

# 13 ACGs

**ARCASIA**

**COVID19 Guidelines**

**For Built Environment Intervention**

By ARCASIA Committee on Social Responsibility

and

ARCASIA Emergency Architects

December 2020

# 13 ARCASIA COVID19 Guidelines for Built Environment Intervention (Final draft 26 Nov 2020)

## Introduction

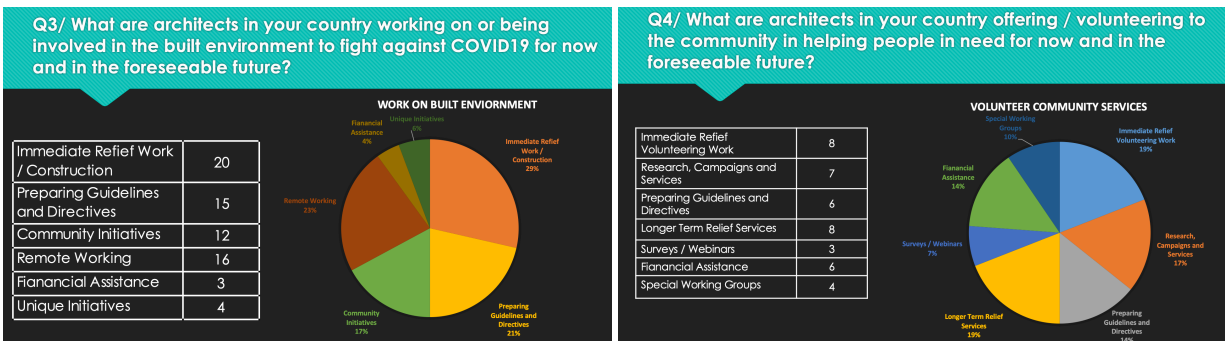
By Assistant Professor Thana Chirapiwat, Ph.D., Convener

Back in May 2020, when cities and countries have started lock-downs from COVID-19 pandemic. Work-from-home and study-from-home became a must-do for a large group of urban population. However, other groups of the population suffer for that work-from-home and study-from-home are not viable options. They either have to go out and work or cannot work at all, jobless, which means no income.

ACSR and AEA members who represent ARCASIA 21 member countries also worried about difficulties our member architects encountered. To understand the early impacts of and reactions to the pandemic, we sent out a survey in early May.

Here are a couple of samples of the answers to the survey questions. Question number 3 asked what architects are working in fighting against COVID-19? Immediate relief works related to construction of facilities and preparing guidelines were the main answers.

Another question on volunteering to help communities: we spread out doing so many things almost equally such as relief works both immediate and long-term reliefs, campaigns and services, preparing guidelines, and even financial assistance to the communities.



The key results from that survey showed that we were not concerned only about ourselves, how we worked and survived in the crisis, we wanted to reach out and being significant parts of the community to fight against the pandemic.

ACSR and AEA then set up a task force to develop a roadmap to consolidate various guidelines issued by organizations, which are overwhelming and difficult to comprehend to the public.

Aiming to write up a set of guidelines, simple, comprehensive, comprehensible, and implementable utilizing ARCASIA as a platform with member institutes to help co-inventing the guidelines and to expand the implementation.

The process includes reviewing existing guidelines, compiling what are applicable and what need to be added into the first draft of ARCASIA COVID-19 Guidelines. We had an online workshop in September with 4 experts from various fields to work on improving the first draft. They also join us today as the panelists. Then, our editorial team revised, reorganized the contents of the guidelines. As a result, we now have the 13 ACGs as a new draft that was presented for further comments in November 2020 Webinar. The guidelines target 3 major groups: architects and related professions, policymakers and public authorities, and the general public. It covers both private and public domains for short-term and long-term applications.

From there our editorial team finalizes the guidelines for final publication to be released to ARCASIA's 21 member institutes for implementation in their local, domestic contexts and to be distributed to the public, which can be useful to many groups as the pandemic still evolves and affects larger and larger number of people.

## Principles of managing the pandemic.

1. Reducing the exponential spread of the virus that is transmitted via respiratory droplets or aerosol by segregating or protecting people from sources of the virus, either from carriers (with or without symptoms), or from objects where carriers had left the virus (from a few hours to a few days). This includes social distancing\*, wearing protective gear such as face masks and goggles, and frequent cleaning or disinfecting of our hands and objects which we need to touch, and managing ventilation (including air changes per hour and location of supply and exhaust vents) and drainage systems design which are potential media for spreading. This also means drastically reducing human physical interaction in enclosed spaces, prohibiting mass gatherings or crowds and reducing flow of people including closing of country/city/regional borders.

2. Providing suitable healthcare facilities to those who contracted the virus at a level where the local healthcare system can accommodate (“flattening the curve”) the surge, especially to the more vulnerable population such as geriatrics (the elderly), the children and those with chronic diseases. This includes expanding capacity of the current medical facilities and healthcare support, and at the same time limiting the spread by early detection and isolation/quarantine, and other means of physical distancing.

3. Finding alternative methods when people can still maintain a basic level of human activities to live, work, learn, pray and play for all walks of life. Examples are home supplies delivery, working from home, remote schooling, service sectors, etc. This should also take care of boosting general physical and mental health of people so that impact of the disease can be reduced even if they contracted it.

4. Managing the social economic impact of the reduced physical interaction by enhancing infrastructure for communication and ease of access to the provision for Wi-Fi network and computer hardware (i) to enable remote interaction, and transparent communication to the citizens to maintain confidence and (ii) to provide opportunities for alternative financial assistance to those severely impacted (e.g. Loss of job, earnings).

## Summary

The fundamental issues we observed that needs to be tackled are summarized below:

- i) reduced people movement in general but increased remote working and learning in safer environments;
- ii) reduced physical social interaction but increased virtual activities for connectivity;
- iii) reduced large-scale destination-focus events but increased small-scale manageable home or community-based activities;
- iv) rapidly changing external environment and social behaviour, and increased need for adaptation of the physical environment within limitations.
- v) alternative strategies in addressing increased pressure in the social economic situation globally as the pandemic prolongs;
- vi) address increasing anxiety on the uncertainty of the future through continuously informed decisions and one-stop centre to refer to.

## Scope and Limitation

The guidelines focus on what can be done on the built environment to support achieving the four principles listed above as well as science-based behavioural guidance issued by international organizations and respective country authorities.

The Guidelines intended to be general in nature and serve as guidance for individual countries to adapt-for-use in their particular circumstances. It should also be noted in considering the adoption of any guidelines, that there needs to be a balance between a risk-free environment, versus social costs, economic impact and long-term sustainability.

Practice related issues such as financial assistance or finding new job opportunities are not included in this guideline.

