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PUBLIC CONSULTATION ON THE REVIEW OF THE CODE OF PRACTICE FOR INFO-COMMUNICATION FACILITIES IN BUILDINGS ("COPIF")

26 April 2017

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PART I: INTRODUCTION

1. The Code of Practice for Info-communication Facilities in Buildings ("**COPIF**") first came into effect on 15 September 2000 and superseded the earlier Code of Practice for Telecommunication Facilities in Buildings (COP-TEL) published in March 1997. The purpose of the COPIF is to ensure that developers or owners of buildings provide adequate space and facilities, to enable the deployment and operation of installation and plant to be used in providing info-communication services to their buildings ("**Space and Facilities**"). The COPIF also specifies the duties to be observed by developers, owners of buildings and telecommunication licensees ("**Licensees**") in relation to the provision, maintenance and utilisation of the relevant Space and Facilities provided pursuant to the COPIF.

2. In the last review of COPIF which was finalised and published in 2013 ("**COPIF 2013**"), IMDA had implemented policies to support Facilities-based Operators providing public cellular mobile telecommunication services (hereafter referred to as Mobile Network Operators or "**MNOs**") in their deployment of infrastructure within developments to provide in-building mobile coverage. For example, IMDA had required building developers or owners to set aside mobile deployment space to house MNOs' equipment which was required for in-building mobile coverage.

3. With the pervasive adoption of smartphones and other mobile broadband-enabled devices and the use of data-intensive applications, end-users' demands and expectations are increasing for more reliable and better quality service standards both within and outside buildings. Coupled with Singapore's Smart Nation initiatives to leverage technology to better serve the needs of citizens, strengthen and empower communities and use tech-enabled solutions to enhance the way we live, work, play and interact with one another, IMDA is of the view that the COPIF ought to be reviewed to keep pace with the advances in telecommunication infrastructure technology and to support the evolving info-communication needs of users.[1]

4. On 5 August 2016, the Ministry of Communications and Information ("**MCI**") conducted a public consultation and review of the Telecommunications Act (Cap. 323) ("**Telecoms Act**"). The

[1] www.smartnation.sg/initiatives/Services

Telecommunications (Amendment) Bill ("**Bill**") was subsequently passed in Parliament on 10 November 2016 and the Telecommunications (Amendment) Act 2016 came into effect on 1 February 2017.

5. In his speech on the Bill, the Minister for Communications and Information, Dr Yaacob Ibrahim, had highlighted the fast changing environment of the telecoms industry, stating:

"*First, reliance on telecom service by consumers and businesses, especially for mobile telephone services, has increased dramatically over the last few years. Total mobile data usage has more than doubled since 2012, due to increased smartphone penetration and the use of data-intensive applications – such as mobile video streaming. Hence, consumers and businesses have come to expect more reliable and better quality service standards. To meet these rising demands, IMDA must have the ability to facilitate the continued deployment of telecoms infrastructure.*"[2]

6. The Minister further indicated that while the amendments to the Telecoms Act to facilitate the deployment of telecoms infrastructure are intended as general empowering provisions, IMDA would still need to consult with stakeholders on the details to operationalise the new provisions under the Telecoms Act.[3] The COPIF therefore needs to be revised to give effect to the amended Telecoms Act.

7. When reviewing COPIF 2013, IMDA thus took into consideration new market and technology developments. For example, IMDA reflected on whether in-building facilities were adequate and future-ready, taking into account greater fibre penetration, the market entry of the fourth MNO, the development of smart homes and evolution of the Internet-of-Things etc. IMDA has also taken the opportunity to further clarify some of the COPIF provisions and requirements based on observations of issues Licensees and building developers or owners have encountered since the last COPIF review.

8. Accordingly, IMDA has identified key changes that need to be made to COPIF 2013 to reflect the Telecom Act amendments as well as market and technology developments, and would like to invite views and comments from building developers, building owners and the telecommunication industry on the proposed changes before revising the COPIF.[4]

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[2] Response speech for second reading of the Telecommunications (Amendment) Bill, Dr Yaacob Ibrahim, Minister for Communications and Information during parliamentary sitting, 10 November 2016.

[3] The Telecommunications (Amendment) Act 2016 (Commencement) Notification 2017 was published on 13 January 2017.

[4] The amended Telecoms Act came into effect on 1 February 2017.

PART II: IMDA'S PROPOSED KEY CHANGES TO COPIF 2013

SECTION 1 – Use and Scope of Mobile Deployment Space provided within a development to provide mobile coverage

9. In the last COPIF review in 2013, IMDA had required building developers or owners to set aside a specified amount of rent-free space known as Mobile Deployment Space ("**MDS**"), within their developments at the request of MNOs to facilitate their deployment of mobile equipment to ensure good in-building mobile coverage.[5]

10. In addition, IMDA sets Quality of Service ("**QoS**") requirements to regulate the performance of mobile service provided by MNOs such that they achieve reasonable standards, and to ensure that nationwide mobile coverage, including in-building mobile coverage, is provided to the public.

11. On 5 August 2016, MCI conducted a public consultation and review of the Telecoms Act. MCI had proposed legislative amendments to the Telecoms Act to provide IMDA with the powers to establish a framework to regulate and facilitate the access to and use of rooftop space for mobile deployments.[6] The regulatory framework is intended to cover the following key aspects:
    i) Building developers and owners must provide rooftop space as MDS, upon request by MNOs who are required to provide nationwide mobile coverage.
    ii) In line with current requirements, building developers and owners are to provide such IMDA-prescribed rooftop space as MDS on a rent-free basis.

    MNOs may pay building owners for costs in providing access to rooftops and other associated costs (e.g. electricity charges of running mobile equipment) that are reasonably and efficiently incurred.

