通訊事務管理局辦公室
OFFICE OF THE COMMUNICATIONS AUTHORITY

Radio Spectrum and Technical Standards Advisory Committee
SSAC Paper 1/2026

Update on Radio Technologies for Intelligent Transport Systems (ITS) Operating in the 5850 - 5925 MHz Band

Office of the Communications Authority

13 January 2026

Purpose

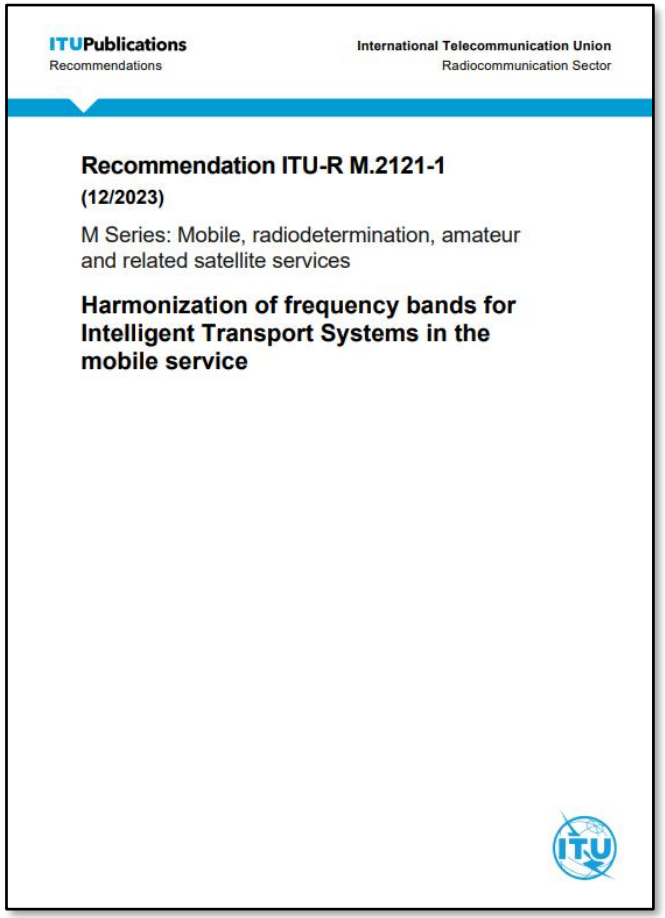
- At the 23rd SSAC meeting (Paper No. 7/2020[1]), we briefed Members on radio technologies and standards for ITS operating in the 5850 – 5925 MHz band ("5.9 GHz band")

- This paper aims to update Members on the latest development of ITS and the technical trials conducted by Hong Kong Applied Science and Technology Research Institute ("ASTRI") on Cellular Vehicle-to-Everything ("C-V2X") in Hong Kong

[1] SSAC Paper No. 7/2020 is available at: https://www.ofca.gov.hk/filemanager/ofca/en/content_751/SSAC_Paper_7_2020.pdf

Introduction of ITS

- According to ITU-R Recommendation M.2121-1[2] –
  - ITS applications may use the 5.9 GHz band, or parts thereof, which is allocated to mobile service
  - ITS applications aim to improve traffic management and assist safe driving but are NOT considered as safety services[3]


ITUPublications
Recommendations

International Telecommunication Union
Radiocommunication Sector

Recommendation ITU-R M.2121-1
(12/2023)