Issues beyond the built environment and control of architects such as labour, economic, political issues are also excluded.

## Glossary

**Private Domain** includes areas occupied exclusively by an individual, his/her families, or a close community such as neighbourhood, at home, in a personal office, a personal workspace, or private realm in any sector.

**Public Domain** includes public areas for transit, work, shop, education, leisure, exercise ...etc. which are open to all people with minimal limitation, to people living in different communities either indoor or outdoor.

**Short Term** refers to a timeframe from now until when all short-term measures are taken or immediate action and attention/resources can be directed to look at long term measures.

**Long Term** refers to a time frame from now to as far out as we can envision, provided attention/resources are available.

**Physical Distancing** is also called “**Social Distancing**”, and refers to keeping a safe space between yourself and other people who are not from your household. Generally, the practice of social or physical distancing is to stay at least 1-2 meters or 3-6 feet (about 2 arms’ length) from other people who are not from your household in both indoor and outdoor spaces. Social distancing should be practised in combination with other everyday preventive actions to reduce the spread of COVID-19, including wearing masks, avoiding touching your face with unwashed hands, and frequently washing your hands with soap and water for at least 20 seconds. (Source: Centers for Disease Control and Prevention, at <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>)

**Separation** refers to the use of physical barriers such as screens or partitions, either transparent or opaque (depending on function), permanent or temporary, ideally of full height and on all sides apart from access/egress point.

**Isolation (or quarantine)** refers to the complete separation from others of a person suffering from contagious or infectious disease. People in contact with the person should be wearing full medical protection gears or PPE.

**Semi-Private Space** refers to space under the control of the Community where access by the public is permitted with effective access control. (e.g. Entrance lobby of an office building)

**Semi-Public Space** refers to space that may or may not be under the control of the Community where access by the public is permitted with limited access control. (e.g. Car parking shared by a shopping mall and residential building)

**Flattening the curves** refers to community isolation measures that keep the daily number of disease cases at a manageable level for medical providers. In epidemiology, the idea of slowing a virus' spread so that fewer people need to seek treatment at any given time is known as "flattening the curve." The "curve" researchers are talking about refers to the projected number of people who will contract COVID-19 over a period of time. It explains why so many countries are implementing "social distancing" guidelines.  
(source: <https://www.livescience.com/coronavirus-flatten-the-curve.html> )

**(Hand)Washing** refers to cleaning (especially of hands) with soap and water after you have been in a public place and had touched any item or surface that may be frequently touched by other people, such as door handles, tables, gas pumps, shopping carts, or electronic cashier registers/screens, lifts buttons, handrail, baluster etc. before touching your eyes, nose, or mouth because that's how germs and virus enter our bodies. Detail methodologies should follow local health authority guidelines as issued from time to time .

**Contactless** refers to the operation of objects or surface such as faucets or lifts buttons; transaction of monies/payment at counters, boards or online; deliveries of goods; conducting social activities, learning and business without having to have physical contact with the object, surface and another person i.e. interface with other media (disposable gloves, etc); or as a physical separation with a device such as hatches or scheduling of space used; or technology such as motion and heat sensors.

**Community** refers to a social group who live, learn, work, play or pray together in the same space. Most people in the community know one another, and/or share similar norms, values, religion, customs, or identity.

**Cleaning** refers to the removal of germs, dirt, and impurities from surfaces. It does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. (Source: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>)

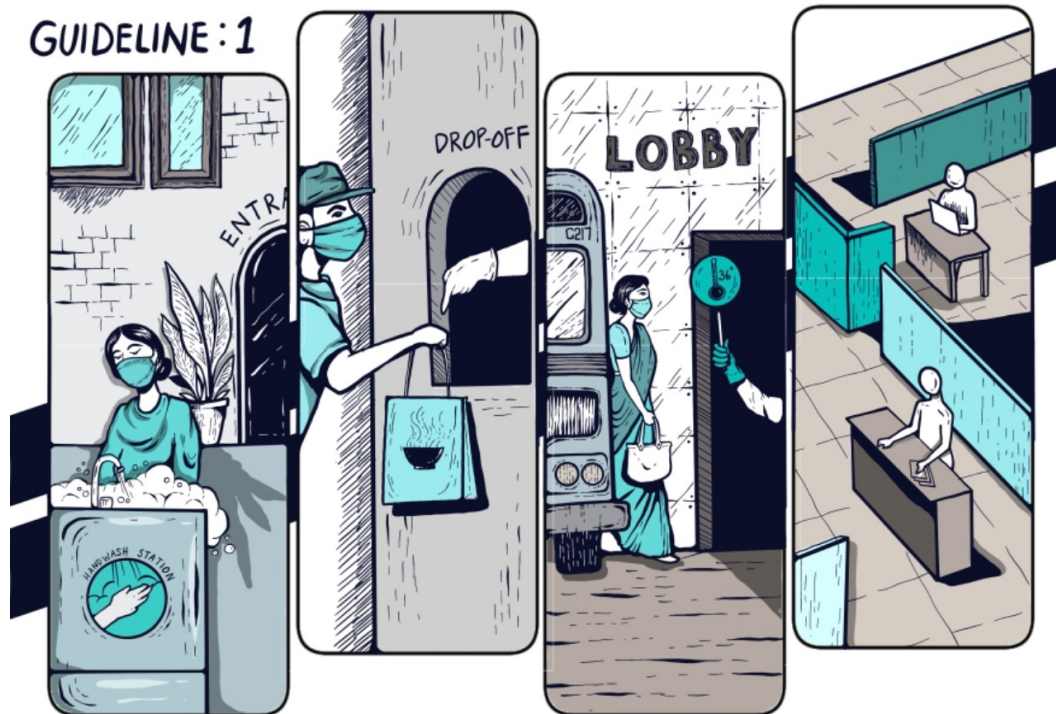
**Disinfecting** refers to using chemicals, for example, EPA-registered disinfectants, to kill germs on surfaces. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection. (Source: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>)



# THE ARCASIA COVID19 GUIDELINES (The 13 ACGs)

## 1 Space Planning

Configure living or working spaces to prevent the entry of contaminants; facilitate separation and social distancing within spaces; allow as required surveillance; and reduce anxiety.



1.1 **Transition Space** - Create a transition space immediately outside or within the entrance space, where cleaning, disinfecting, and changing of clothes can take place. This space should be well ventilated and should be thoroughly and frequently cleaned and disinfected.

Short-Term – Review, identify and modify existing space.

Long-Term – Ideally include hand washing facilities as part of building design.

Private Domain – Include facilities for holding of dirty clothing, shoes, face masks, and easy access to cleaning / disinfecting agents or facilities.

