

## **ITEM FOR FINANCE COMMITTEE**

### **CAPITAL WORKS RESERVE FUND**

### **HEAD 710 – COMPUTERISATION**

### **Customs and Excise Department**

### **New Subhead “Implementation of Information System Strategy Projects for the Customs and Excise Department”**

Members are invited to approve a new commitment of \$114,157,000 for implementing five Information System Strategy projects for the Customs and Excise Department.

### **PROBLEM**

The existing fragmented information technology (IT) infrastructure of the Customs and Excise Department (C&ED) is inadequate in terms of functionality and capacity to meet C&ED’s operational needs. C&ED needs to build an integrated IT infrastructure at the new Customs Headquarters Building for effective operations at both the new Headquarters and other offices at various locations.

### **PROPOSAL**

2. The Commissioner of Customs and Excise, with the support of the Secretary for Security and the Government Chief Information Officer, proposes to create a new commitment of \$114,157,000 to implement five Information System Strategy (ISS) projects for the installation of an IT infrastructure at the new Customs Headquarters Building.

**/JUSTIFICATION .....**

## JUSTIFICATION

### The Need for Implementing the Projects

3. In September 2006, an external IT consultant commissioned by C&ED completed a consultancy study to review C&ED's IT infrastructure and computer systems, and formulate a strategic implementation plan that will enable the Department to cope with its existing operational needs and future development. The consultancy study concluded that C&ED's existing IT infrastructure was inadequate in terms of functionality and capacity. In particular, the consultancy study revealed the following problems and limitations –

- (a) C&ED has over 5 000 staff spread over about 40 locations in the territory. Over the decades, C&ED has developed its IT infrastructure and computer systems at different stages on a project-by-project basis without overall strategic planning. As a result, there are various small-scale computer systems dedicated to serve specific user groups at different locations with limited sharing capacity. C&ED's existing fragmented IT infrastructure is difficult to maintain and support, and limits the scope for the Department to enhance its performance through the use of proven IT;
- (b) the existing systems have no centralised management system for security administration (e.g. updating of operating system settings, virus signature and software patches of all networked servers and workstations). They rely on outdated manual mode for security administration, which is ineffective and relatively risk-prone;
- (c) the network bandwidth of the existing systems has been fully utilised and is not capable of supporting the growing information needs at control points. The existing network equipment also requires upgrading to support the transmission of large-size data files (e.g. X-ray images) over the network at a higher speed;
- (d) currently, C&ED runs four data centres (i.e. two production data centres and two disaster recovery data centres) at four different locations. The scattered data centres prevent the shared use of manpower, storage devices and system monitoring tools;

/(e) .....

- (e) the existing C&ED systems do not provide users with access to a single source of corporate data. For example, to perform background check of trader information for risk assessment and enforcement, users need to go through different systems with data stored in different formats. Historical operation data are stored in offline media in individual application systems. The data access process is time-consuming and thus adversely affects operational efficiency. Moreover, it is difficult to perform data analysis in the absence of a single repository for corporate data; and
- (f) the lack of a centralised and secured information exchange platform entails extra efforts for the exchange of operationally essential data between C&ED's systems and external systems (e.g. those in other government departments). This hampers C&ED's efficient operations.

### The Proposed Projects

4. In the light of the above findings, the consultant recommended implementing five ISS projects from 2009 onwards to put in place a new, integrated and centralised IT infrastructure to support the efficient and effective operations of C&ED. The implementation of the five projects will ride on the completion of the new Headquarters in the third quarter of 2010.

5. Details of the five ISS projects are set out below –

- (a) the **Centralised Data Centre** project will consolidate the four existing data centres into two new data centres (i.e. one primary data centre in the new Headquarters in North Point and one disaster recovery data centre in the Harbour Building in Central) and install a backbone network infrastructure in the new Headquarters to support 24-hour operation of C&ED's systems;
- (b) the **Network and Server Infrastructure** will connect the backbone network infrastructure in the new Headquarters with offices at other locations, thus linking up all servers and workstations in C&ED. All C&ED users at remote locations will be provided with high-capacity network connection to support their daily operations. Moreover, the security standards of the IT systems in C&ED will be enhanced with the centralised security management and support for the networked servers and workstations as well as centralised authentication mechanism for accessing C&ED's computer systems;

/(c) .....

- (c) the **Central Information Repository System** is a central information repository that consolidates all operational data shared among various application systems in C&ED. The new system will not only allow timely access to operational data by C&ED staff to facilitate more efficient decision-making, but also be capable of performing analysis of the data stored in the repository;
- (d) the **Secured Communications Gateway** is a secure platform which will enable efficient exchange of operationally essential data between C&ED's computer systems and the systems in other partner government departments. It is also capable of supporting secure data exchange with other external parties (e.g. overseas customs counterparts); and
- (e) the **Enterprise System Management** project will establish a department-wide framework for monitoring and managing C&ED's overall computing environment, including the computer network and servers.

