Reimagining Fort Kochi

Wayfinding Signage Manual
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INTRODUCTION
1. About the Initiative

The Transformative Urban Mobility Initiative (TUMI) is the leading global implementation initiative on sustainable mobility formed through the union of 11 prestigious partners. The objective of TUMI is to accelerate the implementation of sustainable urban transport development and mitigation of climate change by mobilizing finance, building capacities, and promoting innovative approaches.

The ‘Reimagining Fort Kochi’ project developed by WRI India in collaboration with Kochi Municipal Corporation (KMC) got selected as one of the top 10 shortlisted projects of the TUMI Challenge for the year 2019-20. The project aims to improve the quality of space, mobility and accessibility through infrastructure, management, and provision of information. Fort Kochi and Mattancherry area in Kochi were chosen as the pilot area to demonstrate this through 2 main components.

- Improving accessibility through infrastructure at RoRo jetty node using tactical urbanism processes
- Improving accessibility through information using contextualized wayfinding signages

Kochi Ithile wayfinding portal identified under the Transformative Urban Mobility Initiative (TUMI) Challenge and SMART-SUT project was jointly implemented under the leadership of Kochi Municipal Corporation (KMC), Centre for Heritage, Environment & Development (C-HED), Cochin smart mission limited (CSML); in collaboration with TUMI partner World Resources Institute India (WRI) India & SMART SUT project of GIZ India. The pilot project was funded by German Federal Ministry of Economic Cooperation and Development and contributes to the Indo-German Green Urban Mobility Partnership.

2. About the Document

This document aims at providing insights into the detailed processes involved in the design, development, and installation of wayfinding signages, along with drawing learnings from Kochi. This document will help cities derive a methodology suitable to their context and aims to become a go-to manual for any city that envisages to introduce wayfinding signages to their system.

The document is divided into two parts

- **Part A – Signage Development**: Details the step-by-step processes to be followed while developing wayfinding signages for any city and could be a reference for city authorities while undertaking a similar project in their cities.
- **Part B – Design Guidelines**: Graphic design guidelines, and structural and material specifications to be considered while designing signages. This is a reference for designers involved in design development.

3. Wayfinding Signages

3.1. What are Wayfinding signages?
Wayfinding signages are signages that help people orient themselves in a physical space. It ensures easier navigation by directing them from one point to another with the help of simple information such as the locations, directions, warnings etc.

There are four types of wayfinding signages:

**Directional:** It helps people get to where they are going through information that guide them one step at a time, primarily using arrows.
Example: Junction signage, directory signage, floor markings etc.

**Informational:** Informational signage pertains to the overall facilities/information people need while navigating. They may be in the form of signs and symbols that are universally understandable at a glance.
Example: Facilities and amenities (free Wi-Fi, washrooms, exits), business information (address, numbers) etc.

**Identification:** Identification is the most common type of wayfinding signage which let people know when they have arrived at their destination.
Example: Landmark signage, door plaques and departmental markers

**Regulatory:** Regulatory signage is a proactive form of wayfinding that focuses on safety and liability concerns and sets boundaries on what is, and isn’t, acceptable in a facility. It is used to establish and reinforce rules, safety standards and privacy expectations.
Example: No Smoking, High Voltage, No Parking, No Entry etc.

3.2. What are map based wayfinding signages for cities?

They are signages with easy to read and visually appealing maps that provide information on streets, landmarks, transit networks and various other facilities in the area. They intend to create better accessibility, improve navigation, and enhance walkability in a city—especially for pedestrians.
3.3. Why map-based signages?

Maps provide a detailed picture of an area versus just the name of the location and directions as on conventional signages. This facilitates easier navigation of pedestrians by helping them

▶ Better orient themselves and understand the spatial organization of the area.
▶ Better plan their trip with an option to choose a route that suits them the best.
▶ Get a sense of distance to their destination and decide on what mode to choose.
▶ Have an idea on what falls on their way for an enhanced walking experience.

