For discussion
on 15 March 2024

Legislative Council Panel on Transport

Vehicles and Drivers Licensing Integrated Data System Infrastructure and Application Enhancement of the Transport Department

PURPOSE

The Transport Department ("TD") proposes to enhance the infrastructure and application of the Vehicles and Drivers Licensing Integrated Data System V ("VALID System") and replace the ageing database system and architecture, with a view to extending the service life of the VALID System and improving its functionality and performance for meeting operational needs. This paper seeks Members' views on the proposal and support for submitting the relevant funding proposal to the Finance Committee of the Legislative Council).

BACKGROUND

The Existing VALID V System

2. The VALID V System came into operation in August 2017. It is an integrated computerised information system to support vehicles and driving licensing services such as registration of vehicles; issue and renewal of vehicle licences and permits; issue and renewal of driving licences and permits; arrangement of driving tests; and reservation, retention and assigning of vehicle registration marks. In addition to supporting four Licensing Offices of TD, the VALID System also serves other application channels, including postal delivery, drop-in boxes and relevant online application systems, providing a total of 60 types of licensing services to the public. Furthermore, the VALID System is connected to over 40 systems within and outside TD for data exchange to

support the daily work of various government departments according to their needs. In 2023, the VALID System processed a total of 7 443 000 transactions, including cases relating to licensing and traffic tickets. The major licensing related transactions and their numbers are set out as follows:

	Licensing services	**Number of transactions in 2023**
(a)	Application for vehicle licences	926 000
(b)	Application for driving licences	674 000
(c)	Driving tests (excluding booking service)	164 000
(d)	Application for transfer or retention of a vehicle registration mark	223 000
(e)	Transfer of vehicle ownership	197 000
(f)	Change of personal or vehicle particulars	143 000
(g)	International driving permits	337 000

3. Apart from supporting TD in processing an average of over 10 000 transactions in relation to vehicle and driving licensing services and a series of e-licensing initiatives every working day, the VALID V System also assists the Hong Kong Police Force ("HKPF") in handling prosecution of traffic offences with a daily average of nearly 10 000 traffic tickets, and caters for their enforcement needs, such as issuing vehicle and driving licences with encrypted QR codes to support their issuance of e-tickets. In addition to HKPF, the VALID V System also provides relevant information and support to various government departments (including Judiciary, Customs and Excise Department, Environmental Protection Department and Housing Department, etc.) to meet their operational needs, such as supporting the Judiciary's relevant prosecution work by issuing court orders against late payment of fixed penalty for parking offences.

4. The existing repair and maintenance services contract of the VALID V System will expire in November 2027. With the rapid technological advancement, the hardware and software of VALID V System have gradually become outdated, thus limiting its capability to address the growing demands from the public and user departments for

existing and future services. Moreover, TD needs to plan for the further development of the VALID System to ensure that it can meet future needs and improve performance level.

PROPOSAL

5. We propose to create a new commitment of $312,883,000 for replacing the infrastructure and application of the VALID V System, with a view to enhancing its functionality, performance and capacity, as well as providing support to various e-licensing initiatives of TD, thereby facilitating TD's future digital development, to provide more efficient licensing services to the public.

JUSTIFICATIONS

Enhancing the system for delivery of more quality services to the public

6. In order to continuously improve services and align with the Government's "Be the Smart Regulator" Programme, as well as to respond to the increasing demand for licensing services from the public, TD is committed to implementing e-licensing initiatives to further enhance operational efficiency and bring convenience to the public during the application process. Currently, TD offers 20 online licensing services[1], and has rolled out e-permits[2] by phases since late 2022. Electronic

[1] Including renewal of vehicle licences, first issue of driving licences and application of international driving permits.

