Building a Resilient Kochi

A holistic approach to providing safe public transport and public spaces in times of a pandemic and beyond.

Document prepared by: WRI INDIA ROSS CENTER
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<tr>
<td>CBO</td>
<td>Community Based Organization</td>
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<tr>
<td>CBD</td>
<td>Central Business District</td>
<td></td>
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<tr>
<td>CSEZ</td>
<td>Cochin Special Economic Zone</td>
<td></td>
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<tr>
<td>CSR</td>
<td>Corporate Social Responsibility</td>
<td></td>
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<tr>
<td>DDMA</td>
<td>District Disaster Management Authority</td>
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<tr>
<td>GCDA</td>
<td>Greater Cochin Development Authority</td>
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<td>GIZ</td>
<td>Deutsche Gesellschaft für Internationale Zusammenarbeit</td>
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<td>IPT</td>
<td>Intermediate Para Transit</td>
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<td>IRC</td>
<td>Indian Road Congress</td>
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<tr>
<td>KCR</td>
<td>Kochi City Region</td>
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<td>KMC</td>
<td>Kochi Municipal Corporation</td>
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<td>KMRL</td>
<td>Kochi Metro Rail Limited</td>
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<tr>
<td>KSINC</td>
<td>Kerala Shipping and Inland Navigation Corporation</td>
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<td>KSRTC</td>
<td>Kerala State Road Transport Corporation</td>
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<td>KURTC</td>
<td>Kerala Urban Road Transport Corporation</td>
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<td>MTA</td>
<td>Metropolitan Transport Authority</td>
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<td>MVD</td>
<td>Motor Vehicles Department</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NCMC</td>
<td>National Common Mobility Card</td>
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<td>NMT</td>
<td>Non-Motorized Transport</td>
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<tr>
<td>OD</td>
<td>Origin Destination</td>
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<tr>
<td>PBS</td>
<td>Public Bike Sharing</td>
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<tr>
<td>PPHPD</td>
<td>Passengers Per Hour Per Direction</td>
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<td>PPP</td>
<td>Public-Private Partnership</td>
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<td>SWTAD</td>
<td>State Water Transport Department</td>
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<tr>
<td>TUMI</td>
<td>Transformative Urban Mobility Initiative</td>
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<td>UPI</td>
<td>Unified Payment Interface</td>
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A. ABOUT KOCHI CITY

Kochi is a cradle of Eurasian culture. Located on the south-western coast of India, the city is more than 500 years. A vibrant cultural hub, this coastal city blends different natural landscapes (backwaters, canals and green cover) and tourism is a major contributor to the city’s economy. Kochi is also part of India’s Smart Cities Mission project.

The city consists of 3 administrative boundaries, namely Cochin Municipal Corporation (CMC), Kochi City Region (KCR) and Greater Cochin Development Authority (GCDA) with a population of 6.46 lakhs, 12.23 lakhs and 20.01 lakhs respectively.

With 49% mode share, public transport serves as the backbone of Kochi city and includes metro, city buses, auto-rickshaws, suburban rail and ferry boats.

The city bus system plays a vital role in meeting the travel needs within the city and in connecting Kochi to its satellite towns. The city bus services are jointly run by Kerala State Road Transport Corporation (KSRTC) and private operators for Kochi city and satellite towns. The ferries, operated by State Water Transport Department (SWTD), private operators, the tourism department and Kerala Shipping and Inland Navigation Corporation (KSINC), act as the principal link between the mainland and the islands. The suburban rail, which provides intercity connectivity between Kochi and surrounding towns and cities, functions as another important mode of transport that is used by students and the day to day business and office sector.

The metro is emerging to be the new mode of choice for the city. However, walking and cycling remains a challenge due to lack of safety and infrastructure for short distance users. While these modes function individually, in an efficient manner, there is often lack of integration between these modes leading to increased usage of private transport. Increased carriageway and minimal pedestrian infrastructure poses challenges for walking and cycling in the city.

The key public spaces of the city namely, Jawaharlal Nehru Stadium, Durbar Hall Ground, Marine Drive, Subhash Park, Rajendra Maidan and Changampuzha Park in Ernakulam and Parade Ground and Veli ground in Fort Kochi are concentrated towards the central core of the city making them less accessible to other parts of the city.

Kochi being located at the south-western coast of India with tropical weather conditions, is prone to extreme heat and monsoons, making it highly susceptible to natural disasters.
B. BACKGROUND

The COVID-19 outbreak was declared a global pandemic by the World Health Organization (WHO) on 30th January 2020. India came to a standstill through enforced lockdown and the economy was seriously impacted. Several measures have been taken up by Indian cities to curb the impact of this pandemic. Kerala and its anchor cities like Kochi are serving as an example for others.

While the fight with COVID-19 is ongoing, Kochi city is looking forward to a gradual exit from the lockdown as it moves towards the “new normal”. This gradual exit will require a meticulous plan with short-term, mid-term and long-term strategies especially for providing public transport services and public spaces, as they serve as the lifeline of the city.

As per the principle of ‘Leave No One Behind’ (LNOB) by United Nations for Sustainable Development and its Sustainable Development Goals (SDGs), focus must be given on overcoming discrimination and inequalities. This particularly becomes crucial during the pandemic due to increased requirement of services vs. limited resources. Equal access to public transport and public spaces thus become very critical and to achieve the same, adopting a holistic approach becomes essential.

C. KEY PURPOSE OF THE DOCUMENT

‘Building a Resilient Kochi’ guidance document developed by WRI India under the Transformative Urban Mobility Initiative (TUMI), aims to help reconfigure the usage of public transport systems and public spaces in the new normal i.e. during and post COVID-19 situation while ensuring accessibility, safety and security for the users.

The document aims to -
• Provide safe public transport and spaces for all people as a functioning transport system is vital to satisfying basic needs.
• Make the “urban system” (i.e. public transport + public spaces) more resilient - socially and economically.
• Serve as a guideline for steering the decision-making process and developing actionable measures for restoring public transport service and opening public spaces in the city.
• Provide a broad framework for planning, administration and implementation mechanisms for measures the city needs to undertake for its public transport and public spaces.

D. SCOPE OF THE DOCUMENT

The document adopts a holistic approach in providing recommendations for all public transit modes (including walking and cycling) and public spaces of the city. It proposes measures for three distinct phases — namely the lockdown phase, the post-lockdown phase and post-COVID-19 eradication phase — which will not only address the current and immediate future but will provide guidance for adopting and implementing long-term sustainable measures.

The scope of the document is to -
• Develop an integrated system with the focus on maintaining community health and optimal operations of the city’s transport and public space infrastructure.
• Provide a methodical approach to bridge the gap between government and non-government initiatives (citizens, Community Based Organizations (CBOs) and private sector) through a formalized process.
• Formulate actionable guidelines for efficient public transport and public spaces functioning.
• Ensure relevant actors in Kochi learn from this guidelines and act towards reducing the risk of future pandemics.
E. WHO SHOULD REFER THIS DOCUMENT?

- This document essentially intends to provide guidance to Kochi Municipal Corporation (KMC) and transport agencies such as Kochi Metro Rail Ltd (KMRL), Kerala State Road Transport Corporation (KSRTC), Motor Vehicles Department (MVD) and others, to plan, implement and regulate safe public transport and public spaces for Kochi.
- This document has the potential to guide other parts of the state, and country, to adopt similar suitable measures, thus scaling up the application of suggested measures.
- Private agencies, institutions, community organizations and other key service contributors of the city may also refer this document to understand their possible roles.

F. METHODOLOGY ADOPTED

The document outlines the recommendations for 3 proposed scenarios (lockdown, post-lockdown and post-COVID-19 eradication) based on core principles (see page 3). These guidelines are divided into two parts. Part I provides guidelines for the city and area level interventions. Part II provides specific recommendations based on the public transport mode and different typology of public spaces.

