Summary of views on
Draft Telecommunications (Designation of Frequency Bands Subject To Payment of Spectrum Utilization Fee) Order

Issue	Views of mobile services operators	Legal Service Division's comments on legal issues	Administration's response
Section 1 - Designation of frequency bands subject to payment of spectrum utilization fee	CSL submits the following views – (a) The proposed spectrum assignment of Frequency Division Duplex (FDD) operation is not optimal in avoiding adjacent channel interference. It is suggested that the spectrum will be assigned as per Annex.	The designation of frequency bands is a technical matter within the purview of the Telecommunications Authority (TA). However, before exercising his power to designate frequency bands, TA is required by section 32G(2) of the Telecommunications Ordinance to carry out such consultation with the Telecommunications industry and such other persons who may be directly affected by the exercise of such power, as is reasonable in all the circumstances of the case.	<u>Responses to CSL's comments</u> (a) The TA's proposed frequency plan was developed by reference to a widely accepted band plan (European Radiocommunications Committee (ERC) decision on the harmonised utilisation of spectrum for terrestrial UMTS (ERC/DEC/(99)25)). Such widely accepted band plan has been adopted by other countries including United Kingdom, Germany and Singapore. The adoption of such a plan would allow users in Hong Kong to enjoy international roaming services and have wider choice of equipment. If CSL's proposal were adopted, the last carrier frequency of the Frequency Division Duplex (FDD) block D will not conform to such a band plan.

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	(b) The impact of adjacent channel interference between Time Division Duplex (TDD) carriers and FDD carriers is not known. CSL suggests to migrate one of the proposed assignments of the TDD frequency block (1914.9 - 1919.9MHz) to the other frequency in the TDD band. This would reduce the risk of unexpected interference problem between TDD and assigned FDD frequency block at 1920.3MHz.		(b) The only available band for TDD is 2014.7 - 2019.7 MHz. However, the band 2014.7 – 2019.7 MHz will be used in other countries for apparatus which requires no individual licensing. Such apparatus would potentially be of use in Hong Kong, particularly if the equipment is widely available in the market. If Hong Kong uses this band for licensed public service, it would restrict the use of such apparatus in Hong Kong. Furthermore, there would be serious risk of interference with the licensed public service from such apparatus brought back from overseas markets. We therefore consider it undesirable to move the TDD band 1914.9 – 1919.9 MHz to the band 2014.7 – 2019.7 MHz.
	(c) The impact of adjacent channel interference between TDD carriers is not known.		(c) The proposed channel plan conforms to the widely accepted band plan (ERC/DEC/(99)25 developed by the European Radiocommunications Committee) where the minimum TDD carrier spacing between public operators is 5MHz.

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			Such a band plan has also been adopted in other countries including United Kingdom, Germany and Singapore. Impact on adjacent channel interference between TDD carriers has been addressed when this band plan was developed.
	Hutchison has the following suggestions – (a) The unpaired TDD band 1914.9 - 1919.9 should be moved to 2014.7 - 2019.7 due to the expected TDD high interference on the FDD uplink, which the 400 KHz guard band may not be sufficient for safeguarding the spectrum purity.		<u>Responses to Hutchison's comments</u> (a) Similar to CSL's proposal to migrate the TDD frequency block. See our response to CSL in point (b) above. Moreover, the proximity between the TDD band and FDD band is also present in the band plans of other countries. Our 3G technical consultant advises and OFTA agrees that the 400 kHz guard band between the TDD band and FDD band should be sufficient to prevent unacceptable interference, particularly when the two bands are operated by the same company.

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	(b) The 1964.9 - 1979.7 spectrum is adjacent to the frequency allocated for the mobile satellite service. According to Hutchison's technical findings, there are evidences of such interference. TA is requested to take action prior to the commencement of the auction to control and free such frequency band from interference.		(b) The band 1980 – 2010 MHz has been allocated in other countries to the satellite component of the 3G services. The proximity of the 1964.9 – 1979.7 MHz band to the band allocated to mobile-satellite service is therefore a characteristic present in the band plans for 3G services in other countries. The TA will adopt the best practice in preventing mutual interference between the terrestrial part and the satellite part of the 3G services. Any further information from Hutchison on the interference prevention measures required will be carefully considered by the TA, but no modification of the band plan is required.
	(c) On the basis of the recommendation in (a) above, it is recommended that the spectrum allocated to each of the four successful bidders should be of the same size of 14.8 MHz paired plus 5 MHz unpaired to ensure fairness		(c) The present band plan allocates 14.8 MHz x 2 of FDD spectrum to each of the four 3G network licensees.