[2] E-permits are issued in "portable document format" (pdf) and sent to applicants by email for printing and display. It further enhances operational efficiency, brings convenience to the public during the application process, and improves the public's experience when applying for licences.

vehicle licences[3] are planned for introduction in 2024, while electronic driving licences[4] are planned for introduction between late 2024 and early 2025. Besides, TD will launch the e-licensing portal in mid-2024, which will display licence-related information of the public users in the form of a dashboard. Members of the public can also submit applications through the website links, check the expiry dates of licences and the application status, receive reminders on licences to be expired, etc. In addition, TD plans to launch e-auction for vehicle registration marks in late 2024, allowing members of the public to bid for certain traditional vehicle registration marks online. TD is gradually introducing artificial intelligence ("AI") technology for reviewing and approving applications, with a view to speeding up the processing.

7. The implementation of the above e-licensing initiatives requires access to the relevant data through the VALID System, and there is a need to upgrade the VALID System to cope with the digitalisation of licensing services. As the VALID V System has been gradually lagging behind the advancements in information technology, TD often needs time to develop provisional systems[5] when developing e-initiatives to make up for the constraints in capabilities and capacity of the existing VALID V System. These provisional systems have their limitations and are not effective in

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[3] Vehicle owners will no longer need to replace their paper-form vehicle licence upon each renewal after the first issuance. Meanwhile, TD will set up a free online enquiry platform for vehicle owners to check the expiry dates of vehicle licences. TD will also simplify the requirement on supporting documents to be submitted during application for vehicle licence renewal (such as certificate of roadworthiness, vehicle registration document and third-party risk insurance policy, etc.), with a view to reducing the processing time from 10 working days to less than three working days in 2024, and paving way for full automation of the processing procedures.

[4] While the physical driving licence will continue to be issued, the electronic driving licence will be presented via a mobile application. Driving licence holders may log onto the mobile application after completing the authentication of identity, and may opt for bringing along either the physical driving licence or the electronic driving licence when driving.

[5] TD needs to develop provisional systems/functions to support the various new e-initiatives. However, these provisional systems/functions have their limitations. For instance, provisional systems may not be able to reflect real-time data and improve the availability of the VALID System. Besides, given that the VALID V System and the provisional systems/functions will need to exchange a large amount of data continuously for a prolonged period, it may require additional support measures to safeguard the data integrity. In the long run, it is required to build relevant capabilities and capacity within the VALID System in order to replace these standalone provisional systems/functions.

saving processing time.

8. The proposed enhancement to the VALID System will adopt more innovative technologies to replace the provisional systems of the VALID V System, including the set-up of a new enquiry database ("Enquiry DB")[6]. Apart from supporting higher availability, "Enquiry DB" will provide the standardized application programming interface to streamline the VALID System's integration with other systems of TD and other user departments, so that other systems can more directly retrieve latest data from the VALID System. With improved capacity and performance, the enhanced VALID System will be able to better cater for the implementation of e-initiatives and the demand of other user departments for voluminous data access. Besides, the "Enquiry DB" will be able to support near-real-time data access.

9. The above enhancements in capacity, performance and data updating will strengthen the sustainability of the VALID System. Furthermore, regarding the infrastructure and core system components of the VALID System, TD will replace or upgrade the ageing components as well as adopt open standards as appropriate, including open architecture, open web standard, open source software, etc. With the proposed upgrading of the VALID System, TD would be able to develop new e-initiative services more efficiently, and further enhance public user experience and service efficiency. The open system architecture will also enhance the scalability of the VALID System, laying down the foundation for continuous introduction of new technologies and service improvement initiatives.

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[6] The "Enquiry DB" will support other systems and users for retrieving large volumes of instant information on vehicle licences and driving licences, thus relieving the burden on the VALID System and mitigating the risk of data inaccuracy. In addition, instead of the "Active-Standby" operation mode used in the existing VALID V System, the proposed "Enquiry DB" will adopt the "Active-Active" mode after the proposed enhancement of the VALID System, allowing continued operation even when maintenance work is being carried out for the VALID System, thereby improving the availability of the relevant data enquiry services. TD has invited other user departments to offer views on the new business needs of the VALID System, so that the new generation of the VALID system can have sufficient capacity and capabilities to provide latest information to various departments in a more efficient and stable manner. When designing the new generation of the VALID System, TD will consult relevant user departments regarding the consolidated requirements on the system so as to meet future demands.