Public Domain – Consider integrating this space with screening space.

1.2 **Screening Space** - Create screening spaces in semi-public areas with restricted access to screen visitors, receive deliveries and dispose high-risk garbage (used masks, delivery packaging etc.). Ideally, this should be separated from the normal entrance of occupants. Screening facilities should be designed to conduct thermal scanning of body temperature, handling health declarations, and recording visitors' information for tracking if needed by the health authority.

**Short-Term** – Review, identify and modify existing space.

**Long-Term** – Plan and incorporate in the standard planning guide. Aim at providing segregation of “dirty” and “clean” flow.

**Private Domain** – Screening facilities should ideally be provided in semi-private space. Ensure the ability to segregate “dirty” disposal and “clean” supplies.

**1.3 Access Control to Semi-public Space** - In multiple occupancy developments, as means of reducing public exposure and enhancing focused intensive cleaning and disinfecting; provide access control to semi-public spaces when transitioning from public spaces ( e.g. lift lobbies, lifts, car parking) to private spaces (e.g. private workspaces, residential apartments).

**Short-Term** – Leverage existing semi-public space, review movement patterns, and provide temporary cordoning.

**Long-Term** – Integrate planning into the design.

**Private Domain** – For single occupancy houses, such spaces can be developed on a community basis (village/neighbourhood/district basis).

**Public Domain** – Consider integrating this space with screening space. There can also be multiple layers of access control.

**1.4 Physical Distancing and Separation** - Design spaces exercising the principles of physical dimensions of distancing, orientation, and separation to ensure effective physical distancing is achieved. When isolation is required, provide physical separation which meets applicable health and safety standards without ignoring the need for social connectivity.

**Short-Term** – Review, identify, and modify the arrangement of furniture, adapted space or use of additional temporary structures.

**Long-Term** – Plan and incorporate into the planning guide.

**Private Domain** – Physical distancing can be achieved with planned seating positioning and orientation. Physical separation can be achieved by means of curtains/partition/furniture.... etc. Isolation space should ideally be self-sufficient with its own bathroom facilities and communication connections if possible and practicable.

**Public Domain** – Provide physical separation in addition to physical distancing as much as practicable. Leverage on existing spaces and consider introducing extra barriers. Plan for isolation spaces when suspected cases are identified.

**1.5 Communal Space** - When constraints of resource allocation or physical space availability inhibit the allocation of adequate/suitable space within the private domain for such purposes as a continuation of living, working, learning or playing; identify and modify communal space while limiting access to people within the identified community. Encourage the adaptive use of adjacent or nearby open space and greenery such as plazas, squares, parks and open fields.

**Short-Term** – Review, identify and modify existing space.

**Long-Term** – Plan and incorporate into the planning guide as multi-use space.

**Private Domain** – Identify and modify existing unused/under-utilised space, into new communal space to reduce density and provide relief to people. This requires creativity and community collaboration. Examples are pedestrianizing streets, providing more facilities for non-contact sports... etc.

**Public Domain** – Guideline specific to Private Domain.

## 2 Building Technologies

Adopt appropriate and authorised building technologies to and avoid the spread of the virus or any contaminant through the building systems.



**2.1 Ventilation System** – If constant cross ventilation cannot be achieved in any space within the built environment, mechanical means using technology is sought as follows: On top of achieving standard norms of comfort for its occupants, heating, ventilation, and air conditioning (HVAC) systems design must ensure adequate dilution of conditioned air with fresh air from clean sources as per applicable guidelines, addressing droplets, aerosol, water, and airborne transmitted diseases. The design of HVAC systems should shorten the time taken for respiratory droplets to be removed from the air, and should therefore avoid unnecessary air circulation (draughts) indoors which might spread the contaminants and virus. HVAC should provide for an adequate flow rate (air changes per hour) with an appropriate filter (HEPA, ultraviolet light or other) or 100% fresh air change, which is further facilitated through an appropriate layout of supply and exhaust vents. These precautions are particularly important for spaces occupied by COVID-19 patients or suspected COVID-19 patients or people with any other airborne infection or contaminants.

**Short-Term** – Review and operate according to function including the period of use. Modify the current system in particular with airflow and source of fresh air.

**Long-Term** – Review design standards to find the appropriate balance between the need for fresh air, level of air movement, energy efficiency, and thermal comfort. Consider also having the flexibility to switch to different operation modes to suit the circumstances of an epidemic or pandemic. To state capacity of people per session use of any enclosed space.

**Private Domain** – Fresh air should be sourced from an open area as opposed to narrow back lanes

where drainage or exhaust from other units are discharged. Avoid openings in tall narrow spaces which will potentially be subject to the chimney effect, drawing exhaust air from the immediate neighbourhood.

**Public Domain** – Consider sanitizing the fresh air using UV light or better filters if possible and practicable. Pay special attention to controlling airflow, and prevent draughts which might spread the virus. Maximize the use of natural ventilation.

**2.2 Drainage System** - Where drainage system is used the following should be adhered to: Ensure drainage systems are designed with provision for effective anti-siphonage seals and such seals are properly filled with water to prevent the spread of the virus to adjacent units connected to the same drainage system. If the areas have no specific drainage, communal or shared facilities with or without the system need to adhere appropriately as follows:

**Short-Term** – Conduct review and correct the situation with priority.

**Long-Term** – Ensure basic standards are met and enforced. Conduct research on operationally safe traps (like W Trap) and update them as part of building regulations.

**Private Domain** – Check seals regularly; employ qualified plumbers when conducting alterations.

**Public Domain** – Checking of seals to be a mandatory part of a standard operating procedure.

Other Technologies and Material

**2.3 Latest Technologies / Materials** - If resources permit and available, consider the application of the latest technology and material such as photocatalyst coatings, contact-free taps & lift buttons, easily cleanable surfaces ...etc.

**Short-Term** – Apply new and/or modify existing technologies that are affordable and practicable.

**Long-Term** – Incorporate this design concept into new planning standards. Continue to research into new technologies.

**Private Domain** – Not domain-specific.

**Public Domain** – Not domain-specific.

**2.4 Design and Construction Tools** - Improvement of process and design and construction, through the active application of technology. This includes the capability to collaborate and design remotely, application of new design and construction technologies such as BIM, VR...etc., wider application of automation to reduce the need of contact, and the use of self-cleansing material for touchable surfaces.

**Short-Term** – Adoption of a new way to work requires time and perseverance. “Determination” from leadership is critical, and a proper “Change Management Plan” is helpful.

**Long-Term** – Constant review of the changing environment and emerging technologies should be part of the new normal.

**Private Domain** – Not domain-specific.

**Public Domain** – Not domain-specific.

### 3 Adaptation to Environment

To modify space, usage and utilization of the environment to continue to live, work, learn, pray and play as the epidemic drags on.