M Series: Mobile, radiodetermination, amateur and related satellite services

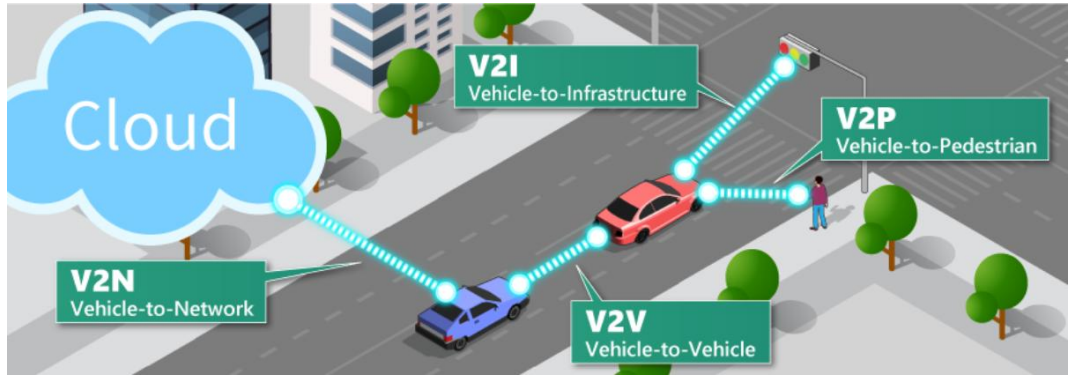
Harmonization of frequency bands for Intelligent Transport Systems in the mobile service

[2] ITU-R Recommendation M.2121-1 is available at: : https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.2121-1-202312-I!!PDF-E.pdf

[3] According to ITU Radio Regulations ("RR") No. **1.59**, safety service refers to any radiocommunication service used permanently or temporarily for the safeguarding of human life and property

Introduction of ITS (Cont'd)

- ITS utilises a combination of computers, communications apparatus, positioning and automation technologies



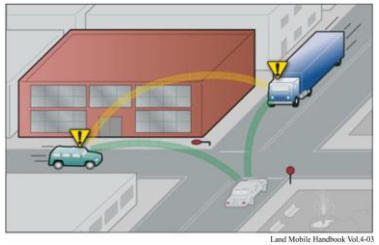
Source: Antrisu

Vehicle-to-Everything ("V2X") communications includes –

- Vehicle-to-Vehicle ("V2V")
- Vehicle-to-Pedestrian ("V2P")
- Vehicle-to-Infrastructure ("V2I")
- Vehicle-to-Network ("V2N")

- Typical ITS applications include –

Vehicle and Road Safety



Traffic Information Service

Autonomous Driving

Introduction of ITS (Cont'd)

- ITS involves deployment of Road-Side-Unit ("RSU") and On-Board-Unit ("OBU") in vehicles

- Radio technologies for ITS / V2X –

  - Dedicated Short-Range Communications ("DSRC")
    - Wi-Fi based (IEEE 802.11p since 2002)
    - Frequency band: 5850 – 5925 MHz

  - C-V2X
    - 3GPP based (Release-14 for LTE-V2X [4] and Release-16 for NR-V2X [5])
    - Frequency band: 5855 – 5925 MHz (band 47 / n47)

[4] 3GPP Release 14 is available at: https://www.3gpp.org/specifications-technologies/releases/release-14

[5] 3GPP Release 16 is available at: https://www.3gpp.org/specifications-technologies/releases/release-16

Frequency Allocation, Licensing Requirement & Technical Standards in Major Economies

Frequency Allocation for ITS in Major Economies

Economies	Band (MHz)	Bandwidth (MHz)	DSRC	C-V2X	Technology Neutral
ITU	5850 – 5925	75			✓
Chinese Mainland	**5905 – 5925**	**20**		✓	
Canada	5895 – 5925	30		✓	
Japan[6]			✓	✓	
US[7]			✗	✓	
Australia	5855 – 5925	70			✓
EU					✓
Singapore			✓	Trial[8]	

Reference: ITU-R Rec. M.2444-1 (09/2023) (https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2444-1-2023-PDF-E.pdf)

✓ **In use / Decided**

[6] In Japan, the 5770 – 5850 MHz band has been allocated for DSRC based ITS applications since 2001. The Ministry of Internal Affairs and Communications of Japan plans to allocate the 5895 – 5925 MHz band for trials on ITS with C-V2X and to assign frequencies in this band in 2026.
https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2024/pdf/000382186_20241213_1.pdf (see page 38)

