Smart city proposal – KOCHI

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CONTENTS

❖ SMART CITIES MISSION - OVERVIEW
❖ KOCHI- SMART CITY PROPOSAL
Smart city

- Smart solutions for basic infrastructure and services
- Planned Development
- Efficient Infrastructure
Objectives of Smart city mission

- Provide Basic infrastructure
- Improved quality of life
- Clean and sustainable environment
- Apply Smart Solutions
- Set examples to be replicated both within and outside the Smart City and catalyze the creation of similar Smart Cities.
Smart Cities Mission Strategy

- Development Strategy
  - Area Based Development
  - Pan-city initiative

- Selection of Cities
  - Intra State and Inter-state Challenge

- Funding Pattern
  - GoI Grand: Rs.500 cr
  - State + ULB: Mini Rs.500 cr
  - Other sources- Convergence, PPP etc

- Implementation through SPV
KOCHI- Smart City Proposal
<table>
<thead>
<tr>
<th>Project Area</th>
<th>KMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical area</td>
<td>94.88 sqkm</td>
</tr>
<tr>
<td>Population</td>
<td>6,020,46</td>
</tr>
<tr>
<td>Literacy</td>
<td>85.6%</td>
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</table>
# SWOT

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique Geography and Location</td>
<td>Land availability constraints</td>
</tr>
<tr>
<td>HDI and social indicators</td>
<td>Differential service levels across the city</td>
</tr>
<tr>
<td>Clean and sanitised city</td>
<td>Constrained road network</td>
</tr>
<tr>
<td>Port and Airport infrastructure</td>
<td>Poor walkability and street safety</td>
</tr>
<tr>
<td>Growing IT and services industry</td>
<td>Inefficient integration of multi-modal transport systems</td>
</tr>
<tr>
<td>History of successfully executed</td>
<td></td>
</tr>
<tr>
<td>Signature Projects</td>
<td>Over-reliance on Grants</td>
</tr>
<tr>
<td>Tourism hotspot and heritage</td>
<td>Outward migration of educated population</td>
</tr>
<tr>
<td>Active Citizen Engagement</td>
<td></td>
</tr>
<tr>
<td>Inclusive and Gender-sensitive development</td>
<td></td>
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</tbody>
</table>
## SWOT

<table>
<thead>
<tr>
<th>OPPORTUNITY</th>
<th>THREAT</th>
</tr>
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<tbody>
<tr>
<td>Potential for multi-modal mobility</td>
<td>Increase in private vehicles</td>
</tr>
<tr>
<td>Kochi Biennale</td>
<td>Climate change</td>
</tr>
<tr>
<td>Potential for development of pristine open spaces around canals</td>
<td>Escalating cost of inputs to infrastructure creation</td>
</tr>
<tr>
<td>Leverage the social base to expand employment generation</td>
<td>Administrative Difficulties in Land Acquisition</td>
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</table>
Key sectors identified

- URBAN TRANSPORTATION AND MOBILITY
- SOLID WASTE, SEWERAGE MANAGEMENT, REJUVENATION OF WATER BODIES ESPECIALLY CANALS
- PUBLIC SPACES/OPEN SPACES
- ECONOMIC OPPORTUNITY
- INTELLIGENT GOVERNMENT SERVICES
“To transform Kochi into an inclusive vibrant city of opportunities with efficient urban services, sustainable growth and ease of living”
Goals

- CONNECTED AND ACCESSIBLE CITY
- A CITY WITH VIBRANT IDENTITY
- CLEAN, GREEN AND HEALTHY CITY
- AN INCLUSIVE SMARTLY GOVERNED CITY
Area Based Development

Option 2: Fort Kochi – Mattancherry

Area of direct impact: 6.9 km square

Population benefitted: 100,000

Land use:
1. Mattanchery: Predominantly residential (Urban poor population)
2. City Centre area: Predominantly Mixed

Significance of area:
- Reflects Heritage value
- Houses the commercial hub of Kochi
- Affected population includes large population of EWS
- Poor quality of urban services in Fort Kochi – Mattanchery area
- Scope for holistic development

Options considered for Area Based Development

Option 1: Transit Oriented Development between Vyttila Mobility Hub and Edapally via Metro Corridor (MG Road)

Area of direct impact: 500m on either side of 25km main corridor

Population affected: approx. 75,000

Land use: Residential + Mixed along corridor

Significance of the area:
- Covers important junctions and nodes of the city
- Important city spine
- Scope for transit oriented growth and commercial development
- Along the Metro Corridor

