M1'S RESPONSE TO IDA'S PUBLIC CONSULTATION ON PROPOSED FRAMEWORK FOR THE ALLOCATION OF SPECTRUM FOR INTERNATIONAL MOBILE TELECOMMUNICATIONS ("IMT") AND IMT-ADVANCED SERVICES AND FOR THE ENHANCEMENT OF COMPETITION IN THE MOBILE MARKET

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Introduction

1. M1 is an established info-communication company in Singapore, providing mobile and fixed services to close to 2 million customers. Since launch of commercial services in 1997, M1 has made significant inroads into the info-communications market and achieved many firsts, including the first operator to offer nationwide 4G service, as well as ultra high-speed fixed broadband, fixed voice and other services on the Next Generation Nationwide Broadband Network (NGNBN). With a continual focus on network quality, customer service, value and innovation, M1 links anyone and anything; anytime, anywhere.

2. M1 welcomes the opportunity to submit our views and comments to IDA for its consideration on the proposed framework for the allocation of spectrum for international mobile telecommunications and IMT-advanced services and for the enhancement of competition in the mobile market.

Part I: Proposed Framework to Facilitate New Entry

(a) *Spectrum set-aside in either 700 MHz or 900 MHz band will enable nationwide coverage*

3. For service coverage purpose, 2x10 MHz in either the 700 MHz or 900 MHz will enable a new Mobile Network Operator (MNO) to achieve nationwide coverage. From a technical perspective, there is no advantage to package two low bands for allocation to one operator as they are neither complementary nor substitutable to each other. Current carrier aggregation spectrum combinations are Low Band-High Band or High Band-High Band. There are no chipsets available today for deployment of carrier aggregation with two Low bands, although we do not rule out that technology to support it might be commercially available in the future.

4. The proposed 2x20 MHz of spectrum set-aside in both 700 MHz and 900 MHz band for a potential new entrant will lead to reduced spectrum resources available to the existing MNOs to support and serve the needs of their existing customers.

(b) *Spectrum set-aside for potential new entrant in 2.3/2.5 GHz band be adjusted to deliver greater spectral efficiency*

5. New technologies for the provision of mobile broadband services require larger contiguous blocks of spectrum to deliver greater spectral efficiency and better user experience. Fragmentation of spectrum will result in loss of efficiency.

6. Based on IDA's proposed allocation in the above 1 GHz spectrum bands, only 10 MHz of 2.3 GHz bandwidth will be available for allocation. This will not provide meaningful throughput gain in carrier aggregation deployment. For the same deployment cost, 20 MHz of spectrum will be able to provide more than double the throughput compared to 10 MHz. To maximize flexibility for both incumbent MNOs and the potential new entrant in terms of network implementation and deployment, which in turn yields optimal spectrum utilization and greater spectral efficiency in both 2.3 GHz and 2.5 GHz bands, the alternative can be as per the table below.

	Frequency Band	Total Availability	Set-aside for New Entrant	Available for Allocation
Proposed Allocation	2.3 GHz	30 MHz	20 MHz	10 MHz
	2.5 GHz	45 MHz	0 MHz	45 MHz
Alternative Allocation	2.3 GHz	30 MHz	0 MHz	**30 MHz**
	2.5 GHz	45 MHz	20 MHz	**25 MHz**

(c) ***New MNO with package secured should not require further spectrum from outset***

7. The proposed spectrum set-aside has a combination of low and high frequency spectrum aimed to enable the new MNO to start its network deployment and quickly compete in the market. Realistically, the new MNO does not require spectrum beyond this set-aside amount from the outset, prior to network deployment and acquisition of customers.

8. We noted that the proposed set-aside amount is greater compared with similar packages for new entrants offered by jurisdictions globally.

	Amount of Spectrum Set-aside for New Entrant	Comparison with IDA's Proposed Spectrum Package
Mexico (Y2010)	30 MHz (2x15 MHz in AWS bands)	30 MHz less
Netherland (Y2012)	30 MHz (2x10 MHz in 800 MHz & 2x5 MHz in 900 MHz)	30 MHz less
Czech Republic (Y2012)	51.6 MHz (2x10 MHz in 800 MHz & 2x15.8 MHz in 1800 MHz)	8.4 MHz less
Austria (Y2013)	40 MHz (2x20 MHz in 800 MHz)	20 MHz less

9. In light of the above, we request IDA to re-consider its position to further allow the new MNO to participate in the general spectrum auction to compete with incumbent MNOs who require the spectrum to serve the needs of their existing customers.

