementation Timelines

Indicative timelines for implementation of Pan City ICT Project are provided in Table 7-32 below:

Table 7-32: Implementation Timelines for Pan City ICT Project

Activities	Date of Submission	Submittals
Signing of Contract of LSI	T	
Project Kick Off Meeting	T1 = T + 1 week	
Detailed Project Plan	T2 = T1 + 1 month	D1: Project Plan
Submission of SRS, FRS & SDD Document	T3 = T2 + 2 months	D2: SRS, FRS & SDD Document

Activities	Date of Submission	Submittals
Phase 1 Implementation & Rollout	T4 = T3 + 4 month	D3: Phase 1 Implementation Completion Report
Phase 2 Implementation & Rollout	T5 = T4 + 5 month	D4:Phase 2 Implementation Completion Report
Final Acceptance	T6 = T5 + 1 month	
Operations & Maintenance	For the Contract Period (post Final Acceptance)	D5: Periodic MIS/Service Levels and other reports as per the Contract

8. ANNEXURES

8.1. Annexure 1: List of Proposed Locations for CCTV Cameras[1]

Table 8.1: Locations Identified for CCTV Surveillance (ICT Guideline)

S.No	Junction Name	No of Arms	PTZ	Fixed
1.	A.C Circle	3	1	2
2.	Devraja URS Circle	3	1	1
3.	MG Circle	4	1	2
4.	Onion Market Circle	3	-	2
5.	ITI Circle Junction	4	1	2
6.	Ram & Co Circle	4	1	1
7.	Sharadamba Circle	4	1	1
8.	Bapuji Circle	3	1	1
9.	DRR College Circle	3	-	2
10.	Ganesha Circle	3	-	3
11.	MBA Circle	4	-	2
12.	Ring Road DC Circle	5	1	3
13.	P.B. Road Court Circle	3	-	2
14.	P.B. Road Ranichannama Circle	4	1	2
15.	Vidya Nagara Gandhi Circle	3	1	1
16.	Jayadeva Circle	6	1	3
17.	Ambedkar Circle	5	1	3
18.	Vidyarthi Bhawan Circle	3	1	2
19.	Dr. Modhi Circle	4	1	3
20.	Lakshmi Floor Mill Circle	4	1	2

S.No	Junction Name	No of Arms	PTZ	Fixed
21.	BIET College	3	-	2
22.	Old P.B Road Uttam Circle	4	-	2
23.	Hondada Circle	5	1	3
24.	Venkateswara Circle	3		2
25.	RTO Circle	4	-	4
26.	New DC Office Circle	4	-	2
27.	Aralimara Circle	3	-	3
28.	Lakshmi Circle	5	1	3
29.	Mandakki Batti Circle	4	1	2
	Total	**110**	**18**	**63**

Table 8-1: Other Locations Identified for CCTV Surveillance

S. No	Road/Junction Name	PTZ	Fixed
1.	Kondajji Road Ashoka Nagara Main Road	1	1
2.	S.M. Krishna Nagara Vinayaka Circle		1
3.	Budal Road Circle (Kurubarakeri Behind)		1
4.	Basha Nagara Main Circle		2
5.	Maganalli Road H. Kalapanalli Junction		2
6.	Maganalli Road Azad Nagara P.S junction	1	2
7.	Jagalur Road Betur Hall Ring Road Junction		1
8.	Azad Nagara Main Circle	1	2
9.	Kondajji Road Seebar Circle		1
10.	Hagedebba Circle		1
11.	Budal Road Main Road Circle	1	1
12.	Kailasa Raste Dr. Ambedkar Circle		1
13.	Kailasa Raste Hindu Burial Ground Main Gate		1
14.	Devaraja URS Layout 'B' block Play Ground Junction	1	1
15.	Hasbhavi Circle	1	2
16.	Charli Pailwan Auto Stand		1
17.	N.R. Road Main Road Junction		1
18.	Jagalur Bus Stand	1	2
19.	RMC Main Road opposite Nurani Shadhi Mahal junction	1	1
20.	Chokipete Main Road M.G. Circle	1	2

S. No	Road/Junction Name	PTZ	Fixed
21.	R.M.C Main Road Basapura Road Junction		1
22.	R.M.C Road Opposite R.M.C Office Main Junction		1
23.	Jalinagar main road park junction	1	1
24.	Clock Tower Junction	1	2
25.	Chamaraja Circle	1	2
26.	K.R. Market Double Road Junction		2
27.	Mandipete Indian Bank Junction	1	1
28.	Mandipete SBI Bank Circle		1
29.	Vasantha Road Shivaji Circle		2
30.	Kaipete Basavanna Circle		1
31.	G.M.I.T College Main Gate		1
32.	Yallamma Nagara 4th Main Circle		1
33.	Vinoba Nagara 2nd Main Ganesh Temple		1
34.	Vinoba Nagara 2nd Main Masque Junction	1	1
35.	Old P.B Road Darga Junction	1	0
36.	Vinoba Nagara 3rd Main Kattige Depot Junction		1
37.	P.J. Extension Avk College Road Paddu Coffee Bar	1	1
38.	P.J. Extension Church Circle	1	1
39.	Old Bus Stand Junction	1	2
40.	Western Railway Station	1	2
41.	Corporation Office	1	3
42.	Shivappa Circle		1
43.	Avaragere Village Junction		2
44.	ESI Hospital Main Road Junction	1	1
45.	Manikanta Circle	1	1
46.	Om Tailor Circle	1	1
47.	Bhagat Singh Nagara Auto stand	1	
48.	Bull Park Junction Nitoli Road	1	
49.	12th Cross 2nd Main KTJ Nagara		1
50.	17th Cross 1st Main KTJ Nagara	1	
51.	K.T.J Nagara 8th Cross		1
52.	Kaveri Juice Stall Junction		1
53.	TJJ Nagara 2nd Main, 17th Cross	1	

S. No	Road/Junction Name	PTZ	Fixed
54.	C.G. Hospital City Bus Stop Place		1
55.	Water Tank Junction Shamanur Road	1	
56.	S. Nijallingappa Extension Amrutanandamai Junction		1
57.	Gasagase Park (Kundavada Tank Road)	1	
58.	Kundawada Tank Road BCM Hostel Junction	1	1
59.	Shamanur Road BIET College Main Gate Junction		1
60.	Kundawada Tank Entry gate	1	1
61.	Indoor Stadium Circle (S.S. Layout 'B' Block)		1
62.	Shamanur Village Main Junction	1	1
63.	Roti Ghar Hotel Junction	1	1
64.	MCC B Block Swimming Pool Junction	1	1
65.	Bhawani Flour Mill Junction		1
66.	Medical hostel road post office junction		1
67.	Fine Arts College Junction		1
68.	Dental College Main Gate Junction	1	1
69.	Hadadi Road Rural Police Station Junction		1
70.	Lenin Circle (Bull Park)		1
71.	Lenin Nagara Korachara Hatti		1
72.	Durgambika Temple Junction	1	2
73.	Kariyamma Temple Junction (Nituvalli Road)		1
74.	Shakti Nagara Main Road Junction		2
75.	Bhumika Nagara Park Main Gate Junction		1
76.	Hitech hospital road NH 48 bridge junction		1
77.	NH-48 Lokikere Bridge Place		2
78.	TV Station Tank Junction	1	1
79.	Shivkumar Badavane 1st Stage Main Road 3rd Cross Junction		1
80.	Saraswati Badavane B block Main Junction		1
81.	Vidya Nagara 2nd Bus Stop Junction	1	1
82.	Vidyanagara Last Bus Stop		1
83.	Hadadi Road NH 48 Bridge Junction		1
84.	Coffee Day Junction (Vidyanagara Main Road)		1
85.	Nutan College Road Junction		1
86.	Fine Arts College Junction		1

S. No	Road/Junction Name	PTZ	Fixed
87.	Ayyappa Swamy Temple BIET College Main Road		1
88.	Hitech Hospital Main Gate	1	1
	Total	**39**	**100**

8.2. Annexure 2: List of Proposed Locations for ANPR Cameras

S.No	Name of location	Description
1.	Entry junction from NH4 to SH76	City entry/exit point from NH 4 to P.B. Road towards Bangalore
2.	SH76 near Anjaneya Cotton Mill	City entry point from NH76, which will enter into city as well as well as to NH4.
3.	City entry area SH 65	City entry point, it will connect to Lokikeri Junction and the major part of Davanagere
4.	City entry area Maganalli Road	It will connect to Mandakki Bhatti Area.

8.3. Annexure 3: List of Proposed Locations for ITMS

8.3.1. Location:

S. No.	Junction Name	No. of Arms	Existing Signal	RLVD	PAS	VMS	Description of Junction
1.	A.C Circle	3	Yes	✓	✓		Junction between P.B. Road and towards Old Court road connected to Ambedkar Circle. Proximity to Railway Station, Government Offices and private bus station
2.	Devraja URS Circle	3	Yes	✓	✓		Junction between P.B. Road and road towards Jayadeva Circle. The junction has heavy traffic and is a way towards the old city
3.	MG Circle	4	Yes	✓	✓	✓	Junction between P.B. Road, road towards Jayadeva Circle and Aralimara Circle SH 65 has heavy traffic.
4.	Onion Market Circle	3	No		✓		Junction between P.B. Road, towards Ganesha Circle and towards Boombu Bazar, Jagalur Road. This is a market area connected to P.B. Road
5.	ITI Circle Junction	4	No	✓	✓	✓	Junction between SH65, Hadaddi Road and Nituvalli Road and Vidya Nagara Main Road. This junction has school-college with heavy traffic during peak hours
6.	Sangoli Rayana Circle	4	Yes	✓	✓	✓	Junction between Ring road and old P.B. Road with heavy traffic
7.	DRR College Circle	3	No	✓			Junction between SH65 and Nituvalli Road. This area has a college
8.	Ganesha Circle	3	No	✓	✓		Busy area and is way towards APMC.