G. OPERATIONALIZING THE RECOMMENDATIONS

- The recommendations provided in the document primarily act as guidance points for both short-term immediate change and long-term planning for future pandemics. These direction pointers help to create a basis for building resilient measures for the city.
- The city agencies, however, are needed to further assess and adopt these recommendations based on on-ground situation analysis and also validate the same through relevant data.
- The demonstrative cases are designed and developed to address the current need for safe distancing. Hence, the immediate adoption of these recommendations can aid to creating safety in public transport and public spaces.

H. ROLE OF WRI India and GIZ

- The document is a derivative of the TUMI project which aims to create sustainable and safe mobility and public spaces in cities.
- WRI India and GIZ (as a partner of TUMI) in consortium will provide necessary technical support to strengthen these solutions and also hand hold the city agencies in the planning and implementation of the recommendations provided in the document.
- WRI India with its current engagement, and key agencies and stakeholder on-ground, aims to provide technical assistance for both the city level decision making process as well as on ground implementation of COVID-19 safety measures.
I. CORE PRINCIPLES

The document adopts the following overarching principles to achieve the vision of a holistic system of public transport and public spaces for Kochi and its citizens. These principles focus on the design and planning, implementation, sustainability and resilience components of the city. The goal is to steer the development of city level guidelines and to offer detailed recommendations for public transport and public spaces, its implementation mechanism, outreach and way forward.

**MODAL INTEGRATION**

Prioritize all potential public and non-motorized transport modes as part of the transport ecosystem

Distribute user and vehicle loads and densities to create balanced mode share

**SAFE ACCESSIBILITY**

Build an integrated network of public spaces

Improve accessibility between and within these public spaces

**PRIORITIZATION**

Prioritize resilience, public health and safety as a part of the city planning process

Develop measures to monitor the health and safety of public transport & public spaces users and service providers

**VISION**

Create a larger vision of sustainable public transport and public spaces which becomes a long-term solution

To achieve this, contextual targeted goals need to be devised for implementation in each scenario

**PHASED IMPLEMENTATION**

Adopt a phased approach to implement short-term, mid-term and long-term goals to achieve the overall vision

Demonstrate, assess and adopt sustainable solutions at every stage of the project

**CAPACITY BUILDING**

Develop a city resilience core team with representation from all departments including community organizations

Build capacities to manage pandemic situations

**AWARENESS**

Spread the right message in the right format

Build simplified tools and programs, for city officials and citizens, to raise awareness about the pandemic situation (current and future) and for control measures

**SUSTENANCE**

Test and assess the measures taken on a regular basis to avoid any shortfalls

Reserve and allocate additional funds and resources for the future

**SCALING UP**

Demonstrate, access and adopt the learnings to different contexts within the city

Building flexible models or formulate suitable guidelines for other cities to adopt

**Guidelines and Recommendations**

**Implementation Mechanism**

**Outreach and Way Forward**
J. REORGANIZING PUBLIC TRANSPORT AND PUBLIC SPACES TO REDUCE THE RISK OF INFECTION

The document proposes actionable measures, to reorganize public transport and public spaces, which can help build a resilient Kochi city for the present and the future. It proposes three distinct scenarios as explained below to attain a sustained approach for tackling immediate and future city requirements.

- **The lockdown scenario** - The phase of complete lockdown where the city is shut with allowance of emergency services only.
- **The post-lockdown scenario** - The immediate next phase where the city is partially opened with restricted or limited public movement for daily needs, daily services and limited functioning of other economic and social activities.
- **Post-COVID-19 eradication scenario** – A phase where the city resumes all its activities. This section also provides for long term guidelines for sustainable solutions.

The guidelines and recommendations are derived from the core principles identified and are applied across the various scenarios across two scales – city level and detailed level as shown below.
PART I
KEY GUIDELINES
SAFE PUBLIC TRANSPORT & PUBLIC SPACES
1a. Introduction

The document points towards adopting a holistic approach keeping in view the core principles (page 4) and by developing an integrated network of transport systems in the city to achieve an efficiency and balance between the modes, trips and density distribution. It also provides a set of generic guidelines to address an integration of public spaces in the city.

For each of the three scenarios, the document also provides mode specific solutions for public transport to address the safety within the modes and supporting infrastructure and specific typology-based guidelines for public spaces to devise long-term safety and accessibility measures, which are summarized in Part II of the document.

1b. Building a sustainable transport ecosystem

- These guidelines cater to a city level approach and focus on integrating the public transport modes including IPT (Intermediate Para Transit) and NMT (Non-Motorized Transport) choices.

- The solutions also intend to distribute passenger and vehicle densities to provide adequate choices for the chosen distances and help the modes, generate revenues through distributed trips.

- The existing public transport system in Kochi has various modes including bus, metro, ferry and suburban railway. Amongst the existing modes, the bus system becomes the most widely used mode with more than 90% of the total ridership.

- Building an ecosystem of these sustainable transit modes to share the load by rationalizing the system based on trip directions and demand. This is done by identifying the major trip generators and attractors in the region in each of the three scenarios.

Lockdown scenario

- Establishing a network of public transport routes linking the major hospitals of the city, cluster of government offices and the important arrival/departure points in the city region.

- The major hospitals and administrative areas are identified and connected through a primary bus route for the movement of staff.

- Also, a bus route connecting railway stations and airport to hospitals and isolation centers is identified for the transfer of people who are arriving or departing from the city (see Fig 4).

- Extensions to the existing ferry routes to Elamkunnapuzha, Cheranelloor and Chitloor are identified which would connect all the primary and secondary health care centers in the islands to the tertiary health services like multi-specialty hospitals in the Ernakulam mainland. An efficient water ambulance system for emergency situations to be made operational in these routes.

- Also, the identified ferry routes could have emergency passenger ferries to ensure public and health workers a shorter distance trip to the healthcare services when compared to road trip.
Post lockdown scenario

- In the existing public transport system, the metro and railway corridors run parallel to the major arterial road of the city which also happens to be the corridor with the highest concentration of bus movement.

- To rationalize the system based on trip directions and demand, the major trip generators and attractors in the region are identified.

- The Central Business District (CBD) area, Kakkanad area and Kalamassery area are identified as the major trip attractors from the Origin-Destination line diagrams (see Fig 6). The areas in the periphery of Kochi City Region (KCR) and areas like Cheranalloor, Vazhakala-Thrikkakkara, Chellanam etc. are identified as the major trip generators (see Fig 5).
To redistribute the load, prioritizing the metro, suburban rail and ferry system as the primary mass transit (trunk lines of the city) which are otherwise underused, and connecting the bus system to this corridor from various neighborhoods, work centers, recreational areas etc. which are identified (see Fig 7)

Measures to strengthen the trunk lines by planning and regulating first and last mile connectivity with walking, cycling and autorickshaws, improving the infrastructure, increasing the supply, rationalizing the routes etc. The ferry route may be extended to:

(i) Ernakulam – Vypeen - Elamkunnapuzha-Mulavukadu – Ernakulam
(ii) Varapuzha – Aster medicity – Amritha Institute (Connecting major hospitals)

- Arriving at a suitable bus network connecting to the trunk lines by considering the demand based on the actual on-ground context and also by analyzing the routes and demand through regular Trip Origin-Destination (OD), Passengers Per Hour Per Direction (PPHPD) etc. (See Fig 8)
- The schools and colleges remaining closed/partially open, private firms and Information Technology-Cochin Special Economic Zone (IT-CSEZ) enforcing work from home or being partially open, migrant workers returned to their home towns etc. are some of the factors which indicate a reduced public transport demand in these city regions:
  - Kakkanad - Kalamassery, Palarivattom and Mulamthuruthy
  - Aluva - Perumbavoor and Kanjoor

**Post-COVID-19 eradication scenario**

- Arriving at the suitable bus network connecting to the trunk lines by analyzing the routes and demand through regular Trip OD, PPHPD etc. (See Fig 9)
  - The major networks identified connect trunk lines to Paravur, Kottapuram, Kumbalam, Varapuzha, Perumbadappu, Kakkanad etc.
  - The secondary networks connect trunk lines to Cherai, Chellanam, Mulamthuruthy, Ambalamugal, Perumbavoor, Kanjoor etc.
Suggesting the routes of the public transport network is the primary step to route rationalization. A comprehensive analysis of the demand-supply dynamics must be carried out to establish the number of trips, headway, time schedule, trip lengths etc. of various routes for all modes of transport. This next step must be taken up by the city authorities with the support of various transport agencies and a technical team to do the elaborate study and analysis.

