

## **ITEM FOR FINANCE COMMITTEE**

### **CAPITAL WORKS RESERVE FUND**

### **HEAD 710 – COMPUTERISATION**

### **Immigration Department**

### **New Subhead “Next Generation Electronic Passport System”**

Members are invited to approve a new commitment of \$357,833,000 for the Next Generation Electronic Passport System.

### **PROBLEM**

The Immigration Department (ImmD) needs to develop a new computer system, namely the Next Generation Electronic Passport System (e-Passport-2 system), to replace the existing ageing computer system for enhancing the operational efficiency and effectiveness in meeting rising service demands.

### **PROPOSAL**

2. The Director of Immigration, with the support of the Secretary for Security and the Government Chief Information Officer, proposes to create a new commitment of \$357,833,000 for the e-Passport-2 system.

**/JUSTIFICATION .....**

## JUSTIFICATION

### **Ageing and obsolescence of the Electronic Passport system (e-Passport system)**

3. The current e-Passport system handles applications for and production of passports and other travel documents of the Hong Kong Special Administrative Region (HKSAR)<sup>1</sup>. It was developed in 2005 following a new standard for biometric passports published by the International Civil Aviation Organization (ICAO)<sup>2</sup> and was commissioned in 2007. Similar to other major computer systems, the e-Passport system was designed for optimal use for about ten years. The current system maintenance agreement that would originally expire in June 2017 has been extended until 2019. As the system was built on technologies prevailing about a decade ago, ImmD will face practical difficulties in securing critical maintenance of the major hardware and software of the system (such as mid-range servers, storage systems, etc.) upon expiry of the maintenance agreement. Further extension would pose risk to system reliability as some critical components may no longer be available for replacement. Implementation of the e-Passport-2 system would avoid the risk of large-scale system failure which could lead to serious disruption of critical public service (e.g. suspension of application processing and production of HKSAR Passports) resulting in grave public inconvenience.

4. Separately, the new Information Technology Infrastructure<sup>3</sup> (ITI) of ImmD is being implemented by phases since April 2015 to re-engineer and re-organise ImmD's existing computer application systems to meet anticipated increase in business needs and requirements. Systems running on the existing and the new ITIs cannot communicate directly. Implementation of the e-Passport-2 system which is compatible with the new ITI will ensure smooth and efficient communication between ImmD's electronic passport system and its other

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<sup>1</sup> Besides HKSAR Passport, the system also handles applications for and production of HKSAR Documents of Identity for Visa Purposes (Doc/I) and HKSAR Re-entry Permits.

<sup>2</sup> ICAO is a specialised agency of the United Nations responsible for, among other things, devising travel document standards for compliance by contracting members with a view to enhancing the effectiveness of control on passport fraud and maintaining the integrity and security of passports and other travel documents. China is a council member state of ICAO, and HKSAR is a participant of the ICAO Public Key Directory, an established body to support global interoperability of e-passport validation.

<sup>3</sup> The ITI strategically adopts new technology to pave way for the implementation of the new systems blueprinted under the third Information Systems Strategy (ISS-3) Review. It will provide a solid IT infrastructural foundation for the next generation of IT-enabled immigration services. A funding of \$862.20 million was approved on 9 December 2011 for the development of the project vide FCR(2011-12)56.

mission-critical computer systems also running on the new ITI (e.g. the new immigration control system which is being commissioned by phase starting from early 2016<sup>4</sup>). This would avoid unnecessary delays in the daily operation of e-Passport system, hence reducing the efforts and time for application development, integration, testing and maintenance.

### **Coping with increasing demand**

5. The number of HKSAR Passport applications substantially increased from around 539 000 in 2007 to 762 000 in 2015<sup>5</sup>, representing an increase of more than 40%. To cope with such increase, ImmD has been stretching the operation of the e-Passport system to beyond its designed capacity under normal usage. For example, the personalisation machines at the Travel Document Personalisation Centre, which is a key component of the current e-Passport system, have been consistently deployed for operation substantially beyond their designed handling capacity, sometimes eating into the capacity originally spared for system maintenance and backup in emergencies. Even so, in the past four years, the daily demand for personalisation of HKSAR Passports and Documents of Identity for Visa Purposes (Doc/I)s exceeded the maximum designed capacity of the machines by 5% to 20% around 10% of the time<sup>6</sup>. Such prolonged overuse has seriously aggravated the ageing and wear and tear of the machines. There is an imminent need for their replacement.

