

ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND

HEAD 710 - COMPUTERISATION

Inland Revenue Department

New Subhead “Implementation of System Infrastructure Enhancement Project for the Inland Revenue Department”

Members are invited to approve a new commitment of \$305,315,000 for implementing the System Infrastructure Enhancement Project for the Inland Revenue Department.

PROBLEM

We need to update the information technology (IT) infrastructure of the Inland Revenue Department (IRD) as it will approach the end of its serviceable life with some of the major components becoming obsolete, and upgrade it to better meet operational requirements and enhance efficiency.

PROPOSAL

2. The Commissioner of Inland Revenue, with the support of the Secretary for Financial Services and the Treasury and the Government Chief Information Officer, proposes to create a new commitment of \$305,315,000 to implement the System Infrastructure Enhancement (SIE) Project.

JUSTIFICATION

3. At present, IRD maintains over 4.5 million tax files. Given the huge amount of tax data involved and to meet the increasing demand from the public, IRD attaches much importance to the strategic use of IT to enhance the efficiency of its day-to-day operations and to provide a wide range of electronic services to the public.

4. The major components of IRD's existing IT infrastructure, comprising the mainframe, midrange, personal computer (PC) and local area network (LAN) platforms, were implemented in 2000-2001. Subsequent technological advancement is such that we need to update and upgrade the IT infrastructure so as to maintain a secure and reliable IT platform for IRD to meet its operational requirements effectively.

Constraints of the Existing IT Infrastructure

5. In 2009, IRD did a study of its IT infrastructure. The main findings of the study are -

(a) *Constraints of the mainframe platform*

IRD has been using the mainframe platform since 1980. The serviceable life of the mainframe machine is approaching its end. Technological advancement has also moved away from the mainframe platform, and products and service support for the mainframe platform have become limited in the market, rendering the recurrent maintenance for the platform and its applications much higher than that of newer platforms.

There are various tax applications running on the mainframe platform to handle millions of tax returns and assessments. To meet the changing business needs over the years, there have been numerous ad hoc enhancements to the applications, which invariably affect the coherence among the applications and render the maintenance and further enhancements of these applications to support new business needs increasingly difficult and costly. Besides, as mainframe applications are text-based, their user interfaces are not as user-friendly as the newer web-based applications. Integration is also more difficult between the mainframe systems and the midrange systems.

(b) *Need to update software*

IRD uses Windows 2000 as the operating system of desktop PCs. As normal service support for Windows 2000 has expired, there will no longer be fixes and security patches. The lack of service support for

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the LAN file servers and the Document Management System (DMS)^{Note} will also lead to maintenance problems. There is a need to update the relevant software to newer version for which service support is available.

(c) *Need to upgrade for better protections against data security risks*

A new IT infrastructure and better support will enhance safeguard against risks of leakage of data and improper access to data.

(d) *Update applications for processing Chinese characters*

IRD's Chinese processing applications do not conform to the prevailing standard (i.e. Unicode) both within the Government and among general computer users. Hence, exchange of Chinese data between IRD and other government agencies often requires labour-intensive code conversion process. Such limitation also affects the efficiency of electronic services for the public.

The Proposed SIE Project

6. In the light of these findings the study recommended the implementation of the SIE project. To avoid interruption to IRD's operations and its public services, the proposed SIE project will be implemented in three stages, as follows -

(a) *Stage I: File server and workstation infrastructure upgrade*

The operating system of all PCs will be upgraded with office automation software as well as various application software. The file server will be upgraded with enhanced shared network resources. New desktop management software will be installed for software management on the PCs. A centralised fax server will replace the existing isolated and scattered fax PCs. The Intranet will be redeveloped to allow knowledge-sharing among IRD officers with strengthened access control. It is expected that the upgrading will be completed by December 2012.

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^{Note} Implemented in 2003, the Document Management System allows IRD officers to have concurrent access to the electronic documents through the computer network and facilitates them to handle various tasks simultaneously.

(b) *Stage II: DMS upgrade*

The DMS comprising the servers, related PC workstations and scanners will be upgraded to enhance system capacity. It is expected that the upgrading will be completed by March 2013.