1c. Integrating public spaces with the city’s transit network

The following guidelines indicate the generic measures adopted for all public spaces in the city:

**Lockdown scenario**
- Identify open spaces of the city – government, institutional, private, port trust and others.
- Assign these open spaces as important centers for supply of emergency goods, medical supplies and parking/waiting for emergency vehicles like ambulances, fire fighting vehicles etc. based on the availability of space and accessibility.

**Post-lockdown scenario**
- Improve safety and hygiene within public spaces by provision of amenities such as clean public toilets, drinking water and sanitization facility and adequate provisions for safe distancing.
- Improve access by connecting these spaces with an integrated network of streets. These streets should compulsorily have access to public transport, emergency vehicles, walking and cycling.

**Post-COVID-19 eradication scenario**
- Map all the open spaces of the city and regulate these to function as resilient spaces during pandemic situations to accommodate emergency needs of the city.

- Establish an integrated network of streets and public open spaces with efficient access to public transport, emergency vehicles, walking and cycling (see Fig 10).
- Regulate the authorization of land and ownership of public spaces.
1d. On-ground implementation

To ensure the safety of users in transit spaces and public spaces, a set of measures can be taken up which includes ensuring physical distancing, provision of various amenities and safety booths, awareness signages, etc. These can be applied in a range of public spaces including various scales of open spaces, streets and transit spaces. These measures can be implemented as low cost makeshift measures to meet the immediate requirement. Some of these measures can be permanently implemented, if necessary, at a later stage.

The images below show a demonstration of how these measures can be applied on-ground, taking the case of different spaces in Fort Kochi such as transit spaces, streets and open spaces.

Fig 13: Segregation of vending zones with adequate space between stalls and waiting customers. Provision of buffer between vending and vehicle line-up (old boat jetty open space).

Fig 14: Provision of adequate width and demarcation of 1m safety grid on footpath to maintain distance between pedestrians.
Fig 15: Provision of segregated bus bays and platforms, emergency health care and safety center for staff and passengers; segregation of seating and facilitation of queuing at the platforms for safe boarding.

Fig 16: Provision of temporary partition and shade for two rows of 2-wheeler line-up and segregation of auto line-up and customer pick-up zones.

Fig 17: Provision of safety measures for queuing and boarding at bus stops and separate entry and exit for passengers.

Fig 18: Segregation of access and line-up for 2- and 4-wheelers which are distanced from pedestrians and provision of covered contactless ticket counters with scanning screens.
2. IMPLEMENTATION MECHANISM FOR CITY LEVEL INTERVENTIONS

The various tasks for implementation of city level guidelines are categorized based on the types of task under enforcement, planning and regulation, infrastructure implementation and communication and outreach. The flow chart also shows the scenario in which each task must be taken up and the agencies responsible to implement the same.

Knowledge partners like WRI India and GIZ
- Provide technical expertise throughout the process to all the agencies

Transport enforcement agencies like MVD, Traffic police etc. along with knowledge partners
- Lockdown
- Post-lockdown
- Post-COVID-19 eradication

Transport Agencies (Government and Non-government) under Metropolitan Transport Authority Kochi along with Knowledge partners
- Facilitate regular meetings between transport agencies and other key decision makers for timely action measures
- Communicate and coordinate with local community groups to facilitate requirements based on ground needs
- Develop relevant communication pieces to raise awareness about public transport and the prominent public spaces in the city
- Build campaigns around social distancing, importance of public health and safety in public spaces

Enforcement
- Restrict movement of vehicles
- Enforce cycling and walking for emergency
- Limited functioning and restrict entry of vehicles to the city
- Constant monitoring of crowds and gatherings in public spaces
- Monitoring cleanliness and dumping of waste in city premises and open spaces

Planning and regulation
- Assign open spaces and institutions for emergency services
- Form a COVID-19 committee to build capacities along with monitoring and management
- Regulate public spaces to have an added function of reliance
- Test public space and street level pop-up solutions to facilitate cycling and walking
- Implement permanent cycling and walking infrastructure for streets to promote safe distancing
- Provide the necessary infrastructure for social distancing in public spaces
- Build a network of public spaces with prominent streets to accommodate movement of emergency vehicles

Infrastructure implementation
- Provision of public transport vehicles and IPT facilities for emergency services
- Regulate movement of mass transit systems with limited occupancy and rationalized routes
- Rationalize routes and the use of mass transit, IPT and NMT modes with incentives
- Facilitate regular meetings between transport agencies and other key decision makers for timely action measures

Communication and outreach
- Create an agreement of all the concerned agencies to represent, coordinate and facilitate collective measures during pandemics
- Develop relevant communication pieces to raise awareness about public transport and the prominent public spaces in the city
- Build campaigns around social distancing, importance of public health and safety in public spaces
- Government administrative agencies like KMC, GCDA, District Administration etc. along with Knowledge partners
- Build a network of public spaces with prominent streets to accommodate movement of emergency vehicles
PART II

DETAILED RECOMMENDATIONS
3. RECOMMENDATIONS BASED ON MODES OF PUBLIC TRANSPORT

The document identifies a set of recommendations, under the three scenarios, to ensure safety of passengers and staff within the various modes of public transport and supporting infrastructure while ensuring affordability. The following have been identified to develop mode specific solutions.

a. Buses - KSRTC (Kerala State Road Transport Corporation) and KURTC (Kerala Urban Road Transport Corporation)

b. Buses - Private Operators

c. Water transport – SWTD (State Water Transport Department) boat service

d. Water transport - RoRo service

e. Metro rail

f. Autorickshaw and other IPT

g. Walking

h. Cycling
## DETAILED RECOMMENDATIONS FOR INDIVIDUAL TRANSPORT MODES

### a. KSRTC and KURTC BUSES

<table>
<thead>
<tr>
<th>Component</th>
<th>Lockdown scenario</th>
<th>Post-lockdown scenario</th>
<th>Post-COVID-19 eradication scenario</th>
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<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Use primarily for emergency services – to deliver essentials to containment zones, the homeless, migrant workers etc. and to transfer COVID-19 patients, emergency workers (fire, police, ambulance and public health workers, government employees etc.) along with homeless and migrant people - based on requirement.</td>
<td>Use primarily for regular passengers and occasionally to transfer government and public health employees on need basis. Maintain a record of passengers to enable contract tracing.</td>
<td>Regular use - formalize the routes, trips and frequencies through route rationalization and safety considerations, based on new COVID-19 norms for the city. Define new guidelines for buses to serve as emergency vehicles during pandemic situations.</td>
</tr>
<tr>
<td><strong>Circulation routes</strong></td>
<td>Operate bare minimum buses on specified routes for a critical need-based transfer - public health, fire or disaster emergency, food supply and other emergencies.</td>
<td>Operate on very limited routes and stops connecting to key anchor points of the city including hospitals, government offices, emergency services etc. and to the economic centers of the city. This must be planned to avoid overlaps with private bus operators.</td>
<td>Retain the existing routes with added consideration of emergency health and service points. Operate longer routes during off-peak hours</td>
</tr>
<tr>
<td><strong>Nos. and frequency of buses</strong> (Ernakulam district has 403 buses)</td>
<td>Exact number of buses and trips to be decided purely based on the need. Use spare buses only for emergency purposes.</td>
<td>Operate with an occupancy of 50% of the seating capacity and cater to “in person” dependent jobs (vending, shops, services etc.) and core emergency services such as public health, firefighting etc.</td>
<td>Resume the 100% service of buses with defined frequencies and number of passengers per bus.</td>
</tr>
<tr>
<td><strong>Ticketing/Payment</strong></td>
<td>Free fare</td>
<td>Facilitate temporary measures to ensure contactless ticketing like Unified Payment Interface (UPI), Paytm, QR code ticketing, dropping exact change in the box provided etc.</td>
<td>Adopt a formal contactless ticketing system like National Common Mobility Card (NCMC) where a single card can be used for payment in all modes of public transport.</td>
</tr>
<tr>
<td><strong>Hygiene and safety of bus and staff</strong></td>
<td>Clean and sanitize the buses after every trip. Provide safety measures to drivers, conductors and passengers both inside the bus and at the bus station. Isolate driver cabins. Monitor and carry out regular health check-ups of the driver and conductor. Communicate with passengers about compulsory mask wearing, physical distancing etc.</td>
<td>Clean and sanitize the buses daily. Monitor the health of drivers and conductors daily. Plan alternate day shifts for drivers and conductors. Ensure passengers follow the guidelines – i.e. compulsory mask wearing, physical distancing etc. Prioritize the operation of non-AC buses. Retrofit AC buses with window vents to increase natural ventilation in the vehicle.</td>
<td>Ensure buses are cleaned daily and sanitized once in a month.</td>
</tr>
</tbody>
</table>
### b. PRIVATE BUSES

