Chapter 5: Overview of Major Developments in the Communications Market

Broadcasting

5.1 An Overview of the Developments in the Broadcasting Market

5.1.1 Number of Licensees and Channels

Television Programme Services

As at March 2017, the total number of free TV, pay TV and non-domestic TV licensees was 21. They provided 598 television channels[3], of which 465 were receivable in Hong Kong, representing an increase of 0.6% since March 2016. An overview of the channels provided by the television programme service licensees is shown in Figure 1.

As at March 2017, there were three **free TV licensees**, viz. Fantastic TV, HKTVE and TVB. HKTVE and TVB provided a total of 9 channels[4]. Two channels ("TVB Jade" and "TVB Pearl"[5]) were simulcast in both analogue and digital formats and five were digital channels. HKTVE's digital channels comprised two HDTV channels, viz. "ViuTV" and "ViuTVsix". TVB's digital channels comprised three HDTV channels, namely, "J2", "iNews" and "J5".

As at March 2017, there were three **pay TV licensees**, viz. HKCTV, PCCW Media Limited (PCCW Media) and TVB Network Vision Limited (TVBNV)[6], providing a total of 403 pay television channels and offering a diversity of local and overseas productions. There has been an increase of 21% in the total number of HDTV channels from 107 to 129 offered by the licensees within the same period.

As at March 2017, there were 15 **non-domestic TV licensees** providing a total of 186 television channels, 53 channels of which were available to Hong Kong viewers, representing an increase of 18% in the number of channels available to Hong Kong viewers since March 2016.

During the period under review, the number of **other licensable TV licensees** providing television programme services in hotels in Hong Kong decreased by one to 23. Together they provided services to 80 hotels.

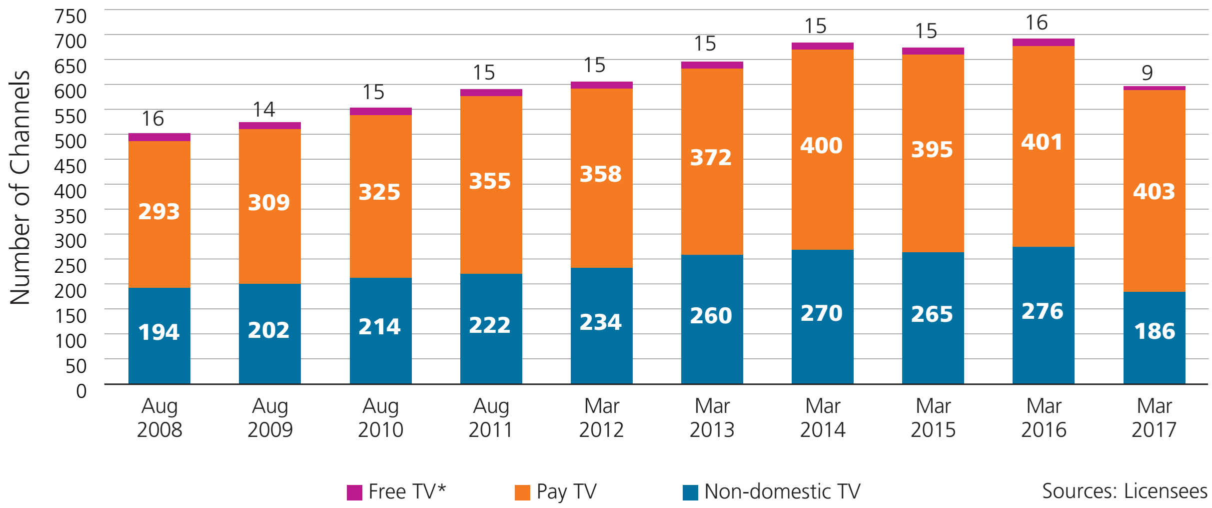
3 Some channels were provided by more than one licensee at the same time.

4 Fantastic TV officially launched the "Fantastic TV Chinese Channel" on 14 May 2017.

5 The digital simulcast of TVB "Jade" and "Pearl" channels is broadcast in HDTV format.

6 In January 2017, TVBNV applied for the approval of the CE in C for the termination of its pay TV licence. The CE in C approved the termination of TVBNV's pay TV licence with effect from 1 June 2017.

Figure 1: Television Channels Provided by Television Programme Service Licensees in Hong Kong (as at 31 March 2017)



* The simulcast channels of Asia Television Limited (2008-2016) and TVB (2008-2017) are counted for both the analogue and digital platforms.

In addition to the television channels provided by television programme service licensees, Hong Kong viewers can receive free unencrypted satellite television programme channels uplinked from Hong Kong and elsewhere. As at March 2017, there were more than 400 such free-to-air satellite television channels available for reception via the Satellite Master Antenna Television (SMATV) systems in Hong Kong. The list of channels currently available can be downloaded at http://www.ofca.gov.hk/filemanager/ofca/en/content_295/st_smatv.pdf.

Sound Broadcasting Services

During the period under review, the number of sound broadcasting licensees decreased by one[7] to two, namely, Hong Kong Commercial Broadcasting Company Limited (CRHK) and Metro Broadcast Corporation Limited (Metro). Radio Television Hong Kong (RTHK) is the public service broadcaster in Hong Kong.

7 The CE in C approved the termination of the sound broadcasting licences of Digital Broadcasting Corporation Hong Kong Limited and Metro for provision of digital audio broadcasting (DAB) services with effect from 15 October and 12 November 2016 respectively. After termination of its DAB licence, Metro continues to hold a sound broadcasting licence for provision of AM and FM services.

As at March 2017, there were 13 analogue radio channels (three by CRHK, three by Metro and seven by RTHK). On digital audio broadcasting (DAB) services, as at March 2017, RTHK provided a total of five DAB channels. All analogue and DAB channels provided by the commercial licensees and RTHK were broadcast round-the-clock. The CE in C decided on 28 March 2017 that DAB services should be discontinued in Hong Kong, and the DAB services provided by RTHK should be terminated within six months, or as soon as practicable thereafter[8].

5.1.2 Transmission Modes

Television

The regulatory regime for television programme services in Hong Kong as enshrined in the BO is technology-neutral[9]. Licensees are free to choose their transmission arrangements for delivery of television services. Broadcasters can build their own transmission networks to deliver their services and, in such cases, they need to apply for a carrier licence from the Authority to cover the transmission network. Alternatively, they can engage any of the existing carrier licensees to provide the transmission service. Licensees can also provide their television programme services via multiple transmission platforms so as to maximise the coverage.

The transmission modes employed by television programme service licensees are set out in Figure 2.

