CHAPTER 8

Office of the Government Chief Information Officer
Customs and Excise Department
Department of Health
Environmental Protection Department
Fire Services Department
Highways Department
Leisure and Cultural Services Department
Water Supplies Department

Procurement and inventory management of ICT products and services

Audit Commission
Hong Kong
5 April 2016

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. 66 of the Director of Audit contains 8 Chapters which are available on our website at http://www.aud.gov.hk

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PROCUREMENT AND INVENTORY MANAGEMENT OF ICT PRODUCTS AND SERVICES

Contents

PROCUREMENT AND INVENTORY MANAGEMENT OF ICT PRODUCTS AND SERVICES

Executive Summary

1. The Government leverages on information and communications technology (ICT) to improve the operational efficiency of government bureaux and departments (B/Ds) as well as the quality and cost-effectiveness of public services. The responsibility for overseeing the use of ICT in the Government rests with the Government Chief Information Officer, who heads the Office of the Government Chief Information Officer (OGCIO). In the ten-year period from 2005-06 to 2014-15, the total amount of the Government's ICT expenditure increased by 48.9% from $2,805 million to $4,176 million.

2. The Audit Commission (Audit) has recently conducted a review of the Government's procurement and inventory management of ICT products and services. The review also included the provision of mobile applications (apps) by B/Ds. Audit selected: (a) four government departments (i.e. the OGCIO, the Customs and Excise Department (C&ED), the Environmental Protection Department (EPD) and the Highways Department (HyD)) for review of procurement and inventory management of ICT products and services; and (b) another four departments (i.e. the Department of Health, the Fire Services Department, the Leisure and Cultural Services Department and the Water Supplies Department) for review of the provision of apps.

Procurement of ICT products and services

3. ***E-Procurement programme.*** In December 2013, the full function of e-Procurement, which was developed by the OGCIO, was ready for use by B/Ds to procure stores and non-construction services (including ICT products and services). Up to 31 October 2015, $80.1 million had been spent for the development and implementation of e-Procurement. Up to late December 2015, however, only 10 of the some 70 B/Ds of the Government had implemented the full function of e-Procurement (paras. 2.4, 2.8 and 2.10).

4. ***Procurement practices.*** For each of the four departments (see para. 2(a)), Audit examined 20 procurement cases conducted in the period from 2012-13 to 2014-15. Audit noted that: (a) instead of consolidating purchases to achieve better economies of scale, the C&ED and the EPD divided procurement of $2.1 million and $4.6 million respectively into two and six separate purchases; and (b) in a procurement, in order to fulfil the procurement requirements stipulated by the OGCIO and the Government Logistics Department (GLD) (e.g. the quoted values of trade-in items should not be lower than the approved minimum values), the HyD ended up paying more for the goods it procured (paras. 2.3 and 2.17 to 2.21).

5. ***Performance information and replacement strategy.*** The OGCIO publishes on its website the Government's annual expenditure on ICT to demonstrate the extent to which the Government is committed to and making progress on e-Government services. Audit found that there were large discrepancies between the ICT expenditure of some B/Ds included in the expenditure published by the OGCIO and the actual ICT expenditure of these B/Ds. For example, the HyD's actual ICT expenditure had been understated by $23.8 million (74%). Audit also noted that of the four departments, only the OGCIO had planned and replaced its obsolete computers and related software on a continual basis. The OGCIO could consider issuing guidelines to B/Ds to help them draw up replacement strategies for their ICT products (paras. 2.28, 2.29, 2.35 and 2.36).

Control of ICT inventories

6. ***ICT inventory control.*** In the period from May to October 2015, Audit conducted a total of 12 stocktakes at selected operational units of the four departments. Audit found that: (a) up to 30 November 2015, 107 (11%) of 1,009 selected ICT inventory items had not been located by the departments concerned. The cost of these missing items amounted to some $451,000; (b) 32 (30%) of the 107 missing items were embedded with data storage devices (e.g. personal computers), the loss of which could be a breach of security according to the Security Regulations; and (c) the ICT inventory records of the C&ED, the EPD and the HyD were not properly kept. For example, 1,840 items were recorded as being kept by the Departments' Information Technology Management Units, but 1,523 (83%) of them had in fact been traded-in or were kept by other units (paras. 3.4 to 3.6, 3.9 and 3.11).

7. ***Computerised inventory control systems.*** Of the four departments, the HyD was the only department that had not computerised its inventory control system. This could be a reason why many of the HyD's inventory items were found missing and a long time (up to six months after Audit's stocktakes) was taken to locate some of the items. Audit reviewed the computerised inventory control systems of the C&ED, the EPD and the OGCIO and found that there was room for improvement. For example, while the C&ED had a computerised inventory control system, it still largely relied on its manual system for inventory control purposes. Furthermore, there were large discrepancies between the inventory records of the C&ED's computerised inventory control system and those of its manual system (paras. 3.5(c), 3.7 and 3.23).

Disposal of ICT products

8. ***ICT disposal strategies.*** Keeping ICT products in storage pending disposal is costly because they quickly lose value and unjustifiably occupy valuable office space. A disposal strategy, covering such matters as conducting ageing analysis of ICT inventories and periodic reviews of their condition and serviceability, would help the management dispose of obsolete inventories in a timely and systematic manner, thereby generating higher residual values on disposal. For each of the four departments, Audit examined 20 disposal cases conducted in the period from 2012-13 to 2014-15. Audit found that in general the departments did not have in place ICT disposal strategies to facilitate timely disposal decisions. For example, some obsolete ICT products with a cost of some $3.8 million could have been disposed of by the OGCIO in early 2008 were not brought up for disposal until 2015 (paras. 4.5 and 4.6).

9. ***Donation of ICT products.*** In September 2009, the EPD started a scheme to donate old ICT products for green and charitable purposes. Up to 30 September 2015, the EPD had made 65 donations, involving a total of some 3,600 items of ICT products with a cost of $10.7 million. Audit noted that: (a) some 1,300 items of unserviceable ICT products should have been sold to the GLD disposal term contractors in accordance with the Stores and Procurement Regulations (SPRs); and (b) all the donations were only made to one non-governmental organisation (paras. 4.14 and 4.15).

Provision of apps

10. Government apps have been developed at a fast rate. As at 31 August 2015, 127 apps were launched. Audit examined the apps of four departments (see para. 2(b)). Audit found that: (a) the mobile device features of some apps were limited and were virtually duplications of the websites of B/Ds; (b) 15 apps had not been listed on the OGCIO's "GovHK Apps" and the GovHK website, which are centralised platforms for enabling the public to be aware of the availability of government apps; and (c) as at 31 August 2015, of the 31 apps developed for one-off events, 23 had already been decommissioned. The total development cost of the decommissioned apps amounted to some $2.6 million. The number of downloads of some apps for one-off events had been on the low side (paras. 5.6 to 5.8, 5.13 and 5.14).

Audit recommendations

11. **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:**

Procurement of ICT products and services

(a) **identify the reasons why the majority of B/Ds had not implemented the full function of e-Procurement and take measures to attract more B/Ds to implement the full function (para. 2.15(a) and (b));**

(b) **in collaboration with the Director of Government Logistics:**

(i) **remind B/Ds periodically the need to comply with the procurement requirements (para. 2.23(a)); and**

(ii) **conduct a review of the procurement requirements to ascertain whether certain requirements (e.g. the "minimum trade-in value requirement") need to be revised to provide more flexibility in conducting procurements (para. 2.23(b));**

(c) **take measures to enhance the accuracy of the Government's ICT expenditure reported on the OGCIO's website (para. 2.37(a));**

(d) **consider issuing guidelines to B/Ds to facilitate their drawing up of replacement strategies for ICT products (para. 2.37(c));**

Provision of apps

(e) **take measures to ensure the completeness of government apps listed on "GovHK Apps" and the GovHK website as far as possible (para. 5.19(a));**

(f) **promulgate the criteria for justifying the development of apps for one-off events (para. 5.19(b)); and**

(g) **in the light of the audit recommendations, promulgate guidelines on the provision of government apps (para. 5.27(a)).**

12. **Audit has also *recommended* that:**

Procurement of ICT products and services

(a) **the Commissioner of Customs and Excise and the Director of Environmental Protection should take measures to ensure that in procuring ICT products and services, the procurement requirements are observed (para. 2.22);**

Control of ICT inventories

(b) **the Commissioner of Customs and Excise, the Director of Environmental Protection, the Director of Highways and the Government Chief Information Officer should:**

(i) **for those ICT inventory items which could not be located, institute the procedures (e.g. write-off) stipulated in the Financial Circular No. 7/2003 and SPRs (para. 3.13(b)); and**

(ii) **for those lost ICT inventory items which have embedded data storage devices, take remedial measures as stipulated in the Security Regulations (para. 3.13(c));**

(c) **the Commissioner of Customs and Excise, the Director of Environmental Protection and the Director of Highways should take measures to ensure that the inventory records are properly kept and updated (para. 3.14);**

(d) **the Director of Highways should establish a computerised inventory control system to improve the management of the HyD's inventories (para. 3.24);**

(e) **the Commissioner of Customs and Excise, the Director of Environmental Protection and the Government Chief Information Officer should enhance their computerised inventory control systems (paras. 3.25 to 3.27);**

(f) **the Director of Government Logistics should:**

(i) **take measures to regularly remind B/Ds of the need to maintain inventory records up-to-date (para. 3.16); and**

(ii) **promote the use of computerised inventory control system by B/Ds for more timely recording and better control of inventories (para. 3.28(b));**

Disposal of ICT products

(g) **the Commissioner of Customs and Excise, the Director of Environmental Protection, the Director of Highways and the Government Chief Information Officer should conduct a review of their ICT inventories to identify inventory items that are due for disposal, and dispose of the obsolete inventory items in a timely and systematic manner (para. 4.7(a) and (b));**

(h) **the Director of Environmental Protection should:**

(i) **take measures to ensure compliance with the SPRs in future donations of ICT products (para. 4.16(a)); and**

(ii) **explore whether there are other non-governmental organisations in need of donations of ICT products and consider donating ICT products to them in future donations (para. 4.16(b));**

(i) **the Director of Government Logistics should:**

(i) **promote the formulation of ICT disposal strategies by B/Ds (para. 4.8(a)); and**

(ii) **in consultation with the Secretary for Financial Services and the Treasury, explore the possibility of improving the procedures stipulated in the SPRs to facilitate the donation of ICT products (para. 4.17); and**

Provision of apps

(j) **the Director of Fire Services, the Director of Health, the Director of Leisure and Cultural Services and the Director of Water Supplies should:**

(i) **regularly review the contents of their apps to ascertain whether the contents could be enhanced to attract more people to use the apps (para. 5.15(a)); and**

(ii) **consider decommissioning those apps that eventually could not meet the original objectives of developing them (para. 5.15(d)).**

Response from the Government

13. The Government 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

Government's objectives on information and communications technology

1.2 The Government defines information and communications technology (ICT) as all technologies and applications that involve information processing and/or exchange over communication network(s), including the Internet. ICT is often used as an extended synonym for IT (information technology).

1.3 The Government leverages on ICT to improve the operational efficiency of government bureaux and departments (B/Ds) as well as the quality and cost-effectiveness of public services. The Government encourages and expands the use of ICT in government offices subject to the availability of resources.

1.4 The responsibility for overseeing the use of ICT in the Government rests with the Government Chief Information Officer, who heads the Office of the Government Chief Information Officer (OGCIO) established in July 2004. According to the OGCIO, it provides leadership in driving forward ICT proactively within the Government, adopting new technologies, influencing business processes, and accounting for the Government's investment in ICT and related programmes, in terms of cost-benefit, efficiency and services, and impact on the community. It also provides a single focal point with responsibility for ICT policies, strategies, programmes and measures, in addition to providing common ICT services and support in the Government.

1.5 As at 31 December 2015, the OGCIO had a staff establishment of 630. Its estimated expenditure for 2015-16 amounted to $719 million. An extract of the organisation chart of the OGCIO is shown at Appendix A.

Procurement of ICT products and services

1.6 To meet its objectives on ICT (see para. 1.3), the Government frequently procures ICT products and services for establishing new computer systems or replacing old ones. Government computer systems are classified into two types:

(a) ***administrative computer systems.*** These systems provide decision-making support to management and assist in performing administrative and operational duties (e.g. the Case Processing System of the Customs and Excise Department — C&ED, and computer systems used for email communication, word processing, data processing and analysis, presentations, etc.); and

(b) ***non-administrative computer systems.*** These systems support professional disciplines in performing technical tasks (e.g. the communication facilities of the radiation monitoring network of the Hong Kong Observatory).

1.7 ICT products and services include the following:

(a) products such as servers, desktop computers, notebook computers, tablet computers, computer accessories, printers, scanners, fax servers, webcams, smartphones and software;

(b) services such as pre-implementation and project management services, system maintenance and support, system implementation and system integration, and security risk assessment services; and

(c) services for the development of mobile applications, which are commonly referred to as mobile apps (hereinafter referred to as apps). Apps are computer programs designed to run on mobile devices such as smartphones and tablet computers. They are downloadable from application distribution platforms, which are typically operated by owners of mobile operating systems, to target devices for execution.

1.8 According to the OGCIO, it considers the amount of expenditure spent on ICT as a measure to demonstrate the extent to which the Government is committed to and making progress on e-Government (Note 1) services. The OGCIO publishes on its website the Government's annual expenditure on ICT. A breakdown of the 2014-15 ICT expenditure of $4,176 million is shown in Table 1.

Note 1: *E-Government involves the use of ICT to improve the activities of the Government.*

Table 1

Government ICT expenditure
(2014-15)

Expenditure	No. of projects involved	Amount ($ million)
Procurement of ICT products and services by B/Ds		
General Revenue Account (GRA): Recurrent Account	N.A.	646
GRA: Capital Account	14	35
Capital Works Reserve Fund (CWRF) Head 710: Computerisation (Subhead A007GX — block allocation)	597	905
CWRF Head 710: Computerisation (other Subheads)	42	639
CWRF Head 708: Capital Subventions and Major Systems and Equipment	51	194 (Note 1)
	Sub-total	2,419
Others		
Costs of OGCIO's staff posted to other B/Ds (Note 2)	N.A.	668
OGCIO's departmental expenses (Note 3)	N.A.	780
ICT expenditure of trading funds (Note 4)	N.A.	309
	Total	4,176

Source: *Audit analysis of OGCIO records*

Note 1: *The expenditure of $194 million represented 3.4% of the total expenditure of $5,648 million under CWRF Head 708 for 2014-15.*

Note 2: *The expenditure was the costs of the OGCIO's departmental grade staff posted to the Information Technology Management Units (ITMUs) of B/Ds on project basis or other initiatives.*

Note 3: *The expenditure included the OGCIO's operating expenses and staff on-cost (e.g. medical benefits and housing benefits).*