3.4. How does it benefit the city and the people?

Wayfinding signages benefit the city and its people by:

▶ Improving the legibility of the city to ensure people, especially visitors/tourists, are encouraged to feel safe and can explore the city better
▶ Ensuring inclusivity through readily available information accessible to all.
▶ Establishing walking and cycling as a reliable and quick method for moving around the city for shorter trips.
▶ Helping users develop “mental maps” of the city through progressive disclosure of information, which is a spatial representation of the place in terms of its locations, landmarks, geography etc. kept in mind.
▶ Promoting active mobility and thereby ensuring increased health benefits and leisure opportunities.
The overall process of developing and implementing wayfinding signages involves four stages:

**Stage I:**
- **City Appraisal**
  - Determining the need and potential
  - Defining principles
  - Identifying areas of intervention
- **Proposal Formulation**
  - Determining the potential of wayfinding signages through city appraisal to formulate the proposal and derive key principles.

**Stage II:**
- **Determining Information**
  - Determining information
  - Acquiring information
- **Determining Medium/Types**
  - Determining medium/types
  - Design detailing
  - Determining number and locations
- **Design Development**
  - Determining the kinds of signages and its variants and detailing out the design for each.

**Stage IV:**
- **Tendering and Vendor Selection**
  - Tendering and vendor selection
- **Manufacture, Implementation & Maintenance**
  - Manufacture
  - Implementation
  - Maintenance
  - Identifying the vendors, managing manufacturing and installation on ground, and ensuring its sustenance.

**STAKEHOLDER INCLUSION**

Sustainable mobility for a better future
www.transformative-mobility.org
5. Stage I – Proposal Formulation

A wayfinding signage proposal is formulated based on a thorough analysis of city’s existing wayfinding scenario and determining the right kind of signages that would add to its accessibility for an inclusive user group. This could be done through the following steps.

5.1. City appraisal

The first step is to understand the city in terms of its scale, mobility options, accessibility and walkability followed by analyzing the existing wayfinding infrastructure to understand how it caters to pedestrians and non-motorized transport (NMT) users.

Kochi, located on the south-western coast of India, is a vibrant cultural hub, which blends different natural landscapes (backwaters, canals and green cover). Public transport serves as the backbone of the city and includes metro, city buses, auto-rickshaws and ferry boats. With increasing willingness to shift towards sustainable mode choices, people are slowly adopting public transport along with cycling and walking.

Existing wayfinding infrastructure in the city is limited to location signages, direction signages and traffic regulatory signages – which are primarily for vehicles and rarely for pedestrians and public transport users. Lack of information on public transport and guidance for short trips make it difficult for people, especially new visitors, to navigate the city resulting in private vehicle dependence.

5.2. Determining the need and potential

Kochi city being an important commercial center of the state and a tourist destination has a significant inflow of people including migrants and domestic and international tourists. It is important to ensure the city is accessible to all of them by providing necessary infrastructure and improving its legibility. It is an added advantage that Kochi’s core areas are walkable in scale but at the same time it is disappointing that it lacks information that encourage people to walk. Considering the aspects of people’s willingness to shift, and the scale of the city, there is a high potential to shift people to walking and public transport if guided properly.

5.3. Defining Principles

Considering the existing scenario, need and potential, Kochi wayfinding signages were developed based on the following principles.

1. **Accessible**: Making the city accessible to all by all modes including walking, through provision of accessible information.

2. **Legible**: Engraining simple and easy to read maps which can help create an associative environment for the users.
3. **Continuity**: Ensuring continuity of movement by guiding people throughout their trip till destination through a network of signages

4. **Flexible**: Flexibility in design to be able to adopt to different on ground parameters.

5. **Equitable**: Providing localized information in international and local languages to cater to users of all age groups and economic background

5.4. **Identifying area of intervention**

Area of intervention is decided based on various factors and may vary depending on the context. In Kochi, Fort Kochi – Mattancherry has been chosen as the pilot area considering it is the historic center of the city. The area sees a high footfall of both tourists and locals and is a walkable scale of around 2km X 2km. This makes it a good test bed to demonstrate the wayfinding signages as its success here can eventually scale up to the rest of the city.
6. Stage II – Determining and Collating Information

Once the potential and need of the city is understood, the principles are defined and the area is finalized, the next step is to decide what information has to be included in the signages and gathering this information from various sources to create a comprehensive data set.