8 Pursuant to the CE in C's decision, the DAB service of RTHK was terminated on 4 September 2017.

9 An exception is that a service provided on the Internet is exempted from the regulatory regime under the BO.

Figure 2: Transmission Modes Employed by Television Programme Service Licensees

Licensee	Transmission Mode	Network Coverage as at March 2017
Free TV		
TVB	Terrestrial UHF[10], including (a) Analogue PAL-I format; and (b) Digital National Standard format	99% of population
HKTVE	(a) Fixed broadband network (from 31 March 2016) (b) Terrestrial UHF (from 2 April 2016)	(a) Around 98% of total households (b) 99% of population
Fantastic TV	HFC[11] and MMDS[12]	Around 93% of total households (as at May 2017)
Pay TV		
HKCTV	HFC, MMDS and satellite (Digital)	Around 96% of total households
PCCW Media	PON and DSL[13] Broadband network (Digital)	Around 98% of total households
TVBNV	HFC, satellite and broadband network (Digital)	Around 98% of total households
Non-domestic TV		
All the 15 licensees	Satellite (Digital)	35% of total households (889 896 households)

10 Terrestrial Ultra High Frequency.

11 Hybrid Fibre Coaxial Cable.

12 Microwave Multipoint Distribution System.

13 Passive Optical Network and Digital Subscriber Line.

Penetration of Different Broadcasting Services

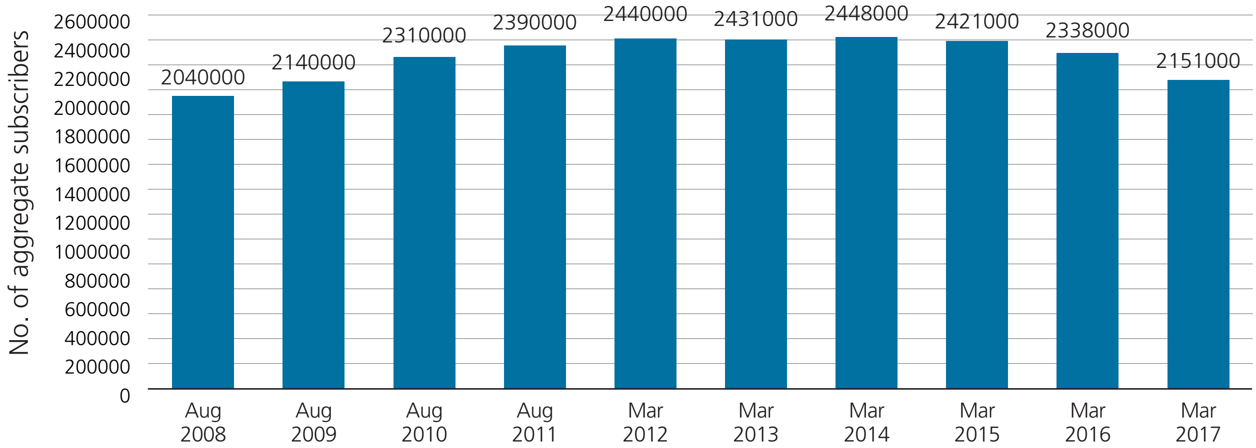
For free TV services, the penetration rate of analogue broadcasting stood at about 99% of the total households as at end of March 2017. As regards digital terrestrial television (DTT) services, the take-up rate was close to 85% of all the households in December 2015[14].

The penetration of licensed pay TV services was over 85%[15] of the total households as at end of March 2017. The total number of subscribers to licensed pay TV services stood at over 2 100 000 in March 2017[16]. The changes in total number of subscribers from 2008 to 2017 are shown in Figure 3.

Sound Broadcasting

During the period under review, the analogue radio broadcasters provided their services in FM and AM modes. Seven FM programme channels were provided through seven hilltop sites and supplemented by two low-power FM gap-fillers. In addition, six AM programme channels were broadcast from two island and hilltop sites, supplemented by six low-power AM/FM gap-fillers to improve the AM programme services. The services practically covered the whole territory of Hong Kong.

Figure 3: Subscribers to Licensed Pay TV Services in Hong Kong



Sources: Licensees

14 According to a public survey conducted in December 2015, close to 85% of the households in Hong Kong were receiving DTT services.

15 Penetration of licensed pay TV services is calculated by dividing the total number of subscribers to licensed pay TV services by the total number of households. Some subscribers were counted more than once if they subscribed to more than one pay TV service.

16 Some subscribers were counted more than once if they subscribed to more than one service.

5.1.3 Broadcasting Revenues and Investment

Licensed broadcasting services contributed an estimated $6.86 billion[17] to the Hong Kong economy, which represented about 0.27% of the gross domestic product in 2016. There are two main sources of revenues for the provision of broadcasting services, viz. advertising and subscription. The incomes of free TV licensees and sound broadcasting licensees mainly come from sales of advertising spots within programme breaks. Pay TV licensees, on the other hand, derive their incomes mainly from subscription fees while sales of advertising spots remain a secondary income source.

Advertising Revenue

According to the report of AdmanGo Limited, the advertising expenditures on television and radio accounted for 30% (about $11.94 billion) and 4% (about $1.59 billion) respectively of the accumulated $39.8 billion advertising expenditures in the media in 2016[18].

In 2016, the actual advertising revenues of HKTVE and TVB were around $160 million and $2.62 billion[19] respectively. The actual advertising revenues of other licensees were not publicly available.

Subscription Revenue

According to the annual report of i-CABLE, the parent company of HKCTV, HKCTV's turnover (including mainly subscription revenue and also some advertising revenue) was $1.04 billion in 2016, representing a decrease of 8% over the figure in 2015. The decrease was mainly due to lower subscription and advertising revenue.

According to the annual report of PCCW Limited (PCCW), the holding company of PCCW Media, the turnover of its pay TV service and related services provided in Hong Kong under the "now" brand was $2.9 billion in 2016, representing a decrease of 1% over the figure in 2015.

The subscription revenue of TVBNV is not publicly available.

17 Source: Company reports of major broadcasting licensees.

18 Source: Adspend Report for 2016 of AdmanGo Limited. All the advertising expenditures presented in the report have taken into consideration the discount factor based on an assumption of 60% off rate card rate.

19 According to TVB's annual report 2016, the turnover from the Hong Kong television broadcasting business segment was $2,620 million, which comprised advertising revenue from the Group's free and pay television channels.

Investment in Broadcasting Industry

Key investment projects in the television industry in recent years include digitisation of the terrestrial broadcasting network, HDTV content and production technology, interactive television services, and regular network maintenance and upgrades that are required to maintain or expand the ever-advancing scope of services. In addition, with the increasingly competitive television industry, the exclusive rights to broadcast premium contents such as sports events have been a major attraction to viewers.