<u>Designation of rooftops as preferred location for MDS</u>

12. With increasing demand for pervasive mobile services in land scarce Singapore, IMDA notes that it is not feasible for MNOs to rely solely on public areas to deploy equipment to provide mobile coverage to areas outside the property developments ("**External Areas**").

13. Currently, the MDS set aside by any building developer or owner is primarily for the purpose of providing mobile coverage within that development. MNOs would have to either find space outside the

[5] The exact amount of rent-free space depends on the size of the building/development.

[6] At present, it is not mandatory for Mobile Deployment Space to be sited at building rooftops.

development or commercially negotiate with the building developer or owner for the provisioning of mobile coverage to External Areas, such as public walkways and roads.

14. IMDA has observed that MNOs face many on-site challenges that have delayed timely deployment of mobile coverage by the MNOs. For example, mobile deployments on building rooftops have been rejected by some building owners, particularly where these do not primarily serve the property developments even when there is space available on the rooftops. Due to the nature of mobile coverage provision, once mobile equipment is deployed on a rooftop, there is "spill over" coverage which allows for External Areas to also be served from the same rooftop. However, in some instances, MNOs have to spend significant resources in protracted negotiations with building developers or owners and may be asked to pay high charges for the use of space in the developments to provide mobile coverage to External Areas. Even where MNOs already have existing installations on a rooftop, they may not be allowed to retain the same site unless MNOs pay the rental charges required by building developers or owners. These events may result in MNOs having to remove their installations or re-locate elsewhere, thus causing disruption to mobile services and affecting the overall mobile experience of users ("**Mobile Users**").

15. In addition, in-building mobile coverage for a development may be better served by mobile deployments on rooftops from **adjacent** buildings. This is a practical way of achieving more optimal coverage of each mobile antenna, since the antenna would point outwards from each rooftop instead of downwards into the same building. Such deployments on adjacent rooftops would allow neighbouring buildings to provide mutual in-building coverage to each other from their rooftops, while also providing coverage to the External Areas.

16. In his speech on the Telecommunications (Amendment) Bill, the Minister for Communications and Information, Dr Yaacob Ibrahim, had also explained that "*In our dense urban environment, mobile deployments need to be sited at suitably high locations, such as building rooftops and towers, to optimise coverage of each mobile antenna. Accordingly, it is usually optimal for mobile operators to deploy their infrastructure on rooftops to serve multiple buildings from one location.*" The Minister further added that "*With the proposed amendments, it is envisaged that building owners must provide rooftop space as MDS if mobile operators request for it*".[7]

17. In view of the above and to operationalise the recently amended Telecoms Act to designate rooftops as the **preferred** location for MDS, i.e. building developers or owners must provide rooftop space as MDS, upon request by MNOs who are required to provide nationwide mobile coverage, IMDA intends to incorporate provisions into the COPIF that will allow MNOs to

[7] Second reading speech of the Telecommunications (Amendment) Bill, Dr Yaacob Ibrahim, Minister for Communications and Information during parliamentary sitting, 10 November 2016.

also use the MDS to serve a wider area. Hence, IMDA will be expanding the scope of MDS to:

(i) designate building rooftops as the preferred MDS location; and

(ii) allow the use of MDS to not only serve the property development itself, but also allow MNOs to use the MDS to house equipment to serve External Areas.

This would allow every Mobile User, building and development to benefit from the enhanced mobile coverage derived from inter-dependent rooftop deployments.

Question 1: IMDA invites views and comments on:

i. Any <u>procedural</u> issues (e.g. physical access or implementation matters) arising from IMDA's proposed amendments to the COPIF on the scope and use of the MDS on building rooftops to provide coverage to External Areas.

SECTION 2 – Requirements of Space and Facilities to be provided to MNOs

Location of MDS

18. Generally, MNOs have the commercial flexibility to design their network and choose the deployment location and space they require. Such space could be rooftop and non-rooftop areas within a property premise. Under COPIF 2013, building developers or owners are presently allowed to decide the location of the MDS. There have been instances, however, where some building developers or owners choose a location that may not meet the MNOs' design and deployment plan, thus causing the MNOs to negotiate commercially for a more suitable location. In addition, building developers or owners may not fully understand how mobile networks are designed and hence, there may be confusion as to where the MDS should be sited to optimise the deployment of equipment.

19. IMDA is also mindful that, as each development is different and site conditions could differ, it may not be possible to determine a specific location to be the MDS for all developments. For example, MNOs may deploy a common antenna system to provide mobile services in a particular building and, under such a scenario, it would be better for the MDS to be located within the building. In another situation where the MNOs may need to use the MDS to serve the development and beyond, it may be better for the MDS to be located on the rooftop of that development, at a specific corner of that rooftop.

20. In view of the expanded service scope to also serve External Areas, IMDA is of the view that the location of the MDS should be determined by MNOs, in consultation with building developers or owners, subject to availability of suitable space. This is in recognition that there is a greater need for MNOs to take into consideration their larger network topology in assessing suitable locations to site their equipment.

21. Where any building developer or owner disagrees with the location as proposed by MNOs, due to circumstances such as lack of available space, or where such deployments may breach safety or other regulatory requirements, the building developer or owner should work with MNOs to provide alternative locations that are suitable for MNOs' deployment. In the event that a building developer or owner and any MNO cannot come to an agreement, both parties may jointly seek IMDA's facilitation to resolve the matter.

22. In the case where all MNOs choose the same location, IMDA's present view is that all MNOs can deploy their telecommunication equipment in the same building, unless it is not feasible to do so due to physical constraints. IMDA also expects MNOs to be efficient in their deployment and work together to ensure that MDS is efficiently used.