<table>
<thead>
<tr>
<th>Component</th>
<th>Lockdown scenario</th>
<th>Post-lockdown scenario</th>
<th>Post-COVID-19 eradication scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Use private buses as an additional support for critical need-based transfer – i.e., public health, fire, food supply and other emergencies</td>
<td>Use primarily for regular passengers and occasionally for critical need-based transfer. Maintain a record of passengers to enable contract tracing.</td>
<td>Regular use - formalize the routes, trips and frequencies through route rationalization and safety considerations, based on new COVID-19 norms for the city.</td>
</tr>
<tr>
<td><strong>Circulation routes</strong></td>
<td>Operate for critical need-based transfers on specified routes.</td>
<td>Operate on very limited routes and identified stops that connect neighborhoods to trunk routes and key anchor points of the city including work centers and recreational areas. Routes to be rationalized in coordination with KSRTC to avoid overlaps.</td>
<td>Rationalize routes in relation with other modes. Formalize a network of identified sub-arterial and collector roads for private buses which could serve as feeders to the identified trunk lines.</td>
</tr>
<tr>
<td><strong>Nos. and frequency of buses</strong> (Ernakulam district has 1185 private buses)</td>
<td>Exact number of buses and trips to be decided purely based on the need.</td>
<td>Rationalize the trips in coordination with KSRTC and distribute the commuter crowd accordingly.</td>
<td>Resume the 100% service of buses with defined frequencies and no. of passengers per bus.</td>
</tr>
<tr>
<td><strong>Ticketing/Payment</strong></td>
<td>Not applicable</td>
<td>Facilitate temporary measures to ensure contactless ticketing like UPI, QR code ticketing, dropping exact change in the box provided etc.</td>
<td>Adopt a formal contactless ticketing system like NCMC where a single card can be used for payment in all modes of public transport.</td>
</tr>
<tr>
<td><strong>Hygiene and safety of bus and staff</strong></td>
<td>Clean and sanitize buses after every trip. Provide sanitizers and other safety measures to drivers, conductors and passengers. Isolate driver cabins. Ensure passengers follow the guidelines – compulsory mask wearing, physical distancing etc.</td>
<td>Clean and sanitize the buses daily. Monitor the health of drivers and conductors daily. Ensure passengers follow the guidelines – compulsory mask wearing, physical distancing etc. Good ventilation should be maintained in all operating vehicles.</td>
<td>Ensure buses are cleaned daily and sanitized once in a month.</td>
</tr>
<tr>
<td><strong>Revenue model</strong></td>
<td>Incentivize revenues (through PPP model) and offer regular health check-ups to the drivers and conductors of buses that offer services to the government.</td>
<td>Incentivize regular health monitoring of drivers and conductors. Plan alternate day shifts for drivers and conductors. Subsidize the operating expenses, like diesel cost and taxes, to operate with restricted occupancy.</td>
<td>Creating a formalized PPP model between government and private bus operations to manage revenue and staff cost during emergency situations in the city.</td>
</tr>
<tr>
<td><strong>Multi-modal integration</strong></td>
<td>Operate last mile modes such as IPT to ensure last mile connectivity.</td>
<td></td>
<td>Rationalize routes and fares in relation with other modes (metro and autorickshaw). This can help distribute the passenger load and balance revenue systems.</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Primary use for emergency services such as transferring COVID-19 patients, firefighting and public health workers, government employees etc, along with homeless and migrant people - based on requirement.</td>
<td>Primary use for regular passengers and occasional use to transfer government and public health employees on need basis. Maintain a record of passengers to enable contact tracing.</td>
<td>Regular use - formalize trips and frequencies through safety considerations, based on new COVID norms for the city. Defining new guidelines for boats to serve as emergency vehicles during pandemic situations.</td>
</tr>
<tr>
<td><strong>Circulation routes</strong></td>
<td>Operate for critical need-based transfers on specified routes.</td>
<td>Operate on identified existing routes based on demand and extend services to potential areas, if required, to distribute the load across other modes.</td>
<td>Formalize water transport as a trunk line – utilize the full potential by expanding the network of water transport to various parts of the city and linking it with other modes of public transport.</td>
</tr>
<tr>
<td><strong>Nos and Frequency</strong></td>
<td>Exact number of boats and trips to be decided purely based on the need. However minimum (10% of numbers) passenger boats to be kept available 24/7 for emergency use.</td>
<td>Operate with an occupancy equal to 50% of the seating capacity to cater to ‘in person’ dependent jobs (vending, shops and service sector jobs) and core emergency services such as public health, firefighting etc.</td>
<td>Resume the 100% service with defined frequencies and no of passengers per Jetty. Regulate additional boats and trips from 9pm-7am, which could also serve during emergency situations.</td>
</tr>
<tr>
<td><strong>Ticketing/Payment</strong></td>
<td>Not applicable</td>
<td>Facilitate ticketing inside the boats to avoid crowding at the jetty counters. Provision of temporary measures to ensure contactless/digital ticketing like UPI, Paytm, dropping exact change in the box provided.</td>
<td>Adopt a formal contactless ticketing system like NCMC where a single card can be used for payment in all modes of public transport.</td>
</tr>
<tr>
<td><strong>Hygiene and safety</strong></td>
<td>Clean and sanitize the boats after every trip and provide sanitizers to the staff and passengers. Monitor and carry out regular health checkup of boat staff. Ensure passengers follow the guidelines – compulsory mask wearing, physical distancing etc.</td>
<td>Clean and sanitize the boats daily. Monitor the health of boat staff daily. Plan alternate day shifts for boat staff. Ensure passengers follow the guidelines – compulsory mask wearing, physical distancing etc. Good ventilation should be maintained inside the boats.</td>
<td>Ensure boats are cleaned daily and sanitized once in a month.</td>
</tr>
<tr>
<td><strong>Emergency services</strong></td>
<td>Develop a quick fix solution wherein a minimum number of passenger boats can be modified to incorporate emergency medical care facilities.</td>
<td>Introduce water ambulance-boats with full-fledged emergency medical care facility.</td>
<td>Formalize the number and service of water ambulances through a proper system – establish a network for linking the primary and secondary health care facilities in the islands to the tertiary facilities in the mainland.</td>
</tr>
</tbody>
</table>
## d. RORO BOAT SERVICE