Fantastic TV, HKTVE and TVB have committed to investing a total of $1.2 billion for the six-year period from 2016 to 2022, $1.5 billion for the six-year period from 2015 to 2021 and $6.3 billion for the six-year period from 2016 to 2021 respectively for the provision of free TV services. Investment commitments of Fantastic TV, HKTVE and TVB comprise capital expenditures and programming expenditures. As at March 2017, HKTVE and TVB provided a total of 168 and 801 hours of HDTV programmes per week respectively. TVB has also committed to increasing the amount of independent local productions in its programming progressively[20].

As regards the pay TV market[21], i-CABLE, the parent company of HKCTV, reported in its 2016 Final Results Announcement that the capital expenditure of the group for the year had increased from $207 million in 2015 to $238 million in 2016. Its major items of investment included network equipment, television production and broadcast facilities as well as the new FANhub set-top-box. According to the 2016 Annual Results of PCCW, the parent company of PCCW Media, the capital expenditure for the year on its media business was $192 million, representing a decrease of 18% over the figure in the previous year. Its major items of investment included the upgrading of broadcasting equipment.

CRHK and Metro have committed to investing a total of $909 million and $685 million respectively for the six-year period from 2016 to 2022 for the provision of analogue sound broadcasting services. The investment commitment of CRHK and Metro covers programming improvement and upgrading of infrastructure and facilities and other developments brought by technological advancement to further enhance their service quality.

20 TVB has agreed to provide on its free TV service independent local productions on an incremental basis from 20 hours per year in 2016 to 60 hours per year by 2020.

21 As for TVBNV, with the termination of its pay TV licence with effect from 1 June 2017, it was not required to complete the six-year investment plan which would end in 2019.

5.1.4 Programme Variety and Positive Programme Requirements

(a) Programme Variety and Diversity

Number of Broadcast Hours and Hours of Station Productions

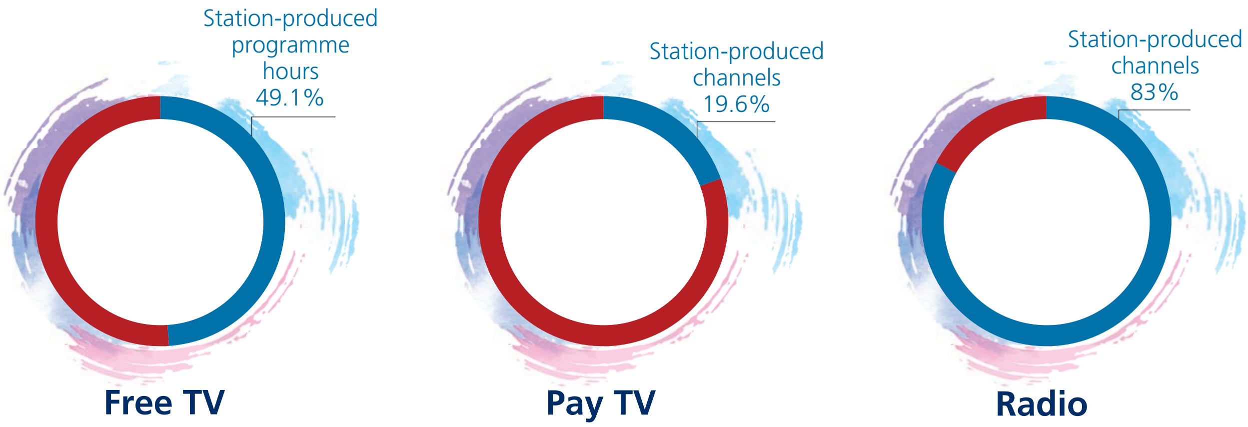
As at March 2017, the licensees broadcast about 70 137 hours of television programmes a week. Among them, the two analogue channels of TVB provided a total of 335 broadcast hours per week, the seven digital channels of HKTVE and TVB provided a total of 1 124 broadcast hours per week, while the 403 channels of the three pay TV licensees provided a total of 59 774 broadcast hours per week. As at March 2017, the 53 channels of non-domestic TV licensees receivable in Hong Kong provided a total of 8 904 broadcast hours per week.

The weekly number of broadcast hours for analogue and DAB sound broadcasting services as at March 2017 was 3 024. The 13 analogue channels of sound broadcasting operators provided a total of 2 184 broadcast hours per week while the five digital channels provided a total of 840 broadcast hours per week.

For the period under review, there were a total of 36 400 hours of station productions broadcast on HKTVE and TVB, of which 9 460 hours were on analogue channels and 26 940 on digital channels. Of the 403 channels provided by pay TV licensees, 79 channels (19.6%) were produced by the licensees themselves.

As for sound broadcasting services, with the exception of RTHK's relay of BBC World Service on Radio 6 and its digital radio services and programmes of "China National Radio" on its digital radio services, the other 12 analogue radio channels and three digital radio channels (83% of all relevant channels) were mainly produced by the broadcasters themselves.

Figure 4: Proportion of Station Production in March 2017



Source: Licensees

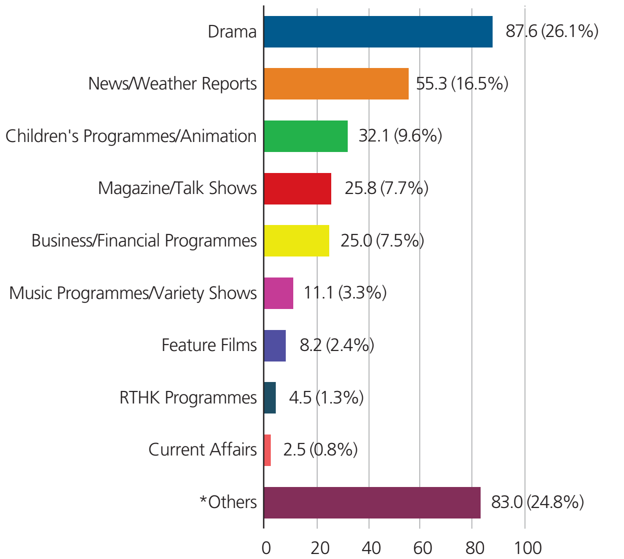
Free TV Services

Chinese and English Channels

During the period under review, drama series and news/weather reports were the dominating programme genres during prime time on the Chinese channels (viz. "TVB Jade" and "ViuTV"). Drama series on "TVB Jade" were mostly in-house productions; while both "TVB Jade" and "ViuTV" broadcast Mainland, Korean and Japanese drama series. In addition, children's programmes/animation, magazine/talk shows, business/financial programmes, music programmes/variety shows and feature films, etc. were also broadcast during prime time on the Chinese channels.