[7] In November 2024, FCC published an Order mandating the transition from DSRC to C-V2X by December 2026
https://docs.fcc.gov/public/attachments/FCC-24-123A1.pdf
https://www.federalregister.gov/documents/2024/12/13/2024-28980/use-of-the-5850-5925-ghz-band

[8] In October 2019, a trial site on 5G C-V2X was set up by the industry with support from IMDA at the Singapore Science Park.
https://www.imda.gov.sg/-/media/imda/files/news-and-events/media-room/media-releases/06/5g-media-factsheet_sgpc.pdf

Technical Standards for Radio Equipment of ITS Operating in the 5.9 GHz Band

	European Union ("EU") (EN 302 571)	United States ("US") (FCC 24-123)	Chinese Mainland (《管理規定》)
Status	V2.1.1 published in Feb 2017[9]	Upon consultations conducted in 2020[10] and 2021[11], a decision was published in Nov 2024[12]	With effect from 1 Dec 2018[13][14]
Technology	Technology Neutral	C-V2X	C-V2X
Frequency Band	5855 – 5925 MHz	5895 – 5925 MHz	5905 – 5925 MHz
Maximum Output Power (EIRP)	RSU & OBU 33 dBm	RSU & OBU 33 dBm	RSU: 29 dBm OBU: 26 dBm
Channel Bandwidth	10 MHz	10 MHz, 20 MHz or 30 MHz	10 MHz or 20 MHz[14]

[9] https://www.etsi.org/deliver/etsi_en/302500_302599/302571/02.01.01_60/en_302571v020101p.pdf

[10] https://www.federalregister.gov/documents/2020/02/06/2020-02086/use-of-the-5850-5925-ghz-band

[11] https://www.federalregister.gov/documents/2021/05/03/2021-08801/use-of-the-5850-5925-ghz-band

[12] https://docs.fcc.gov/public/attachments/FCC-24-123A1.pdf

[13] 《車聯網（智能網聯汽車）直連通信使用5905-5925MHz頻段管理規定（暫行）》(「《管理規定》」)
https://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5442658.htm

[14] https://www.miit.gov.cn/jgsj/wgj/gzdt/art/2024/art_6994e7ba117f48efa518a135a0f4d439.html

Licensing Requirement for ITS in Major Economies

Economies	Technology	Licensing Requirements	
		RSU	OBU
Chinese Mainland	**C-V2X**	**Yes**	**No**
Australia	Neutral	Class Licence	Class Licence
Canada	C-V2X	Yes	No
EU	Neutral	No	No
Japan	DSRC, C-V2X	No	No
Singapore	DSRC	Yes	No
US	C-V2X	Yes	No

Latest Development of ITS in Major Economies

Latest Development – Mainland China

- In October 2018, the Ministry of Industry and Information Technology ("MIIT") announced[15] that, among others, –
  - the 5905 – 5925 MHz band (i.e. 20 MHz) would be used for C-V2X based ITS
- In December 2024, MIIT issued a notice [16] specifying that –
  - channel bandwidth of OBUs can be either 10 MHz (5905 – 5915 MHz) or 20 MHz (5905 – 5925 MHz)
  - channel bandwidth of RSUs can be either 10 MHz (5915 – 5925 MHz) or 20 MHz (5905 – 5925 MHz)

[15] 《車聯網（智能網聯汽車）直連通信使用5905-5925MHz頻段管理規定（暫行）》 https://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5442658.htm

[16] 工業與資訊化部國家標準化管理委員會關於印發《國家無線電辦公室關於進一步明確車聯網直連通信無線電發射設備有關技術要求的通知》的通知 (https://www.miit.gov.cn/jgsj/wgj/gzdt/art/2024/art_6994e7ba117f48efa518a135a0f4d439.html)

Latest Development – Australia

- Since January 2018, a Class Licence has been used to authorise the use of ITS equipment[17] –

  - operating in the 5855 – 5925 MHz band for road transport
  - covering both OBU and RSU
  - ITS equipment shall comply with EN 302 571
  - technology neutral (i.e. supporting both DSRC and C-V2X)

