



## Subway Modernisation – progress update

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**Date of meeting** 15 December 2023

**Date of report** 5 December 2023

### Report by Director of Transport Operations

#### 1. Object of report

To provide to the Partnership the latest progress update on the Subway Modernisation programme.

#### 2. Background to report

The Subway Modernisation programme is the most significant investment and improvement programme to be undertaken in the Subway within the last 40 years.

The programme was scoped for delivery under five principal workstreams. The first two of these workstreams are now fully complete:

- Stations and accessibility improvements; and
- New Ticketing System.

The three remaining active workstreams are:

- Renewal and Upgrade of Existing Infrastructure & Depot Facilities;
- New Rolling Stock, Signalling and Automated Control Systems; and
- Organisational Change and Employee Relations.

This report provides an update on the key areas of progress and emerging issues since the last written report to the Partnership in June 2023.

#### 3. Outline of proposals

##### 3.1 Existing infrastructure

Works have continued on the infrastructure workstream with the ongoing focus of completing key improvement and modification works across tunnel, track and line assets, in readiness for the new system. Progress made since the last update is as follows:

- The five-year programme of further tunnel lining improvements awarded to Freyssinet Ltd continues. With void grouting significantly complete, work continues on lining repairs and water ingress management.
- Works to confirm the ongoing health of legacy electrical, telecoms and IT assets have continued with the primary focus being to ensure that sufficient obsolete spares are available, and that SPT staff have the right knowledge, competence and information available to them, to keep the legacy systems operational.

- The conceptual and functional design process for improvements and/or upgrades of the Subway substations has continued, and efforts will be made during this work to maximise energy efficiency principles for both climate and cost purposes. Earthing surveys and analysis have now been completed, along with the analysis of the supporting High Voltage supply network to ensure compliance with modern standards. The next phase of these design preparation activities has started, where the capturing and storage of regeneration braking energy is being assessed.
- The Traction Power Negative Feeder cable replacements at Byres Road Substation (Hillhead) and at Dundasvale Substation (Cowcaddens) are now complete, Broomloan Substation works had been planned for FY 2023/2024 but this work is currently suspended due to access restrictions caused by testing of the new trains, which has made the activities undeliverable at this time. This situation is planned to be re-assessed early 2024 after some additional facilitation works, to minimise the required track access time has been completed.

### 3.2 Broomloan Depot facilities

Work activity to ensure the integrity, reliability and longevity of key assets within Broomloan Depot, in conjunction with readiness and new asset introduction, continues. In addition, the key areas of progress on this workstream are:

- Works have commenced to improve the condition and secure the long-term integrity of the retaining walls of the ramp access to the sub-surface tunnels at Broomloan Depot.
- A contract has been awarded to Story Contracting Ltd for delivery of a package of track and civil works within the yard, including replacement of sections of embedded track. Early planning has commenced with a view to works commencing mid-2024.

### 3.3 New Rolling Stock and Control Systems

All of the following activity is delivered by the Hitachi and Stadler joint venture (ANSTA) and their sub-contracted supply chain under the Manufacturing & Supply Agreement (MSA) contract:

- As previously reported, in-tunnel system testing of the new trains at night was successfully completed in early 2023 with all vehicle functional tests now successfully completed.
- The testing of the modifications to the legacy signalling required to run the new fleet on the legacy system was completed in July 2023.
- Fault Free Running (FFR) is complete for the first three trains in preparation for the planned introduction of the new fleet (known as 'Configuration Point X' or 'CPX'). Fault Free Running for the remainder of the fleet is currently underway.
- Stadler has now completed production of all 17 new trains. The Factory Acceptance Tests of all trains have been completed and 15 of the trains have been delivered to Glasgow. The delivery of the remaining two trains will be undertaken once space becomes available in Glasgow following decommissioning and removal of legacy trains. The trains in Glasgow remain the property of ANSTA until the trains are formally handed over.
- As reported previously, the installation of the new signalling and control equipment in station equipment rooms has been completed in all stations with close out of snags continuing. The ongoing installation of communications equipment and cabling within the stations and tunnels means that ceiling cableways remain exposed in certain parts of the system. The ceiling tiles are being replaced as soon as possible after the cable installation works are completed.

