



MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

मुंबई महानगर प्रदेश विकास प्राधिकरण

IT Cell/MMRDA/2014/253

Date: 17th October 2014

To,

1. All the Bidders
2. MMRDA Website
3. MMRDA eTender Portal

Sub: **Standard Set of deviations (SSD)** - EOI for "Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai"

Ref: Pre Bid Meeting held on 29th September 2014

Sir/Madam,

The **Minutes of the Pre Bid meeting** for "Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai" held on 29th September, 2014 along with attendance sheet is attached herewith as (Annexure – 1).

The **Standard Set of Deviations** (Annexure – 2) shall become integral part of the Bid document. The broad scope has been defined in the Eoi, however detailed scope and specifications will be provided during the RFP (Request for Proposal) stage.

Kindly note that the **last date of online submission of the bid is 17th November 2014, 6.00 pm**. Further, the bidder has to conduct **online transfer of bid from 17.11.2014, 7.00pm (IST) to 18.11.2014, 3.00pm (IST) for successful transfer of bid for evaluation**.

All the bidders shall note that the submission of e-Eoi is through MMRDA eTendering portal i.e. **etendermmrda.maharashtra.gov.in**. MMRDA has also engaged e-tendering helpdesk for any assistance for submission of bids. The helpdesk can be contacted at following coordinates: e-mail: etendersupport@mailmmrda.maharashtra.gov.in and phone: 022-26595971 during MMRDA office working hours (9:30 am to 6:30 pm) on all working days.

This is issued with the approval of Additional Metropolitan Commissioner.

Thanking You

Yours Sincerely


(S.C. Deshpande)

In-Charge, IT Cell JPD (TP), MMRDA

Encl: Annexure as above

Bandra-Kurla Complex, Bandra (East), Mumbai - 400 051.

EPABX : 2659 4000 • FAX : 2659 1264 • WEB SITE : <http://www.mmrda.mumbai.org>

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Minutes of Pre-Bid Meeting: 29th September, 2014 at 3.00 pm

Annexure- I

EOI for “Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai”

1. The EOI Pre-Bid Meeting for “**Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai**” was held under the chairmanship of AMC-1 on Tuesday, 29th September, 2014 at 3.00 pm in Committee Room, 6th floor, MMRDA Building, Bandra-Kurla Complex, Bandra (E), Mumbai 400 051. The **list of attendees** is attached as **Annexure - A**
2. At the outset, AMC (1) and Shri S.C Deshpande, IT Cell In-charge JPD (TP) welcomed all the bidders and briefed them about the bid. They also explained MMRDA’s expectations from the bidders. The bidders raised queries on the bid conditions and the same was discussed. It was clarified that MMRDA will answer the queries that would be submitted to MMRDA till 10th October 2014.
3. Bidders were informed that the complete clarifications will be issued on MMRDA website and e-Tendering portal (<http://etendermmrda.maharashtra.gov.in>) as **Standard Set of Deviations.**
4. It was clarified that Standard Set of Deviations will become an integral part of the bid document.
5. It was noted that few of the bidders who attended the pre-bid meeting had not registered on MMRDA’s e-Tendering solution portal. The bidders were informed that for participation in the Bidding process it is mandatory for Bidders to register on MMRDA’s e-tendering portal. Registered Bidders would also get automated notification via SMS alerts and email alerts for any change in the Bidding process. The bidders agreed to the same.
6. The meeting concluded with thanks to the chair and stating that MMRDA will issue Standard Set of Deviations on MMRDA’s e-Tendering portal and MMRDA’s Website.

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MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY



Attendance Sheet

Sub: Pre Bid Meeting, EOI for Implementation of Smart BKC in MMRDA
Date: 29th September 2014, 3:00 pm

Annexure - A

533/15

Sr. No.	Name	Company	Email ID	Contact No.	Sign
1	Shri Sanjay Sethi (IAS) (In-Chair)				
2	Ajay Singh	Allied Tele sis JP	ajay-singh@alliedtelecom.com	976914 33029	Ajay Singh
3	Padma Kirri	LAT Construction	padmakirri@lntec.com	9987909489	Padma Kirri
4	AMIT IRVAGE	PHILIPS	AMIT.IRVALE@PHILIPS.COM	9821309930	AMIT IRVAGE
5	RATESH NADKARNI	RAMBOLL INDIA PVT. LTD.	Rajesh.Nadkarni@ramboll.in	887965220	Ratesh Nadkarni
6	ANIKET S MAHAJAN	PHILIPS INDIA - LTD.	aniket.mahajan@philips.com	9967718301	Aniket Mahajan
7	PAWAN S YADAV	RIL (RIL) RELIANCE	pawan.s.yadav@ril.com	8454014666	Pawan S Yadav
8	RAJAT BANSAAL	"	rajat.bansal@ril.com	7718851981	Rajat Bansaal
9	Mangesh Wankhade	Scout Technologies	m.wankhade@scoutgroup.co.in	8237112200	Mangesh Wankhade

51	Harjant Singh / Capta	ILT AS			
52	ALEX GEORGE	IBM	haarp unex. kyre i1tsid@id.com alegeor@in.ibm.com	9619748880 9900541647	LA Jy
53	ADVAIT AUNDHOKAR	AIISS	aundhokar@gmail.com	9322901906	Ward
54	SIDHI TYAGI	Vodafone	Sidhi.tyagi@gmail.com Sidhi.tyagi@vodafone.com	9619218083	Sidhi
55	Dulip Kowaturam	MUMBAI			Neel

EXCP, MUMBAI

2659 4078

56. D. SRINATH KUMAR

Neel



MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Attendance Sheet

Sub: Pre Bid Meeting, EOI for Implementation of Smart BKC in MMRDA

Date: 29th September 2014, 3:00 pm



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10	ASHOK RAJ BOHAN GAIKWAD	PCS Reehndry	Ashok.Raj@Pcstech.com rohan.gaikwad@pcstech.com	9004179958 9812720467	<i>[Signature]</i>
11	Yash Dedliya	Black Intel	Yash.dedliya@intel.com	9938079905	<i>[Signature]</i>
12	Rohit Jayaraj	Honeywell	rohit.jayaraj@honeywell.com	9920188229	<i>[Signature]</i>
13	Amit Dandale	Mindteck Ltd.	amit.dandale@mindteck.com	9867650994	<i>[Signature]</i>
14	Mangy J The	Dimension Data for B2B	mangy.the@dimension data.com	9879770574	<i>[Signature]</i>
15	Aamrhad Khan.	Synoptics Tech - technologies Pvt Ltd.	aamrhad.ichan@synoptics.co.in	8879977882	Achen. <i>[Signature]</i>
16	Aman Dalmia	Vodafone India	aman.dalmia@vodafone.com	9820018364	<i>[Signature]</i>
17	N. Parmeshwararam	Verint System	Parmeshwararam@verint.com	9833269813	<i>[Signature]</i>
18	Dharmendra Singh	RCOM	dharmendra.ka.singh@ relianceada.com	9699898911	<i>[Signature]</i>
19	Sanjay G. Adani	Relta India Ltd	Sanjay.adani@relta.com	9987065425	Sanjay <i>[Signature]</i>

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MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Attendance Sheet

Sub: Pre Bid Meeting, EOI for Implementation of Smart BKC in MMRDA
Date: 29th September 2014, 3:00 pm



537/15

20	Varghese Pepperton	Zolta India	Varghese.Pepperton@zolta.co	9825501050	
21	Aayush Bansal + K.V.Naidu	ABB India Ltd	aayush.bansal@in.abb.com	9967494364	
22	HIMANSHU KANJANI	RCOM	Himanshu.kanjani@rcom.com	8080767880	
23	NEERAJ KUMAR	RCOM	neeraj.kumar.damodar@rcom.com	9699943438	
24	Prashant Gulalkari	Persistent	prashant_gulalkari@persistent.co.in	9822015811	
25	Pranav Wangikar	Persistent	pranav-wangikar@persistent.co.in	9552572625	
26	Prashant Kedarp	Sify Technology	prashant.kedarp@sifycoop.co.in	9967010348	
27	Sudhir Sankh	WIPRO	sudhir.sankh@wipro.com	92692557	
28	Juhi Panchole	WIPRO	juhi.panchole@wipro.com	9920740388	
29	ABHAY KUMAR	ADUC infow LTD	abhay@aducinfow.com	8834588113	

MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Attendance Sheet

Sub: Pre Bid Meeting, EOI for Implementation of Smart BKC in MMRDA
Date: 29th September 2014, 3:00 pm



5394/5

30	Veena Wankhede	IBM Invoia	Veena.wankhede@in.ibm.com	9323650195	M. Subhad
31	Zunzun	TCS	Zunzun.tatil@tcs.com	9223173302	Zunzun
32	Vivek J. M. Sinha	Datashow & Co.	vivek-singh@datashow.com	9892599994	Vinod
33	Gaurav Malviya	CyberTech Systems	gaurav.malviya@cybertech.com	9167406041	G.M.
34	NIRJAN MALHOTRA	Dolphin RFID	nirjan@dolphinrfid.in	9967013261	N.M.
35	Y. Sandeep	MTNL	ameebgmsatol@gmail.com	9869435500	Sandeep
36	C.V. Galdi	MTNL	galdicvmbd@gmail.com	9869415883	C.V. Galdi
37	Sujit Dey	L&T	Sujit.dey@lntelbg.com Sujit.dey@lntelbg.com	9820632420	Sujit Dey
38	SHARAD SRIVASTAVA	L&T	Sharad.Srivastava@lntelbg.com	9819452333	Sharad
39	Ashish Pranami	Absen	ashish.pranami@abmindia.com Abmindia.com	9320086896	A.P.

(Handwritten signature)

MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Attendance Sheet

Sub: Pre Bid Meeting, EOI for Implementation of Smart BKC in MMRDA
 Date: 29th September 2014, 3:00 pm



40	Rakesh Sharma	ABY Knowledge LTD	rakesh@abmindia.com	9820784613	[Signature]
41	Sachin Bajne	sys computers Pvt	sachin_bajne@sys.co.in	9833840240	[Signature]
42	Amej Mane	Cisco systems	amane@cisco.com	9920474124	Amej
43	Ravi Kanade	HP DC	ranindra.ranade@hp.com	9833607902	[Signature]
44	Pankaj Bhatiya	NEC	pankaj.bhatiya@necindia.in	9820188850	[Signature]
45	Bhushan Chaugule	NEC	bhushan.chaugule@necindia.in	9805712121	B Chaugule
46	ABY	ETPL	abyt@ebenezercorp.com	-	[Signature]
47	Ajinkya	Neogy	ajinkya.tankar@neogen.com	9821488845	[Signature] → need to check
48	N M JAIN	N D P L	nagroj.jain@nirmaldata.com	9823468888	N M J
49	Netaji Patil	R C O M	Netaji.Patil@relianceada.com	980330202	[Signature]

[Signature]

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R K A Deshpande

125

Kalish Kamraj

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J K Bhosale

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58

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Mihir Jain

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Pratik Shah 9920753016 HP India

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Pratik

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Pratik

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Pratik

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9029099839

67

Krunal Sidhpura - Ernst & Young

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8692927666

Pratik

68. S.C. Daryankar

Refer: Pre Bid Meeting held on 29th September 2014 at 3.00 PM

Standard Set of Deviation for EOI for - Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai” - Annexure

Sr. No.	Clause No.	Criterion as per Eoi	Modified Criterion
1	Key Events & Dates, Page-3	Last date of Online submission : 28.10.2014 Till 6.00pm (IST) EOI Transfer date: From Date/Time: 28.10.2014 From 7.01pm (IST) To Date/Time: 29.10.2014 Till 3.00pm (IST)	Last date of Online submission : 17.11.2014 Till 6.00pm (IST) EOI Transfer date: From Date/Time: 17.11.2014 From 7.00pm (IST) To Date/Time: 18.11.2014 Till 3.00pm (IST)
2	Annexure-EOI Template-Section 3, Page 16	Section-3 Financial Details of the Lead Bidder and Section-4 Financial Details of the Consortium Partner, if any	The Financial Details of Lead Bidder and Consortium Partner can be submitted on respective bidders company letter head supported by audited balance sheet and P&L Account)
3	Joint Venture and Consortium, Clause no. 6, Page- 9	Consortium Partner	No Change in EOI Terms and Conditions. 1. There is no limit of Consortium members at the EOI Stage 2. Bidders can form consortium or apply as sole bidder at the EOI Stage. Bidder can form Consortium/ JV during the RFP Stage. Bidders can submit their response of participation in One or all the Five Smart BKC initiatives during EOI stage, However MMRDA would prefer to have Consortium submitting EOI with end to end implementation capabilities for effective understanding of the ecosystem. 3. One Bid would be allowed from the lead member of the consortium 4. The technology Partner can be part of Multiple Consortium
4	Vision Smart BKC 1.0, Claus. 3, Page- 5	Overall Smart BKC Strategy & Phases	No Change in Terms and Conditions Please refer to Annexure to this SSD
5	Scope of Vision Smart BKC 1.0, Clause 3, Page- no 7	Specific on Implementation of All Five initiatives Commercial Model, Estimated Cost of The project, Implementation Approach, Technical Specifications etc.	No Change in Terms and Conditions The specifics of Legal Framework, Integration with Stakeholders and required support from MMRDA, Operational Model, Bandwidth requirements, SLA, Costing, Financing Model, Technical Specification of Hardwares, Softwares, Setting up of Command centre and its location, scope etc would be detailed during the RFP Stage.