6. It is expected that the number of HKSAR Passport applications would remain high in the longer run, reaching over 936 000 in 2023<sup>7</sup>. If the proposed e-Passport-2 system is not implemented as planned, ImmD will not be able to cope with such increase in HKSAR Passport applications in the next decade<sup>8</sup>.

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<sup>4</sup> A funding of \$912.22 million was approved on 8 February 2013 for the development of the project vide FCR(2012-13)67.

<sup>5</sup> It does not include the number of applications for Doc/I which remained at around 50 000 per year in the past five years.

<sup>6</sup> From 2012 to 2015, there were 122 working days on which the daily throughput of personalisation machines had to be stretched to personalising 3 700 to 4 200 booklets a day, against the designed maximum capacity limit of 3 500 booklets per day.

<sup>7</sup> Forecast based on the number of eligible e-Passport applicants and the number of passports to be expired.

<sup>8</sup> Subject to the outcome of the upcoming tendering exercise and actual system design, it is expected that the next generation personalisation machines for the production of HKSAR Passports and Doc/Is will be able to sustain a much higher throughput, at least doubling the existing capacity.

## Enhancing the application and issuance process

7. Implementing the e-Passport-2 system provides an opportunity to enhance public service during the HKSAR Passport application process. For example, electronic submission of applications, which is available for use by only selected types of electronic HKSAR Passport (e-Passport) applicants now<sup>9</sup>, may be extended to all eligible applicants regardless of age. Electronic submission of e-Passport applications may also be extended from the web-based platform to the mobile platform, making it more accessible to applicants in completing and submitting e-Passport applications at their convenience. Self-service collection kiosks will be introduced to provide flexibility of extending service hours and allow eligible applicants to collect their passports at their convenience. Furthermore, the wider adoption of automation will shorten the time needed to assess those straightforward applications of e-Passport and Doc/Is, making possible room to shorten the overall processing time required for such applications in future. All these expansions on the use of electronic application will increase the efficiency in the overall processing and issuance of e-Passports and Doc/Is, hence providing greater convenience to the public.

## Upgrading e-passports according to recommendations of the ICAO

8. ICAO recommends that passport issuing authorities should introduce changes to passport designs and security features every ten years. The current e-Passport system cannot support the printing of latest security features in the market due to obsolete hardware and software. Implementing the e-Passport-2 system will create room for ImmD to enhance the security features of current e-Passports in use since 2007 with up-to-date technologies in the market (such as see-through window, multi-colour UV print, etc.) to keep the forgery rate low. This is crucial to our on-going efforts in maintaining confidence of overseas authorities in allowing HKSAR Passport holders visa-free access to their country or region. ImmD will keep in view the latest ICAO recommendations and standards, including those on security features and chip technology<sup>10</sup>, and upgrade the e-Passports accordingly in this project.

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<sup>9</sup> At present, on-line application is only applicable to those applicants who are holders of valid Hong Kong Permanent Identity Card (HKPIC), aged 11 or above and are able to collect the passports in person. With the implementation of the e-Passport-2 system, on-line application will be extended to HKPIC holders aged below 11 for replacement of HKSAR passport application.

<sup>10</sup> To protect the information stored in the chip from unauthorized access, the existing e-Passport adopts a Basic Access Control mechanism in accordance with the specifications set by ICAO. When the bio-data page of an e-Passport is directly placed onto an optical and electronic passport reader, selected information in the Machine Readable Zone (MRZ) will be optically captured to form a “key text string”, which will be used by the reader to generate, through a specific access control algorithm, a real time and one-off key for establishing a one-to-one and exclusive encrypted communication channel between the chip of the e-Passport and the reader. The wireless data transmission function of the chip will be turned on only after such encrypted communication channel is successfully established.

**Personal data privacy protection**

9. There has been no known case of leakage of personal data stored in e-Passports since its introduction in 2007. That said, to ensure compliance with the data protection principles as promulgated in the Personal Data (Privacy) Ordinance (Cap. 486), ImmD will conduct Privacy Impact Assessments at critical stages of implementation of the e-Passport-2 system, including system analysis and design and before system rollout. In addition, a Privacy Compliance Audit will be conducted after system rollout. Relevant reports will be passed to the Office of the Privacy Commissioner for Personal Data, whose comments will be duly taken into account in the implementation of the e-Passport-2 system.