- Installation of the new CCTV system has continued with a focus on the platform cameras and driver despatch screens in stations that are required when the new vehicles come into passenger use.
- Installation of the new fibre optic cabling and relevant “J” Hangers have continued in the system. Installation of the new axle counters throughout the tunnels is substantially complete.
- Work has continued on the installation of bracketry for the communications backbone ‘waveguide’ cable that will facilitate communication between the new Operational Control Centre (OCC) and the new trains.
- SPT continues to challenge and monitor the evidence provided by ANSTA to demonstrate the safety case required under SPT’s Safety Verification (SV) Scheme. Based upon previously reported assurance reviews carried out, the specific portfolio of evidence required for mainline testing has been collated to allow the continuation of tunnel testing.

### 3.4 Subway Sunday closures

As noted previously, SPT has agreed for ANSTA to utilise a number of Sunday closures. These short closures allow the efficient and safe installation of signalling cabling and equipment, mainly focused within the tunnel infrastructure. The closures also give us the opportunity to progress initial civil works required to strengthen our station platforms to enable the installation of Platform Screen Doors (PSDs) at a later date.

In addition to the Sunday closures in support of installation works, on 30 July and 20 August 2023, SPT agreed for ANSTA to utilise two additional Sunday closures for the purposes of Fault Free Running. These two Sundays allowed in excess of 1,300 miles to be accumulated.

The next planned closures will re-commence in early 2024 with the exact details to be communicated in due course. These closures will be used for the installation of the main power and communications backbone cables around the system. We will continue to communicate the forthcoming closures with the public via media outlets and our own social media channels.

### 3.5 Continuation of in-tunnel testing

As reported previously, the extensive programme of vehicle system train testing was completed in early 2023 and work has continued since that time to collate test reports and assurance evidence that will, after validation by independent safety assessors, feed into the safety case to support the start of passenger operations.

The testing of the modifications to the legacy signalling system to ensure that the new trains can be safely controlled from the legacy system whilst the new signalling is installed is also now complete. Work since completion of this testing has focussed on collation of test reports and assurance evidence that will, after validation by independent safety assessors, feed into the safety case to support the start of passenger operations.

Since the completion of the signalling system testing, the focus for the majority of the calendar year has been on the final phase of testing which is Fault Free Running. During this phase, each new train is run at night to simulate, as closely as possible, normal passenger service. The testing is carried out for each vehicle and only when each train completes an acceptable level of miles without fault can it then be accepted by SPT for introduction into passenger service. Given the nature of train testing this can very often mean considerable levels of train miles overall.

At the time of writing, the first three trains have completed an acceptable level of Fault Free Running and are in the final handover phase. The Fault Free Running for the remainder of the fleet is currently ongoing with up to four trains being tested each night. It

is expected that the Fault Free Running will be complete for the full fleet within the first quarter of 2024.

As noted previously, the above testing of the legacy signalling and new trains has, and continues to be, implemented concurrently with the new signalling system being installed.

### 3.6 Vehicle handover and new fleet introduction

Once each vehicle has completed its respective Fault Free Running phase, each train then undergoes a thorough final inspection by SPT and any issues identified are rectified by ANSTA before each vehicle is formally handed over to SPT. At the current time it is expected that the first two trains will be ready to be handed over to SPT at start of December 2023. It is expected that the remaining trains will be handed over sequentially between December 2023 and mid-2024.

Following vehicle handover and completion of the final CCTV works, the required evidence will be provided by ANSTA to demonstrate the safety case required under SPT's Safety Verification (SV) Scheme. This safety assurance evidence will be reviewed by both ANSTA's Independent Safety Assessors and SPT's Independent Competent Person. Only when all parties are satisfied will the new fleet be formally accepted by SPT as ready for passenger service. At the time of writing it is expected that the first two trains will be introduced to passenger service within the first half of December 2023.

### 3.7 Manufacturing & Supply Agreement

The Partnership should continue to note that the existing Subway service continues to be maintained daily despite the scale of the work being undertaken each day/night, and this in itself continues to present significant challenges. However, SPT is committed to keeping a service running recognising the invaluable role the Subway plays in the transport network. Despite the challenges of this implementation, Subway patronage continues to recover strongly with patronage now at c.102%+ of pre-pandemic levels. This growth to beyond pre-pandemic levels is testimony to all involved in providing our vital Subway services.