Standard Set of Deviation for EOI for - Implementation of Smart BKC initiatives in Bandra Kurla Complex, Mumbai"- Annexure

Sr. No.	Clause No.	Criterion as per Eoi	Modified Criterion
			<p>The estimation provided in EOI and this Standard Set of Deviation document is indicative in nature and for basic understanding of the MMRDA Smart BKC 1.0 action plan. However the bidder may carry out the site visit of BKC E & G Block after obtaining written permission of MMRDA and obtain for itself on his own responsibility all information on the existing Infrastructure, required structural and Technical changes, possible operational plan for implementation of the select 5 initiatives in BKC, that may be necessary for estimation, technical understanding and preparing the EOI response. The cost of such visits to the site(s) shall be at the Bidder's own expense.</p>
6	General	RFP process, Timeline and Smart BKC Phases	<p>No Change in Terms and Conditions Subsequent to EOI process, MMRDA intends to expedite the Bid Process Management for RFP for selection of Implementation Partner/s for implementation of Smart BKC 1.0. Further to successful implementation of Smart BKC 1.0, MMRDA would leap to the next Phase- 2.0 and 3.0 with learning and best practices.</p>
7	General	Smart City Consultant as PMC	<p>No Change in Terms and Conditions MMRDA is in process of appointing a Smart City consultant for Overall strategy, design and act as overall PMC , however the Lead Bidder-Master System Integrator would act as the implementation partner with responsibility to bring all required sub- System Integrators, OEM, other partners on board with a cohesive design for implementation & Maintenance of the select 5 initiatives as part of Smart BKC 1.0. MMRDA may decide to implement some of the initiatives on standalone basis depending on the inputs received from the EOI process.</p>





MMRDA

Mumbai Metropolitan Region Development Authority

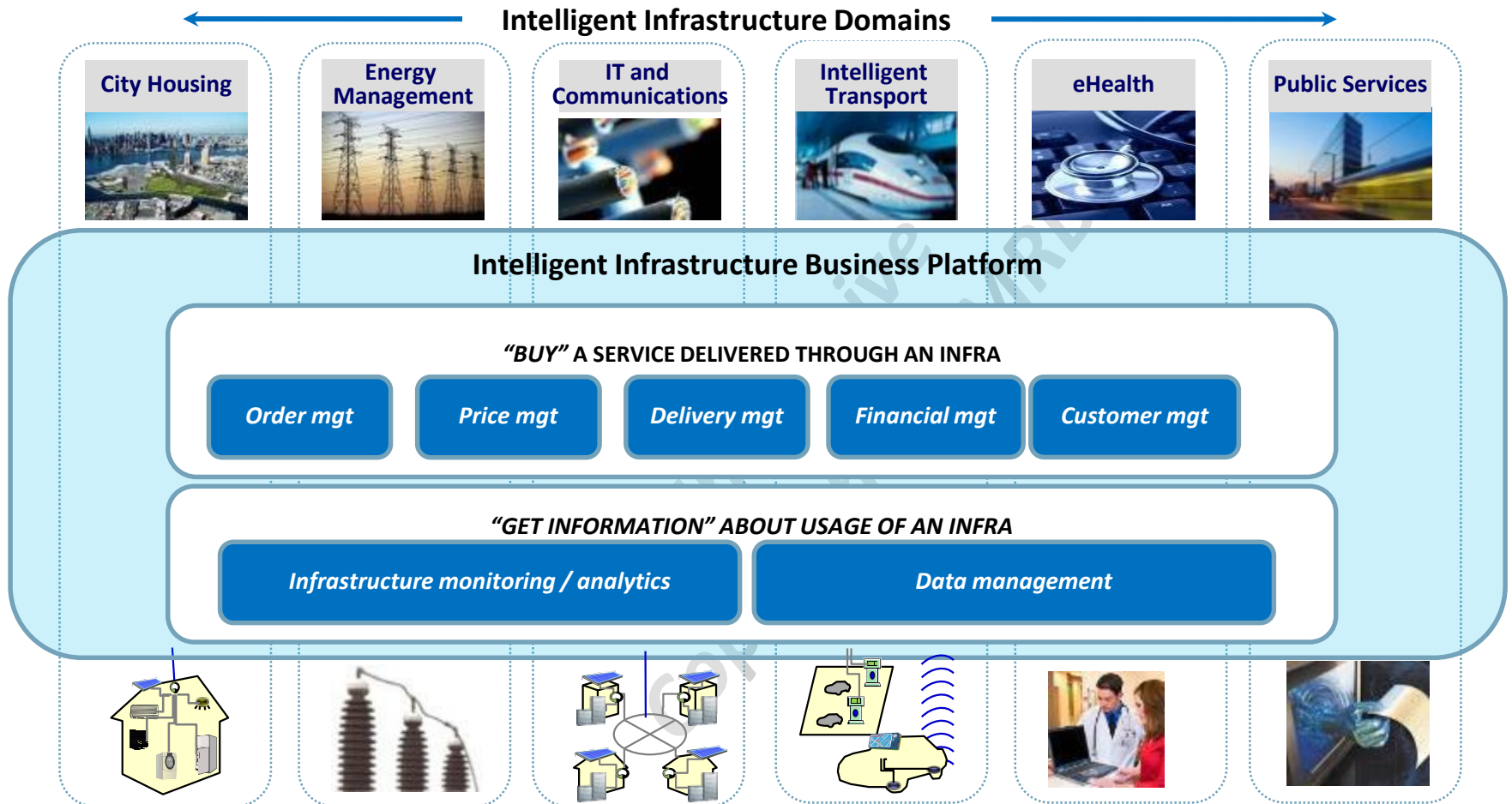
EOI for Implementation of Smart BKC initiatives- Annexure to Standard Set of Deviations

Oct 2014

Confidentiality Statement

- This document contains material proprietary to MMRDA.
- The material, ideas, and concepts contained herein are to be used exclusively for purpose of understanding of Vision Smart BKC only and indicative in nature. The information and ideas herein may not be disclosed to anyone outside MMRDA or be used for purposes other than implementation of Smart BKC initiatives.
- The specifics of Legal Framework, Integration with Stakeholders and required support from MMRDA, Operational Model, Bandwidth requirements, SLA, Costing, Financing Model, Technical Specification of Hardware's, Software's, Setting up of Command center and its location, scope etc would be detailed during the RFP Stage.
- However the bidder may carry out the site visit of BKC E & G Block after obtaining written permission of MMRDA and obtain for itself on his own responsibility all information on the existing Infrastructure, required structural and Technical changes, possible operational plan for implementation of the select 5 initiatives in BKC, that may be necessary for estimation, technical understanding and preparing the EOI response.
- The cost of such visits to the site(s) shall be at the Bidder's own expense.

Intelligent Infrastructure provides a common approach to respond to each city's sustainable attractiveness imperative

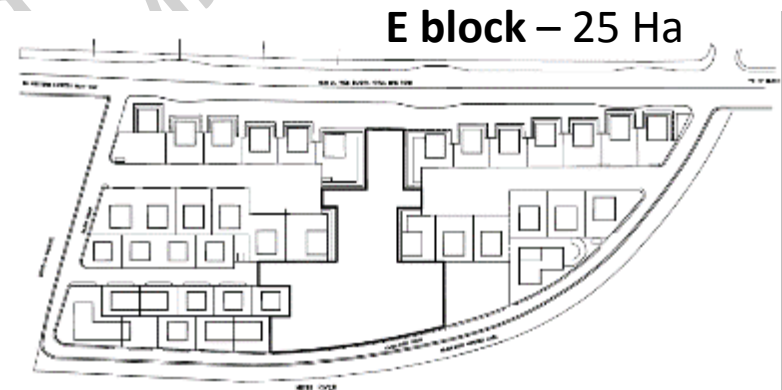


MMRDA envisioned BKC to be an easily accessible, intelligent and sustainable International Financial & Business Hub

- **BKC** was instituted by **MMRDA** to create an easily accessible, intelligent and sustainable **International Financial and Business hub**.
- BKC houses a number of financial & business houses including **National Stock Exchange, SEBI, ICICI Bank, Citibank**, Dena Bank, Bank of Baroda, **State Bank of India**, Jammu & Kashmir Bank National Business Centre, **NABARD** Head Office, IL&FS, Asian Heart Institute, Dow Chemicals, **Bharat Diamond Bourse**, Dhirubhai Ambani International School, American School of Bombay & Fortune 500.
- It also is home to the **Mumbai Cricket Association's** cricket ground and the United States Mumbai Consulate.
- Open plots in the BKC area are given out on rent to host events and are known as the **MMRDA grounds**.



G block – 170 Ha



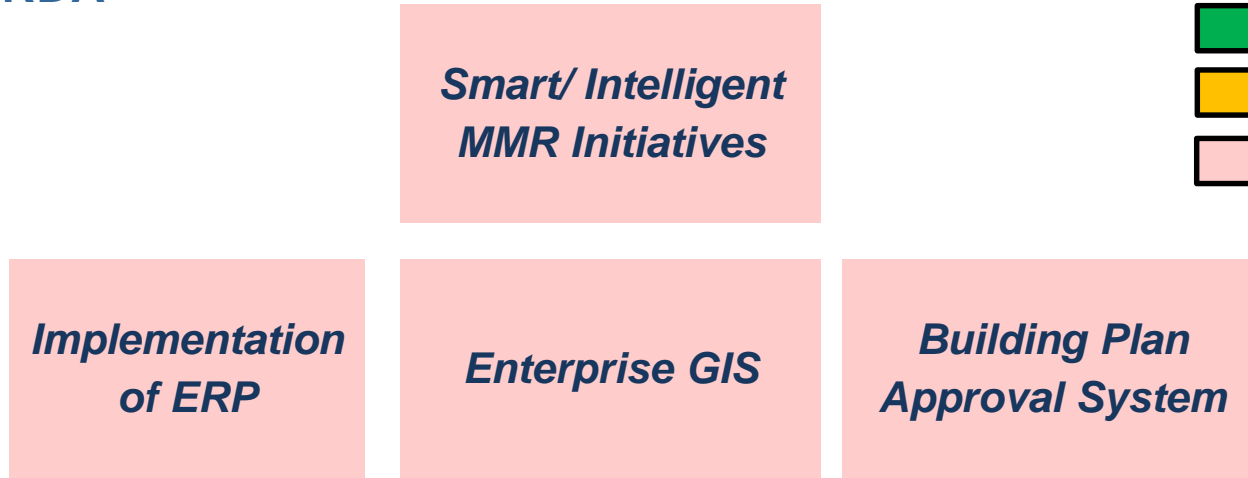
E block – 25 Ha

- There are **6,40,000 employees** working in the BKC area
- About **64000 people** is assumed to be the **floating population** that comes to BKC everyday
- Apart from this about **1,560,0,000 people** visit the **MMRDA exhibition grounds** every year
- Total available **office area E & G – 6400000 sqm**
- Total **length of roads in E & G – 20km**