Mitigating the risk of supply chain disruption

10. As the existing VALID V System uses proprietary products, it is not ideal in terms of compatibility with other products. If the supply of core components is disrupted unexpectedly, there will be a risk of the VALID System becoming inoperable. TD plans to replace the core database components with open source or national/local brand software, providing us with a wider range of software options during procurement. This will mitigate the risk of suppliers discontinuing the supply of product components and services, address potential supply chain issues for advanced technology products arising from geopolitical tensions, and lower the risk of service interruption which would pose adverse impact on the public and operations of other relevant government departments. Since the proposed project is a large-scale one involving the migration of the entire core database of the VALID V System to a new open database management system, TD will carry out the migration arrangements carefully to ensure the normal daily operation of the system.

Ensuring system sustainability and strengthening information security

11. The existing maintenance contract of the VALID V System will expire in November 2027, and the implementation of the new VALID System should be completed before that time. As some core components of the VALID V System were developed based on earlier designs, while these components are still functional, the production of certain components has been discontinued. The reliable operation of the VALID System is crucial to the delivery of effective services by TD and various government departments. If the operation is interrupted due to inadequacy in system maintenance or information security, it will affect the operation of the relevant departments and provision of licensing services to the public, and even result in adverse impacts on the operation of the transport sector. In addition, given that the VALID System contains information of over two million driving licence holders and over 800 000 registered vehicle owners, it is of pivotal importance to adopt effective measures to protect the security of personal data. It is therefore necessary to replace the ageing system security components in a timely manner to sustain effective

maintenance and support services, and introduce a new generation of security management measure and monitoring mechanism. TD will safeguard the security of the VALID System by replacing the outdated components, and adopt the new generation of IT Security Solution[7]. TD will also establish the satellite site under the Government Cloud Infrastructure Services ("GCIS") in accordance with the Government Cloud Architecture Framework set out by the Office of the Government Chief Information Officer ("OGCIO") to enhance data security.

ANTICIPATED BENEFITS

12. Overall, it is considered necessary for TD to implement the proposed project, in order to enhance the functionality, performance and capacity of the VALID System and replace the ageing system, with a view to ensuring the sustainable operation of the VALID System and supporting more digitized licensing services in the future. The core database component of the VALID System will also be migrated to open source products.

FINANCIAL IMPLICATIONS

13. TD has issued a Request For Information ("RFI") to relevant service providers in the market and invite them to provide cost estimates for the proposal. Relevant information has been taken into account in formulating the relevant estimated expenditure.

Non-recurrent expenditure

14. The proposed project involves non-recurrent expenditure of $312,883,000 over a six-year period from 2024-25 to 2029-30. The breakdown is as follows —

[7] Enhancing the VALID System will strengthen security information and event management by centralizing the collected log and event records from various equipment of the system to detect irregular activities, thereby achieving comprehensive and proactive monitoring of potential security threats and responding to security issues and incidents more promptly.

		2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	Total
		($'000)	($'000)	($'000)	($'000)	($'000)	($'000)	($'000)
(a)	Hardware	-	8,465	16,929	-	-	-	25,394
(b)	Software	-	3,718	7,437				11,155
(c)	Communication network	-	2,968	5,858	333	333	79	9,571
(d)	Implementation services	-	20,890	48,625	55,038	34,147	-	158,700
(e)	Contract staff	10,274	11,208	11,208	11,208	10,520	510	54,928
(f)	Training	-	-	-	350	350	-	700
(g)	Others	990	8,998	3,826	3,826	3,755	2,596	23,991
(h)	Contingency	1,126	5,625	9,388	7,076	4,911	319	28,444
	Total	**12,390**	**61,872**	**103,271**	**77,830**	**54,016**	**3,504**	**312,883**