<table>
<thead>
<tr>
<th>Selection Parameter</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
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<tbody>
<tr>
<td>Retrofit of parts of West Kochi and Central City</td>
<td>15</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>TOD around Terminals including Vytilla, Edapally, MG Road</td>
<td>10</td>
<td>10</td>
<td>5</td>
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<tr>
<td>Integrated Intelligent Multi Modal Transport plan linking major modes from Fort Kochi to Edapally.</td>
<td>15</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Alignment with Citizen Priorities and City Vision – 20%</td>
<td>15</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Considerable Economic and livelihood impact – 15%</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Inclusiveness – 15%</td>
<td>15</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Maximum impact wrt number of beneficiaries – 20%</td>
<td>15</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Innovative and building on the unique strengths of the city – 15%</td>
<td>15</td>
<td>8</td>
<td>12</td>
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<tr>
<td>Readiness of plan/ projects – 15%</td>
<td>15</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Area Score</td>
<td>85%</td>
<td>55%</td>
<td>51%</td>
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</table>
SIGNIFICANCE OF FORT KOCHI - MATTANCHERY

- History and Image
- Heritage Value
- Canals and Green Cover
- Tourism
- Pluralistic Culture

ISSUES FACED BY FORT KOCHI - MATTANCHERY

Loss of Character
1. Dilapidated Historic Buildings
2. Poor Heritage Management and Maintenance
3. Lack of Public Amenities for Tourists
4. Lack of strict Development Guidelines

 Poor Standard of Living
1. Dilapidated and Poor Housing structures
2. Absence of Sewerage System
3. Discontinuous and Limited Water Supply
4. Poor Sanitation and Health
5. Lack of access to Quality Education

Mobility
1. Narrow Discontinuous Roads
2. Poor quality Road surfaces
3. Last mile connectivity issues

Urban Form
1. Highly Dense Residential Area - Mattanchery
2. Degradation of Canals and Green Cover
3. Not Compact - Poor access to basic amenities

Safety and Security
1. Petty Crimes
2. Drug Abuse

SIGNIFICANCE OF KOCHI CITY CENTRE

- Major Transportation Grid
- Heritage Value
- City Promenade - Marine Drive
- Institutional Hub
- Commercial Hub

ISSUES FACED BY KOCHI CITY CENTRE

Mobility
1. Poor Traffic Management
2. Poor quality Road surfaces
3. Large number of intersections
4. Poor Public Transport
5. Last mile connectivity issues
6. Not pedestrian friendly

Standard of Living
1. Lack of Sewerage System
2. Inconsistent quality of water
3. Poor solid waste management systems
4. Lack of Sanitation and Public Amenities

Urban Form
1. Haphazard Development
2. Extreme Lack of Open Spaces
3. Degradation of Canals and Green Cover
4. Lack of Dedicated Walkways

Safety and Security
1. Transport related safety issues
2. Lack of surveillance and monitoring
3. Delayed Emergency Response

RELEVANCE OF AREA SELECTION FOR SMARTCITY PROPOSAL

The selected area has potential to be developed in a wholistic and replicable manner.
West Kochi (Fort Kochi - Mattanchery) is characterised by multi-cultural settlement patterns, heritage hotspots, settlements of urban poor, poor infrastructure levels and a narrow road network.
The City Centre is characterised by commercial areas, mixed land use development, multimodal transport nodes and higher quality of life.
The water sheet connecting the 2 areas, brings about a unique setup for development of an area based Smartcity Proposal.
## Demographics – Fort Kochi – Mattancherry – Central city area