Vision of MMRDA

-  Completed
-  In Process
-  Future Initiatives

Core Solutions



Basic IT Infrastructure



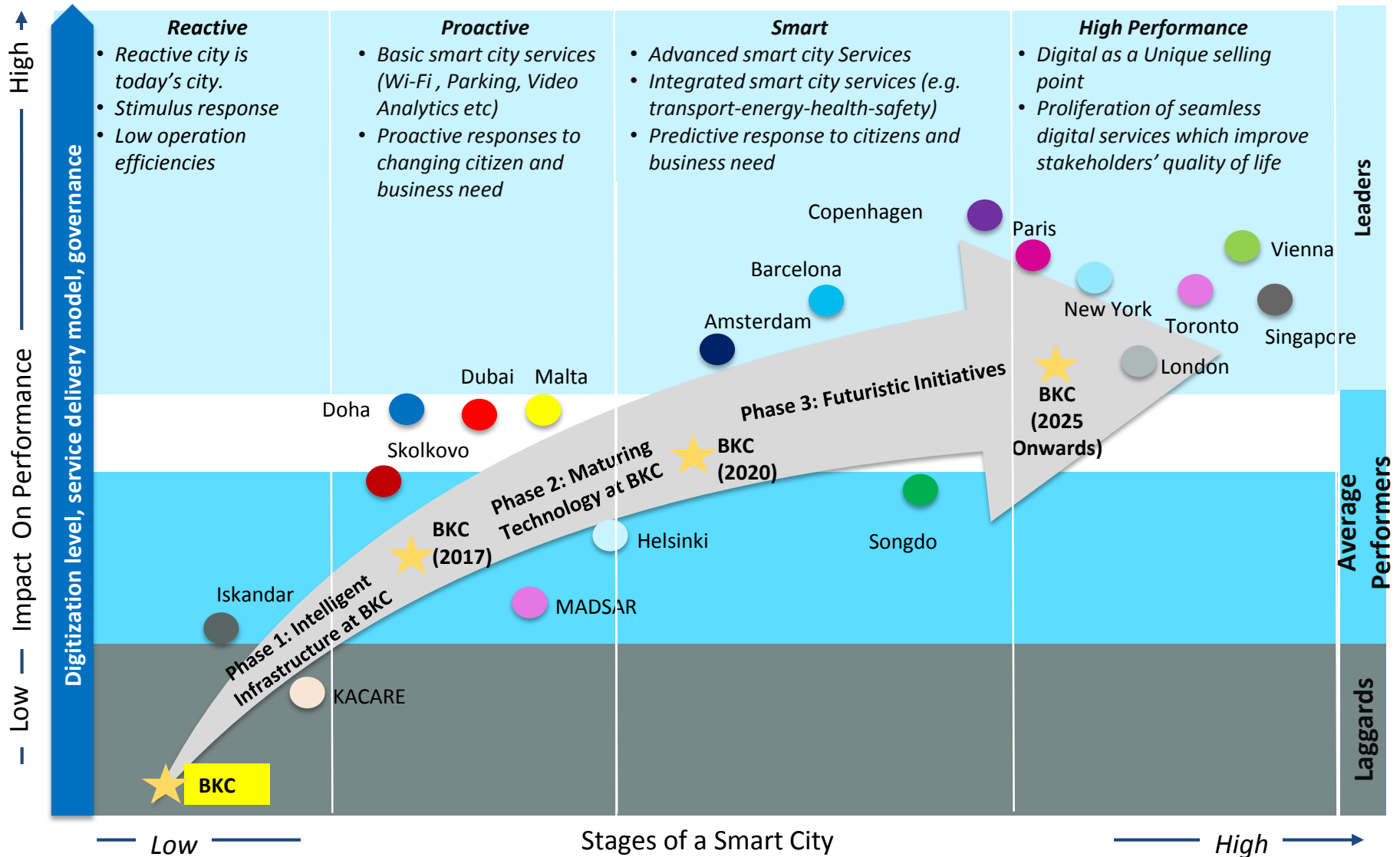
Basic IT Solutions



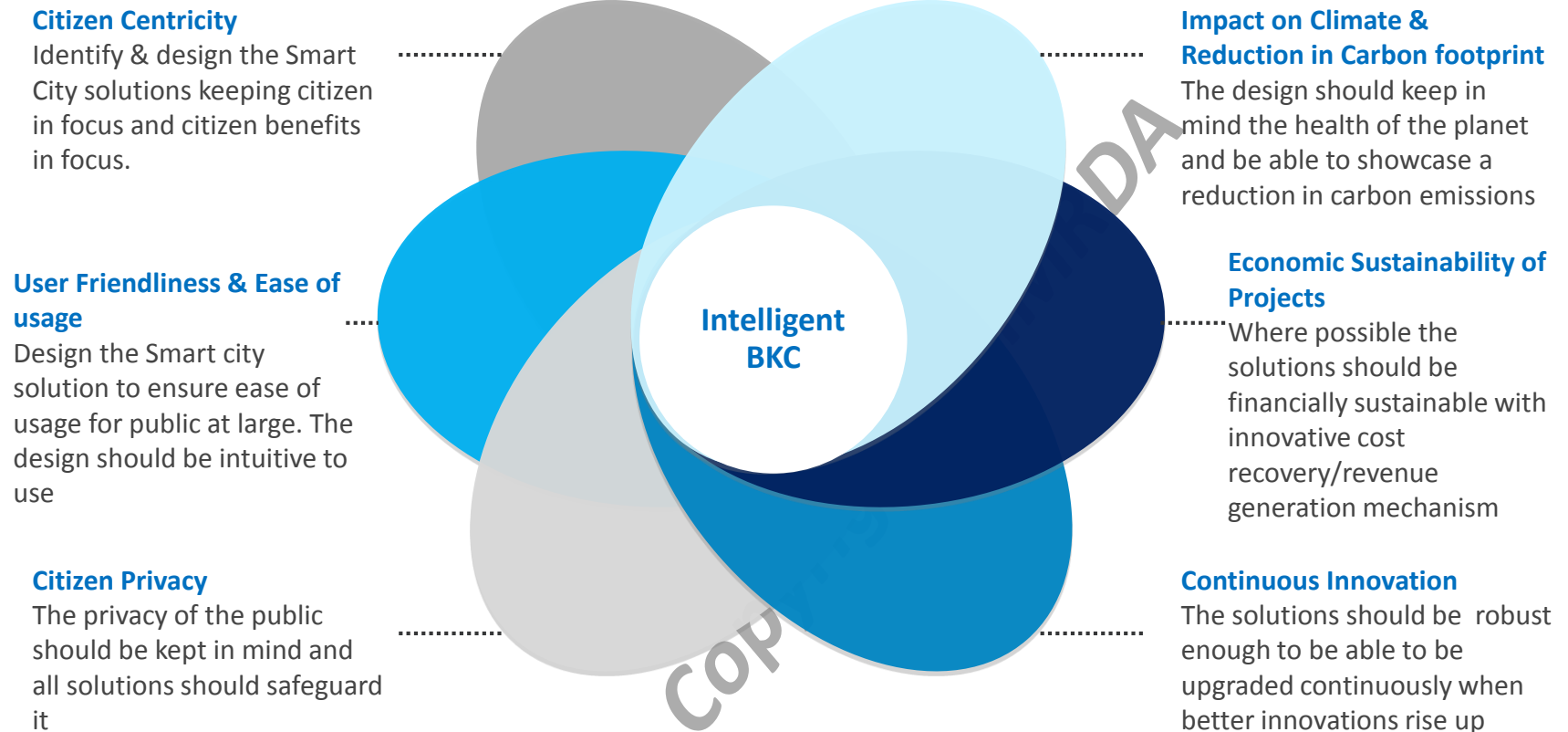
Preparatory Activities



Based on the various smart cities across the globe, a smart city Journey for Bandra Kurla Complex is defined to help achieve this vision



For BKC the approach is guided by citizen, businesses, economic and environmental needs to select, shortlist and design the Initiatives



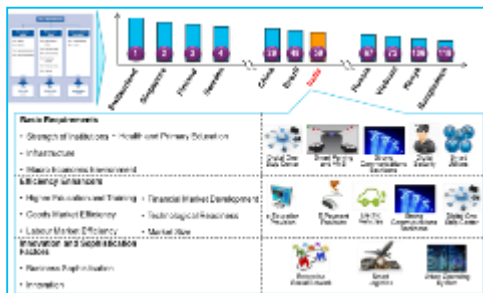
Leveraging stakeholder analysis, best practices and opportunity assessment the five Intelligent Cities initiatives are shortlisted

1 Stakeholder Analysis & Best Practices Survey

- Stakeholder analysis to understand the needs and requirements of
 - residents,
 - visitors ,
 - commercial tenants and
 - MMRDA Officials .
- Conducted In Person interviews and fact finding surveys



- Best Practice Analysis and Benchmarking



2 Opportunity Assessment

- Opportunity Analysis to identify long list of initiatives

Category 1	• More Conferencing	• Citizen Hallways
Category 2	• Online Code Reviews	• Interactive Displays
Category 3	• Mobile Devices	• Mobile Devices
Category 4	• Wireless Displays	• Data Management Services
Category 5	• Digital Signage	• Data Analytics
Category 6	• Mobile Applications	• Mobile Applications
Category 7	• Mobile Applications	• Data Analytics
Category 8	• Mobile Applications	• Data Analytics
Category 9	• Mobile Applications	• Data Analytics
Category 10	• Mobile Applications	• Data Analytics

- Initiatives are prioritized to arrive at top 5 quick wins for BKC region on consultation held with MMRDA officials, BKC tenant stakeholders and fact finding surveys

Category 1	• More Conferencing	• Citizen Hallways
Category 2	• Online Code Reviews	• Interactive Displays
Category 3	• Mobile Devices	• Mobile Devices
Category 4	• Wireless Displays	• Data Management Services
Category 5	• Digital Signage	• Data Analytics
Category 6	• Mobile Applications	• Mobile Applications
Category 7	• Mobile Applications	• Data Analytics
Category 8	• Mobile Applications	• Data Analytics
Category 9	• Mobile Applications	• Data Analytics
Category 10	• Mobile Applications	• Data Analytics

3 Phase 1 Initiatives for BKC

- Identified five Solutions and Solution



Wi-Fi



Smart Parking



Intelligent Streetlights



Video Analytics



Citizen App

5 initiatives earmarked for Smart BKC (Indicative Impact points)



5 MBPS High Speed Wireless Internet Connectivity

175 Hectare Area Covered in Public Wi-Fi in BKC

Seamless Wi-Fi Connectivity Across E& G Blocks

50,000 man days saved per year

Public Wi-Fi as Value Added service for Business and Exhibition Use



3000 Smart Parking Slots

Parking Time Reduced from 20 minutes to 5 minutes

19000 Liters of Fuel saved annually

24 tonnes of Carbon Reduced Annually

7800 Man days saved per year

Reduction in Unauthorized Parking



841 Streetlights touched

800 tonnes of Carbon Reduced Annually

Energy Consumption reduced by 40%

200KW of clean energy generated

Reduced Maintenance Cost

Reduced investment for Wi-Fi and CCTV

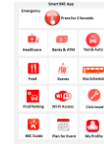


Complete E & G Block covered with 90 cameras

Greater coordination among Security Agencies

Reduced Street furniture Theft

Improved Emergency Response



33000 man-days saving due to ease of access of information

33000 man-days saving due to ease of access of information

Improves Citizen Communication

Improved Emergency Alert and Response

6.5 Lacs Employees touched

Improved Location Attractiveness

Improved Quality of Life

Increased Business Confidence And Safer BKC

Increase in Real Estate Value

Branding Benefits for BKC and MMRDA



The BKC wide Wi-Fi solution will provide seamless connectivity to entire E and G block regions at BKC

Solution Details

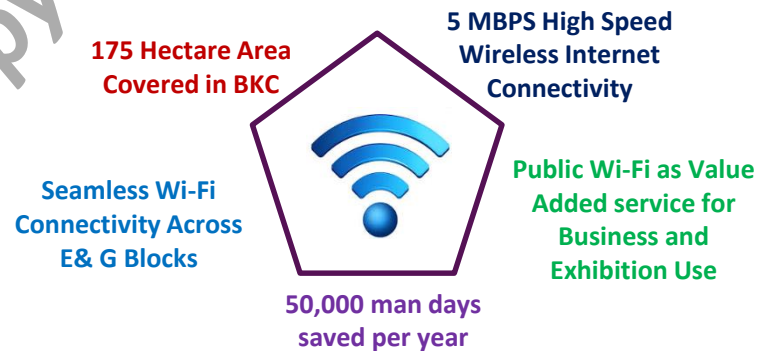
- The entire **BKC E** and **G blocks** will be Wi-Fi enabled with 100 Wi-Fi access points
- Wi-Fi will also be used as **the communication backbone** for smart city applications
- **Wi-Fi Access points** will be **installed** on **streetlights** where ever possible to provide last mile connectivity.
- Each Wi-Fi Access points will be **connected** with **Fiber backbone**.
- **SMS based authentication** based **security** will be implemented as per **DOT guidelines**
- **Internet access** will be **free of cost** for first **30 min**
- Users will have to **pay online** to **get continuous access**.



Benefits

- BKC wide Wi-Fi will **provide high speed seamless connectivity**
- It will serve as a **backbone** for **intelligent city applications and sensors**.
- **Incremental revenue streams** from several **subscription models**
- Development of robust IT infrastructure and effective channel of communication across MMRDA focus areas

Impact

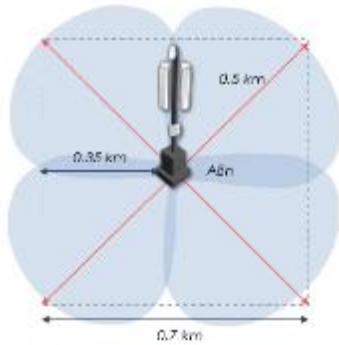


* Wi-Fi will also act as backbone network for other initiatives

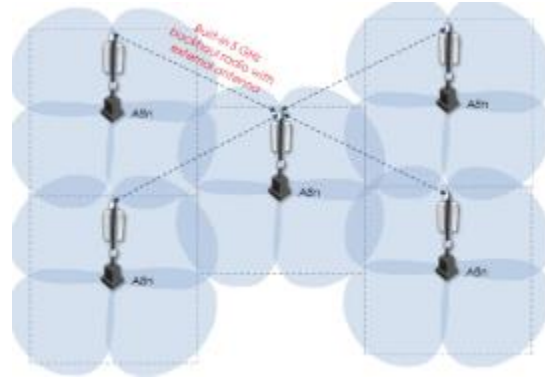
For both the options Wi-Fi Access points will provide last mile connectivity with fiber backbone to ensure high bandwidth (Indicative)



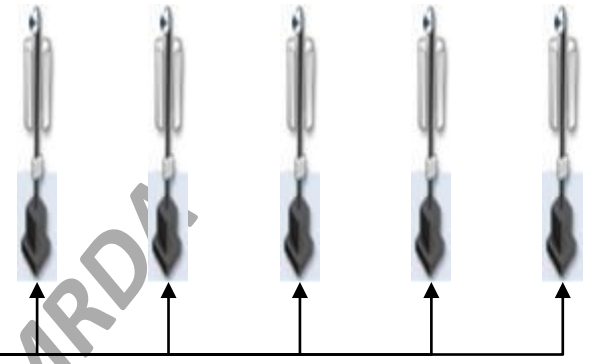
Access Points



Signal Coverage



Typical Cluster Structure



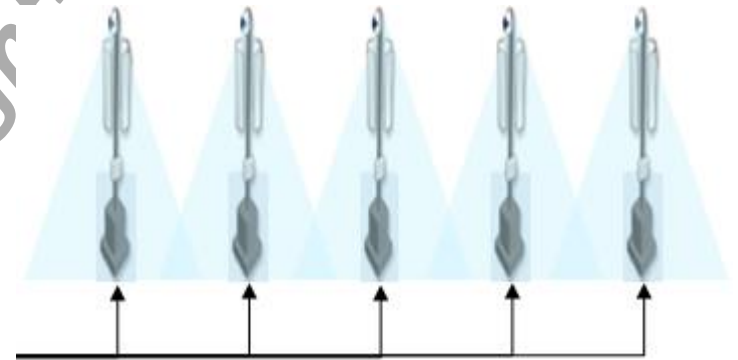
Fiber Backbone
Wi-Fi Access Points Connected to Fiber Backbone

Architecture Options



Cellular Architecture

Require less no. of Access Points but users may face disruption in service in overlap regions. Due to non reliability of Wi-Fi, it cannot be used for communication backbone for Smart City.



