

# **CHAPTER 8**

## **Office of the Government Chief Information Officer**

<h3><b>Provision of GovWiFi service</b></h3>
--

**Audit Commission  
Hong Kong  
28 March 2013**

*This audit review was carried out under a set of guidelines tabled in the Provisional Legislative Council by the Chairman of the Public Accounts Committee on 11 February 1998. The guidelines were agreed between the Public Accounts Committee and the Director of Audit and accepted by the Government of the Hong Kong Special Administrative Region.*

Report No. 60 of the Director of Audit contains 8 Chapters which are available on our website at <http://www.aud.gov.hk>

Audit Commission  
26th floor, Immigration Tower  
7 Gloucester Road  
Wan Chai  
Hong Kong

Tel : (852) 2829 4210  
Fax : (852) 2824 2087  
E-mail : [enquiry@aud.gov.hk](mailto:enquiry@aud.gov.hk)

# PROVISION OF GovWiFi SERVICE

## Contents

	<b>Paragraph</b>
<b>EXECUTIVE SUMMARY</b>	
<b>PART 1: INTRODUCTION</b>	<b>1.1 – 1.3</b>
Government Wi-Fi Programme	1.4 – 1.9
Next Generation GovWiFi Programme	1.10 – 1.13
Monitoring mechanism	1.14
Audit review	1.15 – 1.17
General response from the Administration	1.18
Acknowledgement	1.19
<b>PART 2: MONITORING OF GovWiFi CONTRACTS</b>	<b>2.1</b>
Contract monitoring measures	2.2 – 2.3
Sample checks	2.4 – 2.5
Audit recommendations	2.6
Response from the Administration	2.7
Service interruptions	2.8 – 2.10
Audit recommendations	2.11
Response from the Administration	2.12

	<b>Paragraph</b>
Service orders	2.13 – 2.17
Audit recommendation	2.18
Response from the Administration	2.19
User feedback	2.20 – 2.23
Audit recommendations	2.24
Response from the Administration	2.25
 <b>PART 3: QUALITY OF GovWiFi SERVICE</b>	 3.1
User feedback on service quality	3.2 – 3.4
Wi-Fi coverage	3.5 – 3.6
Access to the Internet and connection speed	3.7 – 3.12
Audit recommendations	3.13
Response from the Administration	3.14
 <b>PART 4: SECURITY OF GovWiFi SERVICE</b>	 4.1
Security measures	4.2 – 4.4
Usage of encrypted channel	4.5 – 4.15
Audit recommendations	4.16
Response from the Administration	4.17
Effectiveness of content filtering mechanism	4.18 – 4.24
Audit recommendations	4.25
Response from the Administration	4.26

	<b>Paragraph</b>
<b>PART 5: PROMOTION OF GovWiFi SERVICE</b>	5.1
Promotional activities for launching GovWiFi service	5.2 – 5.3
Promoting GovWiFi service on government premises	5.4 – 5.5
Awareness of availability of GovWiFi service	5.6 – 5.7
Audit recommendations	5.8
Response from the Administration	5.9
 <b>PART 6: FUTURE DEVELOPMENT OF GovWiFi SERVICE</b>	 6.1
Provision of GovWiFi service	6.2 – 6.13
Audit recommendation	6.14
Response from the Administration	6.15
 <b>Appendices</b>	 <b>Page</b>
A: Details of audit survey	66 – 67
B: 20 government premises selected for audit field tests (December 2012)	68
C: Free Wi-Fi services provided in some overseas cities	69
D: Acronyms and abbreviations	70



# PROVISION OF GovWiFi SERVICE

## Executive Summary

1. The Government Wi-Fi (GovWiFi) service has been in operation since March 2008. It provides the public with free Wi-Fi Internet connection service on selected government premises with high public patronage (e.g. public libraries). As at 31 December 2012, there were around 400 premises installed with such service. Up to January 2013, the expenditure of the service amounted to \$212.4 million. The Government adopted a total outsourcing approach for the installation of Wi-Fi facilities, provision of Wi-Fi service and their ongoing operations. The Office of the Government Chief Information Officer (OGCIO) oversees, coordinates and manages the provision of the service. The Audit Commission (Audit) has recently conducted a review on the service.

### Monitoring of GovWiFi contracts

2. *Sample checks.* The OGCIO performs sample checks (about three premises per month) on access to the Internet, Wi-Fi signal strength and coverage, and content filtering of the GovWiFi service. Audit found that: (a) the OGCIO conducted 154 sample checks involving only 137 government premises during the period May 2008 to November 2012. Another 300 premises remained to be checked. It needs to implement measures to expedite the sample checks and conduct checks on more premises; (b) the items used for testing (e.g. websites for testing the content filtering mechanism) had remained unchanged since 2008 despite new developments in technology; (c) the notebook computer used for testing did not have a limit on the maximum bandwidth usage as ordinary user devices had. The testing therefore could not reveal the normal connection speeds of ordinary user devices; and (d) sample checks were only conducted during office hours, which were not ideal for some premises (e.g. outdoor premises such as public parks) (paras. 2.4 and 2.5).

3. *User feedback.* According to the GovWiFi contracts, the contractor has to conduct web-based user satisfaction surveys on the GovWiFi service periodically, and to follow up the suggestions received. There were 8,671 users who took part in the surveys during the period October 2011 to September 2012. Out of these users,

## Executive Summary

---

19% had encountered problems in using or connecting to the GovWiFi service. There were also some 2,900 comments on problems encountered, many of which were related to service quality. There are merits in analysing the problems encountered and comments made by users to identify trends and common issues, so that proactive action can be taken to minimise service interruptions (paras. 2.20, 2.22 and 2.23).

### Quality of GovWiFi service

4. *Audit survey.* The OGCIO's surveys (see para. 3) were restricted to users who had successfully connected to the Internet using the GovWiFi service and did not cover those who used other Internet connection services (e.g. a subscribed 3G network). In December 2012, Audit conducted a survey and ascertained the views of 153 users of the GovWiFi service and 301 users of other Internet connection services. Of the GovWiFi users, 8% expressed dissatisfaction on the overall service, and 13% to 24% expressed dissatisfaction on coverage, connection stability and connection speed. Of the users of other services, 54% knew that the GovWiFi service was available but chose not to use it. The main reasons included: (a) GovWiFi coverage on the premises concerned was inadequate; (b) Internet connection services of telecommunications companies were faster and more stable; and (c) they had difficulties in logging onto the GovWiFi service (paras. 3.2 to 3.4).

5. *Wi-Fi coverage, access to the Internet and connection speed.* Audit field tests indicated that, on 2 of 20 selected government premises, Wi-Fi coverage was not available in areas where public use could reasonably be expected. Audit also used mobile devices to connect to the GovWiFi service. Audit found that on outdoor premises, Audit was unable to: (a) connect to the service in 17.7% of the 288 tests of connecting to the service; and (b) access the websites in 19.6% of the 720 tests of accessing websites. Moreover, in Audit's 279 connection speed tests, Audit could not complete 33 tests due to weak or unstable Wi-Fi signals. For the remaining 246 tests, Audit examined whether the download and upload speeds could attain the OGCIO's stipulated bandwidth of at least 1 Megabits per second (Mbps) for each user. Audit found that: (a) the download speeds of 25% (for indoor premises) and 55% (for outdoor premises) of the tests conducted were less than 1 Mbps; and (b) the upload speeds of 17% (for indoor premises) and 40% (for outdoor premises) of the tests conducted were less than 1 Mbps (paras. 3.6, 3.9 to 3.11).



## Executive Summary

---

### Security of GovWiFi service

6. *Usage of encrypted channel.* GovWiFi users are provided with two Wi-Fi connection options — encrypted and unencrypted channels. They are advised to use the encrypted channel whenever possible for better protection of their privacy when transmitting sensitive information. Audit found that: (a) for the period October 2010 to September 2012, the usage of the encrypted channel was low, and the percentage of encrypted connections decreased gradually from 20% to 13%; (b) of the 153 people covered by the audit survey who used the GovWiFi service, 57 (37%) did not know that encrypted Wi-Fi connections could reduce the risk of data interception in the course of wireless transmission. Furthermore, 41 of the 102 people who did not use the encrypted channel did not know that such channel was available; and (c) the setup procedures of some mobile devices for using encrypted connection were cumbersome. For example, in an extreme case, 25 steps were required to login to the encrypted channel using a laptop computer (paras. 4.5, 4.7, 4.10 to 4.13).

7. *Content filtering mechanism.* The GovWiFi service has implemented content filtering mechanism to prevent users from accessing inappropriate websites. Audit's field tests on 20 government premises indicated that: (a) 2 websites containing pornographic contents and 1 illegal gambling website were not blocked; (b) an online game website was not blocked in the 3 public libraries where tests were conducted; and (c) by using mobile applications, the content filtering mechanism of the GovWiFi service could be bypassed (paras. 4.18, 4.19 and 4.24).

### Promotion of GovWiFi service

8. In examining the promotion of the GovWiFi service, Audit found that signages indicating the availability of the service were sometimes not posted at conspicuous areas or were posted in areas without Wi-Fi coverage. Furthermore, of the 454 people interviewed by Audit, 139 said that they did not know that there was GovWiFi service available. For some government premises, over 50% of the respondents were not aware of the service (paras. 5.5 and 5.6).

### Future development of GovWiFi service

9. In the longer term, the OGCIO is facing the challenge of how best to take forward the development and enhancement of the GovWiFi service and to run the

## Executive Summary

---

service more cost-effectively, taking into account the following issues: (a) 108 (27%) of around 400 existing government premises had average number of daily users below 15, and the average cost per Wi-Fi connection on some premises could be expensive (say over \$50); (b) the need to extend the provision of free public Wi-Fi service to venues such as public hospitals, clinics, health centres, post offices and more tourist spots; and (c) the proliferation of mobile devices and mobile data services offered by telecommunications companies that generally provide better services at competitive subscription plans (paras. 6.5, 6.8, 6.10, 6.11 and 6.13).

### Audit recommendations

10. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Government Chief Information Officer should:**

#### *Monitoring of GovWiFi contracts*

- (a) **take measures to expedite sample checks on government premises (e.g. by increasing the inspection frequency or exploring the feasibility of engaging the staff of user departments in performing the checks) (para. 2.6(a));**
- (b) **review and revise the test procedures, including the timing of checks, and the websites and applications used (para. 2.6(b));**
- (c) **request the contractor to analyse the feedback of users on the quality of the GovWiFi service, and take appropriate follow-up action (e.g. site inspection) (para. 2.24(a));**

#### *Quality of GovWiFi service*

- (d) **consider conducting periodic surveys to obtain the public's views on the quality of the GovWiFi service (para. 3.13(a));**
- (e) **conduct a comprehensive review of the Wi-Fi coverage areas to ensure that Wi-Fi coverage is available in areas where Internet connection is reasonably expected (para. 3.13(c));**

## Executive Summary

---

- (f) take measures to enhance the connection to the GovWiFi service, the accessibility to the Internet websites and the connection speed, where appropriate (para. 3.13(e));

### *Security of GovWiFi service*

- (g) take effective measures to improve the utilisation of the encrypted channel, such as stepping up education and publicity to raise the public's awareness of wireless security (para. 4.16(b));
- (h) enhance the user-friendliness of using the encrypted channel (e.g. by exploring the availability of simplified procedures for commonly used mobile devices for the encrypted connection setup) (para. 4.16(c));
- (i) take action to ensure that the content filtering mechanism is operating effectively (para. 4.25(a));
- (j) review and update the existing content filtering mechanism in the light of the growing popularity of using mobile applications for accessing online information (para. 4.25(c));

### *Promotion of GovWiFi service*

- (k) step up the promotion of the GovWiFi service and regularly engage the user departments to visit government premises to ensure proper display of signages (para. 5.8(a) and (d)); and

### *Future development of GovWiFi service*

- (l) take on board the audit recommendations in this Audit Report and conduct a strategic review to determine the way forward of the GovWiFi service (para. 6.14).

## Response from the Administration

11. The Government Chief Information Officer agrees with the audit recommendations.



## **PART 1: INTRODUCTION**

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

### ***Background***

1.2 Wi-Fi (Note 1) is a technology which supports the connection and access to the Internet through Wi-Fi enabled mobile devices, such as notebook computers, tablet computers and smartphones. The provision of public Wi-Fi access points (commonly known as “hotspots”) has become a global trend nowadays. The impetus is largely fuelled by the increasing use of mobile devices with Wi-Fi capability.

1.3 In its 2008 Digital 21 Strategy (Note 2), the Government set out its vision to make broadband Internet access available to all citizens in Hong Kong, regardless of whether they are at home or on the move. At present, many of citizens are using wired broadband access to the Internet. The development and adoption of wireless broadband Internet access is conducive to the development of Hong Kong into a digital society with ubiquitous access to information, applications and services on the Internet.

---

**Note 1:** *Wi-Fi is a trademark owned by the Wi-Fi Alliance. It is a popular technology that allows an electronic device to exchange data wirelessly using radio waves over a computer network, including high-speed Internet connections, based on the Institute of Electrical and Electronics Engineers (IEEE) 802.11 standards.*

**Note 2:** *The Digital 21 Strategy is the Government’s blueprint for the development of information and communications technology in Hong Kong. The focus of the Strategy is to advance Hong Kong’s achievements, seize new opportunities and harness its advantage so as to strengthen its position as a leading digital city. The ultimate aim is to promote Hong Kong’s economic development and to provide better services to citizens. The Strategy was launched in 1998 and is updated regularly to take into account technological advancement and changing needs of the society. The latest edition, 2008 Digital 21 Strategy, was announced in December 2007.*

# Government Wi-Fi Programme

### *Funding approval*

1.4 In May 2007, the Finance Committee of the Legislative Council approved funding of \$217.6 million for implementing the Government Wi-Fi (GovWiFi) Programme. The Programme provides the public with free Wi-Fi Internet connection service on selected government premises with high public patronage. These premises include public libraries, public enquiry service centres and job centres, as well as major parks, key cultural and recreational centres, sports venues, cooked food markets and cooked food centres, community halls and government buildings and offices.