6.1. Determining information

Based on the major functions for which people navigate, and the infrastructure that facilitates and supports their easy movement, eight broad information layers were determined for the signages as given below and sub-layers were identified:

6.2. Acquiring information

Once the information layers are finalized, the same has to be acquired from various sources ranging from authorities to stakeholders on ground to create a consolidated data set. This information might largely be in different formats which may need to be refined and combined to use in the signages. Following are the various sources from which information could be gathered:

a. Authorities
   Public transport agencies (KSRTC, SWTD KMRL etc. in Kochi)
   Tourism department etc.

b. Site survey and documentation
   On-ground mapping of various facilities, attractions and important landmarks in the area.

c. Online sources
   Open sources like google maps, open street map etc.

d. Stakeholder consultations on ground
   Key persons from the area who can provide local information – historians, councillors etc.
While approaching the development of signage designs it is important to decide on the types of
signages first, based on the project intend and kind of information to be conveyed. Once decided
detailed designs may be developed for each with the support of technical experts.

7.1. Determining medium for information dissimination

The primary objective was to ensure easier navigation of pedestrians and public transport users for
which map-based wayfinding signages were found to be ideal. At the same time, being a tourist hub
Kochi had much more information beyond wayfinding that could be conveyed to its users, which
include attractions in the city, upcoming events, alerts etc. To incorporate these a combination of
physical and digital mediums was chosen to develop the following variants:

► a. Physical Signage
   These are printed signage panels with information on location, directions to nearest
   landmarks, and a wayfinding map which show where you are and all the attractions and
   facilities in a walkable radius of 500 meters. These are designed in two variants—Type A and
   Type B of widths 3ft and 2ft respectively, taking into account narrow streets and footpaths.

► b. Digital Signage
   These are signage panels with a touch sensitive screen, plugged in with an application that
   incorporates a digital version of wayfinding map along with other relevant information
   about the city.

► c. Application and website
   These are digital version of signages providing wayfinding information in the form of a map
   along with additional information such as places to visit, things to do, events, alerts etc. The
   application is designed in two variants - one for the mobile phones and the other for the
digital panels.
7.2. Design process

The design process includes the layout and detailed design of both the physical and digital panels, as well as the structural design and development of the website and associated application. These require specific expertise and was developed by a team of graphic designers, structural designers, data analysts and web developers.

- **a. Graphic design of panel**
  This includes graphic design of the panels from its overall composition to details such as the color scheme, typograph and elements on the map such as icons, lines, labels etc.

- **b. Design of frame structure**
  This includes the structural design of both physical and digital panel frames and determining the suitable materials that take into account the city’s climate and on-ground conditions to ensure strength and durability.

- **c. Design of website/app layout**
  This includes layout design and development of a digital platform and feeding in information collected from various sources with the support of a data team.

7.3. Determining the number of signages and locations

The number of signages required depends on the size of the intervention area and is determined by a thumb rule of at least one signage within a grid of 500m X 500m, where 500m is the average walkable distance, to ensure continuity while walking. The number of signages could increase depending on the functionality of certain locations and the footfall.
The Kochi wayfinding pilot covers an area of 2.5km X 2km and around 25 locations, including 20 physical and 5 digital signages, were identified in the area on a 500m X 500m grid as shown above. These locations were chosen based on a set of criteria explained below.

**Physical signage**

- **Footfall at the location:** Important nodes of the city with high footfall, like landmarks, major junctions, transit stations etc., as well as important public transit routes or major roads from which diversions are to be taken to certain nodes.

- **Availability of space:** Availability of space on the footpath to accommodate panels without hindering pedestrian movement, in a perpendicular orientation to the direction of movement so that the signs are visible from either side.

- **Visibility:** Visible to pedestrians from a distance without being blocked by elements such as electric posts, sign boards etc.

- **Feasibility of installation:** The signage locations should avoid storm water drains, utility ducts etc. and ensure feasibility of laying concrete foundation.