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<tr>
<td>Fortkochi</td>
<td>355</td>
<td>2,578</td>
<td>72</td>
<td>10,279</td>
<td>1106</td>
<td>10,739</td>
<td>11,333</td>
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<tr>
<td>Kalvathy</td>
<td>94</td>
<td>1,652</td>
<td>206</td>
<td>7,814</td>
<td>1107</td>
<td>8,205</td>
<td>8,615</td>
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<tr>
<td>Earaveli</td>
<td>43</td>
<td>1,282</td>
<td>367</td>
<td>6,425</td>
<td>1115</td>
<td>6,746</td>
<td>7,084</td>
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<tr>
<td>Karippalam</td>
<td>98</td>
<td>2,003</td>
<td>222</td>
<td>8,882</td>
<td>1037</td>
<td>9,326</td>
<td>9,792</td>
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<tr>
<td>Mattanchery</td>
<td>153</td>
<td>2,227</td>
<td>164</td>
<td>10,144</td>
<td>1015</td>
<td>10,651</td>
<td>11,184</td>
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<tr>
<td>Ekm South</td>
<td>385</td>
<td>1,741</td>
<td>38</td>
<td>5,941</td>
<td>1082</td>
<td>6,832</td>
<td>7,857</td>
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<tr>
<td>Ekm Central</td>
<td>394</td>
<td>2,131</td>
<td>55</td>
<td>8,734</td>
<td>1023</td>
<td>10,044</td>
<td>11,551</td>
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<tr>
<td>Ekm North</td>
<td>204</td>
<td>1,140</td>
<td>53</td>
<td>4,414</td>
<td>1091</td>
<td>5,076</td>
<td>5,838</td>
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<tr>
<td>Floating Pop +</td>
<td></td>
<td></td>
<td></td>
<td>40,000</td>
<td></td>
<td>51,627</td>
<td>62,984</td>
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<td>Indirect</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Beneficiaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1,726</strong></td>
<td><strong>14,754</strong></td>
<td><strong>-</strong></td>
<td><strong>100,000</strong></td>
<td></td>
<td><strong>119,300</strong></td>
<td><strong>136,238</strong></td>
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Source: Census 2011
Key Issues in Central City

- Narrow roads, traffic bottlenecks and congestion
- Limited sewerage access
- Polluted canals
- Limited open spaces, parking facilities
- Fragmentation of land parcels and haphazard development
- Lack of land availability for new development
Key issues in West Kochi

- POOR HOUSING CONDITIONS
- LIMITED ACCESS TO BASIC SERVICES
- NARROW ROADS, LACK OF PEDESTRIAN FACILITIES AND ENCROACHMENTS
- POLLUTED CANALS/ WATER BODIES
- LACKS SCIENTIFIC SOLID WASTE MANAGEMENT
- LACKS SAFE & SECURE ENVIRONMENT FOR TOURISTS
Key Components of ABD

1. SEAMLESS URBAN MOBILITY
2. RECONSTITUTION OF URBAN FORM & REJUVENATION OF NATURAL ELEMENTS
3. SMART URBAN SERVICES AND INCLUSIVE DEVELOPMENT
4. REVIVAL OF IDENTITY AND CULTURE
5. EMBEDDED SMART SOLUTIONS
1. SEAMLESS MOBILITY AND INTELLIGENT TRANSPORTATION NETWORK
Achieving seamless and safe mobility for pedestrians, bicyclists, and vehicles via a green and smart transportation network, improved multi-modal transportation linkages, with smart last mile connectivity, world class roads, non-motorised and pedestrian friendly streets.

2. RECONSTITUTION OF URBAN FORM
Reviving the cities natural elements through rejuvenation of water canals and existing parks, creation of plazas and walkways along canals and green pockets, ensuring a greener tomorrow for Kochi.

3. REVIVAL OF IDENTITY AND CULTURE
Reviving the image of Fort Kochi as the Cultural and Heritage capital and that of the City Centre as a Commercial Hub will help restore the city to its former glory. Smart brand building and redevelopment of key areas will prove to be vital in achieving this.

4. INCLUSIVE PLANNING
The city aims to achieve this by factoring in the needs of all its citizens belonging to various groups of society (vulnerable sections, differently abled etc.). Redevelopment of slum colonies ensuring access to quality basic services and amenities including education and health infrastructure is the goal. A barrier free environment will help transform Kochi into a sensitive city.
Seamless urban mobility

- ROAD-RAIL - WATERWAY LAST-MILE LINKAGE
- BOAT CONNECTIVITY
- NMT WITH ELECTRIC VEHICLE SYSTEM & PEDESTRIAN FRIENDLY WALKWAYS
- RE-DESIGNED ROAD NETWORK WITH NMT FACILITIES
Developing a smart multimodal network with last mile connectivity via affordable and green para-transit modes of commutation with Smart Bicycle sharing system

Enhanced water transport Infrastructure (Boats & Jetty redevelopment)

Transforming spinal roads into eco-friendly corridors equipped with footpath on either side and dedicated bicycle lane

Developing all secondary roads as pedestrian friendly with bicycle sharing

No-go zones for vehicles / complete pedestrianization

Enhancing walkability via connected pathways, FOBs, increased parks and green spaces and redevelopment of waterfront

Smart Parking and Smart Junctions

Barrier free city

Signage and Road markings

Towards a smarter Kochi...

Priority area: Seamless mobility and intelligent transportation network

Achieving seamless mobility via green and smart transportation network, improved multimodal transportation linkages, world class roads, non motorized and pedestrian friendly streets.
Urban Form and Rejuvenated natural elements

- Transit-oriented compact mixed use development
- Re-development to free land for open and public spaces
- Rejuvenating canals with green walkways
- Improved landscaping/citizen amenities at Nehru Park
Towards a smarter Kochi...