(c) *Stage III: Migration of mainframe applications to midrange platform*

A new midrange platform adopting open standard architecture and employing prevalent application development tools will be set up. Tax applications on the mainframe platform will then be migrated to the new midrange platform. During the process, one of the tax applications (i.e. the Property Tax System) will be redeveloped to cope with business requirements more efficiently. To cater for bulk printing requirements, there will be a new enterprise printing solution for flexible form design, output management, printing and generation of electronic documents. The Chinese processing applications will also be upgraded with a view to conforming to the Unicode standard. The migration and redevelopment will be conducted in two phases, with the first and the second phases expected to be completed by December 2015 and July 2016 respectively.

Benefits of the Proposed SIE Project

7. The proposed SIE project will improve IRD's IT infrastructure as detailed in paragraph 5 above. With the establishment of a more flexible and adaptable system architecture, the project will bring about the following benefits -

(a) *Enhanced operational efficiency and business capability*

Updated IT infrastructure and applications will enable IRD to enhance efficiency and to respond more speedily to changing operational needs, including the introduction of additional e-services and other means to improve service quality.

(b) *Better system integration*

The migration of tax applications from the mainframe platform to the new midrange platform with standardised architecture will substantially improve the efficiency of integration and data sharing among different tax applications and systems.

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(c) ***Enhanced system security and risk management***

The upgraded IT infrastructure, with strengthened system security, will enable even better protection of taxpayers' data.

(d) ***Better use of departmental resources***

The new technology will reduce demand for manpower for monitoring system performance and maintaining tax applications, and will reduce maintenance costs.

Cost Savings/Avoidance

8. The implementation of the proposed SIE project will enable savings of an estimated non-recurrent cost of \$74.6 million that would otherwise be required for upgrading mainframe hardware and software as well as the redevelopment of the Property Tax System on the mainframe platform.

9. Moreover, we estimate that the proposed project will bring about annual savings of \$10,345,000 from 2016-17 onwards, comprising -

(a) ***Realisable savings of \$5,687,000 per annum***

The savings in maintenance cost for the existing systems and equipment will be \$16,454,000, part of which will offset the annual recurrent cost of \$10,767,000 arising from the proposed project as set out in paragraph 25 below. The net recurrent annual savings from the proposed project would therefore be \$5,687,000.

(b) ***Notional savings of \$2,939,000 per annum***

These represent fragmented staff cost savings from productivity gain as a result of more efficient operations brought about by the proposed project as well as reduced demand for IT support and maintenance from the new systems. While such savings cannot be realised by deletion of posts given that the posts spread over various application systems, the posts will be deployed to cover other minor enhancements that may arise in future.

(c) ***Cost avoidance of \$1,719,000 per annum***

This represents the avoidance of additional hardware and software maintenance costs, which would otherwise be required to support the upgrading of the obsolete mainframe system.

Encl. 10. A cost and benefit analysis of the proposed project is at Enclosure.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

11. We estimate that the proposed SIE project would entail a total non-recurrent expenditure of \$305,315,000 over a seven-year period from 2010-11 to 2016-17, with breakdown as follows -

	2010-11 \$'000	2011-12 \$'000	2012-13 \$'000	2013-14 \$'000	2014-15 \$'000	2015-16 \$'000	2016-17 \$'000	Total \$'000
(a) Hardware	-	22,395	17,319	-	-	-	-	39,714
(b) Software	-	39,267	13,057	-	-	-	-	52,324
(c) Communication lines	-	116	116	-	-	-	-	232
(d) Implementation services	3,960	18,077	25,978	32,421	48,478	15,436	-	144,350
(e) Contract staff	707	4,931	6,602	8,177	15,285	6,880	292	42,874
(f) Site preparation	-	144	3,653	5	-	-	-	3,802
(g) Training	465	1,970	1,022	310	433	133	-	4,333
(h) Consumables and miscellaneous	40	252	330	328	485	155	-	1,590
(i) Accommodation cost	35	220	319	360	452	170	-	1,556
(j) Contingency	260	4,369	3,420	2,080	3,257	1,139	15	14,540
Total	5,467	91,741	71,816	43,681	68,390	23,913	307	305,315

12. On paragraph 11(a) above, the estimated expenditure of \$39,714,000 is for acquisition of computer hardware, including servers, switches, storage devices, system backup equipment and high-speed scanners.