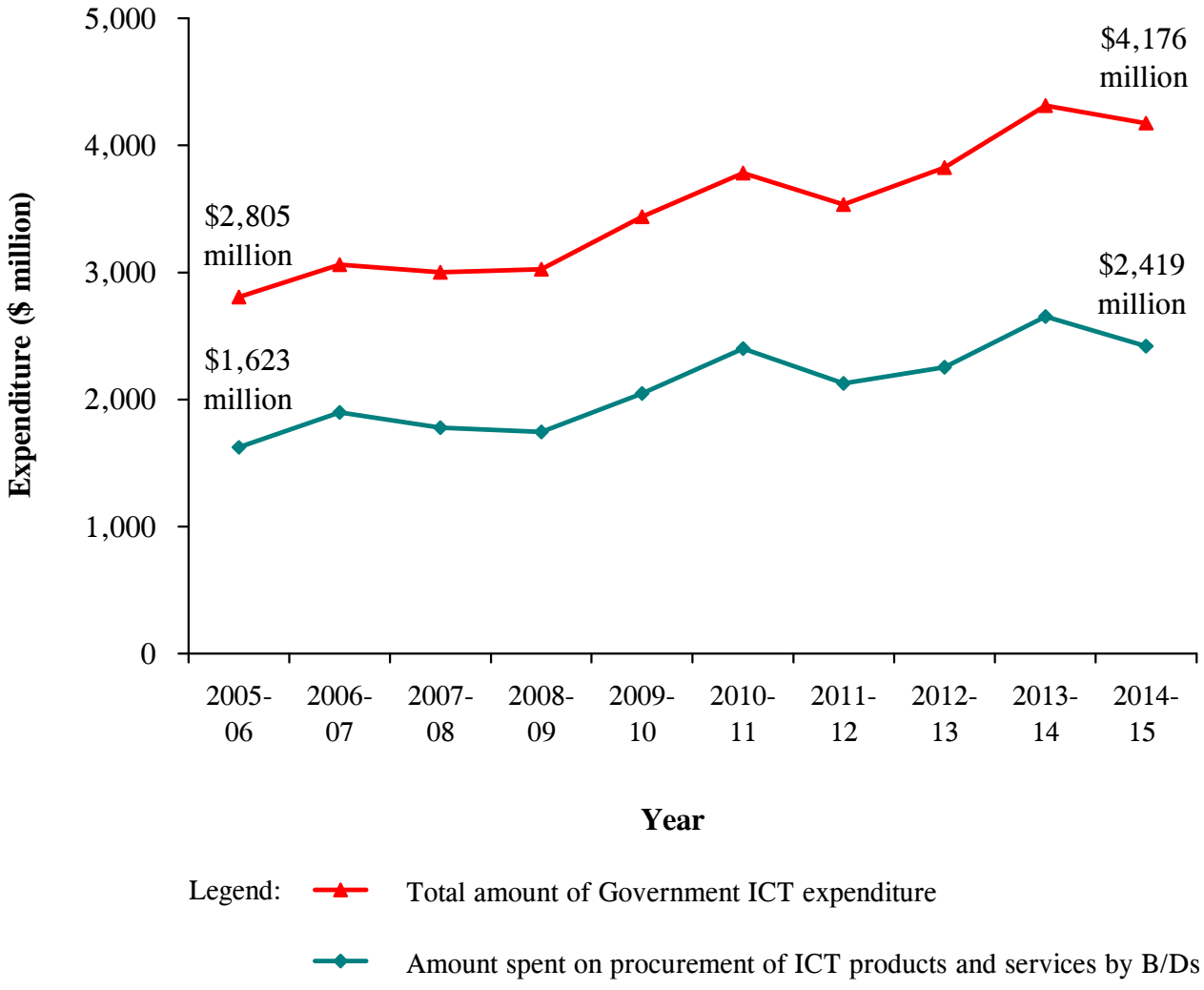
Note 4: *The expenditure was the ICT expenditure of five trading funds, namely the Companies Registry Trading Fund, the Electrical and Mechanical Services Trading Fund, the Land Registry Trading Fund, the Office of the Communications Authority Trading Fund and the Post Office Trading Fund. The OGCIO obtained annually from the trading funds their expenditure incurred on ICT. Prior to their establishment, the trading funds were government departments. The OGCIO therefore included their ICT expenditure in the Government's ICT expenditure.*

Introduction

1.9 In the ten-year period from 2005-06 to 2014-15, the total amount of the Government's ICT expenditure increased by 48.9% from $2,805 million to $4,176 million while the amount spent on procurement of ICT products and services by B/Ds increased by 49% from $1,623 million to $2,419 million (see Figure 1).

Figure 1

Government ICT expenditure
(2005-06 to 2014-15)



Source: *OGCIO records*

1.10 The authority for approving expenditure for procuring ICT products and services by B/Ds is shown at Appendix B. In procuring ICT products and services, B/Ds are required to observe the Stores and Procurement Regulations (SPRs) prescribed by the FSTB, relevant circulars and the procurement guidelines promulgated by the OGCIO and the Government Logistics Department (GLD). The GLD also advises B/Ds about the good practices on procurement activities and management of stores. More information on these guidelines and regulations is given in PART 2 of this Audit Report.

Control of ICT inventories

1.11 Given the substantial amount of ICT expenditure that has been spent by the Government, the ICT inventories held by B/Ds are of significant value. It is important for B/Ds to have proper inventory controls to minimise the risk of loss. To this effect, the SPRs set out regulations relating to inventory control. More information on the inventory control is given in PART 3.

Disposal of ICT products

1.12 Due to obsolescence or damages, every item of ICT products procured will ultimately require disposal. There is no precise information on the total number of ICT products currently in use in the Government (Note 2), or the associated waste generated. It could, however, be a significant volume and will grow in the future due to the rapid changes in technology.

Note 2: *According to the accrual-based consolidated financial statements of the Government for the year ended 31 March 2015, the cost and net book value of computer assets were $15.8 billion and $3.6 billion respectively. In accordance with the Accrual Accounting Policies and Guidelines issued by the Treasury, computer assets are only recognised as fixed assets in the financial statements if:*

(a) they are computer hardware, software, licences and systems; and

(b) the cost of an asset is not less than $150,000.

This capitalisation threshold is intended to reduce the costs and efforts involved in identifying and valuing a large number of fixed assets of relatively small values.

1.13 ICT products can be disposed of efficiently at the end of their useful lives as they can potentially be refurbished and redeployed, re-sold or donated to charity. Keeping aged ICT products in storage is costly because they rapidly lose value and failure rates increase when components are kept inactive in storage. Disposal of ICT products also involve the issue of data erasure to reduce security risk. The SPRs set out how ICT products should be disposed of while the Government's Security Regulations (SRs) set out how the information stored in computer systems should be destroyed. More information on the SPRs and the SRs are given in PART 4.

Provision of apps

1.14 According to the OGCIO, it has become increasingly prevalent for the public to access information and use services through mobile devices. A survey conducted by the Census and Statistics Department in 2014 indicated that about 77% of Hong Kong people were using smart devices (e.g. smartphones and tablet computers). According to the Office of the Communications Authority, as of October 2015, Hong Kong's mobile subscriber penetration rate (number of mobile telephone subscribers divided by the population) was 226.6%.

1.15 The Government has launched apps to provide information and services to the public. The first government app, "MyObservatory", was launched in 2010. In August 2012, the OGCIO launched the "GovHK Apps" as a centralised platform to let the public search and download apps conveniently and securely.

1.16 As at 31 August 2015, there were 127 apps launched by 36 B/Ds (Note 3). Most of these apps were developed by contractors (Note 4). The cumulative amount of development cost of apps was some $38 million while the maintenance cost for 2014-15 was some $3.7 million.

Note 3: *The 127 apps excluded apps that had been decommissioned (e.g. apps for one-off events).*

Note 4: *As at 31 August 2015, of the 127 apps launched by B/Ds, 94 (74%) were developed by contractors and the remaining 33 (26%) were mainly developed by B/Ds in-house or in collaboration with the OGCIO.*

1.17 The OGCIO has promulgated guidelines for B/Ds to follow in their development of apps. More information on the guidelines is given in PART 5.

Audit review

1.18 In May 2015, the Audit Commission (Audit) commenced a review of the Government's procurement and inventory management of ICT products and services, which are mainly used for administrative computer systems (see para. 1.6). This audit review did not cover expenditure charged to CWRF Head 708: Capital Subventions and Major Systems and Equipment (See Table 1 in para. 1.8). CWRF Head 708 is the expenditure head for charging expenditure for capital subventions and non-administrative computer systems (see para. 1.6). Selected non-administrative computer systems had been examined in past audits (Note 5).

1.19 This audit has focused on the following areas:

(a) procurement of ICT products and services (PART 2);

(b) control of ICT inventories (PART 3);

(c) disposal of ICT products (PART 4); and

(d) provision of apps (PART 5).

Audit has found room for improvement in the above areas and has made a number of recommendations to address the issues.

Note 5: *In the past years, Audit conducted a number of reviews covering systems developed under Head 708, for example, the speed enforcement camera system of the Transport Department (Chapter 2 of the Director of Audit's Report No. 60 issued in March 2013) and the air traffic control system of the Civil Aviation Department (Chapter 4 of the Director of Audit's Report No. 63 issued in October 2014).*

1.20 This audit review covered eight government departments (Note 6) (see Tables 2 and 3).

Table 2

ICT expenditure of four government departments covered in this review (2014-15)

Department	ICT expenditure (Note) ($ million)
OGCIO	883
C&ED	159
Environmental Protection Department (EPD)	41
Highways Department (HyD)	8

Source: OGCIO records

Note : The amounts mainly included the ICT expenditure charged by the departments to GRA and CWRF Head 710: Computerisation.

Note 6: *Audit selected four departments (see Table 2) for review of the audit areas mentioned in paragraph 1.19(a) to (c). These departments incurred ICT expenditure ranging from small to large amounts in 2014-15. Audit selected another four departments (see Table 3) for review of the audit area mentioned in paragraph 1.19(d). These departments developed large, medium and small number of apps as at 31 August 2015.*

Table 3

No. of apps launched by four government departments covered in this review (31 August 2015)

Department	No. of apps
Leisure and Cultural Services Department (LCSD)	18
Department of Health (DH)	10
Fire Services Department (FSD)	3
Water Supplies Department (WSD)	1

Source: OGCIO records

Acknowledgement

1.21 Audit would like to acknowledge with gratitude the full cooperation of the staff of the OGCIO and the seven other government departments covered in this audit review.

PART 2: PROCUREMENT OF ICT PRODUCTS AND SERVICES

2.1 This PART examines the procurement of ICT products and services, focusing on the following issues:

(a) e-Procurement programme (paras. 2.4 to 2.16);

(b) procurement practices (paras. 2.17 to 2.27); and

(c) performance information and replacement strategy (paras. 2.28 to 2.38).

Procedures for procuring ICT products and services

2.2 Achieving best value for money and maintaining open and fair competition are the twin policy objectives for government procurement. As mentioned in paragraph 1.6, the Government frequently procures ICT products and services. The SPRs have stipulated the procedures and requirements for procuring stores and services (including ICT products and services) by B/Ds. Under the SPRs, B/Ds are required to seek quotations for procurement with an estimated value of over $5,000 but not more than $1.43 million, which is a requirement set by the FSTB in reference to the Agreement on Government Procurement of the World Trade Organization. For a procurement with an estimated value of over $1.43 million, B/Ds should conduct open tendering. For those with an estimated value of more than $5 million, open tender should be conducted by the GLD.

2.3 In 2000, to facilitate B/Ds' frequent procurement of ICT products and services, the OGCIO introduced the Standing Offer Agreement (SOA) as an alternative means of procurement. The OGCIO and the GLD arrange open tenders periodically to shortlist suppliers that can provide ICT products and services to the OGCIO's specifications (Note 7). Shortlisted suppliers are placed on six SOAs for supplying six different types of ICT products and services:

Note 7: *The GLD arranges open tenders on behalf of the OGCIO for ICT products and services listed in paragraph 2.3(a), (b) and (c). The OGCIO arranges open tenders for ICT products and services listed in paragraph 2.3(d), (e) and (f).*

(a) personal computer products;

(b) network products and server systems;

(c) mobile workplace services (e.g. purchase of mobile handheld devices and mobile service plans);

(d) ICT professional services (e.g. system implementation, maintenance and support, infrastructure and network planning, and security risk assessment);

(e) data centre services (e.g. server management and support services, database administration and management services, and disaster recovery services); and

(f) engagement of contract staff services.

Instead of sourcing suitable suppliers by B/Ds themselves, in conducting procurement through SOAs, B/Ds only need to obtain bids from the suppliers placed on the SOA of the respective type of ICT products or services. For procuring through SOAs, the financial limits for obtaining bids are:

— $1.43 million for procuring personal computer products, network products and server systems, mobile workplace services, or engagement of contract staff services;

— $10 million for procuring ICT professional services; and

— no stated financial limit for procuring data centre services.

For procurement that exceeds the financial limits of the SOAs, B/Ds should conduct open tendering in accordance with the SPRs. The GLD and the OGCIO have set requirements on procurement for different types of ICT products and services through SOAs (Note 8).

Note 8: *The GLD and the OGCIO have jointly set procurement requirements for ICT products and services listed in paragraph 2.3(a), (b) and (c). The OGCIO has set such requirements for ICT products and services listed in paragraph 2.3(d), (e) and (f).*

E-Procurement programme

2.4 In January 2007, in view of the fact that more than 99% procurement of stores and non-construction services (including ICT products and services) were high-volume-low-value purchases, the OGCIO sought and the FC of LegCo approved a funding of $49.2 million for the implementation of a pilot e-Procurement programme to enable B/Ds to procure stores and non-construction services with a value of not more than $1.3 million ($1.43 million effective from 1 February 2009). E-Procurement was expected to benefit both the Government and the suppliers:

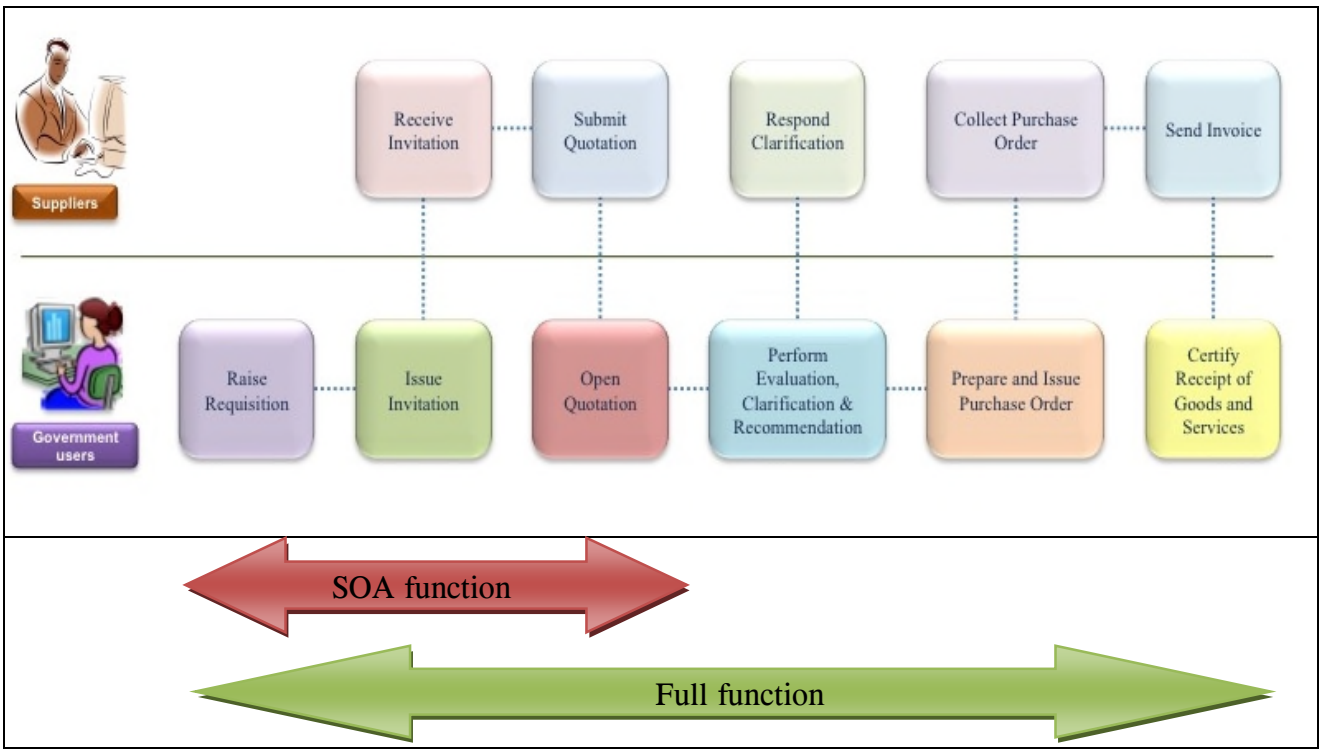
(a) for the Government, the benefits included improving efficiency and effectiveness by reducing the procurement cycle time, improving quality and accessibility of procurement information, reducing human errors and enhancing traceability, reducing transaction cost, and reducing purchase prices through consolidating and aggregating purchases across B/Ds; and

(b) for the suppliers, the benefits included communicating with the Government more effectively and efficiently by reducing the turnaround time of correspondences and enhancing accessibility to government procurement information, expanding suppliers' business opportunities with the Government by updating their product catalogues to the e-Procurement portal, and migrating suppliers to the electronic means of doing business, thereby enhancing their capability in e-commerce.

2.5 Figure 2 shows the functions of e-Procurement.

Figure 2

Functions of e-Procurement



Source: OGCIO records

2.6 In the 2007 FC paper for seeking funding approval (see para. 2.4), the OGCIO stated that the pilot programme (for implementing and running the full function of e-Procurement — see Figure 2 above) would be rolled out between January 2008 and June 2009. This would be followed by a review of the programme by the OGCIO between December 2009 and April 2010. The pilot programme was subsequently rolled out to three departments, namely the OGCIO, the EPD, and the Immigration Department in March 2010, January 2011 and February 2011 respectively, while the review was completed in February 2012. In the review report, the OGCIO concluded that the expected benefits were achieved and recommended a wider rollout of the programme to other B/Ds.