Rejuvenation of city canals
Redevelopment of existing parks and open spaces
Protection of green cover
Creation of green walkways, plazas, etc
Compactness: Mixed land use – Transit Oriented Development along all major roads

Reviving the cities green and glory through rejuvenation of water canals, existing parks, creation of plazas, walks along canals and green pockets, ensuring a greener tomorrow for Kochi.
Smart urban services

- 24*7 WATER SUPPLY
- ACCESS TO TOILETS
- 100% SEWERAGE / SEPTAGE MANAGEMENT
- EFFICIENT SWD NETWORK INTEGRATED WITH CANALS
- DUCTING/UNDERGROUND CABLING
- HOUSING FOR ALL
Towards a smarter Kochi...

Heritage and Tourism Master plan

Heritage Trail

Cultural centre for promotion of local art forms

Smart Branding

Smart amenities for tourists

Reviving the image of Fort Kochi as the cultural and heritage capital and that of the city centre as a commercial hub will restore the city to its former glory. Smart building and redevelopment of key areas will prove to be vital in achieving this.
Identity and culture elements:

- REVIVAL OF HERITAGE - Fort Kochi-Mattancherry
- MARKET REDEVELOPMENT
- REJUVENATION OF PARKS AND PUBLIC SPACES, ETC.
- BRANDING KOCHI - BIENNALE
Towards a smarter Kochi...

**Priority Area: Reviving Identity and Culture**

**ERNAKULAM MARKET**

- **Reconstitution of shops and stalls**
- **Transforming defunct market jetty into Market Canal Square**
- **Redevelopment of Ernakulam Market**
- **Pedestrianization of Broadway**

**Section of proposed footpath - Broadway**
Embedded Smart Solutions

- WIFI HOTSPOTS AND KIOSKS FOR PUBLIC SERVICES
- SMART TRAFFIC SIGNAL MANAGEMENT
- SMART METERING - WATER AND ELECTRICITY
- ENERGY EFFICIENT LIGHTING WITH MULTI-FUNCTIONAL SMART POLES
Streetlight system & smart pole

- SOLAR BASED STREETLIGHT SYSTEM
- INTEGRATED MULTI-FUNCTIONAL SMART POLE
  - Emergency response,
  - Traffic monitoring,
  - Intelligent street lamp
  - Waste dumping
  - Wifi hotspots
  - Bus information
Pan City Initiatives
Pan City Initiatives - 1

- Integrated delivery of Government-to-Citizen (G2C) services using *Smart Card* and *mobile platforms* in two phases

**Phase 1:** Extension of SMART Card payment solution from Transportation to all City Services

**Phase 2:** Development of an integrated mobile platform for Citizen Engagement and ubiquitous delivery of all G2C services
Kochi App

Transport Services
• Live train schedule
• Route map
• Fare details
• Integrated Mobile ticketing
• Location sharing

City Information
• City calendar
• Weather forecast
• Tourist destinations
• Merchant Directory

Public services
• Emergency alerts
• Hospital speed dials
• Utility bill payments
• Suspicious activity reporting

M-commerce
• Cab bookings
• Click & Collect
• Mobile recharge
• Bus/ train ticketing
• Hyper Local

Infotainment
• Free Wifi
• Music/ video streaming
• Live cricket scores
• Restaurant search

Value added services
• Wallet services
• Concierge services
• Shared cab services
• Tourism services
Pan-city initiative -2

IMPLEMENTATION OF A INTELLIGENT WATER MANAGEMENT SOLUTIONS

- City-wide 24x7 supply covering
  - GPS/GPRS-enabled meters for city-wide water connections to capture automated meter and citizen data on a centralized location
  - Efficient metering billing and collection solutions
  - Centralized command and control centre backed by efficient ICT infrastructure
Project Budget

- TOTAL PROJECT COST – Rs 207.6 Mn
  - Central Share – Rs 50Mn
  - State and ULB Share – Rs 57.7Mn
  - Convergence of schemes – Rs 50.5 Mn
  - Loans/PPP/External fund – Rs 49.4 Mn
Potential areas of Collaboration

♥ TECHNOLOGICAL PARTNERSHIP
  ▪ Integrated Multi-modal Transport Network
  ▪ Heritage Conservation & Management
  ▪ Non Motorised Transport System
  ▪ Urban Form etc

♥ FUNDING PARTNERSHIP
  ▪ Loans
  ▪ Private investments
Thank You