**Digital signage**

- **Footfall at the location:** In the premises or close to an important landmark or transit node where footfall is high.

- **Spatial characteristics:** Preferred in shaded or semi-shaded spaces like porches or inside buildings to protect the signage from weather. When on a street, the signage should be protected with shading and placed against a compound wall to be visible from the street side.

- **Security:** A secured space with surveillance mechanisms to protect the signage from vandalism, theft, and damage.

- **Availability of services:** Availability of stable electricity supply and internet connection for smooth functioning.
8. Stage IV – Manufacture, Implementation and Maintenance

After the design is finalized, vendors are to be identified who can manufacture the signages and install them on ground. This stage includes calling for proposals to selecting vendors, manufacturing, installing and maintaining the signage.

8.1. Tendering and Vendor selection

The process of tendering and vendor section may vary depending on the type of tender and organizational requirements. In the case of Kochi, it was a closed tender in the form of a Request for Proposal (RFP). The steps followed during the process are given below:

**REQUEST FOR PROPOSAL**

**KOCHI WAY-FINDING DIGITAL SIGNAGE**

**DIGITAL SIGNAGE QUOTATION**

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Signage component</th>
<th>Specifications</th>
<th>Unit Cost</th>
<th>No. of Units</th>
<th>Total Cost/ component</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Material</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Frame</td>
<td>Mild Steel 14 gauge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Panel board</td>
<td>Stainless Steel (SAE316L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Base plate</td>
<td>Mild Steel (15mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Finishing</td>
<td>Powder coating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Digital touch screen display</td>
<td>Touch screen display screen of min 55 inches or more with high brightness (3000 nits or above)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Protection case for the screen</td>
<td>IP65 case or equivalent to ensures optimum protection from outdoor extremities. (all-weather proof)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Print</td>
<td>Vinyl/non-vinyl sheet with reflective property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Connection</td>
<td>Internet via Wi-Fi/Ethernet provision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Shading structure</td>
<td>Partial enclosure or a roof to keep the screen protected from external forces - Mild steel frame with acrylic or metal roofing and side covers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Mounting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Foundation</td>
<td>M20 Concrete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Anchor rods, bolts, nuts and washers</td>
<td>Mild Steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Labour &amp; installation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Logistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Transportation</td>
<td>Inter-state and within the city</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Maintenance</td>
<td>2 years material and installation warranty</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Total Signage Cost</th>
<th>GST</th>
<th>Total Cost</th>
</tr>
</thead>
</table>

*Note: Please include the Shading structure cost based on RFP requirements. However, this component may not be required for all the 5 units depending on the locations identified.*
An RFP, which explains the design of the signages and terms of references, was prepared to call for quotations for both physical and digital signages.

The RFP was floated on the organizations’ website for a period of one month to accept quotations from vendors in the following format along with company details and previous work samples.

The proposals were then assessed to identify a list of qualified vendors that meet the conditions stated in RFP for physical and digital signage manufacturing.

From the identified list, three vendors were shortlisted in the following two stages and evaluated based on the given criteria.

**Stage 1:** Fulfilling the technical requirements and bidding process based on:

- Competitiveness of the quote for manufacturing and installation of signage
- Team qualifications and experience in projects
- Composition of manufacturer’s team

**Stage 2:** Manufacturing a prototype for examining design, quality, and durability

- Three shortlisted vendors manufactured one sample each of the ‘to scale’ prototype based on the specifications mentioned in the document or an equivalent material of top-quality standards
- Prototype examined to test legibility, colour, reflectivity, scale, and cost

The prototype stage adopted a system wherein 50% of the prototype cost was borne by the vendor and would be paid the remaining only if they were chosen as the finalist. This system was not feasible for digital signages as vendors could not shoulder the steep cost of half of one unit. Instead, the three shortlisted digital signage vendors made a presentation of their proposal along with their similar previous works.

This stage was followed by a technical assessment, where the vendors were compared and assessed based on the quality of prototype as well as their quotation to choose the final one.
The contract was then awarded to the chosen vendor for manufacturing, installation and maintenance.