Procurement of ICT products and services

2.7 In April 2012, the OGCIO reported to LegCo Panel on Information Technology and Broadcasting that with suitable enhancement to the system, acquisition and installation of hardware and software, and training to users, e-Procurement would be made available for use by all B/Ds by the end of 2013. The OGCIO also stated that e-Procurement would be available for B/Ds in the form of a new shared service riding on the Government Cloud Computing Platform (Note 9).

2.8 In May 2012, the OGCIO sought and the ACPC (see Note 2 in Appendix B) approved a funding of $9.9 million for the provisioning of e-Procurement on the Government Cloud Computing Platform. In December 2013, e-Procurement was ready for use by B/Ds. Up to 31 October 2015, $80.1 million had been spent on e-Procurement comprising:

(a) $49.2 million for the e-Procurement pilot programme;

(b) $9.9 million for the provisioning of e-Procurement on the Government Cloud Computing Platform; and

(c) $21 million for other expenditure such as development of add-ons in e-Procurement. The expenditure was borne by CWRF Head 710: Computerisation.

Note 9: *Under the Government Cloud Computing Platform, computing resources such as computer servers and data storage can be pooled together for shared use by B/Ds. Separate FC funding approval had been sought for the establishment of the Platform.*

Slow full roll-out of e-Procurement

2.9 According to a survey conducted by the OGCIO in July 2010, 50 (71%) of some 70 B/Ds (Note 10) agreed that there was opportunity to implement e-Procurement. Of these 50 B/Ds, 30 indicated an expected timeframe of between "anytime" and 2015-16 for its implementation (see Table 4). In June 2012, in seeking the FC's funding approval (see Note 9 in para. 2.7), the OGCIO stated that some 30 B/Ds would implement e-Procurement by 2017-18.

Table 4

Timeframe for implementation of e-Procurement by 30 B/Ds based on OGCIO's 2010 survey

Timeframe	No. of B/Ds
"Anytime"	5
2011-12	5
2012-13	13
2013-14	5
2014-15	1
2015-16	1
Total	30

Source: OGCIO records

2.10 While e-Procurement was available for use by B/Ds in December 2013, up to late December 2015, of the some 70 B/Ds of the Government:

(a) 10 B/Ds (vis-a-vis the target of 30 B/Ds by 2017-18 — see para. 2.9) had implemented the full function of e-Procurement (see Figure 2 in para. 2.5). These B/Ds comprised (i) the Auxiliary Medical Service, the Civil Service Bureau (Joint Secretariat for the Advisory Bodies on Civil Service and Judicial Salaries and Conditions of Service only), the FSTB (the Treasury Branch only), the GLD, the Independent Commission Against Corruption, the Official Receiver's Office, and the Working Family and Student Financial Assistance Agency (the Working Family Allowance Office only),

Note 10: *Some non-B/Ds (e.g. the Office of the Communications Authority) were also treated as B/Ds in the OGCIO's survey.*

which implemented e-Procurement between April 2014 and November 2015; and (ii) the EPD, the Immigration Department and the OGCIO, which joined the pilot programme and implemented e-Procurement between March 2010 and February 2011 (see para. 2.6);

(b) 2 B/Ds had not implemented any functions of e-Procurement. According to the OGCIO, one department (the Hong Kong Police Force) had its own information systems to handle procurement activities and therefore interfacing them with e-Procurement was not considered desirable. The other department (the Housing Department) would not adopt e-Procurement because it had its own departmental procurement contracts (and therefore would not use SOAs for procurement); and

(c) the remaining B/Ds had put into use a partial function of e-Procurement (i.e. the SOA function only — see Figure 2 in para. 2.5).

2.11 B/Ds that have implemented the full function of e-Procurement are required to make financial contributions to sustain the operation and management of e-Procurement. According to the OGCIO, as e-Procurement is a shared service (see para. 2.7), B/Ds have to share the recurrent cost of running e-Procurement, which includes, for example, costs for maintaining hardware and software, and helpdesk support service. Table 5 shows the contributions payable by B/Ds.

Table 5

Contributions to e-Procurement payable by B/Ds
(July 2015)

Size of B/Ds	No. of annual purchases	Annual contribution ($)
Large	More than 6,000	500,000
Medium	From 2,501 to 6,000	220,000
Small	From 501 to 2,500	120,000
Casual	Less than 501	28,000

Source: *OGCIO records*

Remarks: *B/Ds are not required to contribute to e-Procurement if they only use the SOA function.*

2.12 Furthermore, according to the OGCIO, if the amount collected from B/Ds is insufficient to cover the cost of running e-Procurement, additional funding might need to be sought from the ACPC or the deficiency might need to be covered by the OGCIO's departmental expenses. It is therefore important that there is sufficient number of B/Ds to participate in e-Procurement to minimise the amount of possible deficit incurred by the e-Procurement programme. Audit found that the total annual contributions collected from B/Ds were some $162,000 and $172,000 in 2014-15 and 2015-16 (up to December 2015) respectively. On the other hand, the cost of running e-Procurement was some $1.2 million and $1.3 million in 2014-15 and 2015-16 (up to December 2015) respectively. The shortfalls of some $1.04 million and $1.13 million had been borne by the OGCIO.

2.13 According to the OGCIO, although the full functionality of e-Procurement provides better management and improved efficiency of procurement process as well as better accessibility and traceability of procurement records, B/Ds are reluctant to accord it with high priority when competing with their core business for funding. However, the FSTB informed Audit in March 2016 that:

(a) under prevailing funding mechanism for capital non-work projects, relevant Controlling Officers are required to absorb all recurrent consequences of the computerisation projects within existing resources. As for common shared e-Procurement system, the participating B/Ds accordingly should share the recurrent cost of running the system; and

(b) the annual recurrent contribution for B/Ds ranges from $28,000 to $500,000 depending on the size of annual purchases. Given the amount involved only takes up a small percentage of the total recurrent operational allocation of B/Ds, the FSTB considers that tight recurrent resources is unlikely to be the major reason underlying B/D's slow roll-out of the full function of e-Procurement. Taking the cases of the C&ED and the HyD as examples, the annual contribution of $500,000 only represents 0.08% and 0.18% of their respective total departmental expenses allocation in 2016-17, it also falls short of their respective underspending of $18.5 million and $5.0 million in 2014-15.

2.14 Audit also found that the C&ED and the HyD had not implemented the full function of e-Procurement because:

(a) they had concern on the annual contribution payable;

(b) additional resources (e.g. regular training and helpdesk service to be provided to users) would be required to handle e-Procurement transactions; and

(c) as not all suppliers or service providers had joined e-Procurement, both manual and electronic procurement processes would need to be undertaken.

Audit recommendations

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

(a) **identify the reasons why the majority of B/Ds had not implemented the full function of e-Procurement; and**

(b) **based on the reasons identified, take measures to attract more B/Ds to implement the full function of e-Procurement.**

Response from the Government

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

Procurement practices

2.17 For each of the four government departments covered in this review (see Table 2 in para. 1.20), Audit examined 20 procurement cases conducted in the period from 2012-13 to 2014-15. Audit found that there were shortcomings in some departments' procurement practices, which are detailed in paragraphs 2.18 to 2.21.

Dividing procurement requirements into instalments

2.18 According to the SOA, quotations are required to be sought for purchase of ICT products with an estimated value of over $5,000 but not more than $1.43 million. For purchase with an estimated value of over $1.43 million, B/Ds should arrange open tender. B/Ds should also observe the following principles and requirements as stipulated in the SPRs:

> *"The financial limits set out in these Regulations refer to the total value of stores or services of a similar nature or total value of revenue which, in normal practice, are obtained or generated in a single purchase or contract. Controlling Officers should ensure that public officers responsible for procurement matters interpret these limits strictly, and that they do not evade the limits by dividing procurement requirements into instalments ..... In making procurement, Controlling Officers should consolidate requirements of stores and services of similar nature as far as possible to achieve better economies of scale." (Audit's underlining)*

2.19 Audit found that the C&ED and the EPD had not followed the above principles and requirements in conducting procurement in Cases 1 and 2.

Case 1

C&ED's procurement of workstations

On 5 November 2013, the ITMU of the C&ED requested the Supplies Section of the department to arrange procurement of workstations and other related accessories and software. These ICT products were the same or similar and their aggregated price was $2.1 million (i.e. above $1.43 million), which would have required open tendering. Both the ITMU and the Supplies Section had not combined the purchases but procured the products in two separate purchases (see Table below).

Order	Example of products included in purchase	Amount ($)	Date of delivery of products
1	116 workstations with Intel Core i5-3470 or better processor	848,438	5 March 2014
2	280 workstations with Intel Core i5-3470 or better processor	1,253,280	12 March 2014
	Total	2,101,718	

Source: C&ED records

Case 2

EPD's upgrade of ICT products

1. In September 2013, given that Windows XP and Office 2003 would not be supported by the vendor effective from early April 2014, the OGCIO urged B/Ds to upgrade the operating system and software to newer versions.

2. Among the four government departments visited by Audit, the EPD had arranged the procurement for the upgrades by conducting six separate procurements through seeking quotations. Details are shown below.

Department	ICT products procured	Date of procurement	Total amount ($ million)
EPD	1. 155 Windows 7 Professional licence and 550 Microsoft Office 2013 Standard	21.10.2013 (through seeking quotations)	1.2
	2. 300 Intel Core i5 desktop computers with Windows 7 Professional	21.10.2013	1.1
	3. 198 Intel Core i3 desktop computers with Windows 7 Professional	22.10.2013	0.7
	4. 95 Intel Core i5 notebook computers with Windows 7 Professional	22.10.2013	0.6
	5. 162 Intel Core i7 desktop computers with Windows 7 Professional	28.10.2013	0.7
	6. 70 Intel Core i5 desktop computers with Windows 7 Professional	3.12.2013	0.3
			4.6
C&ED	1,850 Microsoft Office 2013 Standard	1.11.2013 (through inviting tenders)	3.4
HyD	1. 475 Intel Core i3 desktop computers with Windows 7 2. 356 Microsoft Office 2013 Standard 3. 161 Microsoft Office 2013 Professional	1.11.2013 (through inviting tenders)	3.0

3. In February 2016, the EPD informed Audit that with the exception of Procurement 2 and 6, the remaining four procurements were for different items. Furthermore, Procurement 2 and 6 were conducted on 21 October 2013 and 3 December 2013 respectively, and the sum of the procurement values was less than $1.43 million. Open tendering was therefore not required.

Case 2 (Cont'd)

4. Notwithstanding the EPD's views, Audit noted that, according to the SPRs, B/Ds should consolidate procurement requirements of stores and services of similar nature as far as possible (see para. 2.18). As shown in the Table above, the EPD's purchases were for similar products and were conducted within a short span of time (except for Procurement 6). The EPD could have combined the purchases. In fact, as can be seen in the Table, the HyD had combined its purchases for hardware and software (regarded as different items by the EPD) in one procurement only.

Source: *Records of C&ED, EPD, HyD and OGCIO*

Remarks: *The OGCIO planned and replaced its obsolete computers on a continual basis. It therefore did not need to conduct an upgrade exercise all in one go.*

SOA requirements need to be reviewed

2.20 Under the SOA requirements, for procurement of personal computer products, network products and server systems, B/Ds should accept the lowest conforming offer, unless otherwise justified. They should also ensure that:

(a) the products to be supplied by suppliers are those that have been approved by the GLD for inclusion in the product lists of the SOAs (Note 11(a)); and

(b) the quoted prices of products do not exceed the maximum prices shown on the product lists, and the quoted values of trade-in items are not lower than the minimum values shown on the product lists (Note 11(b)).

Note 11: *According to the GLD:*

(a) the product list requirement serves as a control mechanism to ensure that every new product or service item proposed by contractors is assessed by the OGCIO to determine that it is within the scope of the relevant SOA and meets the minimum technical requirements; and

(b) the purpose of minimum trade-in price serves to protect the Government's interest by ensuring a minimum scrap value of items for trade-in.

2.21 Audit noted that in a procurement made in 2014, in order to fulfil the SOA requirements stated in paragraph 2.20, the HyD ended up paying more for the goods it procured (see Case 3).

Case 3

Lower offers not accepted by HyD

1. In April 2014, the HyD invited quotations for five new servers (together with four-year maintenance) and trade-in of five old servers. In May 2014, seven quotations were received. The HyD accepted a quotation which was higher than two other quotations (see Table below):

	Contractor A	Contractor B	Successful bidder
Price of new servers and maintenance (a)	$175,000	$206,530	$224,250
Trade-in price of old servers (b)	$50	$5	$2,500
Net price (c)=(a) - (b)	$174,950 ($46,800 lower than that of the successful bidder)	$206,525 ($15,225 lower than that of the successful bidder)	$221,750

2. The HyD did not accept the quotations of Contractors A and B because:

(a) Contractor A offered free upgraded products, which were not included in the product list; and

(b) Contractor B's trade-in price was lower than the minimum value shown on the product list.

Source: Audit analysis of HyD records

Audit recommendations

2.22 **Audit has *recommended* that the Commissioner of Customs and Excise and the Director of Environmental Protection should take measures to ensure that in procuring ICT products and services, the SOA requirements are observed.**

2.23 **Audit has *recommended* that the Government Chief Information Officer, in collaboration with the Director of Government Logistics, should:**

(a) **remind B/Ds periodically the need to comply with the SOA requirements; and**

(b) **conduct a review of the SOA requirements to ascertain whether certain requirements (e.g. the "product list requirement" and the "minimum trade-in value requirement" — see para. 2.20) need to be revised to provide more flexibility in conducting procurements.**

Response from the Government

2.24 The Commissioner of Customs and Excise agrees with the audit recommendation in paragraph 2.22. He has said that the C&ED will consolidate procurement of ICT products and services of similar nature, and all relevant personnel have been reminded to observe the SOA requirements.

2.25 The Director of Environmental Protection agrees with the audit recommendation in paragraph 2.22.

2.26 The Government Chief Information Officer agrees with the audit recommendations in paragraph 2.23.

2.27 The Director of Government Logistics accepts the audit recommendations in paragraph 2.23. She has said that the GLD will work with the OGCIO accordingly.

Performance information and replacement strategy

Inaccurate disclosure of government ICT expenditure

2.28 The OGCIO publishes on its website the Government's annual expenditure on ICT to demonstrate the extent to which the Government is committed to and making progress on e-Government services. For 2014-15, the expenditure was $4,176 million (see para. 1.8).

2.29 Audit sample checked the ICT expenditure published by the OGCIO. Audit found that there were large discrepancies between the ICT expenditure of some B/Ds included in the expenditure published by the OGCIO and the actual ICT expenditure of these B/Ds. Table 6 shows the details of Audit's examination.

Table 6

Discrepancies between published and actual ICT expenditure of C&ED, EPD, HyD and OGCIO (2014-15)

Department	ICT expenditure of department included in OGCIO's published expenditure (Note 1) (a) ($'000)	Actual ICT expenditure spent by department (Note 2) (b) ($'000)	Overstatement/(Understatement)	
			(c) = (a) − (b) ($'000)	(d) = ((a)/(b) − 1) × 100%
C&ED	159,365	139,387	19,978	14%
EPD	40,891	75,915	(35,024)	(46%)
HyD	8,332	32,171	(23,839)	(74%)
OGCIO	882,900	882,900	0	N.A.

Source: Records of C&ED, EPD, HyD and OGCIO

Note 1: The amounts were extracted from the Government Financial Management Information System by the OGCIO.

Note 2: The amounts of ICT expenditure spent were provided by the departments to Audit.

2.30 Audit noted that the large discrepancies (understatements) as shown in Table 6 were mainly due to the following reasons:

(a) in computing the Government's ICT expenditure, the OGCIO obtained from the Government Financial Management Information System the ICT expenditure charged by B/Ds to the CWRF, GRA Subhead 117 (recurrent account for expenditure on hardware, software and data processing), and the Non-recurrent/Capital Account of the GRA; and

(b) B/Ds, in addition to charging ICT expenditure to the CWRF and GRA Subhead 117, had also charged it to other GRA Subheads such as Subhead 100 (expenditure for stores and equipment), Subhead 111 (expenditure for hiring of services and professional fees) and Subhead 121 (expenditure for contract maintenance).