[17] ACMA's class licence for ITS is available at – https://www.acma.gov.au/licences/intelligent-transport-systems-class-licence

Latest Development – Canada

- In December 2022, Canada reallocated the 5.9 GHz band in a similar way to the US[18] –
  - 5850 – 5895 MHz for RLAN use
  - 5895 – 5925 MHz for ITS with a mandate to use C-V2X
    - OBUs are exempted from licensing
    - RSUs require a licence, which would be created through a further consultation
- In October 2023, Canada released a technical specification for C-V2X based OBUs[19] with reference to 3GPP Release 14

[18] https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/decision-technical-and-policy-framework-radio-local-area-networks-devices-5850-5895-mhz-band-and

[19] https://ised-isde.canada.ca/site/spectrum-management-telecommunications/sites/default/files/documents/2023-11/RSS-252-i2-eng.pdf

Latest Development – EU

- According to the Electronic Communications Committee's Decision (08)01[20] –
  - the 5855 – 5925 MHz band is allocated for safety related ITS
  - the principle of technology neutrality is upheld
  - both OBU and RSU are licence exempted
- In October 2023, the European Council adopted [21] a new framework to boost the rollout of ITS by revising the 2010 Directive aiming to –
  - take account of technological developments, such as connected and automated mobility
  - accelerate the availability and enhance the interoperability of digital data that feed services, such as multimodal journey planners and navigation services

[20] The latest edition (Nov 2022) of Electronic Communications Committee ("ECC") Decision (08)01 titled "The harmonised use of Safety-Related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band" is available at: https://docdb.cept.org/download/4232. According to the Decision, the 5925 – 5935 MHz band dedicated for use by urban railway systems only.

[21] https://www.consilium.europa.eu/en/press/press-releases/2023/10/23/council-adopts-new-framework-to-boost-the-roll-out-of-intelligent-transport-systems/

Latest Development – Japan

- In February 2023, Japan established a study group on next-generation ITS communications for cooperative automated driving[22]

- According to Japan's Frequency Reorganisation Action Plan released in December 2024, a maximum of 30 MHz in the 5895 – 5925 MHz band would be allocated for ITS (C-V2X or DSRC) by 2026[23]

- Currently, DSRC based ITS equipment is exempted from licensing for non-safety related ITS applications, such as electronic toll charging and car park management[24]

[22] https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2023/2/09_02.html

[23] https://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pressrelease/2024/pdf/000382186_20241213_1.pdf (see page 38)

[24] https://www.soumu.go.jp/main_content/000458674.pdf

Latest Development – Singapore

- In 2017, the Infocomm Media Development Authority decided to allocate the 5875 – 5925 MHz band for DSRC [25] based ITS applications where –

5855 – 5875 MHz	for shared use by short range devices and low power ITS equipment* on a licence-exempted basis
5875 – 5925 MHz	DSRC equipment^ for safety related ITS applications – ➢ OBU: exempted from licensing ➢ RSU: a licence is required ▪ Localised Radio-Communication Station Licence; or ▪ Wide Area Private Network Licence

* With a RF output power limit of 20 dBm EIRP
^ With a RF output power limit of 33 dBm EIRP and higher emission power may be approved on an exceptional basis

[25] https://www.imda.gov.sg/regulations-and-licences/regulations/consultations/consultation-papers/2017/proposed-regulatory-framework-and-standards-for-its