Treatment of existing agreements or arrangements for use of rooftop MDS

23. Where there are already agreements or arrangements in place between MNOs and building developers or owners for the use of rooftop space, and these are still in effect, such agreements and arrangements will be allowed to run their course. The proposed framework will thus apply only after the termination or expiry of these agreements or arrangements. This is to ensure that building developers' or owners' contractual rights are respected. However, IMDA recognises that there may be agreements or contracts with unique considerations. For such cases, IMDA may allow flexibility to cater to these considerations where appropriate and advise the relevant parties directly.

24. Where MNOs already have existing equipment sited in an MDS within a building and have not exhausted their allocated MDS, but wish to relocate all equipment to the rooftop at the MNOs' cost, following the proposed changes to the COPIF, IMDA is of the view that the MNOs may do so. This is provided the re-located MDS ("**new MDS**"), i.e. rooftop space they seek to use, does not exceed their total allowed MDS as stipulated in the COPIF. For the avoidance of doubt, regardless of where MNOs locate their equipment, the total space used by all MNOs in the building must not exceed the total MDS that the building developer or owner is required to provide at no charge. Any excess space required shall be commercially negotiated with building developers or owners, regardless of whether it serves the development itself or External Areas.

Size of MDS

25. With the entry of a new MNO operating in the market, it may be argued that more space overall may be needed for MNOs to deploy their equipment. However, the current MNOs have ceased operating their 2G mobile networks. Moreover, not every MNO may require the use of the same location in every development. Coupled with the trend for vendors to manufacture equipment with smaller footprints, IMDA is of the view that it is not necessary to increase the existing MDS even with the entry of a new MNO. Hence, IMDA proposes for the size of the MDS in residential and non-residential developments to remain as is currently specified under the COPIF.

26. For the avoidance of doubt, IMDA intends for the existing COPIF principles of equal sharing of MDS among the Licensees to continue to apply even with the entry of the fourth MNO.

27. Nevertheless, this does not preclude that under unique or special circumstances, IMDA may require some building developers or owners to provide more space than that stipulated under the COPIF, subject to the availability of space in those buildings. Where MNOs require excess space beyond what is allocated or shared, IMDA will require the MNOs to

commercially negotiate with the building owner for such space in excess of the allocated MDS.

28. For the avoidance of doubt, in the unique or special circumstances that IMDA directs a building developer or owner to provide more space than stipulated under the COPIF as MDS, IMDA may require the excess space to be provided at the MNO's cost.

Determining and ascertaining the size of MDS

29. COPIF 2013 stipulates the following requirements with regard to the size of MDS to be provided by building developers or owners:

Table 1: Mobile Deployment Space to be provided in residential developments comprising one or more multi-storey residential buildings

Total number of residential units in the development	Mobile deployment space# (m^2)		Minimum height of mobile deployment space (m)
	Where the mobile deployment space is provided as a single space	Where the mobile deployment space is provided as two or more separate spaces	
80 to 200	18	24*	3
201 to 600	36*		
601 to 1500	54*		
> 1500	To consult IMDA		

* Size of each disaggregated MDS shall be at least $8m^2$
# Space required in excess of MDS shall be commercially negotiated between licensee and building developer or owner, unless IMDA directs otherwise

Table 2: Mobile Deployment Space to be provided in non-residential developments comprising one or more non-residential buildings (all of which are not tunnels)

Total mobile coverage area ('000 m^2)	Mobile deployment space# (m^2)		Minimum height of mobile deployment space (m)
	Where the mobile deployment space is provided as a single space	Where the mobile deployment space is provided as two or more separate spaces	
> 2 to ≤ 6	18	24*	3
> 6 to ≤ 20	36*		
> 20 to ≤ 100	54*		
> 100 to ≤ 200	72*		
> 200	To consult IMDA		

* Size of each disaggregated MDS shall be at least $8m^2$
# Space required in excess of MDS shall be commercially negotiated between licensee and building developer or owner, unless IMDA directs otherwise

30. For non-residential buildings, "Mobile Coverage Area" has been used to determine the size of MDS that must be provided under the current COPIF. During the implementation of the COPIF, IMDA has received queries from building developers or owners on how to measure the Mobile Coverage Area for non-residential developments and sought clarification from IMDA.

31. IMDA thus takes this opportunity to clarify that the original policy objective is for mobile coverage to be made available anywhere within a property development. Indeed, the COPIF presently defines Mobile Coverage Area as "*any area within a development which is to be served by any public cellular mobile telecommunication system*". For example, Mobile Coverage Area encompasses common outdoor areas and open spaces within a development (e.g. swimming pools and its surrounding patio/open area, open air carparks). However, not all building developers may have included these in their computation.

32. Moreover, with the amendments to the Telecom Act to allow the use of MDS to provide mobile coverage beyond the development, the definition of Mobile Coverage Area under the COPIF will also need to be updated. IMDA will ensure that an objective assessment of the space to be provided by building developers or owners will continue to be performed.

33. IMDA is of the view that it is reasonable to continue to determine the provision of such space based on the size of the property development, because the deployment and installation of mobile network equipment (especially those for in-building coverage) will still benefit the development as a whole. IMDA's view is that Mobile Coverage Area should be based on Gross Floor Area ("**GFA**"), being an objective and consistent basis used in standard building plans, plus site/land area. IMDA therefore seeks feedback on whether this basis (i.e. GFA + site/land area) is clear; or, if not, how this could be better clarified under the revised COPIF.