Need to publish performance information

2.31 The OGCIO reported annually:

(a) the progress on the development of e-Government to LegCo Panel on Information Technology and Broadcasting. It listed out, for example, the new ICT systems implemented by the OGCIO and several other B/Ds, and the progress of implementation of some ICT systems; and

(b) the total amount of Government's ICT expenditure on its website.

2.32 Audit performed a research on overseas governments' performance information relating to ICT. Audit found that there is performance information used by overseas governments that the OGCIO could compile and publish. Examples are shown in Table 7.

Table 7

Examples of performance information used by overseas governments relating to ICT

Country	Performance information
Australia	• ICT operating and capital expenditure • ICT expenditure per service tower (e.g. midrange, wide area network, mainframe and computer applications) • ICT expenditure by cost element (e.g. personnel, hardware and software)
United Kingdom	ICT expenditure on: • hardware (e.g. portable computers, servers and IT consumables) • software (e.g. application licences and system licences) • services (e.g. hardware maintenance, software maintenance and IT consultancy) • communications (e.g. fixed-line, wireless and networking equipment)

Source: Audit's research

Need to enhance replacement strategies

2.33 As mentioned in paragraph 1.4, the OGCIO assumes a leadership role in the use of ICT within the Government. To discharge this role, the OGCIO:

(a) conducts annual survey to collect information (e.g. types of computers and versions of software) on the use of ICT hardware and software by B/Ds. Information on hardware is collected for performance reporting purposes while information on software is to ascertain whether the software would be supported by software vendors in the near future;

(b) conducted surveys in 2014 and 2015 to obtain information on major software (e.g. the Java Development Kit and the Oracle Database Server Enterprise) in use by B/Ds in their major ICT systems, that would soon be de-supported by software vendors;

(c) alerts B/Ds about software support that will soon be discontinued by software vendors and provides support services to facilitate software replacement (e.g. issuing practical guidelines and conducting workshops, and setting up testing environment for the replaced software); and

(d) issued a circular in October 2014 to remind B/Ds about the best practices in managing the obsolescence of ICT systems. According to the circular, B/Ds who are owners of their ICT systems have the primary responsibility to manage the obsolescence of their ICT systems in operation. They should have a good grasp of the inventories of their ICT systems and plan for upgrade/replacement on a regular basis.

2.34 Audit noted that the four departments covered in this review had regularly conducted procurement to trade-in their old ICT inventory items and replace them with new ones (see Table 8).

Table 8
Number of ICT inventory items traded-in by C&ED, EPD, HyD and OGCIO (2012-13 to 2014-15)

Department	2012-13	2013-14	2014-15
C&ED	218	719	865
EPD (Note)	73	171	177
HyD	975	1,490	557
OGCIO	713	724	262
Total	1,979	3,104	1,861

Source: Audit analysis of C&ED, EPD, HyD and OGCIO records

Note: Instead of trading-in, the EPD donated most of its old ICT products (see para. 4.14 for details).

2.35 As shown in Case 2 in paragraph 2.19, of the four departments, only the OGCIO had planned and replaced its obsolete computers and related software on a continual basis while the other three departments only replaced their old computers and software upon receiving reminders from the OGCIO. The work efficiency of these departments could have been enhanced if the old computers and software were progressively replaced. Furthermore, as indicated in paragraph 2.33(c), the OGCIO's initiatives were mainly focused on gathering information on software support that would soon be discontinued by software vendors, and based on the information gathered, informing B/Ds to replace or plan for the replacement of their software which would soon be out-dated.

2.36 Audit considers that the OGCIO could do more to help improve the work efficiency of B/Ds. For example, it could consider issuing guidelines to B/Ds to help them draw up more effective replacement strategies. The guidelines may include, for example, the suggested optimal lifespan of ICT products and the conditions under which the products should be replaced. For instance, although software support has not yet been discontinued by the software vendor, the software may have already been incapable of handling files of newer versions and therefore a replacement could be considered.

Audit recommendations

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

(a) **take measures to enhance the accuracy of the Government's ICT expenditure reported on the OGCIO's website;**

(b) **to enhance transparency and public accountability, develop and publish more performance information relating to the extent the Government has met the objectives on ICT; and**

(c) **consider issuing guidelines to B/Ds to facilitate their drawing up of replacement strategies for ICT products.**

Response from the Government

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

(a) review the basis of compiling the Government's ICT expenditure reported on the OGCIO's website;

(b) develop and publish more performance information relating to the extent the Government has met the objectives on ICT; and

(c) issue guidelines for the replacement of major software products (including desktop operating system and office automation software) to B/Ds to facilitate their drawing up of replacement strategies for ICT products.

PART 3: CONTROL OF ICT INVENTORIES

3.1 This PART examines the control of ICT inventories, focusing on the following issues:

(a) ICT inventory control (paras. 3.4 to 3.21); and

(b) computerised inventory control systems (paras. 3.22 to 3.33).

Requirements of SPRs on control of ICT inventories

3.2 As mentioned in paragraph 1.11, the ICT inventories held by B/Ds are of significant value. B/Ds are required under the SPRs to account for the movements (receipt, transfer and trade-in/disposal) of inventory items (Note 12) (see Appendix C). The C&ED, the EPD and the OGCIO use computerised inventory control systems. However, the HyD's inventory control system is a manual system.

3.3 In addition to the requirements in paragraph 3.2, B/Ds are also required to:

(a) maintain control index sheets to record the number of Inventory Sheet and Distribution Record (see Appendix C) in use and ensure their completeness;

(b) ensure that the public officer maintaining the inventory items in an operational unit records the inventory movements correctly; and

(c) arrange to check inventory items at least once a year and ensure that any discrepancies are dealt with.

Note 12: *According to the SPRs, inventory items are stores of permanent or non-consumable nature with a unit cost of $1,000 or above at the time of purchase and must be accounted for while all other stores are non-inventory items. For control purposes, B/Ds may also account for the movements of items with unit cost below $1,000 as inventory items.*

ICT inventory control

Missing ICT inventories

3.4 In the period from May to October 2015, Audit conducted a total of 12 stocktakes at three operational units of each of the four government departments (see Table 2 in para. 1.20). Audit altogether examined 407 ICT products involving 1,009 ICT inventory items with a total cost (original purchase price) of $5.1 million in these 12 units.

3.5 Audit's stocktakes revealed that:

(a) up to 30 November 2015, of the 1,009 items, 107 (11%) had not been located by the departments concerned (see Table 9). The cost of these missing items amounted to some $451,000 (see Table 10);

(b) of the 328 items of the HyD selected for checking by Audit, 94 (29%) could not be located by the HyD (see Table 9). The cost of these missing items amounted to some $380,000 (see Table 10); and

(c) some operational units of the C&ED, the EPD and the HyD took a long time to locate some of the items for audit examination (up to 127 days, 73 days and 165 days respectively) (see Table 9).

Table 9

Results of Audit's stocktakes of ICT inventory items
(30 November 2015)

Department	Kinds of ICT products examined	ICT inventory items				Time taken to locate items by operational unit after stocktakes	No. of missing items
		Selected for examination		Located during stocktakes	Located by operational unit after stocktakes		
		(a) = (b) + (c) + (d) (No.)	Cost ($)	(b) (No.)	(c) (No.)	(Day)	(d)
C&ED	131	339	350,056	319	16	8 to 127	4 (Note 1)
EPD	91	205	1,348,617	196	5	1 to 73	4
HyD	95	328	770,183	198	36	7 to 165	94 (Note 2)
OGCIO	90	137	2,633,941	127	5	1 to 26	5
Overall	407	1,009	5,102,797 (Note 3)	840	62	1 to 165	107

Source: Audit's stocktakes conducted in the period from May to October 2015

Note 1: On 3 February 2016, the C&ED further informed Audit that 2 of the 4 missing items had been located (see para. 3.8).

Note 2: On 30 December 2015, the HyD informed Audit that 74 of the 94 inventory items had been disposed of and 7 items had been located (see para. 3.7(a) to (d) for details).

Note 3: Cost information of 274 (27%) inventory items could not be provided by the departments.

Table 10

Missing ICT inventory items
(30 November 2015)

Department	Missing ICT inventory items		Examples of missing inventory items
	Quantity	Cost (Note) ($)	
C&ED	4	0	CD writer, video camera, zip drive
EPD	4	43,600	Computer
HyD	94	379,585	Computer, monitor, notebook computer, printer, tape drive, external disk drive, fax machine
OGCIO	5	27,701	Computer, monitor, tape drive
Total	107	450,886	

Source: Audit's stocktakes conducted in the period from May to October 2015

Note: Cost information of 68 (64%) inventory items could not be provided by the departments.

3.6 Audit also noted that 32 (30%) of the 107 missing ICT inventory items were embedded with data storage devices (e.g. personal computers, notebook computers). According to the SRs, this could be breaches of security (Note 13). A breach of security which might involve the compromise of classified information should be reported immediately to the Government Security Officer of the Security Bureau. It should then be investigated initially by the B/D concerned. If the breach relates to information systems or is a leak of classified data in electronic form, the incident handling requirements (e.g. a B/D should set up its departmental Information Security Incident Response Team and appoint a Commander to oversee the handling of all information security incidents) specified by the OGCIO should also be followed.

3.7 On 30 December 2015 (six months after Audit's stocktakes conducted in June 2015), the HyD informed Audit that of the 94 missing ICT inventory items:

Note 13: *Examples of breaches of security as laid down in the SRs include:*

(a) the loss or apparent loss, temporary or permanent, of mobile devices or removable media that contain classified information; and

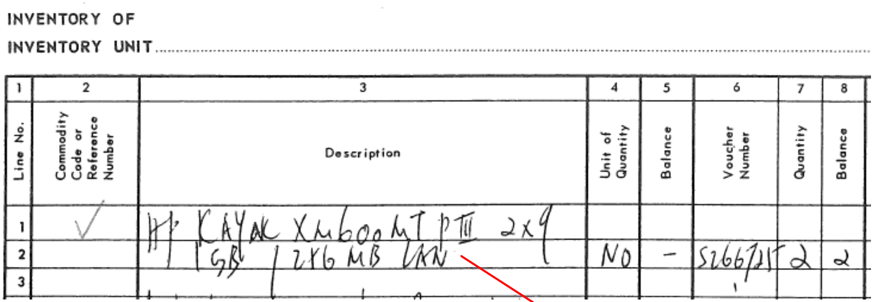
(b) unauthorised access of classified information that is on a set of computer system.

(a) it eventually found that 68 items had been disposed of. Audit, however, noted that the inventory records, which were kept manually, did not provide sufficient details for 63 of the 68 items. For instance, the description of an item disposed of was different from that in the inventory record and the reference number of the item concerned was missing (see Example 1). Consequently, Audit was unable to ascertain whether the 63 items had been properly disposed of;

Example 1

Inventory records of an ICT item disposed by HyD

Record for receipt of item from supplier



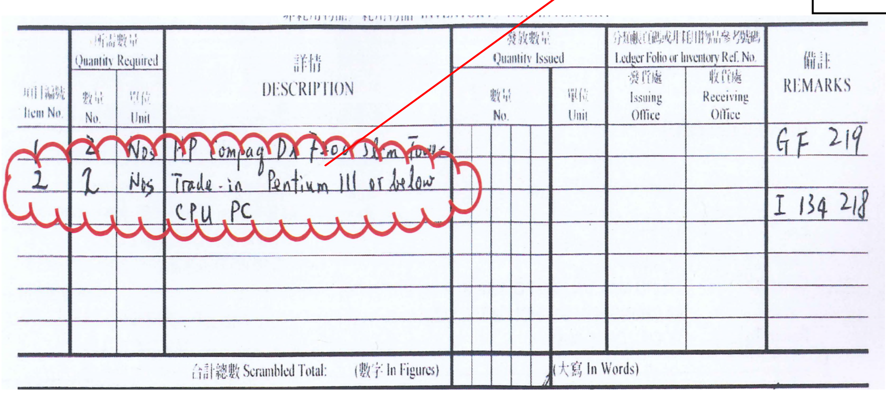
INVENTORY OF

INVENTORY UNIT

1 Line No.	2 Commodity Code or Reference Number	3 Description	4 Unit of Quantity	5 Balance	6 Voucher Number	7 Quantity	8 Balance
1	√	HP CAYAK XM600 MT PIII 2x9					
2		GB / 256 MB LAN	NO	–	S266721	2	2
3							

- Descriptions of the inventory item did not match
- Reference number for the inventory item was not recorded

Disposal record



項目編號 Item No	需請數量 Quantity Required 數量 No.	需請數量 Quantity Required 單位 Unit	詳情 DESCRIPTION	發放數量 Quantity Issued 數量 No.	發放數量 Quantity Issued 單位 Unit	分類帳頁碼或存貨冊編號 Ledger Folio or Inventory Ref. No. 發貨處 Issuing Office	分類帳頁碼或存貨冊編號 Ledger Folio or Inventory Ref. No. 收貨處 Receiving Office	備註 REMARKS
1	2	Nos	HP Compaq DX 7400 Slim Tower					GF 219
2	2	Nos	Trade-in Pentium III or below					
			CPU PC					I 134 218

合計總數 Scrambled Total: (數字 In Figures) (大寫 In Words)

Source: HyD records

(b) 5 personal computers should have been disposed of. The HyD could not furnish Audit with evidence for the disposal;

(c) one plotter should have been traded-in, but the HyD could only provide to Audit an e-mail showing that a plotter of the same model would be collected by the contractor;

(d) 7 items were located after extensive search. However, one of these items (a digitizer) had not been used since 2003; and

(e) the remaining 13 items could not be located after extensive search.

3.8 In February 2016 (eight months after Audit's stocktakes conducted in May and June 2015), the C&ED informed Audit that it located 2 of the 4 missing ICT inventory items listed in Table 10 in paragraph 3.5.

Shortcomings in keeping ICT inventory records

3.9 ***Incomplete and inaccurate ICT inventory records.*** During the visits to the three operational units of each of the four government departments, Audit noted that:

(a) the Lo Wu Division of the C&ED did not maintain control index sheets (see para. 3.3(a));

(b) the New Territories Region of the HyD lost a page of Inventory Sheet and Distribution Record (see Appendix C); and

(c) the Hong Kong Region of the HyD had not updated one of the control index sheets.

As a result, Audit was unable to ascertain the completeness and accuracy of the ICT inventory records and the ICT inventory items held by these three operational units.

3.10 ***Failure to keep proper ICT inventory records.*** Since 2001, some B/Ds have established ITMUs to help make use of ICT in delivering their policy/operational objectives. The ITMUs are responsible for the B/Ds' ICT planning, management and operation.

3.11 For each of the ITMUs of the four government departments, Audit examined 10 ICT products which according to the ITMUs' inventory records were kept by the ITMUs. Audit noted that except the OGCIO's ITMU, the remaining three ITMUs had failed to properly keep their inventory records. The 10 ICT products of each ITMU of the C&ED, the EPD and the HyD constituted 1,840 ICT inventory items. Audit found that of these 1,840 items, 1,523 (83%) were in fact not kept by the ITMUs as per the inventory records. Of these 1,523 items said to be kept by the ITMUs:

(a) 1,389 (91%) items were located in other operational units of the departments concerned; and

(b) 134 (9%) items could not be located because they had been traded-in and were not with the departments any more.

Details of Audit's findings are shown in Table 11.

Table 11

Incorrect inventory records of ICT inventory items
(30 November 2015)

ICT product	No. of items recorded as with ITMU (a) = (b) + (c) + (d)	No. of items with ITMU (b)	No. of items incorrectly recorded	
			Located in other operational units (c)	Not located (Traded-in) (d)
ITMU of C&ED				
Desktop computer	1,185	210	884	91
Monitor	212	9	203	0
Tablet	50	20	30	0
Sub-total	1,447	239	1,117	91
ITMU of EPD				
Ethernet router	23	4	0	19
ITMU of HyD				
USB port smart card reader	265	59	206	0
Desktop computer	28	15	4	9
External hard disk 750 GB	15	0	0	15
Tablet	19	0	19	0
Monitor	43	0	43	0
Sub-total	370	74	272	24
Total	1,840 (100%)	317 (17%)	1,389 (76%)	134 (7%)

Source: Audit analysis of ITMUs records

3.12 ***Annual stocktakes not properly conducted.*** As mentioned in paragraph 3.3(c), B/Ds are required to check inventory items at least once a year and ensure that any discrepancies are dealt with. Audit's stocktakes conducted in May to October 2015 revealed that some ICT inventory items had been disposed of or traded-in by the C&ED, the HyD and the OGCIO prior to the latest stocktakes conducted by the three departments in 2014 or 2015. However, the departments' stocktake records indicated that these items had been checked and were still kept by the departments.