**3.1 Capacity, Crowd and Density Planning** - Review existing capacity and modify layouts to suit density guidelines to avoid overcrowding, as updated from time to time by the local health authority; ensure adequate physical distancing and separation is achieved. Consider alternative means to fulfil business objectives, as opposed to enforcing traditional regular hours of physical attendance to premises.

**Short-Term** – Adapt to the immediate impact of movement and activity restrictions. Provide quick adjustments to the physical environment as well as operational changes. For example; more take-away for restaurants; delivery service for groceries; virtual classes for schools. Storage capacities may be adjusted as regular delivery of stock and frequency of purchase change due to movement restrictions.

**Long-Term** – Design the physical environment and operational procedures with long term flexibility to cope with future recurrence. For example; the hybrid service model with both on-site and off-site service delivery; blended learning in education... etc.

**Private Domain** – Where density cannot be improved, consider the application of physical separation (Guideline 1.4) or adapt communal space (Guideline 1.5).

**Public Domain** – Consider different operational models, in addition to providing flexibility in the physical environment and service delivery models. For example, in a workplace, consider working in time shifts or staggered work hours where employees occupy space at different times; or reduce working hours at the workplace to avoid having lunch together. Enable workers to work from home as far as practicable; thereby reduce the burden on the transport system.

**3.2 Remote Working and Learning** - Provision of working and learning spaces at home, hotels, hostels, dormitories and any accommodation; which are comfortable (ideally naturally lit), private and free from distractions.

**Short-Term** – Adjustment and compromise in terms of the physical environment and behaviour of co-

occupants. Experiment with different approaches to arrive at a solution acceptable to all.

**Long-Term** – Such considerations will need to be part of the initial design, or achieved through the permanent modification of existing spaces. Where space limitation prohibits meaningful change, the usage of communal space to be considered. (Guideline 1.5)

**Private Domain** – This guideline is private domain-specific.

**Public Domain** – This guideline is not domain-specific.

**3.3 Religious and Socio-cultural Activities** - Consider incorporating religious and socio-cultural activity spaces at home, or office, or close to home; in a communal setting for individuals, or for the congregation; to conduct daily, weekly or annual rituals or process; with social distancing, hygiene and respiratory etiquette.

**Short-Term** – Provide existing space at home to enable attendance to such activities virtually. Leverage on existing communal space where small scale activities can be conducted in a safe and controlled environment after careful risk assessment. (Guideline 12)

**Long-Term** – Consider the new norm and incorporate the design and planning of private and communal space to accommodate. (Guideline 12)

**Private Domain** – Providing space at home for conducting some of these activities. (Guideline 12)

**Public Domain** – Develop new planning and design guides with respect to facilities where such activities are conducted to accommodate the requirement of the new norm. (Guideline 12);

**3.4 Time / Space Sharing** - Improve space availability and help relieve the pressure of maintaining occupant density and social distancing. Consider how space could be shared by different users at different times of the day and utilized for different functions.

**Short-Term** – The adoption of multifunctional and shared spaces is encouraged especially when addressing the needs of low-income communities or when space is a premium.

**Long-Term** – Suitability of this strategy should be subject to careful consideration as it varies greatly between communities and organizations.

**Private Domain** – Sharing facilities is already a norm in the Private Domain. The key is to design and set it up properly. (Guideline 3.2) Some usages already in practice include using the dining table as a worktable (when working from home), or the sofa as a bed (when temporary isolation is required to confine someone).

**Public Domain** – Multifunctional and shared spaces are being adopted by many multinational corporations and sophisticated businesses in the form of “Alternative Workplace Strategy”. For example, there are no assigned seats, and cafés are often used as meeting spaces. This requires adaptation in behaviour and following norms of etiquette. For example, a good cleaning and disinfecting protocol will give employee confidence to use shared space comfortably.

**3.5 Connectivity for Communication**- Enable proper communications with the outside world, and accommodate remote working and learning by providing adequate, stable and secure Wi-Fi connectivity.

**Short-Term** – Maximize the capability as much as the bandwidth permits and provide additional support

to the underprivileged communities who are adversely affected by the lack of infrastructure.

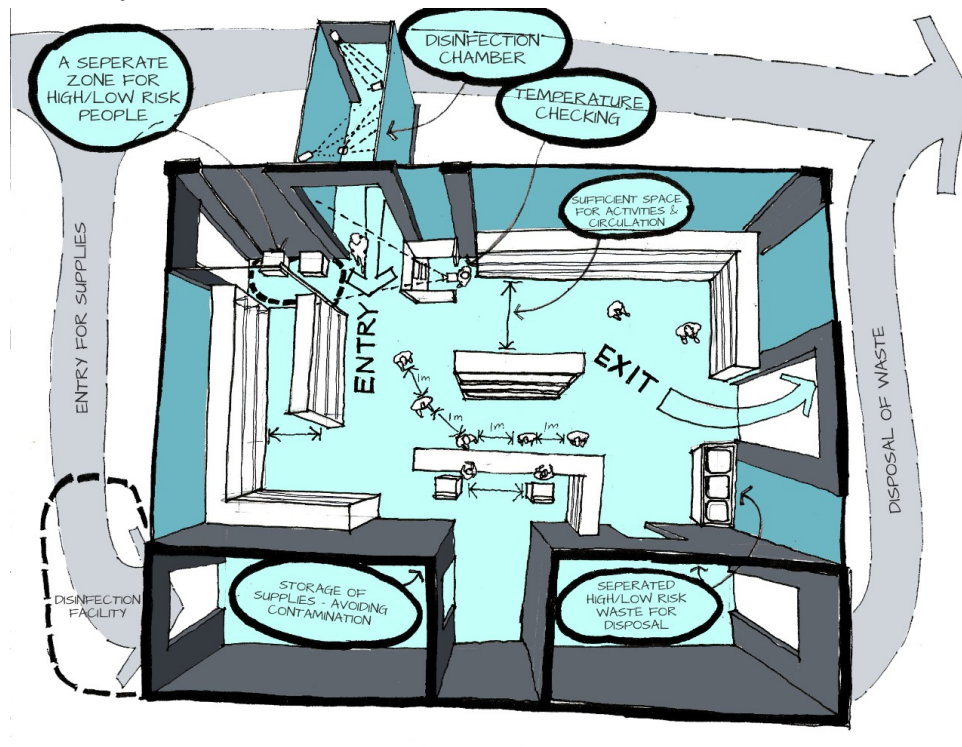
**Long-Term** – The government and telecommunication service providers need to work together to enhance coverage to all as an essential utility (no less than water and electricity ). Incorporate design concepts into new planning guidelines. Architects and Planners to incorporate this as an integral part of the design.