### Benefits

6. The implementation of the five projects will bring the following benefits –

- (a) the five projects will form a reliable, secure and scalable IT network with a department-wide connection to serve more than 5 000 C&ED staff. They will consolidate and rationalise C&ED's IT infrastructure, and form the integrated backbone for connecting C&ED's computer systems at different locations. The new IT infrastructure will enable the Department to enhance its performance through effective use of updated IT facilities and applications, and will cater for the Department's future IT needs;
- (b) the new Centralised Data Centre in the new Headquarters will provide integrated connection for all the computer systems in C&ED and physically house all critical IT resources and equipment under one roof. This will also allow the shared use of manpower resources, storage devices and system monitoring tools;
- (c) with an expanded network bandwidth, the new Network and Server Infrastructure will support the use of new IT applications and multimedia facilities, which will in turn assist C&ED staff at remote offices/control points in carrying out their daily operations more efficiently. By enabling system-wide automatic updating of virus signature and software patches as well as configuration of workstation settings, the system security level of all networked servers and workstations will be enhanced;

/(d) .....

- (d) the new Central Information Repository System will standardise the data format and allow timely access to frequently updated operational data to facilitate decision-making. In some cases, the time required for data access can be considerably reduced from hours to minutes with the introduction of this new system. Data analysis can be performed on all stored data, including historical data, to identify trends in C&ED's performance and achievements. This will facilitate the formulation of enforcement strategy and operational planning;
- (e) the new Secured Communications Gateway will provide C&ED with more efficient interfaces with the systems of other government departments to facilitate sharing and exchange of essential operational data. The gateway is also capable of supporting secure information exchange between C&ED and its overseas customs counterparts. More efficient information exchange with other law enforcement agencies, both locally and overseas, will enhance C&ED's capability to detect and combat smuggling activities and transnational crimes; and
- (f) the new Enterprise System Management will provide a single console to monitor all systems and network components, allowing effective measurement and tuning of system performance. The new infrastructure will enable IT support staff to maintain IT facilities at a high level of availability and provide highly responsive support services to end users.

## Cost

7. The non-recurrent and recurrent costs of the five ISS projects are set out under the section on Financial Implications in paragraphs 9 to 25 below. These costs, under a cost and benefit analysis, will be partly offset by annual savings of \$12,099,000 from 2012-13 onwards brought about by implementation of the proposed projects. The savings comprise –

- (a) Realisable savings of \$4,361,000 per annum

These include the maintenance costs and dataline charges for the existing system and equipment of \$3,459,000, and the saving of \$902,000 for two Computer Operator grade and one contract IT staff posts after the consolidation of the data centres. The savings will be redeployed to cover part of the recurrent costs of \$27,448,000 per annum arising from the proposed projects as set out in paragraphs 19 to 25 below.

/(b) .....

- (b) Notional savings of \$4,825,000 per annum

These represent the quantification of productivity gains through more efficient operations brought about by the new IT projects and the related savings in staff costs as C&ED staff will have more efficient access to computer systems and data to facilitate their planning and decision making.

- (c) Cost avoidance of \$2,913,000 per annum

This represents the avoidance of additional staff efforts which will otherwise be required to support corporate data analysis.

**Cost and Benefit Analysis**

- 8. A cost and benefit analysis for implementing the proposed projects is at Enclosure 1.

**FINANCIAL IMPLICATIONS**

**Non-recurrent Expenditure**

- 9. We estimate that the implementation of the proposed projects will require a total non-recurrent expenditure of \$114,157,000 over a period of four years from 2009-10 to 2012-13, broken down as follows –

	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>Total</b>
	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>	<b>\$'000</b>
(a) Hardware	9,754	30,161	3,354	363	43,632
(b) Software	5,382	11,984	12,091	1,243	30,700
(c) Implementation services	1,584	7,609	3,943	-	13,136
(d) Site preparation	150	11,615	2,260	-	14,025
(e) Consumables and miscellaneous	460	1,477	318	33	2,288
(f) Contingency	1,733	6,284	2,196	163	10,376
<b>Total</b>	<b>19,063</b>	<b>69,130</b>	<b>24,162</b>	<b>1,802</b>	<b>114,157</b>

10. On paragraph 9(a) above, the estimate of \$43,632,000 is for the acquisition of computer hardware, including servers, routers, switches, storage devices, system backup equipment, firewall, intrusion detection systems and security tokens.