Audit recommendations

3.13 **Audit has *recommended* that the Commissioner of Customs and Excise, the Director of Environmental Protection, the Director of Highways and the Government Chief Information Officer should:**

(a) **take efforts to locate the missing ICT inventory items;**

(b) **for those ICT inventory items which could not be located, institute the procedures stipulated in the Financial Circular No. 7/2003 and the SPRs (e.g. carry out investigation into the cases and apply for write-off); and**

(c) **for those lost ICT inventory items which have embedded data storage devices, take remedial measures as stipulated in the SRs.**

3.14 **Audit has *recommended* that the Commissioner of Customs and Excise, the Director of Environmental Protection and the Director of Highways should take measures to ensure that the inventory records are properly kept and updated in accordance with the requirements of the SPRs.**

3.15 **Audit has *recommended* that the Commissioner of Customs and Excise, the Director of Highways and the Government Chief Information Officer should properly conduct annual stocktakes and keep stocktake records.**

3.16 **Audit has *recommended* that the Director of Government Logistics should take measures to regularly remind B/Ds of the need to maintain inventory records up-to-date.**

Response from the Government

3.17 The Commissioner of Customs and Excise agrees with the audit recommendations in paragraphs 3.13 to 3.15. He has said that:

(a) the two missing ICT inventory items (i.e. a video camera and a zip drive) could not be located. There was no data storage device in these two items. The C&ED has instituted the procedures stipulated in the Financial Circular No. 7/2003 and the SPRs;

(b) all relevant personnel have been reminded to ensure that the inventory records are properly kept and updated in accordance with the requirements of the SPRs, and supervisory checking has also been instituted. For those ICT products recorded as ITMU's inventories and deployed to other offices for operational use, detailed deployment lists will be appended to the corresponding inventory records; and

(c) all relevant personnel have been reminded to properly conduct annual stocktakes and keep stocktake records.

3.18 The Director of Environmental Protection agrees with the audit recommendations in paragraphs 3.13 and 3.14.

3.19 The Director of Highways agrees with the audit recommendations in paragraphs 3.13 to 3.15. He has said that:

(a) he welcomes the audit review which can help improve the overall management and effectiveness of inventory control;

(b) the HyD has been taking extra efforts to locate the missing inventory items. Other than those that had already been located (see para. 3.7), the HyD will continue to locate the remaining items. In case the items cannot be located, the HyD would instigate the procedures stipulated in the Financial Circular No. 7/2003, the SPRs and the SRs; and

(c) the HyD is preparing an internal accounting circular to remind its staff of the relevant requirements of the SPRs and to stipulate measures to strengthen the inventory control procedures:

(i) with a view to ensuring that the inventory records are properly kept and updated in accordance with the requirements of the SPRs; and

(ii) that include a cross-office sample checking mechanism in the annual stocktake processes to double-check the accuracy of the inventory records. The cross-office sample checking mechanism has been taking place.

3.20 The Government Chief Information Officer agrees with the audit recommendations in paragraphs 3.13 and 3.15. He has said that:

(a) every effort has already been made to locate the five missing ICT inventory items (see Table 9 in para. 3.5) but in vain and action is being taken to deal with the loss according to established procedures; and

(b) the annual departmental inventory verification exercise for 2016 has been conducted and follow-up actions are being taken.

3.21 The Director of Government Logistics accepts the audit recommendation in paragraph 3.16. She has said that the GLD will take follow-up actions accordingly.

Computerised inventory control systems

Under-utilisation and inadequacies of computerised inventory control systems

3.22 According to the SPRs, B/Ds should keep complete records of the movements of all stores in manual or preferably computerised stores ledgers. The use of computerised inventory control system would facilitate the tracking of inventory items and the preparation of ageing analysis of inventories and thereby assist procurement and disposal decisions.

Control of ICT inventories

3.23 Of the four government departments, the HyD was the only department that used a manual inventory control system. The lack of a computerised inventory control system could be a reason why many of its inventory items were found missing during Audit's stocktakes (see Table 9 in para. 3.5) and a long time was taken to locate some of the items (see Table 9 in para. 3.5 and para. 3.7). On the other hand, Audit reviewed the computerised inventory control systems of the EPD, the C&ED and the OGCIO and found room for improvement as follows:

(a) ***The EPD's inventory control system.*** The EPD has used a computerised inventory control system since 1997. In January 2015, it revamped the system at a cost of $3.18 million. The new system has the following features:

(i) each inventory item is assigned a unique barcode. Using a barcode scanner, similar inventory items can be distinguished and the physical locations of items can be promptly identified. Moreover, the system can generate discrepancy reports;

(ii) each operational unit can view the inventory items registered under the unit on a real-time basis; and

(iii) the costs of inventory items are captured.

Nevertheless, the EPD could make better use of its system. For example, it could conduct ageing analysis based on the information contained in the system to facilitate disposal decision making (see Case 7 in para. 4.6 for details);

(b) ***The C&ED's inventory control system.*** In November 2010, the C&ED launched a computerised inventory control system known as the IT Asset System (ITAS) at a cost of some $160,000. The C&ED, however, still largely relied on its manual system for inventory control purposes and used the ITAS for supplementary inventory control purposes. This may explain why the C&ED took a long time to locate some of its ICT inventories (see Table 9 in para. 3.5). Audit compared the ICT inventory records of the ITAS with the manual records of an operational unit of the C&ED, and found that there were large discrepancies (see Table 12); and

Table 12

Discrepancies between the manual inventory control system and the ITAS of an operational unit of the C&ED (mid-May 2015)

ICT inventory item	No. of inventory items recorded in both ITAS and manual records	No. of inventory items recorded only in	
		ITAS	Manual records
Desktop computer	11	40	8
Monitor	16	34	11
Notebook computer	2	1	1
Printer	13	40	13
Scanner	12	8	4
Total	54	123	37

Source: Audit analysis of C&ED records

(c) ***The OGCIO's inventory control system.*** In October 2001, the OGCIO launched a computerised inventory control system at a cost of $454,500. Audit found that:

(i) although a barcode was assigned to each inventory item, the system was not supported by a barcode scanner and the barcodes were not used; and

(ii) only the Supplies Section of the OGCIO could have access to the inventory records. The other operational units could not access the inventory items registered under their units on a real-time basis for inventory control purposes.

Audit recommendations

3.24 **Audit has *recommended* that the Director of Highways should establish a computerised inventory control system to improve the management of the HyD's inventories.**

3.25 **Audit has *recommended* that the Director of Environmental Protection should make better use of the EPD's computerised inventory control system (e.g. conducting ageing analysis to facilitate disposal decisions).**

3.26 **Audit has *recommended* that the Commissioner of Customs and Excise should:**

(a) **reconcile the discrepancies between the inventory records in the C&ED's computerised inventory control system and the manual inventory records; and**

(b) **enhance the C&ED's computerised inventory control system with a view to replacing the manual inventory system.**

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

(a) **conduct a review of the OGCIO's computerised inventory control system; and**

(b) **in the light of the results of the review, take measures to enhance the functions of the system with a view to providing better support on inventory control.**

3.28 **Audit has *recommended* that the Director of Government Logistics should:**

(a) **establish guidelines on the circumstances under which it would be worthwhile to set up a computerised inventory control system by B/Ds (for example, it may be cost-effective for a B/D with significant number of inventory transactions to set up such a system); and**

(b) **promote the use of computerised inventory control system by B/Ds for more timely recording and better control of inventories.**

Response from the Government

3.29 The Director of Highways agrees with the audit recommendation in paragraph 3.24. He has said that the HyD is making preparation to set up a computerised inventory control system with a view to replacing the manual inventory system.

3.30 The Director of Environmental Protection agrees with the audit recommendation in paragraph 3.25.

3.31 The Commissioner of Customs and Excise agrees with the audit recommendations in paragraph 3.26. He has said that the C&ED is reconciling the discrepancies between the inventory records in the C&ED's computerised inventory control system and the manual inventory records. The C&ED will consult the OGCIO and the GLD with a view to examining the feasibility of developing a full-fledged computerised inventory control system. Meanwhile, the C&ED will enhance the ITAS to better support inventory control.

3.32 The Government Chief Information Officer agrees with the audit recommendations in paragraph 3.27. He has said that the OGCIO has already planned to review and revamp its existing computerised inventory control system in the departmental IT plan. In view of the benefits of better support on inventory control, the OGCIO will accord higher priority to the project and expedite its implementation.

3.33 The Director of Government Logistics accepts the audit recommendations in paragraph 3.28. She has said that the GLD will prepare general guidelines on the circumstances that might warrant the setting up of a computerised inventory control system for reference by B/Ds.

PART 4: DISPOSAL OF ICT PRODUCTS

4.1 This PART examines the disposal of ICT products, focusing on the following issues:

(a) ICT disposal strategies (paras. 4.2 to 4.13);

(b) donation of ICT products (paras. 4.14 to 4.20); and

(c) data erasure practices (paras. 4.21 to 4.31).

ICT disposal strategies

Procedures for disposal of surplus stores items

4.2 The SPRs stipulate the procedures for disposal of surplus stores items (including ICT inventory items). Ways of disposal include transferring to other B/Ds through posting a notice on the Central Cyber Government Office to ascertain if the inventory items are needed by the B/Ds, selling to the GLD disposal term contractors, commercial disposal (e.g. auctions), donations and as a last resort, dumping. A flow chart of the procedures for disposing inventory items is shown at Appendix D.

4.3 Under the SPRs, the Controlling Officer of a B/D is required to establish a Departmental Disposal Committee (DDC) to approve the disposal of surplus stores items with a value (Note 14) at or below $1.43 million. For the four government departments covered in this audit review (see Table 2 in para. 1.20), the DDC comprised a Senior Treasury Accountant or a Chief Executive Officer (who was the Chairman) and two members who were either Supplies Officer Grade Staff or Accounting Officer Grade Staff. The Controlling Officer or a directorate officer designated by him may, on the recommendation of the DDC, approve the disposal of surplus stores items with a value exceeding $1.43 million.

Note 14: *Value of a surplus stores item is the GLD stock price or the original purchase cost or, where neither of these can easily be determined, the replacement cost.*

Lack of ICT disposal strategies

4.4 Table 13 shows the number of ICT inventory items disposed of by the four government departments in the period from 2012-13 to 2014-15.

Table 13

Number of ICT inventory items disposed of by C&ED, EPD, HyD and OGCIO (2012-13 to 2014-15)

Department	2012-13	2013-14	2014-15
C&ED	247	412	382
EPD	1,359	759	975
HyD	64	3	432
OGCIO	754	513	246
Total	2,424	1,687	2,035

Source: Audit analysis of C&ED, EPD, HyD and OGCIO records

4.5 ICT products become obsolete very quickly. Every item of ICT products purchased will ultimately require disposal. Keeping ICT products in storage pending disposal is costly because they quickly lose value, and the failure rate of components increases with time when they are kept inactive in storage. Furthermore, storing obsolete ICT products, especially those bulky products such as laser printers, unjustifiably occupies valuable office space. According to the GLD, a common irregularity relating to the disposal of inventory items is that unserviceable items have often been kept for a long time without being disposed of.

4.6 A disposal strategy, covering such matters as conducting ageing analysis of ICT inventories and periodic reviews of their condition and serviceability, would help the management of B/Ds dispose of obsolete inventories in a timely and systematic manner, thereby generating higher residual values on disposal. For each of the four government departments, Audit examined 20 disposal cases conducted in the period from 2012-13 to 2014-15. Audit found that in general the departments did not have in place a disposal strategy to facilitate timely disposal decisions (see Cases 4 to 7 for illustrations).

Case 4

A disposal case of C&ED in 2014-15

1. On 28 November 2014, an operational unit of the C&ED submitted an application for disposal of 26 unserviceable digital cameras to the department's DDC. These cameras were purchased before 2002 at a total purchase cost of $46,400.

2. The DDC approved the disposal application on 10 December 2014. On 17 December 2014, the GLD posted a notice on the Central Cyber Government Office to ascertain whether the cameras were wanted by other B/Ds. No B/D expressed interest in these cameras.

3. In January and February 2015, three auctions were held by the GLD to dispose of the cameras. The auctions were unsuccessful as either the reserve prices were not met or there was no bidding. On 26 February 2015, the GLD recommended the C&ED to dispose of the cameras at its own discretion as the re-auctioning costs would exceed the potential proceeds.

Audit comments

4. Digital cameras become obsolete very quickly. If a disposal strategy was in place, more timely decision on disposal could have been made. As at the time of audit on 11 May 2015, the cameras were still stored as the C&ED's inventories.

Source: Audit analysis of C&ED records

Case 5

A disposal case of HyD in 2014-15

1. On 4 February 2015, a regional office of the HyD submitted an application for disposal of unserviceable ICT products to the department's DDC. The disposal application involved 323 ICT inventory items with a total replacement cost of $25,690. Details of the items were as follows:

ICT product	Quantity	Year of purchase
Dot matrix printer	14	Before 2000 to 2006
Inkjet printer	1	Before 2000
Laser printer	4	Before 2000 to 2002
Personal computer with 286 central processing unit	1	Before 1990
Personal computer with Pentium central processing unit	33	Before 2000 to 2007
Cathode ray tube monitor	10	Before 1990 to 2000
Keyboard	144	Before 2000
Modem	4	Before 2000 to 2008
Mouse	72	Before 2000
Scanner	6	Before 2000 to 2003
Server	2	Before 2000
Switch	27	Before 2000 to 2007
Uninterruptible power supply	5	Before 2000
Total	323	

2. The DDC approved the disposal application on 10 February 2015 and the items were sold to a GLD disposal term contractor for some $4,000.

Audit comments

3. Audit noted from the HyD's records that the items were mainly purchased before 1990 to early 2000. Most of these items (e.g. the dot matrix printers and the personal computer with 286 central processing unit) had likely been stored for a long period of time before a disposal decision was made. An earlier disposal could have resulted in better selling price of the items.

Source: Audit analysis of HyD records

Case 6

Three disposal cases of OGCIO in 2014-15

1. In the first quarter of 2015, an operational unit of the OGCIO submitted three applications to the department's DDC for approving the disposal of obsolete ICT products related to a system retired in January 2008. The disposal applications involved 234 ICT inventory items, which were mainly purchased between 1999 and 2001. The total original purchase cost of these items amounted to some $3.8 million.

2. The DDC approved the disposal applications in February and April 2015. Some of the obsolete ICT products were sold to the GLD disposal term contractors while some others (67 items with a total original purchase cost of some $1 million) were put up for auctions in three batches. The GLD arranged three auctions for each batch between April and July 2015. The sales through auction were unsuccessful as the reserve prices were not met. As a result, the GLD recommended the OGCIO to dispose of these items at its own discretion as the re-auctioning costs would exceed the potential proceeds.

Audit comments

3. The obsolete ICT products could have been disposed of in early 2008. However, they were not brought up for disposal until 2015.

Source: Audit analysis of OGCIO records

Case 7

Ageing analysis of EPD's ICT products

1. The EPD could make better use of its computerised inventory control system (see para. 3.23(a)). For example, the system could provide information for ageing analysis and facilitate disposal decisions.

2. Audit extracted from the system information on the ICT inventories held by an operational unit of the EPD as of August 2015 and conducted an ageing analysis:

ICT product	No. of ICT inventory items					
	1 year and below	>1 year to 3 years	>3 years to 5 years	>5 years to 10 years	>10 years	Total
Personal computer	9	73	55	116	85	338
Digital camera	14	19	14	3	4	54
DVD/digital recorder	0	0	1	6	30	37
Hard disk	0	2	0	20	52	74
Mobile phone	10	16	16	101	30	173
Monitor	13	52	42	134	58	299
Printer	6	12	16	72	63	169
Scanner	4	2	4	1	20	31
Video camera	1	2	2	2	4	11
Total	57 (5%)	178 (15%)	150 (13%)	455 (38%)	346 (29%)	1,186 (100%)

Audit comments

3. As shown above, 346 (29%) of 1,186 ICT inventory items were purchased more than 10 years ago. The EPD needs to review the condition and serviceability of these items. The EPD also needs to conduct ageing analysis of its ICT inventories periodically to facilitate the making of timely disposal decisions.