**Benefits of e-Passport-2 system**

10. The e-Passport-2 system will bring about the following benefits –
- (a) **sustain ImmD's existing effective operations into the next decade by avoiding possible large-scale system failure** that could cause severe disruption to the application and production of HKSAR Passports and other travel documents;
  - (b) **expand the capacity to cope with the increasing HKSAR Passport applications** through replacement of hardware and software, including the acquisition of personalisation machines with a higher throughput;
  - (c) **enhance HKSAR Passport application and issuance process** through various improvement initiatives such as extending the electronic submission of HKSAR Passport applications to all eligible applicants regardless of their age and from web-based platform to the mobile platform, introducing self-service collection kiosks and widening the adoption of automation to meet potential new public service need and improve quality of service; and
  - (d) **provide room for enhancing security features of the current e-Passport with up-to-date technologies in the market to uphold the security, integrity and global interoperability of the HKSAR Passport**, and therefore maintaining confidence of overseas authorities to allow HKSAR Passport holders visa-free access to their country or region.

/FINANCIAL .....

**FINANCIAL IMPLICATIONS****Capital expenditure**

11. It is estimated that the implementation of the e-Passport-2 system will incur a total capital expenditure of \$357,833,000 over four financial years from 2016-17 to 2019-20. The breakdown is as follows –

Items	(\$'000)				Total
	2016-2017	2017-2018	2018-2019	2019-2020	
(a) Hardware	-	-	10,027	95,470	105,497
(b) Software	-	-	8,025	72,502	80,527
(c) Implementation, contract staff and consultancy services	665	3,040	13,886	70,952	88,543
(d) Site Preparation	-	-	1,251	4,903	6,154
(e) Consumables	-	-	44,451	-	44,451
(f) Communication Network	-	-	131	-	131
(g) Contingency	66	304	7,777	24,383	32,530
<b>Total</b>	<b>731</b>	<b>3,344</b>	<b>85,548</b>	<b>268,210</b>	<b>357,833</b>

12. On paragraph 11(a) above, the estimated expenditure of \$105.50 million is for purchasing computer hardware, such as system servers, workstations, storage devices, network equipment, travel document personalisation machines, self-service collection kiosks, etc.

13. On paragraph 11(b) above, the estimated expenditure of \$80.53 million is for purchasing system software and packages.

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14. On paragraph 11(c) above, the estimated expenditure of \$88.54 million is for acquiring implementation services from external service providers and contract staff, including system analysis and design, development, testing, installation and training, etc. It also includes the acquisition of consultancy services to conduct consultancy studies, namely the Privacy Impact Assessments, Privacy Compliance Audit and Information Technology Security Risk Assessment and Audit at different implementation stages of the e-Passport-2 system.

15. On paragraph 11(d) above, the estimated expenditure of \$6.15 million is for site preparation, including Immigration Branch Offices, Travel Document Personalisation Centre and computer room facilities, etc.

16. On paragraph 11(e) above, the estimated expenditure of \$44.45 million is for acquiring consumables, including contactless chips and polycarbonate sheets for bio-data pages and other start-up consumables, such as testing chips and travel document booklets, printer toners, etc.

17. On paragraph 11(f) above, the estimated expenditure of \$131,000 is for the installation of communication lines.

18. On paragraph 11(g) above, the estimated expenditure of \$32.53 million represents a 10% contingency on the cost items set out in paragraphs 11(a) to 11(f).

#### **Other non-recurrent expenditure**

19. The proposed implementation of the e-Passport-2 system will require a project team for project management, procurement of hardware, software and services, system analysis and design, site preparation, user acceptance tests, implementation support, etc. This will entail a non-recurrent staff cost of some \$53 million from 2016-17 to 2019-20. ImmD will review the staffing requirement nearer the time and include the provision in the annual Estimates of the respective year.

**/Recurrent .....**

**Recurrent expenditure**

20. The proposal will entail an indicative annual recurrent expenditure of \$143.05 million in 2018-19, increasing to \$203.54 million from 2020-21 and onwards. This expenditure covers the costs of hardware and software maintenance, on-going support and contract staff services, communication network, consumables, travel document booklets and additional staffing required. Such requirements will be reflected in the annual Estimates of the relevant years, with the following breakdown –

Items	2018-19	(\$ million)	
		2019-20	2020-21 and onwards
(a) Hardware Maintenance	-	-	18.64
(b) Software Maintenance	-	-	17.05
(c) On-going Support Services	0.06	0.65	15.30
(d) Consumables	0.12	1.42	1.42
(e) Communication Network	1.36	4.08	4.08
(f) Travel Document Booklets	141.49	146.75	146.75
(g) Staff Cost	0.02	0.30	0.30
<b>Total</b>	<b>143.05</b>	<b>153.20</b>	<b>203.54</b>