1.5 The GovWiFi Programme is a major initiative under the 2008 Digital 21 Strategy to help develop Hong Kong into a wireless city. As commercial service providers are providing Wi-Fi services on commercial premises such as cafes, restaurants and shopping malls, the Government considers that through the Programme and in concert with other Wi-Fi initiatives in the private sector, ubiquitous access to the Internet would be realised progressively in all built-up areas of Hong Kong.

1.6 According to the funding paper, the benefits of the GovWiFi Programme included:

- (a) helping to bridge the digital divide in the community by providing the public with free Internet access on government premises;
- (b) facilitating the delivery of more e-government services through the wireless and mobile channel;
- (c) creating additional employment and new business opportunities for the information technology industry, and catalysing the development of related Wi-Fi applications in the market; and
- (d) facilitating visitors' business and leisure activities, thereby building a positive image for Hong Kong and upholding its status as a leading digital city.

### *Implementation of GovWiFi Programme*

1.7 The GovWiFi Programme (see Figure 1) was launched in March 2008 on over 30 government premises. In June 2009, the Programme was fully rolled out and the number of government premises installed with the GovWiFi service was around 350. Thereafter, the Office of the Government Chief Information Officer (OGCIO — see para. 1.14) had included additional government premises in the GovWiFi Programme in response to demand. As at 31 December 2012, there were around 400 government premises installed with the GovWiFi service. Distribution of these premises is shown in Table 1.

**Figure 1**

**Logo of GovWiFi**



*Source: OGCIO records*

**Table 1**  
**Government premises with GovWiFi service**  
**(31 December 2012)**

Type of government premises	Number
Sports centre, sports ground and stadium	100
Public library	67
Government joint-user building and office	50
Community hall, centre and complex	44
Park, garden and visitor centre	40
Cooked food centre and cooked food market	37
Public enquiry service centre	20
Cultural and recreational centre	14
Job centre	12
Others (e.g. ferry terminal and promenade)	11
Total	395

*Source: OGCIO records*

### ***GovWiFi contract***

1.8 The Government adopted a total outsourcing approach for the installation of Wi-Fi facilities, provision of Wi-Fi service and their ongoing operations. The contract was awarded in December 2007 for a period of five years from December 2007 to December 2012.

1.9 The contractor was responsible for providing Internet access service, network operation and management, and helpdesk service for the GovWiFi Programme for a period of five years. It was also required to implement security measures, such as content filtering (to prevent users from accessing websites that may contain obscene, indecent, malicious or illegal contents) and data encryption.



## Next Generation GovWiFi Programme

1.10 In June 2011, as the five-year contract awarded in December 2007 would expire in December 2012 (see para. 1.8), the Finance Committee approved an increase of \$68 million to the initial funding of \$217.6 million (see para. 1.4) for implementing the Next Generation GovWiFi Programme. The increase brought the total approved funding to \$285.6 million.

1.11 According to the Government, the GovWiFi service had been well received by the public and the percentage of citizens having devices with Wi-Fi capabilities was increasing. The Next Generation GovWiFi Programme would continue to provide the public with free Internet connection service on the government premises (see para. 1.7). It would also extend the service to about 40 additional government premises and introduce technological enhancements to improve the service (Note 3). The Government would continue to adopt a total outsourcing approach in providing service under the Next Generation GovWiFi Programme.

1.12 The Next Generation GovWiFi Programme covers the period from December 2012 to December 2017. The estimated expenditure of the programme is \$152 million. It is financed by the unspent balance of \$84 million from the funding of \$217.6 million approved in May 2007, and the additional funding of \$68 million approved by the Finance Committee in June 2011. The estimated expenditure comprises:

- (a) \$110 million for the acquisition of external services for the provision of hardware, software, site preparation, installation, ongoing operation and maintenance, Internet connection and helpdesk service;

---

**Note 3:** *Technological enhancements under the Next Generation GovWiFi Programme include:*

- (a) *the adoption of a more advanced Wi-Fi standard IEEE 802.11n, which provides better signal coverage and faster data transfer, and reduces signal interference; and*
- (b) *the support of the latest Internet Protocol version 6 for accessing websites and Internet services.*

## **Introduction**

---

- (b) \$28.5 million for the coordination, management and support work; and
- (c) \$13.5 million for contingency.

The contract for the Next Generation GovWiFi Programme was awarded in March 2012. The two GovWiFi contracts were awarded to the same contractor through open tendering exercises.

1.13 Up to January 2013, the expenditure of the GovWiFi Programme and the Next Generation GovWiFi Programme amounted to \$212.4 million, including \$12.7 million for the Internet connection charges paid to the contractor.

## **Monitoring mechanism**

1.14 The OGCIO oversees, coordinates and manages the provision of the GovWiFi service (see PART 2). A Programme Steering Committee, chaired by the Government Chief Information Officer with representatives from participating and advisory departments (e.g. the Leisure and Cultural Services Department and the Electrical and Mechanical Services Department — EMSD), oversees the GovWiFi Programme and the Next Generation GovWiFi Programme and monitors their implementation progress. A Programme Office is established to support the implementation and day-to-day management of the programmes. The Programme Office comprises a team of 1 Systems Manager, 3 Analyst Programmers and 2 non-civil service contract staff. It is headed by a Chief Systems Manager and supported by a Senior Systems Manager who are working part-time on the programmes.

## **Audit review**

1.15 The Audit Commission (Audit) has recently conducted a review of the provision of the GovWiFi service, focusing on the following areas:

- (a) monitoring of GovWiFi contracts (PART 2);
- (b) quality of GovWiFi service (PART 3);

- (c) security of GovWiFi service (PART 4);
- (d) promotion of GovWiFi service (PART 5); and
- (e) future development of GovWiFi service (PART 6).

1.16 During the review, Audit carried out an opinion survey on selected government premises installed with the GovWiFi service in December 2012 (the audit survey). The objectives of the survey were to gauge the public's views on, and their experience of using, the GovWiFi service (Note 4). Audit successfully interviewed 454 people who were using mobile devices (such as notebook computers and smartphones) for connection to the Internet at the time of the survey. The findings of the survey were incorporated into this Audit Report. Details of the survey are shown in Appendix A.

1.17 Audit has found that there is room for improvement in the areas referred to in paragraph 1.15 and has made a number of recommendations to address the issues.

### **General response from the Administration**

1.18 The Government Chief Information Officer agrees with the audit recommendations.

### **Acknowledgement**

1.19 Audit would like to acknowledge with gratitude the full cooperation of the staff of the OGCIIO during the course of the audit review.

---

**Note 4:** *In designing the survey questionnaire, Audit had taken into account views expressed by the OGCIIO.*

## **PART 2: MONITORING OF GovWiFi CONTRACTS**

2.1 This PART examines the following areas relating to the monitoring of the GovWiFi contracts:

- (a) sample checks (paras. 2.4 to 2.7);
- (b) service interruptions (paras. 2.8 to 2.12);
- (c) service orders (paras. 2.13 to 2.19); and
- (d) user feedback (paras. 2.20 to 2.25).

### **Contract monitoring measures**

2.2 Under the GovWiFi contracts, the contractor is required to provide an integrated Wi-Fi network service, which includes installation, ongoing operation and maintenance, Internet connection service and helpdesk service. The OGCIO oversees the performance of the contractor in compliance with the service requirements.

2.3 Contract monitoring measures adopted by the OGCIO includes:

- (a) monthly service management meetings with the contractor and the EMSD (see para. 2.4) to review the performance and ongoing support of the service, review incidents and follow-up actions, reconcile the correctness of monthly reports, follow up on outstanding tasks, and plan for support activities in the coming months;
- (b) review of daily usage statistics and monthly reports prepared by the contractor;
- (c) monthly sample checks on selected government premises;
- (d) review of weekly report on support service prepared by the EMSD;
- (e) weekly internal status update to the senior management; and
- (f) monthly internal progress meetings with the senior management.

In the new Programme, a Maintenance Board was formed with participation of major user departments as members to strengthen their engagement in service management on premises and ongoing development of the service. The contractor is required to maintain a 97% service availability per month for each government premises (Note 5). According to the OGCI0, the contractor had maintained an average service availability of almost 100% for the first contract.

### Sample checks

2.4 The OGCI0 performs sample checks (about three premises per month) to ensure that the GovWiFi service provided there meets the service requirements. The sample checks cover testing on access to the Internet, Wi-Fi signal strength and coverage, and content filtering. In selecting the premises for checking, the OGCI0 considers factors such as service usage, complaints received, any major events to be held, and the need to spread evenly amongst regions and premises types. The OGCI0 has also commissioned the EMSD to provide professional advice and technical support service. The service scope includes checking within the contract period on the safety conditions, coverage and radiation of GovWiFi facilities installed on the premises.

2.5 Audit noted that:

- (a) the OGCI0 conducted 154 sample checks (involving 137 government premises) during the period May 2008 to November 2012. It would therefore take some time to cover the remaining premises (about 300, including those new ones under the Next Generation GovWiFi Programme). Audit considers that the OGCI0 needs to implement measures to expedite the sample checks and conduct checks on more premises, e.g. by increasing the checking frequency or exploring the feasibility of engaging the user departments to perform the tests;
- (b) the items used for testing (e.g. the websites for testing the content filtering mechanism) had remained unchanged since the beginning of the

---

**Note 5:** *Service availability for a premises is expressed as a percentage. It is the ratio of actual available time to the scheduled available time for the Wi-Fi service on the premises.*

## Monitoring of GovWiFi contracts

---

sample check in 2008 (Note 6). Given the new development in technology and growing popularity of mobile devices (e.g. smartphones) and mobile applications, the OGCIO needs to review and revise the test procedures (see also paras. 4.19 and 4.20);

- (c) ordinary user devices were subject to limit on the maximum bandwidth usage (Note 7). The notebook computer used for testing did not have such a limit so that it can be used to perform stress test on the committed bandwidth capacity for specific premises. The testing, therefore, could not reveal the normal connection speeds of ordinary user devices on that premises (see also audit findings on connection speed in paras. 3.10 and 3.11); and
- (d) sample checks were only conducted during office hours, which were not ideal for some premises. For example, outdoor premises (such as public parks) of which the peak hours were in weekends and public holidays.

## Audit recommendations

**2.6 Audit has recommended that the Government Chief Information Officer should:**

- (a) **take measures to expedite sample checks on government premises (e.g. by increasing the inspection frequency or exploring the feasibility of engaging the staff of user departments in performing the checks); and**
- (b) **review and revise the test procedures, including the timing of checks, and the websites and applications used.**

## Response from the Administration

**2.7** The Government Chief Information Officer agrees with the audit recommendations. He has said that the OGCIO will work with the user departments of the premises to take relevant measures to expedite the sample checks.

---

**Note 6:** *According to the OGCIO, the items used for sample checking the service commitments of the contractor (including content filtering) were still relevant and applicable with reference to the contracts since 2008.*

**Note 7:** *In telecommunications, bandwidth means the data transfer rate of a network or Internet connection. It is usually expressed in megabits per second (Mbps). For GovWiFi, the download speed for ordinary user devices was capped at 3 Mbps.*

## Service interruptions

2.8 According to the OGCIIO, an “incident” is the occurrence of an event (e.g. cable damage) that leads to interruption of the Wi-Fi service. Swift reporting and follow up of incidents are essential to upkeep the service quality and reliability.

2.9 The contractor submits the following reports on incidents, which lead to partial or total service interruptions:

- (a) ***Overall Wi-Fi Service Support Progress Report.*** It is a monthly report listing out the salient information (e.g. date and time of occurrence, problem description and solution adopted) about each incident; and
- (b) ***Incident Report.*** In addition, the contractor is required to prepare an Incident Report for each case of total service interruption of which the contractor is the responsible party. In the Report, the contractor needs to state the outline and highlights of the incident, root cause, service and business impact, and follow-up action (including intermediate and long-term solutions).

2.10 Audit reviewed the Progress Reports and Incident Reports for the period October 2011 to September 2012 and noted that:

- (a) there were 372 incidents which resulted in partial service interruption, of which 134 cases (36%) were due to modem problems and 80 cases (22%) due to access point problems. No details of the problems were, however, mentioned in the reports. As a good practice, the OGCIIO could require the contractor to further analyse the problems for identifying any common causes in order to minimise recurrence of similar incidents in future; and
- (b) there were 13 incidents which resulted in total service interruption and were responsible by the contractor (e.g. due to malfunctioned equipment or damaged cable). According to the reports, 10 incidents were due to damaged cable or cable problems, including 4 incidents in which the cables were damaged by “mice bite”. Furthermore, in 12 Incident Reports, the section on “Follow-up action” was filled in as “N/A” (i.e. not applicable). The OGCIIO should urge the contractor to take a more

## **Monitoring of GovWiFi contracts**

---

proactive approach in suggesting follow-up action to identify common causes leading to service interruptions, and to provide suggested solutions. The OGCIO should also request the contractor to update the “Follow-up action” section for future reference.

### **Audit recommendations**

**2.11 Audit has *recommended* that the Government Chief Information Officer should:**

- (a) request the contractor to:**
  - (i) analyse incidents which lead to partial/total service disruptions with a view to identifying common causes, and suggest solutions to minimise the recurrence of similar incidents in future; and**
  - (ii) as far as practicable, state in the Incident Reports any follow-up actions (including intermediate and long-term solutions) to address the causes of the incidents; and**
- (b) strengthen the monitoring of the work of the contractor in reducing service interruptions.**

### **Response from the Administration**

2.12 The Government Chief Information Officer agrees with the audit recommendations. He has said that the incidents were mostly caused by equipment wear and tear. The equipment was replaced or recovered without the need for further follow-up action.



