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By Email: Consultation@imda.gov.sg

Dear Ms Chia

PUBLIC CONSULTATION ON THE REVIEW OF COPIF

1. TPG Telecom Pte Ltd (TPG) is the putative fourth entrant into the Singapore mobile telecommunications market. Obviously, as a new mobile network operator, site access is critical to TPG and TPG thanks the IMDA for the opportunity to comment on the proposed revisions to the COPIF Code.
2. In general, TPG is supportive of many of the positions in the Consultation Paper issued on 26 April 2017 (the “**Consultation Paper**”). Responses to the particular issues raised in the Consultation Paper follow.

Question 1: Any procedural 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.

3. TPG agrees with the suggested course of mandating space in buildings for the supply of services both to users in the development and those in other areas.
4. About procedural issues or implementation matters, TPG considers that information about the requirements of the revised code will need to be widely promoted so as to ensure good knowledge and willing participation on the part of building owners.
5. Some form of quick resolution methodology may be advantageous to making it quickly possible for MNO’s to secure access in the absence of a co-operative building owner. For example, an administrative process such as a conciliation conference managed and run by the IMDA to assist in resolving any dispute between a building owner might promote a quick easy response where the building owner will come away with better knowledge and, if they continue not to facilitate access, the MNO may then be able to seek alternative remedies with the benefit of evidential support of having undertaken the IMDA process.
6. TPG does have concerns about the possibility of limited Mobile Deployment Space (MDS) and it all being used by other MNOs. As is proposed, the IMDA should mandate that the free available MDS should be split equally amongst the four MNOs and that MNOs should

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not be allowed to reserve space more than their requirements as this will deprive other MNOs of the space required.

7. It is recommended that the MDS space for each MNO (assuming equal sharing basis) and additional MDS usage beyond each MNO's allocation is calculated and defined, and the formula to charge for additional MDS space be recommended by IMDA. This will help handle situations when the MDS has already been fully occupied and additional MDS space is required by the MNO(s).
8. In the case where a building already has the MDS fully occupied by MNO(s), and a new MNO request use of space IMDA should determine if the space is efficiently used and regulate if required. The COPIF should require existing MNOs to create space in an MDS to accommodate another MNO and that this be completed within a specified time following request from an MNO. To the extent not otherwise available, any MNO should be able to call on other MNOs to identify all equipment of that MNO located in a particular building.
9. IMDA should mandate that the building owners should not reject an application to install MNO equipment in a building based on aesthetic reasons, resident's objections or due to planned solar panel installations.
10. Finally, with the proposed changes to COPIF and expected reduction in rooftop space rental fees, some building owners are likely to try to compensate for the reduction of license fees by charging excessive high access or escort fees to the MNO(s). This should be prohibited.
11. The building owners should grant each MNO access to the MNO's equipment at no additional charge to the MNOs. If IMDA decides that the MNOs may pay building owners for costs in providing access to rooftops that are reasonable and efficiently incurred, it would be good for COPIF to include the guidelines on how such costs are calculated.
12. Currently some building owners reject the application as they do not want any MNOs in their buildings or if there are too many MNOs on their rooftop. The COPIF Code should expressly disclaim such objections.
13. TPG also notes that the proposal not to unreasonably interfere with contractual rights of building owners. One possible concern is that the practice amongst building owners is to require the removal of all equipment at the expiry of a licence and such a term is usually stipulated in the licence agreement. The IMDA should consider stipulating in the COPIF that, if an MNO has entered into a licence agreement with a building owner and that licence agreement has been or can be terminated, the MNO should be able to rely on the COPIF to leave their equipment on or in the building and without having to remove equipment and then reinstall it.

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.***

14. TPG considers it sensible for MNOs to determine the location of MNOs in consultation with building owners.
15. However, the key issue will be the time that it takes to resolve any disagreement with a building owner using the IMDA's facilitation process. Again, some form of quick administrative conciliation process may be beneficial.

16. The same process will need to be available for difficulties arising between the MNOs. Clearly, the IMDA has a right to expect that all parties will be reasonable in their dealings with each other but sometimes commercial considerations can result in delays or positions being taken that cannot be resolved without some kind of umpire. That resolution process is important. Preferably, it should carry some kind of disincentive (such as a costs order or a fine) so as to motivate parties to be reasonable and not capriciously or for commercial reasons refer matters to the dispute resolution process.
17. Although MNOs would obviously always seek to secure more rather than less space, TPG cannot take any issue with the proposed definition of Mobile Coverage Area.

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.