(d) ***Spectrum package and reserve price generous for rollout of one network***

10. The indicative reserve price for the entire spectrum package at $40m (60% lower than the reserve price) is unprecedented. Although some reasons have been given by the IDA for the spectrum type in the proposed spectrum set-aside, for greater clarity, we would enquire how IDA derived the lower reserve price and what factors the IDA took into account.

11. The total of 60 MHz of spectrum for the rollout of a single network is also disproportionate to the amount of spectrum holdings by each of the incumbent MNOs (70 - 85 MHz) which operate 3 networks (2G/3G/4G) respectively.

12. While we are cognizant of IDA's intent to facilitate the entry of a new MNO, we look to the IDA to maintain an appropriate balance between the interests of the incumbent operators and the new MNO, so as to deliver a market outcome that is sustainable and in the best interests of the industry and consumers.

Part II: Spectrum Bands to Be Allocated

(e) ***900 MHz necessary to support existing 3G operations which is expected to remain in commercial demand for the foreseeable future***

13. Currently, the 900 MHz band is being used by incumbent MNOs for the primary provision of 2G and 3G services. We would also highlight that spectrum that is capable to be utilised for 3G is limited to 900 MHz and 2.1 GHz bands. In conjunction with the 2.1 GHz spectrum that it technically complements, the 900 MHz band effectively serves close to 60% of mobile population in Singapore.

14. Under the 3G FBO Licence and Spectrum Rights, the incumbent MNOs are required to provide nationwide 3G services and meet stringent 3G Quality of Service (QoS) standards up till Y2021 (i.e. only when both Licence and Spectrum Rights expire). Despite the increasingly mature 4G landscape in Singapore, 3G services are expected to remain in commercial demand for the foreseeable future given that there remains a 3G subscriber base of over 4 million[1].

[1] IDA, Statistics on Telecom Services, URL: http://www.ida.gov.sg/Tech-Scene-News/Facts-and-Figures/Telecommunications/Statistics-on-Telecom-Services/Statistics-on-Telecom-Services-for-2015-Jan-Jun

15. Low frequency spectrum, with better propagation characteristics, enable the MNOs to provide good in-building penetration for mobile services. Spectrum that is capable to be utilised for 3G is limited to 900 MHz/2.1 GHz bands. Hence, there is a genuine need for incumbent MNOs to retain prevailing spectrum in 900 MHz to meet IDA's stringent 3G QoS standards.

(f) ***Spectrum for GSM for Railway ("GSM-R")***

16. IDA indicated that it will have to reserve 2x5 MHZ of the EGSM band for the High Speed Rail use, given that GSM-R operates in the EGSM band. M1's view is that it is feasible to open up the entire 900 MHz band for allocation (i.e. 2x35 MHz instead of the 2x25 MHz). Based on the standard GSM-R deployed in Europe, the frequency channel is as follows:-

    - Uplink: 876–880 MHz used for data transmission
    - Downlink: 921–925 MHz used for data reception

    Based on this band, it will not encroach into the 900 MHz or EGSM band, paving the way for a full allocation of the band. This will also ensure that the limited spectrum resources can be fully utilized over the entire island.

17. The Chinese model, which uses the following EGSM band that will only be utilized along the rail track, does not facilitate maximizing the full potential of this valuable spectrum.
    - Uplink: 885–889 MHz
    - Downlink: 930–934 MHz

18. As the High Speed Rail ("HSR") system is planned to be confined to the western part of Singapore, the proposed spectrum lot in the EGSM band to be designated for this purpose may be allocated with the restriction to deploy this spectrum within a determined distance away from the rail system that will prevent interference to the rail communication system. In this way, the MNO that acquires the spectrum lot can still deploy this frequency in other parts of Singapore and optimize the usage of such scarce spectrum resource. If the rail system is built underground, then the restriction on the use of this spectrum may be further relaxed.