### Service orders

2.13 The OGCIO periodically reviews the bandwidth requirements of each government premises and issues service orders to the contractor to revise the bandwidth of the premises based on the findings. For premises that require downward bandwidth adjustment, such adjustment would be commissioned immediately to reduce ongoing service cost. For those premises that require upward bandwidth adjustment, the contractor would assess the requirement and confirm whether sufficient bandwidth capacity of the network infrastructure is readily available for the upgrade. Service orders would be issued once the bandwidth capacity is confirmed.

2.14 According to a bandwidth review completed in May 2012 by the OGCIO, the bandwidth of 238 government premises needed to be adjusted. Audit noted that up to December 2012, service orders for 20 premises had yet to be issued.

2.15 In response to Audit's enquiry, the OGCIO informed Audit that the main reasons for not being able to issue the service orders were:

- (a) there was no fiber/copper cable connection that could accommodate the bandwidth upgrade; and
- (b) either the contractor had practical difficulties to add the cable connection because of cost consideration (e.g. for outlying islands such as Peng Chau), or the civil works for the cable connection were still in progress.

2.16 Audit reviewed the progress of the 20 outstanding cases (see para. 2.14) and noted that:

- (a) for three cases, all on the outlying islands, the contractor said that their bandwidth adjustments would require costly construction work for laying cables under seas, which were difficult to justify. According to the OGCIO, the bandwidth limitation was a regional issue on these islands and the contractor could only upgrade the bandwidths when there were other major infrastructure upgrade works to be carried out on these islands. The OGCIO also told Audit that it had periodically enquired with the contractor on any potential bandwidth upgrade on the islands; and

## Monitoring of GovWiFi contracts

- (b) for another three cases, the need for bandwidth adjustment had already been identified in the previous review of bandwidth requirements, as shown in Table 2.

**Table 2**  
**Outstanding cases of bandwidth adjustment**  
**(31 December 2012)**

Site	Bandwidth (Mbps)			
	Original	Proposed in		Actual (since November 2011)
		Review of August 2011	Review of May 2012	
Central Market	5	9	14	8 (Note)
Harbour Road Sports Centre	7	12	12	
Mong Kok Cooked Food Market	7	9	9	

Source: OGCIO records

Note: As an interim measure, the bandwidths for the sites were all upgraded to 8 Mbps (the maximum available bandwidth on the premises) in November 2011.

In response to Audit's enquiry in January 2013, the OGCIO explained that the upgrading of bandwidth for Central Market was put on hold because of a redevelopment plan of the premises as advised by the user department. According to the latest update from the user department, the GovWiFi service needed to be provided on the premises and the contractor would start the implementation work in due course. For Harbour Road Sports Centre, as there was no spare cable available to the site, works permit from the Highways Department was applied for the civil works, and upgrading work could be started in February 2013, after the completion of civil works. For the remaining 15 sites (excluding the three sites on the outlying islands mentioned in (a) above and including Mong Kok Cooked Food Market in Table 2), the civil works were still pending because of various reasons (such as the need to obtain approval for road works).

2.17 While it is understandable that in some cases civil works are required for additional cable connections, Audit considers that the OGCIO needs to step up efforts to ensure timely completion of the bandwidth adjustments in order to maintain the service level. For example, the OGCIO may agree a practical target time with the contractor to complete the civil works, and consider alternatives in case the cable connection could not be done in the near future.

### **Audit recommendation**

2.18 **Audit has *recommended* that the Government Chief Information Officer should ensure that bandwidth adjustments are completed in a timely manner.**

### **Response from the Administration**

2.19 The Government Chief Information Officer agrees with the audit recommendation. He has said that an interim measure to upgrade the bandwidth of the 20 outstanding premises to the maximum available bandwidth on the premises has been implemented and the existing bandwidth provisions for those premises are sufficient to meet the current usage demands.

### User feedback

2.20 The regular collection and analysis of user feedback is an effective means for assessing and improving the provision of service. According to the contracts, the contractor has to conduct web-based user satisfaction surveys on the GovWiFi service periodically, and to follow up the suggestions received. The contractor has been conducting the survey since April 2008. The contractor also maintains a helpdesk service to provide usage support and answer enquiries.

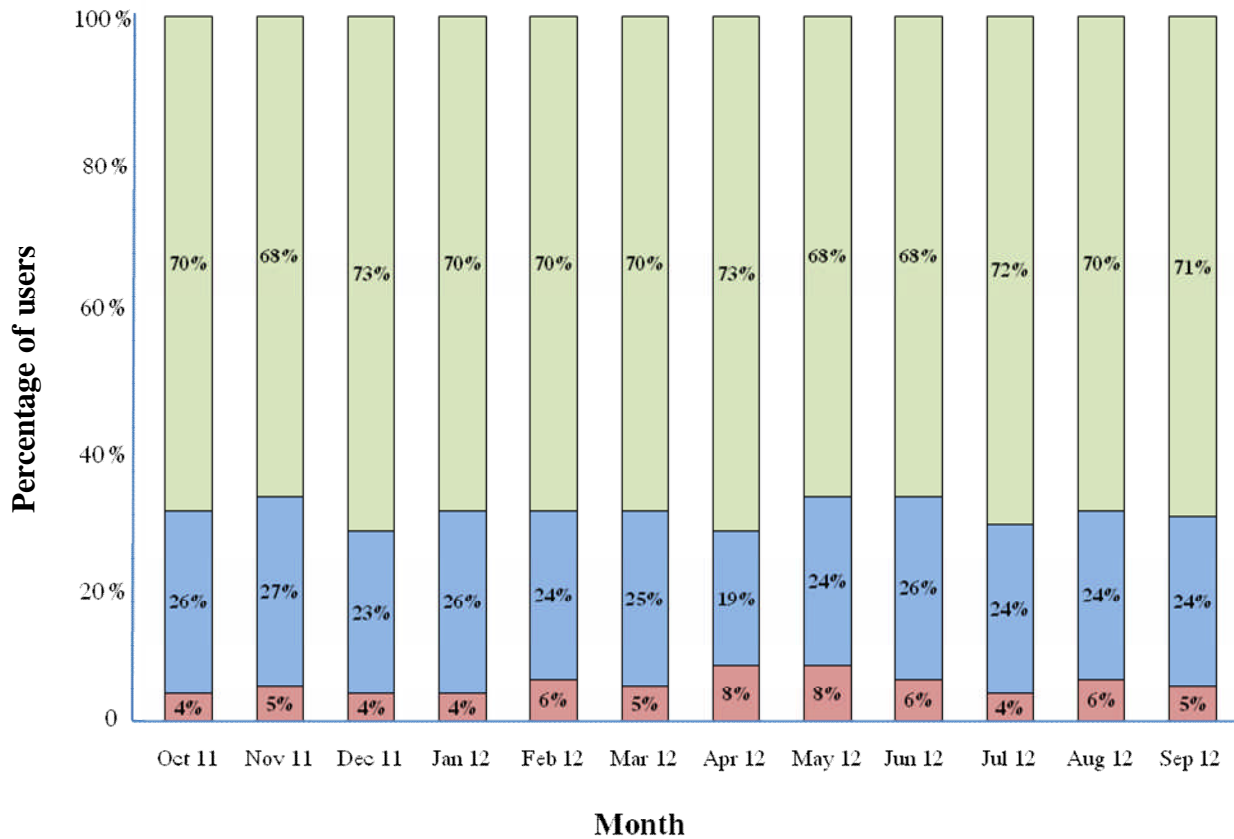
2.21 After logging onto the GovWiFi service, users are randomly selected for participating in the survey. Alternatively, they can choose to participate on their own initiative. The survey consists of several short questions on usage, views on service, and problems encountered. A monthly User Satisfaction Summary Report summarises the survey results of that month, as well as any specific comments raised by the users.

2.22 There were 8,671 users who took part in the surveys during the period October 2011 to September 2012 (about 700 users a month). As shown in Figure 2, around 70% of the users rated the GovWiFi service as good or very good. Nonetheless:

- (a) 1,667 (19%) of the 8,671 users had encountered problems in using or connecting to the GovWiFi; and
- (b) about 2,900 comments were made by the users on problems encountered when using the GovWiFi service. Many of these were related to service quality, such as:
  - (i) weak or no signal;
  - (ii) frequent disconnection;
  - (iii) slow connection speed; and
  - (iv) difficulties in using the encrypted channel.

Figure 2

User satisfaction on GovWiFi service  
based on OGCIO's online survey  
(October 2011 to September 2012)



Legend:   
■ Good or very good  
■ Fair  
■ Poor

Source: OGCIO records

## Monitoring of GovWiFi contracts

---

2.23 While it may not be practical to follow up on each and every comment made by users, there are merits in analysing the problems encountered and comments made by users to identify trends and common issues (Note 8), so that proactive action can be taken to minimise service interruptions (e.g. a site inspection may be required if there are many adverse comments on service quality — Note 9). The OGCIO can review the user feedback analysis and the follow-up action taken by the contractor in the monthly service management meetings (see para. 2.3(a)).

## Audit recommendations

2.24 Audit has *recommended* that the Government Chief Information Officer should:

- (a) **request the contractor to analyse the feedback of users on the quality of the GovWiFi service, and take appropriate follow-up action (e.g. site inspection); and**
- (b) **review the analysis of user feedback and follow-up action taken by the contractor at the monthly service management meetings.**

## Response from the Administration

2.25 The Government Chief Information Officer agrees with the audit recommendations. He has said that the OGCIO puts great emphasis on the service quality in meeting public expectation. For example, once the helpdesk received incidents reported by users, the OGCIO and the contractor would promptly perform onsite signal checking and tuning for the premises to improve the service.

---

**Note 8:** *The analysis could also take into account complaints on the GovWiFi service received by the contractor's helpdesk or referred from the Government's 1823 hotline. In 2012, there were altogether 117 complaints, including around 20 complaints referred by the 1823 hotline.*

**Note 9:** *For instance, in October 2011, nine users commented that they had experienced slow or unstable Wi-Fi connection in the Hong Kong Central Library.*

## **PART 3: QUALITY OF GovWiFi SERVICE**

3.1 This PART examines the following areas relating to the quality of the GovWiFi service:

- (a) user feedback on service quality (paras. 3.2 to 3.4);
- (b) Wi-Fi coverage (paras. 3.5 and 3.6); and
- (c) access to the Internet and connection speed (paras. 3.7 to 3.12).

The audit recommendations in respect of above inter-related areas are summarised in paragraph 3.13.

### **User feedback on service quality**

#### *Audit survey*

3.2 In December 2012, Audit carried out the audit survey (see para. 1.16) to ascertain users' views on the quality of the GovWiFi service (Note 10). Audit interviewed 454 people who were using mobile devices for Internet connection. Of these 454 respondents:

- (a) 153 were using the service to access the Internet (GovWiFi respondents); and

---

**Note 10:** *Since April 2008, the OGCI0 has required the contractor to conduct online survey to collect users' feedback on the quality of the GovWiFi service (see para. 2.20). The survey, however, is restricted to users who have successfully connected to the Internet using the service and does not cover those who have used other Internet connection services (e.g. a subscribed 3G network). The audit survey is free from this restriction (see para. 3.2(b)). Furthermore, it was conducted in December 2012, after enhancements to the GovWiFi service had been made (see para. 1.11).*

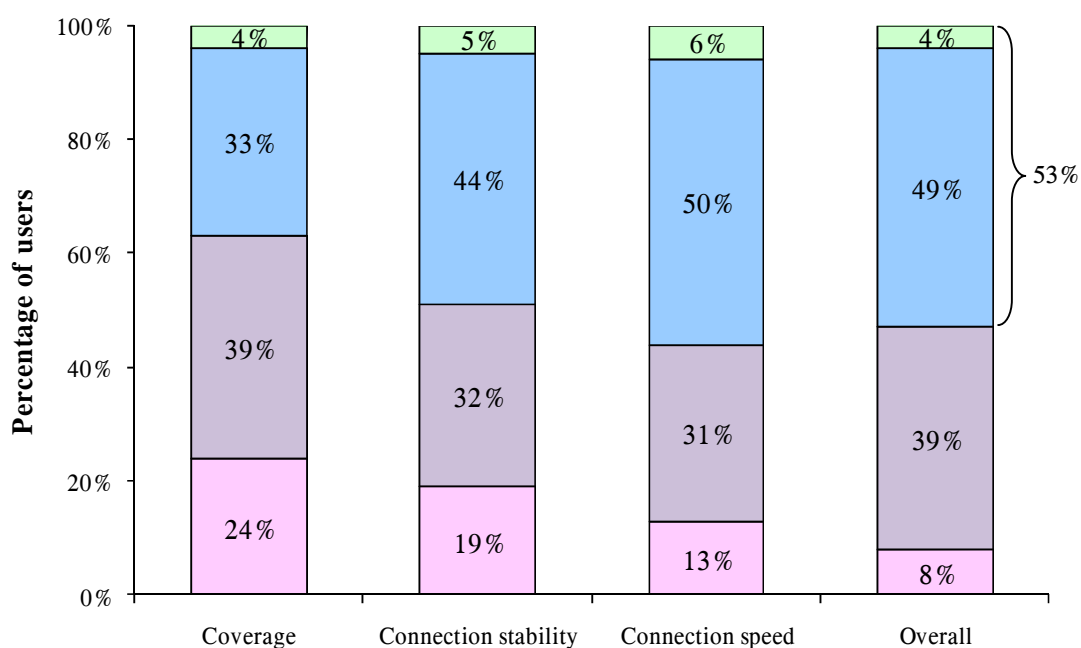
## Quality of GovWiFi service

- (b) the remaining 301 were using other Internet connection services (such as subscribed 3G network) provided by telecommunications companies (non-GovWiFi respondents). These people, though not using the GovWiFi service, were still interviewed to find out the reasons for not using the service and their views on it.