**Savings and cost avoidance**

21. If the proposed e-Passport-2 system could not be approved and the Government had to sustain the existing business operation, the following costs would be involved –

- (a) Extraordinary expenses for sustaining the existing business operation: A one-off provision of \$335.39 million in 2017-18 would be needed to revamp the existing e-Passport system and related service components that would soon become obsolete. A recurrent provision of \$29.29 million from 2020-21 and onwards would be required as the additional maintenance cost for the revamped system and staff costs to sustain business operation which could be enhanced by the e-Passport-2 system. These costs would be avoided if the new system is approved; and

/(b) .....



- (b) Regular maintenance, procurement of travel document booklets and staff costs under existing system: A recurrent provision of \$155.54 million in 2018-19 and \$147.83 million from 2019-20 and onwards would be needed for the regular maintenance cost of the existing system, cost required for the procurement of travel document booklets under the existing system and staff costs to sustain existing business operation which could be enhanced by the e-Passport-2 system. These costs would be saved if the new system is approved.

Encl. 1      22.      A cost-benefit analysis for the new system is at Enclosure 1.

### IMPLEMENTATION PLAN

23.      Subject to Finance Committee (FC)'s approval of the proposed new commitment, we plan to implement the proposed project according to the following schedule –

Activity	Target Completion Date
Preparation for Procurement and Tendering	Fourth quarter 2016
Procurement of Hardware, Software and Services	
Tender Invitation	First quarter 2017
Tender Evaluation	Third quarter 2017
Tender Award	Fourth quarter 2017
System Development and Implementation	
System Analysis and Design	First quarter 2018
Site Preparation	Fourth quarter 2018
System Development	First quarter 2019
User Acceptance Test	Second quarter 2019
Training	Second quarter 2019

/Production .....

Activity	Target Completion Date
Production Rollout by two phases:	
Phase One (including introduction of new version HKSAR e-Passport)	First quarter 2019
Phase Two (including introduction of self-service collection kiosk)	Second quarter 2019

24. With the implementation of the e-Passport-2 system, security features of HKSAR e-Passports will be enhanced. HKSAR e-Passports issued by the existing e-Passport system will continue to be valid until their expiry when they become due for replacement.

## **PUBLIC CONSULTATION**

25. We consulted the Legislative Council Panel on Security on 5 May 2015. The Panel supported the proposal and its submission to the FC for funding approval.

## **BACKGROUND**

26. The HKSAR Passport is one kind of national passports of the People's Republic of China. Article 154(1) of the Basic Law stipulates that the Central People's Government shall authorise the HKSAR Government to issue, in accordance with law<sup>11</sup>, HKSAR Passports to all Chinese citizens who hold permanent identity cards of the Region, and travel documents of the HKSAR of the People's Republic of China to all other persons lawfully residing in the Region. As at end March 2016, over nine million HKSAR Passports have been issued since 1 July 1997. The number of countries or territories which have granted visa-free access or visa-on-arrival to holders of the HKSAR Passport has reached 156.

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<sup>11</sup> The issue, amendment and cancellation of the HKSAR Passports and matters incidental thereto or connected therewith are provided for under the HKSAR Passports Ordinance (Cap. 539).

Encl. 2

27. Since the 1980s, machine-readable passports issued by authorities of different countries or regions worldwide are standardised by ICAO. Fully complying with the ICAO standard published in 2004, the current e-Passport contains a contactless chip that stores information including those printed in the Machine Readable Zone (MRZ) of the bio-data page (a sample at Enclosure 2)<sup>12</sup>, as well as the holder's image, full name in English and Chinese, place of birth, issuing authority and date of issue.

28. In March 2010, ImmD engaged an external consultant to conduct its third Information Systems Strategy (ISS-3) Review. On completion of the review, the ISS-3 consultant recommended that ImmD, amongst other things, implement an e-Passport-2 system to address the obsolescence of hardware and software of the existing e-Passport system and to cater for potential new business needs. The e-Passport-2 system is part of the eight strategic information technology projects formulated under the ISS-3 Review to be implemented in a structured programme. The eight ISS-3 projects are –

- (a) New Information Technology Infrastructure<sup>13</sup>;
- (b) Immigration Control System<sup>14</sup>;
- (c) New Generation Smart Identity Card System<sup>15</sup>;
- (d) e-Passport-2 system;
- (e) Visa Automation System;
- (f) Assistance to Hong Kong Residents, Births, Deaths & Marriage, Right of Abode Decision Support System;
- (g) Enforcement Case Processing System; and
- (h) Human Resources Management System.