S. No.	Junction Name	No. of Arms	Existing Signal	RLVD	PAS	VMS	Description of Junction
9.	Ring Road DC Circle	5	No	✓	✓	✓	Junction between Ring road (Sangoli Rayana to Bapuji Circle), road towards Gundi Circle, towards Kundvada road
10.	P.B. Road Court Circle	3	Yes	✓	✓		Junction between P.B. Road and towards Old Davanagere with heavy traffic
11.	P.B. Road Ranichannam a Circle	4	No	✓	✓		Junction between P.B. Road, towards Hondada Circle, towards Church Road and Sangoli Rayana Circle is a way towards old city.
12.	Vidya Nagara Gandhi circle	3	No	✓	✓		Busy Circle, connected between Vidya Nagara Main road, Hadadi Road and Gundi Circle.
13.	Jayadeva Circle	6	Yes	✓	✓	✓	Junction between Road towards URS Circle, Ambedkar Circle and MG Circle. This is the city centre.
14.	Ambedkar Circle	5	Yes	✓	✓		Busy junction with mixed traffic
15.	Vidyarthi Bhawan circle	3	Yes	✓	✓		Heavy traffic area junction between SH65 and Samanur Road.
16.	Dr. Modhi Circle	4	Yes	✓	✓		Heavy traffic area, main city junction and junction between Samanur Road, Vidyarthi Bhawan Circle, Vidyanagara Main Road and Church Road.
17.	Lakshmi Floor Mill Circle	4	No	✓	✓		Busy area with heavy traffic, junction towards Samanur road NH4 and Gundi Circle. This junction has school and college traffic
18.	Hondada Circle	5	No	✓	✓		Old market area and the junction needs improvement

S. No.	Junction Name	No. of Arms	Existing Signal	RLVD	PAS	VMS	Description of Junction
19.	Venkateswara circle	3	No	✓	✓		Junction between SH65 and APMC market area.
20.	RTO Circle	4	No	✓	✓		Junction between ring road and Kondajji Road with heavy traffic since this is an entry-exit point for the city
21.	Aralimara Circle	3	No	✓	✓		Main city area junction between SH65 and Jagalur Road. The junction needs improvement
22.	Lakshmi Circle	5	No	✓	✓		Entry to old market, Market area with heavy traffic. The junction needs improvement
23.	Mandakki Batti Circle	4	No	✓	✓		Junction between Mandakki Bhatti main road and Outer Ring Road. Way to City entry-exit point, Outer ring road yet to be developed which will connect to Basha Nagara Circle

8.4. Annexure 4: List of locations for Speed Violation System

S.No	Name of location/Road	Police station	Remarks
1.	Hadadi Road near Maganurubasappa field	South Traffic Police Station	City entry road from National Highway, busy road & main road between Lokikere road junction and ITI College junction.
2.	Vidyanagara Main Road 2nd Bus Stop	South Traffic Police Station	Road connected to National Highway, School/College area nearby.
3.	Shamanur Road BIET College Main Gate (2)	South Traffic Police Station	Shamanur Main Road
4.	Old P.B Road opposite GMIT College	North Traffic Police Station	College area near DC office/ City entry area (Davanagere- Harihar road)
5.	Old P.B Road Opposite Fire Office	South Traffic Police Station	Busy road, entrance/exit area connected to National Highway.
6.	Maganalli Road in-front of Azad Nagara Police Station	North Traffic Police Station	Old city area near Mandakki Bhatti, connected to Outer Ring Road and way towards Maganalli.

8.5. Annexure 5: List of Parking Lots

S. No	Location	Number of Lots	Approx. Area in Sq.m	Remarks
1.	Ashoka Road	4	807	Odd-Even day parking
2.	Medical College Road	5	1537	-
3.	Jayadeva Circle to Ambedkar Circle	2	507	Both side parking
4.	Ambedkar Circle to AVK Road	2	560	Both side parking
5.	AVK College Road	11	2768	-
6.	Toll gate (ITI College) to Gandhi Circle	3	676	-
7.	Old Court Road	4	517	One side parking
8.	Jayadeva Circle to PB Road	1	257	-
9.	UBDT Engineering College Boys Hostel	4	636	One side parking
10.	Vidyarthi Bhawan to Ganesh Bakery	2	707	Odd-Even day parking
11.	Gundi Circle to Nurshing Home	2	252	One side parking

8.6. Annexure 6: List of Locations for City Wi-Fi

S. No	Area	Locations to be covered
1.	e-Learning Centres	5
2.	City Corporation Libraries	12
3.	Outside Railway Station- City Corporation Office	1
4.	KSRTC Bus Stand	1
5.	Old Bus Stand	1
6.	Jagaluru Bus Stand	1
7.	DC Office	1
8.	Zilla Panchayat Office	1
9.	DUDA Office	1
10.	Clock Tower Junction	1
11.	K.R Market	1
12.	Mandipet	1
13.	Court Circle	1
14.	Davanagere One Centres	3
15.	Dental College Junction	1
16.	Durgambika Temple	1
17.	S.P Office	1
	Total	**34**

10 locations to be chosen for implementation.

8.7. Annexure 7: List of online services under different channels in Davanagere

Services available through Karnataka-One Centres[2]

1. Davangere City Municipal Council – Water Tax
2. Bangalore Electricity Supply Company (BESCOM):
3. RPO - Generate ARN
4. CellOne
5. Bharat Sanchar Nigam Limited (BSNL)
6. E-Filing of Returns:
7. Airtel (Mobile Post-Paid)
8. Vodafone (Mobile Post-Paid)
9. ING VYSA Life Insurance
10. KSRTC
11. Bangalore University
12. PUC Applications
13. Davanagere City Corporation – Property Tax
14. Karnataka Building and Other Constructions Workers Welfare Board
15. E-Procurement
16. Govt/Private Job applications
17. Police Verification Services
18. DISH TV
19. RTO
20. EPIC CARD
21. UIDAI
22. Government Department Forms
23. IDEA
24. MTS
25. Food and Civil Supplies
26. Karnataka Housing Board
27. Davanagere City Corporation – Payment of Water Tax
28. CSC Services
29. Reliance Communications Services
30. EESL

[2] Source: http://www.karnatakaone.gov.in/Davanagere/DavanagereOneHome.aspx

List of Services available through MRC website (http://www.davanagerecity.mrc.gov.in/)

1. Complaint Registration (Jana Hita)
2. Building License (Nirman)
3. Trade License (Vyapar)
4. Jalanidhi
   a) UGD Connection
   b) Water Tap Connection
5. Birth and Death
6. E-AAsthi
7. Property Tax Calculator
8. Search Property (AAsthi)

List of services delivered through Atalji Janasnehi Kendra[3]

1. Agricultural Family Member Certificate
2. Agricultural Labour Certificate
3. Agriculturist Certificate
4. Attestation of Family Tree
5. Bonafide Certificate
6. Caste and Income Certificate
7. Caste Certificate (Cat-A)
8. Caste Certificate (SC/ST)
9. Domicile Certificate
10. HK Region Residence and Eligibility Certificate
11. Income Certificate for compass for Employment
12. Income Certificate for Employment Certificate
13. Land holding Certificate
14. Land less Certificate
15. Living Certificate
16. Income Certificate
17. No Govt. Job Certificate
18. No Re-Marriage Certificate
19. Non-creamy layer Certificate
20. Non-Tenancy Certificate

[3] Source: http://164.100.133.30/Online_service/RD_DOC_3.htm

21. OBC Certificate (Central)
22. Population Certificate
23. Residence Certificate
24. Small / Marginal farmer Certificate
25. Solvency Certificate
26. Surviving Family Members Certificate
27. Unemployment Certificate
28. Widow Certificate

Number of proposed services through Seva Sindhu Portal (e-District Project)[4]

Under the National Mandatory category of services, the following sub-category of services are identified;

Sub-Category	No. of Services
Certificates	32
Social Welfare (Pensions)	7
Revenue Court Cases	17
Ration Card Services	10
RTI and Grievances	5

Under the State Selected category of services, the following sub-category of services are identified:

Sub-Category	No. of Services
AYUSH Department	3
Karnataka Slum Development Board	3
Dept. of Differently Abled and Sr Citizens	2
Revenue (MAG Court Cases)	2
Dept. of Electrical Inspectorate	21
Dept. of Agriculture	3
Dept. of Social Welfare	4
Dept. of Tribal Welfare	4
Dept. of Minorities	12
Dept. of Backward Classes Welfare	9

[4] Source: http://www.karnataka.gov.in/edistrict/Pages/Services.aspx

Revenue (Services)	3
Department of Commercial Taxes	6
Department of Forests	2
Inspector General of Registration (IGR)	13
Karnataka State Education Examination Board (KSEEB)	2
Labour Department	20
Department of Employment Exchange	2
Rajiv Gandhi Rural Housing Corporation	3
Women & Child Development	1
Department of Excise	8
Dept. of Health & Family Welfare	5
Transport Department (RTO)	5
Transport Department (KSRTC)	6
Commerce & Industries Department	7
Rural Development and Panchayat Raj (RDPR)	68
Karnataka Housing Board (KHB)	9
Directorate of Municipal Administration	7
Directorate of Pre-University Education,	9
Department of Public Instruction	36

