ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND HEAD 710 – COMPUTERISATION Fire Services Department

New Subhead "Development of a computer system for provision of post-dispatch advice"

Members are invited to approve a new commitment of \$37,880,000 for developing a computer system for the Fire Services Department to provide post-dispatch advice in the handling of emergency ambulance calls.

PROBLEM

Fire Services Department (FSD) needs to develop a computer system to efficiently provide post-dispatch advice (PDA) in handling ambulance calls related to a wider range and more complicated cases of injuries and sicknesses.

PROPOSAL

2. The Director of Fire Services, with the support of the Secretary for Security and the Government Chief Information Officer, proposes to create a new commitment of \$37,880,000 for developing a computer system whereby FSD can provide callers of emergency ambulance services (EAS) with more comprehensive and appropriate PDA that helps stabilise patients' conditions, thus enhancing the EAS rendered by FSD.

JUSTIFICATION

The Need to Provide PDA for EAS Callers

3. Since May 2011, FSD has been gradually providing PDA to EAS callers in respect of six common types of injury and sickness (i.e. bleeding,

fracture/dislocation of limbs, burns, convulsion, heat exposure and hypothermia), with a view to enhancing its EAS. From May 2011 to February 2015, FSD successfully provided simple PDA to about 23 800 callers. Subsequently, FSD conducted a telephone survey with around 13 500 callers of EAS. Over 99% of the respondents were satisfied with the PDA provided by FSD and considered it helpful to the callers and the patients. They also agreed that FSD should continue to provide PDA to callers in future. In view of the favourable responses from the public, FSD plans to continue with the provision of PDA and proposes expanding its scope for further enhancing the EAS.

Constraints on the Current Provision of Simple PDA

4. Currently, upon receipt of an emergency ambulance call, an operator of the Fire Services Communications Centre (FSCC) will hang up and dispatch an ambulance immediately after obtaining information on the location of the incident, the nature of the call and the caller's contact. If the ambulance call falls within the six types of easily identifiable injury/sickness mentioned above, the same operator will call back the caller to provide simple PDA after the ambulance is dispatched. The PDA has been formulated in consultation with the Medical Director of FSD.

5. The PDA formulated by FSD currently covers only six types of injury and sickness that are relatively common and involve less complicated handling procedures. Furthermore, given that only simple first-aid advice and time-saving advice are provided at present, FSD has not procured or established a specific computer system for the purpose. However, for efficient provision of PDA on a wider range and more complicated cases of injuries and sicknesses, FSD needs to develop a computer system to assist FSCC operators in grasping information on patients' conditions systematically and, through analysis by the computer system, providing detailed and appropriate PDA accurately.

Details of the Proposed Initiative

6. FSD proposes to develop a computer system that incorporates an internationally-accredited questioning protocol software to assist FSCC operators in identifying various conditions of injuries and sicknesses, thereby providing callers of EAS with more comprehensive and appropriate PDA that helps stabilise patients' conditions. The questioning protocol incorporated in the computer system is developed by the International Academies of Emergency Dispatch

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Encl.

(IAED)^{Note} and has been clinically approved. Similar computer systems and questioning protocols are adopted by some 3 000 communication centres from over 40 countries/jurisdictions, including the United States, Canada, the United Kingdom, France, Italy, Germany, Australia, New Zealand, Malaysia and the Mainland.

7. The proposed computer system will assist FSCC operators in asking callers questions following the questioning protocol to obtain systematically information on patients' conditions. Through immediate analysis by the computer system, operators can provide detailed and appropriate PDA to callers and guide them to render assistance to patients. The PDA will cover over 30 types of injury/sickness, including physical trauma, loss of consciousness, cardiac arrest (see Enclosure), basically covering all types of injury/sickness that FSD deals with in its daily handling of EAS calls. Apart from the conditions which are more easily identifiable, such as the handling of bleeding wounds and fractured limbs, the PDA will cover those more complicated cases (e.g., instructing the caller to perform cardiopulmonary resuscitation and/or use the Automated External Defibrillator on a patient with cardiac arrest). Before the system is put into operation, FSD's Medical Director will critically examine the questioning protocol and adapt it where appropriate to cater for the needs of the local culture and language environment.

8. The proposed computer system will be integrated into FSD's existing Third Generation Mobilizing System for dispatch of fire appliances and ambulances. The procedures of taking calls and dispatching resources will be taken up by two individual FSCC operators as call-taker and dispatcher respectively. Once a call-taker confirms the location of the incident, the nature of the call and the caller's contact information, the computer system will instantly transmit information and dispatch instructions to a dispatcher for the immediate dispatch of ambulances. Meanwhile, the call-taker will maintain communication with the caller on the phone, raise a set of pre-structured questions according to the questioning protocol in the system to grasp the patient's conditions systematically, thereby giving detailed and appropriate PDA to the caller through immediate analysis by the computer system.