(a) the estimated expenditure of $25,394,000 is for procuring computer hardware, including servers, storage area network, virtual backup equipment and system security equipment, etc.;

(b) the estimated expenditure of $11,155,000 is for procuring various software, including virtualisation software, application system, network and system management software, system security software (such as the security information and event management solution) and database management system, etc.;

(c) the estimated expenditure of $9,571,000 is for procuring communication network, including network equipment and telecommunications line rental fees during the set-up of the VALID System, etc.;

(d) the estimated expenditure of $158,700,000 is for engaging external service providers for implementation services, including overall project management, infrastructure design and set-up, system migration, program enhancement, data conversion, and user acceptance tests ("UAT") support, etc.;

(e) the estimated expenditure of $54,928,000 is for hiring

professional IT contract staff to support the internal project management team in project planning, monitoring and system acceptance testing;

(f) the estimated expenditure of $700,000 is for providing relevant training services for internal staff;

(g) the estimated expenditure of $23,991,000 is for other items, which include relevant arrangements for system development and acceptance testing, as well as performing independent third party assessments of information security risks and privacy impact assessments, etc.; and

(h) the estimated expenditure of $28,444,000 is for contingency fee, which is an approximate 10% of the total cost of the items in (a) to (g) above.

Other non-recurrent expenditure

15. TD will need to deploy an internal team for implementation of the proposed project, including tendering, project management, system analysis and design, UAT, etc. The project team will entail a non-recurrent staff cost of $19,946,000 from 2024-25 to 2028-29, which will be undertaken by TD's existing resources.

Recurrent expenditure

16. The estimated recurrent expenditure for the proposed project will be $16,221,000 in 2027-28, and will increase to $37,157,000 per annum from 2029-30 onwards. The breakdown is as follows –

		2027-28 ($'000)	**2028-29** ($'000)	**From 2029-30** ($'000)
(a)	Hardware and software maintenance	7,993	11,989	11,989
(b)	Communication network	547	821	821
(c)	Cloud services	560	840	840

(d)	Ongoing system support services[8]	-	8,550	12,825
(e)	Contract staff	6,600	9,900	9,900
(f)	Consumables	227	340	340
(g)	Others	294	442	442
	Total	**16,221**	**32,882**	**37,157**

(a) the estimated annual expenditure of $11,989,000 is for the maintenance cost of system hardware, and software licence renewal cost to support the new infrastructure;

(b) the estimated annual expenditure of $821,000 is for rental of telecommunications lines;

(c) the estimated annual expenditure of $840,000 is for the government cloud service satellite site technology;

(d) the estimated annual expenditure of $12,825,000 is for on-going system maintenance and support, helpdesk services, and minor application enhancements, etc.;

(e) the estimated annual expenditure of $9,900,000 is for contract IT staff cost for regular system monitoring and on-going system enhancement of the enhanced VALID System;

(f) the estimated annual expenditure of $340,000 is for consumable expenses for data centre, including tapes for system backup, printer consumables, etc.; and

(g) the estimated annual expenditure of $442,000 is for maintenance of computer equipment in Licensing Offices and miscellaneous expenses of data centre, etc.

[8] TD will enter into an agreement with the service provider that covers implementation service and ongoing support service for the VALID VI System. The relevant support service would commence upon completion of Phase 2 of the project (i.e. from 2028-29 onwards), and the cost will be recurrent expenditure.

17. Besides, to facilitate system management, the existing staff supporting the VALID V System will continue to support and manage the new system. The annual staff costs involved will be $13,857,000.

18. After offsetting the annual realisable savings of $27,533,000 (as detailed in paragraph 19(a) below), the proposal will require a net annual recurrent expenditure of $9,624,000 from 2029-30 onwards.