11. On paragraph 9(b) above, the estimate of \$30,700,000 is for the acquisition of computer software, including operating systems, data warehouse software, system monitoring framework software and message exchange software.

12. On paragraph 9(c) above, the estimate of \$13,136,000 is for the acquisition of services from external service providers and contract IT professional staff to implement the ISS projects. Main implementation activities include system analysis and design, system development and installation, and provision of technical consultancy services.

13. On paragraph 9(d) above, the estimate of \$14,025,000 is for the site preparation works at the data centres, network equipment rooms and C&ED offices, including conversion of one of the existing data centres into a consolidated disaster recovery data centre, installation of network nodes and power points, as well as the associated trunking and cabling works.

14. On paragraph 9(e) above, the estimate of \$2,288,000 is for the acquisition of start-up consumables and training of C&ED staff in administering and using the new systems.

15. On paragraph 9(f) above, the estimate of \$10,376,000 represents a 10% contingency on the cost items set out in paragraphs 9(a) to 9(e) above.

16. The above costs are estimated on the basis that all existing usable and compatible hardware and software will be reused in the new systems as far as possible.

### **Non-recurrent Staff Effort**

17. The implementation of the proposed projects will entail an additional non-recurrent staff cost of \$15,723,000, with breakdown as follows –

/Staff .....

	2009-10 \$'000	2010-11 \$'000	2011-12 \$'000	Total \$'000
Staff cost	4,934	6,834	3,955	15,723
<b>Total</b>	<b>4,934</b>	<b>6,834</b>	<b>3,955</b>	<b>15,723</b>

18. The staff cost estimated above represents a total of 67 man-months of Inspectorate grade staff of C&ED and 135 man-months of Analyst/Programmer and Computer Operator grades staff for system analysis and development, site preparation, relocation of data centres and user acceptance tests. C&ED will absorb the requirement from within its existing resources.

### Recurrent Expenditure

19. We estimate that the recurrent expenditure arising from the projects will be \$27,448,000 per annum from 2012-13 onwards, with breakdown as follows –

	2010-11 \$'000	2011-12 \$'000	2012-13 and onwards \$'000
(a) Hardware and software maintenance	4,634	9,719	12,173
(b) On-going system support services	444	1,372	2,490
(c) Rental of communication lines	2,419	4,978	4,978
(d) Consumables	55	447	609
<b>Sub-total</b>	<b>7,552</b>	<b>16,516</b>	<b>20,250</b>
(e) Staff cost	<b>968</b>	<b>3,697</b>	<b>7,198</b>
<b>Total</b>	<b>8,520</b>	<b>20,213</b>	<b>27,448</b>

20. On paragraph 19(a) above, the estimated annual expenditure of \$12,173,000 is for the provision of hardware and software maintenance, and for software licence fees to support the new IT infrastructure.

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21. On paragraph 19(b) above, the estimated annual expenditure of \$2,490,000 is for the hiring of contract staff to provide on-going system support and maintenance services for the new IT infrastructure.

22. On paragraph 19(c) above, the estimated annual expenditure of \$4,978,000 is for the rental of new data lines.

23. On paragraph 19(d) above, the estimated annual expenditure of \$609,000 is for the acquisition of consumables such as backup tapes and toner cartridges.

24. On paragraph 19(e) above, the estimated annual staff cost of \$7,198,000 represents the staff effort required for on-going system maintenance services, and support and administration of new systems.

25. After offsetting the realisable savings of \$4,361,000 mentioned in paragraph 7(a) above, the net additional recurrent expenditure for implementing the five projects will be \$23,087,000 per annum. C&ED will absorb this additional recurrent expenditure from within its existing resources.

**IMPLEMENTATION PLAN**

26. We plan to implement the proposed ISS projects according to the following timetable –

<b>Project</b>	<b>Target completion date</b>
Centralised Data Centre	June 2011
Network and Server Infrastructure	December 2010
Central Information Repository System	March 2012
Secured Communications Gateway	January 2011
Enterprise System Management	March 2011

Encl. 2 27. A detailed implementation plan for individual projects is at Enclosure 2.

28. In implementing the projects, C&ED will ensure that all data stored in the existing computer systems will be removed by means of de-magnetisation and the hard disks physically destroyed before they are disposed of. We will ensure that these physically destroyed hard disks and other unserviceable microcomputers and accessories such as printers, monitors, routers and modems will be disposed of in accordance with relevant government procedures.

## **PUBLIC CONSULTATION**

29. We consulted the Legislative Council Panel on Security on the proposal on 6 January 2009. Some Members made general enquiries about the information security of the new IT infrastructure and the need for information sharing within the Department. In response, the Administration explained that the new IT infrastructure would increase the level of information security by, for example, centralising the updating and anti-virus management of computer systems, and that there was an operational need for different units in the Department to exchange information, e.g. exchange of X-ray images among the control points to facilitate anti-smuggling work. The Panel supported the proposal.