8.8. Annexure 8: Breakdown of Cost Components

8.8.1. City Surveillance System

Server Room for City Surveillance									
#	Cost head	Unit	Qty	Unit Rate	AMC Rate	CAPEX	Opex/Year	Opex for 5 years	Total
Network Components									
1	L2 Switch	No.	0	40,000	10%	-	-	-	-
2	Firewall	No.	2	2,000,000	10%	4,000,000	400,000	1,600,000	5,600,000
3	24 Core rack mounted LIU with all accessories including fiber, patch card etc.	No.	10	15,000	10%	150,000	15,000	60,000	210,000
4	48 Core rack mounted LIU with all accessories including fiber, patch card etc.	No.	10	25,000	10%	250,000	25,000	100,000	350,000
Security Components									
Server Infra									
5	IPS/IDS	No.	0	1,500,000	10%	-	-	-	-
6	Anti Virus Software	No.	1	400,000	10%	400,000	40,000	200,000	600,000
7	HIPS	License	0	45,000	10%	-	-	-	-
8	Database Server	No.	1	700,000	10%	700,000	70,000	280,000	980,000

9	Web Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
10	Application Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
11	Video Management Server	No.	4	500,000	10%	2,000,000	200,000	800,000	2,800,000
12	Video Analytics Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
13	ANPR Server & RLVD Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
14	EMS Server	No.	0	500,000	10%	-	-	-	-
15	Back up server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
16	Server for Testing	No.	0	500,000	10%	-	-	-	-
17	KVM Switch	No.	2	15,000	10%	30,000	3,000	12,000	42,000
18	KVM Monitor	No.	2	15,000	10%	30,000	3,000	12,000	42,000
19	SAN Storage for Applications (10 TB)	No.	1	2,000,000	10%	2,000,000	200,000	800,000	2,800,000
	SAN Switch	No.	1	1,200,000	10%	1,200,000	120,000	480,000	1,680,000
20	Storage- NAS	TB	789	25,000	10%	19,725,952	1,972,595	9,862,976.07	29,588,928
21	Racks - 42U-(Smart Rack)	No.	3	100,000	10%	300,000	30,000	120,000	420,000
22	Tape library	No.	1	1,500,000	10%	1,500,000	150,000	600,000	2,100,000
23	IP EPABX	No.	1	80,000	10%	80,000	8,000	32,000	112,000

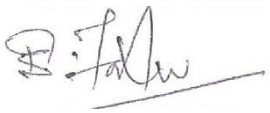
Common System Software									
24	Server OS	No.	10	80,000		800,000	800,000	3,200,000	4,000,000
25	DB License (Per Licence)	No.	8	100,000		800,000	800,000	3,200,000	4,000,000
26	Enterprise Management System (EMS) Software	No.	0	15,000,000	12%	-	-	-	-
27	Backup Software	No.	1	2,000,000	12%	2,000,000	240,000	1,200,000	3,200,000
28	Mailing & Messaging Software	No.	0	600,000	12%	-	-	-	-
29	LDAP Software	No.	0	600,000	12%	-	-	-	-
Site Preparation Cost									
30	Site Preparation Cost (including Cabling, Flooring, Ceiling etc.)	lumpsum	1	1500000		1,500,000		-	1,500,000
Support Systems									
31	VESDA/ Fire Alarm & Suppression System	System	1	1,500,000	10%	1,500,000	150,000	750,000	2,250,000
32	Rodent Repellent System	System	1	120,000	10%	120,000	12,000	60,000	180,000
Network Operation Center & Mux Room									
Hardware Components									
33	Desktop PC	No.	2	30,000	10%	60,000	6,000	24,000	84,000
34	I.P Phones	No.	1	6,000	10%	6,000	600	2,400	8,400
35	IP Based MFP Printer	No.	1	30,000	10%	30,000	3,000	12,000	42,000

36	L2 Switch	No.	1	20,000	10%	20,000	2,000	8,000	28,000
37	Network Rack	No.	1	6,000	10%	6,000	600	2,400	8,400
38	LED Screen	No.	1	40,000	10%	40,000	4,000	16,000	56,000
39	Telecom Rack	No.	1	70,000	10%	70,000	7,000	28,000	98,000
41	Surveillance System (Camera)	No.	2	50,000	10%	100,000	10,000	40,000	140,000
Support System									
42	Printers and scanners	Set	1	30,000	10%	30,000	3,000	12,000	42,000
43	Biometric access control system	Set	1	35,000	10%	35,000	3,500	14,000	49,000
44	Air Conditioning (2 Ton)	No.	2	40,000	10%	80,000	8,000	32,000	112,000
						42,062,952	**5,536,295**	**24,559,776**	**66,622,728**

CCTV Surveillance									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	OPEX /year	Opex for 5 years	Total
City Surveillance									
1	Camera Type 1 (Fixed Camera)- City Surveillance	Number	100	65,000	10%	6,500,000	650,000	2,600,000	9,100,000

2	Camera Type 1 (Fixed Camera)-At Junctions	Number	63	65,000	10%	4,095,000	409,500	1,638,000	5,733,000
3	Camera Type 2 (PTZ Camera)-City Surveillance	Number	39	100,000	10%	3,900,000	390,000	1,560,000	5,460,000
4	Camera Type 2 (PTZ Camera)-At Junctions	Number	18	100,000	10%	1,800,000	180,000	720,000	2,520,000
5	ANPR Cameras	Number	16	100,000	10%	1,600,000	160,000	640,000	2,240,000
6	IR illuminator	Number	163	15,000	10%	2,445,000	244,500	978,000	3,423,000
Support Field equipment									
7	Pole for fixed Camera	Number	50	25,000	1%	1,250,000	12,500	62,500	1,312,500
8	Pole for PTZ Camera Mounting	Number	57	35,000	1%	1,995,000	19,950	99,750	2,094,750
9	Access Switch	Number	88	40,000	10%	3,520,000	352,000	1,408,000	4,928,000
10	UPS	Number	111	50,000	10%	5,550,000	555,000	2,220,000	7,770,000
11	Rugged Enclosure (for Switch, UPS etc.)	Number	111	20,000	10%	2,220,000	222,000	888,000	3,108,000
12	Site Infra (Survey, Digging, Power Cabling,	Lumpsum	111	20,000	0%	2,220,000	-	-	2,220,000

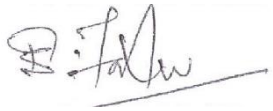
	UTP cabling, Finishing etc.)								
13	Electricity Meter with rugged enclosure	Number	88	10,000	0%	880,000	-	-	880,000
Mobile Surveillance Vehicle									
14	**Mobile Surveillance Vehicle**	**Number**	**3**	**3,000,000**	10%	9,000,000	900,000	3,600,000	12,600,000
Software System									
15	Video Management Software	Base License	1	2,000,000	12%	2,000,000	240,000	1,200,000	3,200,000
16	Video Management Software	Per Camera Licence	160	40,000	12%	6,400,000	768,000	3,840,000	10,240,000
17	Video Analytics Software	Base License	1	10,000,000	12%	10,000,000	1,200,000	6,000,000	16,000,000
						65,375,000	**6,303,450**	**27,454,250**	**92,829,250**



8.8.2. ITMS: Smart Signals

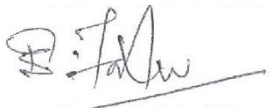
Intelligent Traffic Signals									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex /year	Opex for 5 years	Total
Field Components									
1	ATCS Compatible Controller	Number	23	360,000	10%	8,280,000	828,000	3,312,000	11,592,000
2	GPRS Connectivity	Number	23	1,200			27,600	138,000	138,000
3	Vehicle Detection	Number	87	165,000	10%	14,355,000	1,435,500	5,742,000	20,097,000
4	Countdown timer (EN Certified)	Number	87	25,000	10%	2,175,000	217,500	870,000	3,045,000
5	Galvanized Cantilever poles	Number	87	30,000	10%	2,610,000	261,000	1,044,000	3,654,000
6	Galvanized Standard Poles	Number	174	20,000	10%	3,480,000	348,000	1,392,000	4,872,000
7	Traffic Light Aspects - Red	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
8	Traffic Light Aspects - Green-Straight Arrow	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
9	Traffic Light Aspects - Green Left Arrow	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
10	Traffic Light Aspects - Green Right Arrow	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
11	Traffic Light Aspects – Amber	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400

Intelligent Traffic Signals									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex /year	Opex for 5 years	Total
12	Pedestrian lamp heads – Stop Man	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
13	Pedestrian lamp heads –Walk Man	Number	174	9,000	10%	1,566,000	156,600	626,400	2,192,400
14	Junction Box/Cabinets	Number	261	1,500	10%	391,500	39,150	156,600	548,100
15	Solar Panel and associated fitments	Number	23	500,000	10%	11,500,000	1,150,000	4,600,000	16,100,000
Software									
16	ATCS Software Application	License	1	3,000,000	12%	3,000,000	360,000	1,800,000	4,800,000
Support System									
17	UPS, Battery	Number	0	60,000	10%	-	-	-	-
18	SITC (System Installation, Testing & Commissioning)	Lot	23	250,000	0%	5,750,000	-	-	5,750,000
	Total					**62,503,500**	**5,762,950**	**23,439,400**	**85,942,900**



8.8.3. ITMS: Traffic Enforcement System

Traffic Enforcement									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex per year	Opex	Total
Traffic Enforcement Systems									
1	RLVD System per lane	Total Lanes	8	600,000	10%	4,800,000	480,000	1,920,000	6,720,000
2	Speed Detection Camera (System)	Locations	12	600,000	10%	7,200,000	720,000	2,880,000	10,080,000
Software System									
3	ANPR, RLVD, SCV License	Base License	1	8,000,000	12%	8,000,000	960,000	4,800,000	12,800,000
4	Echallan Application	Set	1	2,500,000	12%	2,500,000	300,000	1,500,000	4,000,000
5	E-Challan Hand held devices with E-Challan s/w for Handheld	Number	30	25,000	10%	750,000	75,000	375,000	1,125,000
					Total	**23,250,000**	**2,535,000**	**11,475,000**	**34,725,000**