19. Overall, IDA should assign a lower reserve price for this spectrum lot due to its restricted usage.

(g) ***There would be corresponding increase in spectrum requirement in the 900 MHz spectrum band following retirement of 2G network***

20. Notwithstanding the impending cessation of 2G services in Y2017, there will be a corresponding increase in requirements to support migration of users to 3G. It is planned that the spectrum currently used for 2G will be used to provide faster, more advanced 3G and 4G services.

21. Without any 900 MHz spectrum for deployment to meet IDA's stringent mandated 3G QoS requirements, a significant increase in the number of base stations will be needed to address the challenge in achieving in-building coverage. Notwithstanding the costs involved, the practical difficulty in acquiring >1000 additional sites will result in a prolonged period of poor customer experience and degraded 3G service.

(h) ***Ensuring service continuity and minimizing service disruption to end users by granting first right of refusal to existing 3G operators***

22. In light of the above, M1 requests a first right of refusal ("FROR") of at least 2x5 MHz in 900 MHz (including EGSM) band to be granted to each incumbent 3G operator for the continuous provision of 3G services. This is critical in order to meet the stringent 3G QoS regulations in place.

23. M1 notes that such an approach will not only be consistent with international best practices in advanced markets (e.g. Hong Kong, UK, USA etc.) which are effectively competitive, but also mirrors IDA's past policy and conduct in relation to spectrum management (including on the renewal of PCMTS spectrum rights in Y2008), where priority has always been placed on ensuring service continuity and minimizing disruption to end users.

24. With regards to IDA's specific concerns on potential market distortion and strengthening of incumbency should FROR be adopted in 900MHz/EGSM band, M1 believes that these unlikely effects can be adequately addressed:-

- ***There is sufficient spectrum set aside for new entrant***– New entrant would not be disadvantaged given that a spectrum package consisting of both low and high frequency bands has been set aside in the proposed framework. This would reasonably enable any potential entrant to roll out services nationwide and effectively compete in the market within short period of time.

- ***Opportunity for interested MNO to obtain additional spectrum*** – With FROR to incumbent MNOs, there will be 2x5 MHz in 900 MHz/EGSM band remaining should there be further need from any MNO to obtain additional spectrum for their network requirements.

- ***There is inherent incentive to ensure most efficient use of spectrum*** – In a competitive market, operators will already have incentive to ensure efficient usage of spectrum to maintain competitiveness and maximize their return on investment. With mandatory service obligations, regulators are also empowered to seek the return of any unused spectrum or spectrum that are not efficiently utilised.

It is, therefore, our view that a FROR approach as recommended above is not likely to result in adverse effects for the mobile market which is of concern to IDA. Such a request for FROR to incumbent MNOs for 2x5 MHz spectrum in the 900MHz/EGSM band is not unreasonable given that IDA is prepared to set-aside 2x10 MHz for the one potential new entrant.

25. As an incumbent MNO, M1 is a committed, long term investor in Singapore's info-communication market. Significant capital expenditure has been put into network investments in reliance on the Licence together with existing Spectrum Rights and their continuity upon renewal following expiry. It should be reasonable to accord Licensees and its investors with basic measure of certainty on the renewal of essential spectrum rights to ensure business continuity.

(i) ***Level playing field by extending FROR of spectrum rights to all incumbent operators***

26. In relation to the above, based on IDA's current proposal, only one operator out of the three incumbent 3G operators will be granted a FROR for 2x5 MHz in EGSM band for a period of at least 3 to 5 years.

27. Even though IDA indicated that it will not proceed with the FROR if there is certainty before IDA commences the spectrum allocation exercise that the relevant spectrum will be ready for use from 2017, realistically, our assessment is that this scenario is not likely. Such FROR is, in fact, an unfair advantage accorded to the incumbent operator concerned.

28. To provide a level playing field, M1 requests that a FROR of 2x5 MHz in the 900 MHz/EGSM band be granted to each incumbent operator. Operationally, this will also be a practical approach to minimise impact to existing customers of each of the incumbent operators.

(j) ***4G Quality of Service ("QoS") requirements to be mandated only upon availability of 700 MHz***

29. In view of the growing 4G subscriber base and increasing upward trend in data usage triggered by the ubiquity of smart phones/devices with more data intensive applications, additional spectrum will be needed by all operators to facilitate expansion of radio capacity to meet the surging demands, as well as to provide quality 4G services to end users with the best service levels.