Source: Audit analysis of EPD records

Audit recommendations

4.7 **Audit has *recommended* that the Commissioner of Customs and Excise, the Director of Environmental Protection, the Director of Highways and the Government Chief Information Officer should:**

(a) **conduct a review of their ICT inventories to identify inventory items that are due for disposal; and**

(b) **in the light of the results of the review, dispose of the obsolete inventory items in accordance with the SPRs in a timely and systematic manner.**

4.8 **Audit has *recommended* that the Director of Government Logistics should:**

(a) **promote the formulation of ICT disposal strategies by B/Ds (e.g. conducting periodic reviews of the condition and serviceability of the inventories with due regard to the service period of the items and the guidelines issued by the OGCIO on the products' optimal lifespan to facilitate timely disposal of obsolete ICT products); and**

(b) **remind B/Ds to arrange timely disposal of obsolete ICT products.**

Response from the Government

4.9 The Commissioner of Customs and Excise agrees with the audit recommendations in paragraph 4.7. He has said that the C&ED has conducted a review of the ICT inventories and would arrange disposal of the obsolete inventory items in accordance with the SPRs.

4.10 The Director of Environmental Protection agrees with the audit recommendations in paragraph 4.7.

4.11 The Director of Highways agrees with the audit recommendations in paragraph 4.7. He has said that in reviewing the ICT inventories, the HyD will consider their condition and serviceability to identify inventory items that are due for disposal. Furthermore, the HyD is preparing an internal accounting circular in which guidelines would be given for the inventory holders to set the timeframe (such as within three months from the date of identifying the surplus inventory items) to carry out the disposal action or to review the status of surplus items.

4.12 The Government Chief Information Officer agrees with the audit recommendations in paragraph 4.7. He has said that in the annual departmental inventory verification exercise for 2016, inventory units of the OGCIO have been reminded to review the inventory items under their charge so as to identify any unwanted inventory items for disposal in accordance with the SPRs.

4.13 The Director of Government Logistics accepts the audit recommendations in paragraph 4.8. She has said that the GLD will take follow up action accordingly.

Donation of ICT products

Donation of ICT products by EPD

4.14 Of the four government departments covered in this review, the EPD was the only department that had donated ICT products. In September 2009, the EPD started a pilot scheme to donate old ICT products to a non-governmental organisation (NGO) for green and charitable purposes. The EPD considered that the scheme would set a good example to all B/Ds as well as the ICT industry and the public. In December 2009, the pilot scheme was adopted as a regular departmental practice. Since then, a compulsory "vetting" step has been introduced to screen old ICT products (serviceable and unserviceable) suitable for donation. Up to 30 September 2015, the EPD:

(a) had made 65 donations, involving a total of 3,636 items of ICT products (see Table 14). The original purchase cost of these products amounted to $10.7 million; and

(b) had 1,543 items of ICT products (498 serviceable and 1,045 unserviceable items) awaiting donation. Their original purchase cost amounted to $5.6 million.

Table 14

ICT products donated by EPD
(September 2009 to September 2015)

ICT product	No. of inventory items		Total
	Serviceable	Unserviceable	
Personal computer	327	654	981
Notebook	36	65	101
Monitor	443	330	773
Printer	102	304	406
Scanner	31	27	58
Server	21	9	30
Hard disk	35	134	169
Others (e.g. accessories for personal computers, notebooks, printers and servers)	480	638	1,118
Total	1,475	2,161	3,636

Source: Audit analysis of EPD records

Areas for improvement in EPD's donations of ICT products

4.15 While the EPD's donation is a good act of benevolence that helps the needy, Audit noted areas for improvement as follows:

(a) for serviceable ICT products, the EPD had acted in accordance with the procedures laid down in the SPRs (see Appendix D). However, of the 2,161 items of unserviceable ICT products, 1,366 (63%) were covered by the GLD disposal term contracts and, according to the SPRs, should have been sold to the term contractors (see Appendix D); and

(b) all the donations were only made to one NGO.

Audit recommendations

4.16 **Audit has *recommended* that the Director of Environmental Protection should:**

(a) **take measures to ensure compliance with the SPRs in future donations of ICT products; and**

(b) **explore whether there are other NGOs in need of donations of ICT products and consider donating ICT products to them in future donations.**

4.17 **Audit has *recommended* that the Director of Government Logistics should, in consultation with the Secretary for Financial Services and the Treasury, explore the possibility of improving the procedures stipulated in the SPRs to facilitate the donation of ICT products (e.g. waiving, for donation purposes, the requirement that unserviceable ICT products should first be sold to GLD disposal term contractors).**

Response from the Government

4.18 The Director of Environmental Protection agrees with the audit recommendations in paragraph 4.16.

4.19 The Director of Government Logistics agrees with the audit recommendation in paragraph 4.17. She has said that the GLD will explore with the FSTB the possibility of aligning the different procedures in the SPRs for the disposal of serviceable and unserviceable stores, including ICT products, to enable B/Ds to consider donation and commercial disposal in parallel based on the merits of each case including residual value, re-saleable value and public interest.

4.20 The Secretary for Financial Services and the Treasury has said that the FSTB will explore with the GLD the possibility of aligning the different procedures in the SPRs for the disposal of serviceable and unserviceable stores, including ICT products, to enable B/Ds to consider donation and commercial disposal in parallel based on the merits of each case including residual value, re-saleable value and public interest.

Data erasure practices

Guidelines on data erasure

4.21 Over time, B/Ds will inevitably accumulate a considerable amount of information in ICT products such as computers. The SRs provide guidelines and requirements on the destruction of classified information stored in ICT products prior to their disposal. The OGCIO has promulgated policies and guidelines on ICT security, which cover the issue of destruction of classified information. Moreover, the GLD has issued a memorandum to require B/Ds to observe certain security guidelines concerning the disposal of computers.

4.22 According to the SRs and the OGCIO's ICT security guidelines:

(a) prior to the disposal of computers, all classified information should be completely cleared from the storage media through sanitisation (e.g. by degaussing to magnetically erase data from the media by exposing the media to a strong magnetic field — see Photograph 1). If for any reason sanitisation is infeasible, the storage media must be physically destroyed to prevent the recovery of classified information; and

Photograph 1

A degausser used by HyD for sanitisation of storage media

Source: HyD records

(b) for disposal of other ICT products with embedded storage devices (e.g. tablets and mobile phones), the rigour as described in (a) above applies. For disposal of ICT products containing unclassified information, as a good practice to protect data privacy, B/Ds are advised to adopt the same rigour.

Shortcomings in data erasure practices

4.23 Audit examined the data erasure exercises conducted in the period from 2012-13 to 2014-15 by the four departments that Audit visited. For the C&ED, the HyD and the OGCIO, depending on the departments' internal resources, the data erasure was performed either in-house or through contractors. For the EPD, all data erasure was performed in-house. Audit's examination revealed the following shortcomings:

(a) according to the SRs, checks and balances should be in place to ensure that data erasure is duly conducted. Accordingly, for data erasure conducted by contractors, contractors are required to provide a certificate indicating that they have properly conducted the erasure. Audit examined 20 certificates issued by five contractors engaged by the C&ED, the HyD and the OGCIO, and found that only in three certificates issued by one contractor stated that the OGCIO's policies and guidelines on ICT security had been complied with;

(b) according to the OGCIO's ICT security guidelines, sample checks of erased storage media should be performed by another party to ensure that all classified information is properly erased. The four departments informed Audit that they had conducted the sample checks. However, of the four departments, only the OGCIO and an operational unit of the HyD could provide evidence that such checks had been conducted; and

(c) according to the GLD's memorandum, for disposal of computers, a declaration is required to confirm that the procedures for data erasure as set out in the OGCIO's ICT security guidelines have been followed. However, the memorandum was silent on whether a declaration is required for disposal of other ICT products with embedded storage devices or for trade-in (Note 15) of ICT products. Of the four departments, the OGCIO had made declarations for disposal of other ICT products with embedded storage

Note 15: *Trade-in of ICT products is covered in PART 2 of this Audit Report.*

devices. Upon Audit's enquiry in May 2015, the HyD had started to follow the OGCIO's practice. All the four departments visited had not made declarations for trade-in of ICT products. In response to Audit's enquiry in February 2016, the OGCIO had started to make declarations for trade-in cases.

Audit recommendations

4.24 **Audit has *recommended* that the Commissioner of Customs and Excise, the Director of Environmental Protection and the Director of Highways should:**

(a) **ensure that independent sample checks of erased storage media are performed in accordance with the OGCIO's ICT security guidelines to ensure that all information is properly erased; and**

(b) **keep proper documentation of sample checks conducted.**

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

(a) **take measures to ensure that B/Ds fully understand the data destruction requirements and follow the OGCIO's guidelines in conducting data erasure exercises (e.g. conducting sample checks of erased storage media and documenting the sample checks); and**

(b) **consider standardising the core information required for a data erasure certificate (e.g. requiring contractors to declare in the certificates that the OGCIO's policies and guidelines on ICT security have been complied with in performing the data erasure).**

4.26 **Audit has *recommended* that the Director of Government Logistics should promulgate the requirement that when a B/D disposes of computers as well as other ICT products with embedded storage devices and for trade-in of ICT products, a declaration is needed to confirm that the data erasure procedures as set out in the OGCIO's ICT security guidelines have been followed.**

Response from the Government

4.27 The Commissioner of Customs and Excise agrees with the audit recommendations in paragraph 4.24. He has said that the C&ED has performed independent sample checks of erased storage media in accordance with the OGCIO's ICT security guidelines. It has also reminded all relevant personnel to keep proper record of the sample checks.

4.28 The Director of Environmental Protection agrees with the audit recommendations in paragraph 4.24.

4.29 The Director of Highways agrees with the audit recommendations in paragraph 4.24. He has said that the HyD is preparing an internal accounting circular to remind its staff of the relevant security requirements including the OGCIO's ICT security guidelines. The circular will be regularly circulated to the staff concerned and their supervisors to ensure that independent sample checks of erased storage media are performed for disposal and trade-in of ICT inventory items and relevant record are properly kept.

4.30 The Government Chief Information Officer agrees with the audit recommendations in paragraph 4.25. He has said that:

(a) B/Ds are required to conduct sample checks on erased storage media by another party but some B/Ds did not keep proper records on actions taken. The OGCIO will review the existing guidelines to require B/Ds to keep proper records on sample checks of erased storage media for compliance audit; and

(b) the OGCIO will develop a sample of data erasure certificate for B/Ds' reference.

4.31 The Director of Government Logistics accepts the audit recommendation in paragraph 4.26. She has said that the GLD will take follow up action accordingly.

PART 5: PROVISION OF APPS

5.1 This PART examines the provision of apps by the Government, focusing on the following issues:

(a) review of government apps (paras. 5.7 to 5.24); and

(b) way forward for government apps (paras. 5.25 to 5.28).

Overview of government apps

5.2 The first government app, "MyObservatory", was launched in 2010. As at 31 August 2015, there were 127 apps launched by 36 B/Ds (see Table 15). The development cost of these apps amounted to some $38 million (ranged from about $20,000 to $3.3 million each — Note 16).

Table 15

Apps launched by B/Ds
(31 August 2015)

No. of apps launched	No. of B/Ds	Total no. of apps launched
1	14	14
2 to 3	12	32
4 to 5	4	16
6 to 10	3	22
11 to 15	2	25
16 to 20	1	18
Total	36	127

Source: Audit analysis of OGCIO records

Note 16: *The development costs of some apps were high because cost had been incurred not only on the development of apps, but also on the procurement of hardware and software for backend server.*

5.3 Table 16 shows the average monthly number of downloads of government apps from the launching dates of apps to 31 August 2015.

Table 16

Average monthly number of downloads of government apps (31 August 2015)

Average monthly number of downloads	No. of apps	Percentage
0 to 30	6	5%
31 to 90	23	19%
91 to 900	49	40%
901 to 1,800	20	17%
1,801 to 4,500	9	7%
Over 4,500	15	12%
Total	122 (Note)	100%

Source: Audit analysis of OGCIO records

Note: Information on the average monthly number of downloads of five apps as at 31 August 2015 was not available from the OGCIO. The OGCIO was following up with the B/Ds concerned.

5.4 Tables 17 and 18 further show, as at 31 August 2015, the listing of ten apps with the highest and lowest average monthly number of downloads respectively.

Table 17

Ten apps with highest average monthly number of downloads
(31 August 2015)

	B/D	Name of app	Development cost ($)	Annual maintenance cost ($)	Cumulative number of downloads as at 31 August 2015	Average monthly number of downloads (Note 2)
1	Hong Kong Observatory	MyObservatory	Not available (Note 1)	Not available (Note 1)	5,187,000	88,190
2	Radio Television Hong Kong	RTHK On The Go	200,000		1,628,063	37,001
3	Transport Department	HKeTransport	1,100,000	220,000	1,369,000	29,008
4	OGCIO	GovHK Notifications	460,000	160,000	687,961	18,594
5	Labour Department	Interactive Employment Service (iES) smartphone application	125,000	83,928	574,164	13,493
6	OGCIO	Wi-Fi.HK	340,000	80,000	150,940	11,637
7	LCSD	My URBTIX	Not available (Note 1)	Not available (Note 1)	155,340	11,376
8	Radio Television Hong Kong	RTHK Mine	409,000		131,316	10,943
9	Radio Television Hong Kong	RTHK Screen	250,000		216,248	10,812
10	LCSD	My Library	3,321,691	313,000	132,505	10,509

Source: Audit analysis of OGCIO records

Note 1: Due to reasons such as the app being developed by in-house staff, the development of the app bundled with other services without separate cost breakdown, and no maintenance service from the service provider, cost information was not available from the B/Ds.

Note 2: The average monthly number of downloads of an app was the sum of the average monthly numbers of downloads of the app from different operating platforms (i.e. Android, iOS, Symbian and Windows Phone) from the launch dates of the platforms to 31 August 2015. In cases where there was insufficient information (e.g. some launch dates of platforms of an app were not available from the OGCIO), the latest launch date was used in calculating the average monthly number of downloads.

Table 18

Ten apps with lowest average monthly number of downloads
(31 August 2015)

	B/D	Name of app	Development cost ($)	Annual maintenance cost ($)	Cumulative number of downloads as at 31 August 2015	Average monthly number of downloads (Note 3)
1	Education Bureau	Eye Care for Hong Kong Students (Note 2)	Not available (Note 1)	Not available (Note 1)	89	11
2	LCSD	Restore King Yin Lei			200	12
3	LCSD	Matching@ King Yin Lei			233	14
4	LCSD	Puzzle@King Yin Lei			270	16
5	Education Bureau	QEF ebook (Note 2)			308	18
6	Home Affairs Bureau	"M" Mark Events App	70,000	14,400	1,013	31
7	LCSD	Photo ME@King Yin Lei	Not available (Note 1)	Not available (Note 1)	559	33
8	LCSD	King Yin Lei			590	35
9	Food and Environmental Hygiene Department	Food Safety Charter (Note 4)	130,000		1,459	35
10	Education Bureau	TSS Channel (Note 2)	Not available (Note 1)		362	36

Source: Audit analysis of OGCIO records

Provision of apps

Note 1: *Due to reasons such as the app being developed by in-house staff, the development of the app bundled with other services without separate cost breakdown, and no maintenance service from the service provider, cost information was not available from the B/Ds.*

Note 2: *The Education Bureau informed Audit in March 2016 that:*

(a) the "Eye Care" app is part of the parent education resource materials launched in 2015/16 school year. While the app was launched in January 2015 for trial run, other resource materials are not yet ready. The Bureau also sees the need to review and enrich the resource materials on eye care to address the rising concern of parents and the rapid technology development on the subject. The Bureau plans to widely publicise the whole package of resource materials, including the app, when they are available towards the latter half of 2016;

(b) the "QEF ebook" app is a pilot scheme and is developed for supporting the learning of students with special education needs. The target users are the teachers who teach these students. Apart from using the app on both iOS and Android platform, teachers can also download the same resources through a website and the platform of HKEdCity. The numbers of downloads from these two channels were some 1,200 (from April 2013 to March 2016) and some 6,700 (from September 2014 to March 2016) respectively; and

(c) the "TSS Channel" app aims at equipping technical support staff (TSS) at schools and their supervising teachers the necessary technical knowledge and skills. It contains 90 video clips. The same video clips are also available on YouTube, which is far more popular among the target group. The Bureau will consult stakeholders on the effectiveness of the app and does not rule out the possibility of decommissioning the app in the near future.