9. There will be no delay in the process of dispatching an ambulance as the dispatching and questioning processes will be taken up by two individual operators. The call-taker may, in the light of actual needs, send information

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^{Note} The IAED is a non-profit-making and standard-setting institution, promoting safe and effective emergency dispatch services world-wide. Its status as a standard-bearer in the field has been recognised by professional organisations such as the American Heart Association, the American College of Emergency Physicians and the American Medical Association.

about the patient's conditions to the ambulance en route to the incident scene via the system so that the ambulance crew can get an early understanding of the patient's conditions and get prepared.

10. Prior to the commissioning of the system, FSD will allow sufficient time for public education programme to enhance the understanding of PDA by members of the public, especially elderly groups and patient organisations. In addition, FSD will organise publicity activities, including demonstrations on how the call-takers would ask questions and how the callers should respond.

ANTICIPATED BENEFITS

11. The proposed computer system will provide EAS callers with detailed and appropriate PDA that helps stabilise patients' conditions, thereby enhancing the EAS rendered by FSD. The implementation of the proposal is expected to bring about the following benefits –

(a) Providing immediate assistance to callers in rescuing lives

With the computer system, FSD will be able to provide PDA on more than 30 types of injury and sickness, basically covering all types of injury and sickness in the daily handling of emergency ambulance calls by FSD. The PDA will help reduce the potential risks arising from wrong treatment given by members of the public without the proper knowledge, and help stabilise or improve patients' conditions.

(b) <u>Alleviating distress in patients and callers</u>

If a caller is given appropriate advice while awaiting an ambulance, it helps alleviate anxiety and distress of both the patient and the caller.

(c) <u>Allowing for better preparation of ambulance crew</u>

FSCC's call-takers, when necessary, will send information gathered about patients' conditions to frontline ambulance crew who are on their way to the scene of an incident, who can then make early preparation for the immediate provision of appropriate treatment to the patients upon arriving at the incident scene. (d) Facilitating review and formulation of EAS strategies

The proposed computer system will enable FSD to comprehend and analyse information concerning the EAS, such as the nature of the EAS calls, patients' conditions, geographic distribution and times of occurrence, more systematically and accurately. Such information will facilitate FSD in reviewing and formulating long-term planning strategies of the EAS and ambulance deployment.

FINANCIAL IMPLICATIONS

Capital Expenditure

12. The project is estimated to incur an expenditure of \$37,880,000 spanning five financial years from 2015-16 to 2019-20. The breakdown is as follows –

		2015-16 \$'000	2016-17 \$'000	2017-18 \$'000	2018-19 \$'000	2019-20 \$'000	Total \$'000
(a)	Computer hardware	-	-	1,322	2,423	661	4,406
(b)	Computer software	-	-	4,434	8,129	2,217	14,780
(c)	Implementation of services	-	-	1,665	3,052	833	5,550
(d)	Security risk assessment and audit	-	-	-	250	-	250
(e)	Contract staff	600	900	900	300	-	2,700
(f)	Training	-	-	-	6,750	-	6,750
(g)	Contingency	60	90	832	2,090	372	3,444
	Total	660	990	9,153	22,994	4,083	37,880

13. As regards paragraph 12(a), the estimated expenditure of \$4,406,000 is for procurement of computer hardware, including computers and servers, storage systems, security installation, etc.

14. As regards paragraph 12(b), the estimated expenditure of \$14,780,000 is for procurement of system software, including operating systems, questioning protocol software, PDA software, central data repository, etc.

15. As regards paragraph 12(c), the estimated expenditure of \$5,550,000 is for paying the costs of service implementation, including system analysis and design, development and installation, etc.

16. As regards paragraph 12(d), the estimated expenditure of \$250,000 is for conducting security risk assessment and audit of the project.

17. As regards paragraph 12(e), the estimated expenditure of \$2,700,000 is for engagement of contract staff to support development and implementation of the system.

18. As regards paragraph 12(f), the estimated expenditure of \$6,750,000 is for training of FSCC staff on the operational process of the proposed system.

19. As regards paragraph 12(g), the estimated expenditure of 33,444,000 is for contingency. The amount is equivalent to 10% of the costs for items (a) to (f) in paragraph 12 above.