34. IMDA has also received queries on the computation methodology for determining MDS in non-residential developments where the Mobile Coverage Area is assessed to be more than 200,000m^2. IMDA thus clarifies that it adopts a proportionate method of calculation by first determining the MDS to be provided for a Mobile Coverage Area of 100,000m^2 – 200,000m^2 (or its multiples), then determining the MDS space to be provided for the remaining areas using the same table and adding these together to compute the Total MDS. To illustrate:

For a non-residential development of 450,000m^2 (not road or MRT tunnels)

1st component: MDS for 400,000m^2 = 72m^2 + 72m^2 (two sets of 200,000m^2)

2nd component: Remaining 50,000m^2 = 54m^2

Total MDS to be provided = 72m^2 + 72m^2 + 54m^2 = 198m^2

Question 2: IMDA invites views and comments on:

i. The proposal to allow MNOs to determine the location of the MDS, in consultation with building developers or owners; and

ii. The proposed definition of "Mobile Coverage Area" using GFA + site/land area.

SECTION 3 – Use of and Access to Space and Facilities by Licensees

Use of Space and Facilities: Rules of Usage

35. With the COPIF's proposed changes to designate rooftops as the preferred location for MDS and to give MNOs the option to indicate their preferred MDS location, IMDA expects MNOs to continue to deploy their equipment efficiently on rooftops and consider the building developer's or owner's requirements to use the rooftops for other purposes, e.g. installing solar panels. It is important therefore for the parties to lay down house rules (such as a list of "Do's and Don'ts") to ensure that tidiness and safety are not compromised, whilst requiring that MNOs deploy their equipment efficiently.

36. IMDA believes that a set of guidelines should be included where MNOs use the rooftops. IMDA seeks views and recommendations to ensure that MNOs deploy their equipment efficiently, taking into consideration the building developers' or owners' future needs and requirements.

37. Nonetheless, IMDA recognises that not every building developer or owner would have the same house rules. IMDA will generally leave it to the MNOs and building developers or owners to mutually agree on the house rules to be adhered to. While it is not feasible to provide an exhaustive list of "Do's and Don'ts" as guidelines for house rules, IMDA expects that these should minimally include requirements on the Rules of Usage (including requirements on tidiness and safety) as currently laid out in the COPIF.[8] Please see **Annex A** for an extract of the Rules of Usage.

38. Should parties refer disputes relating to the application of the house rules to IMDA for resolution, IMDA proposes to rely on the requirements set out under the COPIF Rules of Usage as a guide to facilitate resolution of the disputes. IMDA thus seeks feedback on the relevance of the requirements set out in the Rules of Usage and if any additional requirements should be included.

Access to Space and Facilities located at a height of more than four (4) metres above floor level

39. Under COPIF 2013, where the Space and Facilities are located at a height of more than 4 metres above floor level ("**Height Limit**"), the building developer or owner shall provide the necessary means for Licensees to access such Space and Facilities in accordance with prevailing legislation or regulatory requirements on workplace safety and health, at no cost to the Licensees.

[8] COPIF 2013, paragraph 16.4 Rules of Usage.

40. IMDA had noted that Licensees would incur additional deployment and access costs where the Space and Facilities were located above a height that is reasonably accessible by step-ladders. Facilities situated above the Height Limit would necessitate the deployment of mechanised equipment like cherry pickers, scissors or boom lifts, or facilities such as scaffoldings ("**Equipment**"). Recognising that such costs would be specific to these buildings, it was decided that the necessary means of access (including the provision of mechanised equipment) should therefore be provided by building developers or owners instead of Licensees.[9]

41. IMDA has noticed that since then, an increasing number of buildings come with high ceilings that exceed 4 metres with the cable distribution systems usually attached to the ceilings. Some of the high ceilings are built to facilitate the operation of large machinery and/or to allow large vehicles to enter the buildings for loading and unloading purposes e.g. warehouse and industrial buildings. New buildings are also constructed with high ceilings for aesthetic reasons. It is therefore necessary for the COPIF requirements to adapt to such changing preferences in building structures and keep up with the new building designs.

42. While IMDA currently requires building developers or owners to provide the Equipment for Licensees to access the facilities, there have been instances where Licensees faced difficulties in their discussions with building developers or owners providing the Equipment, thus causing delays in the provisioning of services to tenants at the development.

43. In the interest of facilitating speedy service provisioning to tenants, IMDA is of the view that it would be more practical and cost-effective for Licensees to rely on their own resources (i.e. through ownership or lease of such Equipment) to access the cable distribution systems or other Space and Facilities above the Height Limit, given the frequency with which Licensees need to rely on such Equipment at different buildings.

44. Considering the above, IMDA intends to remove the obligation on building developers or owners to provide the necessary means for Licensees to access the cable distribution systems or other Space and Facilities which are located above the Height Limit. Notwithstanding the above, building developers or owners shall continue to facilitate Licensees' access (e.g. timely approval, not imposing unreasonable security deposit etc.) to the said Space and Facilities. For the avoidance of doubt, it remains the building developers' or owners' responsibility to ensure that the Space and Facilities remain otherwise accessible, i.e. not concealed, obstructed or located within inaccessible areas, to Licensees for their network deployment.

9 Building developers or owners could, if they wished, recover such costs from their tenants as part of the rental with amenities provided.

Access to Space and Facilities – Emergencies

45. From time to time, there may be instances where Licensees need to access Space and Facilities urgently to repair or replace their equipment to restore services.

46. Undue delay by building owners/managers to provide emergency access to Space and Facilities may affect service restoration and result in significant inconvenience to the affected public/end users. This is more apparent where the Licensees use the Space and Facilities for Springboarding, e.g., using MDS/MDF rooms to house equipment to serve External Areas, as the building owners/managers are not directly affected by such disruptions to the telecom services. Many of these delays could be due to lack of means of contact where an emergency arises, or requiring the service restoration engineers to provide additional means of verification and/or take additional steps to satisfy access criteria on an urgent basis. IMDA also recognises that ad hoc urgent access without any pre-agreed arrangements may pose security risks to building owners/managers, as it is still important for building owners/managers to ensure that their premises are secured and safe for their own residents/tenants.