**Private Domain** – This is important when remote working and learning is required. Enhancing connectivity requires not only the work of the government and telecommunications service providers but also the developers and property managers of the communities as enablers. The situation is particularly acute in poorer communities where funding is scarce and the lack of basic personal hardware is common.

**Public Domain** – Similar to Private Domain. The availability of free stable seamless Wi-Fi throughout an area is important.

## 4 Flow Management

Management of the circulation of people, and the flow of goods, with adequate provision for service maintenance and disposal.



Review current layout to manage flow; reduce cross-traffic of people (e.g. separating entry and exit at markets or departmental stores); identification and segregation of “clean” (known / low risk) and “dirty” (unknown/high-risk) applicable to both the flow of material and people. Provide transition and storage space to manage delivery and increased supplies storage requirements.

**Short-Term** – Review current flow pattern to identify if the possibility of cross-contamination exists, and fix them with short term operational measures.

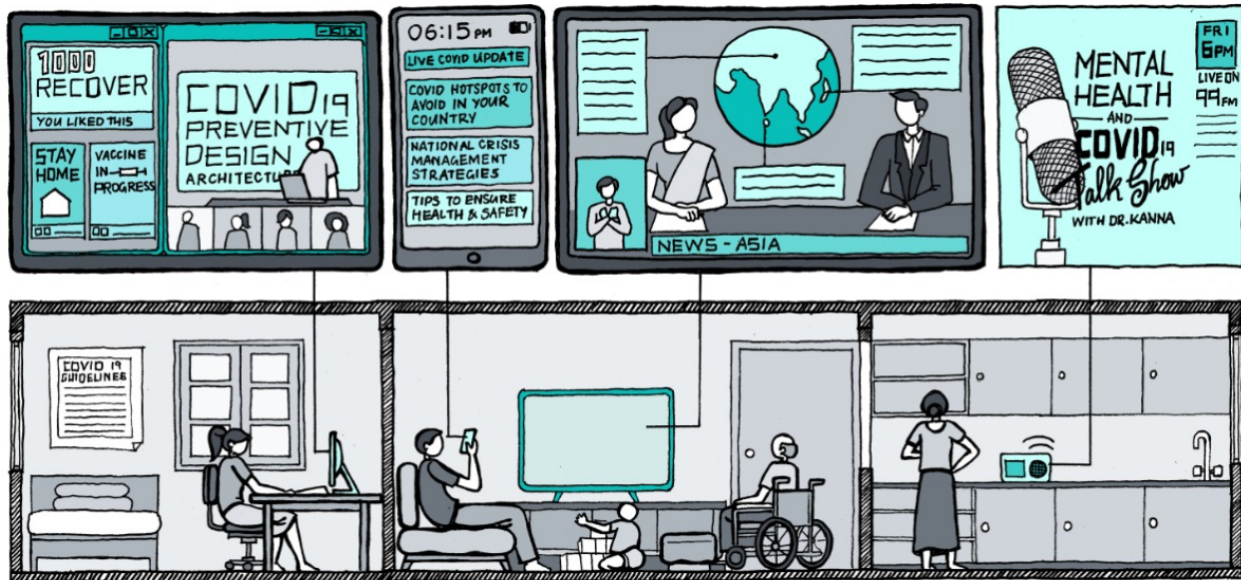
**Long-Term** – Incorporate Flow Management into design standards. Such measures may be permanent or part of emergency measures that could be implemented in times of crisis.

**Private Domain** – Usage of semi-public transitional spaces to deal with delivery, disposal, and public access control. (Guidelines 1.1, 1.3, 1.5)

**Public Domain** – Clear signage needs to be provided to direct such flow. This is critical for medical and healthcare facilities such as hospitals and clinics, and other high-risk areas such as homes for elderly, as well as places where there is a high level of circulation of people and a high flow of material (markets, department stores, schools, airports, transport terminals... etc.).

## 5 Communication and Education

Reduce uncertainty and instil confidence through transparency in providing fact-based education, which is communicated to all levels of the public.



**Short-Term** – Provide access to a communication network; to notify, educate and remind people of appropriate hygiene and social distancing practices in the form of stakeholder e.g. training (e.g. to parents for schools, caregivers for geriatric homes... etc.), signage, visual cues or verbal announcements.

**Long-Term** – Develop the school curriculum and civil education system to include general awareness and knowledge of the following tenets:

- a) the importance and impact of the built environment on hygiene, health and safety
- b) crisis management.

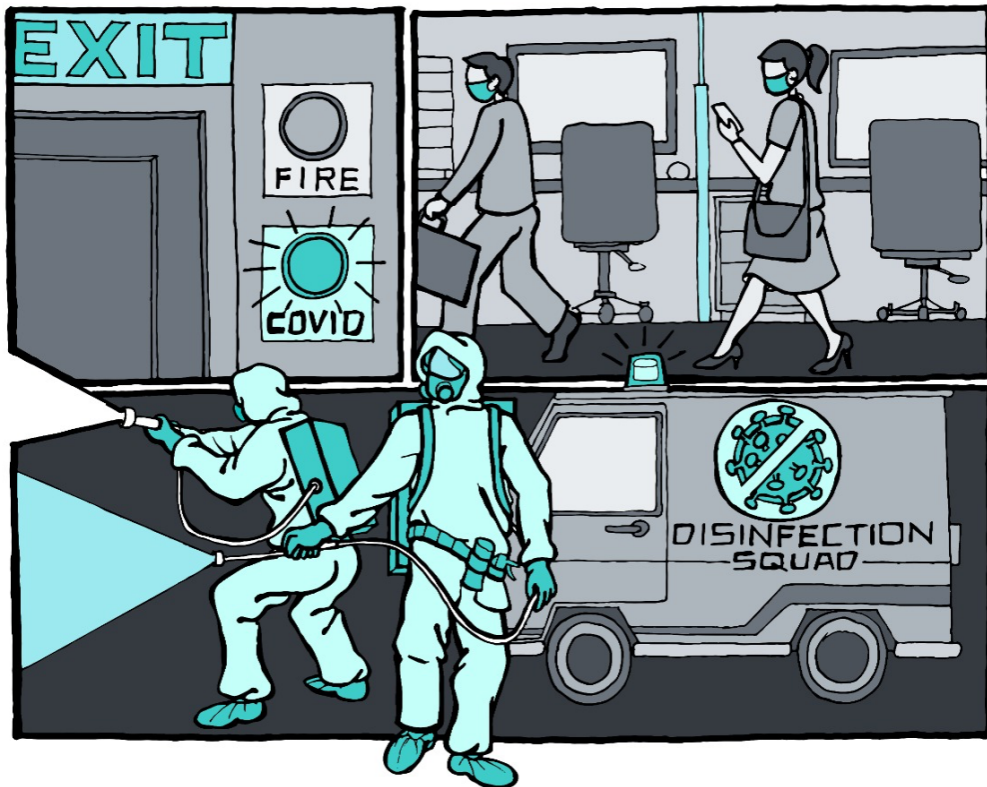
All levels of society, especially built environment professionals, to be provided science-based education pertinent to the situation, contingency planning, new standard operating procedures for coping with the new normal and managing future crisis situations.