3.3 The views of the 153 GovWiFi respondents on various service areas were summarised in Figure 3.

**Figure 3**

### Results of audit survey on user satisfaction of GovWiFi service (December 2012)



Legend:   
 Very satisfactory   
 Satisfactory   
 Neutral   
 Unsatisfactory

Source: *Audit survey*

Remarks: *The analysis of the results was based on 153 GovWiFi respondents.*



While 53% of GovWiFi respondents were either satisfied or very satisfied with the overall quality of the GovWiFi service, 8% expressed dissatisfaction on the overall service, and 13% to 24% expressed dissatisfaction on coverage (i.e. areas where Wi-Fi is available), connection stability and connection speed.

3.4 Audit survey results also revealed that 162 (54%) of the 301 non-GovWiFi respondents knew that free GovWiFi service was available on the premises but chose not to use it. The 162 respondents gave the following main reasons (respondents could choose more than one reason):

- (a) it was more convenient to use the services of telecommunications companies (102 respondents);
- (b) Internet connection services of telecommunications companies were faster and more stable (52 respondents);
- (c) they had difficulties in logging onto the GovWiFi service (12 respondents); or
- (d) GovWiFi coverage on the premises concerned was inadequate (8 respondents).

In December 2012, to supplement the findings of the audit survey, Audit conducted field tests on Wi-Fi coverage, access to the Internet and connection speed of the GovWiFi service on 20 selected government premises from an end-user's perspective (see Table 3) (Note 11).

---

**Note 11:** *The field tests were conducted on the government premises after enhancements to the GovWiFi service had been made.*

**Table 3**

**Audit field tests on GovWiFi service**

Period of test	12 to 20 December 2012
Premises selected for testing	20 (10 indoor and 10 outdoor) premises spreading across Hong Kong, Kowloon and the New Territories (see Appendix B)
Number of spots selected for testing in each premises	2 to 6 (depending on the floor area)
Total number of spots selected for testing	93 (45 on indoor premises and 48 on outdoor premises)
Equipment used in conducting the tests	1 Android-based smartphone 1 iOS-based tablet computer 1 Windows-based laptop computer  All the above equipment are compatible with the technical requirements (such as the IEEE 802.11n standard) of the GovWiFi service.
Application used for testing connection speed	Office of the Communications Authority Broadband Performance Test (Note)
Websites used for testing accessibility	Local website: • <a href="http://www.gov.hk">http://www.gov.hk</a>  Overseas websites: • <a href="http://www.taobao.com/index.php?spm=a2133.1110891.0.31.hz9Ix5">http://www.taobao.com/index.php?spm=a2133.1110891.0.31.hz9Ix5</a> • <a href="http://www.visitbritain.com/en/HK/">http://www.visitbritain.com/en/HK/</a> • <a href="http://www.ebay.com/">http://www.ebay.com/</a>

*Source: Audit field tests*

*Note: This application is also used by the OGCI in performing sample checks on government premises installed with the GovWiFi service (see para. 2.4).*

## Wi-Fi coverage

3.5 According to the OGCIO, Wi-Fi coverage on government premises is proposed by user departments (e.g. the Wi-Fi service provided at the Registration of Persons — Hong Kong Office is proposed by the Immigration Department). The OGCIO will work out and agree with the user department on the final coverage of the premises taking into consideration the following factors:

- (a) the coverage area is accessible by the public and conducive to Wi-Fi Internet access;
- (b) the coverage must not affect the department's business nor venue safety;
- (c) the coverage for premises of similar type should be aligned in order to have consistent service provision and fulfil user expectation; and
- (d) the associated constraints and restrictions (e.g. positions for mounting poles and access points and availability of 24-hour power supply).

Wi-Fi coverage areas of premises are published on the GovWiFi website.

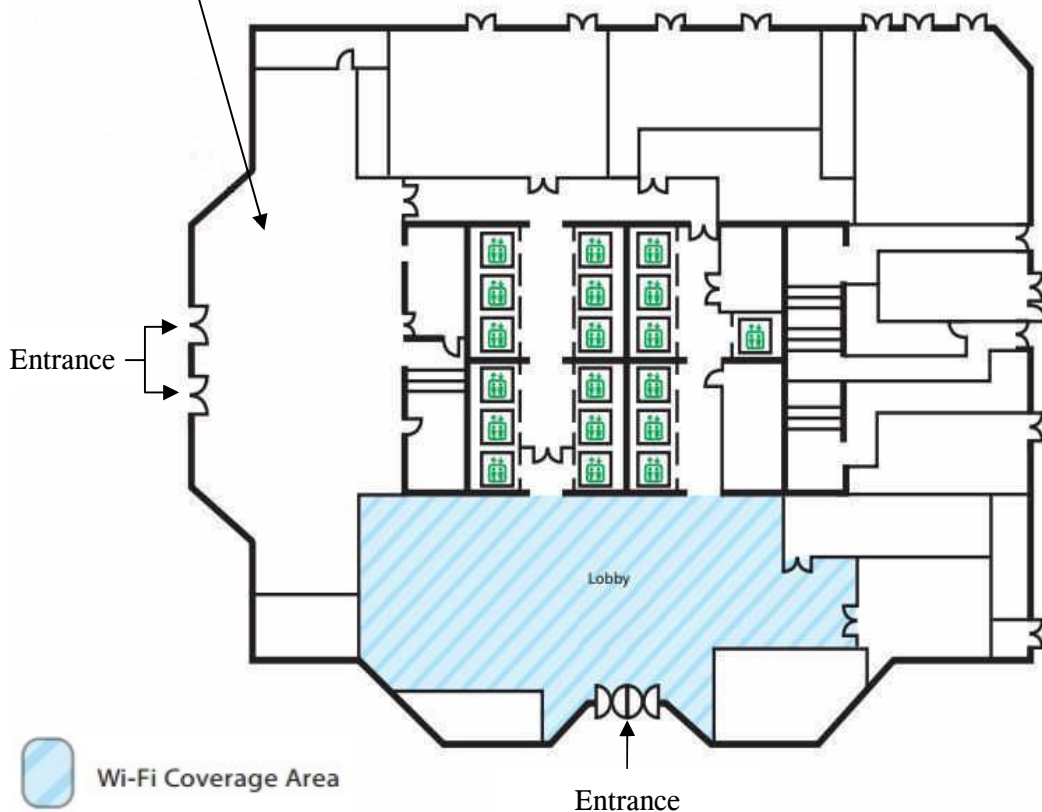
3.6 Audit field tests indicated that on 2 of the 20 premises (see Table 3 in para. 3.4), Wi-Fi coverage was not available in areas where public use could reasonably be expected. In fact, Audit's findings tie in with the views of the respondents of audit survey (see para. 3.3). An example is shown below.

Case 1

Example showing unavailability of Wi-Fi coverage in a public area

1. Figure below shows the Wi-Fi coverage on the ground floor of a joint-user building (the Immigration Tower).

Seating area



2. Audit field tests revealed that the Wi-Fi coverage area covered only about half of the floor area of the lobby and did not cover the seating area (see figure above).

Case 1 (Cont'd)

*Audit comments*

3. As a good customer service practice, Wi-Fi should be available in the entire lobby and the seating area of the premises. The OGCI0 needs to:
- (a) review the Wi-Fi coverage area of the above premises; and
  - (b) conduct a comprehensive review of the Wi-Fi coverage on other premises.

*Source: OGCI0 records and Audit field tests*

### Access to the Internet and connection speed

#### *Service level requirements*

3.7 From an end-user's perspective, the ability to access the Internet and connection speed are important factors in evaluating a Wi-Fi service. According to the GovWiFi service level requirements specified in the contracts signed between the OGCIO and the contractor:

- (a) a mobile device should be able to access the Internet using the GovWiFi service in the coverage area (Note 12); and
- (b) the bandwidth requirement will be set by the OGCIO with an aim to support an average bandwidth of at least 2 Mbps downstream and 1 Mbps upstream per user.

3.8 The OGCIO states in the GovWiFi website that:

- (a) in general, the bandwidth allocated to each user is about 1 to 2 Mbps; and
- (b) the actual performance would depend on the number of concurrent users and the signal strength of the spot the user is located.

#### *Access to the Internet*

3.9 Audit used three mobile devices to connect to the GovWiFi service and access one local and three overseas websites (see Table 3 in para. 3.4) to find out how readily it was to access the Internet. Audit conducted 558 tests of connecting to the GovWiFi service (Note 13) and 1,395 tests of accessing websites on the 20 selected premises (Note 14). Audit found that:

---

**Note 12:** *The coverage area should be at least 95% of the area where the GovWiFi service is available.*

**Note 13:** *Audit used three mobile devices to conduct 558 tests at 45 indoor and 48 outdoor spots (see Table 3 in para. 3.4). At each spot, Audit used each mobile device to connect to the GovWiFi service (once using encrypted channel and once using unencrypted channel) (93 spots × 3 devices × 2 channels = 558 tests).*

**Note 14:** *Audit used three mobile devices to conduct 1,395 tests at 45 indoor and 48 outdoor spots (see Table 3 in para. 3.4). At each spot, Audit used each mobile device to access a local website twice (once using encrypted channel and once using unencrypted channel) and three overseas websites once (using unencrypted channel) (93 spots × 3 devices × 5 websites = 1,395 tests).*

- (a) for 17.7% of tests of connecting to the GovWiFi service on outdoor premises, Audit was unable to connect to the service, whereas it was 4.8% on indoor premises (see Table 4); and

**Table 4**  
**Tests of connecting to GovWiFi service**  
**(December 2012)**

Premises	Number of tests conducted (a)	Number of tests in which Audit was unable to connect to the service (b)	Percentage of tests in which Audit was unable to connect to the service (b) ÷ (a) × 100%
Indoor	270	13	4.8%
Outdoor	288	51	17.7%
Overall	558	64	11.5%

*Source: Audit field tests*

- (b) on outdoor premises, for 19.6% of the tests of accessing websites, Audit could not access the websites. On indoor premises, it was 2.7% (see Table 5).

**Table 5**  
**Tests of accessibility to websites on the Internet**  
**(December 2012)**

Website tested	Premises	Number of tests conducted (a)	Number of tests in which Audit was unable to access the website (b)	Percentage of tests in which Audit was unable to access the website (b) ÷ (a) × 100%
One local website	Indoor	270	13	4.8%
	Outdoor	288	56	19.4%
Three overseas websites	Indoor	405	5	1.2%
	Outdoor	432	85	19.7%
Overall	Indoor	675	18	2.7%
	Outdoor	720	141	19.6%

*Source: Audit field tests*

### *Connection speed test*

3.10 At each selected spot of the 20 premises, Audit used three mobile devices to test the connection speed by running the application “Office of the Communications Authority Broadband Performance Test” (see Table 3 in para. 3.4). Figure 4 shows a sample of the connection speed test.

**Figure 4**

**A sample of connection speed test of GovWiFi service**



*Source: Audit field tests*



3.11 Audit conducted 279 connection speed tests (Note 15). Audit could not complete 33 tests due to weak or unstable Wi-Fi signals. Based on the results of the remaining 246 tests, Audit noted that:

- (a) the average download speed was 1.32 Mbps (see Table 6). However, the download speeds of 25% (for indoor premises) and 55% (for outdoor premises) of the tests conducted were less than 1 Mbps (see para. 3.8 and Figure 5); and

**Table 6**  
**Results of connection speed tests**  
**(December 2012)**

<b>Premises</b>	<b>Average connection speed</b>	
	<b>Download (Mbps)</b>	<b>Upload (Mbps)</b>
10 indoor	1.55	1.92
10 outdoor	1.05	1.52
Overall	1.32	1.74

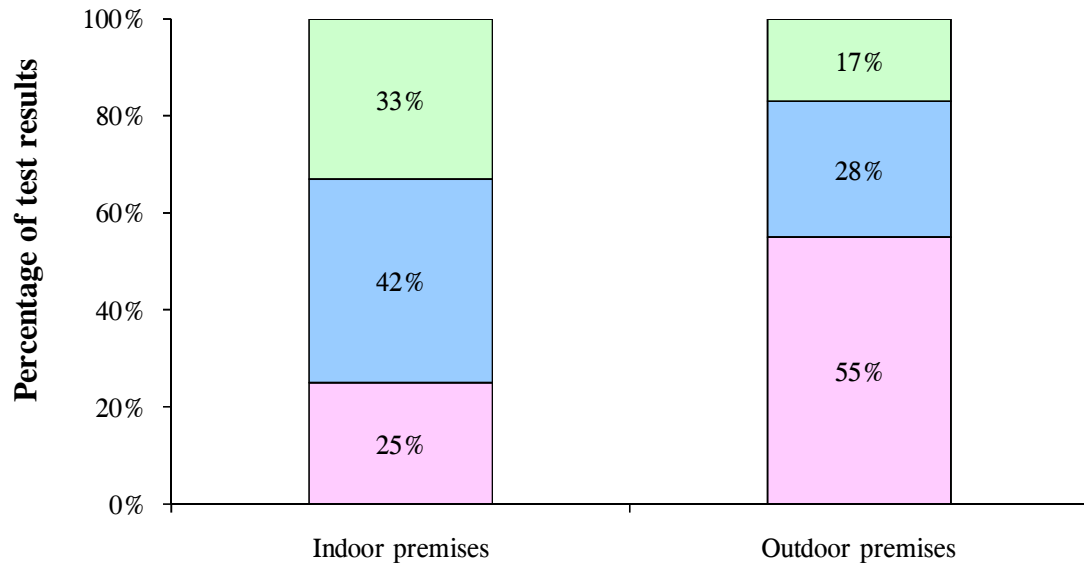
*Source: Audit field tests*

---

**Note 15:** *The 279 tests were conducted at 45 indoor and 48 outdoor spots using three mobile devices at each spot (see Table 3 in para. 3.4).*