47. IMDA has previously advised Licensees, particularly for Licensees that Springboard, on the need to engage building owners/managers to make the necessary arrangements to ensure that they will be able to access the premises and any related Space and Facilities for service restoration during any emergency. However, IMDA has observed that the issue of emergency access delays continues to persist.

48. IMDA thus believes it is necessary to require that pre-agreed access arrangements between building owners/managers and Licensees must be in place, particularly for service restoration during emergencies. It is in the public interest that prior arrangements for urgent access to the building's Space and Facilities are agreed upon in advance. This is to ensure that should an emergency arise, urgent access to such Space and Facilities, based on pre-agreed processes between the building owners/managers and Licensee, will be smooth, to enable the services to be restored expeditiously.

49. In developing the pre-agreed arrangements for emergency access, IMDA agrees to allow for reasonable notice to be provided to building owners/managers by Licensees. There is also a need to cater for buildings that are manned by security guards or management personnel on-site round-the-clock, i.e. on a 24-hours, 7-days-a-week basis, and those that are not managed on a round-the-clock basis. IMDA is also of the view that any pre-agreed arrangements should clearly define and distinguish between procedures for emergencies vis-à-vis non-emergencies, e.g., scheduled maintenance or ad-hoc servicing.

50. As a general guide, IMDA is of the view that where the buildings are managed on a 24x7 basis, two (2) hours would be a reasonable period for notice to be provided to building owners/managers before emergency access, unless there are good reasons why access cannot be provided within the specified time.

51. For those buildings that are unmanned and/or with key card access, IMDA proposes to allow the parties some flexibility in agreeing on what is an acceptable notice period to be provided to building owners/managers before emergency access, as long as such access is provided soonest possible upon notification. Parties should also consider, when discussing pre-agreed emergency access timeframes and arrangements, the need to respond expeditiously to resolve the problem and other service and regulatory obligations, whether required by IMDA or other government agencies.

52. By engaging building owners/managers well in advance and agreeing on the emergency processes, Licensees can remain confident in the pre-arranged access procedures to enable speedy restoration. Should there be any issue that arises during these engagements, IMDA may facilitate discussions between Licensees and building owners/managers where necessary.

Question 3: IMDA invites views and comments on:

i. Whether a set of guidelines should be included where MNOs use the rooftops, to ensure that MNOs deploy their equipment efficiently, taking into consideration the building developer's or owner's future needs and requirements;

ii. The proposal to continue relying on the Rules of Usage, laid down in COPIF paragraph 16.4, as a guide to resolving disputes over how house rules are to be applied when Licensees use COPIF Space and Facilities; whether these Rules should be expanded and/or new rules added and what these additional rules should encompass;

iii. The proposed removal of the obligation on building developers or owners to provide the necessary means for Licensees to access cable distribution systems or other Space and Facilities which are located above the Height Limit, i.e. it is recommended that Licensees will be obliged to secure their own means of access to Space and Facilities beyond the Height Limit; and

iv. (a) The proposed requirement for Licensees and building owners/managers to secure pre-agreed emergency access for service restoration during emergencies, particularly where the Licensee is using the space and facilities for Springboarding;

(b) The recommendation for managed buildings to have pre-agreed emergency access to be provided with two (2) hours' notice and for unmanned buildings to have pre-agreed emergency access provided soonest possible upon notification; and

(c) Any specific details that should be included in such pre-agreed emergency access requirements.

SECTION 4 – Requirements to Enhance Network and Service Resilience

Resilience of networks and services

53. With telecommunication services becoming an integral part of business operations, IMDA has required Licensees to enhance the resilience of their network and services, e.g., through the provision of network redundancy and diversity. At the same time, IMDA has also advised business end-users who are dependent on telecommunication services to provide vital services to the public, who cannot risk any downtime, to assess their risk exposures and take appropriate measures to enhance the reliability of the telecommunication services purchased. It is thus important that building premises which accommodate the operations of these vital services are constructed to enable resilient services to be provided when required, e.g., through facilitating infrastructure diversity. Examples of such vital services buildings include:

    (i) public hospitals;
    (ii) airports or immigration checkpoints;
    (iii) police stations;
    (iv) power generation or control plants;
    (v) data centres; and
    (vi) key financial centres such as the Stock Exchange

54. Currently, the guidelines to the COPIF provide the diversity requirements for the buildings that accommodate these vital services, e.g. additional set of lead-in pipes to be provided at a different location. However, as there may be other infrastructure required to ensure sufficient resilience, IMDA intends to expand the diversity requirements to include an additional:
    (i) MDF room;
    (ii) telecom riser; and
    (iii) set of cable distribution system.

    IMDA's view is that the above requirements ought to be made mandatory instead of including these as recommendations under the COPIF guidelines, in the light of the vital services that require continuous delivery which are housed within the building.

Question 4: IMDA invites views and comments on:

i. Whether the current requirement of 2 sets of lead-in pipes (i.e. one set in vital services buildings and essential facilities, with an additional set at a different location) is sufficient for resilience purposes;

ii. Whether an additional MDF room, telecom riser and set of cable distribution system should be provided as mandatory requirements or included as recommendations under the COPIF guidelines; and

iii. Any other types of developments (besides those stated in this Section) that should be included in the list of vital services buildings and essential facilities, and the reasons for doing so.