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13. On paragraph 11(b) above, the estimated expenditure of \$52,324,000 is for acquisition of computer software, including operating systems, database management system, file server software, desktop management software, fax system, enterprise printing software, document management software and system monitoring framework software.

14. On paragraph 11(c) above, the estimated expenditure of \$232,000 is for installation of the communication lines for the centralised fax system.

15. On paragraph 11(d) above, the estimated expenditure of \$144,350,000 is for hiring of services from external service providers to implement the project, including system analysis and design, technical consultancy, system development, installation and nursing.

16. On paragraph 11(e) above, the estimated expenditure of \$42,874,000 is for engagement of services of contract staff to supplement the in-house project management team to provide support in project planning, monitoring and conducting system acceptance tests.

17. On paragraph 11(f) above, the estimated expenditure of \$3,802,000 is for site preparation works at the IRD data centre, server room and IRD offices, including installation of new uninterruptible power supply and power points, network nodes, as well as the associated trunking and cabling works.

18. On paragraph 11(g) above, the estimated expenditure of \$4,333,000 is for acquisition of training service for IRD staff in administering and using the new systems.

19. On paragraph 11(h) above, the estimated expenditure of \$1,590,000 is for acquisition of start-up consumables such as backup tapes, toner cartridges and printers toners.

20. On paragraph 11(i) above, the estimated expenditure of \$1,556,000 is for provision of general office furniture for the staff involved in the implementation of the project.

21. On paragraph 11(j) above, the estimated expenditure of \$14,540,000 represents a 5% contingency on the cost items set out in paragraphs 11(a) to 11(i) above.

22. 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.

Other Non-recurrent Expenditure

23. The implementation of the proposed project will entail an additional non-recurrent staff cost of \$93,334,000, as follows -

	2010-11 \$'000	2011-12 \$'000	2012-13 \$'000	2013-14 \$'000	2014-15 \$'000	2015-16 \$'000	2016-17 \$'000	Total \$'000
Staff Cost	3,401	8,737	12,363	22,308	29,054	14,067	3,404	93,334
Total	3,401	8,737	12,363	22,308	29,054	14,067	3,404	93,334

24. This staff cost represents a total of 2 085 man-months of departmental and IT professional grade staff for tendering, system analysis and design, managing the project and conducting acceptance tests. IRD will absorb the requirement by internal staff re-deployment.

Recurrent Expenditure

25. We estimate that the recurrent expenditure arising from the proposed project will be \$10,767,000 per annum from 2016-17 onwards, as follows -

	2013-14 \$'000	2014-15 \$'000	2015-16 \$'000	2016-17 and onwards \$'000
(a) Hardware and software maintenance	186	4,028	4,419	8,844
(b) On-going system support services	164	1,364	1,364	1,364
(c) Communication lines	116	116	116	116
(d) Consumables and miscellaneous	10	202	221	443
Total	476	5,710	6,120	10,767

26. On paragraph 25(a) above, the estimated annual expenditure of \$8,844,000 is for provision of hardware and software maintenance, and for software licence fees to support the new IT infrastructure.

27. On paragraph 25(b) above, the estimated annual expenditure of \$1,364,000 is for on-going system support and maintenance services for the new IT infrastructure.

28. On paragraph 25(c) above, the estimated annual expenditure of \$116,000 is for rental of communication lines for the fax system.

29. On paragraph 25(d) above, the estimated annual expenditure of \$443,000 is for acquisition of consumables such as backup storage media and toner cartridges.

30. Taking into account the annual savings of \$16,454,000 in maintenance cost for the existing systems and equipment as mentioned in paragraph 9(a) above and the annual recurrent expenditure of \$10,767,000 arising from the proposed project, the net realisable recurrent savings after implementing the proposed project will be \$5,687,000 per annum from 2016-17 onwards.