Figure 5

Connection speed test results — download speed  
(December 2012)



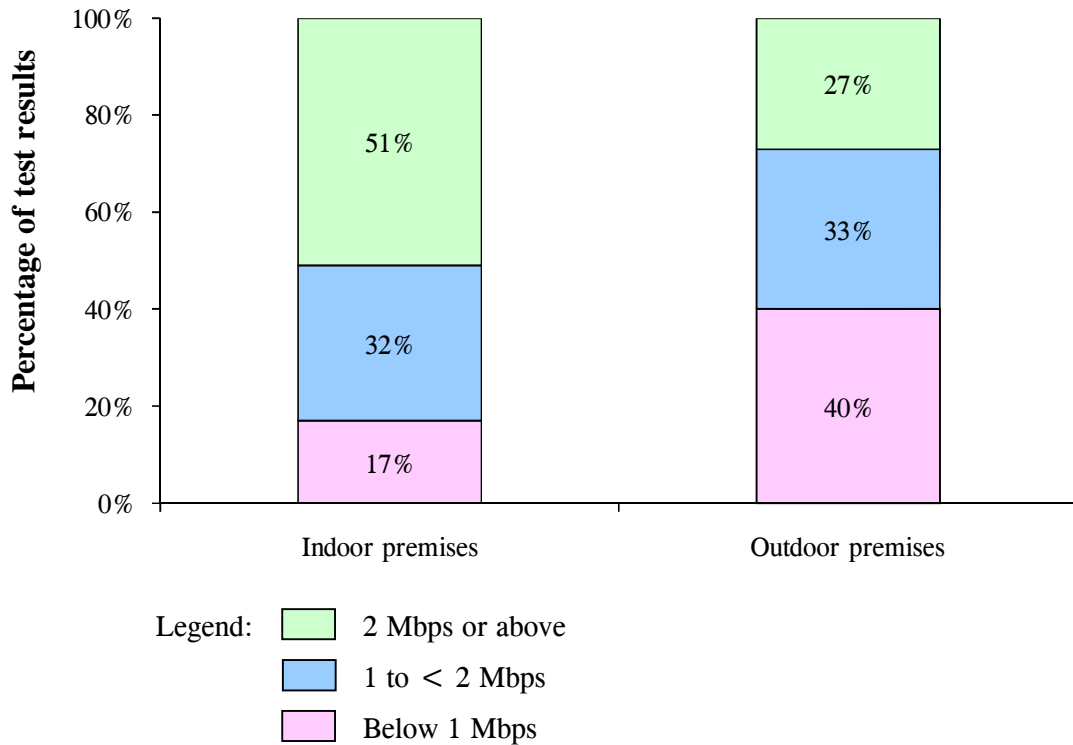
Legend:  2 Mbps or above  
 1 to < 2 Mbps  
 Below 1 Mbps

Source: *Audit field tests*

- (b) the upload speeds of 17% (for indoor premises) and 40% (for outdoor premises) of the tests conducted were less than 1 Mbps (see Figure 6).

**Figure 6**

**Connection speed test results — upload speed  
(December 2012)**



Source: Audit field tests

### ***Overview of access to the Internet and connection speed***

3.12 Audit recognises that in a wireless transmission environment, access to the Internet and connection speed can be affected by a number of factors (Note 16). Audit field tests revealed that such factors had stronger impact on service on

---

**Note 16:** According to the OGCIO, the factors include the number of concurrent users, signal strength at the spot of the user access, and environmental factors (such as interference of other wireless devices, services nearby, weather condition, and obstacles like trees and moving objects).

## Quality of GovWiFi service

---

outdoor premises. The results of the audit tests indicate that there is a need to enhance:

- (a) the connection to the GovWiFi service and the accessibility to the Internet websites on outdoor premises; and
- (b) the download and upload speeds on some indoor and outdoor premises.

## Audit recommendations

3.13 **Audit has *recommended* that the Government Chief Information Officer should:**

- (a) **consider conducting periodic surveys to obtain the public's views on the quality of the GovWiFi service;**
- (b) **analyse the feedback gathered from the surveys (e.g. the public's comments and the problems they encountered) and take necessary actions to improve the GovWiFi service;**
- (c) **conduct a comprehensive review of the Wi-Fi coverage areas (including Case 1 in para. 3.6) to ensure that Wi-Fi coverage is available in areas where Internet connection is reasonably expected;**
- (d) **investigate and follow up on the cases of inability to connect to the GovWiFi service and access to Internet websites, and slow connection speed as identified in Audit field tests; and**
- (e) **take measures to enhance the connection to the GovWiFi service, the accessibility to the Internet websites and the connection speed (particularly for outdoor premises), where appropriate.**

## Response from the Administration

3.14 The Government Chief Information Officer agrees with the audit recommendations. He has said that the OGCIO will continue to explore appropriate measures such as providing users with more information on signal strength and coverage area of the premises, as well as usage guidelines and best practices to enhance their experience of using the service, in particular on outdoor premises.

## **PART 4: SECURITY OF GovWiFi SERVICE**

4.1 This PART examines the following issues relating to the security of the GovWiFi service:

- (a) usage of the encrypted channel (paras. 4.5 to 4.17); and
- (b) effectiveness of the content filtering mechanism (paras. 4.18 to 4.26).

### **Security measures**

4.2 Under the GovWiFi contracts, the contractor is required to implement appropriate security measures, including (Note 17):

- (a) data encryption service (through an encrypted channel) to safeguard against Internet threats such as hacking or attack by neighbour wireless users; and
- (b) content filtering mechanism to protect users from entering inappropriate sites, such as pornographic, obscene and gambling sites.

4.3 Members of the Legislative Council had expressed their concerns on the security of the GovWiFi service. They had urged the Government to step up publicity to enhance public awareness of information security when using Wi-Fi facilities on government premises.

---

**Note 17:** *According to the OGCIO, the contractor is also required to implement the following security measures:*

- (a) *firewall systems to protect the service and its users from cyber attacks;*
- (b) *peer-to-peer blocking to prevent users on the same premises from launching attacks or gaining illegal access to mobile devices of one another; and*
- (c) *network management measures to detect and prevent data theft through rogue access points set up within GovWiFi premises.*

## Security of GovWiFi service

---

4.4 The Government had implemented various measures to enhance public awareness of the importance of wireless security, such as:

- (a) producing announcements in the public interest, promotion videos, posters and information leaflets;
- (b) placing a set of security tips for using Wi-Fi facilities at the GovWiFi website;
- (c) promulgating best practices for deploying wireless networks in office and home environments in the Government's information security portal;
- (d) organising information security seminars in collaboration with the information technology industry; and
- (e) sponsoring the SafeWiFi Campaign since 2008 (Note 18).

## Usage of encrypted channel

4.5 Users of the GovWiFi service are provided with two Wi-Fi connection options, i.e. encrypted and unencrypted channels for connecting to the Internet. Users are advised to use the encrypted channel whenever possible for better protection of their privacy when transmitting sensitive information. If the users' mobile devices are not equipped with the required encryption function, they may use the unencrypted channel. However, in such case, users are advised to transmit only non-sensitive information or perform general web browsing only. This is because data transmission using the unencrypted channel is unprotected and hence, there is a higher risk of data interception in the course of wireless transmission.

---

**Note 18:** *The SafeWiFi Campaign aims to educate the public about the importance of Wi-Fi security and the need to set up appropriate security measures. The Campaign is organised by the Hong Kong Wireless Technology Industry Association, which is a non-profit-making trade association registered in Hong Kong.*

4.6 To use the encrypted channel, users have to set up their mobile devices and input a user name and a password provided by the GovWiFi service upon login. The user name and password are published in GovWiFi website, leaflet, signage on government premises where the GovWiFi service is provided, as well as the captive portal upon login to the unencrypted channel of the GovWiFi service (see Figure 7). They can also be obtained from the user departments or by calling the GovWiFi helpdesk.

Figure 7

### Screenshot of the captive portal upon login to the unencrypted channel



**Unencrypted Connection**  
([Recommend to use Encrypted Connection](#))

**You are now using unencrypted connection.  
To better protect your privacy, please use  
encrypted connection:**

**SSID: "freegovwifi-e"  
User-ID: "govwifi"  
Password: "govwifi"**

**Recommend to turn off automatic mobile  
Internet connections**

**Conditions of Use and Disclaimers for the Use  
of GovWiFi Facilities**

*Source: OGCIO records*

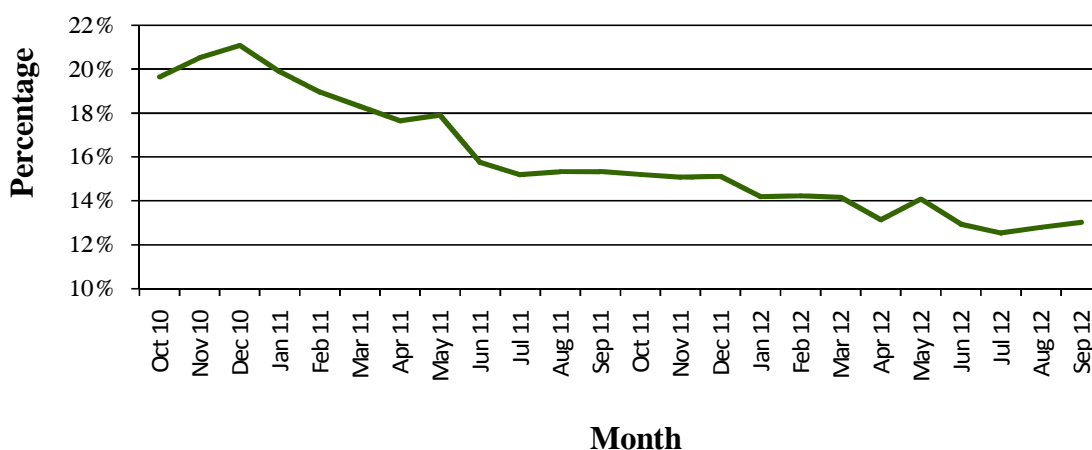
The setup procedures for encrypted connection in general are device specific and vary among different mobile devices and operating systems. Detailed setup procedures of encrypted connection for common types of operating systems are available on the GovWiFi website.

### *Low utilisation of the encrypted channel*

4.7 Notwithstanding the efforts undertaken by the Government in promoting public awareness on wireless security (see para. 4.4), Audit analysis of the monthly connection statistics of the GovWiFi service for the period October 2010 to September 2012 revealed that usage of the encrypted channel was low (constituting less than 20% of the total number of connections). Moreover, the percentage of encrypted connections decreased gradually from 20% in October 2010 to 13% in September 2012 (see Figure 8).

**Figure 8**

**Percentage of encrypted Internet connections  
(October 2010 to September 2012)**



*Source: Audit analysis of OGCIO records*

4.8 Apart from general web browsing, Audit noted that the public also use the GovWiFi service frequently for other purposes, such as communication, social networking and performing online transactions (see Table 7). These activities would involve the transmission of sensitive and private information such as personal particulars and passwords.



**Table 7**

**Purposes of using GovWiFi service  
(January to September 2012)**

Purpose	Number of respondents	Percentage of respondents
Communication (e.g. e-mail and instant messaging)	3,255	50%
Social networking (e.g. Facebook, Twitter, Weibo and blogging)	3,177	49%
General web browsing	2,603	40%
Study	2,153	33%
Entertainment (e.g. Television drama, movie, music and reading)	1,630	25%
Online transaction (e.g. electronic banking, online shopping and online bidding)	813	12%
Others	159	2%

*Source: Audit analysis of the results of OGCIO's online survey*

*Remarks: Respondents could choose more than one purpose. The respondents were those who responded to the OGCIO's online survey (see Note 10 in para. 3.2) when using the GovWiFi service.*

4.9 Audit considers that the OGCIO needs to monitor the above situations and analyse the data for identifying the possible causes for the low utilisation of the encrypted channel. It also needs to alert GovWiFi users on the risk of using the unencrypted channel for transmitting sensitive data, and encourage them to use the encrypted channel instead.

### *Audit survey on the use of encrypted channel*

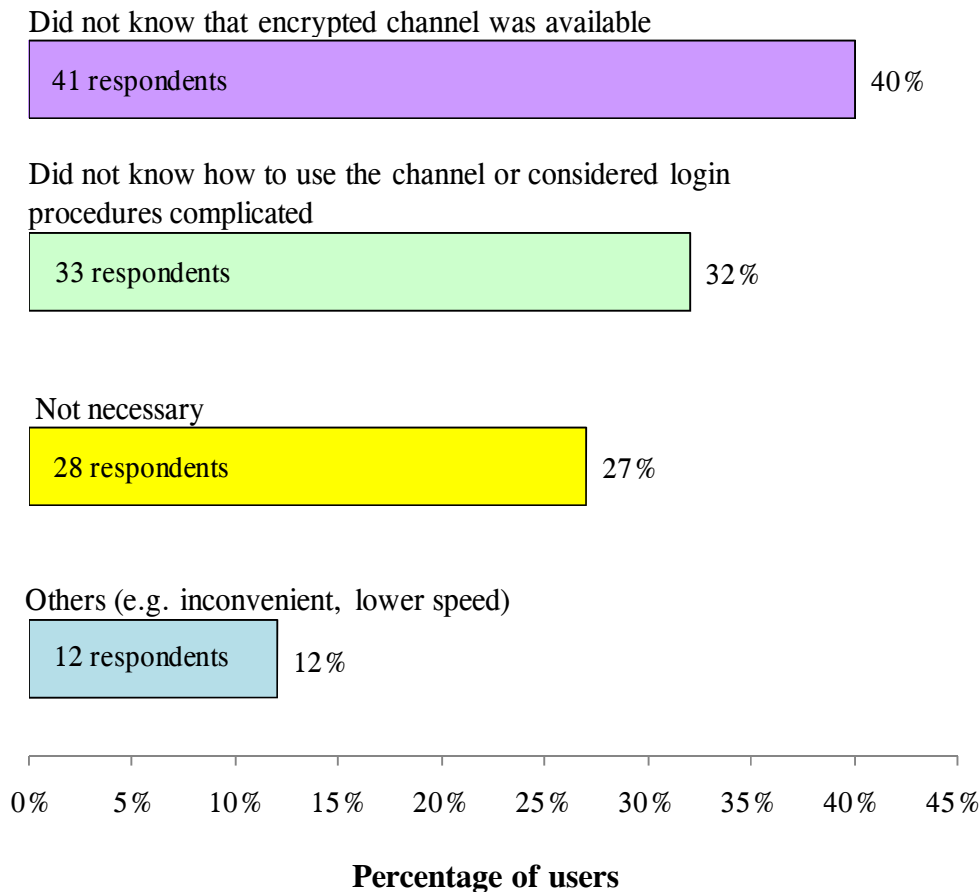
4.10 In the audit survey (see para. 1.16), GovWiFi users were asked whether they knew that encrypted Wi-Fi connections could reduce the risk of data interception in the course of wireless transmission. Of the 153 respondents who were using the GovWiFi service, 57 (37%) indicated that they did not know that encrypted Wi-Fi connections could reduce such risk.