Note 3: *The average monthly number of downloads of an app was the sum of the average monthly numbers of downloads of the app from different operating platforms (i.e. Android, iOS, Symbian and Windows Phone) from the launch dates of the platforms to 31 August 2015. In cases where there was insufficient information (e.g. some launch dates of platforms of an app were not available from the OGCIO), the latest launch date was used in calculating the average monthly number of downloads.*

Note 4: *According to the Food and Environmental Hygiene Department, the "Food Safety Charter" app has already been decommissioned and was removed from the App Store in February 2016. Its functions are included in the new "Food Safety" app developed by the Department with more functions and features.*

Remarks: *To make allowance for the time and effort required to promote apps, apps launched for a period of less than six months were excluded in the compilation of the list.*

5.5 To facilitate B/Ds to develop apps for the public, the OGCIO has since 2011 issued several guidelines on what makes a good app. In July and December 2015, the OGCIO also issued and updated respectively a good practice guide. Among other things, the guide states that B/Ds should consider what an app can do for users and that they should not build an app just for the sake of building it. It also states that B/Ds should have a reasonable estimate of the number of downloads before considering developing an app. Moreover, B/Ds should consider decommissioning an app if it does not meet the original objectives of developing the app, or there are other apps that can better serve its purposes.

5.6 In the period from October 2015 to January 2016, Audit examined the apps of four government departments (see Table 3 in para. 1.20) to ascertain whether there is scope for improvement in their provision of apps to better provide information and services to the public. The audit findings are shown in paragraphs 5.7 to 5.14.

Review of government apps

Need to enhance app contents

5.7 According to the OGCIO's guidelines and good practice guide, a good app should be able to provide mobile device features such as location services/Global Positioning System (GPS) function and push notifications. In January 2016, Audit downloaded 22 apps (Note 17) of the four departments and conducted a review of the contents of the apps. Some of the apps were catered for specific targeted users and may not have broad appeal. Audit found that:

(a) the mobile device features of some apps were limited (see Table 19). Apps with limited or nil features were virtually duplications of the websites of the B/Ds. Audit noted that in 2014 and 2015, to save administrative and maintenance costs, the Agriculture, Fisheries and Conservation Department had decommissioned four apps that duplicated its web contents. For those apps whose average monthly number of downloads were low (e.g. the DH's "Framework@PC" and the LCSD's "Restore King Yin Lei" — see Table 19), the B/Ds concerned need to enhance the app contents to attract more people to use the apps. For example, the feature of push notification

Note 17: *The 22 apps comprised all the 10 apps of the DH, all the 3 apps of the FSD, 8 of the 18 apps of the LCSD, and the only app of the WSD.*

could be added to the apps to alert users about "what's new". The B/Ds concerned also need to consider decommissioning the apps if the apps eventually could not meet the original objectives of developing them; and

Table 19

Mobile device features of 22 apps of DH, FSD, LCSD and WSD (January 2016)

	Name of app	Average monthly number of downloads as at 31 August 2015	Mobile device features							
			Camera	Games to run offline	Link to calling function	Location services/ GPS function	Mobile map	Push notification	Quick response (QR) code	Sharing function
DH										
1	CookSmart: EatSmart Recipes	471	–	–	✓	–	–	–	–	✓
2	EatSmart Restaurant	1,629	–	–	✓	✓	✓	–	–	✓
3	Framework @PC	53	–	–	✓	–	–	✓	–	✓
4	Hong Kong Chinese Materia Medica Standards Volume 1, Department of Health	281	–	–	–	–	–	–	–	–
5	IMPACT	288	–	–	–	–	–	–	–	–
6	Primary Care Directory	563	–	–	✓	✓	✓	–	–	✓
7	Quit Smoking App	1,073	–	–	✓	–	–	✓	–	✓
8	Snack Nutritional Classification Wizard	209	–	–	–	–	–	–	–	–
9	Student Weight For Height Check	1,728	–	✓	–	–	–	✓	–	✓
10	1069 試戴樂	599	–	✓	✓	✓	✓	✓	–	–

Table 19 (Cont'd)

	Name of app	Average monthly number of downloads as at 31 August 2015	Mobile device features							
			Camera	Games to run offline	Link to calling function	Location services/ GPS function	Mobile map	Push notification	Quick response (QR) code	Sharing function
FSD										
1	Hong Kong Fire Service Mobile Application	810	✓	–	–	✓	✓	✓	–	✓
2	Live safe, be watchful	934	–	✓	–	–	–	–	–	✓
3	Stay Calm and Collected	1,262	–	✓	–	–	–	–	–	✓
LCSD										
1	Bruce Lee: Kung Fu Art Life	1,373	✓	–	–	–	–	–	✓	✓
2	Hong Kong International Poster Triennial 2014	160	–	–	✓	–	✓	–	–	✓
3	King Yin Lei	35	–	–	–	–	–	–	–	–
4	Matching@ King Yin Lei	14	–	✓	–	–	–	–	–	–
5	My Culture	1,050	–	–	✓	✓	✓	✓	–	✓
6	Photo ME@King Yin Lei	33	✓	–	–	–	–	✓	–	–
7	Puzzle@King Yin Lei	16	–	✓	–	–	–	–	–	–
8	Restore King Yin Lei	12	–	✓	–	–	–	–	–	–
WSD										
1	WSD Mobile App	602	–	–	✓	–	–	✓	–	–

Source: *OGCIO records and analysis of apps downloaded by Audit*

Remarks: *– denotes feature not available*
✓ denotes feature available

(b) in October 2014, the WSD conducted a review of its "WSD Mobile App". The review compared the services provided by the app and those by other utility and telecommunication companies, and concluded that some enhancement features could be added to the app. Examples of enhancement features were:

(i) provision of user's payment history;

(ii) provision of bill alert and due date alert;

(iii) provision of hyperlink to Internet payment service providers or provision of e-bill in QR Code for payment at convenience stores; and

(iv) allowing users to update their personal particulars.

However, Audit tested the functions of the app (on Android platform on 11 January 2016 and on iOS platform on 29 January 2016) and found that none of these enhancement features had been added to the app.

Need to step up promotion of apps

5.8 It is stated in the OGCIO's good practice guide that a B/D should promote the app it developed to let more people use it. This would be necessary especially for those government apps that had low number of downloads (see Table 19 in para. 5.7(a)). In reviewing the government apps, Audit noted the following issues relating to the promotion of apps by B/Ds:

(a) since August 2012, the OGCIO has launched "GovHK Apps" to provide one-stop e-Government services to the public through the mobile channel. The app serves as a centralised platform for people to choose and download any government apps. In addition, the OGCIO has publicised on the GovHK website a list of government apps known as "Mobile websites and mobile applications of Government". In mid-November 2015, Audit examined the government apps listed on "GovHK Apps" and the GovHK website. Audit found that 15 of the 127 apps (see para. 5.2) had not been listed (see Table 20). In February 2016, the OGCIO informed Audit that generally it would put the apps of B/Ds onto the "GovHK Apps" and the GovHK website upon request by B/Ds as a way to improve the apps' publicity on a voluntary basis. The OGCIO would also try to motivate B/Ds to list their apps on the "GovHK Apps" and the GovHK website. Some apps were not listed on the "GovHK Apps" and the GovHK website because either the apps were event/project-based and were no longer up-to-date, or the B/Ds concerned did not request the OGCIO to include their apps in the list or the GovHK website. As both the "GovHK Apps" and the GovHK website are centralised platforms for enabling the public to be aware of the availability of government apps, Audit considers that the OGCIO needs to take measures to enhance the completeness of apps listed on the "GovHK Apps" and the GovHK website; and

Table 20

Government apps not listed on "GovHK Apps" and the GovHK website (16 November 2015)

B/D	No. of apps	Examples of apps
Education Bureau	8 (Note 1)	Eye Care for Hong Kong Students, QEF ebook, TSS Channel
LCSD	3	Hong Kong International Poster Triennial 2014, Appreciation of Qing Scientific Instruments
Innovation and Technology Commission	2 (Note 2)	春田花花科學盛會, McMug on Green Technology
DH	1	1069 試戴樂
Home Affairs Bureau	1	Families with Newborn Babies
Total	15	

Source: Audit examination of OGCIO app and website

Note 1: According to the Education Bureau, for the "QEF ebook" app, it is suitable to place the e-books on the platform of the HKEdCity (see Note 2 in Table 18 in para. 5.4). The teachers are familiar with this platform. The Bureau has therefore planned to migrate the e-books to the HKEdCity and phase out the app in the first half of 2016. The Bureau has no plan to place the "QEF ebook" app onto the "GovHK Apps" and the GovHK website. Regarding the "TSS Channel" app and the "Eye Care" app, the Bureau has informed the OGCIO the launch of two apps through regular updates called by the OGCIO. It also gave consent to the OGCIO on 19 November 2015 to include these two apps in the "GovHK Apps" upon the OGCIO's request on 18 November 2015.

Note 2: According to the Innovation and Technology Commission, the two mobile apps were developed respectively for the annual InnoCarnival in 2012 and 2013. They were designed for members of the public to participate in and be kept apprised of promotional news of on-site events of the InnoCarnival. The Commission has not developed similar apps since 2013.

(b) in April 2012, the DH launched "1069 試戴樂" targeting for the gay community. The app aims to provide Human Immunodeficiency Virus (HIV) education to gays including information on locations where they can obtain free HIV antibody test (which is used to screen for and diagnose HIV infection). Audit found that:

(i) since its launch in April 2012 to 31 August 2015, the cumulative number of downloads of the app was some 25,000. According to DH's reply in late January 2016 to an audit enquiry, the number of adult gays in Hong Kong was estimated to be in the region of 100,000 to 137,500. This indicated that 75% to 82% of the estimated population may not aware of the app and therefore had not downloaded the app. This situation was not satisfactory as according to the "FACTSHEET on HIV/AIDs Situation in Hong Kong" published in 2015 by the DH's Centre for Health Protection, the DH received a record high of 651 reports of HIV infection under the voluntary and anonymous HIV/AIDS reporting system in 2014 — a 16% increase compared to the 559 cases in 2013; and

(ii) the app was only available in Chinese. Audit, however, noted that according to the FACTSHEET, 28% of the people infected with HIV were non-Chinese or of unknown ethnicity in 2014.

In February 2016, the DH informed Audit that in addition to the app, the DH had used other means such as website and Facebook for gays' HIV health promotion and prevention. According to a DH's survey in 2014, 71% (731/1,026) of the respondents had received HIV prevention message. Nevertheless, as a large number of gays may not be aware of the app (see para. 5.8(b)(i)), the DH needs to step up its promotion of the app. It also needs to launch an English version of the app.

Need to improve post-implementation review of apps

5.9 For apps funded by CWRF Head 710: Computerisation (see Appendix B), the B/D is required to submit to the OGCIO a Post-Implementation

Departmental Return (PIDR — Note 18) six months after the completion of the project or live run of the system (Note 19).

5.10 Of the 22 apps examined by Audit, 10 apps were funded by the CWRF and therefore PIDR was required. Audit noted that for 3 of the 10 apps, although the PIDR had been submitted to the OGCIO, there were no deliberations in the PIDR on what could be done to improve the low number of downloads. All these three apps were developed by the FSD (see Table 19 in para. 5.7(a)).

5.11 As stated in the FSD's funding application, the three apps were expected to attract 250,000 downloads in the first year with an estimated annual growth rate of 10%. However, in the period from the launch of the app in May 2014 to 31 August 2015, the cumulative number of downloads of the three apps was 48,077 only. In the PIDR submitted to the OGCIO in February 2015, the FSD stated that on-going promotional activities would be arranged to increase the number of downloads. Notwithstanding this, Audit noted that, the number of downloads was still on the low side.

5.12 In February 2016, the FSD informed Audit that it had added five mini-games to the three apps and conducted a series of promotional activities such as video on YouTube, radio broadcasting and promotional programmes at kindergartens, primary and secondary schools. As at 26 January 2016, the cumulative number of downloads of the three apps had increased to 57,225.

Apps for one-off events

5.13 In reviewing the government apps, Audit noted that as at 31 August 2015, 31 apps had been developed for one-off events. Of these 31 apps, 23 had already been decommissioned. The total development cost of the decommissioned 23 apps amounted to some $2.6 million. Table 21 shows a list of decommissioned apps developed by the departments covered in this review.

Note 18: *PIDR sets out the app's achievements and the reasons for any deviations from the planned achievements.*

Note 19: *In the OGCIO's good practice guide of December 2015, B/Ds are recommended to conduct post implementation review for apps that are funded by the B/Ds' own departmental expenses.*

Table 21

Decommissioned apps for one-off events by LCSD
(31 August 2015)

	Name of app	Development cost ($)	Launched in	Decommissioned in	Total number of downloads
1	Chinese Opera Festival 2012	80,000 (Note 1)	April 2012	January 2013	608
2	Chinese Opera Festival 2013	60,000 (Note 1)	April 2013	January 2014	1,241
3	Enchanting Arts of Asia	40,770	August 2011	August 2013	969
4	Lasting Legacies of Eastern Europe 2013	60,770	September 2013	March 2015	900
5	New Vision Arts Festival 2012	65,964	August 2012	March 2015	948
6	The Majesty of All Under Heaven: The Eternal Realm of China's First Emperor	120,000	July 2012	November 2012	2,752
7	Exploring Tsarskoye Selo	180,000	November 2014	March 2015	3,644
8	Portable Dunhuang Story Player	185,000	November 2014	March 2015	6,745
9	3rd HK Games	65,000	March 2011	May 2011	Not available (Note 2)
	Total	857,504			

Source: *Audit analysis of OGCIO records*

Note 1: *The amount included development cost and maintenance cost.*

Note 2: *The LCSD did not provide the information to the OGCIO.*

Remarks: *Of the four departments covered in this review, only the LCSD had decommissioned apps.*

5.14 As shown in Table 21, the number of downloads of some apps for one-off events had been on the low side. Audit considers that the OGCIO needs to introduce more guidance for developing apps for one-off events.

Audit recommendations

5.15 **Audit has *recommended* that the Director of Fire Services, the Director of Health, the Director of Leisure and Cultural Services and the Director of Water Supplies should:**

(a) **regularly review the contents of their apps to ascertain whether the contents could be enhanced to attract more people to use the apps;**

(b) **for those apps with number of downloads on the low side, take measures to enhance the contents to improve the download rate;**

(c) **step up the promotion of their apps to boost the number of downloads; and**

(d) **consider decommissioning those apps that eventually could not meet the original objectives of developing them.**

5.16 **Audit has *recommended* that the Director of Health should consider launching an English version of the "1069 試戴樂" app for the gay community.**

5.17 **Audit has *recommended* that the Director of Fire Services should enhance the public awareness and the usefulness of the three FSD apps so as to improve their download rates.**

5.18 **Audit has *recommended* that the Director of Water Supplies should consider adding enhancement features to "WSD Mobile App".**

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

(a) **take measures to ensure the completeness of government apps listed on "GovHK Apps" and the GovHK website as far as possible; and**

(b) **promulgate the criteria for justifying the development of apps for one-off events in the good practice guide.**

Response from the Government

5.20 The Director of Fire Services agrees with the audit recommendations in paragraphs 5.15 and 5.17. He has said that:

(a) five newly developed mini-games will be added to the apps in April 2016 and the promotional video on YouTube will also be uploaded in May 2016;

(b) the FSD will continue to promote the mobile apps at various kinds of publicity events (e.g. fire station/ambulance depot open days, district fire prevention carnivals, and fire safety roving exhibitions) and to the Fire Safety Ambassadors and Building Fire Safety Envoys, who are volunteers from the public;

(c) mobile apps promotion kiosk will be installed at publicity vehicles including the Mobile Publicity Unit, Fire Safety Education Bus and the Ambulance Service Publicity Vehicle;

(d) mobile apps promotion corner will be set up shortly at the Fire and Ambulance Education Centre cum Museum at the newly commissioned Fire and Ambulance Services Academy at Tseung Kwan O; and

(e) the FSD would continue to improve the contents of the apps and take concrete measures to enhance the public awareness to improve the download rate.

Provision of apps

5.21 The Director of Health agrees with the audit recommendations in paragraphs 5.15 and 5.16. She has said that:

(a) the DH will review regularly to enhance the contents of the apps as needed and continue to find possible ways to step up promotion of the apps to attract more target users to use the apps as well as to improve the download rate. The DH will also consider decommissioning the apps that ultimately do not meet the original objectives; and

(b) the DH will revamp the "1069 試戴樂" app with improvement in its content and incorporation of an English version for the gay community. The new version is planned to be launched in March 2017.