The safety of all staff, contractors and customers remains the top priority for the Subway Modernisation programme and to support this, SPT continues to work with ANSTA to ensure that all works are carried out using safe systems of work and that industry standard best practise is used. Any 'near miss' events are thoroughly investigated to ensure that any unsafe conditions are eliminated as and when they are observed, and lessons are learned to prevent future repeat occurrences.

As noted above, ANSTA is currently holding the position that new trains will be in revenue service ('CPX') in December 2023. Following the new fleet introduction, new signalling finalisation and commissioning will become the next key milestone, followed by the installation of Platform Screen Doors and full Unattended Train Operation (UTO) capability.

### 3.8 Technical Support and Spares Supply Agreement (TSSSA)

The Technical Support and Spares Supply Agreement is the other contract to be delivered by ANSTA. This contract supplies all spares and special tools required for the integrated system, defines the maintenance approaches and plans for maintenance activities, and manages the material supplies to SPT stores in relation to the modernised equipment.

As previously reported, the TSSSA contract has continued to require close monitoring at Project Board level to ensure ANSTA is pressed for progress on readiness and progressing their workstreams with input from SPT. ANSTA has set a target for TSSSA readiness, the progress of which will remain under review at Project Board level.

### 3.9 Organisational Change and Employee Relations (including Operational Readiness)

Work continues to ensure that Subway Operations and Maintenance staff are ready for the introduction of the new trains later this year. As we approach CPX, there has been ongoing work on developing new processes, behaviours and models throughout Subway to ensure Readiness at each stage of the Modernisation Project.

#### 3.9.1 Learning and Development

Since May 2023, the Operations Training team welcomed two new Training Officers and a Lead Training Officer to guide the team. A combination of onsite and online training courses covering the following were delivered:

- Control Training - required for the introduction of new trains (12 control staff completed)
- Module 3 (New Train) training – for all Drivers
- Hybrid Course Modules 1-3 (New Train) – for new Drivers
- Station Delivery Officer Induction Courses x 2
- Station Delivery Officer Induction Course for Drivers x 1
- Station Delivery Assistant Course - for new employees x1

All staff within Subway Operations and/or based at Broomloan Depot were required to complete ACT (Action Counter Terrorism) modules which supports the guidance for new security legislation for light rail, the Light Rail Security Plan (LRSP).

The two recent Sunday closures at the end of July and August were used as an opportunity to refresh staff on the importance of delivering excellent Customer Service and Conflict Resolution. The training was well received and took a more interactive approach that encouraged group work and classroom participation. A total of 40 staff participated in these training sessions.

Over the last 6 months, a dedicated team of Tech Craft Rolling Stock (Team 7) has been working on the verification of New Rolling Stock Work Instructions and being trained on the Rolling Stock with the assistance of ANSTA. Competence assessments have been rolled out for the current members of Team 7 before they return to the rotating teams. A new cohort of Maintenance staff started working in Team 7 throughout October.

Tech Craft Line members of staff attended a Power Protection Relay course which builds on the City and Guilds HV Switching course. Training on LEU (Lineside Electronic Unit) and Balise (new signalling system) which ties the old signalling system into the new allowing for mixed fleet running has been completed. An introduction to Linux and Database training has been completed by all Tech Craft Line staff as this will be required for the new signal and monitoring systems.

Personal Development Plans have been carried out with all members of the Maintenance teams. Training needs have been identified and discussed and will be arranged, including technical and soft skills to develop staff within their current and potential future role.

Specific training for Permanent Way staff has been arranged to eradicate the need of having contractors provide yard and depot maintenance at Broomloan Depot. The training covers ballast replacement/packing and line and level rectification, concrete and timber sleeper replacements and insulated block joints maintenance and replacements. Training will take place during October for the first cohort of staff with further dates to be confirmed for remaining staff.

Since the start of this year, we have introduced more Assessors and Verifiers and so far, have supported eight Assessors and two Verifiers to achieve their Awards. The role of an Assessor is to assess workplace competencies through observation, questioning and witnessing work related tasks being undertaken by staff within their area, and to deem them competent. The Verifier will maintain internal quality assurance by verifying assessments being undertaken by the Assessor. This will allow more resilience when assessing competencies in the workplace, especially as training within Subway Operations is moving quickly in readiness for the introduction of the new trains.