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	and equal treatment to all successful licensees. SmarTone submits the following views – (a) PHS band occupies 1895 – 1906 MHz. It overlaps with Block B spectrum in Government's current proposal. The interference from PHS band will definitely degrade the system capacity of Block B spectrum.		<u>Responses to SmarTone's comments</u> (a) Personal Handyphone Systems (PHS) are not widely used in Hong Kong and OFTA considers that the interference, if existing, would be very localized. OFTA recognized the minor differences between the four sets of frequencies for 3G services in terms of capacity and interference potential. However, whether and the extent to which this actually affects the operation of the 3G network must be assessed by each individual bidder having regard to its own business plan. A cash auction would be conducted for the successful bidders to determine the priority for choosing the specific set of frequencies.

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			It has also been proposed in the Radio Spectrum Advisory Committee under the auspices of OFTA that the PHS band should be vacated to make way for the 3G services in the long term as the band is currently under-utilised. A public consultation on a review of the frequency spectrum for Cordless Telecommunications Apparatus including PHS will be conducted in due course.
	(b) The Government proposes 400 KHz guard band between TDD and FDD uplink spectrum. This 400 KHz narrow guard band may not be enough to minimize the interference between TDD and FDD carriers. The capacity loss on the FDD uplink is potentially up to 11% in the worst case.		(b) The requirement for a guard band of 400 kHz is developed based on a widely accepted band plan (European Radiocommunications Committee (ERC) decision on the harmonised utilisation of spectrum for terrestrial UMTS (ERC/DEC/(99)25)). Potential interference between adjacent blocks of TDD and FDD operation could be avoided if TDD (Block A) and FDD (Block A) are allocated to the same operator so that it could be taken care of during system design. Such arrangement has been adopted in other countries including the United Kingdom,

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			Germany and Singapore.
	(c) Blocks A and B frequency spectrum cannot be 100% utilized due to the interference from PHS band or TDD interference. Compared to Blocks C and D, the spectral capacity of Blocks A and B will suffer more severe interference.		(c) OFTA agrees that the frequency blocks A, B, C and D may not be the same from the viewpoint of electromagnetic compatibility. However, whether and the extent to which this actually affects the operation of the 3G network must be assessed by each individual bidder having regard to its own business plan. A cash auction would be conducted for the successful bidders to determine the priority for choosing the specific set of frequencies. .
	(d) TA should consult the industry including major equipment vendors and mobile operators on the frequency band allocation before finalizing the designation.	TA is required by law to consult the telecommunications industry before exercising his power to designate frequency bands. The term "telecommunications industry" is defined to mean	(d) The proposed 3G spectrum allocation has been discussed at OFTA's IMT-2000 Focus Group which consisted of members from the mobile operators and equipment vendors. Such allocation has also been discussed at the Radio Spectrum Advisory Committee. Further, two industry consultations on 3G licensing,

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	.	"the industry comprising the persons who provide or supply telecommunications networks, systems, installations, customer equipment or services. Failure to comply with the statutory consultation requirement may render TA liable to legal challenge.	including spectrum allocation, have been conducted in March and October 2000 for collecting views from interested parties including the equipment vendors. We have met the statutory requirement on consultation under section 32I(1).

Annex

Frequency Bands for 3G

Draft Order		CSL Suggested	
UL (MHz)	**DL (MHz)**	**UL (MHz)**	**DL (MHz)**
1920.3-1935.1	2110.3-2125.1	1920.1-1934.9	2110.1-2124.9
1935.1-1949.9	2125.1-2139.9	1935.1-1949.9	2125.1-2139.9
1950.1-1964.9	2140.1-2154.9	1950.1-1964.9	2140.1-2154.9
1964.9-1979.7	2154.9-2169.7	1965.1-1979.9	2155.1-2169.9