Finance Committee

Date: **8 March 2023**

Item: **Future Operational Network**

This paper will be considered in public

1 Summary

1.1 The purpose of this paper is to brief the Committee on (i) our strategy for the ongoing provision of critical radio communication and data network services on the London Underground, and (ii) the proposed approach to execute and deliver the strategy.

1.2 A paper is included on Part 2 of the agenda which contains exempt supplementary information. The information is exempt by virtue of paragraphs 3 and 5 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the financial and business affairs of TfL. It also contains legally privileged advice. Any discussion of that exempt information must take place after the press and public have been excluded from the meeting.

2 Recommendation

2.1 The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.

3 Background

3.1 The Connect System currently in use comprises a TETRA-based radio system and multiple data networks that are required for the operation of the radio system and other key operational services. The Connect System is an operationally critical service used throughout the London Underground (LU).

3.2 The Connect System is operated, maintained and upgraded through our contract with Thales (Thales Connect Contract), which delivers three key services:

(a) the day-to-day operational support and maintenance of the Connect System;

(b) Business as usual projects which typically comprise changes to the Connect System that are required to accommodate changes within the LU estate e.g. station modifications and underground line extensions; and

(c) upgrade projects which aim to keep the Connect System at supported levels of hardware and software to ensure the ongoing operational stability and security of this critical service.

3.3 Our analysis shows that a more modern alternative to the TETRA radio system cannot be deployed throughout the LU network until the mid-2030s. This means that we need to deliver a series of upgrade projects to refresh various hardware and software components of the Connect System to keep it operationally stable and secure until the mid-2030s.

3.4 By June 2023 we will have completed all the upgrade projects necessary to keep the TETRA radio system supportable to the mid-2030s (the date by when we expect to have migrated to a more modern alternative service). We have not addressed, however, the obsolescence and capacity issues with the three data networks that form an integral part of the Connect System.

3.5 Two of the Connect System's data networks are already obsolete and out of support, while the third is capacity constrained and will also be out of support by 2026. Together, these data networks are critical to the provision of the Connect System, LU CCTV and telephony services, and the delivery of service information for customers.

3.6 In the context of data networks, obsolescence means that it is no longer possible to secure spares, nor is the equipment patchable or upgradeable. The consequence of this is that in the absence of the required upgrades:

(a) the Connect System will become increasingly unreliable, leading to material impacts on LU services;

(b) the skills necessary to maintain these obsolete data networks will become increasingly scarce, requiring Thales to balance resources in a dwindling arena of capability; and

(c) the absence of software patching will compromise our ability to meet our cyber security obligations with the Network and Information Systems directive.

3.7 These three data networks therefore need to be replaced, preferably with a single data network (the Future Operational Network or FON), which will be designed to provide data network services for multiple operational services in addition to the TETRA radio system e.g. the Piccadilly line signalling system upgrade (PLU).

3.8 Additional (currently unapproved) capital investment will be required in the period up to 2025/26 to deliver the FON and to protect (through a technology refresh) the ongoing availability of the below-ground data network services that underpin (and are a key dependency for) the TETRA radio system.

3.9 Based on inputs from external independent subject matter experts Analysys Mason, we envisage that the implementation of the FON will take around 2.5 years to complete from executing the FON transaction and will require substantial capital investment.

4 Strategy

4.1 Our TfL Data Networks and Telecommunications Strategy, agreed in 2018, sets out that we should minimise the number of data networks deployed throughout TfL. Instead of building new data networks for each requirement, we should instead look to build or buy the minimum number of data networks which are capable of cost-effectively meeting our requirements.

4.2 Our strategy also requires that wherever possible, we should adopt a multiservice approach, implementing data networks which can securely support multiple use-cases e.g. CCTV data, signalling data, SCADA data (Supervisory Control and Data Acquisition, SCADA systems are used for controlling, monitoring and

analysing industrial devices and processes), Wi-Fi data. Our approach to replacing the three data networks that form part of the Connect System follows this approach, with the aim being to implement one new below-ground data network (the FON) which has much wider utility for TfL than just supporting TETRA radio and Connect data network services.

4.3 In April 2021 we commissioned external experts Analysys Mason to provide us with a report that set out a recommended technical strategy, implementation plan, and a cost breakdown for each activity detailed in the implementation plan. The key findings from the Analysys Mason engagement were:

(a) we should design and implement a new below-ground data network that is flexible, expandable, highly resilient and secure. It should be architected to:

(i) deliver the capabilities required of the TETRA radio system but without being an integral part of the Connect System i.e. the TETRA radio and data network services should be disaggregated and be capable of being managed as separate systems by separate organisation;

(ii) be suitable for meeting all known and likely future data network demands of the operational railway e.g. PLU and Connect; and

(iii) leverage existing infrastructure where possible to minimise costs e.g. Connect optical fibres, reserved space, and reserved power;

(b) it will take around 2.5 years to build the new data network;

(c) migration of our critical data services from the legacy data networks to the new below-ground data network will be a complex operation which will need careful planning and execution if we are to avoid significant disruption to LU services; and

(d) the design, build and migration activities will require substantial TfL investment.

4.4 Additional information regarding the execution of the strategy is included in the paper on Part 2 of the agenda.

5 Assurance

5.1 We are working with TfL Project Assurance to address any issues and final assurance report(s) will be submitted when we seek any approval.

List of Appendices to this paper:

Exempt supplementary information is included in the paper on Part 2 of the agenda.

List of background papers:

None

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