8.8.4. Information Dissemination System: Public Address System

Public Address System									
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex/ year	Opex for 5 years	Total
1	IP based PA System; Switchable, Multi Zone, PA Speakers	Number	20	60,000	1,200,000	10%	120,000	600,000	1,800,000
	GPRS Connectivity	Number	20	1,200			24,000	120,000	120,000
2	Cat 6 Cable	Meters	600	250	150,000	10%	15,000	75,000	225,000
3	Network Switch	Number	0	130,000	0	10%	0	0	0
4	Civil Work	Lot	20	10,000	200,000	10%	20,000	100,000	300,000
5	Power Cable	Meters	0	500	0	10%	0	0	0
	Total				**1,550,000**		**179,000**	**895,000**	**2,445,000**

8.8.5. Information Dissemination System: Variable Message Signs

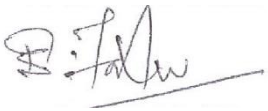
Variable Message Sign Board									
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex / Year	Opex for 5 years	Total
1	VMS board including VMS controller and Application	Number	5	1,500,000	7,500,000	10%	750000	3,750,000	11,250,000
2	Mounting structure for VMS as per site requirements and IRC guidelines	Number	5	300,000	1,500,000	10%	150000	750,000	2,250,000
3	Provisioning of Electrical Power -Shared	Set	5	-	0	10%	0	-	-
				Total	**9,000,000**		**900,000**	**4,500,000**	**13,500,000**

8.8.6. Smart Parking

Smart Parking									
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex per year	Opex for 5 years	Total
Field Equipment									
1	CCTV Cameras (with In-Camera storage)	Number	47	50,000	2,350,000	10%	235,000	940,000	3,290,000
2	Handheld Devices incl spare battery (incl 25% spare)	Number	24	25,000	593,750	10%	59,375	237,500	831,250
3	LED Display Board	Number	27	50,000	1,350,000	10%	135,000	540,000	1,890,000
4	Thermoplastic Paint	Lumpsum	11	25,000	275,000	10%	27,500	137,500	412,500
5	SIM Card with GPRS Connection	Annual Rate	51	1,200		10%	60,900	304,500	304,500
6	Parking Board (Static Metal Board)	Number	11	15,000	165,000	10%	16,500	66,000	231,000
7	Poles for CCTV Camera	Number	19	20,000	380,000	10%	38,000	190,000	570,000
8	Cantilever Pole for LED Board/Camera	Number	29	50,000	1,450,000	10%	145,000	725,000	2,175,000
ICT and Control Centre Equipment									
9	PMIS Application Software and Mobile Application	License	1	1,000,000	1,000,000	12%	120,000	600,000	1,600,000
	Total				**7,563,750**		**837,275**	**3,740,500**	**11,304,250**

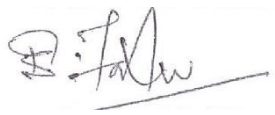
8.8.7. Intelligent Transport System (ITS)

Intelligent Transportation Systems									
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex per year	Opex for 5 years	Total
1	Bus Equipment (GPS, Speakers and PIS Boards)	Number	0	10,000	0	10%	0	0	0
2	Fire Tender + Pilot Vehicle	Number	9	6,500	58,500	10%	5,850	23,400	81,900
3	SWM Vehicle	Number	120	6,500	780,000	10%	78,000	312,000	1,092,000
4	Ambulance in City and District	Number	35	6,500	227,500	10%	22,750	91,000	318,500
5	Police vehicle	Number	70	6,500	455,000	10%	45,500	182,000	637,000
6	Private buses	Number	0	6,500	0	10%	0	0	0
7	Auto Rickshaw	Number	0	6,500	0	10%	0	0	0
8	Bus Shelter PIS and associated accessories (2 each)	Number	104	50,000	5,200,000	10%	520,000	2,080,000	7,280,000
9	GPRS Connectivity	Number	588	1,200			705,600	3,528,000	3,528,000
10	Software Application	Number	1	5,000,000	5,000,000	12%	600,000	3,000,000	8,000,000
	Total				**11,721,000**		**1,677,700**	**7,716,400**	**19,437,400**



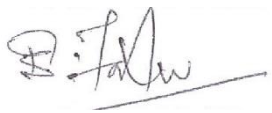
8.8.8. City Wi-Fi

Wi-Fi									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex per Year	Opex for 5 Years	Total
Security Components for Wi-Fi									
1	Wireless Intrusion Prevention System	Nos	0	4,500,000	10%	-	-	-	-
2	Centralized Wi-Fi Management System	Nos	1	3,500,000	10%	3,500,000	350,000	1,750,000	5,250,000
3	Wireless Controller with AP licenses	Nos	2	5,500,000	10%	11,000,000	1,100,000	5,500,000	16,500,000
Field Setup and Support System									
1	Access Point	Nos	10	30,000	10%	300,000	30,000	120,000	420,000
2	Network Switch Ruggedized + SFP Module	Nos	10	200,000	10%	2,000,000	200,000	800,000	2,800,000
3	Junction Box	Nos	10	20,000	10%	200,000	20,000	80,000	280,000
4	UPS – 1 KVA	Nos	10	40,000	10%	400,000	40,000	160,000	560,000
5	Site Preparation Price	Lump Sum	10	20,000	0%	200,000	-	-	200,000
	Total					**17,600,000**	**1,740,000**	**8,410,000**	**26,010,000**



8.8.9. Environment Sensors

Environmental Sensors + Large Display Boards									
	Total quantity -5								
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex per Year	Opex for 5 years	Total
Environment Sensors									
1	Environment Sensors @ five location	Set	5	1,500,000	7,500,000	10%	750,000	3,000,000	10,500,000
2	GPRS Connectivity	No.	5	1,200			6,000	30,000	30,000
Large Display Board									
3	Multi-Colour LED Board (for displaying Pollution Info, Advertisement and Govt messages)	Number	1	2,000,000	2,000,000	10%	200,000	800,000	2,800,000
4	Site Infra (UPS, Fitment Components etc.)	Set	1	1,000,000	1,000,000	10%	100,000	500,000	1,500,000
	Total				**10,500,000**		**1,056,000**	**4,330,000**	**14,830,000**



8.8.10. Citizen Kiosks (running One Touch Website)

Kiosk							
#	Cost head	Qty	Unit Rate	CAPEX	Opex per Year	Opex for 5 years	Total
	Kiosk Terminals	Qty	Unit Rate	CAPEX	Opex per Year	Oper for 5 years	Total
1	Kiosk terminal machine consisting of touchscreen, processors, speakers, microphone, card Reader, CC/DC reader & interface, QR reader, Receipt printer	20	220,000	4400000	440000	1760000	6160000
2	4G Connectivity	20	1,200		24000	120000	120000
3	Installation work and related equipment such as access switch, junction box, SFP module, etc.	20	30,000	600000	60000	240000	840000
4	Consumables cost (@ 1% of terminal costs) for 20 machines	20	2,200	44000	44000	220000	264000
5	KIOSK Application cost	1	400,000	400000	48000	240000	640000
	Total			**5,444,000**	**616,000**	**2,580,000**	**8,024,000**

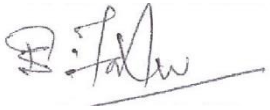
8.8.11. City Portal and Mobile APP

City Portal & Mobile Application						
#	Cost head	Qty	Unit Rate	CAPEX	Opex	Total
1	Web Portal, Mobile Portal & Mobile Application Design, Documentation, Development & Testing	1	6,241,561	6,241,561	3744937	9986498
2	Audit, Compliance & Certification	1	100,000	100,000		100,000
3	Content Management Solution (CMS)	1	120,000	120,000		120,000
	Total			**6,461,561**	**3744937**	**10,206,498**

8.8.12. Help Desk (One City-One Number)

Call Center at City									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex/ Year	Opex for 5 years	Total
	Hardware								
1	Headset	No.	4	5,000	10%	20,000	2,000	8,000	28,000
2	Call Switching Equipment	No.	1	150,000	10%	150,000	15,000	60,000	210,000
3	Automatic Call Distributor	No.	1	1,200,000	10%	1,200,000	120,000	480,000	1,680,000
4	Dialer	No.	1	45,000	10%	45,000	4,500	18,000	63,000
5	Voice Logger	No.	1	45,000	10%	45,000	4,500	18,000	63,000
6	IP PBX	Set	1	800,000	10%	800000.00	80,000	320,000	1,120,000
7	IP Phones	No.	1	6,000	10%	6000.00	600	2,400	8,400
	Software								
8	Automated Call Distribution Software	No.	1	2,000,000	12%	2,000,000	240,000	1,200,000	3,200,000
9	Computer Telephony Integration Software	No.	1	1,000,000	12%	1,000,000	120,000	600,000	1,600,000
10	Answering Service Software	No.	1	1,000,000	12%	1,000,000	120,000	600,000	1,600,000
11	Interactive Voice Response Software	No.	1	1,000,000	12%	1,000,000	120,000	600,000	1,600,000
12	Softphone Software	No.	1	1,000,000	12%	1,000,000	120,000	600,000	1,600,000
13	Voice Broadcasting Software	No.	1	1,000,000	12%	1,000,000	120,000	600,000	1,600,000