Latest Development – US

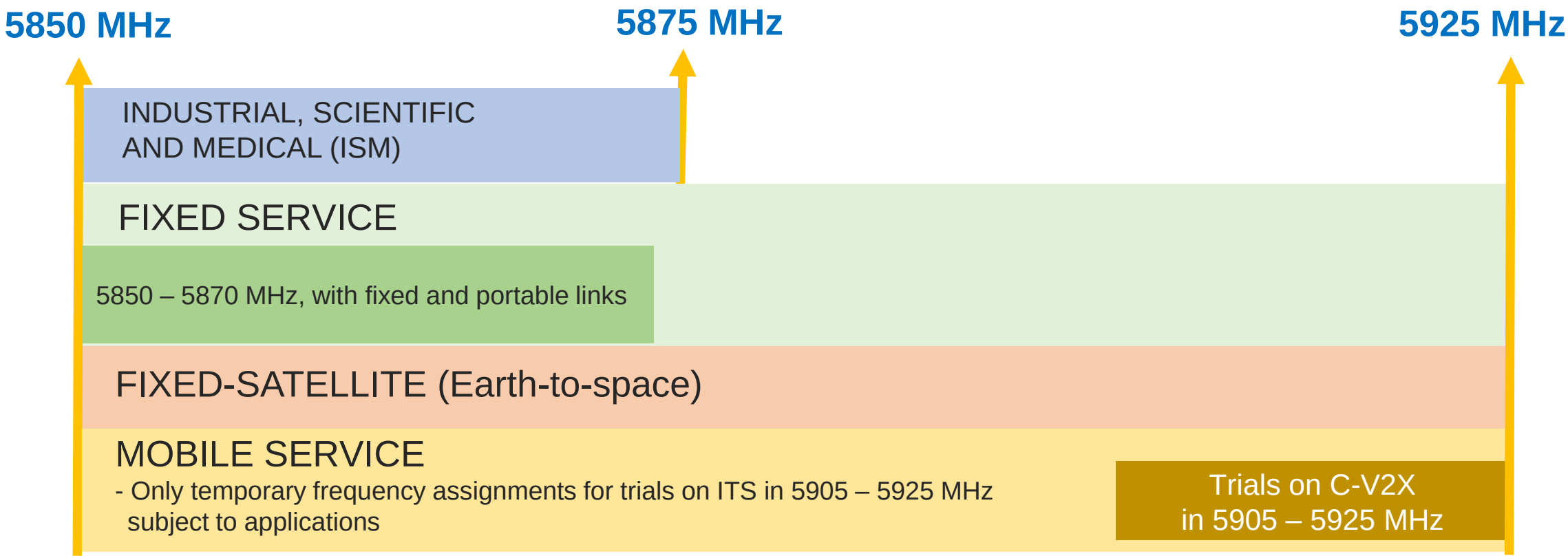
- The Federal Communications Commission in the US issued a Second Report and Order [26] updating its rules for ITS operations in the 5.9 GHz band. The Final Rule established a framework to complete the transition from DSRC-based technology to C-V2X-based technology in the upper 5.9 GHz band (viz. 5.895 – 5.925 GHz).

  - The Order established a two year period for the transition to C-V2X, beginning on 13 December, 2024
  - Within two years, all ITS operations must convert to C-V2X or cease
  - During the transition period, existing licenses for DSRC systems may be renewed as necessary, but only for a period not to exceed 14 December, 2026

[26] In December 2024, FCC published an Order mandating the transition from DSRC to C-V2X by December 2026 https://docs.fcc.gov/public/attachments/FCC-24-123A1.pdf