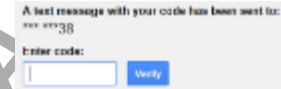
Mesh Architecture With Fiber Backbone (Preferred)

Require more no. of Access Points to create mesh and users will get seamless connectivity all across without disruptions Preferred for Smart City application.



The options have also been designed considering the DoT Guidelines on Wi-Fi Security

Users with Indian Mobile Number



1. User Connect to Wi-Fi Network

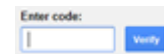
2. Social/Web Identity Authentication: User Ask to Sign-in using one of the below Account

3. SMS Authentication: User Ask to Enter Mobile no.

4. SMS with Code is sent from Server

5. User Enter SMS code and Start internet browsing after successful authentication

Users Without Mobile Number/International Number



1. User Connect to Wi-Fi Network

2. Social/Web Identity Authentication: User Ask to Sign-in using one of the below Account.

3. Manual Authentication: User Select do not have India mobile

4. Server shows nearest retail store to get coupon. User go-to retail store and submit valid ID proof to get manual code

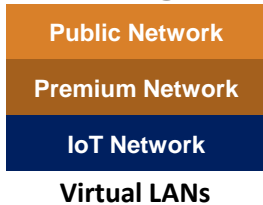
5. User Enter Manual code and Start internet browsing after successful authentication

BKC Wide Wi-Fi architecture will enable secure access to internet after SMS authentication as per DoT guidelines



Secure V-LAN with dedicated bandwidth will provide seamless connectivity for Intelligent BKC sensors

Wireless@BKC



Public Network

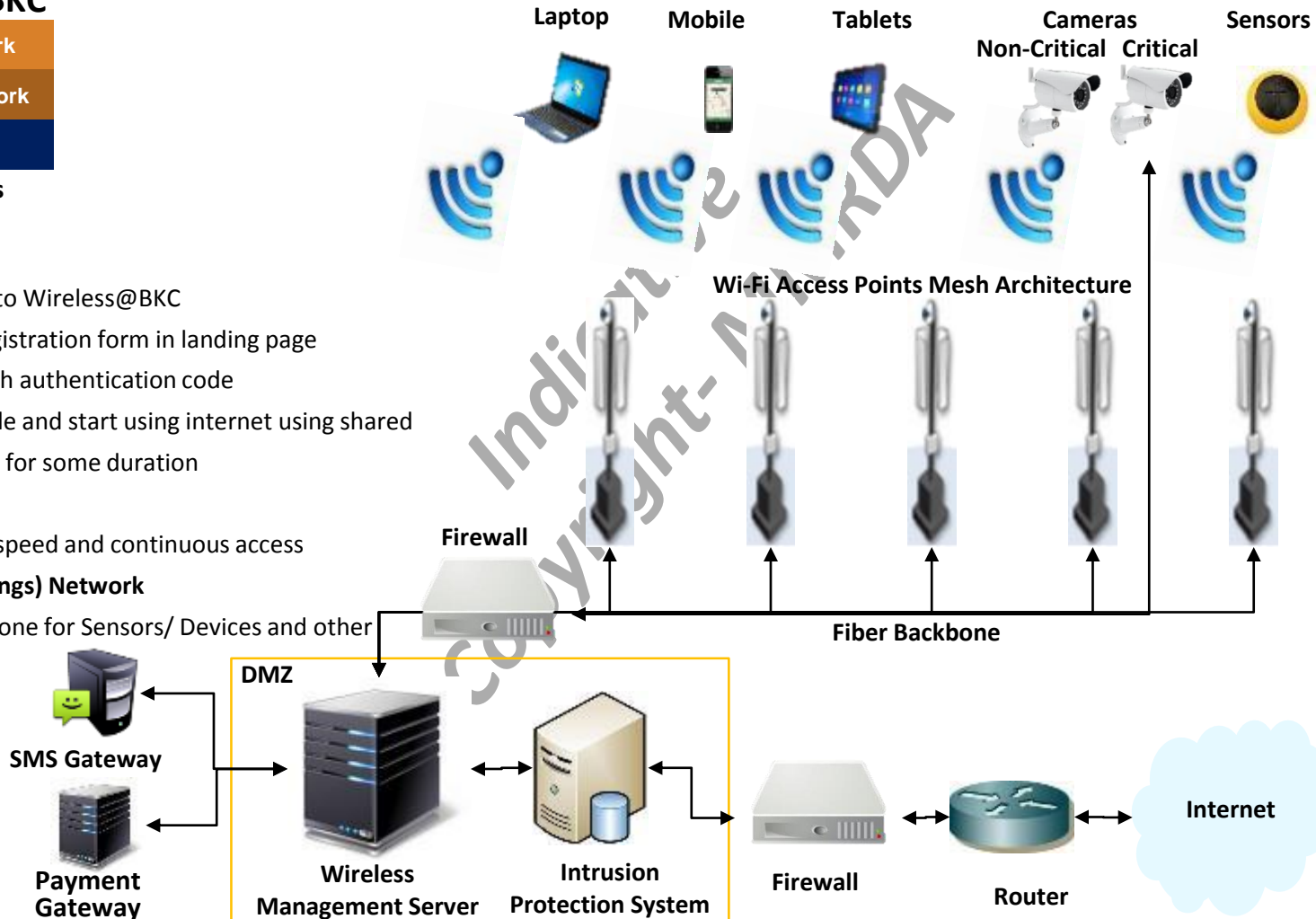
- Users Connect to Wireless@BKC
- User Fill the registration form in landing page
- SMS is send with authentication code
- User enters code and start using internet using shared bandwidth free for some duration

Premium Network

- Users get high-speed and continuous access

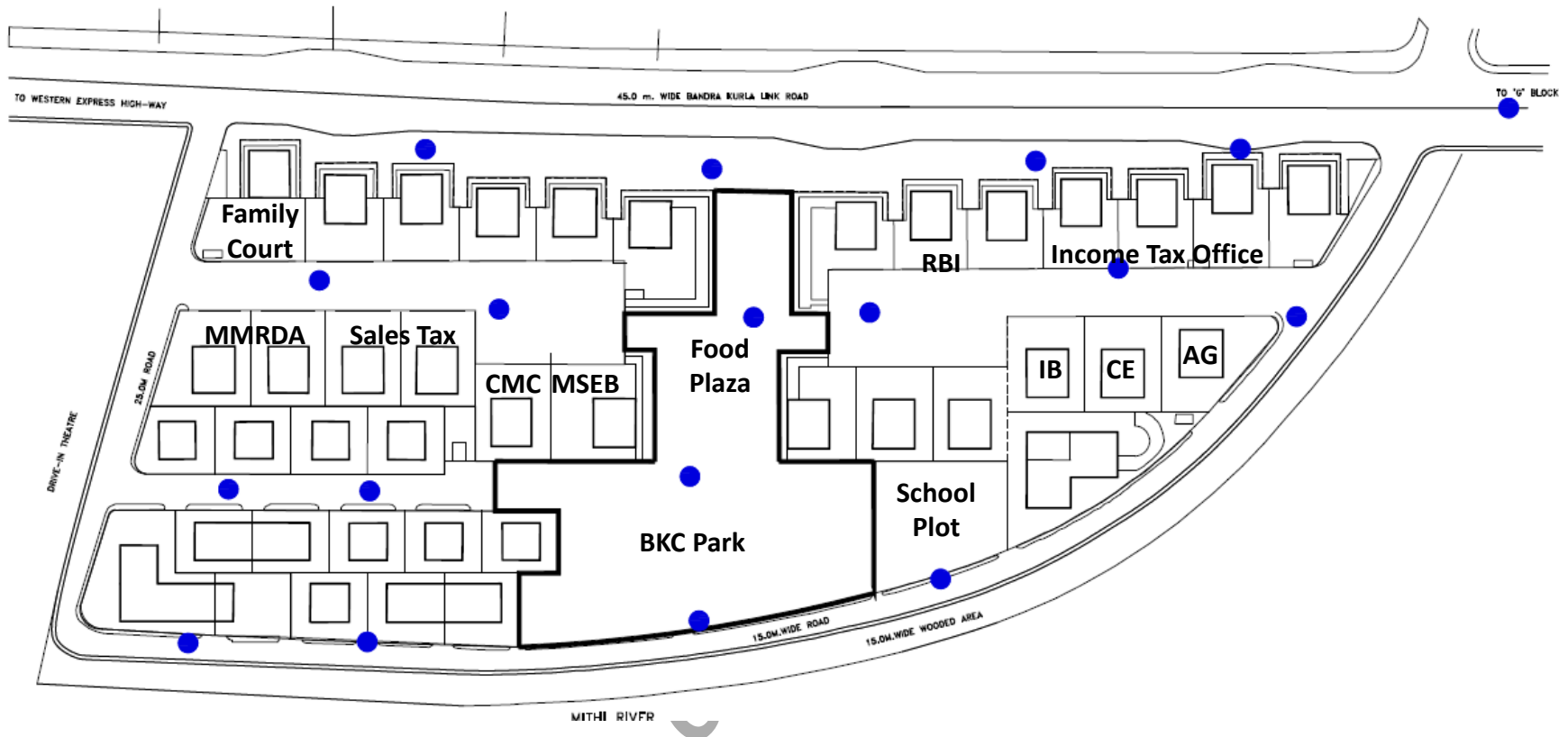
IoT(Internet of Things) Network

- Network Backbone for Sensors/ Devices and other Applications





Location Analysis is performed to identify the Wi-Fi access points locations in E- Block to ensure carpet coverage

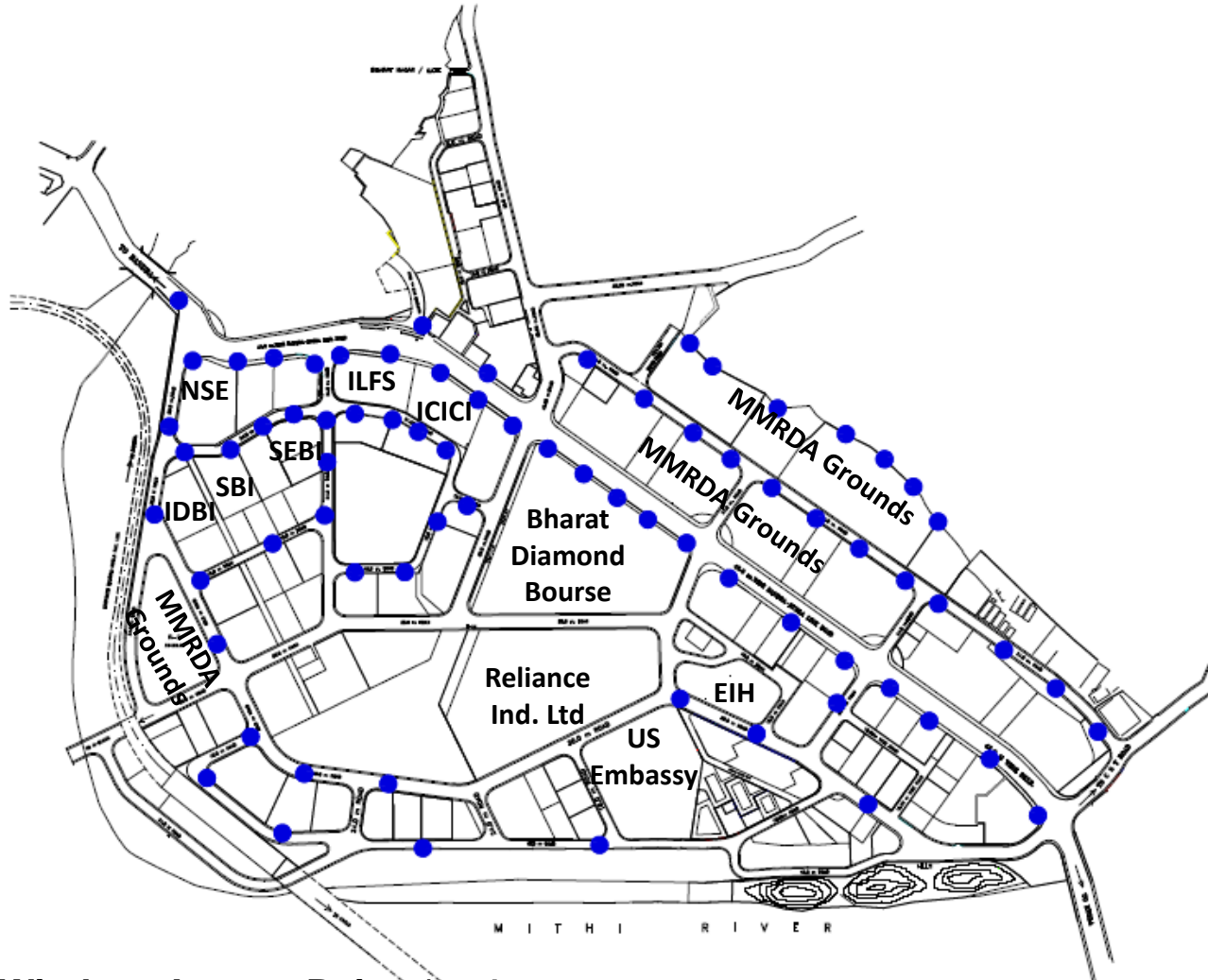


● Wireless Access Points*: 18

*Wireless access points have been identified in consultation with telecom service provider. Detailed feasibility study will be done during implementation



Location Analysis is also done for G Block to identify Wi-Fi access points locations to ensure carpet coverage



● **Wireless Access Points*: 74**

**Wireless access points have been identified in consultation with telecom service provider. Detailed feasibility study will be done during implementation*