Recurrent Expenditure

20. We estimate that, from 2020-21 onwards, the annual recurrent expenditure required for implementing the proposed system will be \$15,896,000, which mainly covers the repair and maintenance of the computer system and other operational expenses, as well as the costs of engaging a contract Medical Director and other additional posts for professional medical input and staff training. The breakdown of the expenditure is as follows –

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		2016-17 \$'000	2017-18 \$'000	2018-19 \$'000	2019-20 \$'000	2020-21 and each year afterwards \$'000
(a)	Repair and maintenance of computer hardware and software	-	-	-	1,611	3,221
(b)	Service contract of Medical Director	1,113	1,670	1,670	1,670	1,670
(c)	Regular assessment of FSCC operators	-	-	-	89	89
(d)	Recurrent staff expenditure		6,910	10,916	10,916	10,916
	Total	1,113	8,580	12,586	14,286	15,896

21. As regards paragraph 20(a), the estimated annual expenditure of \$3,221,000 is for the repair and maintenance of hardware and software, as well as the licensing cost of software.

22. As regards paragraph 20(b), the estimated annual expenditure of \$1,670,000 is for the engagement of a contract Medical Director who will provide professional medical input, examine and approve the PDA, and review regularly the service level of FSCC operators in providing PDA according to the computer software.

23. As regards paragraph 20(c), the estimated annual expenditure of \$89,000 is for the regular assessment of FSCC operators which is a requirement for operating the proposed system.

24. As regards paragraph 20(d), the estimated recurrent staff expenditure is about \$6,910,000 in 2017-18 and will increase to \$10,916,000 from 2018-19 onwards. The expenditure is required for implementing the proposed computer system, including the staff to operate the proposed system and to take charge of quality management.

IMPLEMENTATION PLAN

25. We plan to implement the proposal according to the following schedule –

	<u>Activity</u>	Target completion date
(a)	Tender preparation	February 2016
(b)	Tendering and award of contract	February 2017
(c)	System analysis and design	August 2017
(d)	User acceptance test and in-house training	February 2018
(e)	System live-run	March 2018

PUBLIC CONSULTATION

26. In the past two years, FSD has consulted different bodies, including organisations of patients, the elderly, emergency services, medical professionals, on the proposed computer system. They supported the proposal.

FSD also consulted the Panel on Security of the Legislative Council on 8 July 2014. Members generally supported the proposal and agreed that it should be submitted to the Finance Committee for funding approval. Besides, FSD arranged a visit to FSCC for Legislative Council Members on 23 March 2015 to enhance their understanding on the provision of PDA rendered by FSD and the proposed computer system.

/BACKGROUND

BACKGROUND

28. Since 1 May 2011, FSD has been providing PDA to EAS callers in respect of three common types of injury, including general bleeding, burns and dislocation/fracture of limbs. The advice includes simple first-aid advice (such as cooling burn wounds with water and applying pressure to a bleeding wound with clean towel) and time-saving advice (such as reminding the caller to bring along the patient's medications and consultation summaries for doctors' reference at the Accident and Emergency Department). Since 1 June 2012, FSD began to offer advice on two more types of sickness, namely convulsion and heat exposure and on hypothermia since 1 January 2013.

Security Bureau April 2015

<u>Conditions of injuries and sicknesses covered</u> <u>by the proposed computer system</u>

- 1. Abdominal pain/problems
- 2. Allergies (reactions)/envenomations (stings, bites)
- 3. Animal bites/attacks
- 4. Assault/sexual assault
- 5. Back pain (non-traumatic or non-recent trauma)
- 6. Breathing problems
- 7. Burns (scalds)/explosion (blast)
- 8. Carbon monoxide/inhalation/hazmat/Chemical, Biological, Radiological and Nuclear
- 9. Cardiac or respiratory arrest/death
- 10. Chest pain (non-traumatic)
- 11. Choking
- 12. Convulsions/seizures
- 13. Diabetic problems
- 14. Drowning (near)/diving/scuba accident
- 15. Electrocution/lightning
- 16. Eye problems/injuries
- 17. Falls
- 18. Headache
- 19. Heart problems/Automatic Implanted Cardiac Defibrillator
- 20. Heat/cold exposure
- 21. Hemorrhage/laceration
- 22. Inaccessible incident (non-vehicle)
- 23. Overdose/poisoning (ingestion)
- 24. Pregnancy/childbirth/miscarriage
- 25. Psychiatric/abnormal behaviors/suicide attempt
- 26. Stab/gun shot/penetrating trauma
- 27. Stroke (Cerebrovascular Accident)
- 28. Traffic/transportation incidents
- 29. Traumatic injuries
- 30. Unconscious/fainting (near)
- 31. Unknown problem (man down)
- 32. Health Care Professional Admission
- 33. Pandemic/Epidemic/Outbreak (Officially Enacted Triage)