SECTION 5 – Provision of Cables for Telecommunication (Non-Broadband Coaxial Cable) Systems in all Developments

Requirements for Cable Installation in Residential Developments

55. Currently, for all residential developments, i.e., landed dwelling houses, strata landed dwelling-houses and multi-storey residential buildings, a minimum of one (1) 2-core optical fibre cable complying with ITU-T G.652.D specifications is required to be provided in each residential unit of such developments. The cables shall be terminated into a fibre termination point with 2 sets of Standard Connector/Angle Polished Connector ("**SC/APC**") connectors at one end (which may be located in the utility room or closet) and into a fibre interface point with 2 sets of SC/APC connectors located in the gate pillars or telecommunication risers (whichever applicable). In addition, within each residential unit, unshielded twisted pair cable(s) (Category 6 ("**Cat 6**") or better), complying with TIA 568-C specifications, from an RJ45 outlet in each of the bedroom(s) and two (2) RJ45 outlets in each of the living room(s) of the residential property, shall be terminated into an RJ45 patch panel (which may be located in the utility room or closet).

56. With the increasing use of smart devices and applications in Singapore's residential properties (e.g. monitoring sensors and alert systems), coupled with the likely advent of more such devices and innovative gadgets requiring connectivity, IMDA is of the view that COPIF 2013's requirement for one 2-core optical fibre cable to a residential unit may not be sufficient to support the increasing number of connected devices that will be required to use a whole suite of services. IMDA is of the view that an additional 2-core optical fibre cable should be provided to meet future needs of homes.

57. Similarly, IMDA is of the view that COPIF 2013's requirement for unshielded twisted pair cable(s) within a residential unit, i.e. to be terminated in the RJ45 patch panel at one end and into an RJ45 outlet in each of the bedroom(s) and 2 RJ45 outlets in each of the living room(s) at the other end, ought to be revised. With the increasing reliance on and pervasive usage of smart devices, which are not confined to any one space within the home, it may be prudent to ensure that other spaces such as the residential unit's main entrance and kitchen be equipped to cater for such developments. This is in consideration that it is more cost-effective and convenient for in-residential unit cabling to be fitted out and enabled to support the smart solutions/services which can better integrate with day-to-day Smart Nation living. Please refer to the New Plan View illustration in **Figure 1**.

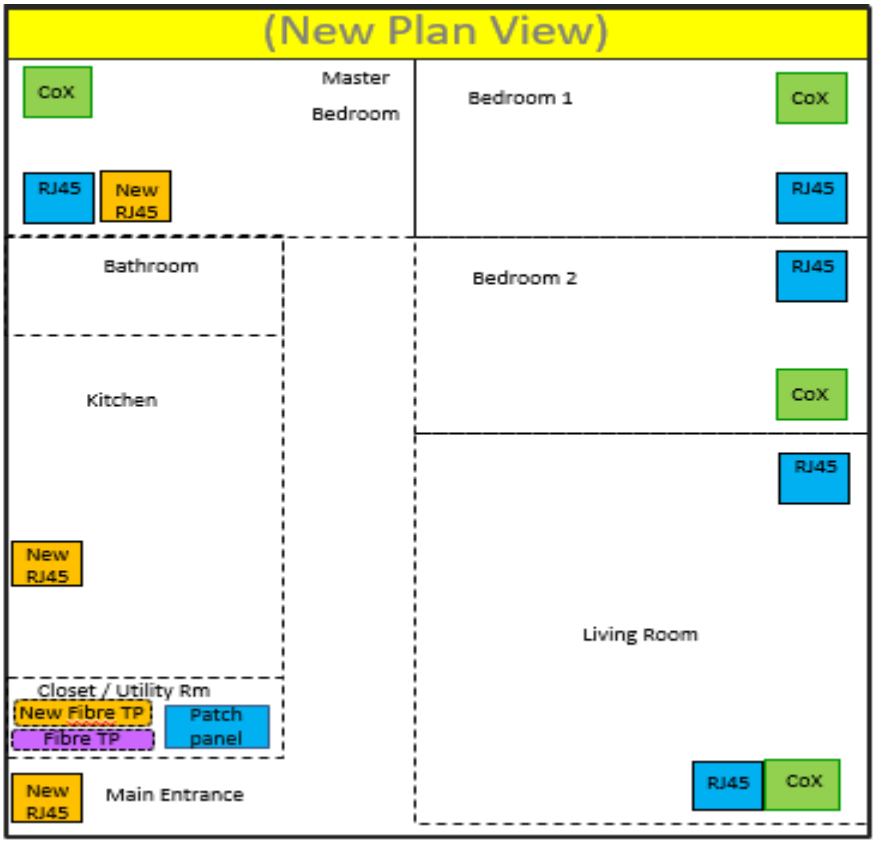

Figure 1. Illustration of the New Plan View

58. Notwithstanding the requirements for installation of optical fibre cables in residential developments, IMDA intends to retain the existing COPIF 2013 requirements related to the broadband coaxial cable system for the time being, as StarHub Cable Vision is still providing services over the coaxial system.

Requirements for the Provision of Internal Telecommunication Wiring for Non-residential Developments

59. Currently, the building developer or owner for any non-residential development is required to provide a minimum of 2 cable trays (1 for Broadband Coaxial Cable and the other for Non-Broadband Coaxial Cable) from the MDF room to the telecommunication riser, and a cable distribution system from the telecommunication riser to each unit, to facilitate Licensees' installation of cables into the units to provision telecommunication services. Whenever a Licensee receives a service request from an end-user in the development, the Licensee will approach the building developer or owner to access the cable trays and cable distribution system to install their cable to the end-user's unit. However, there may be situations where such cable trays and cable distribution systems are concealed for aesthetic reasons and the building developer

or owner may need to create access panels or assist to remove the existing access panels to facilitate the Licensee's cable installation. Further, Licensees may also need to remove and reinstate fire-stop seals in the telecommunication risers between floors in order to install additional cables from the MDF room to the unit.