5.22 The Director of Leisure and Cultural Services agrees with the audit recommendations in paragraph 5.15.

5.23 The Government Chief Information Officer agrees with the audit recommendations in paragraph 5.19.

5.24 The Director of Water Supplies agrees with the audit recommendations in paragraphs 5.15 and 5.18. He has said that:

(a) provision of QR code for payment at convenience stores has already been implemented;

(b) the WSD will consider the implementation of the other three enhancement features (see para. 5.7(b)(i), (ii) and (iv)) when resources are available; and

(c) an enhancement for sub-dividing district to smaller districts is being designed and would be implemented in the second quarter of 2016.

Way forward for government apps

5.25 Government apps have been developed at a fast rate. Since the launch of the first government app "MyObservatory" in 2010, some 160 apps (including apps for one-off events that had been decommissioned) had been developed as at 31 August 2015. According to the OGCIO, an anticipated total of 29 new apps would be launched by the end of 2015-16.

5.26 In this PART, Audit identified scope for improvement in the provision of apps by the Government. As mentioned in paragraph 1.4, the OGCIO provides leadership in driving forward ICT proactively within the Government and accounts for the Government's investment in ICT and related programmes. The OGCIO needs to incorporate the audit recommendations into the good practice guide and in view of the rapid technology change, regularly review the guide to ascertain if revisions are needed.

Audit recommendations

5.27 **Audit *recommends* that the Government Chief Information Officer should:**

(a) **in the light of the audit recommendations, promulgate guidelines in the OGCIO good practice guide on the provision of government apps; and**

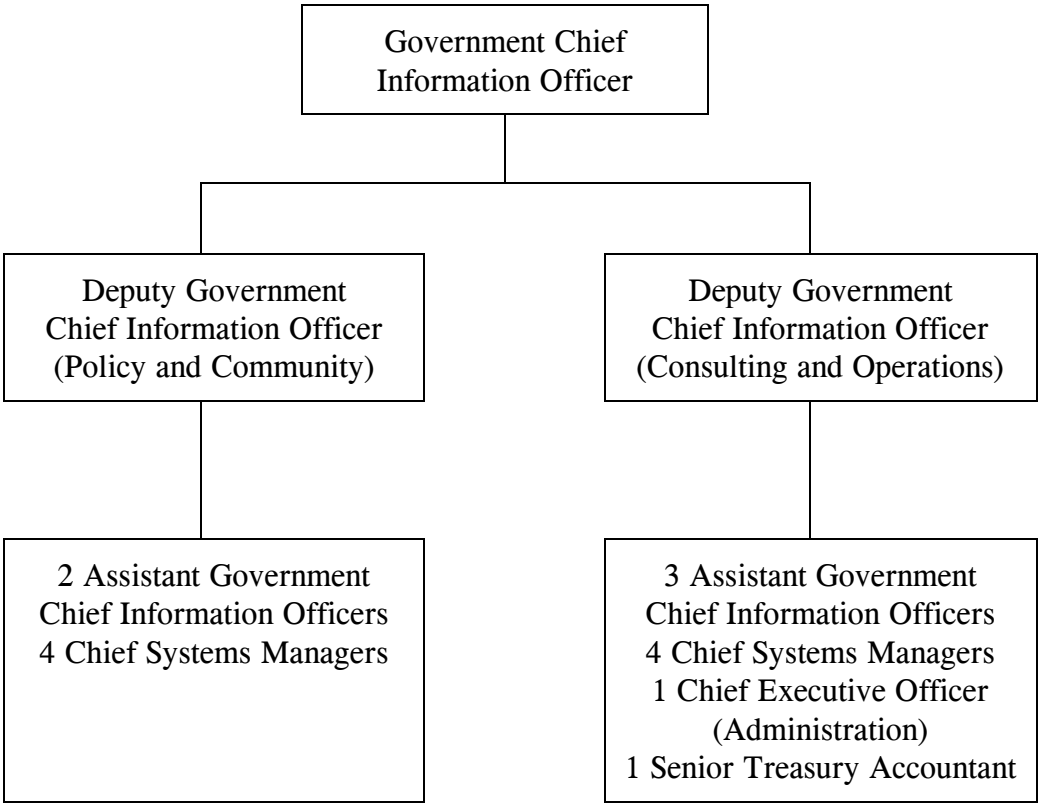
(b) **regularly review the guide to determine if revisions are needed due to technology changes.**

Response from the Government

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

Appendix A
(para. 1.5 refers)

OGCIO: Organisation chart (extract)
(31 December 2015)



Source: *OGCIO records*

Remarks: *The OGCIO was set up in July 2004 through the merger between the then Information Technology Services Department and the IT-related divisions of the then Commerce, Industry and Technology Bureau. In July 2007, the Bureau merged with some business functions of the then Economic Development and Labour Bureau to form the Commerce and Economic Development Bureau. Following this 2007 merger, the Government Chief Information Officer reported to the Permanent Secretary for Commerce and Economic Development (Communications and Technology). Following the establishment of the Innovation and Technology Bureau in November 2015, he reports to the Permanent Secretary for Innovation and Technology.*

Appendix B
(paras. 1.10, 2.8 and 5.9 refer)

Approving authority for expenditure for procuring ICT products and services (up to 31 March 2016)

Source of funding	Estimated procurement cost	Authority for endorsing projects	Authority for approving funding
Administrative computer systems			
GRA: Recurrent Account of the appropriate Head of Expenditure	Project or standalone computer equipment costing not more than $150,000 (Note 1) each	N.A.	Relevant Controlling Officer
CWRF Head 710: Computerisation (Subhead A007GX — block allocation)	Above $150,000 (Note 1) but not exceeding $10 million each	OGCIO's Administrative Computer Projects Committee (ACPC — Note 2)	Government Chief Information Officer
CWRF Head 710: Computerisation (Other Subheads)	Above $10 million each	Technical support by OGCIO and funding support by the Financial Services and the Treasury Bureau (FSTB)	Finance Committee (FC) of Legislative Council (LegCo)
Non-administrative computer systems			
GRA: Recurrent Account of the appropriate Head of Expenditure	Project or standalone computer equipment costing not more than $150,000 (Note 1) each	N.A.	Relevant Controlling Officer

Source of funding	Estimated procurement cost	Authority for endorsing projects	Authority for approving funding
GRA: Capital Account Subhead 661 — Minor Plant, Vehicles and Equipment (Block vote) of the appropriate Head of Expenditure	Above $150,000 (Note 1) but not exceeding $2 million (Note 3) each	Funding support by FSTB	FSTB
(i) CWRF Head 708: Capital Subventions and Major Systems and Equipment for non-administrative computers, communication equipment and mechanised systems only (ii) GRA: Capital Account Subhead 603 — Plant, Vehicles and Equipment of the appropriate Head of Expenditure for systems/equipment other than (i) above	Above $2 million (Note 3)	Funding support by FSTB	FSTB for project cost above $2 million but not exceeding $10 million each; or FC of LegCo for project cost above $10 million each

Source: OGCIO records

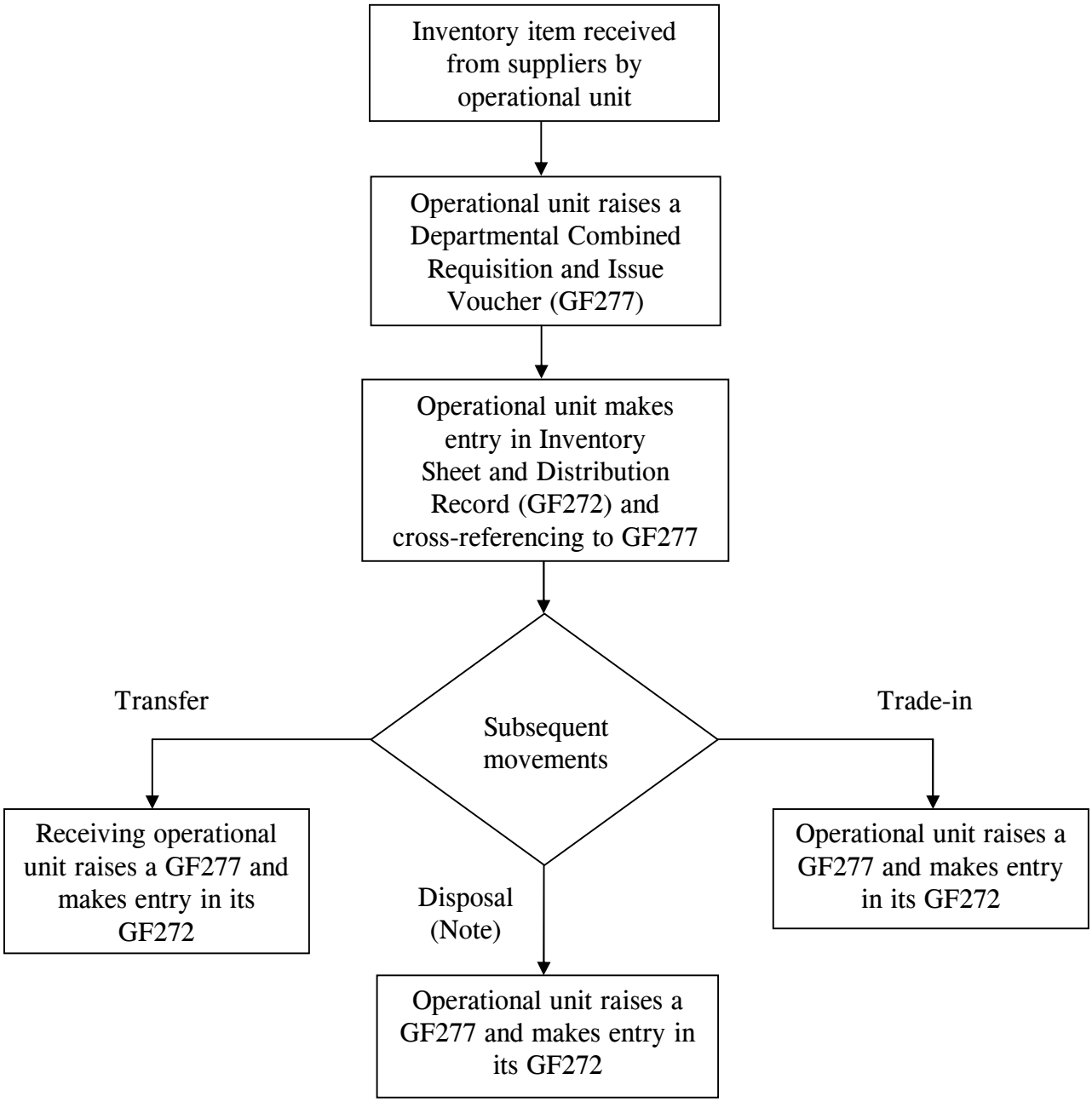
Note 1: The amount will be revised to $200,000 with effect from 1 April 2016.

Note 2: The ACPC is chaired by the Deputy Government Chief Information Officer (Consulting and Operations). Its members comprise the Deputy Government Chief Information Officer (Policy and Community), two Assistant Government Chief Information Officers and a Chief Systems Manager.

Note 3: The amount will be revised to $10 million with effect from 1 April 2016.

Appendix C
(paras. 3.2, 3.3(a) and 3.9(b) refer)

Controls of movements of inventory items under the SPRs

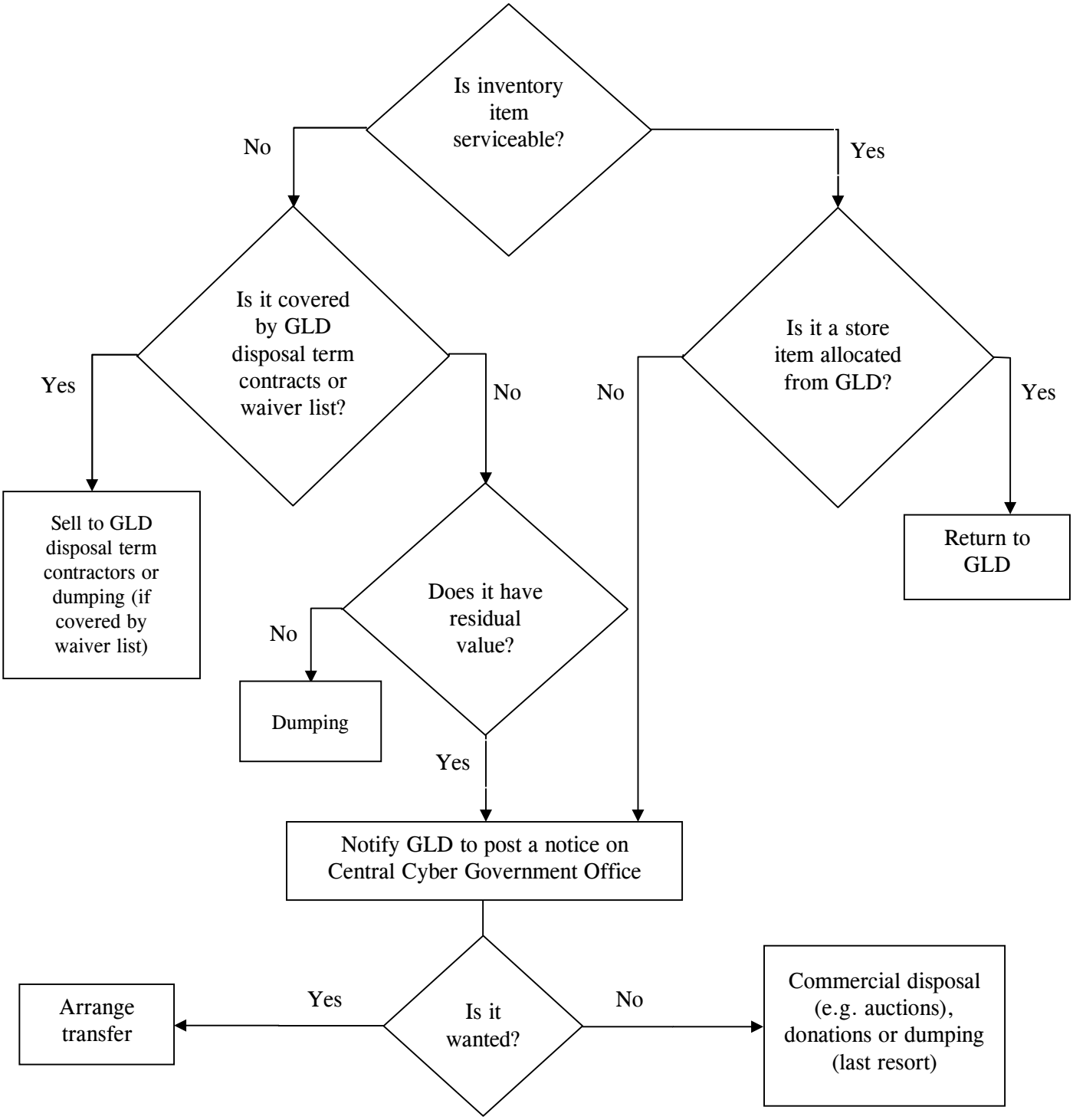


Source: *SPRs*

Note: *Inventory items can be disposed of through commercial means (e.g. auctions), donations or dumping. Disposal of ICT inventory items is covered in PART 4 of this Audit Report.*

Appendix D
(paras. 4.2 and 4.15(a) refer)

Procedures for disposal of inventory items under the SPRs



Source: SPRs

Acronyms and abbreviations

ACPC	Administrative Computer Projects Committee
apps	mobile applications
Audit	Audit Commission
B/Ds	Government bureaux and departments
C&ED	Customs and Excise Department
CWRF	Capital Works Reserve Fund
DDC	Departmental Disposal Committee
DH	Department of Health
EPD	Environmental Protection Department
FC	Finance Committee
FSD	Fire Services Department
FSTB	Financial Services and the Treasury Bureau
GLD	Government Logistics Department
GPS	Global Positioning System
GRA	General Revenue Account
HIV	Human Immunodeficiency Virus
HyD	Highways Department
ICT	Information and communications technology
IT	Information technology
ITAS	IT Asset System
ITMU	Information Technology Management Unit
LCSD	Leisure and Cultural Services Department
LegCo	Legislative Council
NGO	Non-governmental organisation
OGCIO	Office of the Government Chief Information Officer
PIDR	Post-Implementation Departmental Return
QR code	Quick response code
SOA	Standing Offer Agreement
SPRs	Stores and Procurement Regulations
SRs	Security Regulations
WSD	Water Supplies Department