Call Center at City									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex/ Year	Opex for 5 years	Total
	Support System								
14	Desktops	No.	4	50,000	10%	200000.00	20,000	80,000	280,000
15	Consumables	Lumpsum	1	40,000	10%	40000.00	4,000	16,000	56,000
16	IP Based MFP Printer	No.	1	30,000	10%	30000.00	3,000	12,000	42,000
17	LAN Switch -48 Ports	No.	1	40,000	10%	40000.00	4,000	16,000	56,000
	Total					**9,576,000**	**1,097,600**	**5,230,400**	**14,806,400**



8.8.13. e-Learning Centres

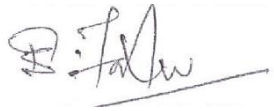
	e-Learning center with kiosk center								
#	Cost Head	Unit	Qty	Unit Rate	CAPEX	AMC	Opex per Year	Opex for 5 years	Total
e-Library center		No. of E-Library Center= 5							
1	Digital library software application Digital content	License	1	400,000	400,000	12%	48,000	240,000	640,000
2	Touch Screen Terminal	No.	60	30,000	1,800,000	10%	180,000	900,000	2,700,000
3	UPS and Inverter	No.	5	250,000	1,250,000	10%	125,000	625,000	1,875,000
4	AC 2 Ton	No.	5	40,000	200,000	10%	20,000	100,000	300,000
5	IP Based MFP	No.	5	30,000	150,000	10%	15,000	75,000	225,000
6	Network Switch	No.	5	9,000	45,000	10%	4,500	22,500	67,500
7	Network Rack	No.	5	15,000	75,000	10%	7,500	37,500	112,500
8	Wifi Access, Modem	No.	5	6,000	30,000	10%	3,000	15,000	45,000
9	Internet Connection	Set	5	20,000	100,000	100%	100,000	500,000	600,000
10	Access Router	No.	5	10,000	50,000	10%	5,000	25,000	75,000
11	Internal Surveillance System (Dome Camera)	No.	5	50,000	250,000	10%	25,000	125,000	375,000
12	Fire extinguisher	Set	5	10,000	50,000	10%	5,000	25,000	75,000
13	42" LED TV	No.	5	40,000	200,000	0%	0	0	200,000
14	Site improvement, Furniture etc.		5	300,000	1,500,000	10%	150,000	750,000	2,250,000
	Total				**6,100,000**		**688,000**	**3,440,000**	**9,540,000**

8.8.14. e-Office Suite for DSCL and City Corp

Kiosk							
#	Cost head	Qty	Unit Rate	CAPEX	Opex per Year	Opex for 5 years	Total
1	e-Office Solution	1	12,000,000	12000000	1440000	7200000	19200000

8.8.15. Server Licenses for KMDS

Server Licesnses at KMDS									
#	Cost head	Unit	Qty	Unit Rate	AMC Rate	CAPEX	Opex/Year	Opex for 5 years	Total
	Common System Software								
1	Server OS	No.	10	80,000	12%	800,000	800,000	3,200,000	4,000,000
2	DB Server (Per licence)	No.	32	100,000	12%	3,200,000	3,200,000	12,800,000	16,000,000
						4,000,000	**4,000,000**	**16,000,000**	**20,000,000**



8.8.16. Command & Control Centre (CCC)

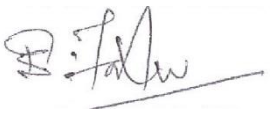
Command and Control Centre									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex/Year	Opex for 5 years	Total
CCC ICT Components									
1	Video Wall- Main Control Room (4 X 2) Cube	Cube	8	1,317,000	10 %	10,536,000	1,053,600	4,214,400	14,750,400
2	Video Wall- Police Control Room (4 X 2) Cube	Cube	8	1,317,000	10 %	10,536,000	1,053,600	4,214,400	14,750,400
3	Video Wall Controller & Application	No.	2	3,600,000	12 %	7,200,000	864,000	3,456,000	10,656,000
4	Workstation Desktop (25 operator each for control room & police control room)-2 Screen	No.	50	80,000	10 %	4,000,000	400,000	1,600,000	5,600,000
5	Keyboard Joystick to control PTZ Cameras	No.	30	20,000	10 %	600,000	60,000	240,000	840,000
6	Network Printers (MFC)	Set	2	75,000	10 %	150,000	15,000	60,000	210,000
7	Local Printer	Set	2	10,000	10 %	20,000	2,000	8,000	28,000
8	Video Conferencing Solution	Set	1	1,000,000	10 %	1,000,000	100,000	500,000	1,500,000
9	I.P Phones	No.	30	6,000	10 %	180,000	18,000	72,000	252,000
10	LAN Switch -48 Ports	No.	2	40,000	10 %	80,000	8,000	32,000	112,000
Support System									
11	Biometric access control system	Set	1	100,000	12 %	100,000	12,000	60,000	160,000

12	Internal surveillance System	Set	1	50,000	12 %	50,000	6,000	30,000	80,000
13	BMS	Set	1	6,150,000	12 %	6,150,000	738,000	3,690,000	9,840,000
14	Site Infra	Lot	1	1,500,000	2%	1,500,000	30,000	150,000	1,650,000
						42,102,000	**4,360,200**	**18,326,800**	**60,428,800**

8.8.17. Satellite Command & Control Centre

Satellite Command and Control Centre									
#	Cost head	Unit	Qty	Unit Rate	AMC	CAPEX	Opex/Year	Opex for 5 years	Total
CCC ICT Components									
1	Video Wall (2 X 3) Cube	Set	6	1,317,000	10%	7,902,000	790,200	3,160,800	11,062,800
2	Workstation Desktop	No.	10	80,000	10%	800,000	80,000	320,000	1,120,000
3	Keyboard Joystick to control PTZ Cameras	No.	10	20,000	10%	200,000	20,000	80,000	280,000
4	Video Conferencing	Set	1	1,000,000	10%	1,000,000	100,000	400,000	1,400,000
5	I.P Phones	No.	10	6,000	10%	60,000	6,000	24,000	84,000
6	LAN Switch -48 Ports	No.	2	40,000	10%	80,000	8,000	32,000	112,000

7	LAN Router	No.	1	200,000	10%	200,000	20,000	80,000	280,000
									Support System
8	Site Infra	Set	1	1,500,000	2%	1,500,000	30,000	150,000	1,650,000
9	Fire Alarm System	Set	1	1,000,000	10%	1,000,000	100,000	500,000	1,500,000
10	Rodent Repellent system	Set	1	120,000	10%	120,000	12,000	60,000	180,000
11	Printers and scanners	Set	1	75,000	10%	75,000	7,500	30,000	105,000
12	Biometric access control system	Set	1	35,000	10%	35,000	3,500	17,500	52,500
13	Internal surveillance System	Set	1	50,000	10%	50,000	5,000	25,000	75,000
14	Air Conditioning (2 Ton)	No.	4	50,000	10%	200,000	20,000	80,000	280,000
15	UPS 20 KVA	Set	1	700,000	10%	700,000	70,000	280,000	980,000
	Total					**13,922,000**	**1,272,200**	**5,239,300**	**19,161,300**



8.8.18. Server Room for City Surveillance

Server Room for City Surveillance									
#	Cost head	Unit	Qty	Unit Rate	AMC Rate	CAPEX	Opex/Year	Opex for 5 years	Total
Network Components									
1	L2 Switch	No.	0	40,000	10%	-	-	-	-
2	Firewall	No.	2	2,000,000	10%	4,000,000	400,000	1,600,000	5,600,000
3	24 Core rack mounted LIU with all accessories including fiber, patch card etc.	No.	10	15,000	10%	150,000	15,000	60,000	210,000
4	48 Core rack mounted LIU with all accessories including fiber, patch card etc.	No.	10	25,000	10%	250,000	25,000	100,000	350,000
Security Components									
5	IPS/IDS	No.	0	1,500,000	10%	-	-	-	-
6	Anti Virus Software	No.	1	400,000	10%	400,000	40,000	200,000	600,000
7	HIPS	License	0	45,000	10%	-	-	-	-
Server Infra									
8	Database Server	No.	1	700,000	10%	700,000	70,000	280,000	980,000
9	Web Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000

10	Application Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
11	Video Management Server	No.	4	500,000	10%	2,000,000	200,000	800,000	2,800,000
12	Video Analytics Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
13	ANPR Server & RLVD Server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
14	EMS Server	No.	0	500,000	10%	-	-	-	-
15	Back up server	No.	1	500,000	10%	500,000	50,000	200,000	700,000
16	Server for Testing	No.	0	500,000	10%	-	-	-	-
17	KVM Switch	No.	2	15,000	10%	30,000	3,000	12,000	42,000
18	KVM Monitor	No.	2	15,000	10%	30,000	3,000	12,000	42,000
19	SAN Storage for Applications (10 TB)	No.	1	2,000,000	10%	2,000,000	200,000	800,000	2,800,000
	SAN Switch	No.	1	1,200,000	10%	1,200,000	120,000	480,000	1,680,000
20	Storage- NAS	TB	789	25,000	10%	19,725,952	1,972,595	9,862,976.07	29,588,928
21	Racks - 42U-(Smart Rack)	No.	3	100,000	10%	300,000	30,000	120,000	420,000
22	Tape library	No.	1	1,500,000	10%	1,500,000	150,000	600,000	2,100,000
23	IP EPABX	No.	1	80,000	10%	80,000	8,000	32,000	112,000
Common System Software									