4.11 The 153 respondents were also asked whether they were using the encrypted channel for connecting to the Internet. The findings are summarised below:

- (a) 51 (33%) respondents indicated that they were using the encrypted channel;
- (b) for the remaining 102 (67%) respondents who indicated that they were not using the encrypted channel, their reasons for not using it are analysed in Figure 9. It is worth noting that 41 (40%) of these 102 respondents did not know the availability of the encrypted channel; and

Figure 9

Reasons for not using encrypted channel



Source: *Audit survey*

Remarks: *The number of respondents does not tally 102 because some respondents gave more than one reason.*

- (c) of the 24 respondents who were tourists (including persons visiting Hong Kong for business purposes), 21 (88%) did not use the encrypted channel for Internet connection. For these 21 respondents, 12 (57%) did not know that the encrypted channel was available (see Table 8).

**Table 8**

**Analysis of usage of encrypted channel**

Analysis	Tourists	Hong Kong residents
	Number (percentage)	Number (percentage)
Encrypted channel used	3 (12%)	48 (37%)
Encrypted channel not used	21 (88%)	81 (63%)
Reasons for not using the encrypted channel (Note):		
(a) did not know that encrypted channel was available	12 (57%)	29 (36%)
(b) did not know how to use the channel or considered login procedures complicated	4 (19%)	29 (36%)
(c) not necessary	1 (5%)	27 (33%)
(d) others	4 (19%)	8 (10%)

Source: Audit survey

Note: Respondents could choose more than one answer to the question on the reasons for not using the encrypted channel.

***User-friendliness of setting up mobile devices***

4.12 Audit field tests have revealed that the setup procedures of the mobile devices for using encrypted connection are not user-friendly. Before inputting the user name and the password (see para. 4.6), users have to manually configure the network settings of the mobile devices, including the network mode, security type, authentication method and certification authority. Moreover, the method of configuring the network settings varies for different types of mobile devices and operating systems. For network configuration purpose, the OGCIO has published on the GovWiFi website setup guides for commonly used operating systems (e.g. Android, iOS and Windows). These setup guides contain step-by-step instructions guiding the users on how to set up their mobile devices for logging onto the encrypted channel.

4.13 It is not easy to perform the network configuration. For example, it takes about 6 to 10 steps to login to the encrypted channel when using smartphones. In an extreme case, 25 steps are needed when using a laptop computer.

4.14 To access the encrypted channel, users can follow the guides posted on the GovWiFi website. They can also call the contractor's helpdesk for assistance. However, both ways are cumbersome and may likely discourage users from using the encrypted channel. For example, it is inconvenient for the users to switch between the interfaces of the setup guides on the GovWiFi website and the network settings on a smartphone or tablet computer.

4.15 Audit understands that the setup procedures for encrypted connection of mobile devices are device specific as defined by their respective manufacturers. However, Audit considers that the OGCIO needs to explore the feasibility of enhancing the user-friendliness of mobile devices on the encrypted connection setting. The need is indeed supported by the result of Audit's survey. Of the 56 GovWiFi respondents (Note 19) who knew that encrypted Wi-Fi connections could reduce the risk of data interception in the course of wireless transmission but had not used the encrypted channel, 25 (45%) indicated that they did not know how to use the encrypted channel or considered the device setup procedures complicated.

### **Audit recommendations**

4.16 **Audit has recommended that the Government Chief Information Officer should:**

- (a) **monitor the utilisation of the encrypted channel of the GovWiFi service and identify the causes for its low utilisation;**
- (b) **take effective measures to improve the utilisation of the encrypted channel, such as stepping up education and publicity to raise the public's awareness of wireless security; and**

---

**Note 19:** *Of the 153 GovWiFi respondents (see para. 4.10), 96 knew that encrypted channel could reduce the risk of data interception. Of these 96 respondents, 40 used the channel and 56 did not use the channel.*

## **Security of GovWiFi service**

---

- (c) **enhance the user-friendliness of using the encrypted channel by, for example:**
  - (i) **exploring the availability of simplified procedures for commonly used mobile devices for the encrypted connection setup;**
  - (ii) **providing more guidelines on the device setup for the encrypted channel;**
  - (iii) **reminding the public of the need to properly configure their mobile devices for encrypted connection before using the GovWiFi service; and**
  - (iv) **posting the setup parameters for commonly used operating systems on government premises.**

## **Response from the Administration**

4.17 The Government Chief Information Officer agrees with the audit recommendations. He has said that the OGCIO will continue to explore more user-friendly setup procedures and guidelines on the use of the encrypted channel for reference by the users.

## Effectiveness of content filtering mechanism

4.18 The GovWiFi service has implemented content filtering mechanism to prevent users from accessing websites that may contain obscene, indecent, malicious, or illegal contents (such as pirated software or illegal gambling). The content filtering requirements are adjusted on government premises to align with their operations. For example, online gambling (such as the betting website of the Hong Kong Jockey Club) and online game websites accessible on some premises, are blocked by the GovWiFi service at public libraries.

### *Some websites were not properly blocked*

4.19 In December 2012, Audit conducted field tests on the effectiveness of the content filtering mechanism on 20 government premises (including 3 public libraries) installed with the GovWiFi service. Audit found that:

- (a) on all the 20 premises, 2 websites containing pornographic contents and 1 illegal gambling website (Note 20) were not blocked;
- (b) on 2 non-library premises, the betting website of the Hong Kong Jockey Club and an online game website were blocked although there was no requirement for them to be blocked; and
- (c) in all the 3 public libraries, an online game website (Note 20) was not blocked.

### *Inadequate follow-up action of sample checks*

4.20 On 29 November 2012, Audit staff accompanied OGCIO staff in conducting sample checks of the GovWiFi service on three government premises. The OGCIO staff tested, among other things, the content filtering mechanism of these three premises. Audit observed the following abnormalities:

---

**Note 20:** *Audit tested 2 online game websites and 5 websites containing obscene, indecent or illegal gambling contents. These websites were not the same as those used by the OGCIO for sample checks (see para. 2.5(b)).*

- (a) a website with pornographic contents was blocked when viewed on a laptop computer. However, the same website was not blocked when it was viewed on a smartphone; and
- (b) the betting website of the Hong Kong Jockey Club and an online game website were incorrectly blocked in a non-library premises.

4.21 The OGCIO informed Audit that the above abnormalities would be fixed as soon as possible and a follow-up check would be scheduled to ensure that the content filtering mechanism was working properly. However, Audit noted that up to 29 January 2013, two months after the sample checks had been conducted, the abnormalities had not yet been fixed.

4.22 In February 2013, the OGCIO informed Audit that the above abnormalities required more in-depth technical analysis. Longer time would be needed for the service provider of the content filtering mechanism to diagnose and develop fixes for the abnormalities. For the case mentioned in paragraph 4.20(a), an interim solution was applied in mid-December 2012.

4.23 While it is technically not feasible for a 100% effective content filtering, Audit considers that the OGCIO needs to follow up in a timely manner with the service provider on the necessary rectification upon reporting of any improper filtering, in order to ensure that the content filtering mechanism is operating effectively.

### ***Content filtering mechanism for mobile applications***

4.24 With the growing popularity of mobile applications (Note 21) for use on hand-held devices such as smartphones and tablet computers, access to online information is no longer restricted to the use of web browsers. Audit performed a site test and noted that by using mobile applications, the content filtering mechanism of the GovWiFi service could be bypassed. Case 2 below is an illustration.

---

**Note 21:** *Examples of mobile applications are My Observatory (developed by the Hong Kong Observatory) and WhatsApp Messenger.*



Case 2

**Making use of mobile applications to bypass content filtering mechanism**

1. In December 2012, Audit visited a public library to test the effectiveness of the content filtering mechanism. Audit accessed the website of a legal betting operator in Hong Kong on the browser of a smartphone and the website was blocked.

2. Audit then used the mobile application provided by the betting operator on the smartphone to access the website. Audit found that the contents could be displayed and bets could be placed through the GovWiFi network using the mobile application.

*Audit comments*

3. By using mobile applications on smartphones or tablet computers, the content filtering mechanism could be bypassed. The OGCIO needs to address the issue and work with the contractor on making the necessary improvements to the content filtering mechanism.

Source: *Audit field tests*

**Audit recommendations**

4.25 **Audit has recommended that the Government Chief Information Officer should:**

- (a) **take action to ensure that the content filtering mechanism is operating effectively;**
- (b) **take timely follow-up action to resolve abnormalities relating to content filtering identified during sample checks; and**
- (c) **review and update the existing content filtering mechanism in the light of the growing popularity of using mobile applications for accessing online information.**

## **Response from the Administration**

4.26 The Government Chief Information Officer agrees with the audit recommendations. He has said that:

- (a) the GovWiFi service adopts prevailing industry practices in information security and content filtering. The contractor has employed a renowned global information technology security service provider for the content filtering mechanism. The content filtering system deploys industry-recognised methodology and practices. The service provider also maintains a website for its clients as well as the general public to inquire on the classification of websites as well as offer suggestions on the classification, to facilitate rectification of incorrect filtering as far as practicable; and
- (b) the OGCIO will continue to closely monitor the work of the contractor to ensure timely follow up of incorrect filtering and the effective operation of the content filtering mechanism.

## **PART 5: PROMOTION OF GovWiFi SERVICE**

5.1 This PART examines issues relating to the promotion of the GovWiFi service.

### **Promotional activities for launching GovWiFi service**

5.2 In July 2007, GovWiFi was installed at the Hong Kong Heritage Discovery Centre for trial use. A series of promotional activities were then carried out to promote the launching of the GovWiFi service (see Table 9).

**Table 9**

**Promotional activities on GovWiFi service  
(2007 to 2009)**

<b>Date</b>	<b>Event</b>
July 2007	Opening ceremony for the commencement of the GovWiFi service and rollout of Wi-Fi facilities at the Hong Kong Heritage Discovery Centre
July to December 2007	Roving shows on various government premises, GovWiFi showcases at roadshows and GovWiFi exhibition
December 2007	GovWiFi Programme contract signing ceremony
December 2007 to January 2008	Logo and slogan competition
March 2008	Launching ceremony to mark the official rollout of the GovWiFi service and Symposium on Wireless and Mobile Services and Technology
April 2008	A booth promoting the GovWiFi service was set up at the International ICT Expo 2008 organised by the Hong Kong Trade Development Council.

## Promotion of GovWiFi service

---

Date	Event
March to June 2008	<ul style="list-style-type: none"><li>• Announcements in the public interest were produced and broadcast on various television and radio channels.</li><li>• Printed and online advertisements were placed at newspapers, magazines, public transports and online websites.</li><li>• The GovWiFi service was promoted on the websites of the Hong Kong Airport Authority and the Hong Kong Tourism Board. Leaflets were distributed at their customer service counters. A promotion video was broadcast at the television screens of the airport terminals in the period March to June 2008.</li></ul>
November 2008	A booth promoting the GovWiFi service was set up at the Science in the Public Service — Fun Fair organised by the Hong Kong Observatory.
June 2009	A booth promoting the GovWiFi service was set up at the Ubiquitous City — Hong Kong Fun Fair.

*Source: OGCIO records*

5.3 In December 2012, the OGCIO held a launching ceremony to publicise the implementation of the Next Generation GovWiFi Programme (see para. 1.10). New printed materials, posters and signs were produced for distribution and posting on government premises. A promotion video was also created for showing on the GovWiFi website.

## Promoting GovWiFi service on government premises

5.4 To promote the GovWiFi service and to indicate its availability on the government premises, the OGCIO requested the user departments to post GovWiFi signage (e.g. posters, stickers and tent cards) at eye-catching locations of the premises such as entrance, poster boards and walls. Examples of the signage are shown at Photographs 1 and 2. Information leaflets were delivered to government premises and offices for collection and reference by the public. The OGCIO also reminded the user departments of the need to provide continuous support to the GovWiFi service by posting signages to inform visitors about the availability of GovWiFi on their premises.

Photographs 1 and 2

Examples of GovWiFi signage

Photograph 1



A signage posted at the seating area outside a cultural venue

Photograph 2



A signage posted at the entrance of a cooked food market

Source: Photographs taken by Audit in January 2013

## Promotion of GovWiFi service

---

5.5 The posting of signage at conspicuous area is a convenient and effective way of informing visitors that the GovWiFi service is available on the premises. In January 2013, Audit performed field visits to the 20 premises (see Table 3 in para. 3.4) to ascertain whether signages were properly posted. Audit noted a number of cases where there was scope for improving the posting of signages. Examples are:

- (a) there were no signages in the seating areas in several public parks (such as Quarry Bay Park, Victoria Park, Kowloon Park and Po Hong Park) indicating the availability of GovWiFi;
- (b) there were no signages posted at the main entrance and grandstand, and within the area of the arena and squash court in the Mei Lam Sports Centre; and
- (c) signages were posted in non-covered area (i.e. area where there was no Wi-Fi coverage) in Po Hong Park.