<table>
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</thead>
</table>
| Purpose of use                 | Primary use for emergency services – food and medical supply, transfer of ambulances etc.  
Develop quick fix solutions to utilize the RoRo boats that are not operating as temporary makeshift shelters for the homeless. | Use primarily for regular transfer vehicles and occasionally for emergency services.  
Restrict the use of RoRo boats to transfer vehicles alone. Provide passenger boats in the same route for individual commuters. Maintain a record of passengers. | Regular use - formalize vehicle and passenger occupancy, per RoRo boat, based on new COVID-19 norms for the city. |
| Nos. and frequency             | Operate for critical need-based transfers only.                                   | Operate both RoRo boats and passenger boats on a minimum frequency to cater to the demand with an occupancy of 50% seating capacity for passenger boats. | Resume 100% regular service with defined occupancy.                                                  |
| (KSINC has 2 RoRo boats and 1 passenger boat) |                                                                                 |                                                                                        |                                                                                                    |
| Ticketing/ Payment             | Not applicable                                                                    | Develop segregated makeshift ticket counters for 2- and 4-wheelers. Facilitate ticketing inside the boats to avoid crowding at the counters. Provision of temporary measures to ensure contactless ticketing like UPI, Paytm, dropping exact change in the box provided etc. | Provision of separate ticket counters with scanning screens for 2- and 4-wheelers. Adopt a formal contactless ticketing system like NCMC for passengers where a single card can be used for payment across all modes of public transport. |
| Hygiene and safety             | Clean and sanitize the boats after every trip. Provide sanitizers and other safety measures to boat staff and passengers. Monitor and carry out regular health checkup of boat staff. Ensure passengers follow the guidelines – compulsory mask, physical distancing etc. | Clean and sanitize the boats daily. Monitor the health of boat staff daily. Plan alternate day shifts for boat staff. Ensure passengers follow the guidelines – compulsory mask, physical distancing etc. | Ensure boats are cleaned daily and sanitized once in a month.                                          |
| Hygiene                        | Segregation of 2- and 4-wheeler line up. Provision of temporary partition and shade for two rows of 2-wheeler line-up to ensure physical distancing. |                                                                                        | Permanent spatial solution – segregated access and line-up for 2- and 4-wheelers which are at a safe distance from pedestrians. |
### e. METRO RAIL

<table>
<thead>
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</thead>
<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Use the non-air-conditioned spaces inside metro stations for emergency facilities like collection and segregation of essentials etc.</td>
<td>Resume service with minimum frequency and occupancy and adhere strictly to physical distancing norms. Control the flow of passengers at different stages of entry depending upon the available capacity of the train, to avoid overcrowding at the station.</td>
<td>Regular use - formalize the frequencies and occupancy through safety considerations, based on new COVID-19 norms for the city.</td>
</tr>
<tr>
<td><strong>Additional use of space</strong></td>
<td>Use the metro open spaces around and under the metro to set up emergency medical and food booths, other emergency facilities, temporary relief zones for homeless.</td>
<td>Develop makeshift spaces using simple and cost-effective materials (recycled metal, concrete sheets, shipping containers and others) to accommodate emergency services, shelter for homeless and additional city services to encourage effective use of spaces.</td>
<td>Regulate norms to develop these unused spaces into active emergency spaces. Use the spaces to develop shelters for emergency services and makeshift shelters.</td>
</tr>
<tr>
<td><strong>Ticketing/Payment</strong></td>
<td>Adoption of smart cards (prepared by KMRL) and other existing mechanisms.</td>
<td>Facilitate contactless payment and temporary smart card booths across government buildings, banks and other transit stations (bus stand, railway station etc.) to reduce queuing at metro stations.</td>
<td>Facilitate temporary smart cards through other means, over and beyond the metro ticketing counters. This could include creating ticketing booths outside the metro stations, railway stations, bus stands, auto stands and other government buildings and public spaces.</td>
</tr>
<tr>
<td><strong>Hygiene and safety</strong></td>
<td>Clean and sanitize the coaches after every trip and metro stations daily. Provide sanitizers and other safety measures to staff and passengers. Monitor the health of staff regularly. Ensure passengers follow the guidelines – compulsory mask wearing, physical distancing etc.</td>
<td>Clean and sanitize the coaches daily. Monitor the health of staff daily. Plan alternate day shifts for staff. Ensure passengers follow the guidelines – compulsory mask, physical distancing etc. Stagger air conditioning inside metro and at stations. Sanitize air conditioning vents daily and replace filters frequently.</td>
<td>Ensure the coaches are cleaned daily and sanitized once in a month.</td>
</tr>
<tr>
<td></td>
<td>Maintain designated queue and safe distance between passengers at the entrance of the station, ticket counters and platforms. Limit the number of passengers within each coach.</td>
<td>Develop semi-permanent spatial measures to determine new norms of social distancing in metro stations. Installing health screening machines and emergency health booths. Encourage metro apps for real-time information to avoid crowding.</td>
<td>Implement permanent social distancing measures at security check and boarding platforms in the metro stations. Regular hygiene and quality check in and around metro stations.</td>
</tr>
<tr>
<td><strong>Revenue models</strong></td>
<td>Provision of discounts in fares (with support from the government) for senior citizens, students and lower income groups to encourage use of metro and help reduce load on other modes.</td>
<td>Test alternate revenue models to facilitate lower fares in metro and substantiate the balance amount through alternate measures (government reserved amount, Corporate Social Responsibility (CSR) engagement etc.)</td>
<td>Develop and regulate a shared revenue model for different transit systems to distribute the fare load. In turn encourage and facilitate distribution of different modes based on trip lengths and ODs.</td>
</tr>
<tr>
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</tr>
<tr>
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<td>----------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Purpose of use</td>
<td>Use auto-rickshaws as emergency vehicles for shorter trips - for food/medical supply and medical emergency movement of passengers such as government employees - with adequate permissions and precautions. Drivers could be incentivized by the government for the same.</td>
<td>Selected autos (chosen based on their health condition on a rotation basis) to function both as passenger autos and as emergency vehicles based on need. The revenue and license to be designed accordingly.</td>
<td>Regular use as passenger autos while adhering to new COVID-19 norms for the city. Permit selected number of autos in the city to operate as dual-purpose autos (emergency and regular use). These could help in reaching the inner areas which are not accessible by larger PT modes.</td>
</tr>
<tr>
<td>Circulation routes</td>
<td>Assigning movement of autos only for emergency services.</td>
<td>Rationalize routes and zones for specific trips, to suffice the first and last mile connectivity.</td>
<td>Develop designated zones and routes for autos to serve first and last mile, in turn sharing passenger loads from other PT modes. This helps distribute the passenger load and builds efficiency of all the modes.</td>
</tr>
<tr>
<td>Ticketing/ Payment</td>
<td>Adoption of temporary measures to ensure contactless payment through UPI, providing exact change to avoid exchange etc.</td>
<td>Adoption of temporary measures to ensure contactless payment through UPI, Paytm, QR code payment, providing exact change to avoid exchange etc.</td>
<td>Promote and formalize a contactless digital payment system like NCMC.</td>
</tr>
<tr>
<td></td>
<td>Allowance of maximum of 2 passengers per auto with mask wearing mandatory. Physical separation (through screens) between driver and passengers to allow for greater protection to all stakeholders involved.</td>
<td>Allowance of maximum of 2 passengers per auto with mask wearing mandatory. Physical separation (through screens) between driver and passengers to allow for greater protection to all stakeholders involved.</td>
<td>Allowance of a maximum of 3 passengers with all safety and hygiene precautions always taken.</td>
</tr>
</tbody>
</table>
### g. WALKING