24	Server OS	No.	10	80,000		800,000	800,000	3,200,000	4,000,000
25	DB License (Per Licence)	No.	8	100,000		800,000	800,000	3,200,000	4,000,000
26	Enterprise Management System (EMS) Software	No.	0	15,000,000	12%	-	-	-	-
27	Backup Software	No.	1	2,000,000	12%	2,000,000	240,000	1,200,000	3,200,000
28	Mailing & Messaging Software	No.	0	600,000	12%	-	-	-	-
29	LDAP Software	No.	0	600,000	12%	-	-	-	-
Site Preparation Cost									
30	Site Preparation Cost (including Cabling, Flooring, Ceiling etc.)	lumpsum	1	1500000		1,500,000		-	1,500,000
Support Systems									
31	VESDA/ Fire Alarm & Suppression System	System	1	1,500,000	10%	1,500,000	150,000	750,000	2,250,000
32	Rodent Repellent System	System	1	120,000	10%	120,000	12,000	60,000	180,000
Network Operation Center & Mux Room									
Hardware Components									
33	Desktop PC	No.	2	30,000	10%	60,000	6,000	24,000	84,000
34	I.P Phones	No.	1	6,000	10%	6,000	600	2,400	8,400
35	IP Based MFP Printer	No.	1	30,000	10%	30,000	3,000	12,000	42,000
36	L2 Switch	No.	1	20,000	10%	20,000	2,000	8,000	28,000

37	Network Rack	No.	1	6,000	10%	6,000	600	2,400	8,400
38	LED Screen	No.	1	40,000	10%	40,000	4,000	16,000	56,000
39	Telecom Rack	No.	1	70,000	10%	70,000	7,000	28,000	98,000
41	Surveillance System (Camera)	No.	2	50,000	10%	100,000	10,000	40,000	140,000
Support System									
42	Printers and scanners	Set	1	30,000	10%	30,000	3,000	12,000	42,000
43	Biometric access control system	Set	1	35,000	10%	35,000	3,500	14,000	49,000
44	Air Conditioning (2 Ton)	No.	2	40,000	10%	80,000	8,000	32,000	112,000
						42,062,952	**5,536,295**	**24,559,776**	**66,622,728**

8.8.19. Disaster Recovery Centre on Meghraj Cloud

DRC on Meghraj									
#	Cost head	Unit	Qty	Unit Rate	AMC Rate	CAPEX	Opex/Year	Opex for 5 years	Total
Server Infra									
1	Application Servers	per month	10	25,830			3,099,600	15,498,000	15,498,000
2	DB Servers	per month	1	25,830			309,960	1,549,800	1,549,800
4	Total Storage Requirements	TB	158	750,000			9,000,000	45,000,000	45,000,000

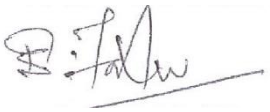
5	Cloud Installation & Setup (One time)	Lumpsum	1	300,000		300,000			300,000
	Sub-Total					**300,000**	**12,409,560**	**62,047,800**	**62,347,800**
Application Licenses (only COTS) for DRC for 5 years (taken at 50% rates of Original Licenses)									**Opex for 5 Years**
6	Video Management Software	Base License	1	1000000	12%	1000000	120000	600000	1600000
7	Video Management Software	Per Camera Licence	160	20000	12%	3200000	384000	1920000	5120000
8	Video Analytics Software	Base License	1	5000000	12%	5000000	600000	3000000	8000000
9	ANPR, RLVD, SCV License	License	1	4000000	12%	4000000	480000	2400000	6400000
	Sub-Total					**13,200,000**	**1,584,000**	**7,920,000**	**21,120,000**
	TOTAL					**13,500,000**	**13,993,560**	**69,967,800**	**83,467,800**

8.8.20. Network Backbone for CCTV Surveillance

Network Backbone for CCTV Surveillance between KMDS and DVG, CCC and Satellite CCC

Network Backbone for CCTV Surveillance, CCC and Satellite CCC									
#	Cost head	Unit	Qty	Unit Rate	CAPEX	AMC %	Opex per year	Opex for 5 years	Total
City Network Backbone- Core Layer									
1	Core Routers (High Availability)	No.	2	1,200,000	2,400,000	10%	240,000	960,000	3,360,000
2	Core Switches (High Availability)	No.	2	1,200,000	2,400,000	10%	240,000	960,000	3,360,000

3	Internet Routers (High Availability)	No.	2	1,175,000	2,350,000	10%	235,000	940,000	3,290,000
4	L2 Switches (High Availability)	No.	2	200,000	400,000	10%	40,000	160,000	560,000
5	Patch Cord (1 Mtr.)	No.	20	90	1,800	1%	18	72	1,872
6	Patch Cord (3 Mtr.)	No.	20	150	3,000	1%	30	120	3,120
7	24 Port Patch Panel(Fully Loaded)	No.	2	4,500	9,000	10%	900	3,600	12,600
8	42U Telecom Rack	No.	1	70,000	70,000	1%	700	2,800	72,800
Leased Line by BSNL									
9	Number of locations for CCTV (rates from BSNL Website) - 10 Mbps and discounted by 40%	No.	88	337,949		Annual Rate	29,739,494	148,697,472	148,697,472
10	Leased Line between Satellite Command Centre and CCC-4Mbps	No.	2	168,689		Annual Rate	337,378	1,686,888	1,686,888
11	Internet Bandwidth at CCC@10 internet lease line	No	2	240,000		Annual Rate	480,000	2,400,000	2,400,000
	Total				7,633,800		31,313,520	155,810,952	163,444,752



8.8.21. Manpower and Operations Cost

Manpower and Operations Cost including one-time migration from Cloud DRC to State Owned DRC

Manpower Cost										
#	Cost head	No of Positions	Yearly Rate	Initial Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Opex
1	Chief Operating Office (Ref:2.1.8) Cost to be borne by DSCL	0	5,000,000	0	-	-	-	-	-	-
2	Project Manager	1	1,500,000	1,500,000	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	9,157,650
3	PMO Staff	0	700,000	0						
4	CCC Manager (1 each shift)	4	700,000	2,800,000	2,800,000	3,080,000	3,388,000	3,726,800	4,099,480	17,094,280
5	Solution Support Personnel at CCC	10	500,000	5,000,000	5,000,000	5,500,000	6,050,000	6,655,000	7,320,500	30,525,500
6	Field Engineers	3	500,000	1,500,000	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	9,157,650
7	Operators	11	300,000	3,300,000	3,300,000	3,630,000	3,993,000	4,392,300	4,831,530	20,146,830
8	Call Center and Support	3	300,000	900,000	900,000	990,000	1,089,000	1,197,900	1,317,690	5,494,590
9	One Time Migration Cost									2,500,000
	Total			-	**15,000,000**	**16,500,000**	**18,150,000**	**19,965,000**	**21,961,500**	**94,076,500**

8.9. Annexure 9: Stakeholder Consultation

8.9.1. Davanagere District Police

No:CB-1/03 /2018

DAVANGERE DISTRICT POLICE

Office of the
Superintendent of Police,
Kondajji Road, Davangere – 06
Davangere Date: 08-01-2018

To,

The Managing Director,
Davanagere Smart City Limited.
Samanur Road, SiddaveerappaLayout
Davanagere, Karnataka.

Sir,

Subject:- Implementation of PAN City ICT Project in Davanagere – Requirements of Police Department.

* * * * *

Kindly refer to Davangere Smart City Proposal, wherein Davanagere City Police is a major stakeholder for implementing various PAN City ICT Projects such as Intelligent Traffic Management System, City Surveillance System, Traffic enforcement system, Command and Control Centre and Satellite command centre ,the fund of 459.35 corers has been earmarked for all the components including urban transport facility .

Based on our analysis, we have worked out our requirements for various ICT components, as listed hereunder:

a. CCTV Cameras – 755 cameras at 310 locations
b. Smart Signals at 49 traffic junctions
c. Public Address System at 40 locations
d. Variable Message Signs – 43 numbers
e. RLVD with ANPR – 38locations.
f. Speed Violation Detection System – 41 locations

Detailed locations for above components and their depiction on Davanagere city map are enclosed in Annexure 1.

We have had discussions with your team/PMC team and we understand that DSCL intends to implement PAN City ICT projects in a phased manner. As such, we have worked out the minimum requirements for various components, needed to be taken up in Phase 1, as under:

a. CCTV Cameras – 220 cameras at 117 locations
b. Smart Signals at 23 traffic junctions
c. Public Address System at 22 locations

d. Variable Message Signs – 5 numbers
e. RLVD – 1 Traffic junction.
f. ANPR – 4 locations
g. Speed Violation Detection System – 6 locations

The locations for above equipment are enclosed in Annexure 2.

In addition to the above, CCTV Cameras may also be installed at all Bus Shelters and Parking locations, proposed to be developed under Smart City programme. Also, the police patrolling vehicles (70 nos.) may be fitted with GPS for their effective deployment and monitoring of their movement.

The Police Department also needs 30 Bikes for city patrolling and four towing vehicles for towing away the vehicles which are illegally parked or are obstructing traffic movement. We would be grateful, if four towing vehicles can be procured as part of Pan City ICT project.

It is requested that the above requirements may be incorporated in the Smart City's Pan City ICT Projects implementation in Davanagere city.

Yours faithfully,

(Dr. Bheemashankara S. Guled, IPS)
Superintendent of Police
Davangere District.

Enclosure: -

1. Annexure 1: Identified locations for Various Components in Davanagere and their locations on Davanagere city map
2. Annexure 2: Identified locations for Various Components to be undertaken in Phase 1

8.9.2. Minutes with Pollution Control Board on Environmental Sensor

Davanagere Smart City Limited

Minutes of Meeting

Agenda:	Discussion on the proposal for Pollution Sensors at five locations in Davanagere
Date:	19th December 2017
Time:	12.30 pm to 1:00 pm
Place:	Pollution Control Board Davanagere
Participants:	1. Mr. Manjunath K, Scientific Officer Pollution Control Board Davanagere 2. Mr. Jnaneswar Thakur , iDECK Consortium (PMC Team)

1) PMC team met with Pollution Control Board officials and discussed about the Pollution levels at various locations in Davanagere city.
2) PMC team provided the overview of the Pollution Sensors, which are planned to be installed at 5 locations in Davanagere City through Smart City Project.
3) It was informed by the Officials of Pollution Control Board that there are no Pollution Sensors present in Davanagere to provide the real time information about the Air Quality to the residents and such sensor would be helpful in creating awareness towards the pollution related problems among the residents . It was decided to install the Pollution Sensors at the following locations.