Smart parking with electric cart will save time, reduce emissions and provide last mile connectivity

Solution Details

- **Wi-Fi Sensor** based Smart Parking solution will manage **indoor, open and street parking**
- Smart Parking enables **1070 Car Parking** spaces, **166 Buses** Parking and **350 2-wheeler** parking
- Provision to enable **2000** more car parking spaces in future
- **Parking Guidance mobile/web app**
- **Digital message board** and **maps** to provide **real time status** of parking at entry and exit points
- **Electric cart** will provide **last mile connectivity** from parking to key locations at nominal fee



Benefits

- **Provides real visibility** on available parking to commuters through web/mobile/message displays
- **Increased revenue** from parking services by improving utilization of parking spaces
- **Hassle free parking** for premium and normal users.
- Streamline the parking operations

Impact

Copyright- M. Indicat

7800 Man days saved per year

19000 Liters of Fuel saved annually

Increase Utilization of Parking areas



24 tonnes of Carbon Reduced Annually

Reduction in Unauthorized Parking

Parking Time Reduced from 20 minutes to 5 minutes

Commuters spend on an average 20 mins. looking for parking slots, which amounts to 92 tonnes of CO2e every year; also leading to unauthorized parking



Location

- There are currently **1070 four-wheeler parking spots, 350 two-wheeler spots and 166 bus spots** spread over **eight parking lots**
- There are **3000** additional parking spots that are currently under construction and will take 2-3 years to be available
- The demand for parking spaces far outstrips the supply of them
- Parking during peak timings in BKC is a frustrating experience with over **18-20 minutes spent circling** looking for a parking space

Plan

- Smart parking will reduce the hassle that commuters to BKC currently have – the difficulty in finding a parking spot.
- This will be addressed by the introduction of **parking sensors in parking spots** which detect the presence of a vehicle and then transmit this information to a smart parking server
- **A well designed app with a map** that points out available parking spots
- The smart parking initiative will be **advertised** during the first few months

Technology

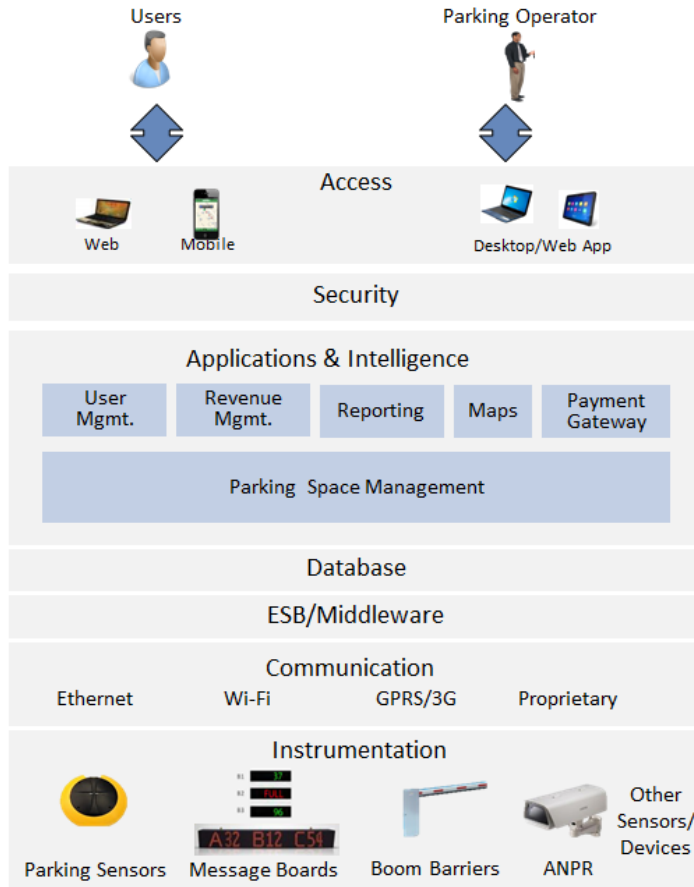
- The parking lots were tendered. The current parking process is manual. The parking attendant **over charges people** (INR 80 or INR 105 instead of INR 60).
- Some of the parking lots are very far from the commercial area thus their tender process was not fulfilled because they **could not meet revenue potential**
- A lot of **street parking goes on illegally** because of unavailability of parking spots
- While towing of some cars happens, several cars remain parked thus making this a **non-optimal way of realizing revenue**

Issues

- Smart parking solution suggested does not cover non-tendered spots where a large fraction of illegal parking goes on
- Uptake of the mobile application for smart parking might not find too many users unless it is designed with users ease of use in mind

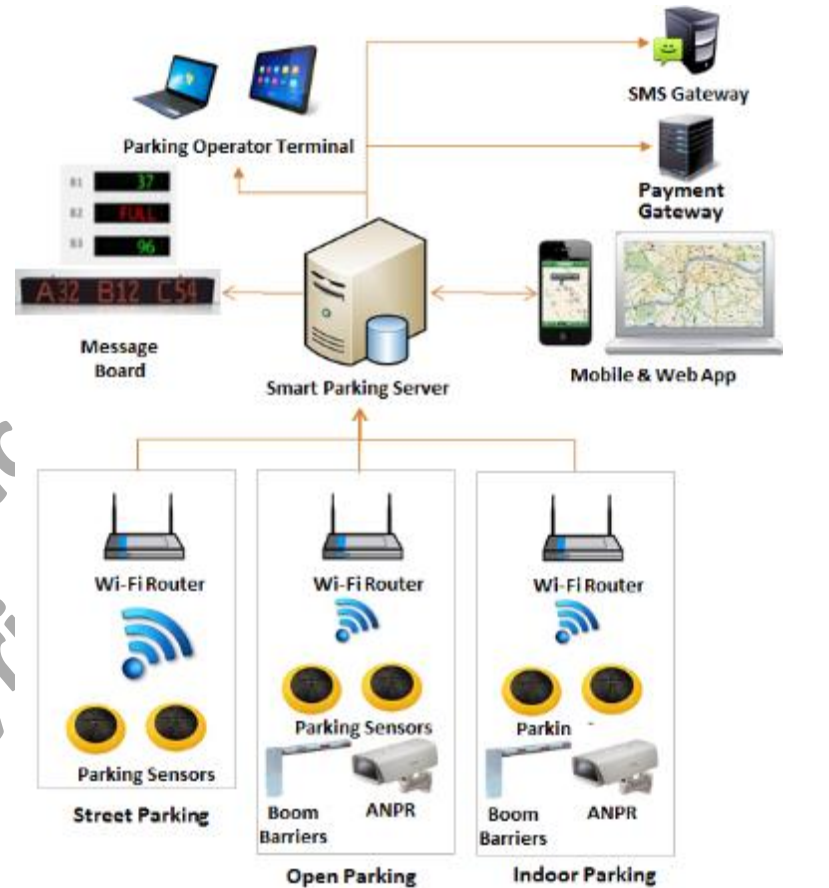
The smart parking base architecture has to be designed (Indicative)

Application



- Parking space management, maps engine, user mgmt., revenue mgmt., reporting and payment gateway are key modules for Smart Parking application architecture.

Infrastructure



- Sensors data will be captured through Wi-Fi routers and transmitted to parking server. Parking server will update the message board and maps frequently to provide real time parking space availability.

Indicative Copy



Intelligent streetlights with solar panel will produce clean energy and reduce carbon footprint

Solution Details

- **Light & Motion sensors** will turn on/off and adjust light brightness in night **based on people/car movement**.
- **Grid Tied Solar PV** will **generate clean electricity** and feed to the grid. Grid can offset the payment based on electricity consumed vs generated.
- **LED lighting** will **reduce electricity consumption** and offer more life thus reducing O&M.
- CCTV cameras and Wireless routers can be installed on same pole to monitor road and maintain Wi-Fi.

Benefits

- **Solar panel** will generate **clean energy** sufficient to cover approx. **25% of current street light energy requirement**
- **Reduce maintenance costs** for lighting equipment by replacing HPSV lamps to LED
- Improved maintenance due to Automatic fault detection and alert

Impact

Indicative
Copyright - MMR

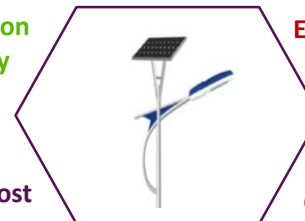


841 Streetlights modified

800 tonnes of Carbon Reduced Annually

Energy Consumption reduced by 40%

Reduced Maintenance Cost



200KW of clean energy generated

Reduced investment for Wi-Fi and CCTV

Currently street lights in BKC consume around 850 kW of electricity resulting in INR 6.5 lakhs of electricity costs and 900 tonnes of CO₂e emissions



Location

- In total there are **841 streetlights with 1325 bulbs** of differing wattages (150, 250 and 70W)
- The street furniture is maintained and owned by Reliance which is the electricity provider.
- The total electricity bill for the month comes up to nearly **INR 6.5 lakhs**
- In addition to the electricity bill, MMRDA pays maintenance costs which brings the total to **INR 14-16 lakhs**
- The lights remain on for 12 hours approx.

Technology

- The streetlights in BKC are currently **ordinary ones without any sensors**
- There are **4 types of streetlights** with the number of bulbs ranging from one to four
- The bulbs used are **High Powered Sodium Vapor (HPSV)** lamps.
- The lights are **turned on manually** with no time or light sensitivity taken into consideration

Plan

- With the addition of light and motion sensors the energy costs will reduce by about **40%**
- There is also a recommendation to **replace the HPSV lamps with LEDs** which will reduce the energy costs by **40%**
- Additionally **solar panels** can be placed on the streetlights and the energy generated fed back to the grid

Issues

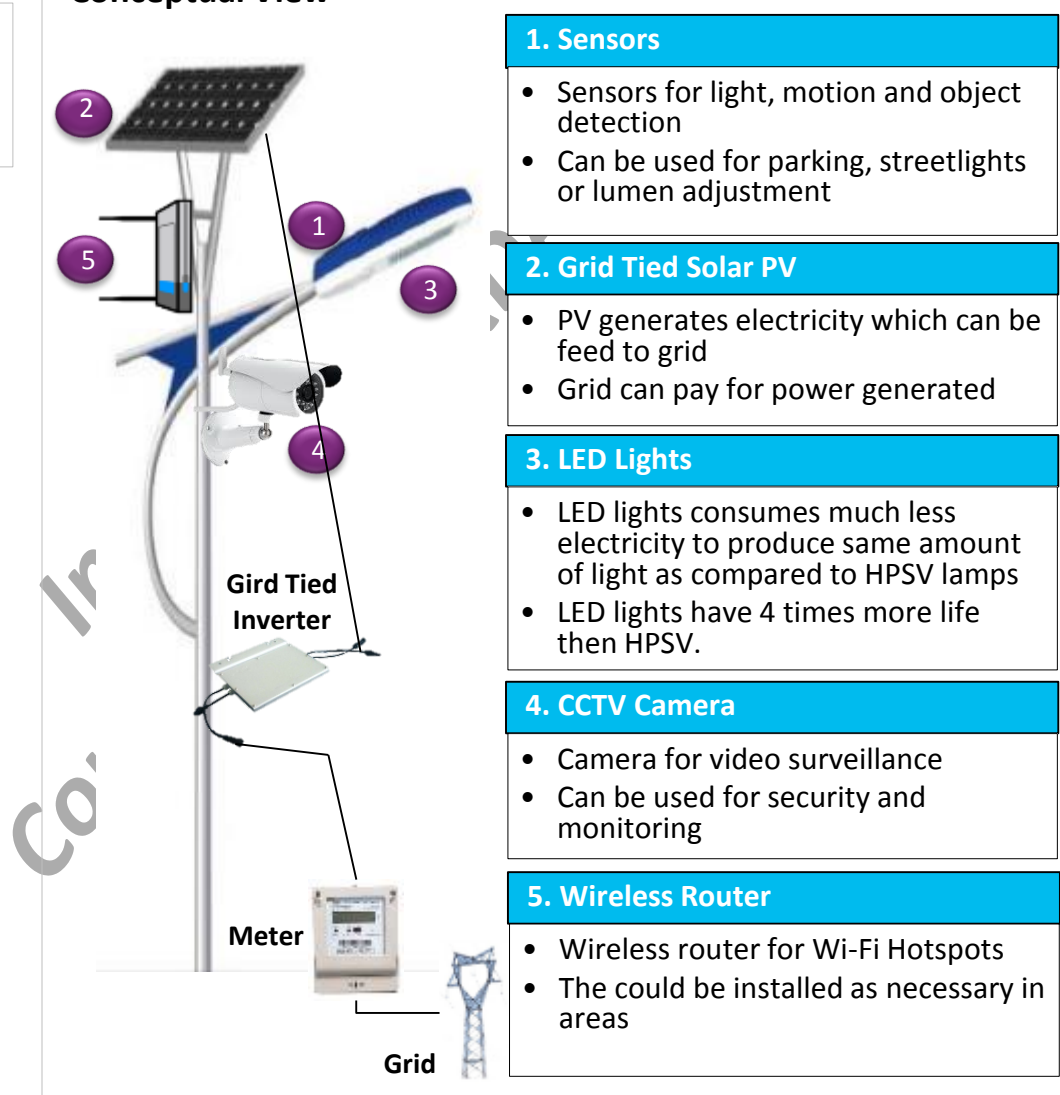
- Differing illumination levels may cause accidents
- Reliance may not agree to purchase the solar power generated and supplied back to the grid
- Panel needs to withstand the wind pressure and be cleaned on daily basis to ensure generation performance.