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian health and safety</td>
<td>Restricted pedestrian movement on streets and open spaces only for basics needs like grocery and medical purposes.</td>
<td>Restrict pedestrian activity only for daily essentials and in-person sector jobs (vending, shops, electrician, plumbing etc.) along with ensuring adequate measures of social distancing etc.</td>
<td>Facilitate the infrastructure and ensure walking is adopted as the primary mode for all short distance trips up to 1 km.</td>
</tr>
<tr>
<td>Footpath hygiene</td>
<td>Constant monitoring of footpaths to ensure physical distancing and to restrict space being occupied by homeless, occurrences of open defecation etc. that create risks of COVID-19 spread.</td>
<td>Timely cleaning and monitoring of footpaths in high pedestrian intensity zones and COVID-19 containment zones. Strict enforcement to prevent non-purposeful activities and waste dumping on footpaths.</td>
<td>Law enforcements for maintenance and cleaning of footpaths. This includes quality checks of the footpaths’ surface and other infrastructure.</td>
</tr>
<tr>
<td>Street network and connectivity</td>
<td>Regulate all streets as pedestrian or bicycle only streets (along with emergency vehicle movement). Individual person movements only for selective emergency purposes.</td>
<td>Create a hierarchy of pedestrian only streets, Ped+ domestic vehicles and all vehicular priority streets using semi-permanent infrastructure (barricades, signage and others) and enforcement.</td>
<td>Develop permanent hierarchy of street network, designating NMT only streets and infrastructure based on detailed on-ground post-pandemic behavioral studies. This includes developing street signage, infrastructure and enforcements.</td>
</tr>
<tr>
<td>Street infrastructure</td>
<td>Create temporary barricading, markings and spacing on streets and public spaces to provide adequate space between multiple users and with vehicles.</td>
<td>Regulate walkable stretches with appropriate infrastructure, keeping in view COVID-19 precautions/ social distancing, for pedestrian priority &amp; NMT only streets using semi-permanent measures as per Indian Road Congress (IRC) Code 103 guidelines.</td>
<td>Develop permanent pedestrian infrastructure with appropriate LOS (Level of Service) for pedestrian priority &amp; NMT only streets as per IRC 103 guidelines.</td>
</tr>
<tr>
<td>Street amenities and facilities</td>
<td>Provision of government led temporary water booths and toilets, and sanitizer and package food supply counters for the homeless and neighborhood users.</td>
<td>Continued provision of temporary amenities along with identification of critical spots for permanent installation of these amenities.</td>
<td>Permanent installation and maintenance of amenities: drinking water facilities, toilets and emergency booths for increased hygiene of the footpath and of pedestrians. Strict enforcements against tampering of these items.</td>
</tr>
<tr>
<td>Measures to impart awareness</td>
<td>Develop informative street signage in the form of risk and safety maps, and information about COVID-19 risks and safety measures in the local language and in English.</td>
<td>Map different intensity and risk level zones depending on the COVID-19 spread and response. Setting up of emergency help centers and health booths to document and address immediate needs of the residents and the homeless.</td>
<td>Permanent installation of wayfinding signage indicating resilient areas, safe zones, emergency booths, local hospitals and emergency services. Public consultation to build awareness regarding the same.</td>
</tr>
</tbody>
</table>
## h. CYCLING

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Restrict cycling to 2 km radius and for basics needs (grocery and medical purposes).</td>
<td>Allow cycling only for daily essentials and in person sector jobs (vending, shops, electrician, plumbing etc.) with adequate measures of social distancing and ensure the same.</td>
<td>Encourage and facilitate cycling as a primary mode for all the short trips (first and last mile) within neighborhoods and city.</td>
</tr>
<tr>
<td><strong>Cycle networks</strong></td>
<td>Allow all streets for cycling.</td>
<td>Identify loops and networks of streets for cycling based on hierarchy of streets.</td>
<td>Develop a city level NMT plan and execution strategy (network of streets with cycle lanes and cycle priority streets).</td>
</tr>
<tr>
<td><strong>Cycling priority streets</strong></td>
<td>Identify and earmark a typology of streets with different cycling priorities (NMT only streets; NMT priority streets; mixed streets).</td>
<td>Test the different cycling priority streets using temporary street elements.</td>
<td>Regulate hierarchy of streets using NMT as the priority.</td>
</tr>
<tr>
<td><strong>Cycling infrastructure</strong></td>
<td>Indicate cycle lanes on identified routes using tapes and signage.</td>
<td>Develop demarcated lanes using semi-permanent materials.</td>
<td>Build dedicated and demarcated cycle lanes using permanent elements.</td>
</tr>
<tr>
<td><strong>Cycle parking</strong></td>
<td>Regulate temporary on-street parking spots, in anchor points that provide emergency and basic services, using markings.</td>
<td>Earmark a section of existing 2- &amp; 4-wheeler parking for cycle parking in both public and private areas.</td>
<td>Identify and develop potential spaces in front of buildings, streets and unused public land as permanent parking infrastructure</td>
</tr>
<tr>
<td><strong>Public bicycle Sharing</strong></td>
<td>Utilize the existing Public Bike Sharing (PBS) systems for short distance travel.</td>
<td>Test alternate models to increase the use of cycles (temporary stalls in neighborhoods).</td>
<td>Incentivize the use of PBS as a part of over all public mode share travel.</td>
</tr>
</tbody>
</table>
4. RECOMMENDATIONS BASED ON PUBLIC SPACE TYPOLOGY

The document provides guidelines to reopen public spaces post-COVID-19 and devises long term safety and accessibility measures. Specific guidelines have been identified for various typology of public spaces as listed below.

- City level open spaces – maidans, city parks and others
- Neighborhood level open spaces
- Opens spaces within institutions and government buildings
- Transit spaces
- Residual/ Incidental spaces
- Streets as public spaces
### a. CITY LEVEL OPEN SPACES

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<tbody>
<tr>
<td><strong>Propose of use</strong></td>
<td>Assign <em>maidans</em> and open grounds as important centers for supply of emergency goods and medical supplies as well as parking and waiting for emergency vehicles.</td>
<td>Make legal provisions for utilizing open spaces for emergency needs and as emergency vehicle parking space during pandemic-like situations. Keep emergency implementation plans ready for every open space in the city.</td>
<td>Regulate the city’s open spaces to function as resilient spaces during pandemic situations and to accommodate the emergency needs of the city.</td>
</tr>
<tr>
<td><strong>Supporting infrastructure</strong></td>
<td>Provide temporary barricades, makeshift shelters, mobile toilets &amp; handwash setups, kiosks for goods &amp; medical supplies etc.</td>
<td>Allocate dedicated space for emergency use. Provide portable toilets as storage space for temporary makeshift items. Define entry and exit to public spaces.</td>
<td>Setting up utilities like public toilets, hand wash with taps operated by foot pedals &amp; drinking water facilities; and monitor them regularly.</td>
</tr>
<tr>
<td><strong>Safety and hygiene measures</strong></td>
<td>Social distancing marking for queuing at temporary markets and medical services that require physical presence of users. Constant cleaning and monitoring of such spaces.</td>
<td>Mandatory cleaning and monitoring of spaces. Define dedicated entry and exit points, stagger the activity and user timings and extend hours for spaces that have regulated access.</td>
<td>Regularize mandatory cleaning of the space and provide dedicated entry and exit gates.</td>
</tr>
</tbody>
</table>

### b. NEIGHBORHOOD LEVEL OPEN SPACES

<table>
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<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Assign neighborhood open spaces as primary relief zones for daily emergency supply of goods and basic services.</td>
<td>Define these spaces as safe meeting zones for neighborhood residents to discuss, update and report the issues and needs of the neighborhood while following social distancing.</td>
<td>Regulate and assign neighborhood open spaces as pandemic reporting and managing centers. These spaces to also function as immediate relief zones during an emergency.</td>
</tr>
<tr>
<td><strong>Supporting infrastructure</strong></td>
<td>Provide necessary space and infrastructure for supply of goods and to organize critical meetings for decision making.</td>
<td>Allocate temporary booths for reporting and managing emergency needs and services of the neighborhood.</td>
<td>Provide facilities for managing infrastructure and resources during pandemic situation.</td>
</tr>
<tr>
<td><strong>Safety and hygiene measures</strong></td>
<td>Create safe meeting and waiting zones. Allow the users only based on a specific need at a specific time.</td>
<td>Define dedicated walking, meeting and recreation zones using marking. Assign limited timing for usage of space with restricted number of people at a given time.</td>
<td>Constant cleaning and maintenance of these spaces. Provision of adequate lighting, segregated seating and separate entry and exit points.</td>
</tr>
</tbody>
</table>
### c. OPEN SPACES WITHIN INSTITUTIONS AND GOVERNMENT BUILDINGS