Cost savings/avoidance

19. It is estimated that the proposed project will bring about total annual savings and avoidance of $47,404,000 from 2029-30 onwards, comprising –

(a) Annual realisable savings of $27,533,000

Since there is no need to pay for the annual maintenance and operational cost of the VALID V System, the annual savings will be $25,566,000 from 2028-29 onwards. As there is no need to use provisional systems to sustain the operation of the existing VALID V System, the annual savings related to the maintenance and improvement of operations will be $1,967,000 from 2029-30 onwards.

(b) Annual notional savings of $14,298,000

The current staff expenditure involved in supporting the VALID V System is $13,857,000 per annum, and the relevant staff will continue to provide support to the new system. In addition, the notional staff cost savings that can be achieved from 2029-30 is $441,000 per annum, as the fragmented staff cost to support the provisional systems of the existing VALID V System can be saved. Relevant staff will be redeployed to support other work of TD.

(c) Annual cost avoidance of $5,573,000

With the implementation of the proposed project, an annual cost of $5,573,000 for system enhancement and facility upgrading to sustain the existing VALID V System can be avoided from 2028-29 onwards.

20. In addition, it is estimated that there will be a one-off cost avoidance of $21,463,000, which would otherwise be incurred for implementing the extra enhancements on the existing VALID V System necessary for maintaining the fundamental operation, including the essential upgrade of the facilities in data centres and system security equipment, etc. if TD cannot commence the proposed project.

IMPLEMENTATION PLAN

21. In view of the complexity of the proposed project and the importance of the VALID System, the project should be implemented in an orderly and prudent manner. Sufficient time should be allowed for smooth transition from the existing system to the new one, in order to avoid any hiccup that may affect the vehicle and driver licensing services and the relevant traffic law enforcement. TD will strictly follow the relevant guidelines issued by the OGCIO, including strengthening the governance mechanism for major IT system projects, ensuring the smooth and orderly implementation and roll-out of the new system in order to meet the needs of departmental operation and the expectation on public services.

22. Taking into consideration the above factors and relevant reference information, it is estimated that the proposed project will take around 52 months to complete, which comprises 16 months of preliminary work[9] and 36 months of two-phased system implementation. The first phase of system implementation will commence in the third quarter of 2025 and will

[9] Preliminary work includes proof-of-concept work on migrating critical database components to open source products, pre-tendering work, site preparation for data centre and system testing, etc.

last for 24 months, which will include re-provisioning of the existing functions of the VALID System on a new infrastructure, roll-over of the support service contract to the new contractor, and completion of the database system migration. While the first phase of system implementation is in progress, the second phase will kick start in the second quarter of 2027, which focuses on the expansion of the system's application functions, setting up the new "Enquiry DB" and optimising the system settings. The second phase of the project is estimated to complete in the third quarter of 2028. The proposed implementation schedule is set out below:

Activity	Estimated completion date
(a) Seeking funding approval from the Finance Committee of the Legislative Council	Q2 2024
(b) Site preparation[10] and tendering	Q3 2025
(c) Project implementation	
- System design	Q1 2026
- System implementation and UAT (Phase 1)	Q2 2027
- System live-run (Phase 1)	Q3 2027
- System implementation and UAT (Phase 2)	Q2 2028
- System live-run (Phase 2)	Q3 2028

WAY FORWARD

23. Subject to Members' agreement, we will seek funding approval from the Finance Committee of the Legislative Council in the second quarter of 2024 for site preparation and tendering in the third quarter of 2025.

[10] Site preparation includes preparation of data centre infrastructure such as power, ventilation, network, etc. for use by relevant equipment of the new system to ensure smooth system implementation. It is also necessary to prepare relevant sites and facilities for use by the development and testing staff.

ADVICE SOUGHT

24. Members are invited to provide comments on and support the proposal.

Transport and Logistics Bureau
Transport Department
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