18. TPG considers that the IMDA should provide a set of guidelines to ensure that MNOs deploy their equipment efficiently, and to also ensure that building developer(s)/owner(s) do not intentionally prevent MNOs from using rooftop space based on purported future needs and requirements that are not real.
19. Building owners should not impose the use of mobile elevating work platforms if MNOs can use scaffolding safely and consistently with WHS requirements.
20. Building owners should not reject MNOs MDS due to future needs or requirements. MNOs can co-operate to overcome such requirements if the building owners identify real and imminent intentions such as solar panel installation.
21. Building owners should grant MNOs and their contractors 24/7 access for manned buildings without charge and should provide a Point of Contact (POC) for emergency access for unmanned building who can respond at least 2 hours upon activation.

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.

22. TPG does consider that diverse entries, comms rooms and risers will enhance the resilience of networks.

23. TPG does consider that the COPIF codes should require 2 sets of lead-in pipes but there should be a requirement that the lead in pipes enter the buildings from locations that are sufficiently apart so as to minimise the risk of both entries suffering cuts. If so positioned, preferable off different streets where possible, 2 lead ins should be sufficient for vital services buildings.

Question 5: IMDA invites views and comments on:

Residential Developments

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.

Non-residential Developments

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 not 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*

24. TPG does not make any comment in relation to this question.

Question 6: IMDA invites views and comments on:

- i. Whether an increase of the MDS beyond the current provision of 40m² for Road and MRT Tunnels is required, to be future-ready, and if so, how much more space in excess of the current 40m² 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.***

25. TPG recommends that the current provision of 40m² of the MDS for Road and MRT Tunnels be increased by 40m², to a total of 80m². The 40m² space is currently shared with the 3 MNOs (SingTel Mobile, StarHub Mobile, M1), with each MNO occupying around 12m² and 4m² for common equipment (such as multi-operator combiners and active solutions). The recommended 80m² space will cater to around 18m² per MNO (4 MNOs in total) and 8m² for common equipment. Each MDS should be provided with 32A TPN per MTO.

26. While it is argued that 2G networks (such as GSM900) have ceased operations, the MNOs will reuse the 2G equipment space for their 3G or 4G services on the 2G band (such as UMTS900 or LTE900). Furthermore, additional equipment space is required to support the 3 new additional spectrum bands that has been recently awarded to the MNOs (700MHz, 2.3GHz, 2.5GHz), to cater to 4G MIMO (which will double the common equipment space), and to be future proof for 5G networks.

Response to Question 6ii.

27. TPG recommends that the total niche size be at least 6m (length) x 2m (depth) x 2m (height). A larger niche size is required to house additional equipment to support 700MHz, 2.3GHz and 2.5GHz bands, and MIMO.

28. In the event that a continuous niche space is not available and the niche space needs to be broken into two or more locations, a recommended size of 3mx2mx2m is required for each niche location. The different niche locations should also not be more than 5m apart. At each niche location, there should be adequate ventilation, power (20A TPN) and fiber connectivity. TPG recommends that the distance between the niches should not exceed 150m.

29. There should also be an interconnecting duct or space between the separated niche space to allow connectivity of coaxial, power and fiber cables between the different equipment in the separated niche spaces.

Response to Question 6iii.

30. TPG recommends that 2 pairs of 1-5/8" LCX (total of 4 LCX cables) be planned in the MRT tunnels, and each LCX pair is placed on opposite sides of the tunnel at the height of the MRT train window.

31. Having the LCX cables on both sides of the tunnel walls (instead of 1 side) will provide better coverage into the trains, and will allow better MIMO performance which results in higher network capacity.

32. For the road tunnels, TPG recommends that 2 pairs of LCX (total of 4 LCX cables) be planned in the tunnels, with each LCX cable evenly spaced out from each other. The LCX cables should also be installed lower than other systems such as ventilation fans, to minimize RF blockage and to maximize coverage and MIMO performance.
33. For both road and MRT tunnels, there should be ample fibre cables installed from the MDS to the various niches and along the entire tunnel. It is also recommended that there should be a separate fibre cable connecting between adjacent MDS (which could be at different MRT stations) to support transmission network redundancy and to allow the support of new future Radio technologies and architectures that can enhance tunnel coverage and capacity.

Response to Question 6iv.

34. TPG recommends that in addition to the traditional AC power supply to the niches in the tunnels (to power the remote equipment at the niches), a separate DC power supply solution and space be considered for the tunnels.
35. Most of the telecom equipment uses DC power, and if the power source is AC, UPS or power supply unit (PSU) are required at each location. These UPS/PSU equipment will not only occupy the niche space, but is also known to be one of the components with the highest failure rate. To reduce the need to access the tunnels to replace faulty UPS or PSU, it is recommended that space is made available at suitable locations to house the centralized DC power system, that can deliver DC power directly to the remote equipment. The other advantage of such DC power system is that it can provide the necessary battery backup system (N+1) for the equipment.
36. TPG also recommends that rooftop MDS space and MDF be made available at the ventilation buildings, for both tunnel coverage and to provide coverage to the surrounding areas.

Yours faithfully



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