To address the lighting needs Sensor based lighting control with or without Solar panel options are evaluated

Solution Options

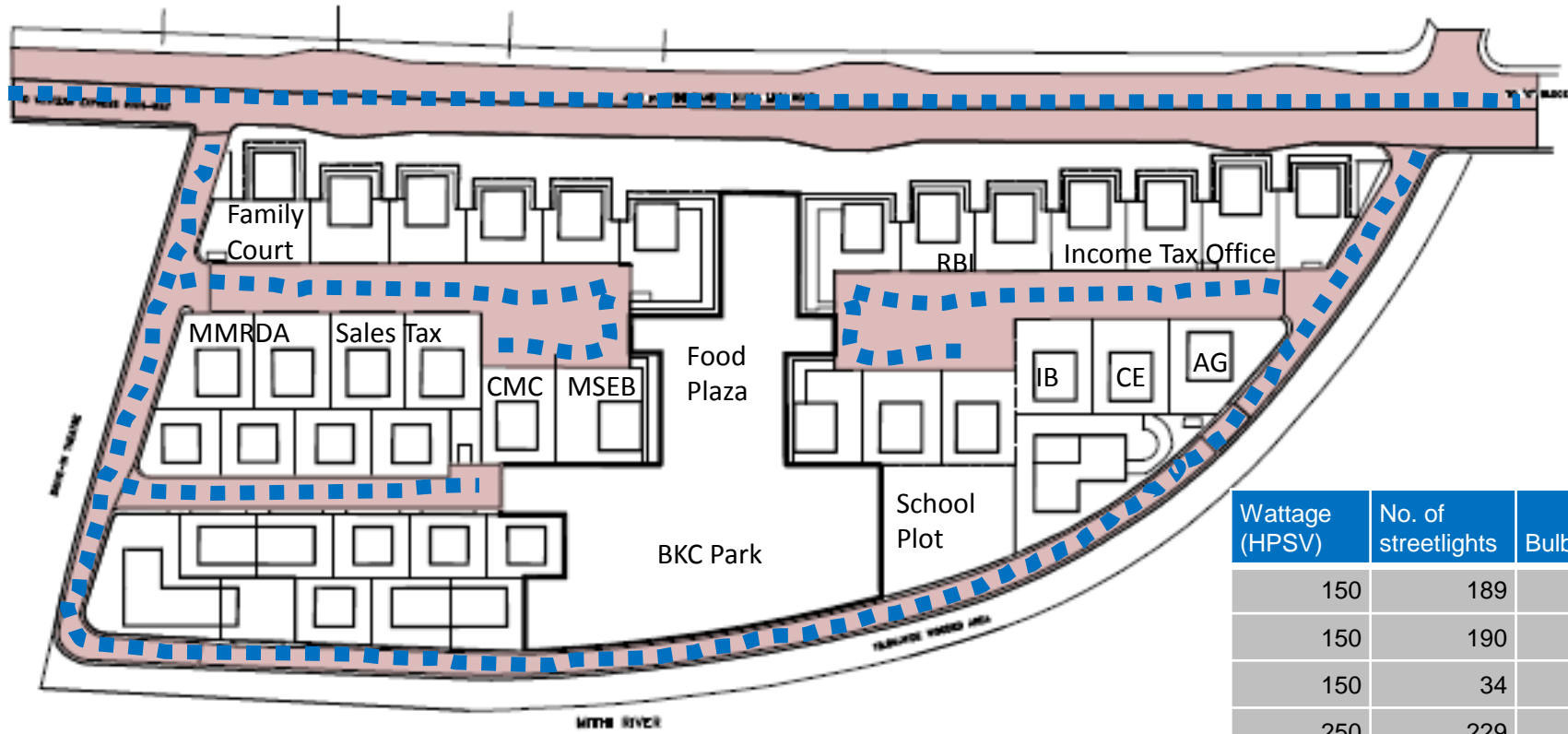
- Sensor based lighting control
- Sensor based lighting control + Grid Tied Solar PV

Conceptual View





Location Analysis – E Block



Wattage (HPSV)	No. of streetlights	Bulbs	Total
150	189	1	189
150	190	2	380
150	34	3	102
250	229	1	229
250	168	2	336
250	21	3	63
250	3	4	12
70	7	2	14
	841		1325



Location Analysis – G Block



Wattage (HPSV)	No. of streetlights	Bulbs	Total
150	189	1	189
150	190	2	380
150	34	3	102
250	229	1	229
250	168	2	336
250	21	3	63
250	3	4	12
70	7	2	14
	841		1325



Aesthetics of Solar Panels for Streetlights

Conventional Designs



Modern Designs



Indica
Copyright- M



Advanced video analytics solution will help security agencies spot incidents, respond quickly, and gather evidence

Solution Details

- **Smart surveillance** consists of **90 cameras** overlaid with **video analytics** that analyze the feed supplied by the cameras in and **point out anomalies real time**.
- The **video analytics server** will process the information and **display the outcomes** in the **command center**.
- **Auto traffic monitoring, crowd counting, people and object recognition, Street furniture theft, left baggage identification** etc. possible with smart Surveillance which would **augment existing security measures**

Benefits

- Video Analytics will provide **proactive threat detection**
- Help in **reducing the street furniture theft**
- Help security agencies **spot incidents, respond quickly, and gather evidence**
- **Improve operations and effectiveness:** Detected events are **automatically analyzed**, and aggregated into **meaningful business alerts**, enabling the Operation Centre to respond in a quick and efficient way

- There are currently about **ten security cameras in the BKC** area installed at important junctions
- The raw feed is monitored by the **police**
- **Mumbai CCTV initiative** has proposed the setting up of cameras in the BKC area. The footage will be monitored by the police

Impact





To address security issues it is proposed to install an advanced video analytics solution

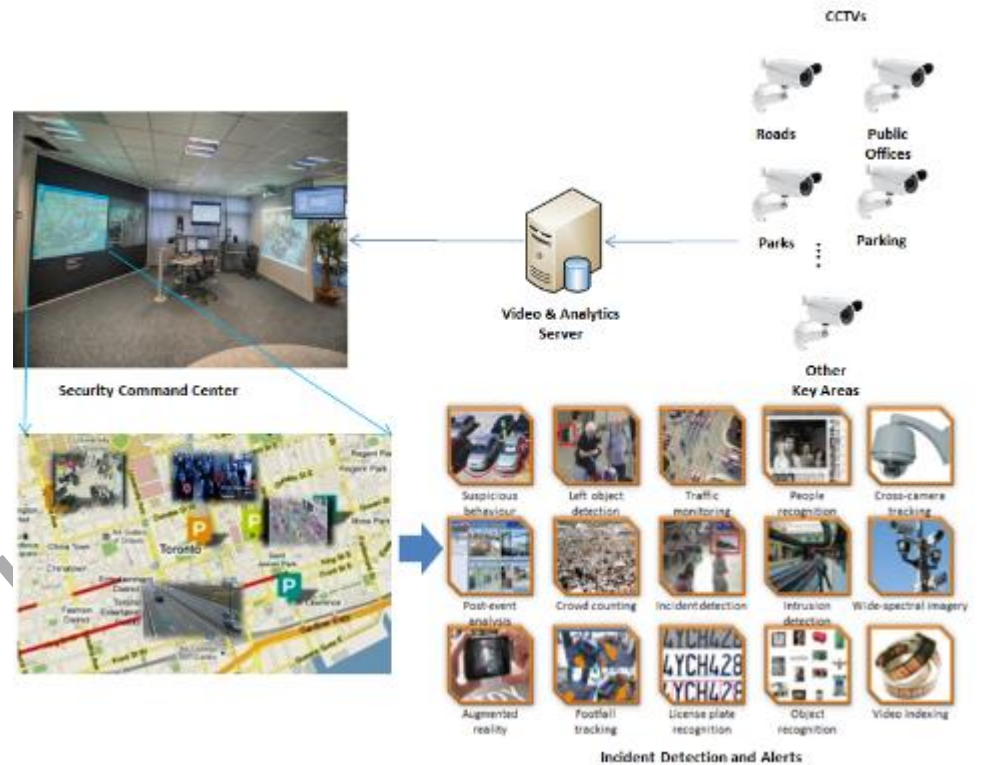
Solution Details

- Smart surveillance consists of **cameras** overlaid with **video analytics** that **analyze the feed** supplied by the cameras in **real time** and point out anomalies based on the instances programmed in it.
- The **video analytics** server will process the information and **display** the outcomes in the **command center**.
- Auto traffic monitoring, crowd counting, people and object recognition, Street furniture theft, left baggage** etc.. would augment existing security measures

Benefits

- Video Analytics will provide **proactive threat detection**
- Help in **reducing the street furniture theft**
- Help security agencies spot incidents, respond quickly, and gather evidence
- Improve operations and effectiveness: Detected events are automatically analyzed, and aggregated into meaningful business alerts, enabling the Operation Centre to respond in a quick and efficient way

Conceptual View

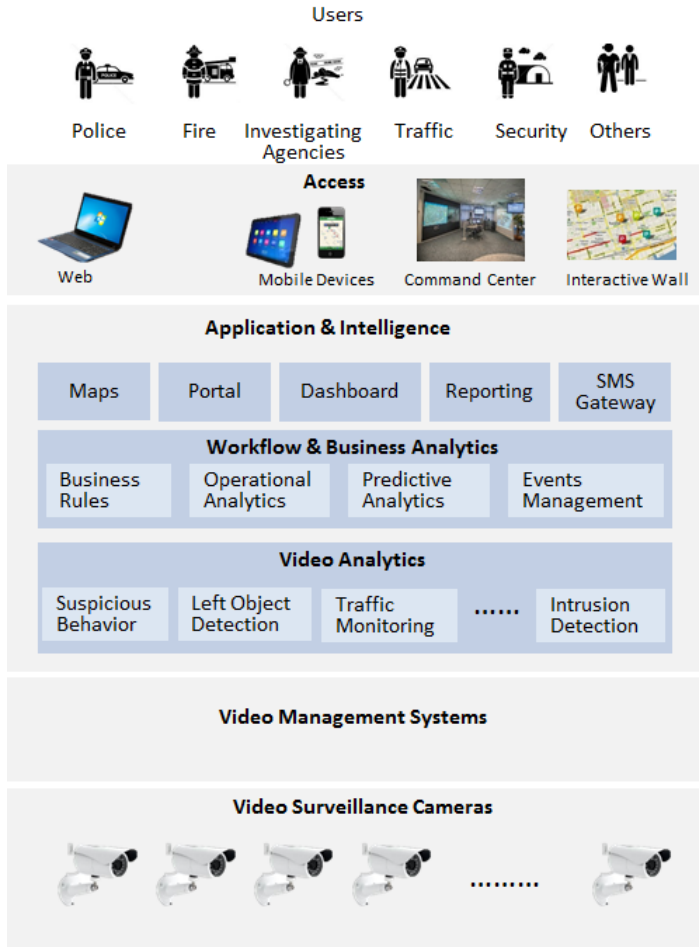


- These video services can **help monitor footfall, security incidents, detect left objects, report suspicious activities** etc..
- Video Feed** can be shared by **multiple agencies** like MMRDA, Police, Fire etc..
- SMS alert will alert respective agency in case of emergency situation

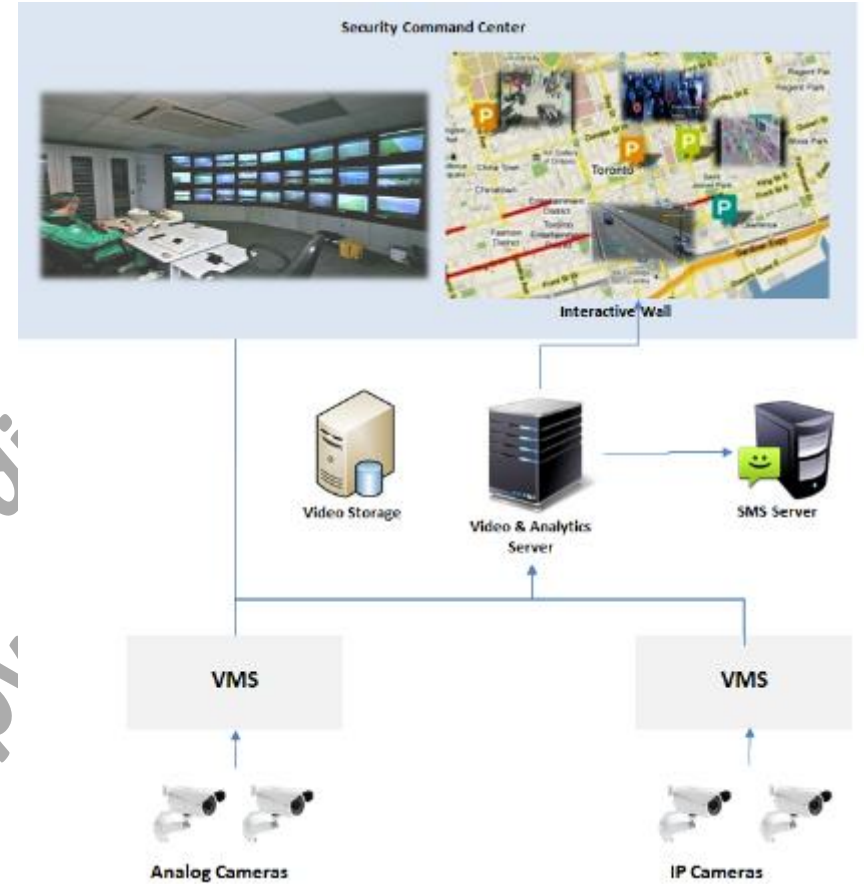
Video analytics architecture would enable integration of multiple VMS and both analog and IP cameras based analytics (Indicative)