**Private Domain** – The target audience to be the household. Multiple popular channels in the country (TV, Newspaper, Social Media... etc.) to be used; and systems in place to measure outreach and success.

**Public Domain** – The process of educating the general public should ensure that it reaches the decision-makers and those controlling resources. Communications and Education should target policymakers of the government, corporations, organizations, and leaders of professions and industries.

## 6 Standard Operating Procedures

Development of new Standard Operating Procedures (SOPs) for cleaning, disinfecting, staying informed and updated and responding to various situations which may arise.



**Short-Term** – Develop SOP if none exist, and review SOP against the current situation to ensure effectiveness.

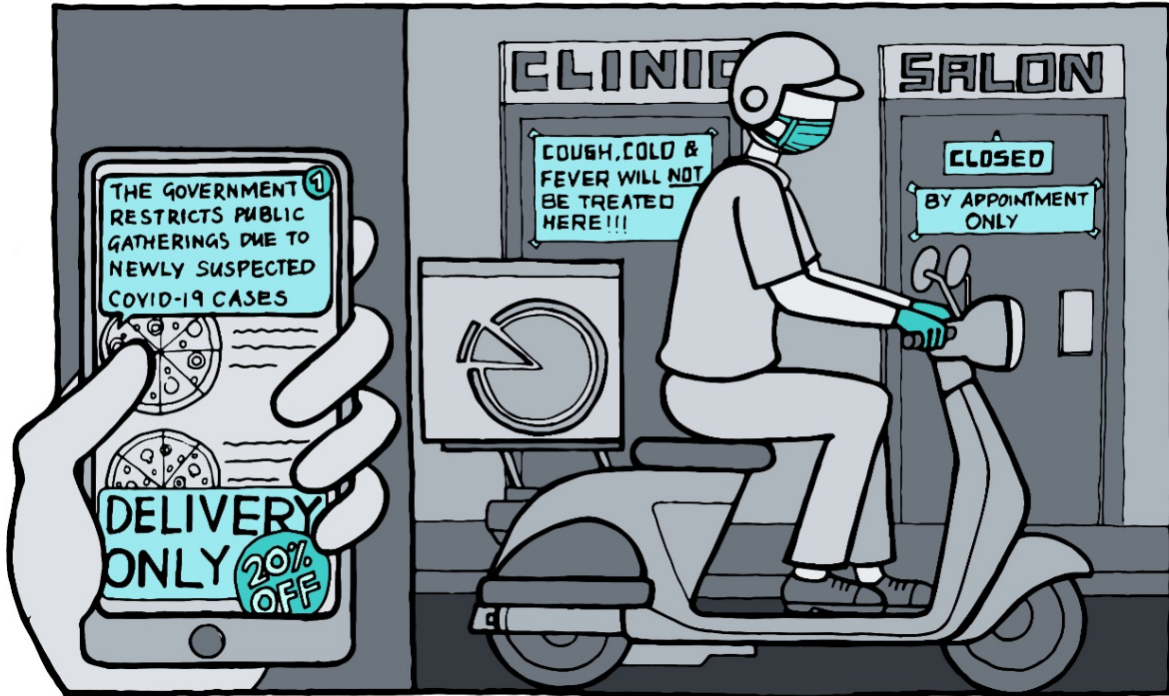
**Long-Term** – Incorporate a regular review process to ensure SOP is updated. Ensure general awareness among all stakeholders, and provide training and drilling so that all participants can work together and react efficiently and effectively.

**Private Domain** – Follow government guidelines and to comply with them diligently.

**Public Domain** – Be prepared for emergency cleaning and disinfecting when confirmed cases are identified. Consider changing dedicated seating at the workplace or place of learning space to one which is shared to reduce personal belongings and clutter, enabling more effective cleaning and disinfecting.

## 7 Resilience and Contingency Planning

Development of well-administered contingency plans for different pandemic scenarios; which are reviewed and updated regularly; communicated to all stakeholders; and reinforced with training and drills.



**Short-Term** – Develop a contingency plan if none exists, and review it against the current situation to ensure effectiveness.

**Long-Term** – Ensure review, training and drilling are practised regularly. Make contingency planning a culture for resilience development.

**Private Domain** – A typical contingency plan for the private domain is the Fire Evacuation plan. For a pandemic it is very different. This should typically include scenarios where a co-occupant is sick (unconfirmed), under home quarantine, work / learn from home... etc. It should respond to different levels of segregation with all occupants.

**Public Domain** – Many organizations already have contingency plans to address different risk scenarios, pandemic being one of them. The objective of such plans is not only to prevent the spread of the virus but also to mitigate disruption to business/operation. The Contingency Plan should include aspects which ensure services continue. Risk scenarios would typically react to such scenarios as existence of a suspected case, confirmed case, disruption of supply, significant fluctuation of demand; while responses may vary from providing different levels of enhanced cleaning and disinfecting, work from home, change in the delivery model (e.g. dine-in versus take-away for restaurants) etc.

## 8 Medical and Healthcare Facilities

Continuously review and maintain the ability to rapidly increase the capacity of isolation, segregation of medical and healthcare facilities; as well as the conversion of adjacent open spaces or facilities for the surge.

Consider multiple usages of facilities at the planning stage, and plan for adaptive reuse of existing facilities. Such interventions could cater to surge re-occurrences and assist in disaster management other than the pandemic. Consider new building technologies and methodologies that can reduce turn-around time significantly to build such facilities.



**Short-Term** – Many of such facilities have been created since early 2020. Existing facilities such as newly completed housing converted into quarantine camps, and large exhibition spaces converted into isolation centres; while repurposed shipping containers were used for the rapid construction of new prefabricated hospitals.

**Long-Term** – Incorporate design concepts into new planning guidelines so that dual or multiple usages is provided for at the beginning of the planning process.

**Private Domain** – Refer specific authority of country /region pertaining to medical and healthcare facilities.

**Public Domain** – Refer specific authority of country /region pertaining to medical and healthcare facilities.

## 9 Building Regulations Review

Review existing regulations, revise, add and/or create new guidelines which would enable a better living environment.