8.2. Manufacture

The manufacturing process, including steps such as making of the frame, finishing, sticking the printed designs on the panels, mounting the screen on to the frame etc., are to be monitored at each step to ensure the quality of product. The digital signages are to be tested in an intermediate stage of manufacture to ensure the application and touch sensitivity works accurately.
8.3. Implementation

The process of implementation includes laying foundation, fixing the panels, providing service connections such as electricity and internet connection and setting up the application for digital signages. While the installation was done by the respective vendors, in Kochi the services were provided by city authorities. This helps in ensuring the longevity of the signages beyond the maintenance period for the future.

8.4. Maintenance

To ensure the sustenance of the signages the contracts with the vendors ensured to include

- Manage and upkeep of signage for a period of 2 years
- Maintenance and repair of the signage for damage due to its build quality or manufacturing defect, for a minimum period of 2 years as a part of the contract (maintenance contract)
- Maintenance contract or an equivalent mechanism for maintenance and repair of signage, for damage caused due to external forces.
- Provision of warranties, guarantees, record drawings and other documentation
- Provision of operating and maintenance instructions on screen, replacement of printed layout and any other.

In Kochi, although the vendors would be taking care of the signage maintenance for two years as per the contract, as the products were handed over to the city authority (Kochi Municipal Corporation) after installation, it also becomes city’s responsibility to coordinate the same.
9. Stakeholders involved

The process from initiation till implementation and beyond in Kochi involved various stakeholders to ensure successful implementation of the signages. This can be broadly categorized into four groups:

- **City Administration**
  - Mayor, Town planning committee, Council, Corporation Secretary etc.

- **Government authorities & other agencies**
  - Engineering Department, Tourism Department, Public transport agencies like KSRTC, SWTD, KMRL, Private Bus Associations etc.

- **Other Organizations in the sector**
  - Smart City Mission SPV, Metropolitan Transport Authority, Smart SUT etc.

- **Stakeholders on ground**
  - Common people, Property owners of identified locations etc.
10. Roles and Responsibilities

Each set of stakeholders took up specific roles and responsibilities at different stages of the project in terms of approvals, provision of data, facilitation, and collaborations. They performed in close coordination with each other to ensure a smooth flow of activities and successful implementation of the project.

11. Scale up

Wayfinding signage can help improve several aspects of a city’s transport ecosystem, particularly by encouraging more people to shift from motorized forms of transport to walking and cycling. The project in Kochi shows potential to be scaled up:

- To the rest of the city
- To a different city or
- By increasing the no. of units in the same area

City authorities may derive a methodology suitable for their context and system based on the process explained in this document to scale up this project.
PART B
DESIGN GUIDELINES
Designing the signage panels, website, and application includes several elements such as layout design, detail design and structural design which are done following various guidelines and specifications, as explained in the following sections.

12. Signage Layout

The panels are designed to have an overall height of 2.2m, with various components placed at certain heights from the ground level to ensure better readability from specific distances:

- The signage height of 2.2m was chosen because it is approximately two feet higher than the average human height (1.6m). This allows the signage panel itself to be visible from 2m away and above even if somebody is blocking it. The information at the top is in a bigger font size to improve readability.

- The maps and screen, which forms the primary information on the signages are placed at the top, 1.8m from the ground level, making it easily readable at eye level from an average distance of 80cm from the panel. Secondary information, which can be viewed from a closer distance, is placed on the bottom of the panel.
12.1. Physical Signage

The physical signage panel layout consists of the following information from top to bottom:

- Title of the project
- Location of the panel
- Directions to the nearest landmarks/ nodes
- Detailed map of walkable area
- Overview map of entire Fort Kochi Mattancherry area
- QR code to access the digital version of the wayfinding signage
- Project partners
- List of landmarks with grid names
- Emergency contacts

These are arranged in this order based on its importance versus visibility as discussed in the previous section.
12.2. Digital Signage

Digital signage panel layout consists of the following information from top to bottom:

- Title of the project
- Location of the panel
- 55-inch touch sensitive screen with the application plugged in
- Project partners
- Emergency contacts

Directions: Street names & landmarks

Emergency contacts

Finder map

Overview map

List of landmarks

RORO JETTY JUNCTION

Location

Emergency Contact
The position of screen was decided based on its visibility and accessibility as discussed in the previous section.