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<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Utilize these spaces for daily staff health monitoring and provision of medical safety kits, for all COVID-19 working staff and experts.</td>
<td>Utilize open spaces outside institutions and government buildings to set up public enquiry and administration centers, to record and report pandemic/ natural disaster incidents etc.</td>
<td>Regulate building and open spaces codes to use the open spaces as centres of public-government interaction. Utilize the building infrastructure of schools and government buildings along with open space as immediate relief zones during pandemics/ natural disasters.</td>
</tr>
<tr>
<td><strong>Supporting infrastructure</strong></td>
<td>Provision of safety equipment, health kits and other necessary services for COVID-19 staff.</td>
<td>Provision of shelter, food and other safety measures for staff. Defined entry, activity space and exit for visitors.</td>
<td>Allocate open space and space within the building for management of staff and resources during future pandemics.</td>
</tr>
<tr>
<td><strong>Safety and hygiene measures</strong></td>
<td>Restrict public movement during lockdown period. Constant cleaning and sanitization of government buildings and open spaces.</td>
<td>Allot limited working hours for offices. Constant monitoring of staff and visitors in government offices and institutions.</td>
<td>Regulate social distancing and hygiene measures in government offices and institutions. Introduce compulsory mock pandemic emergency drills as training.</td>
</tr>
</tbody>
</table>

### d. TRANSIT SPACES

<table>
<thead>
<tr>
<th>Component</th>
<th>Lockdown scenario</th>
<th>Post-lockdown scenario</th>
<th>Post COVID-19 eradication scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of use</strong></td>
<td>Utilise the space to accommodate emergency vehicles and staff circulation. The space to be used for operation and repair on a temporary basis. Provide necessary health and safety facilities for staff and volunteers.</td>
<td>Utilize the space for transit activities. Provide necessary health and safety facilities for staff and public transport users.</td>
<td>Regulate transit spaces to function as resilient spaces, during pandemic situations, and to accommodate the emergency needs of the city.</td>
</tr>
<tr>
<td><strong>Supporting infrastructure</strong></td>
<td>Provision of safety equipment, health kits and other necessary services for COVID-19 staff.</td>
<td>Provide temporary barricades to restrict movement, monitoring and sanitization tunnels at the entrance, mobile toilets &amp; handwash facilities.</td>
<td>Provide permanent facilities to ensure an organized but spread out movement and halting of users in transit spaces.</td>
</tr>
<tr>
<td><strong>Safety and hygiene measures</strong></td>
<td>Transit open spaces to be used to set up health kiosks and check-up centers for operators.</td>
<td>Mandatory cleaning and monitoring of space. Define dedicated entry and exit points and ensure safe distance through queueing and segregated seating. Set a limit on the number of users at a time based on the availability of space.</td>
<td>Regularize mandatory cleaning of the space. Provision of adequate lighting, segregated seating and separate entry and exit points.</td>
</tr>
</tbody>
</table>
### e. RESIDUAL/ INCIDENTAL SPACES

| Component            | Lockdown scenario                                                                                                                                                                                                 | Post-lockdown scenario                                                                                                                                                                                                 | Post-COVID-19 eradication scenario                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Purpose of use**   | Utilize these spaces to provide necessary health and safety facilities for COVID-19 workers like traffic police who are working outdoors to manage people and vehicles.                                                                                       | Revive these incidental spaces and assign purpose to the same as temporary vending zones with restricted number of vendors, citizen help booths, etc.                                                                                                                          | Revive these pockets as public open spaces thereby increasing the supply of public spaces that can result in better management through dispersed use.                                                                                                                                   |
| **Supporting infrastructure** | Provide makeshift shelters and COVID-19 awareness signages in residual spaces along the streets.                                                                                                                                                                        | Provide temporary barricades, on-ground buffer marking, segregated seating etc. to ensure safe distance among users.                                                                                                                                                                      | Provide permanent infrastructure facilities and amenities to ensure safety.                                                                                                                                                                                                                          |
| **Safety and hygiene measures** | Provision of mobile toilets, handwash facilities etc. for COVID-19 workers.                                                                                                                                                                                                       | Mandatory cleaning and monitoring of space. Define dedicated entry and exit points, restrict the number of users at a given time through strict enforcement.                                                                                                                                   | Regularize mandatory cleaning of the space.                                                                                                                                                                                                                                                          |

### f. STREETS AS PUBLIC SPACES

| Component            | Lockdown scenario                                                                                                                                                                                                 | Post-lockdown scenario                                                                                                                                                                                                 | Post-COVID-19 eradication scenario                                                                                                                                                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Purpose of use**   | Utilize streets only for the movement of emergency vehicles, pedestrians and NMT movement for emergency purposes.                                                                                                                                                     | Declare certain areas for on-street emergency vehicle parking in times of emergency, demarcate dedicated zones for vendors and install social distancing provisions etc.                                                                                                   | Repurpose right of way to prioritize pedestrians and NMT on streets through formalizing wider footpaths and provision of NMT lanes.                                                                                                   |
| **Supporting infrastructure** | Provide temporary barricades to restrict movement of people and vehicles and set up monitoring centers at specific locations as per requirement.                                                                                                                               | Repurpose residual right-of-way and bringing it into the public realm. Mark ‘last mile streets’ only for pedestrian and NMT through staggered access.                                                                                                                                                 | Provide necessary permanent infrastructure in terms of better pedestrian and NMT facilities.                                                                                                                                                                                                 |
| **Safety and hygiene measures** | Provide social distancing markings on the ground in waiting areas and at the front of essential service units, shops etc.                                                                                                                                            | Provide wider footpaths and NMT lanes through provision of temporary barricades and demarcate safe distance markings on footpath.                                                                                                                                                             | Regularize mandatory cleaning of the streets and ensure proper lighting as well as waste disposal and management.                                                                                                                                                                                     |
5. INSTITUTIONAL ROLES AND RESPONSIBILITIES – BUILDING A STRONG TASK FORCE

An emergency task force must be formed with representation from all administrative agencies, transport agencies (government and non-government) and all other relevant departments to carry out the various tasks planned for implementation in all the three scenarios. The diagram below broadly lists but is not limited to the various agencies and authorities who may represent the emergency task force.

WRI India, GIZ India and TUMI, as well as other local and global institutions, take the role of knowledge partners in the task force to offer technical expertise through capacity building, planning and strategizing solutions, developing policy recommendations and design interventions, carrying out stakeholder consultations and facilitating implementation.

Each nodal agency must coordinate across respective groups of agencies to ensure efficient implementation and enforcement of the action steps. The nodal agencies and knowledge partners, along with civil societies, will work jointly for better coordination and for issuing necessary orders.
# Lockdown Scenario