1- Mandakki Bhatti Area
2- Near City Corporation Office
3- KSRTC Bus Stand
4- Old City Area
5- Dental College Road. (Gundi Circle)
6. Harlahalli road
7. Shamanur road. (Bapuji Circle)

Ideck Consortium
DSCL -PMC

Pollution Control Board, Davanagere
Environmental Officer,
Karnataka State Pollution Control Board
DAVANGERE.

8.9.3. Minutes with Regional Fire officer on Intelligent Transport System

Davanagere Smart City Limited

Minutes of Meeting

Agenda:	Discussion on the proposal for Vehicle Tracking System for Fire Tenders
Date:	06th January 2018
Time:	12.00 pm to 1:30 pm
Place:	Regional Fire Office
Participants:	1. Mr P.S.Jayaramaiah, Regional Fire Officer 2. Mr BasabaprabhuSharma , District Fire Officer 3. Mr Jnaneswar Thakur PMC Team DSCL

1) PMC team met with officials of Regional Fire Office anddiscussed about the Intelligent Transport System project under smart city program and the plan to equipVehicle Tracking System in Fire Tender Vehicles under Regional fire office Davanagere .
2) PMC teamprovided the overview of theITS project and the scope for City buses and other vehicles included under it.
3) It was informed by the Officials of Regional Fire Office that there is noVehicle Tracking Device equipped with any of the vehicle under Regional Fire Office and these systems would help them for better monitoring and placement of the vehicles,also itmay help the citizen to track the vehicle positionthrough any mobile app or webpage.
4) It was suggested by the officials of Regional Fire Office to include 9 Fire Tenders under Regional Office and other 11 Fire Tenders throughout the District under Intelligent Transport System project of Smart city.

Please include the Davanagere District - taluka vehicle. It will the dept as well as public.

Jnaneswar Thakur
Ideck Consortium

DSCL -PMC

6/1/18
Regional Fire Officer, Davanagere

8.9.4. Minutes with DSCL on Smart Parking

Infrastructure Development Corporation (Karnataka) Limited

iDeCK

Ref: PMU - 2017-18/UPL-08/DAVPMC/161

Date: 23.11.2017

To,

The Managing Director,
Davanagere Smart City Ltd.
No 255, Opp railway station
PB Road, Davanagere-577002

Dear Sir,

Sub: DSCL-PMC— PAN City-ICT & Urban Transport-Smart Parking-Minutes of the Meeting held in City Corporation, Davnagere-reg.

Ref: 1. Agreement no. 212/2016-17 dated 02-01-2017
2. Work Order DSCL/PMC/Smart city/2016-17 dated 2-01-2017

Please find enclosed herewith minutes of the meeting held in DSCL, Davanagere on 07.11.2017 regarding Smart Parking in Davanagere City.

Thanking you and assuring you of our fullest cooperation at all times,

Yours Sincerely,

Team Leader,
DSCL-PMC

Encl: MOM dated 07.11.2017

Sushma.U.K 23/11/17

Davanagere Smart City Limited

9/7, K.C.N. Bhavan, Yamuna Bai Road, Madhavanagar Extension, Off Race Course Road, Bengaluru – 560001.
Tel: +91 80 4344 8000. Fax: +91 80 4344 8001
Website: www.ideck.in, Email:ideckinfo@idfc.com

8.9.5. Minutes with KSRTC on Intelligent Transport System

Minutes of Meeting

Agenda:	Feedback on the scope of PAN City ICT Project DPR
Date: 16-06-2017	08th January 2018
Place:	KSRTC office, Davanagere
Participants:	1. Mr. Kuddus Abdul, Divisional Controller, KSRTC, Davanagere 2. Mr. Arun, DTO, Davanagere 3. Mr. Manish Kumar Pankaj, Project Manager, iDECK Consortium DSCL PMC team

1) With reference to letter no: DCSL/CR-127/2017-18/57 dated 5/01/2018, seeking feedback on the PAN City ICT Project DPR, PMC team presented the Scope of ITS under KSRTC local buses.

2) The discussion points are listed in the table below:

Sr. No	Agenda	Discussion Points
1.	Scope of Intelligent Transport System	1. As per the DPR solution components / features proposed are agreed. 2. Scope of required hardware for KSRTC buses covering 56 buses and LED display on smart bus shelters for 104 (2 each at 52 bus shelter).
2.	Other points / feedback	1. Scope of the project should cover the local operated city buses. 2. Private buses which are not in the good condition and are not complied with the BIS norms or does not have valid documents to be kept out from the city operation. 3. KSRTC has made plan to increase 100 vehicles for city operation within 5 yrs, the same should be included in the scope.

DSCL PMC Team

KSRTC

ವಿಭಾಗೀಯ ನಿಯಂತ್ರಣಾಧಿಕಾರಿ
ಕ.ರಾ.ರ. ಸಾರಿಗೆ ನಿಗಮ, ದಾವಣಗೆರೆ

8.9.6. Minutes with Davanagere Smart City Stakeholders

PROCEEDINGS OF THE STAKE HOLDER MEETING ON THE PAN CITY ICT PROJECT DSCL – Davanagere

Date : 30th January 2018
Time : 11 AM
Venue : Conference Room, DSCL Office, Davanagere
Subject : Stake Holder Meeting on The Pan City ICT Project
Meeting Called & Chaired by : Sri. D S Ramesh IAS, District Magistrate & Deputy Commissioner, Davanagere District
Members Present :

1. Mr Bheemashankar Guleda I.P.S. SP Davanagere.
2. Mr Manjunath Ballari M.D DSCL.
3. Mr Satish M General Manager(Tech&Admin),DSCL.
4. Mr R Sevya Naik Executive Engineer, DSCL.
5. Mr Gurupadaiah K.M Executive Engineer, DSCL.
6. Mr Chandrashekar AEE, DSCL.
7. Ms Athira Thumbi Junior Urban Planner, DSCL.
8. Mr Malatesh B ICT Manager Software, DSCL.
9. Mr Pradeep Kumar Manager DSCL.
10. Mr Manjanna AEE, K.S.R.T.C Davanagere.
11. Mr Maheshwarappa Executive Engineer, BESCOM Davanagere.
12. Mr Patel S.K. Executive Engineer, BESCOM Davanagere.
13. Mr S.H Gonni Scientific Officer K.S Pollution Control Board,Davangere.
14. Mr Ravi H.C FDA RTO Office, Davanagere.
15. Mrs Ramya Avinash DITC Sakala, DC office Davanagere.
16. Mr Naveen Kumar S Technical Consultant Bhoomi, DC office Davanagere.
17. Mr Somayajulu T.R PM L&T-IPDS, Davanagere.
18. Mr Madhusudhan Rao Team Leader, PMC, DSCL.
19. Mr Manish Pankaj Project Manager, PMC DSCL.
20. Mr Jnaneshwara Thakur Asst Project Manager, PMC DSCL.
21. Mr Narasimhamurthy Social Development Specialist, PMC DSCL.

SUMMARY OF PROCEEDINGS

The meeting was convened to discuss with stakeholders about the components included in the DPR prepared for the PAN City ICT project for the Davanagere Smart City.

- ICT Project manager from PMC presented the PPT on ICT projects & API intergration.

The deliberations of the meeting are as follows:

Particulars	Conclusion/Action Points
1. City Surveillance PMC Expert has said that as per the KUIDFC guideline 20 CCTV Camera have been proposed in 20 main junctions with a bandwidth of 8Mbps.	SP Davanagere suggested that the bandwidth is very low & it will not be sufficient for 4K cameras which is proposed in the DPR. In addition to this SP has suggested to increase the number of cameras at 49 junctions. He suggested to increase atleast 3 cameras for each junction.
2. Intelligent Transport System (ITS) for City Buses, Ambulances Etc.,	SP Davanagere suggested to include all police vehicles , private city buses and Auto rickshaws under Intelligent Transportation components
3. Smart Parking	DC suggested that, instead of on street parking some MLCP to be proposed under smart city project and also he has instructed City corporation to verify with the places. 1.K.R Market 2.Old Bus Stand DC instructed EOI to be issued for identifying prospective parties for providing MLCP.
4. Environmental Sensors ICT expert has said that they have proposed environmental sensors in the following locations based on the letter from pollution control board. • Mandakki Bhatti Area • Near City Corporation Office • KSRTC Bus Stand • Old City Area • Dental College Road(Gundi Circle) • Hadadi Road • Shamnur Road(Bapuji Circle)	DC asked the pollution control board officials that whether KSPCS has installed environmental sensors anywhere in the city? S.H Gonni Scientific Officer informed that they have installed one sensor has been installed in their office premises. In addition to this DC instructed to PMC to change the locations proposed in such a way that sensors should be installed in commercial, industrial, educational & residential areas. In the meeting it was suggested that instead of Mandakki Bhatti area sensors can be installed in Karur industrial area as it is recognised industrial area & install it in SS layout, K R Market, Gandhi circle, Shamnur road near laxmi floor mill.
5. Setting up of Data center at SCCC	SP Davanagere suggested to set up datacenter at proposed satellite center as it will serve the purpose of interim datacenter for surveillance and also act as DR. Also to check the feasibility of DR for surveillance at other

	smart city location instead of going for cloud solution.
6. API Integration	It was agreed by all the department to share the required information need for RFP preparation for LSI. Also it was suggested to meet the IT section of the respective department for understanding accessing the present application.
7. General Discussions on the progress of smart city projects.	For the project of bicycle sharing DC has instructed to have an interaction with the stake holders to study the feasibility in the Davanagere City. DC has suggested to provide public toilets in a payable basis rather than providing it for free, so that the general habit of citizens can be changed.