60. Considering that:
    (i) the above works may require building developers or owners as well as Licensees to incur additional resources repeatedly (e.g., open and reinstate access panels and fire-stop seals every time an end-user requests for telecommunication services from a Licensee);
    (ii) some of these works may cause inconvenience to the building developers or owners and tenants in the development; and
    (iii) there may be delays for telecommunication services to be provided to the tenants,

    there may be merit for building developers or owners to pre-install additional infrastructure during the construction of the development to address the above issues and facilitate a Licensee's provisioning of telecommunication services to the unit, since it would be easier to do so during the construction stage. However, IMDA is also cognisant that it may be burdensome to impose such requirements on all non-residential building developers or owners as not all the units may require telecommunication services (e.g., where the development is used as a warehouse, or if the development is single-tenanted).

61. In the case of residential developments, IMDA had required building developers or owners to pre-install fibre and co-axial cables into the dwelling units, with a Cat 6 cabling network within the dwelling unit. For the case of non-residential developments, it may not be appropriate for IMDA to require the same given that the majority of tenants in non-residential developments do not need telecommunication services provided over co-axial cables and tenants may want their Cat 6 cabling network within their units to be configured differently. IMDA will also not consider pre-installing copper given that copper has been phased out for new residential developments and increasingly, tenants in non-residential developments no longer rely on the copper network for telecommunication services. IMDA is henceforth only considering to require building developers or owners to pre-install fibre or infrastructure that supports fibre e.g., (air blown tubes from the MDF room to each unit).

62. In order to ensure that there is a balance of responsibilities between building developers or owners and Licensees, IMDA would like to seek views on whether building developers or owners of new developments should be required to pre-install additional infrastructure to facilitate the provisioning of telecommunication services to the units and where the infrastructure should be terminated (e.g., from MDF room to riser, or from MDF room to the unit etc).

Question 5: IMDA invites views and comments on:

<u>Residential Developments</u>

i. ***Whether the current requirement of one 2-core optical fibre is sufficient to meet future home communication needs and if one more 2-core optical fibre termination point should be provided;***

ii. ***Whether the current requirements of:***
- ***2 RJ45 outlets for each living/dining room in a residential property; and***
- ***1 RJ45 outlet for each bedroom in a residential property***

are sufficient. If not, where else should such RJ45 outlets be located; and

iii. ***Whether any other requirements ought to also be included for in-building cabling for residential developments.***

<u>Non-residential Developments</u>

iv. ***Whether building developers or owners of new non-residential developments should be required to pre-install additional infrastructure to facilitate the provision of telecommunication services to the units, and reasons for or against doing so.***

v. ***Where:***

a) internal telecommunication wiring should be pre-installed,

- ***whether fibre should be the prescribed option and if so, what requisite number of cores of optical fibre would be appropriate;***
- ***where these should be terminated given that for non-residential developments, the use and the size of the units within the developments may change from time to time; and***
- ***what operational issues need to be addressed, including how to manage and monitor the use of the additional facilities/infrastructure (e.g., how to ensure that Licensees remove their cables/connections to the units promptly and what processes should be put in place).***

b) internal telecommunication wiring need <u>not</u> be pre-installed,

- ***whether the current cable distribution systems would be sufficient, or should there be additional obligations imposed on building developers or owners of non-residential developments to install other facilities e.g. air blown tubes to facilitate the installation of fibres by Licensees;***
- ***if other facilities such as air blown tubes were to be pre-installed, where these should be terminated given that, for non-residential***

developments, the use and the size of the units within the developments may change from time to time; and

- ***what operational issues need to be addressed, including how to manage and monitor the use of any other facilities/infrastructure that may be required by additional obligations imposed on building developers or owners (e.g., how to ensure that Licensees remove their cables/connections from the air blown tubes, if air blown tubes are adopted, and what processes should be put in place).***

SECTION 6 – Developments consisting of 1 or more Road or Mass Rapid Transit System ("MRT") Tunnels

63. The mobile network deployed to provide mobile coverage at residential or non-residential buildings differs from the network deployed to provide mobile coverage to road or MRT tunnels. For example, for road and MRT tunnels, leaky cables are usually required to be housed in-tunnel and the provision of niches and transmission equipment at each station are necessary.[10]

Space requirements for Road or MRT Tunnels coverage

64. With the expansion of the train and road networks, coupled with increasing demand by commuters for good mobile data usage experience, IMDA is of the view that an increase of the MDS beyond the current provision of $40m^2$ for Road Tunnels and MRT Tunnels would be required.

Specifications for Space and Facilities required in Road or MRT Tunnels

65. Currently, the COPIF describes the overall space required but does not address specifically the niches required, the distances between such niches and the MDS for Tunnels. MNOs and the developers of the Tunnels expend considerable resources to negotiate and come to an agreement on these specifications to ensure that MNOs are able to deploy their equipment optimally when the Tunnels are constructed.

66. By including the specifications in the COPIF, developers of the Tunnels would be made more fully aware upfront of the requirements they should cater for before construction and minimise the engagement time between developers and the MNOs when designing the Tunnels. IMDA is thus of the view that more detailed specifications could be included in the COPIF for Space and Facilities requirements in Road and MRT Tunnels to avoid insufficient provisioning.

67. For example, IMDA understands that the distance between niches is dependent on the spectrum frequency utilised and is therefore required to be set apart at suitable distances within Tunnels. Had these requirements for Tunnels been made known upfront, construction could have been less time-consuming and more cost-effective overall for stakeholders. IMDA

[10] Niches are recesses within the wall, or enclosures that are set back or indented, along both the road tunnels and MRT tunnels.

thus seeks feedback on requiring suitable specifications (e.g., number of niches and suitable distances apart) for niches to be provided.

68. In addition, IMDA seeks feedback on requiring specifications for leaky cables housed in-tunnel to be aligned with the height of windows of MRT trains and other enhancements to provide mobile coverage within Tunnels, and any other considerations for other suitable specifications such as additional power requirements.