The English channels (viz. "TVB Pearl" and "ViuTVsix") broadcast a wide range of programmes, including business/financial programmes, news/weather reports, children's programmes/animation, imported popular drama series, sports programmes, music programmes/variety shows, documentaries, feature films, education/enrichment and current affairs programmes.

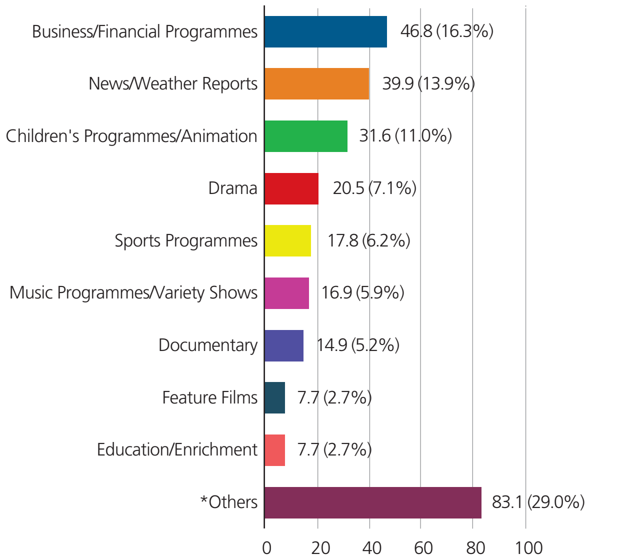
Figure 5: Weekly Hours of Different Programme Types Broadcast on TVB Jade and ViuTV as at March 2017



Weekly Total: **335.1 Hours**
Sources : HKTVE & TVB

* Other programmes include horse-racing, documentary and cooking programmes

Figure 6: Weekly Hours of Different Programme Types Broadcast on TVB Pearl and ViuTVsix[22] as at March 2017



Weekly Total: **286.8 Hours**
Sources : HKTVE & TVB

* Other programmes include current affairs programmes, arts & culture programmes, travelogues etc.

22 As HKTVE started to provide its English channel, ViuTVsix, on 31 March 2017, the sample week selected covered the period from 31 March 2017 to 6 April 2017.

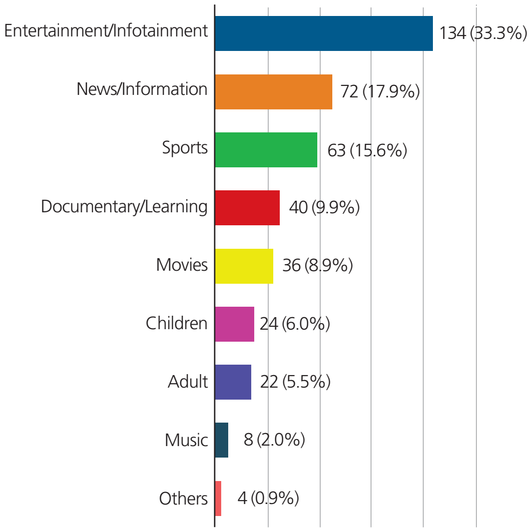
Thematic Channels

TVB provided acquired dramas, documentaries, variety shows, news, finance information programmes, etc. via "J2", "iNews" and "J5".

Pay TV Services

During the period under review, a wide variety of channels were offered on pay TV services, including entertainment/infotainment channels (33.3%), news/information channels (17.9%), sports channels (15.6%), documentary/learning channels (9.9%), and movie channels (8.9%).

Figure 7: Nature of Pay TV Channels as at March 2017



Total channels: **403**
Sources: Licensees

As at March 2017, HKCTV offered a basic package consisting of 70 basic channels and 48 other premium channels (including 27 HDTV channels). PCCW Media's "now TV" service offered 182 channels (including 80 HDTV channels) and 57 video-on-demand services, while TVBNV's service comprised 46 channels (including 22 HDTV channels), of which 16 were also carried on PCCW Media's platform.

Sound Broadcasting

Analogue Channels

As at March 2017, CRHK operated two FM Cantonese language services, viz. "CR1" and "CR2", and one AM English language service, "AM 864". "CR1" provided mainly news, current affairs, financial and personal view programmes. "CR2" was mainly an entertainment channel featuring pop culture and music targeting young listeners. "AM864" was primarily a music channel.

Metro operated two FM Cantonese language services, viz. "Metro Finance" and "Metro Info", and one AM English language service, viz. "Metro Plus". "Metro Finance" provided real-time, market-moving news and information about financial markets around the world. "Metro Info" provided music and entertainment programmes as well as programmes on lifestyle, health, market news and other information of interest to the public. "Metro Plus" was a music channel which also provided programmes for ethnic groups including the Filipino, Indian, Indonesian, Pakistani and Thai communities in Hong Kong.

RTHK operated seven radio channels, providing Cantonese, English and Putonghua services. It offered a variety of thematic channels ranging from information to general entertainment and culture.

Digital Channels

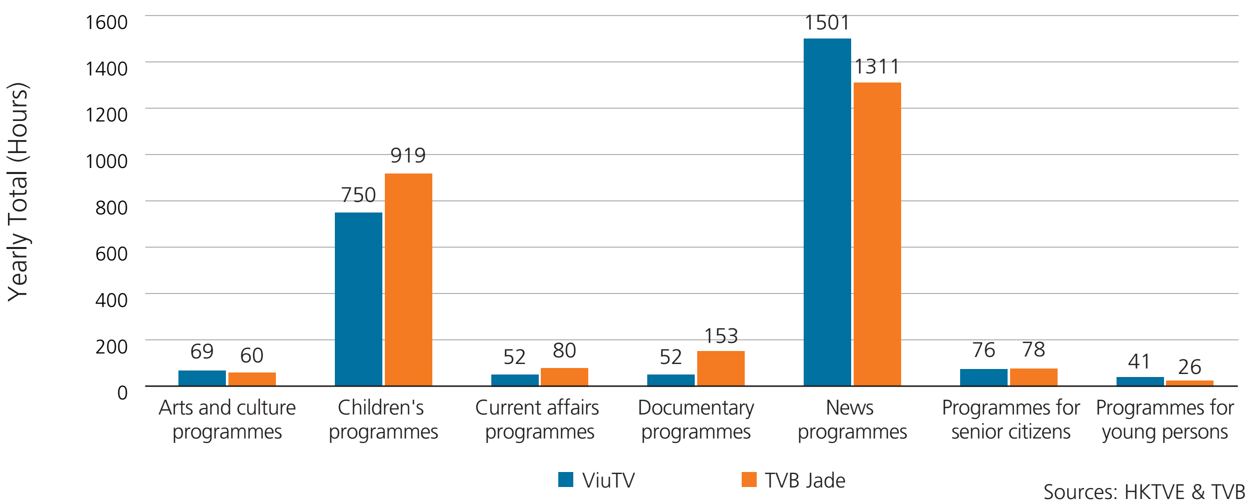
As at end March 2017, RTHK operated five channels, four of which principally simulcast AM channels and the remaining one was a dedicated channel produced by "China National Radio" for RTHK.