The Meeting was concluded up with vote of thanks.

Managing Director, DSCL
Davanagere

8.9.7. Health Department:

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
ಜಿಲ್ಲಾ ಪಂಚಾಯತ್, ದಾವಣಗೆರೆ.
ಜಿಲ್ಲಾ ಆರೋಗ್ಯ ಮತ್ತು ಕುಟುಂಬ ಕಲ್ಯಾಣ ಅಧಿಕಾರಿಗಳ ಕಛೇರಿ,
ಶ್ರೀರಾಮ ನಗರ ರಸ್ತೆ ಎಸ್.ಎಸ್.ಆಸ್ಪತ್ರೆ ಹಿಂಭಾಗ ಎಸ್.ಸಿ.ಸಿ. ಕ್ಯಾಂಪ್ ಪಕ್ಕ ದಾವಣಗೆರೆ
ದೂರವಾಣಿ: 08192 237833ಫ್ಯಾಕ್ಸ್:08192-230919 e mail : dhodavangere@ gmail.com

ಸಂಖ್ಯೆ:ಜಿಆರ್ಡಿ/ಸಾರಿಗೆ/ 25/2017-18 ದಿನಾಂಕ:19-02-2018

ಗೆ,
ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು,
ದಾವಣಗೆರೆ ಸ್ಮಾರ್ಟ್ ಸಿ.ಟಿ. (ಲಿ)
ಕ್ಯಾಮಸೂರು ರಸ್ತೆ,
ದಾವಣಗೆರೆ.

ಮಾನ್ಯರೆ,

ವಿಷಯ: ದಾವಣಗೆರೆ ಜಿಲ್ಲೆಯ ಇಲಾಖಾ ಅಂಬುಲೆನ್ಸ್‌ಗಳಿಗೆ ಇಂಟಿಲಿಜೆಂಟ್ ಟ್ರಾನ್ಸ್‌ಪೋರ್ಟ್ ಸಿಸ್ಟಮ್ ಅಳವಡಿಸುವ ಬಗ್ಗೆ.
ಉಲ್ಲೇಖ: ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಡಿ.ಎಸ್.ಸಿ.ಎಲ್. ದಾವಣಗೆರೆ ಇವರ ಪತ್ರ ಸಂಖ್ಯೆ:127/17-18/ 183, ದಿನಾಂಕ:05-02-2018.

<><><><><>

ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ಉಲ್ಲೇಖಪತ್ರದಲ್ಲಿ ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಡಿ.ಎಸ್.ಸಿ.ಎಲ್. ದಾವಣಗೆರೆ ಇವರು ದಾವಣಗೆರೆ ಜಿಲ್ಲೆಯ ಎಲ್ಲಾ ಸರ್ಕಾರಿ ವಾಹನಗಳಿಗೆ Based Tracking System ನಲ್ಲಿ ತರಲು ತಾಂತ್ರಿಕ ಸಮಿತಿಯಲ್ಲಿ ಸೂಚಿಸಿರುವುದರಿಂದ ದಾವಣಗೆರೆ ಜಿಲ್ಲೆಯ ಅಧೀನದಲ್ಲಿ ಬರುವ ಇಲಾಖಾ ಅಂಬುಲೆನ್ಸ್‌ಗಳನ್ನು ಜಿ.ಪಿ.ಎಸ್. ಬೇಸ್ಡ್ ಟ್ರ್ಯಾಕಿಂಗ್ ಸಿಸ್ಟಮ್‌ನಲ್ಲಿ ತರಲು ಸಮ್ಮತಿಸಿದೆ. ಈ ಪತ್ರದೊಂದಿಗೆ ಜಿಲ್ಲೆಯ ಅಂಬುಲೆನ್ಸ್ ವಾಹನಗಳ ಮಾಹಿತಿಯ ಪ್ರತಿಯನ್ನು ಲಗತ್ತಿಸಿದೆ.

ಮಂದಯೆಗಳೊಂದಿಗೆ

ತಮ್ಮ ವಿಶ್ವಾಸಿ,

ಜಿಲ್ಲಾ ಆರೋಗ್ಯ ಮತ್ತು ಕು.ಕ.ಅಧಿಕಾರಿಗಳು
ದಾವಣಗೆರೆ ಜಿಲ್ಲೆ, ದಾವಣಗೆರೆ.

8.9.8. KMRD letter for API integration:

KMDS

Karnataka Municipal Data Society (R)
Directorate of Municipal Administration
6th Floor, 1-4 IT Park,
Rajajinagar Industrial Estate,
Bangalore-10

Date: 13-02-2018

To,

Managing Director,
Davanagere Smart City Limited
Davanagere

Dear Sir,

Sub : Details of online applications developed by KMDS

Ref : Your letter No. – DSCL/CR-127/17-18/136, Dated 23-01-2018

In your letter cited above in the reference, it was requested to provide technical details of online applications developed by Karnataka Municipal Data Society for which DSCL having plan to integrate APIs with PAN City ICT Project. APIs for respective applications will be developed based on the integration requirements.The details related to Operating System, Database and Technologies are provided in the attached Annexure-1.

Yours Faithfully

Joint Director (R)
Karnataka Municipal Data Society,
Bangalore.

Annexure - 1

Technical Details of online application developed by KMDS

Sl. No.	Application	Operating System	Database	Technologies (Programming Language, Server...etc)	ebxting API available (Y/N)	If not can API be designed
1	Jalanidhi (Water & UGD connection and Bill generation)	RHEL 6	Oracle 11 G	JDK 1.7, JSP 2.3, Struts 1.2, Ajax 1.1, Javascript 1.8, Itext 2.1.7,quartz 2.1.5,JBOSS EAP 6.2.0	No	Yes
2	Property tax Calculator	RHEL 6	Oracle 11 G	JDK 1.7, JSP, Javascript, Spring Framework 4,DWR 3, Tomcat 7	No	Yes
3	Janahitha	RHEL 6	Oracle 11 G	JDK 1.8,JSP 2.3, Javascript 1.8, Spring Framework 4.3, Tomcat 8.5, Jquery 3.0, Ajax 1.1	yes	
4	Birth / Death registration and Certification	RHEL 6	Oracle 11 G	JDK 1.7,JSP 2.3, Javascript 1.8, Struts, Jquery 3.0, Ajax 1.1, Jboss EAP 6.2.0	No	Yes
5	Online Building plan Approval System	Windows Server-2016 std Edition	2016 SQL Std	.Net Frame work, IIS-8.7	No	Yes

8.10. Annexure 10: Compliance on Comments received from TC

Compliance to the proceedings of the 7th meeting of the ICT-Technical Committee for Smart City Mission held on 19-01-2018

S. No	Observation provided by	Details of observation	Compliance from PMC Team
1	ICT-Technical Committee	In the proposed Application Programming Interface (API) integration with the existing application including MRC application of KMDS, flexible and robust way to integrate existing different software application shall be considered.	Included in the API integration chapter page number 57-58.
2	ICT-Technical Committee	DSCL/PMC shall have a clear buy in arrangement with the respective stake holders including KMDS, by way of signing of Memorandum of Agreement (MoA), before signing the contract with SI.	MoA with the stake holder will be completed before signing the contract with SI.
3	ICT-Technical Committee	TC suggested to include revenue generation and monetization strategies in the DPR/RFP in order to ensure sustainability of the project after this project period.	Revenue stream section and monetization covered under section 7.2 page 74.
4	ICT-Technical Committee	Intelligent Transport system (ITS) for City, Buses, Ambulances, Fire Tenders and SWM Vehicles. It is advised to ensure that the number identified are as per the actual requirement. It is suggested to consider municipal are for ambulance tracking.	Number proposed in the DPR are based on the confirmation from various department. Letter from department are attached in Annexure. All the vehicle will have the scope for tracking within the Municipal area. Section 8.9 Annexure letter from stakeholders
5	ICT-Technical Committee	Environmental Sensors: Review the location to be proposed after consultation with CPCB	Revised list in consultation with the stake holder is updated. Refer Section 8.9.6 Annexure letter from stakeholder.

S. No	Observation provided by	Details of observation	Compliance from PMC Team
6	ICT-Technical Committee	Utilization of existing CCTV cameras, Details of existing software and hardware for CCTV and integration.	• Existing CCTV cameras will be utilized and Davanagere Police will be responsible for its network connectivity and upkeeping etc. • Integration of these CCTV will under the scope of LSI.
7	ICT-Technical Committee	WiFi: • Consider only critical location for wifi • Detailing of WiFi shall define number of concurrent users, number of hours of free usage per user per day, restricted usage, etc. • WiFi at critical location only.	Total number of location updated as per client suggestion. Suggestion included in the WiFi detailing section.
8	ICT-Technical Committee	Bill of Quantities: AMC of hardware and software components: 10% of hardware AMC and 12% for software AMC may be considered Manpower requirement shall be dully assessed as per requirements and cost estimate shall be appropriately optimized.	• AMC for Hardware is defined as 10% from 2nd year considering for first year it will come under warranty. • AMC for Software is calculated based on 12%.
9	ICT-Technical Committee	Clarity of integration of GIS based with the LSI scope is to brought out in the DPR	LSI scope added in the DPR section 3.2.10 page 22-23
10	ICT-Technical Committee	Ensure the proposed project timelines are in line with the MSI appointment and implementation timeline	Timeline is aligned with the MSI.

End of Report