IMPLEMENTATION PLAN

31. We plan to implement the proposed SIE project according to the following schedule –

	Activity	Target Completion Date
Stage I	File server and workstation infrastructure upgrade	
	(a) Procurement	March 2012
	(b) System analysis and design	March 2012
	(c) System development	June 2012
	(d) User acceptance	December 2012
	(e) System live-run	December 2012

/Stage II

	Activity	Target Completion Date
Stage II	DMS upgrade	
	(a) Procurement	November 2011
	(b) System analysis and design	February 2012
	(c) System development	August 2012
	(d) User acceptance	November 2012
	(e) Data conversion	January 2013
	(f) System live-run	March 2013
	(g) System nursing	June 2013
Stage III	Migration of mainframe applications to midrange platform	
	(a) Procurement	March 2012
	(b) System analysis and design	January 2013
	(c) Data conversion and rehearsal	December 2015
	(d) System development	June 2016
	(e) User acceptance	June 2016
	(f) System live-run	December 2015 (Phase 1) July 2016 (Phase 2)
	(g) System nursing	January 2017

32. In carrying out the migration plan, IRD will ensure that all data stored in existing computer systems will be thoroughly removed by de-magnetisation and the hard disks physically destroyed. IRD will ensure that these physically destroyed hard disks and other unserviceable microcomputers and accessories like printers, monitors, routers and modems will be disposed of in accordance with relevant government procedures.

PUBLIC CONSULTATION

33. We consulted the Legislative Council Panel on Financial Affairs on the proposal on 5 July 2010. Members supported the proposal and raised no objection to its submission to the Finance Committee (FC).

BACKGROUND

34. IRD's core tax applications running on the mainframe platform were developed and enhanced on several occasions since 1980. The computer equipment and infrastructure were mostly acquired or upgraded since IRD's last Information Systems Strategy (ISS) Review and SIE Study conducted in 1999.

35. The FC approved in June 2000 the creation of a commitment of \$118.9 million under Subhead “Implementation of Information Systems Strategy Projects in the Inland Revenue Department” for implementing three projects under the five-year ISS Plan for 1999-2000 to 2003-04, namely System Infrastructure Enhancement Project, Data Management Enhancement Project and Assess First Audit Later System Phase I Project.

36. The FC approved in June 2001 the creation of a commitment of \$53 million under Subhead “Implementation of the Document Management System Phase I Project in the Inland Revenue Department”.

Financial Services and the Treasury Bureau
October 2010

Cost and Benefit Analysis of the Proposed SIE Project

	Cash flow (\$'000)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Cost											
Non-recurrent											
- Expenditure	5,467	91,741	71,816	43,681	68,390	23,913	307	-	-	-	305,315
- Staff cost	3,401	8,737	12,363	22,308	29,054	14,067	3,404	-	-	-	93,334
Sub-total	8,868	100,478	84,179	65,989	97,444	37,980	3,711	-	-	-	398,649
Recurrent											
- Expenditure	-	-	-	476	5,710	6,120	10,767	10,767	10,767	10,767	55,374
Sub-total	-	-	-	476	5,710	6,120	10,767	10,767	10,767	10,767	55,374
Total cost	8,868	100,478	84,179	66,465	103,154	44,100	14,478	10,767	10,767	10,767	454,023
Savings											
- Realisable savings	-	-	-	336	4,011	4,011	16,454	16,454	16,454	16,454	74,174
- Notional savings	-	-	-	-	-	-	2,939	2,939	2,939	2,939	11,756
- Cost avoidance	-	-	74,600	1,719	1,719	1,719	1,719	1,719	1,719	1,719	86,633
Total savings	-	-	74,600	2,055	5,730	5,730	21,112	21,112	21,112	21,112	172,563
Net shortfall	8,868	100,478	9,579	64,410	97,424	38,370	(6,634)	(10,345)	(10,345)	(10,345)	281,460
Net cumulative shortfall	8,868	109,346	118,925	183,335	280,759	319,129	312,495	302,150	291,805	281,460	