Application

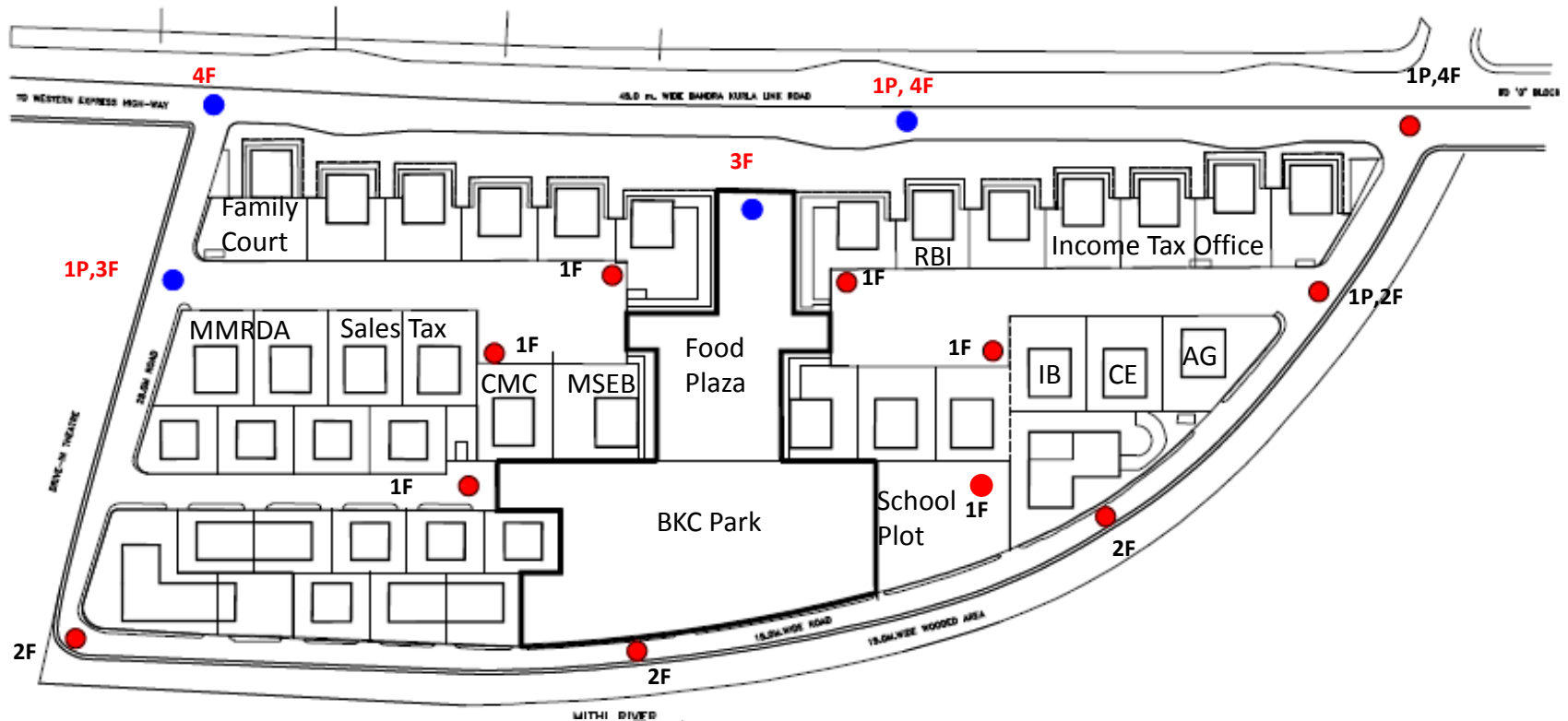


Infrastructure



Copyright Indicative

Location analysis is performed to identify the placement of security cameras in E- Block to ensure optimum video surveillance



Security Cameras suggested



Mumbai CCTV Security Cameras

Security cameras suggested:

Mumbai CCTV cameras:

Total cameras in BKC:

Total cameras suggested in this project: 2 PTZ + 18 fixed cameras
(not including Mumbai CCTV)

2 PTZ + 18 fixed cameras

2 PTZ + 14 fixed cameras

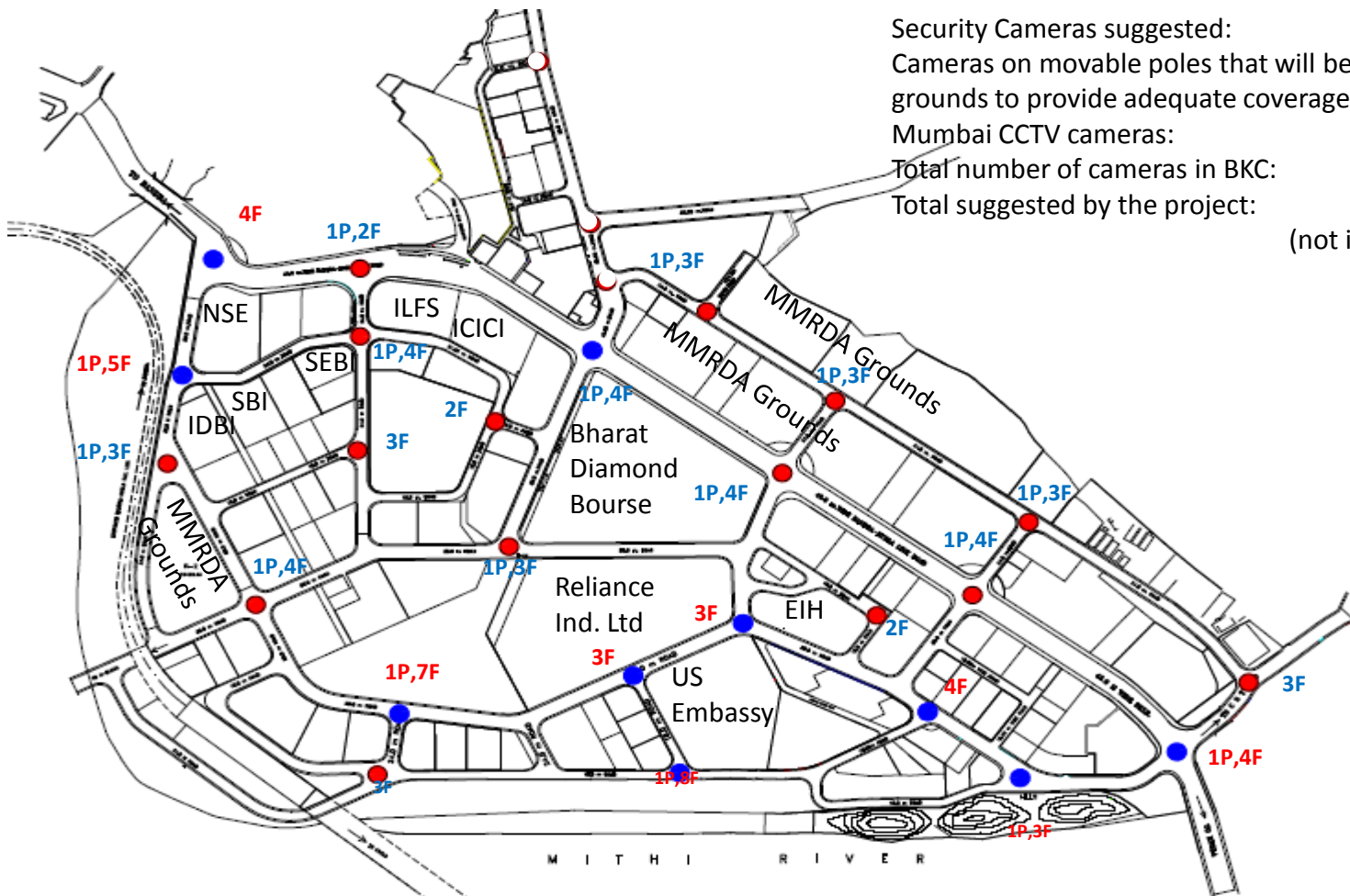
4 PTZ + 32 fixed cameras

Camera locations are decided based on field visit and office area coverage

We are proposing analytics for 20% of cameras. For Mumbai CCTV 1% of the cameras are proposed to have video analytics but it is unknown whether any BKC cameras will be among them

Similar analysis is done to identify the placement of security cameras in G-Block

Security Cameras suggested: 10 PTZ + 42 fixed
 Cameras on movable poles that will be reserved for MMRDA grounds to provide adequate coverage: 5 PTZ + 10 fixed
 Mumbai CCTV cameras: 6 PTZ + 41 fixed
 Total number of cameras in BKC: 21PTZ + 93 fixed
 Total suggested by the project: 15 PTZ + 52 fixed
 (not including Mumbai CCTV)



- Security Cameras suggested
- Mumbai CCTV Security Cameras

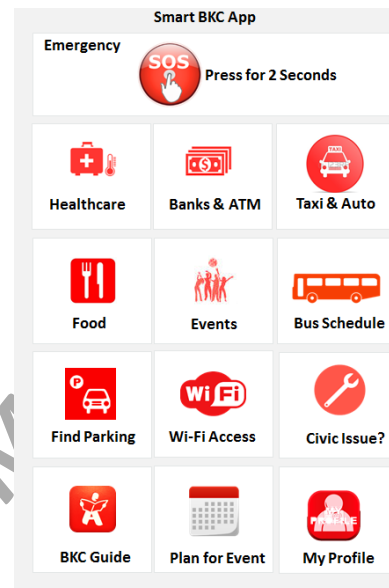
Camera locations are decided based on field visit and office area coverage
 We are proposing analytics for 20% of cameras. For Mumbai CCTV 1% of the cameras are proposed to have video analytics but it is unknown whether any BKC cameras will be among them



A smart BKC mobile application will be give single window access to all information required by citizens

Solution Details

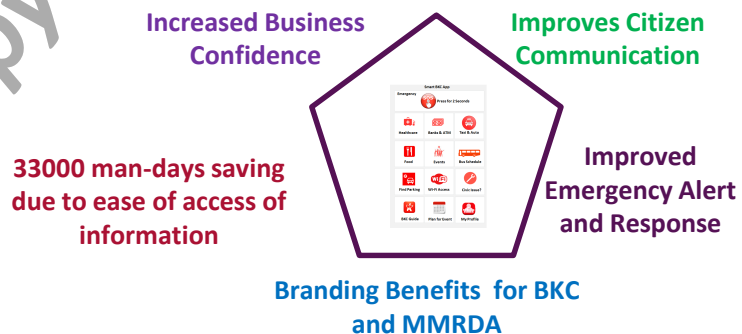
- Citizen Smart App provides **single window access** to all **BKC Guide, Events, Civic Issues**, smart city Applications like **Parking** from remote location
- **SoS button** for generating **alerts in any emergency** situation to **control center, police, hospital & family**
- SoS can also be triggered by clicking start button for 3 times
- Hybrid **HTML5 mobile application** will be available for **Web, iOS, Android, Blackberry & Windows** Platform



Benefits

- One Stop single window for all BKC related information
- **Promotion of brand MMRDA** as planning and development agency which **manages and disburses information efficiently**
- Centralized communication channel for **emergency services**
- MMRDA gains **better control on information** capture and outflow