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<sup>12</sup> Pursuant to the relevant ICAO specification, information printed in the MRZ of the bio-data page of the HKSAR Passport includes the holder's name in English, date of birth, sex, nationality and HKPIC number, and the number and date of expiry of the passport.

<sup>13</sup> A funding of \$862.20 million was approved on 9 December 2011 for the development of the project vide FCR(2011-12)56.

<sup>14</sup> A funding of \$912.22 million was approved on 8 February 2013 for the development of the project vide FCR(2012-13)67.

<sup>15</sup> A funding of \$1,448.79 million was approved on 15 May 2015 for the development of the project vide FCR(2015-16)7.

29. The eight ISS-3 projects are inter-related and essential to ImmD's mission-critical operations. It is of paramount importance that they are implemented in full so as to achieve synergy and ensure the sustainability of ImmD's services. Implementation of ISS-3 would also generate department-wide service improvement opportunities. For the projects (e) to (h), ImmD is planning how best to implement them and will consider whether funding has to be sought in due course.

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Security Bureau  
April 2016

**Cost-Benefit Analysis for the Implementation of the Next Generation Electronic Passport System (e-Passport-2 system)**  
(\$ '000)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
<b>Cost of the proposed system</b>													
Capital Expenditure	731	3,344	85,548	268,210	-	-	-	-	-	-	-	-	357,833
Other Non-recurrent Expenditure	7,420	16,332	25,185	3,638	-	-	-	-	-	-	-	-	52,575
Sub-total	8,151	19,676	110,733	271,848	-	-	-	-	-	-	-	-	410,408
Recurrent Expenditure	-	-	143,054	153,202	203,542	203,542	203,542	203,542	203,542	203,542	203,542	203,542	1,924,592
<b>(A) Total Cost</b>	<b>8,151</b>	<b>19,676</b>	<b>253,787</b>	<b>425,050</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>203,542</b>	<b>2,335,000</b>
<b>Savings and cost avoidance</b>													
<u>Non-recurrent</u>													
Revamp cost for existing system	-	335,392	-	-	-	-	-	-	-	-	-	-	335,392
Sub-total	-	335,392	-	-	-	-	-	-	-	-	-	-	335,392
<u>Recurrent</u>													
Additional maintenance cost for revamped system and staff costs for existing operation	-	-	1,418	6,659	29,290	29,290	29,290	29,587	29,290	29,290	29,290	29,587	242,991
Maintenance cost and staff costs for existing operation	-	-	2,065	24,774	24,774	24,774	24,774	24,774	24,774	24,774	24,774	24,774	225,031
Travel document cost and staff costs for existing operation	-	-	153,478	123,060	123,060	123,060	123,060	123,060	123,060	123,060	123,060	123,060	1,261,018
Sub-total	-	-	156,961	154,493	177,124	177,124	177,124	177,421	177,124	177,124	177,124	177,421	1,729,040
<b>(B) Total Savings</b>	<b>-</b>	<b>335,392</b>	<b>156,961</b>	<b>154,493</b>	<b>177,124</b>	<b>177,124</b>	<b>177,124</b>	<b>177,421</b>	<b>177,124</b>	<b>177,124</b>	<b>177,124</b>	<b>177,421</b>	<b>2,064,432</b>
<b>(C) = (B) – (A)</b>													
Net cost (-)/net saving (+)	<b>-8,151</b>	<b>315,716</b>	<b>-96,826</b>	<b>-270,557</b>	<b>-26,418</b>	<b>-26,418</b>	<b>-26,418</b>	<b>-26,121</b>	<b>-26,418</b>	<b>-26,418</b>	<b>-26,418</b>	<b>-26,121</b>	<b>-270,568</b>
Net Cumulative Cost/Savings	<b>-8,151</b>	<b>307,565</b>	<b>210,739</b>	<b>-59,818</b>	<b>-86,236</b>	<b>-112,654</b>	<b>-139,072</b>	<b>-165,193</b>	<b>-191,611</b>	<b>-218,029</b>	<b>-244,447</b>	<b>-270,568</b>	<b>-</b>

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**Enclosure 2 to FCR(2015-16)38**

### Sample of a Bio-data Page of e-Passport

Machine  
readable  
zone (MRZ)