12.3. Website and Applications

The website and application are designed to have 3 major components:

- **Getting Around:** Helps in planning trips by locating a user's destination and navigation
- **Explore Kochi:** Gives information on places to visit, things to do and upcoming events in the city
- **Alerts:** Provide any critical information concerning the city and public, such as COVID19 related information

The application is designed in two variants to adapt to mobile phone screens and the digital signage panel screen. Changes are made in the position of tabs, font sizes etc., to ensure that it is readable and well composed across both formats.
13. Graphic Design Guidelines

To maintain uniformity, a set of graphic design guidelines and standards should be implemented that can be followed across various components of the project. The set of guidelines developed for Kochi’s wayfinding signages can be used as a reference when scaling up the project to the rest of the city. This could also be used as a reference for designers to derive a new set of standards for different cities.

13.1. Colour palette

All the components – physical signage, digital signage and website/application are designed using the following base colour palette.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: 31%</td>
<td>M: 1%</td>
</tr>
<tr>
<td>Y: 100%</td>
<td>K: 0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: 100%</td>
<td>M: 93%</td>
</tr>
<tr>
<td>Y: 33%</td>
<td>K: 31%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: 99%</td>
<td>M: 89%</td>
</tr>
<tr>
<td>Y: 45%</td>
<td>K: 59%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Colour</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: 22%</td>
<td>M: 5%</td>
</tr>
<tr>
<td>Y: 5%</td>
<td>K: 0%</td>
</tr>
</tbody>
</table>

13.2. Typography

Consistency is maintained in the font used across various components. The style (bold, semi bold, regular etc.) and size of the fonts are adapted depending on the context on the signage to ensure readability. The fonts used for English and Malayalam texts are below, while the image below on the right shows the font heights used for different texts in centimeters.
13.3. Data categorization and colour coding

For better legibility, the eight categories of information explained earlier are colour coded to help users easily identify what they are looking for on the map.

13.4. Graphical representation of information

Information is depicted on wayfinding maps through various representation techniques to ensure easy readability. This includes:

**Linear elements**: lines or coloured streets

- Transit routes
- Special streets – Conserved, pedestrian only etc.
- Heritage trails

**Area - building footprints**

- Architectural landmarks
- Open spaces as landmarks
- Other important buildings

**Labels – Text (English and Malayalam)**

- Streets
- Neighborhoods
- Junctions
- Landmarks
Points – Pictograms/icons

- Transit points
- Basic facilities – toilet, drinking water, ATM etc.
- Public infrastructure - health, education etc.
13.5. Graphical elements to improve readability

To improve readability, certain graphical elements are introduced on the maps that help users better orient themselves and easily locate any point on the map. This includes:

- “You are here” icon with an arrow showing the user’s orientation
- North indicator
- 5 min walk radius
- Grid with a list of landmarks

14. Panel Structure and Material Specifications

The design of the panel frame must be structurally stable and durable, considering the site’s geography and weather conditions. Kochi is a coastal city, and corrosion and exposure to rain were two major concerns considered critically while choosing the materials.

14.1. Structural design

a. Physical panel

The signage panels are made of stainless-steel (corrosion resistant) sheets with a minimum 1.5mm thickness, mounted on a mild steel frame made of 14-gauge pipes and installed on ground through an MS base plate of minimum 15mm thickness, which is fastened to a cement concrete foundation with anchor rods/bolts. The details are given in the drawing below.
b. Digital panel

The signage panels are made of stainless-steel (corrosion resistant) sheets of a minimum 1.5mm thickness and mounted on a mild steel frame made of 14-gauge pipes and installed on ground with an MS base plate of minimum 15mm thickness, which is fastened to a cement concrete foundation with anchor rods/bolts. The screen is fixed to the MS frame using brackets. An opening is provided at the back for maintenance. A partial enclosure or a roof to keep the screen protected from external forces is also included at outdoor locations.
14.2. Material Specifications

SIGNAGE PANEL SPECIFICATIONS

- **Panel boards**: Stainless steel panels of minimum 1.5mm thickness conforming to SAE316L grade or A4 stainless steel. Marine grade or any other equivalent materials for strength and corrosion resistance will be ideal near seashores. Panels may be coated with vitreous enamel, porcelain enamel or any other equivalent material in terms of durability, corrosion resistance, and flexibility.