Case 3 illustrates the areas where posting of signages on a large premises can be improved.

Case 3

GovWiFi signage posted at City Art Square

1. On a Saturday in January 2013, Audit visited City Art Square in Shatin. Figure 10 shows the GovWiFi coverage and the locations of GovWiFi signages at the Square. Audit noted that:

- (a) the five signages were not posted at eye-catching locations. Instead, they were posted at places where traffic of people was limited (see locations A, C and E in Figure 10); and
- (b) of the five signages, two signages were posted in non-covered areas (see locations B and D in Figure 10).

2. The City Art Square is a place where people congregate and attend regular exhibitions and outdoor events. However, the audit survey (see para. 1.16) showed that:

- (a) instead of using the GovWiFi service, 24 (89%) of the 27 respondents were using the Internet connection services provided by telecommunications companies on the premises; and
- (b) of these 24 respondents, 16 (67%) did not know that the GovWiFi service was available at the Square.

*Audit comments*

3. To promote and facilitate the usage of the GovWiFi service, the OGCIO needs to urge user departments to ensure that:

- (a) GovWiFi signages are posted at noticeable positions of the coverage areas; and
- (b) no signages are posted in non-covered areas (in order not to misinform the users).

Source: *Audit site visit in January 2013*

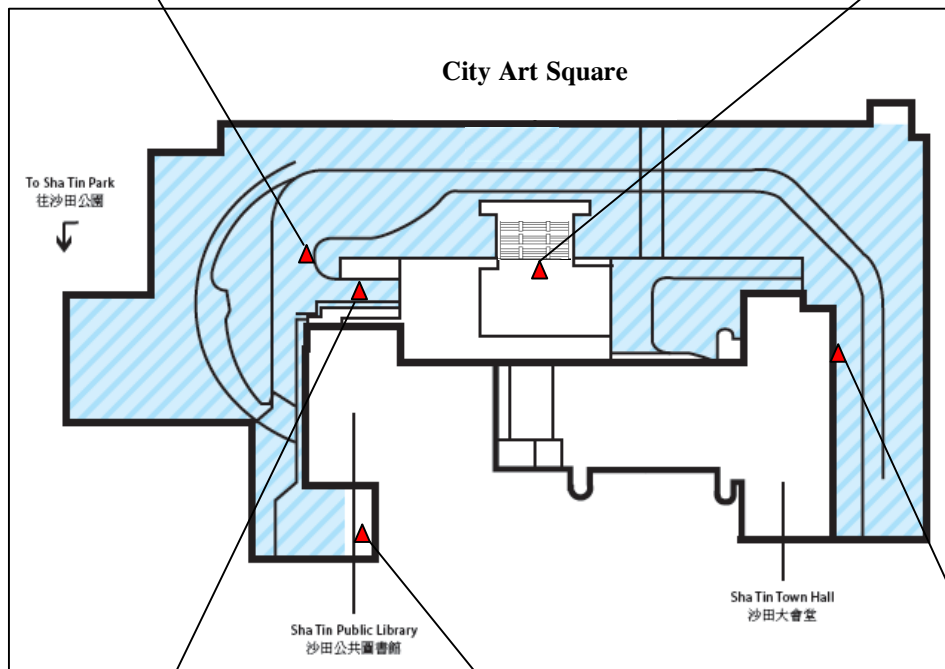
Figure 10

GovWiFi coverage and locations of GovWiFi signages in City Art Square, Shatin





Location A



Location B



Legend:

-  GovWiFi coverage area
-  Signage location
-  GovWiFi signage
-  Staircase

Location C



Location D



Location E



Source: OGCIO records and photographs taken by Audit in January 2013



## Awareness of availability of GovWiFi service

5.6 In the audit survey, Audit asked 454 respondents (see para. 1.16) on their awareness of the availability of the GovWiFi service. Audit noted that:

- (a) 139 respondents said that they did not know that there was GovWiFi service available. Nevertheless, of these 139 respondents, 111 said that they would use GovWiFi in future;
- (b) for some premises, over 50% of the respondents (e.g. 20 of 35 respondents at the China Ferry Terminal and 18 of 34 respondents at the Tsim Sha Tsui Promenade) were not aware that the GovWiFi service was available there; and
- (c) of the 139 respondents, 59 considered that the Government needs to increase the efforts in promoting the GovWiFi service.

5.7 Based on the results of the audit field visits and survey, Audit considers that there is scope for the OGCIO to reinforce its promotion efforts and inform visitors of government premises the availability of the GovWiFi service.

## Audit recommendations

5.8 **Audit has recommended that the Government Chief Information Officer should:**

- (a) **step up the promotion of the GovWiFi service;**
- (b) **in collaboration with the user departments, identify GovWiFi coverage areas where improvement in display of signages is needed, and take action to improve the display;**
- (c) **regularly remind the user departments of the need to ensure the adequate publicity of the GovWiFi service; and**
- (d) **regularly engage the user departments to visit government premises to ensure proper display of signages.**

## **Response from the Administration**

5.9 The Government Chief Information Officer agrees with the audit recommendations. He has said that the OGCIO has set up a Maintenance Board with participation of major user departments as members, to strengthen engagement of user departments in managing the ongoing development and maintenance of the service, including the wider promotion of the service on the premises.

## **PART 6: FUTURE DEVELOPMENT OF GovWiFi SERVICE**

6.1 This PART provides an overview of the development of the GovWiFi service.

### **Provision of GovWiFi service**

#### *Selection of government premises*

6.2 To ensure cost-effectiveness, the GovWiFi service is provided on government premises with high public patronage based on the number of visitors of the respective premises. The OGCIO adopts the following criteria in selecting premises:

- (a) all public libraries, public enquiry service centres and job centres;
- (b) indoor premises with daily number of visitors of 300 or above;
- (c) joint-user buildings with daily number of visitors of 1,000 or above;
- (d) outdoor premises with daily number of visitors of 5,000 or above; and
- (e) premises of strategic values in meeting the service objectives, including promoting Hong Kong's image, addressing urgent and imminent problems of Hong Kong, or facilitating e-service delivery or business operations of departments.

6.3 In estimating the usage of GovWiFi on these government premises, the OGCIO assumed that on a daily basis:

- (a) 5% of the visitors to government indoor premises (including public libraries, public enquiry service centres and job centres) would use the GovWiFi service; and
- (b) 3% of the visitors to joint-user buildings and outdoor premises would use the GovWiFi service.

Accordingly, the OGCIO estimated that there would be 21,000 GovWiFi users per day after the full roll out of the service in June 2009 (see para. 1.7).

## Future development of GovWiFi service

---

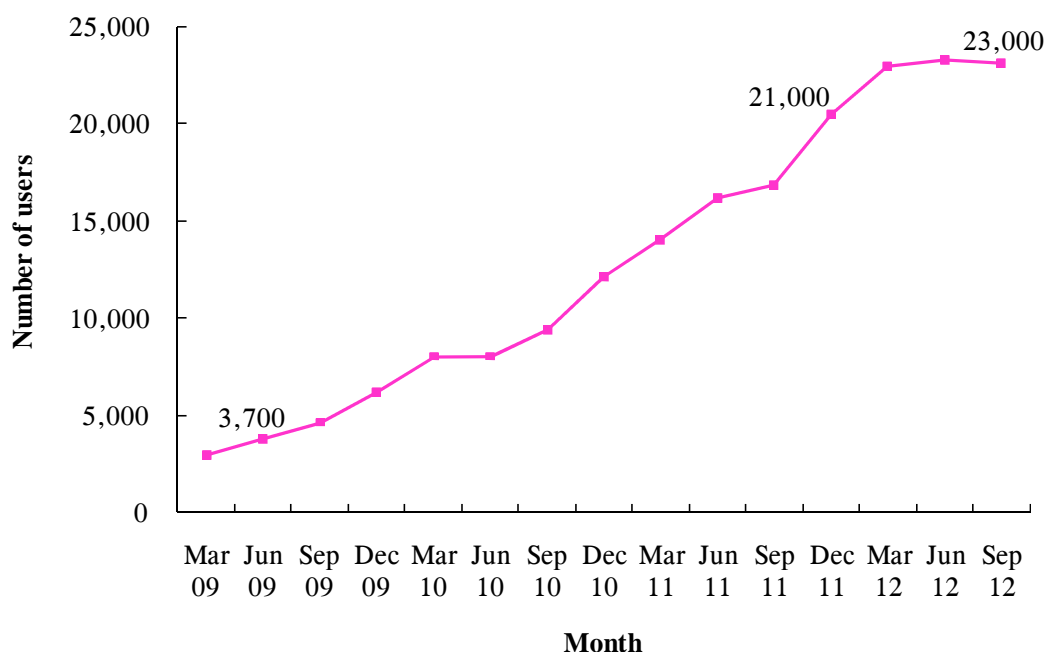
### *Government premises with low GovWiFi usage*

6.4 Figure 11 shows the average number of daily users in the period March 2009 to September 2012 (Note 22). As shown in the Figure:

- (a) the average number of daily users was about 3,700 in June 2009, when the GovWiFi service was fully rolled out on around 350 premises;
- (b) the average number of daily users was gradually increasing. The target of 21,000 was achieved in December 2011 — two and a half years after the GovWiFi service was fully rolled out; and
- (c) the number of daily users has become steady at around 23,000 since March 2012.

**Figure 11**

**Average number of daily users of GovWiFi service  
(March 2009 to September 2012)**



*Source: Audit analysis of OGCIO records*

---

**Note 22:** *As at the time of audit in November 2012, only information up to September 2012 was available.*

## Future development of GovWiFi service

---

Audit noted that, in the past three years from September 2009 to September 2012, 108 government premises had average number of daily users below 15 (Note 23). Details are shown in Table 10.

**Table 10**

**Number of premises with less than 15 users a day  
(September 2009 to September 2012)**

Type of premises	Number
Community hall, centre and complex	37
Public enquiry service centre (Note)	20
Government joint-user building and office	17
Job centre (Note)	11
Public library (Note)	10
Visitor/tourist centre	6
Cultural and recreational centre	3
Integrated family service centre	2
Sports centre	1
Cooked food centre	1
Total	108

*Source:* Audit analysis of OGCIO records

*Note:* According to the OGCIO, for these types of government premises, the GovWiFi service is provided for all premises of the same type in order to maintain service consistency.

*Remarks:* Audit calculated the average number of daily users for March, June, September and December in the period September 2009 to September 2012 of the premises. Audit noted that for 108 premises, the average number of daily users in all these months was less than 15.

---

**Note 23:** The number is arrived at as follows:  
 $300 \text{ visitors (see para. 6.2(b))} \times 5\% \text{ (see para. 6.3(a))} = 15 \text{ visitors}$

## **Future development of GovWiFi service**

---

### ***Extending service to more government premises***

6.5 The OGCIO plans to extend the GovWiFi service to about 40 government premises in 2013. The justifications were mainly based on the prevailing criteria (see para. 6.2). While increase in the number of premises would allow the public to have access to free GovWiFi on more government premises, Audit considers that the OGCIO needs to take measures (e.g. by conducting field surveys) to assess more accurately the estimated number of GovWiFi users on these premises. The reasons are:

- (a) 108 (27%) of around 400 existing premises had an average number of daily users (see para. 6.4) lower than 15;
- (b) the average cost per Wi-Fi connection on some premises could be expensive, say over \$50 (see Table 11);

## Future development of GovWiFi service

**Table 11**

**Average cost per connection for government premises  
with GovWiFi service  
(from commencement of service up to November 2012)**

Average cost per connection (Note 1)	Number of premises	Percentage
> \$100	4 (Note 2)	1.0%
> \$50 to \$100	10 (Note 2)	2.5%
> \$20 to \$50	22	5.6%
> \$10 to \$20	38	9.6%
> \$5 to \$10	105	26.6%
< \$5 to \$5	216	54.7%
Total	395	100.0%

*Source: Audit analysis of OGCIO records*

*Note 1: For each government premises:*

*Average cost per connection = Total cost ÷ Total number of connections from the provision of the GovWiFi service on the premises up to November 2012*

*Total cost included a one-off installation charge, services charges (e.g. for relocation service and on-site support service) and the monthly Internet connection charge incurred up to November 2012. The overall average cost per connection for all premises was \$3.4.*

*Note 2: Due to low usage, the GovWiFi service on 2 of 14 premises, namely the Tuen Mun (South) Integrated Family Service Centre and the Tsz Wan Shan Community Hall, ceased in December 2012.*

- (c) according to the OGCIO, to maintain service consistency (e.g. across public libraries) and enable the public to enjoy free Wi-Fi, government departments were reluctant to cease Wi-Fi service once it had been installed despite experiencing low usage; and

## Future development of GovWiFi service

---

- (d) the public have the option of using the mobile data services of telecommunications companies, which is becoming increasingly popular (see paras. 6.10 and 6.11).

### *Towards a wireless city*

6.6 By providing free Wi-Fi facilities on selected government premises and in concert with other Wi-Fi initiatives in the private sector (Note 24), the Government aims to build Hong Kong as a wireless city (see para. 1.5). Besides the GovWiFi service, public bodies, such as the Housing Authority, have also provided free Wi-Fi facilities on their premises (Note 25).

6.7 Respondents to the audit survey welcomed the provision of the GovWiFi service. Of the 454 respondents:

- (a) 295 (65%) said that the Government should increase the number of premises with Wi-Fi facilities; and
- (b) 234 (52%) said that the Government should continue to provide free service and enhance the service quality.