(b) Positive Programme Requirements

During the period under review, free TV licensees were required to broadcast at least 34.5 hours of positive programmes[23] per week. Both HKTVE and TVB met the requirements[24].

The reports submitted by the licensees to the Authority on six types of positive programmes, viz. current affairs programmes, documentary, children's programmes, programmes for young persons, programmes for senior citizens and arts and culture programmes, are available at http://www.ofca.gov.hk/en/pub_report/compliance_reports/index.html.

Figure 8: Broadcast of Positive Programmes on Cantonese Channels of HKTVE and TVB as at March 2017



Sources: HKTVE & TVB

23 The positive programmes that HKTVE and TVB were required to broadcast included news, current affairs programmes, documentary, arts and culture programmes, children's programmes and programmes for senior citizens and young persons.

24 TVB was required to broadcast at least 45.5 hours of positive programmes per week, including an additional 4 hours on its thematic digital channels (viz "J2", "J5" and "iNews").

To provide more flexibility for new free TV licensees, HKTVE was allowed to gradually increase the broadcast of positive programmes from 34.5 hours per week in 2016 to 41.5 hours per week by 2019.

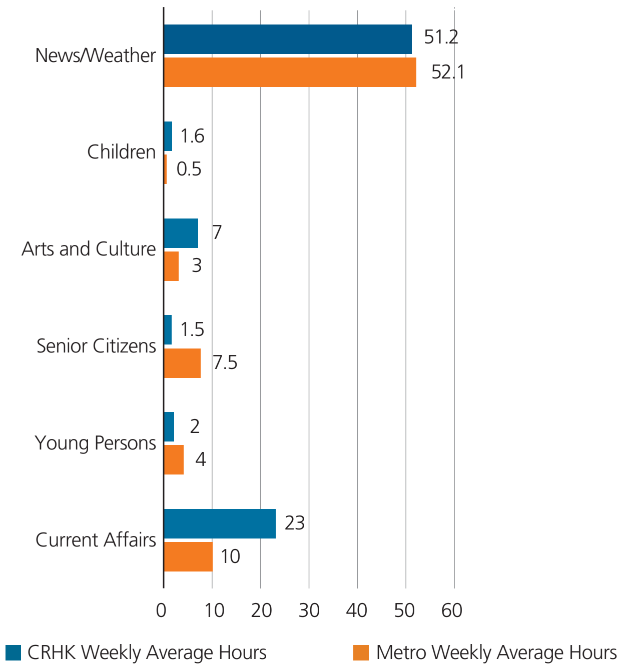
Free TV licensees were required to provide Chinese subtitles for all news, current affairs programmes, weather reports and emergency announcements as well as programmes broadcast during prime time (7:00 p.m. to 11:00 p.m.) on Chinese channels, and English subtitles for all news, current affairs programmes, weather programmes, emergency announcements and educational programmes for teenagers (two hours per week) on English channels[25]. The licensees were also required to provide Chinese subtitling for all drama programmes on Chinese channels and English subtitling for all programmes broadcast on English channels between 8:00 p.m. and 11:30 p.m. Overall, both HKTVE[26] and TVB complied with the requirements on provision of subtitles.

Pursuant to licence requirements, HKTVE and TVB were required to broadcast one minute of Announcements in Public Interest (APIs) in each hour for each channel. Also, they are required to broadcast, on a weekly basis, not more than five minutes in aggregate of publicity material for the Authority for each of the Chinese and English channels[27]. During the period under review, HKTVE and TVB broadcast a total of 1 205 hours of the two types of materials.

As regards sound broadcasting services, analogue sound broadcasting licensees were required to broadcast at least 28.5 hours of positive programmes[28] per week. CRHK and Metro reported that they had complied with the licence conditions on broadcast of positive programmes.

All sound broadcasting licensees were required to broadcast one minute of APIs in each hour and not more than five minutes of publicity material for the Authority each week in each service channel. All licensees reported that they had complied with the requirements.

Figure 9: Broadcast of Positive Programmes on Sound Broadcasting Services as at March 2017



25 TVB is required to provide, on thematic digital channels, Chinese subtitles for all news, current affairs programmes, weather reports and emergency announcements as well as programmes broadcast during prime time.

26 To provide more flexibility for new free TV licensees, HKTVE was allowed to step up the subtitling service incrementally from 2016 to 2019.

27 TVB is required to broadcast two minutes of publicity material for the Authority on other thematic channels per week.

28 The positive programmes that CRHK and Metro were required to broadcast included news and weather programmes, current affairs programmes, art and culture programmes and advisory programmes, viz. programmes for young persons, senior citizens and children.

5.1.5 Hong Kong as a Regional Broadcasting Hub

Hong Kong is a broadcasting hub in the Asia-Pacific region with 15 non-domestic TV licensees operating in and broadcasting from Hong Kong. Altogether they offered a total of 186 satellite television channels serving over 300 million viewers in the Asia-Pacific region, Europe and Africa, of which 53 channels were receivable in Hong Kong. A summary of non-domestic TV services as at March 2017 is at **Annex 1**.

Telecommunications

5.2 An Overview of the Telecommunications Market

Hong Kong has one of the most sophisticated and successful telecommunications market in the world. This has been an important factor in Hong Kong's development as a leading business and financial centre. In 2016, the gross output of the telecommunications sector amounted to $91 billion and it employed around 20 100 persons.

All sectors of Hong Kong's telecommunications market have been liberalised with no foreign ownership restrictions. The Authority's objectives are to maintain a level playing field in the open and competitive telecommunications market and ensure that consumers get the best services available in terms of capacity, quality and price.

5.2.1 The Telecommunications Regulatory Regime

Carrier Licences

The Authority issues carrier licences to facility-based operators, authorising them to establish and maintain telecommunications networks and facilities which may cross unleased Government land and public streets, for the provision of public telecommunications services.

The unified carrier licensing regime has been implemented since 1 August 2008 as the single licensing vehicle for the provision of facility-based fixed, mobile and/or converged telecommunications services in Hong Kong.

A Unified Carrier Licence (UCL) for the provision of local fixed service authorises the licensee to establish and maintain fixed network, wireline-based or wireless-based or a combination of both where applicable, to provide local telecommunications services between fixed points within Hong Kong. A UCL for the provision of external fixed service authorises the licensee to provide external facilities as well as external services operated over external facilities. A UCL for the provision of mobile service enables the licensee to provide two-way communications between moving locations or between a moving location and a fixed location in Hong Kong. The issue of new UCL for the provision of mobile service is subject to the availability of radio spectrum for assignment. An operator may apply for a single UCL to provide all the above services.