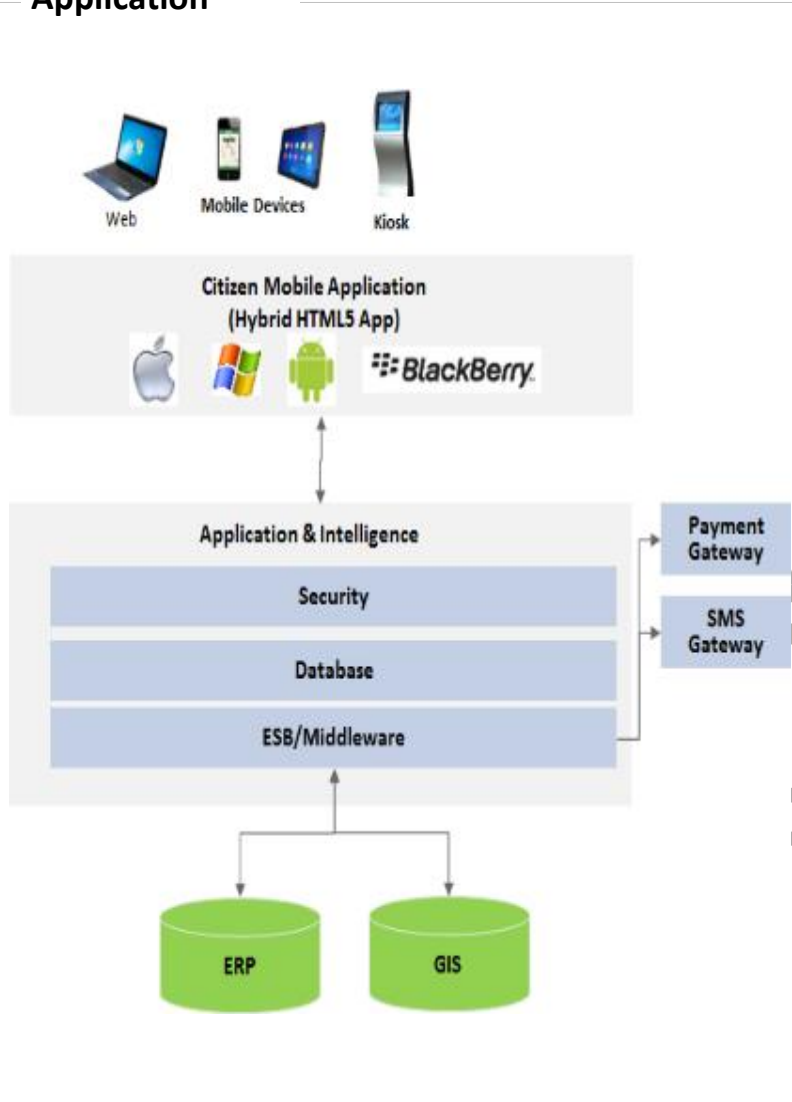
Impact



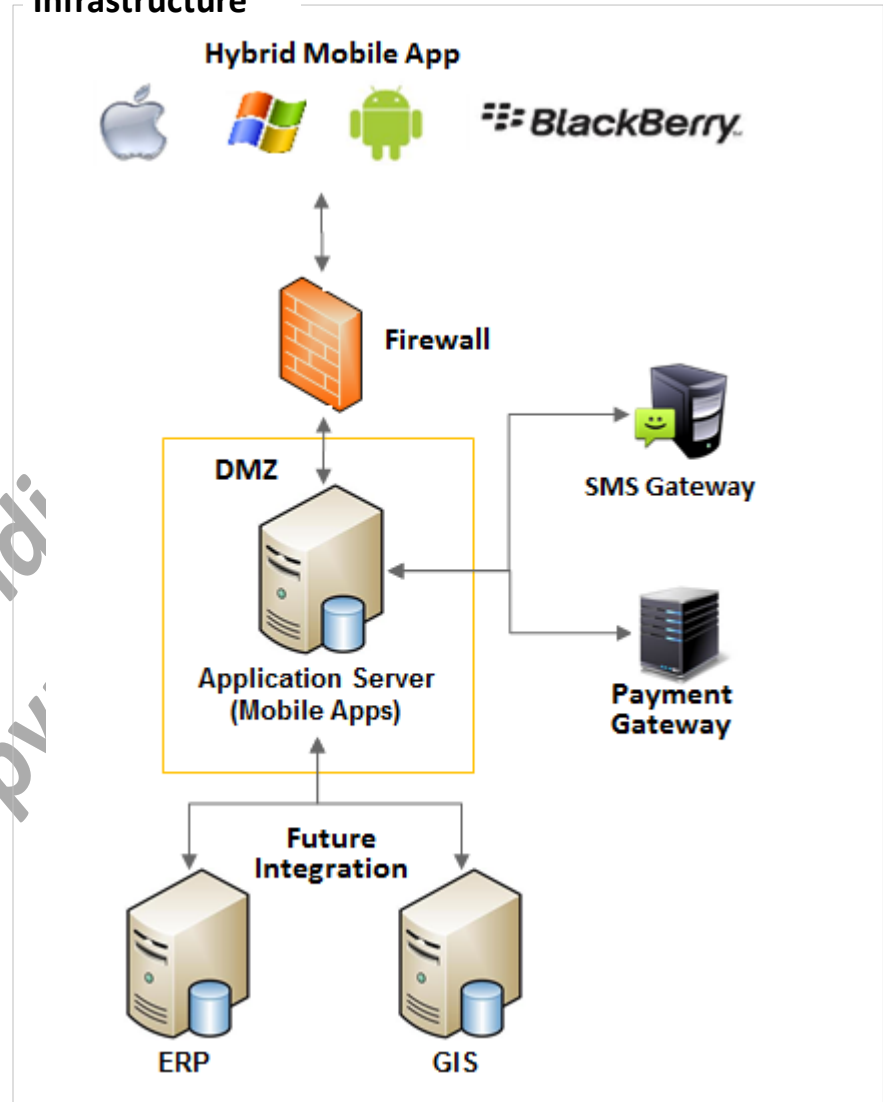
The technical architecture of the Citizen App will leverage the open App development platform which reduces the development effort for multiple platform (Indicative)



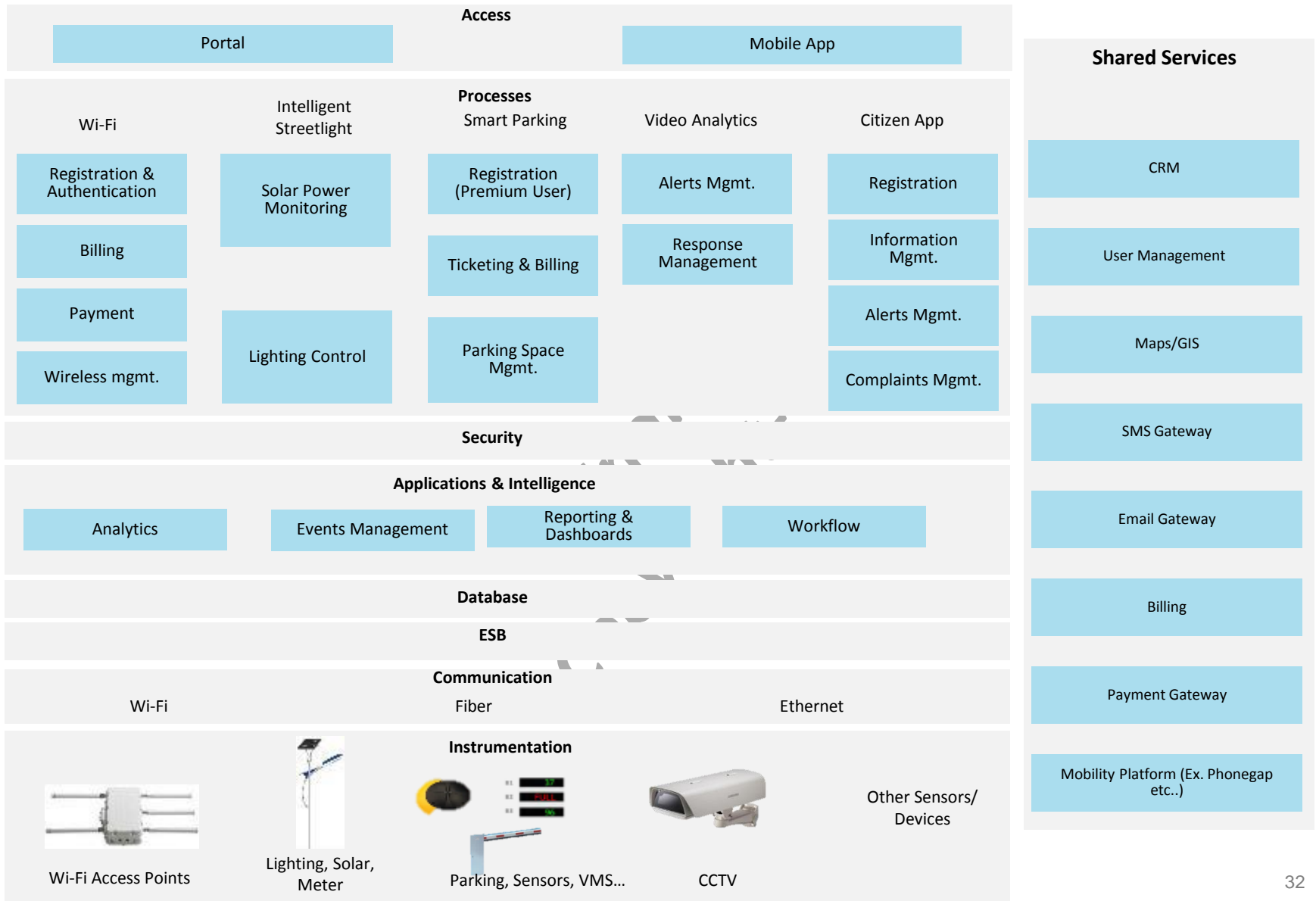
Application



Infrastructure



The design architecture for the combined solution will be based on an open platform



To achieve the vision for an intelligent BKC it is recommended that MMRDA implements all five initiatives as part of phase 1 – this will improve the quality of life for stakeholders of BKC



Wi-Fi

Smart Parking

The consolidated solution is beneficial to stakeholders from a Use case perspective



Intelligent Streetlights

Video Analytics

The consolidated solution is financially self sustainable in the long term



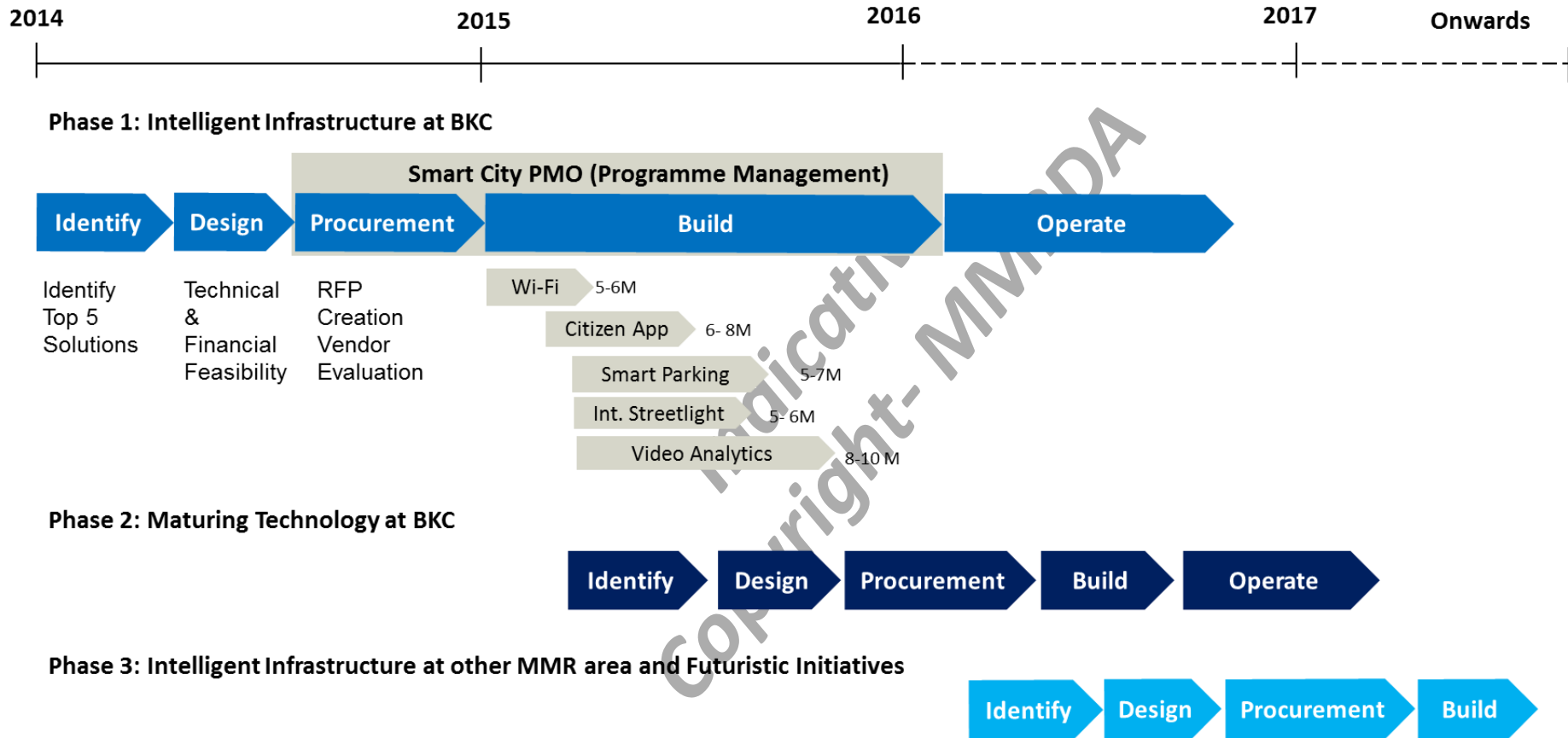
Citizen App

Use of combined architecture ensures seamless experience and synergetic cost saving opportunity

AFTER



To achieve the vision a 3 phased approach is defined – Installation of intelligent infrastructure being the 1st phase- Indicative





Once phase 1 solutions have been implemented additional initiatives can be build upon the existing capabilities

Wi-Fi	Smart Parking	Intelligent Streetlight	Video Analytics	Citizen Mobile Application
<ul style="list-style-type: none"> ▪ BKC Wide Wi-Fi ▪ Communication Backbone for Parking Sensors, CCTVs, Kiosks 	<ul style="list-style-type: none"> ▪ On Street, Open and In Door Parking ▪ Parking Guidance App ▪ Parking Space Management ▪ Parking Reservations 	<p>Lighting</p> <ul style="list-style-type: none"> ▪ Light & Motion Sensor <p>Solar</p> <ul style="list-style-type: none"> ▪ 200 kw Grid Tied Solar PV 	<ul style="list-style-type: none"> ▪ 50 new cameras to cover entire BKC ▪ Integration with Mumbai CCTV ▪ Command Center at MMRDA and BKC Police St. 	<ul style="list-style-type: none"> ▪ BKC Information ▪ Key Contacts ▪ Citizen Involvement Mobile App ▪ Kiosks
<p>Extend for more Smart City Apps</p> <ul style="list-style-type: none"> ▪ Air Pollution Sensors ▪ Smart Meter (Electric/Water/Gas) ▪ Water Quality Meters ▪ Flood Sensors 	<ul style="list-style-type: none"> ▪ EV Charging Stations ▪ EV Charging Station Locator ▪ Differential Parking Charging 	<p>Lighting</p> <ul style="list-style-type: none"> ▪ LED Retrofit Lighting <p>Solar- expand to 1 MW</p> <ul style="list-style-type: none"> ▪ Solar PV on Buildings (Terrace and Façade) ▪ Solar PV on Bus Stops 	<ul style="list-style-type: none"> ▪ Extend Command center at MMRDA to City Command Center ▪ Feed to Transportation Planning 	<ul style="list-style-type: none"> ▪ Citizen Involvement in Planning ▪ Citizen Services -GIS and ERP Integration

Thank You

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