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Tasks</th>
<th>Nodal Authority/ Agency</th>
<th>Supporting Authority/ Agency</th>
</tr>
</thead>
</table>
| 1     | • Restrict movement of private vehicles, cycling and walking (except in critical conditions)  
      • Provision of public transport vehicles and IPT facilities for emergency services  
      • Enforce cycling and walking within 2 km radius of the residence for emergency medical and food necessities  
      • Constant monitoring and safety precautions of COVID-19 transport and administrative staff  
      • Develop a single window clearance module for permissions for emergency vehicle movement | Metropolitan Transport Authority Kochi or KMC or an equivalent agency, which can coordinate the action steps and enforcements by different agencies | All the concerned mass transit agencies (government and private) Eg: KSRTC, Railways, Private bus operators etc  
• Kochi Municipal Corporation  
• Auto-rikshaw & taxi associations  
• Motor Vehicles Department  
• Traffic Police |
| 2     | • Create an emergency COVID-19 team with representation from all transport agencies (private and government), Kochi Municipal Corporation and all other departments  
      • Assign open spaces and associated institutions for emergency healthcare and other important services  
      • Constant monitoring of crowding and gatherings in public spaces, particularly in dense neighborhoods using real-time data for controlling/regulating strategies  
      • Adopt special measures for hotspot zones  
      • Identify local leaders, local organizations and key anchors to micro-monitor the neighborhoods | Kochi Municipal Corporation or an equivalent agency | All transport agencies  
• Infrastructural departments  
• GCDA (Greater Cochin Development Authority)  
• Local NGOs, community representatives, self-help groups and others |
| 3     | • Facilitate regular meetings between transport agencies and other key decision makers of the city to take time measures  
      • Communicate and coordinate with local community groups to facilitate requirements based on on-ground needs  
      • Constant dissemination of both digital and physical messages on safety precautions for COVID-19  
      • Building awareness about social distancing through immediate measures | Metropolitan Transport Authority Kochi or KMC or other equivalent agencies that can coordinate across different agencies and with the community on-ground | A respective transit agency  
• Local NGOs, community representatives, self-help groups and others |
<table>
<thead>
<tr>
<th>Sl.no</th>
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</thead>
</table>
| 1    | • Limited and regulated entry of public and private vehicles along with limited functioning of public transport in the city  
      • Regulate movement of mass transit systems with rationalized routes and limited occupancy of passengers  
      • Test public space and street level pop-up solutions to facilitate cycling and walking as the main mode of commute to areas within 2 km distance  
      • Constant monitoring and ensuring safety precautions of COVID-19 transport and administrative staff  
      • Functional and financial assessment of redistributed route, modes and staff   | Metropolitan Transport Authority Kochi or KMC or an equivalent agency, which can coordinate the action steps and enforcements by different agencies   | All the concerned mass transit agencies (government and private)  
      Eg: KSRTC, railways, private bus operators etc  
      Kochi Municipal Corporation  
      Auto-rickshaw & taxi associations  
      Community organizations  
      Motor Vehicles Department  
      Traffic Police   |
| 2    | • Monitor cleanliness and dumping of waste in open spaces to avoid spread of infection  
      • Constant monitoring of crowds and gatherings in public spaces, particularly in dense neighborhoods  
      • Staggering of work hours of various activities like offices, schools, markets, public spaces etc. – coordinated at city level and at micro-local level.  
      • Form dedicated teams in neighborhoods to monitor and report complaints/ suggestions/ requirements of the neighborhood | Kochi Municipal Corporation or an equivalent agency | All transport agencies  
  Infrastructural departments  
  GCDA (Greater Cochin Development Authority)  
  Local NGOs, community representatives, self-help groups and others   |
| 3    | • Form a core COVID-19 committee to build the capacity of government employees to monitor, manage the situation  
      • Develop relevant communication pieces to bring awareness about public transport and prominent public spaces in the city  | Metropolitan Transport Authority Kochi or KMC or other equivalent agencies that can coordinate across different agencies and with the community on-ground | A respective transit agency  
  Local NGOs, community representatives, self-help groups and others  
  Local media agencies   |
# POST-COVID-19 ERADICATION SCENARIO

<table>
<thead>
<tr>
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<th>Tasks</th>
<th>Nodal Authority/ Agency</th>
<th>Supporting Authority/ Agency</th>
</tr>
</thead>
</table>
| 1     | • Rationalize routes and the use of mass transit, IPT and NMT modes with incentives  
      • Regulate movement of mass transit systems with all the safety measures being undertaken  
      • Build cycling and walking infrastructure for streets with high walking potential and also to promote safe distancing  
      • Constant monitoring and ensuring safety precautions of COVID-19 transport and administrative staff | Metropolitan Transport Authority Kochi or an equivalent agency, which can coordinate the action  
steps and enforcements by different agencies.  
KMC (Kochi Municipal Corporation) | All the concerned mass transit agencies (Government and Private)  
Eg: KSRTC, Railways, Private bus operators etc  
Kochi Municipal Corporation  
Auto-rickshaw & taxi association  
Community organizations |
| 2     | • Build a network of public spaces with prominent streets that can accommodate movement of emergency vehicles  
      • Regulate public spaces to have an added function of reliance that can be utilized during future pandemic situations  
      • Provide the necessary infrastructure and awareness about social distancing in public spaces  
      • Staggering of work hours of various activities – coordinated at city level and at micro-local level  
      • Develop a common resilience committee to manage day-to-day and emergency situations | Kochi Municipal Corporation or an equivalent agency | All transport agencies  
Infrastructural departments  
GCDA (Greater Cochin Development Authority) |
| 3     | • Create an agreement of all the concerned agencies to represent, coordinate and facilitate collective measures during pandemics  
      • Build campaigns around social distancing, importance of public health and safety in public spaces etc.  
      • Create outreach in the form of signage, apps and on social media platforms | Metropolitan Transport Authority Kochi or KMC or other equivalent agencies that can coordinate across different agencies and with the community on-ground | A respective transit agency  
Local NGOs, community representatives, self-help groups and others  
Local media agencies |
7. KEY TAKEAWAYS FOR MAKING KOCHI'S PUBLIC TRANSPORT AND SPACES MORE RESILIENT DURING/ AFTER COVID-19

Cities across the world are coming to terms with the virus. Kochi too is looking forward to embracing this ‘new normal’. This guide aims to support Kochi in undertaking a strategic approach in reconfiguring public transport systems and public spaces for the new normal keeping in view the long-term adoption of resilient sustainable solutions. Below is a brief of key takeaways from this guide:

**Planning and Regulation**

**Public transport**

**City level**

- An integrated network of public transport system is necessary to achieve an efficiency and balance between the modes, trips and density distribution, for which the existing public transport system need to be rationalized for the three scenarios.

- **Lockdown scenario** - The public transport system must cater to emergency requirements and essential services such as health services, administrative services, essential travel like arrival to and departure from the city etc.

- **Post-lockdown and post-COVID-19 eradication scenario** – Rationalize the public transport system where certain corridors are prioritized as trunk lines and establish a feeder network to this to cater to the rest of the city. Metro, Ferry and Railway are chosen as the trunk lines and the city buses both public and private, IPT and NMT would become the feeder network to this trunk corridor.

**Modes of public transport**

- Ensure the safety of passengers and staff within the various modes of public transport through suggested recommendations for the three scenarios. Components like purpose of use, circulation routes, numbers and frequency, ticketing systems, hygiene and safety, network for walking and cycling, street infrastructure etc. become critical here.

**Public spaces**

**City level**

- **Lockdown scenario** - Assign open spaces for emergency requirements such as supply of emergency goods, medical supplies, parking and waiting for emergency vehicles etc. based on the availability of space and accessibility.

- **Post-lockdown and post-COVID-19 eradication scenario** – Improve access to public spaces by connecting them with an integrated network of streets which compulsorily have access to public transport, emergency vehicles, walking and cycling.

**Typologies of public spaces**

- Ensure safety of users through suggested recommendations for the various scales and typology of public spaces under the three scenarios across components like purpose of use, supporting infrastructure and safety and hygiene measures.

**Design intervention**

**Area level**

- Implement a set of low cost, makeshift and pop-up area level solutions like on-ground buffer markings, safety booths, awareness signages etc. in various scales of open spaces, streets and transit spaces to ensure safety of users.

- Permanent solutions to improve safety and hygiene within transit spaces and public spaces by adequate provisions for safe distancing and segregations, and provision of amenities such as clean public toilets, drinking water facility etc.

**Institutional setup**

- Formation of an emergency COVID-19 team with representation from all administrative agencies, transport agencies and other relevant departments along with community organizations to carry out the various tasks planned for implementation in all the three scenarios.

- Appoint nodal agencies that coordinate across respective groups of agencies to ensure implementation and enforcement of the action steps. These nodal agencies would work jointly for better coordination and issuing necessary orders.

**Financing**

- Allocate emergency fund over and beyond the city annual budget from which funding can be channelized to all types of emergency situations.

- Develop revenue models for various modes of public transport to ensure sustenance during pandemic/ emergency situations.
TUMI

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 the 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.

As part of TUMI project, Kochi Municipal Corporation (KMC) in collaboration with WRI India is developing a conceptual proposal for the integration of different modes including NMT at RoRo jetty area which extends from the jetty till the city bus stand area. The project aims to improve accessibility and bring coordination between different modes, in a way that is ‘people centric’ and that stipulates a continuous and involved stakeholder process.

WRI INDIA

World Resources Institute (WRI) India is an action-oriented global organization most recently voted as the top environment and natural resource think tank in the world. WRI goes beyond research to put ideas into action. It provides objective information and practical proposals to foster environmentally sound and socially equitable development. The work focuses on building sustainable and livable cities and working towards a low carbon economy. Through research, analysis and recommendations, WRI India puts ideas into action to build transformative solutions to protect the earth, promote livelihoods and enhance human well-being.

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The team was involved in 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. A list of team members includes:

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