Question 6: IMDA invites views and comments on:

i. Whether an increase of the MDS beyond the current provision of 40m^2 for Road and MRT Tunnels is required, to be future-ready, and if so, how much more space in excess of the current 40m^2 MDS for Road and MRT Tunnels is required;

ii. The requirement for suitable specifications for the niches and the distances between the niches and the MDS in Road and MRT Tunnels to be provided;

iii. The proposal to include requirements for specifications on the leaky cable to be aligned with the height of the MRT train window along MRT Tunnels, and any other considerations which would enhance coverage in the Tunnels; and

iv. Any other considerations (e.g. additional power requirements) or suitable specifications to be included for Space and Facilities in Road and MRT Tunnels.

PART III: INVITATION TO COMMENT

69. IMDA would like to seek views and comments from the industry and members of the public on the proposals in Sections 1 to 6 of Part II of this Consultation Paper.

70. All views and comments should be clearly and concisely written, and should include a reasoned explanation in support of views taken. Parties should also clearly identify the specific Section on which they are commenting.

71. All views and comments should be submitted in soft copy (preferably in Microsoft Word or PDF format), and should reach IMDA by **12 noon, 24 May 2017**. Respondents are required to include their personal/company particulars as well as the correspondence address, contact number and email address, in their submissions. All views and comments should be addressed to:

Aileen Chia (Ms)
Director-General (Telecoms & Post)
Assistant Chief Executive (Connectivity & Competition Development)
Infocomm Media Development Authority
10 Pasir Panjang Road
#10-01 Mapletree Business City
Singapore 117438

Please submit your soft copies, with the e-mail header "Public Consultation on the Review of COPIF", to this e-mail: **Consultation@imda.gov.sg**.

72. IMDA reserves the right to make public all or parts of any written submission and to disclose the identity of the source. Commenting parties may request confidential treatment for any part of the submission that the commenting party believes to be proprietary, confidential or commercially sensitive. Any such information should be clearly marked and placed in a separate annex. If IMDA grants confidential treatment, it will consider (but will not publicly disclose) the information. If IMDA rejects the request for confidential treatment, it will return the information to the party that submitted it and will not consider this information as part of its review. As far as possible, parties should limit any request for confidential treatment of information submitted. IMDA will not accept any submission that requests confidential treatment of all, or a substantial part, of the submission.

ANNEX A

EXTRACT OF "RULES OF USAGE" FROM COPIF 2013

16.4 Rules of Usage

16.4.1 Every licensee who deploys its installation, plant or system in the relevant space and facilities of any development shall –

(a) ensure that it deploys its installation, plant or system in the most efficient manner possible;

(b) only deploy such installation, plant or system as is reasonably necessary to meet the demand for its services and where the licensee is a public telecommunication licensee, to also meet its basic service obligations;

(c) not deploy its installation, plant or system in a manner which unreasonably prevents any other licensee who wishes to deploy its installation, plant or system within the same space and facilities from doing so;

(d) co-operate in good faith with any other licensee who wishes to deploy its installation, plant or system within the same space and facilities to enable such licensee to carry out its deployment in an expedient manner;

(e) not make any structural alteration to the relevant space and facilities without the approval of the developer or owner of that development;

(f) take due care to maintain the cleanliness and condition of the relevant space and facilities in which it deploys its installation, plant or system, and those parts of the land which it accesses in connection with such deployment;

(g) where it causes any damage to the relevant space and facilities in which it deploys its installation, plant or system, or to those parts of the land which it accesses in connection with such deployment, inform the developer or owner of that development and make good the damage caused;

(h) when carrying out any activities in connection with its deployment of installation, plant or system in the relevant space and facilities, take reasonable steps to minimise the disturbance and inconvenience caused to the occupants of the building and comply with all requirements imposed by the relevant authorities including any limits on noise levels and safety;

(i) subject to paragraphs 16.4.3 to 16.4.6, pay for all utility charges incurred for the operation of the installation, plant or system deployed in the relevant space and facilities unless otherwise agreed with the developer or owner of that development;

(j) where it is necessary to drill through any concrete floor or wall of buildings for the laying of its installation, plant or system, consult and obtain the written approval of the developer or owner of that development, and be responsible for any such drilling works at its own cost;

(k) where it is necessary for the laying of its installation, plant or system, be responsible for the removal and replacement of the fire resistant material used to seal the inter-floor openings for the telecommunication risers, at its own expense; and

(l) where it ceases to provide any service to that building, remove, within a reasonable timeframe, any installation, plant or system deployed in the relevant space and facilities which is no longer required.

16.4.2 For the purposes of paragraph 16.4.1, all references to the act of deployment of any installation, plant or system shall include the act of inspecting, maintaining or repairing such installation, plant or system.

16.4.3 Where the developer or owner has served a notice requiring any licensee to bear utility charges for the operation of any installation, plant or system deployed by the licensee in the relevant space and facilities, the licensee shall bear the utility charges on a prospective basis commencing no earlier than a period of one (1) month from the date of service of such notice.

16.4.4 Where such notice as specified in paragraph 16.4.3 is served on the licensee, the developer or owner and the licensee shall reach an agreement on the basis upon which to compute the utility charges to be borne by the licensee. Where the developer or owner and the licensee are unable to agree on such basis, the utility charges to be borne by the licensee shall be based on the estimated power consumption of the licensee's installation, plant or system.

16.4.5 Notwithstanding paragraph 16.4.4, where it is physically feasible, the licensee may, at its own cost, install the necessary electrical installations (including cables, a separate utility meter and any other accessories) to enable the utility charges to be computed on an "as incurred" basis and paid directly to the utility provider.

16.4.6 For the avoidance of doubt, the developer or owner shall not require the licensee to bear any utility charges incurred prior to the commencement date referred to in paragraph 16.4.3.