Fixed Carrier Licences (FCLs) and Mobile Carrier Licences (MCLs) which were issued before the introduction of the UCL remain valid until their expiry dates. The holders of FCL and MCL may apply to the Authority for UCL to replace their licences before or upon expiry.

As at March 2017, there were a total of 61 carrier licensees, providing local fixed services, cable-based external fixed services, non cable-based external fixed services and/or mobile services.

Public Radiocommunications Service Licences

Services which may be authorised under the Public Radiocommunications Service (PRS) Licence include radio paging, community repeater (trunked radio) services, vehicle location information services, one-way data message services and public mobile radio data services.

As the provision of radiocommunications services requires the assignment of suitable operating frequencies, PRS Licences are granted only when the required radio spectrum is available.

As at March 2017, there were a total of nine PRS licensees.

Services-based Operator Licences

Services-based Operators (SBO) make use of the networks and facilities of other licensed facility-based operators for the provision of public telecommunications services, but they are not authorised to establish or maintain any telecommunications means which cross public streets or unleased Government lands.

SBO licence covers three types of services, namely, Class 1 and Class 2 local voice telephony services, and Class 3 services which may include external telecommunications service, Internet access service, international value-added network service, mobile virtual network operator service, private payphone service, public radio communications relay service, security and fire alarm signals transmission service, teleconferencing service and mobile communications service on board an aircraft.

As at March 2017, there were a total of 525 SBO licensees.

Class Licences

The class licensing regime does not require any licence application. Parties meeting the specified eligibility criteria and conditions would automatically become the class licensees, and are required to comply with the conditions set out in the relevant Class Licence as well as the TO. Currently there are nine types of Class Licences:

- Class Licence for 79 GHz Automotive Radar
- Class Licence for 60 GHz Device
- Class Licence for Citizens Band Radio Station
- Class Licence for In-building Telecommunications Systems
- Class Licence for Medical Implant Communication System Device
- Class Licence for Short Range Device
- Class Licence for Taxi Mobile Station
- Class Licence for Offer of Telecommunications Services
- Class Licence for Provision of Public Wireless Local Area Network Services

Other Licences

Apart from the licences mentioned above, there are a number of miscellaneous licences under the purview of the Authority.

A breakdown of the types and numbers of all telecommunications licences are at **Annex 2**.

5.2.2 Developments in the Telecommunications Market and Technology Trends

Mobile Communications Services

Competition in public mobile services is keen. As at March 2017, four mobile network operators, namely, China Mobile Hong Kong Company Limited (CMHK), Hong Kong Telecommunications (HKT) Limited (HKT), Hutchison Telephone Company Limited (HTCL) and SmarTone Mobile Communications Limited (SmarTone), were providing a wide range of public mobile services. The availability of mobile number portability since March 1999 has contributed to promoting effective competition among the mobile network operators as it enables customers to retain their telephone numbers when they switch to another mobile network operator.

The four mobile network operators provide second generation (2G), 3G and 4G services in Hong Kong at very affordable prices. As at March 2017, there were about 17.58 million subscribers to mobile communications services. This represents a population penetration of 238.4%, one of the highest in the world. The number of 3G/4G users reached 15.99 million in March 2017, representing a population penetration of 216.8%. Through spectrum refarming, more spectrum is now used for provision of 4G services with a downlink speed up to 600 Mbps.

With the increasing popularity of smart phones, particularly 4G mobile handsets which were readily available in the market, the monthly mobile data usage surged to 25 348 Terabytes in March 2017, representing 1.2 times and 1.5 times the monthly usage over the same period in 2016 and 2015 respectively. On average, each mobile user used 1 563 Megabytes per month, compared with 1 358 Megabytes in March 2016 and 1 327 Megabytes in March 2015. The continued development of 4G mobile services is expected to further boost the mobile data usage in the future.

Figure 10: Number of Mobile Subscribers (2007 to 2016)

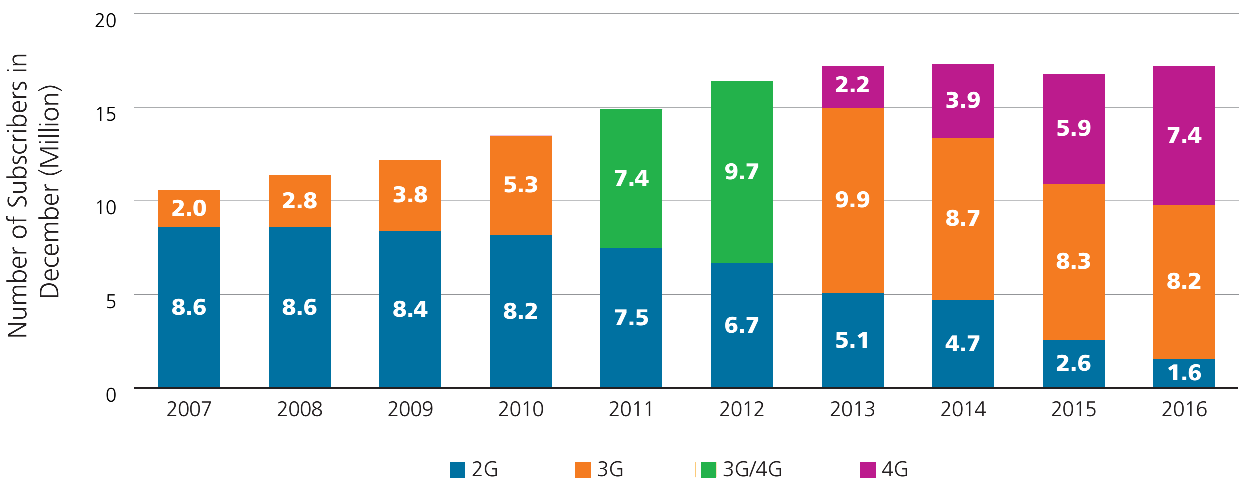


Figure 11: Mobile Customers using Postpaid and Prepaid SIM (2007 to 2016)