- **Mild steel frame**: Frame of 14-gauge MS pipes to support the stainless-steel panels which will be mounted on it.

- **Mild steel base plate**: MS base plate of 15mm thickness conforming to IS 226 and IS 2062 or any other stated IS specification.

- **Anchor rods, bolts, nuts, and washers**: Anchor rods of mild steel, high strength bolts conforming IS 1367 and precision bolts, nuts etc., conforming to IS 1364.

- **Concrete**: Concrete of M20 grade

- **Protection case**: IP65 case for the digital display made of SAE316l stainless steel frame and tempered and laminated front glass to ensure optimum protection from outdoor extremities. It must be water and weatherproof against the damaging effects of the sun, rain, and dust.

- **Finishing**: All the metal parts should be powder coated.

- **Graphics**: Made from vinyl or reflective non-vinyl graphic films to improve readability at night, weather-resistance and colour fastness. A certificate of having the film tested for coefficient of retro-reflection, day/nighttime colour luminous, shrinkage, flexibility, liner removal, adhesion, impact resistance, specular gloss and fungus resistance, 3 years outdoor weathering (as per table 14 of ASTM D 4956-09 – Source: https://www.astm.org/d4956-09.html) and its having passed these tests shall be used.

The above are the materials used in Kochi wayfinding signages. Based on geographies, weather conditions, cost etc. alternate materials could be explored.

DIGITAL TOUCH SCREEN SPECIFICATION

- **Build and quality**: A highly durable antiglare and non-reflective screen which fulfills IP 65/IP 67 rating, suitable to be placed in a semi-outdoor space – Preferably LG or Samsung brand.

- **Size and resolution**: Digital touch screen display of minimum 55 inches or more (16:9 aspect ratio) with a full HD display (1,920 x 1,080) and brightness of 3000 nits or above
**Connectivity:** Input – HDMI, DP, DVI-D, Audio, USB, and output – DP, external speaker output

**Warranty:** Minimum 2 years of warranty

**Operating temperature range:** 0°C to 50°C (without direct sunlight) 0°C to 40°C (direct sunlight)

**Operating hours:** 16x7

**Operating humidity:** 10 – 80 %

**Software compatibility:** compatible with Android and can support .apk files

**INTERNET CONNECTIVITY**

- LAN, Wi-Fi and dongle facilities to support internet supply
- Internet package supporting a bandwidth of 5-10 mbps and tech support by the manufacturer for a period of 2 years

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15. Conclusion

Well-designed, need-based interventions have a positive outcome, both on urban mobility and access to public spaces, to impact the quality of life and well-being of a city’s residents and visitors.

Wayfinding signages is one such intervention that can encourage a modal shift to walking, cycling and public transport through the smart provisioning of information. Such signages can easily be scaled up across a city and can be adopted by other cities to create wide-spread impact.
About WRI India

World Resources Institute India (WRI India) is a research organization that works closely with leaders to turn big ideas into action at the nexus of environment, economic opportunity and human well-being. WRI India Ross Center for Sustainable Cities is WRI India’s largest program dedicated to supporting Indian cities in their journey to be low carbon, resilient and inclusive. WRI India Ross Center works with governments, businesses, multilateral institutions, and civil society groups to develop practical solutions that improve people’s lives and protect nature. Know more on wricitiesindia.org

The WRI India team

The team was involved in the preparation of content and graphics for the document. This was achieved through relevant research, data collection and coordination with GIZ, Kochi Mayor, C-HED and other key stakeholders on ground.

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