Given the shifts in social behaviour, and the economic situation post-pandemic; the potential need for new building types (where notions of live, work, learn, pray and play might be re-thought), including consideration for the psychological environment for mental health, elderly, children and domestic abuses, brings about the need for careful consideration in governing regulations.



**Short-Term** – Review impact of the pandemic on different occupants. Assess how the built environment facilitates or impedes the effort against the pandemic. Identify regulatory issues to be resolved.

**Long-Term** – Conduct a comprehensive review of the regulatory issues, and make amendments to enable future development to be pandemic resilient. Due to forthcoming changes in terms of usage, it is critical to review the existing minimum dimensions and standards in buildings. Enforcement is critical to ensure compliance.

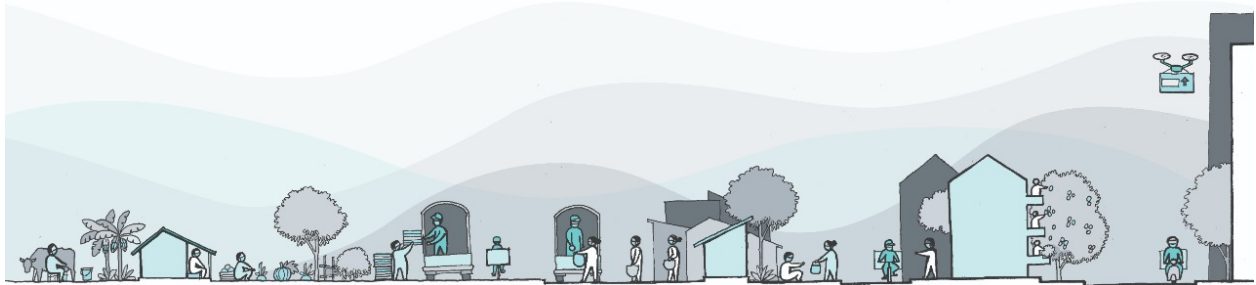
**Private Domain** – Some of the measures to mitigate the pandemic might be in conflict with the regulations (e.g. washing facilities at the entrance without natural ventilation, the home may not be compliant in terms of allowing for certain kinds of work... etc.). Specific attention is needed to factor in the new usage for working and learning.

**Public Domain** – Similarly, in the public domain, there may be conflicts with regulations (e.g. enhanced ventilation might be in conflict with environmental regulations on energy conservation). Confidence building measures have to be adopted in terms of people getting back to work in various building typologies with specific attention to air-conditioned indoor areas.

## 10 City Planning and Urban Design Review

Review the planning of urban and rural environments in light of identified new needs to counter COVID19 and other future pandemics.

Achieving a new balance of risk, resiliency and sustainability should be a key consideration. The review should not be driven only by the government, but also by civilian communities, commercial enterprise, corporations, and property developers as stakeholders. Focus on people and usage, capacity in the differing period of use or events to prevent crowds while preparing for the future, with action plans for opening up the usage, with new normal parameters and innovative people and animal-friendly guidelines.



**Short-Term** – Review the impact of the pandemic on different communities and identify city planning and urban design issues to be resolved.

**Long-Term** – Conduct a comprehensive review of the planning and make amendments to enable future developments to be pandemic resilient. This should include the city planning process itself; the role of urban design; as well as the significance of property values.

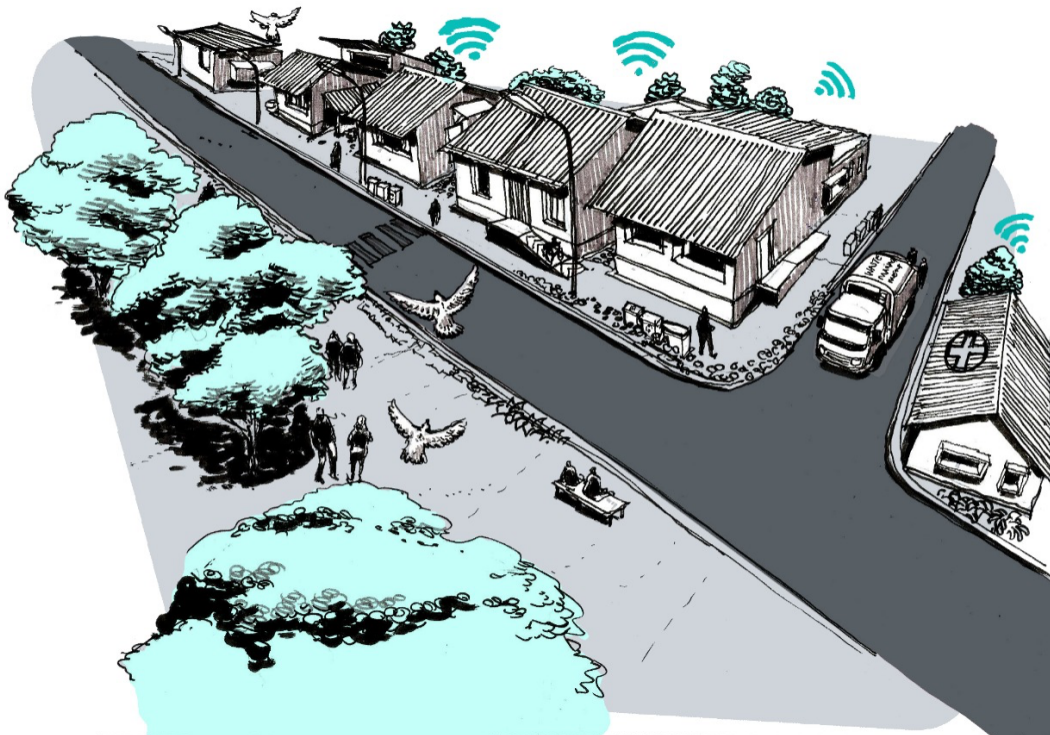
**Private Domain** – Review existing housing typologies in terms of density; number of floors; different income groups; urban/rural setting; self-sufficiency of communities; transport requirements; and infrastructure for support of housing communities.

**Public Domain** – Review existing city planning and urban design mixes in terms of land use, centralization vs decentralization, density, number of floors, single versus multiple occupancies, self-sufficiency of communities, urban/rural setting, and mass transit vs sustainable individual commute (walking and cycling), and presence of green space, fields or plazas for communal needs as it arises.

## 11 Health and wellbeing

Focus on designing for a clean and healthy living environment with access to nature to boost the immune system and improve psychological wellbeing.

It is particularly important for low-income communities (slums), where existing facilities for hygiene and other forms of infrastructure (both in terms of Wi-Fi and utilities) are below standard; and for the elderly and differently-abled individuals whose social interaction is further reduced due to a higher risk of infection and/or impaired in terms of physical mobility. The provision should also be extended to places of work for those who cannot work from home such as cleaners, maintenance personnel, construction workers, domestic help, hotel maids, guards, police and others, apart from health workers as front liners.