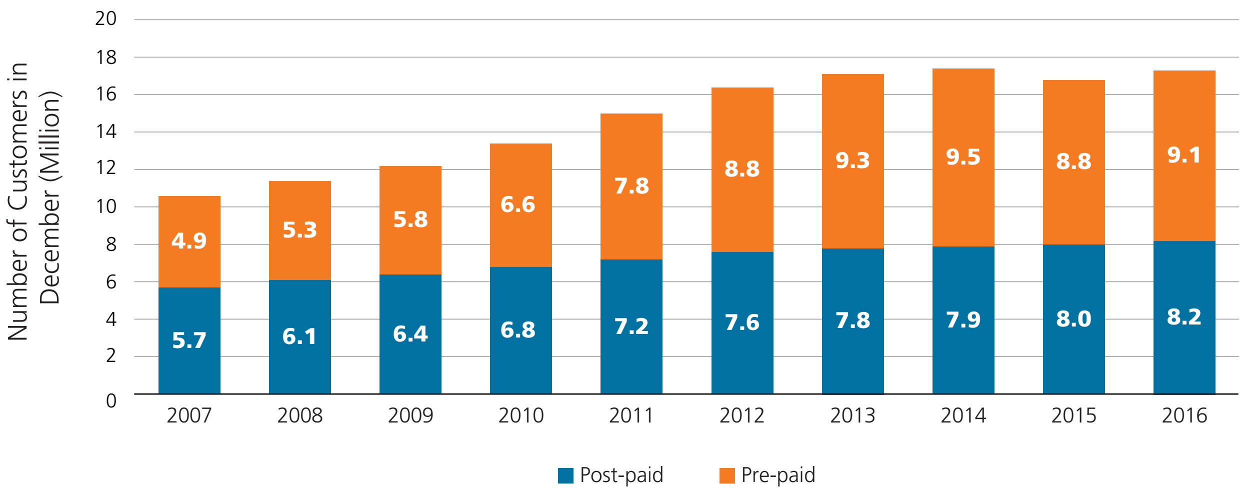
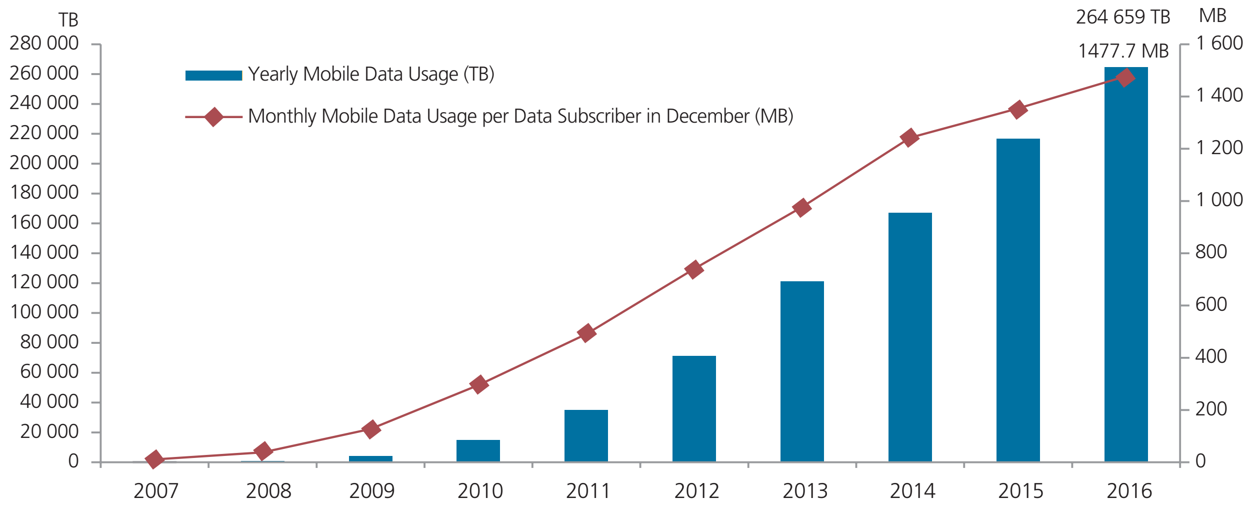


Figure 12: Mobile Data Usage (2007 to 2016)



Fixed Communications Services

The local fixed communications services market has been fully liberalised since 2003. There is no preset limit on the number of licences to be issued for fixed services, or any deadline for the submission of licence applications. Furthermore, there is no specific requirement on network roll-out and investment and licensees may provide their services according to their proposals.

As at March 2017, there were 26 local fixed carriers, providing around 94 fixed lines per 100 households, one of the highest in the world. They were, in alphabetical order:

- 21 ViaNet Group Limited
- China Mobile Hong Kong Company Limited
- China Telecom Global Limited
- China Unicom (Hong Kong) Operations Limited
- ComNet Telecom (HK) Limited
- Equinix Hong Kong Limited
- HKC Network Limited
- Hong Kong Broadband Network Limited
- Hong Kong Cable Television Limited
- Hong Kong Telecommunications (HKT) Limited
- Hutchison Global Communications Limited
- HKBN Enterprise Solutions Limited
- NTT Com Asia Limited
- PCCW Global (HK) Limited
- PCCW-HKT Telephone Limited and Hong Kong Telecommunications (HKT) Limited
- Reach Networks Hong Kong Limited and Reach Cable Networks Limited
- SmarTone Communications Limited
- Superloop (Hong Kong) Limited
- Telstra International HK Limited and Telstra International Limited
- Towngas Telecommunications Fixed Network Limited
- TraxComm Limited
- TVB Network Vision Limited
- Verizon Hong Kong Limited
- Village Telephone Limited
- Vodafone Enterprise Global Network HK Limited
- Wharf T&T Limited

As a result of the active network roll-out by fixed carriers and the former TA's initiative to encourage further network roll-out by the withdrawal of mandatory Type II interconnection policy in mid-2008, 88.4% and 79% of households were able to enjoy a choice of at least two and three self-built customer access networks respectively as at March 2017. It is expected that the figures will keep growing as the carriers continue to roll out their networks.

Local fixed carriers are required to facilitate fixed number portability which enables consumers to switch to another fixed carrier without having to change their telephone numbers.

Fixed Broadband Services

As at March 2017, 26 facility-based operators and 197 SBOs were authorised to provide broadband Internet access services in Hong Kong. With the continuous network roll-out of facility-based operators, the Hong Kong community is able to enjoy the nearly ubiquitous coverage of broadband networks through the deployment of various technologies including asymmetric digital subscriber line, hybrid fibre coaxial cable, fibre-to-the-building, fibre-to-the-home, etc. Broadband access to various applications and content services has become an integral part of the life of people in Hong Kong. As at March 2017, there were around 2.6 million residential and commercial fixed broadband subscribers, with a household penetration rate of 93%. Broadband services are available at speeds up to 10 gigabit per second (Gbps). Around 82% of the broadband subscribers are using service plans with speeds at 10Mbps or above. The statistics of fixed broadband subscribers as at March 2017 and the statistics for the past 10 years are shown in Figure 13 and Figure 14 respectively.