Situation in Hong Kong

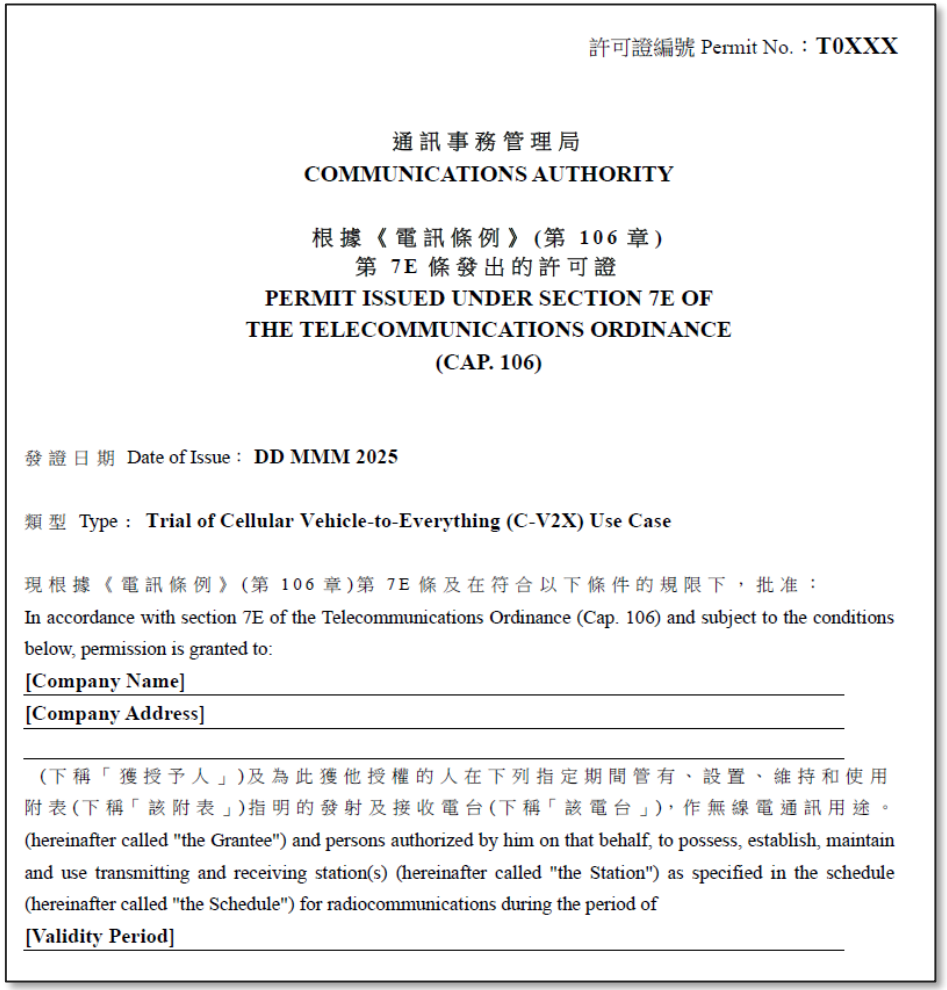
Frequency Allocations and Usage of the 5.9 GHz Band in Hong Kong



The 5850 – 5925 MHz ("5.9 GHz") band is NOT covered by the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106Z)

Trials of C-V2X in Hong Kong

- The Communications Authority (“CA”) issued permits under section 7E of the Telecommunications Ordinance (Cap. 106) for short-term assignment of spectrum in the 5.9 GHz band for conducting trials of C-V2X



許可證編號 Permit No.：**T0XXX**

通訊事務管理局
COMMUNICATIONS AUTHORITY

根據《電訊條例》(第 106 章)
第 7E 條發出的許可證
PERMIT ISSUED UNDER SECTION 7E OF THE TELECOMMUNICATIONS ORDINANCE (CAP. 106)

發證日期 Date of Issue： **DD MMM 2025**

類型 Type： **Trial of Cellular Vehicle-to-Everything (C-V2X) Use Case**

現根據《電訊條例》(第 106 章)第 7E 條及在符合以下條件的規限下，批准：
In accordance with section 7E of the Telecommunications Ordinance (Cap. 106) and subject to the conditions below, permission is granted to:

[Company Name]

[Company Address]

(下稱「獲授予人」)及為此獲他授權的人在下列指定期間管有、設置、維持和使用附表(下稱「該附表」)指明的發射及接收電台(下稱「該電台」)，作無線電通訊用途。
(hereinafter called "the Grantee") and persons authorized by him on that behalf, to possess, establish, maintain and use transmitting and receiving station(s) (hereinafter called "the Station") as specified in the schedule (hereinafter called "the Schedule") for radiocommunications during the period of

[Validity Period]

Way Forward

- OFCA will –

  - ➢ continue to liaise with TD with a view to facilitating the development of ITS in Hong Kong
  - ➢ keep monitoring the development of ITS and make preparations for the standards and licensing arrangement of ITS in Hong Kong

THANK YOU