**Short-Term** – Focus on providing extra protection to sub-optimal environments (e.g. low-income communities, unregulated communities and developments) apart from enforcing existing regulatory requirements or legal acts for the well-being of the various front liners in the community.

**Long-Term** – Strive to enhance the built environment for all communities and developments to achieve basic standards, taking into consideration post-pandemic needs. Explore strategies to counter cyclical vulnerability towards the pandemic in the built environment with reference to varied climate zones, cultures and governance.

**Private Domain** – Special focus should be on underprivileged communities such as slums, where home care is provided to the disadvantaged. Infrastructure such as washrooms, utility spaces and service zones should provide for adequate hygiene and health care, and should be adapted to architectural designs.

**Public Domain** – Special focus should be on communities, in particular those who are vulnerable such as the elderly and the disabled as well as the community front liners.

## 12 Socio-Cultural aspects

Cultural and religious activities are an essential part of peoples' lives. Significant activities should continue with precautionary measures in place and sensitivity towards maintaining its identity and symbolism.

Ensure compliance of personal protection and social distancing. Avoid high-density large-scale gatherings in closed confined spaces, ensure rituals are contactless and minimise the need to remove personal protection (such as masks when eating and drinking).



**Short-Term** – as much as possible conduct events virtually, and have in-person attendance only for significant events. Balance risks, needs and space capacity; control density and crowding by scheduling, and manage the flow of people.(Guideline 3.3)

**Long-Term** – Review annual activities calendar, prioritize based on the nature of different activities; set up a long-term plan on physical versus virtual delivery. By nature of the socio-cultural significance of such activities, the identity of the existing and emerging architectural vocabulary needs to be explored and revisited. The impacts on the transformation of buildings and its architectural identity have to be monitored through a mechanism that respects the prevailing architectural language of the region-specific symbolism and meaning. (Guideline 3.3)

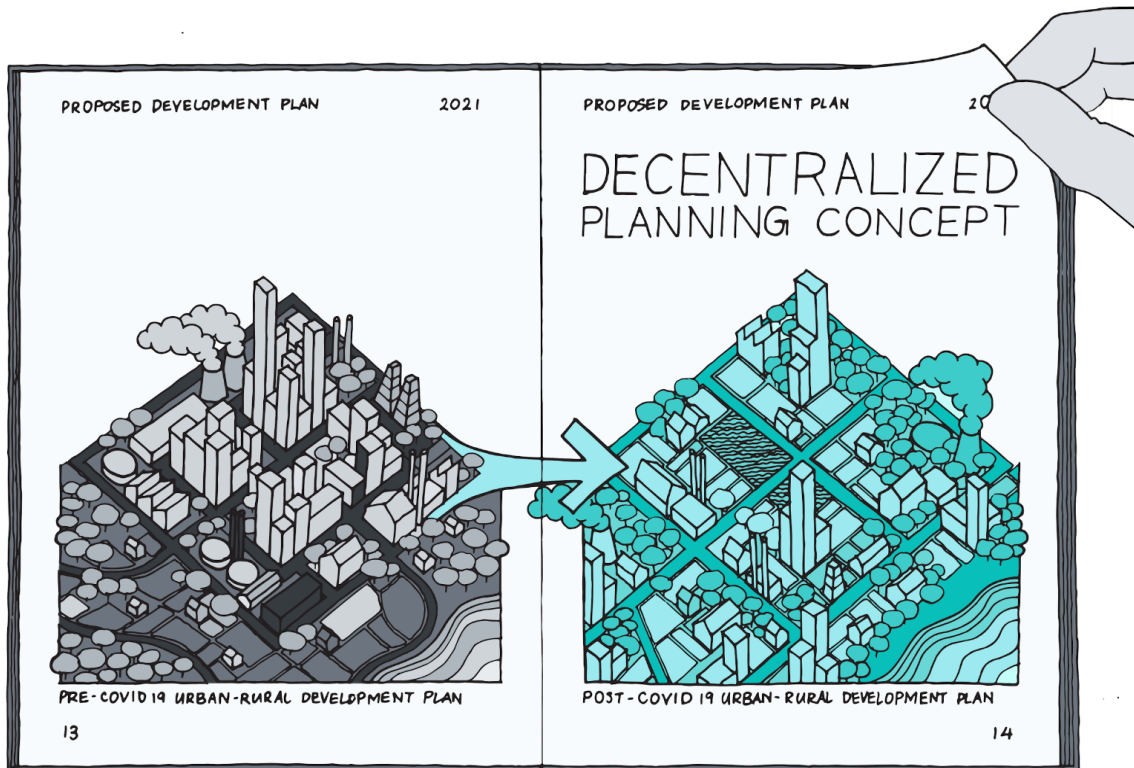
**Private Domain** – Consider providing space at home for conducting some of these activities. (Guideline 3.3)

**Public Domain** – Develop an action plan with adequate safety measures (such as celebrations which are linked to huge gatherings) in terms of its infrastructure provisions of spatial requirement (Guideline 3.3); hygiene provisions and the control of the flow of people within the facilities and its immediate surroundings (Guideline 4).

## 13 Urban / Rural Migration

The significant changes in the economic situation and the need for physical distancing post-pandemic might have an impact on the rate and direction of global and regional urbanization.

The reverse trend of migration from urban to rural areas should be considered in spatial and economic planning and needs a strong people-friendly action plan with sensitive measures.



**Short-Term** – Work with Policy Makers to monitor trending, identify shift patterns, and plan strategies for mitigation. Focus on keeping the business and related economy in continuum especially real estate and service industries which are labour dependent. Explore alternatives as a result of shortage of labour and dependency on technology and automation.

**Long-Term** – Support Policy Makers to implement mitigation strategies in accordance with actual identified migration. Generating employment opportunities in rural areas by policymakers, considering re-looking at long term master plans by introducing decentralization methods in rural and country sides in terms of satellite level planning in fringe areas of the main urban cores, from physical, social, economic and cultural aspects.

**Private Domain** – Should a reverse trend be identified, support the generation of employment opportunities for individuals/families outside urban areas; potentially, promoting local artisans and vernacular construction techniques to the building industry in terms of traditional building materials can open up new roadmaps of economic revival in the rural areas and help people to have a better quality of life.

**Public Domain** – Should a reverse trend be identified, provide infrastructure and well-equipped community facilities in rural and suburban areas such as health care facilities, grocery, wet market, schools, religious place, banks and other facilities within the neighbourhood and network with adjacent neighbourhoods for other facilities.

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