Figure 13: Statistics of Fixed Broadband Subscribers as at March 2017

	No. of subscribers	% share
Total No. of broadband subscribers	2 626 028	
Broadband speed of 10Mbps or above	2 150 594	81.9%
Broadband speed below 10Mbps	475 434	18.1%
Residential	2 346 036	89.3%
Commercial	279 992	10.7%

Figure 14: Fixed Broadband Subscribers (2007 to 2016)

Next Generation Networks

Traditional telecommunications networks are built based on circuit-switched technologies and are primarily designed for the conveyance and provision of dedicated telecommunications services. With the advent of new technologies, it is now possible to build a single network for the conveyance and provision of a variety of services, including fixed voice telephony service, data service, mobile service and television service. Such new networks, commonly referred to as next generation networks (NGNs), serve as an open platform through which service providers are able to develop innovative services and applications, and establish direct relationship with their customers.

In Hong Kong, the development of NGNs has always been driven by technical and commercial considerations of carriers. The major network operators have already launched their NGNs. With the advent of NGN, the Authority will remain vigilant about the challenges to be brought about by NGN and ensure that the regulatory framework remains updated and appropriate in the NGN era. After the completion of a consultancy study commissioned to examine the implication of NGN development on the regulatory framework in Hong Kong, OFCA reconvened the NGN working group between 2012 and 2016 to follow up on the relevant recommendations made by the consultant and other issues pertaining to the development of NGN in Hong Kong. With the support of the Telecommunications Regulatory Affairs Advisory Committee in 2016, a new technical regulatory working group has been established to study the various technical regulatory issues related to telecommunications networks, systems and services in Hong Kong. The NGN working group has ceased operation with its work subsumed under the new technical regulatory working group. OFCA will continue working closely with the industry to address various technical regulatory issues including NGN issues to facilitate the efficient development and deployment of new telecommunications services and technologies in Hong Kong.

Public Wi-Fi Services

Operators have been actively rolling out Wi-Fi networks. Six network operators and 55 class licensees are providing public Wi-Fi services. As at March 2017, there were 44 218 public Wi-Fi hotspots in the city and the number continued to grow. Free Wi-Fi services were available to the public in 599 government premises.

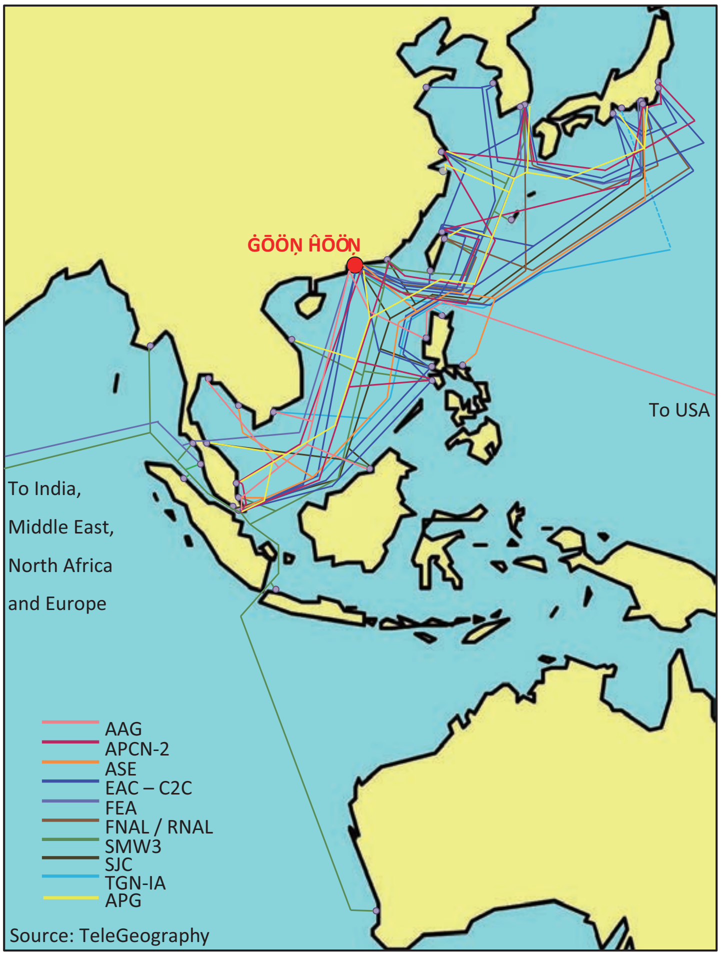
External Telecommunications Services

The external telecommunications facilities market has been fully liberalised since 2000. As at March 2017, 43 fixed carriers were authorised to provide cable-based and/or non-cable-based external telecommunications facilities.

As at March 2017, Hong Kong had a total of eight cable landing stations: two in Tong Fuk, three in Tseung Kwan O and one each in Deep Water Bay, Chung Hom Kok and Cape D'Aguilar, making it a major telecommunications and Internet hub in the region.

In March 2017, Hong Kong was connected to 10 regional and trans-Pacific submarine cable systems. They are Asia-America Gateway Cable System (AAG), Asia Pacific Cable Network 2 (APCN-2), Asia Pacific Gateway (APG), Asia Submarine-Cable Express (ASE), EAC-C2C, FLAG Europe Asia (FEA), FLAG North Asia Loop (FNAL)/REACH North Asia Loop (RNAL), Sea-Me-We 3 (SMW3), South-East Asia Japan Cable System (SJC) and TGN-Intra Asia Cable System (TGN-IA). As at March 2017, the total equipped external capacity exceeded 49 320 Gbps. Total external telephone traffic was 5.1 billion minutes for the period from 1 April 2016 to 31 March 2017. Landing of three additional submarine cable systems are in the pipeline and they are expected to be ready for service in late 2017, 2018 and 2020 respectively.

Figure 15: Submarine Cables between Hong Kong and Other Countries



Source: TeleGeography

Satellite Services

Hong Kong adopts an open sky policy in regulating the provision of satellite services. Satellite-based telecommunications and television broadcasting services are provided via a multitude of satellites in the region with more than 200 transmitting/receiving satellite antennas in earth stations operated by a number of fixed carriers and broadcasters.

Licences are required for the operation of satellites and associated facilities. As at March 2017, two Hong Kong companies were licensed to operate and provide satellite communication services, namely, Asia Satellite Telecommunications Company Limited (AsiaSat) and APT Satellite Company Limited (APT). AsiaSat and APT were established in 1988 and 1992 respectively.

Currently, a total of 10 in-orbit satellites are operated by AsiaSat and APT. The two companies have entered a new investment cycle of launching new satellites for replacement and provision of new business. AsiaSat submitted an application in August 2016 to launch a new satellite in the second half of 2017.