6.8 Similar to the situation in Hong Kong, Audit research indicated that the governments of international cities, such as Singapore and London, also provide free Wi-Fi service to the public. Their Wi-Fi coverage includes most of the public areas, with some even extend to commercial venues through partnership with commercial operators (see Appendix C). Taking into account the practices of international cities, Audit is of the view that the Government could consider providing free public Wi-Fi service to the following venues:

---

**Note 24:** *In the private sector, more than 13,000 hotspots have been set up at places like commercial malls, fast food chains and payphone kiosks.*

**Note 25:** *Free Wi-Fi service is provided by two telecommunications companies at over 150 public rental estates and about 30 shopping centres of the Housing Authority. It is also available at selected Mass Transit Railway stations.*



## Future development of GovWiFi service

---

- (a) *public hospitals, clinics and health centres.* At present, public hospitals and clinics of the Hospital Authority and health centres of the Department of Health are not installed with Wi-Fi (Note 26). Nonetheless, Audit's enquiries revealed that many private hospitals provide free Wi-Fi service on their premises;
- (b) *post offices.* The Hong Kong Post manages post offices with high public patronage (e.g. the General Post Office). It also delivers a popular e-government service — Mail Tracking. However, in early 2011, in preparing for the launch of the Next Generation GovWiFi Programme, trading fund departments such as the Hong Kong Post were not covered by the Programme because they were financially autonomous. Subsequently in April 2012, the Programme Steering Committee (see para. 1.14) approved the inclusion of some selected premises of trading fund departments in the new Programme as it could better serve the public. However, the Hong Kong Post was still not invited; and
- (c) *tourist spots.* Audit's research indicated that some international cities are extending the provision of free public Wi-Fi in tourist districts (Note 27). Given that tourism is an important service industry of Hong Kong, the Government needs to proactively identify more government premises in major tourist spots (e.g. sightseeing spots such as the Giant Buddha on Lantau Island and shopping districts such as the Jade Market in Yau Ma Tei) for inclusion in the GovWiFi service. According to the audit survey, tourists were positive about the GovWiFi service. Of the 39 tourists interviewed:
- (i) 24 (62%) used the GovWiFi service, with 15 of them rated the GovWiFi service as satisfactory or very satisfactory; and
  - (ii) 19 (49%) considered that the Government should increase the number of locations with free Wi-Fi service.

---

**Note 26:** *The Government needs to liaise with and encourage the Hospital Authority about the installation of Wi-Fi at public hospitals.*

**Note 27:** *For example, in late 2012, the Thailand government launched a project "ICT Free Wi-Fi for Tourism" to provide free Wi-Fi in tourist districts.*

## Future development of GovWiFi service

---

### *Other Internet connection services*

6.9 Besides the GovWiFi service, commercial organisations also provide free public Wi-Fi services. Audit compared the connection speed of the GovWiFi service with these services and noted that the download speed of the GovWiFi service was on the low side (see Table 12).

**Table 12**  
**Connection speed of free public Wi-Fi services**  
**(December 2012)**

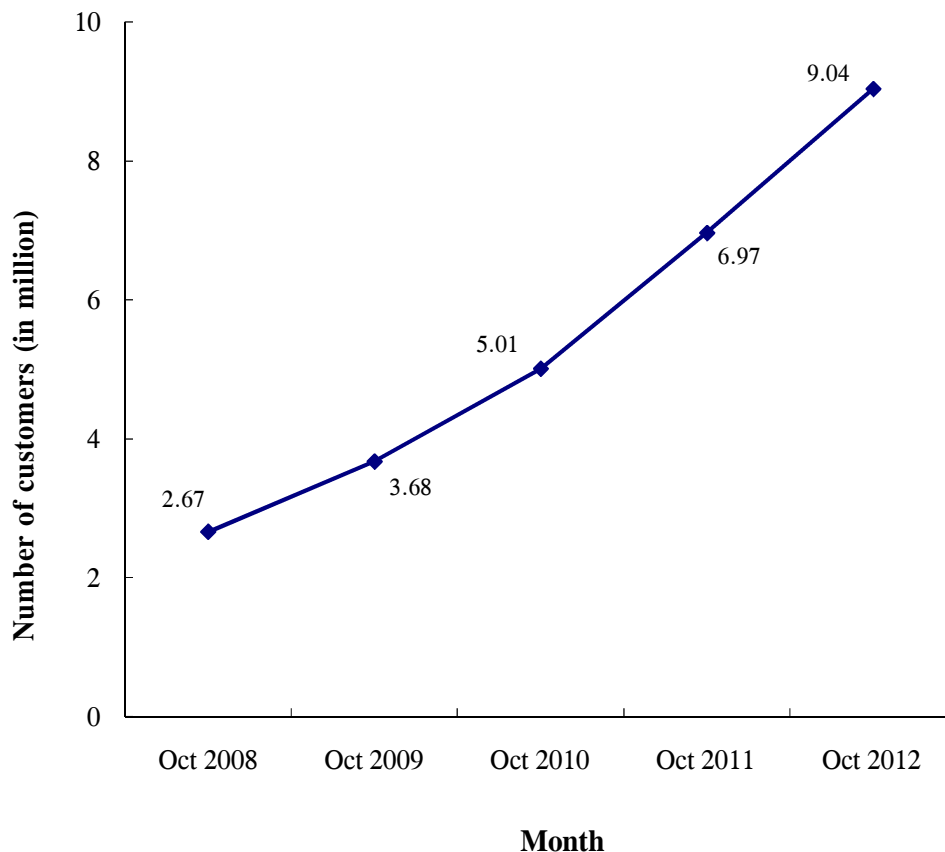
<b>Location of free public Wi-Fi services</b>	<b>Download speed (Mbps)</b>	<b>Upload speed (Mbps)</b>
A Mass Transit Railway station	6.74	11.82
A shopping mall	5.72	0.97
Waiting room of a ferry pier	4.54	0.70
A fast food chain store	4.46	0.86
The Hong Kong International Airport	1.81	6.56
GovWiFi (based on Audit's field tests on 10 indoor premises)	1.55	1.92

*Source: Audit field tests*

6.10 The proliferation of mobile devices and mobile data services (for accessing the Internet) offered by telecommunications companies in recent years has a direct impact on the usage of the GovWiFi service. According to the Office of the Communications Authority, the number of 3G/4G customers had tripled in the four years between October 2008 and October 2012 (see Figure 12).

Figure 12

Number of 3G/4G customers in Hong Kong  
(October 2008 to October 2012)



Source: Office the Communications Authority's records

6.11 Mobile phone subscription plans (which include mobile data usage for Internet connection) of telecommunications companies are very competitive nowadays. Instead of using the GovWiFi service, visitors to government premises might still prefer to use the mobile data services of telecommunications companies for Internet connection. This has been confirmed by the findings of the audit survey:

## **Future development of GovWiFi service**

---

- (a) 162 of the 454 respondents (36%) knew the availability of the GovWiFi service on the premises but still used the services of telecommunications companies. A great majority of them considered that the services of these companies were better (in terms of connection stability and speed) and it was more convenient to connect to the Internet through the services; and
- (b) 246 of the 454 respondents (54%) had experience of using both the GovWiFi service and the Internet connection services of telecommunications companies. Most of them considered the latter had provided a better service.

### ***Overview on GovWiFi service***

6.12 As indicated by the results of the audit survey, the quality of the GovWiFi service in general was up to a satisfactory standard. Nevertheless, as mentioned in PARTs 2 to 5 of this Audit Report, there was scope for further improving the service, if the Government is to achieve its aim of building Hong Kong a city with ubiquitous wireless access.

6.13 In the longer term, the OGCIO is facing the challenge of how best to take forward the development and enhancement of the GovWiFi service and to run the service more cost-effectively, taking into account the issues mentioned in paragraphs 6.4 to 6.11. Taking advantage of the proliferation and generally better services offered by mobile data services as well as other free public Wi-Fi services provided on commercial/public premises (see paras. 6.9 to 6.11), GovWiFi can complement these developments by focusing its effort on those premises with high demand, hence making the service more cost-effective. In Audit's view, as the Finance Committee of the Legislative Council approved the funding for the GovWiFi Programme on the basis that free Wi-Fi Internet connection service is to be provided on government premises with high public patronage, the OGCIO needs to keep a close watch on government premises where the usage is low, and to extend and expand the service at places where demand could be large, for example at public hospitals and more tourist spots.

## **Audit recommendation**

6.14 **Audit has *recommended* that the Government Chief Information Officer should take on board the audit recommendations in this Audit Report and conduct a strategic review to determine the way forward of the GovWiFi service.**

## **Response from the Administration**

6.15 The Government Chief Information Officer agrees with the audit recommendation. He has said that:

- (a) the current average bandwidth provision for each user at 1 to 2 Mbps is considered sufficient for free and general Internet usage including common video streaming services, while maintaining cost-effectiveness in keeping the overall service cost at an economic level of \$3.4 per connection on average;
- (b) the OGCIO welcomes the development of more mobile data services and Wi-Fi services provided by the private sector, which complements the objective of the GovWiFi Programme to build Hong Kong as a wireless city through the concerted effort of the public and private sectors; and
- (c) the OGCIO will take forward a strategic review in collaboration with the user departments, with a view to determining the future direction of public Wi-Fi service.

## **Details of audit survey**

### **Objectives**

The survey aimed to gauge the public's views on, and their experience of using, the GovWiFi service.

### **Survey period**

The survey was conducted in December 2012.

### **Selection of government premises**

Audit staff conducted the survey on 15 government premises which were installed with the GovWiFi service and number of daily users ranged from 140 to 1,300. These premises included public libraries, cooked food centres and a cooked food market, ferry terminals, government building, parks and tourist spots, as follows:

	<b>Government premises selected for audit survey</b>
1	China Ferry Terminal
2	City Art Square
3	Fa Yuen Street Public Library
4	Hong Kong Central Library
5	Hong Kong Cultural Centre
6	Hong Kong Cultural Centre Piazza cum Tsim Sha Tsui Promenade
7	Hong Kong - Macau Ferry Terminal (Inner pier passenger departure waiting hall)
8	Kowloon Park
9	Mong Kok Cooked Food Market
10	Peak Road Garden
11	Registration of Persons - Hong Kong Office, Immigration Department
12	Sha Tin Public Library
13	Tai Po Hui Market Cooked Food Centre
14	Victoria Park
15	Yue Wan Market Cooked Food Centre

**Selection of respondents**

Audit staff interviewed people who were using mobile devices (such as notebook computers and smartphones) for connection to the Internet at the time of the survey. The people were asked to provide their comments on, and experience of using the GovWiFi service, in the survey questionnaire. Audit successfully interviewed 454 people in total.

**Content of survey questionnaire**

The questionnaire covered the following aspects:

- (a) the respondents' usage of the GovWiFi service for connection to the Internet;
- (b) the respondents' usage of encrypted connection under the GovWiFi service;
- (c) the respondents' level of satisfaction with the GovWiFi service; and
- (d) the respondents' opinion on the development of the GovWiFi service.

**Distribution of respondents**

The distribution of the 454 respondents was as follows:

Respondent	Number
Local resident	
Employed	193
Students	132
Retired	8
Others	21
Non-local resident (e.g. domestic helper)	
Employed	49
Students	9
Others	3
Tourist (including person visiting Hong Kong for business purpose)	39
Total	454

**20 government premises selected for audit field tests  
(December 2012)**

<b>Indoor government premises</b>	
1	Chai Wan Public Library
2	Harbour Building (Ground floor and first floor)
3	Hong Kong Science Museum
4	Immigration Tower (Ground floor and first floor)
5	Islands District Office — Cheung Chau Public Enquiry Service Centre
6	Kowloon Public Library
7	Ma On Shan Public Library
8	Mei Lam Sports Centre
9	Sheung Wan Market Cooked Food Centre
10	Tai Po Community Hall
<b>Outdoor government premises</b>	
11	City Art Square
12	Hong Kong Cultural Centre Piazza cum Tsim Sha Tsui Promenade
13	Hong Kong Park
14	Kowloon Park
15	Po Hong Park
16	Quarry Bay Park
17	Sai Kung Waterfront Park
18	Victoria Park
19	Yuen Long Park
20	Yuen Po Street Bird Garden



**Free Wi-Fi services provided in some overseas cities**

	<b>Singapore</b>	<b>Taipei</b>	<b>London</b>
<b>Programme name</b>	The Wireless@SG	Taipei Free	The Cloud's City Wi-Fi network
<b>Coverage area</b>	Community and country clubs, shopping centres, fast food chains, public hospitals and clinics, libraries, parks and tourist spots	(a) Indoor public areas including City Hall, administrative centres, Taipei City Hospital, health service centres, Taipei Mass Rapid Transit stations and Taipei City Mall  (b) Outdoor public areas including main roads, residential and commercial districts and densely populated areas	(a) 95% of the city's outdoor areas  (b) Installed on street fixtures such as street lighting poles and CCTV masts  (c) Cafes, restaurants, stations, stadiums, hospitals and clinics, post offices and shopping centres
<b>Number of Wi-Fi locations/hotspots</b>	over 1,200 locations	over 6,000 hotspots	about 15,000 hotspots
<b>Bandwidth per user</b>	1 Mbps	1 Mbps	2 Mbps
<b>Commencement year</b>	2007	2011	2006
<b>Tariff for use</b>	Free (till March 2013) for basic use, chargeable for higher usage	Free	Majority of venues are free
<b>Pre-registration</b>	Yes	Yes	Yes

Source: Audit's research

**Acronyms and abbreviations**

Audit	Audit Commission
EMSD	Electrical and Mechanical Services Department
GovWiFi	Government Wi-Fi
IEEE	Institute of Electrical and Electronics Engineers
Mbps	Megabits per second
OGCIO	Office of the Government Chief Information Officer