30. M1 welcomes IDA's efforts to make available 700 MHz band to the Singapore mobile market on a soonest possible basis. Being the only sizable low band 4G spectrum that is potentially available in the near future, the timely availability of 700 MHz will be critical, specifically also to meet stringent 4G QoS standards when mandated. In this regard, M1 notes that notwithstanding IDA's efforts to expedite the allocation of 700 MHz band, its availability is still subject to coordination with neighbouring countries on Analogue Switching-off (ASO)

plans. Potentially, there will be a period of service gap (1 Apr 2017 till 2018) if we do not have any spectrum in the low frequency bands to meet QoS standards. Accordingly, we would request IDA not to mandate 4G QoS requirements before the availability of 700 MHz band. We believe that the request is reasonable given that the necessary enablers are not yet in place.

Part III: Other Comments on Proposed Spectrum Allocation

(k) *Duration of spectrum rights to be at least 20 years to ensure business certainty & investor confidence*

31. Incumbent MNOs need certainty regarding renewal of the existing spectrum to enable them to continue investing in new technologies and infrastructure, which are subject to very long term commitments.

32. M1 proposes that the new spectrum rights be granted for duration of at least 20 years. This yields improved business certainty and greater investor confidence that would be positive for the development of the industry.

33. A longer licence duration is also in line with international best practice. Despite being in an era where technological developments are gathering pace, recent regulatory decisions have granted spectrum rights for a long duration with the view that this will improve the investment climate and promote industry development.

Length of spectrum rights awarded by other jurisdictions

	Year of regulator decision	Length of spectrum rights awarded
USA	2015	• Awarded AWS spectrum rights in 1.7/2.1 GHz for 22 years (Initial term of 12 years with subsequent auto-renewal terms of 10 years so long as performance standards are met)
UK	2012	• Awarded 4G spectrum rights in 800/2600 MHz for an initial term of 20 years, after which the regulator will only be able to revoke the license by giving at least 5 years' notice
New Zealand	2013/2014	• Awarded 4G spectrum rights in 700 MHz for a duration of 18 years
New Zealand	2007	• Awarded spectrum management rights for a duration of up to 20 years on a case-by-case basis beginning 2011 (when existing rights begin to expire) for the 800 MHz and 900 MHz frequency bands

(l) ***Appropriate spectrum cap necessary to prevent monopolisation of spectrum***

34. M1 would emphasize that appropriate spectrum caps need to be imposed to prevent potential spectrum grabbing or monopolization of spectrum by any single operator. It is envisaged that efficient spectrum caps should facilitate an outcome where all mobile operators may reasonably be able to obtain necessary spectrum holdings to deliver viable mobile services.

(m) ***Spectrum allocated to new entrant should not be transferable***

35. As spectrum is a scarce resource and given that the spectrum package is set aside at a lower reserve price, we recommend the following controls:-

- Spectrum acquired through the set-aside should not be transferable; and
- In the event that the new MNO is not able to deploy its network by the stipulated deadlines or there is any subsequent consolidation, the spectrum should be required to be returned for potential re-allocation.

Conclusion

36. M1's comments are summarised as follows:-

- 2x10 MHz of spectrum in one of the low bands will enable the rollout of a network with nationwide coverage;
- There is no technical advantage in terms of carrier aggregation, to package 2 low bands for allocation to the potential new entrant;
- Spectrum set-aside in 2.5 GHz instead of 2.3 GHz will maximise the flexibility for MNOs to achieve meaningful throughput gain in carrier aggregation deployment;
- New MNO may not be allowed to further participate in the general spectrum auction;
- IDA to clarify how the indicative reserve price for the spectrum package is derived;
- IDA to review reservation of spectrum for GSM-R;
- First right of refusal of at least 2x5 MHz in 900 MHz (including EGSM) to be granted to each incumbent operator;
- IDA to consider mandating 4G QoS requirements only upon availability of the 700 MHz spectrum;
- Duration of spectrum rights to be at least 20 years;
- Appropriate spectrum caps to prevent monopolisation of spectrum; and
- Spectrum allocated to new MNO should not be transferable.