## **BACKGROUND**

30. On 16 June 2006, the Finance Committee approved funding for the design and construction of the new Customs Headquarters Building at Tin Chiu Street, North Point. The project will put the offices and facilities of the C&ED's existing Headquarters in Harbour Building, Central and over 20 formations under one roof. This will optimise the sharing of departmental resources, improve intra-departmental communication and enhance work efficiency. The approved funding for the new Customs Headquarters Building does not cover the costs of the proposed IT infrastructure.

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## Cost and Benefit Analysis for the Proposed ISS Projects

	Cash flow (\$'000)									
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
<b>Cost</b>										
Non-recurrent										
Expenditure	19,063	69,130	24,162	1,802	-	-	-	-	-	114,157
Staff Cost	4,934	6,834	3,955	-	-	-	-	-	-	15,723
Sub-total	23,997	75,964	28,117	1,802	-	-	-	-	-	129,880
Recurrent										
Expenditure	-	7,552	16,516	20,250	20,250	20,250	20,250	20,250	20,250	145,568
Staff Cost	-	968	3,697	7,198	7,198	7,198	7,198	7,198	7,198	47,853
Sub-total	-	8,520	20,213	27,448	27,448	27,448	27,448	27,448	27,448	193,421
<b>Total Cost</b>	<b>23,997</b>	<b>84,484</b>	<b>48,330</b>	<b>29,250</b>	<b>27,448</b>	<b>27,448</b>	<b>27,448</b>	<b>27,448</b>	<b>27,448</b>	<b>323,301</b>
<b>Savings</b>										
Realisable Savings	-	1,756	4,135	4,361	4,361	4,361	4,361	4,361	4,361	32,057
Notional Savings	-	2,434	3,493	4,825	4,825	4,825	4,825	4,825	4,825	34,877
Cost Avoidance	-	-	-	2,913	2,913	2,913	2,913	2,913	2,913	17,478
<b>Total Savings</b>	<b>-</b>	<b>4,190</b>	<b>7,628</b>	<b>12,099</b>	<b>12,099</b>	<b>12,099</b>	<b>12,099</b>	<b>12,099</b>	<b>12,099</b>	<b>84,412</b>
<b>Net Savings</b>	<b>-23,997</b>	<b>-80,294</b>	<b>-40,702</b>	<b>-17,151</b>	<b>-15,349</b>	<b>-15,349</b>	<b>-15,349</b>	<b>-15,349</b>	<b>-15,349</b>	<b>-238,889</b>
<b>Net Cumulative Savings</b>	<b>-23,997</b>	<b>-104,291</b>	<b>-144,993</b>	<b>-162,144</b>	<b>-177,493</b>	<b>-192,842</b>	<b>-208,191</b>	<b>-223,540</b>	<b>-238,889</b>	

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## Enclosure 2 to FCR(2008-09)68

### Implementation Plan for the Proposed ISS Projects

Activity	Target completion date
<b>1. Centralised Data Centre</b>	
(a) Planning	December 2009
(b) Site preparation for primary data centre	March 2010
(c) Relocation to primary data centre	September 2010
(d) Site preparation for disaster recovery data centre	March 2011
(e) Relocation to disaster recovery data centre	June 2011
<b>2. Network and Server Infrastructure</b>	
<i>2.1 Network Support Services</i>	
(a) System analysis and design	May 2010
(b) Procurement	July 2010
(c) System installation and production	December 2010
<i>2.2 Security Services</i>	
(a) System analysis and design	August 2009
(b) Procurement	October 2009
(c) System development and installation	December 2009
(d) System rollout and production	June 2010
<i>2.3 Network Connectivity Services</i>	
(a) Procurement	June 2010
(b) System installation and production	September 2010

<b>Activity</b>	<b>Target completion date</b>
<b>3. Central Information Repository System</b>	
<i>3.1 Operational Master Database</i>	
(a) System analysis and design	April 2010
(b) Procurement	July 2010
(c) System development and installation	September 2010
(d) User acceptance test	November 2010
(e) Production	December 2010
<i>3.2 Data Warehouse</i>	
(a) System analysis and design	May 2011
(b) Procurement	August 2011
(c) System development and installation	December 2011
(d) User acceptance test	February 2012
(e) Production	March 2012
<b>4. Secured Communications Gateway</b>	
(a) System analysis and design	May 2010
(b) Procurement	July 2010
(c) System development, installation and production	January 2011
<b>5. Enterprise System Management</b>	
(a) Procurement	September 2010
(b) System development, installation and production	March 2011

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