Increased employee engagement activities continue within Subway. Operations continue to offer regular drop-in sessions for their staff to meet and engage with their management team on issues that are important to them. Monthly newsletters ensure that Operations staff are updated on progress and around Modernisation. ICE meetings (Information and Consultation with Employees) also continue on a monthly basis.

### 3.9.2 Authorisation, Certification and Stakeholder consultation

SPT's Health and Safety Department has led on the submission for the review of the five year authorisation with the ORR (Office of Rail and Road). This was formally submitted on 13 April 2023 to meet the required four month Consultation period, with no comments or objections raised. The renewal of the safety authorisation and certification was received by SPT on 11 August 2023, well within the five year expiry timeframe.

Regular meetings with Transec, British Transport Police and Fire Service continue.

### 3.9.3 Rules, Regulation and Procedure

- Train Testing – Live Line Procedure (LLP)

LLP (introduced in April 2022) remains in place. This procedure was implemented in April 2022, allowing train and system testing to be carried out on one Circle whilst the other Circle is isolated to allow maintenance of the infrastructure. This procedure was a substantial change to the way Subway operated previously during "engineering hours".

- Rulebook update

In preparation for Mixed Fleet Operation, substantial changes were made to Subway's Operational Rulebook, with ANSTA and SPT working closely together to ensure all changes to how we would operate were captured. Changes have been communicated to staff via SPT's Learning Platform Moodle to ensure all staff could update their knowledge and for SPT to manage compliance.

### 3.9.4 People, Resources and Structure

- Target Operating Model (TOM) and Transformation Plan

Central to everything we do, is to (i) provide a safe environment for everyone and (ii) to retain and grow our passenger numbers. To enable us to continually deliver these two core objectives, our Structure, Processes, Assets and People each have sub-model plans where required change is identified and will be planned, prioritised and managed going forward. With the use of scored 'Benefit Maps' which have been built using input from the Subway Senior Managers, key objectives have been developed.

Work is ongoing with departments to develop plans around how Subway departments will operate once Modernisation is complete. Alongside this,

Subway are developing Power BI dashboards to make data driven decision/reporting easier through the presentation of key data for each department.

A Lessons Learned session has been scheduled in the New Year to capture what went well in the run up to mixed fleet operation and to capture areas for improvement moving forward into CP4.

### 3.10 Programme budget

Within the overall Subway Modernisation budget of £288.7m, the 2023/2024 budget stands at £25.5m.

To date, £212.3m has been incurred against the total budget of £288.7m on the programme. The remaining programme budget, including contingency, will be required and utilised solely for the delivery of the MSA contract and associated programme support costs.

Overall, the Subway Modernisation capital programme remains within the approved budget, including programme contingency and available funding.

## 4. Conclusion

Notwithstanding that delivery of the modernisation project is being undertaken while continuing to ensure daily Subway operations, and thus limiting the window for works to be done, good progress continues to be made across all Subway Modernisation workstreams, most notably with the testing of the new trains running on the existing signalling system, the completion of 'fault free running' tests for the first three trains, leading to the fleet entering passenger service. Members are advised that patronage is now approximately 102% of pre covid levels, and to re-iterate that safe operation of Subway services while delivering testing, signalling installation and PSD civils work is not feasible.

## 5. Partnership action

The Partnership is asked to note:

- the continued progress made on all Subway Modernisation and improvements works since the last written update to the Partnership in June 2023;
- ongoing progress on the MSA contract including the completion of in-tunnel signalling testing, and also ongoing progress on Fault Free Running, all driving towards new fleet introduction to passenger service ('CPX') in December 2023;
- continued challenge towards performance improvement on the TSSSA contract;
- progress made on operational readiness and delay mitigation actions including existing infrastructure and fleet maintenance improvements;
- that the modernisation programme remains within overall budget and funding; and
- that a further report on progress will be presented to the Partnership meeting in June 2024.

## 6. Consequences

Policy consequences

*The Subway Modernisation is a key objective of the Regional Transport Strategy.*

Legal consequences

*Reported delays and any proposed mitigation will be managed in accordance with the MSA contract terms and SPT Governance.*

Financial consequences	<i>Overall the proposed works remain within the allocated capital and revenue budgets and Subway Modernisation business case.</i>
Personnel consequences	<i>No significant changes within this report although significant changes are expected in the future system migration stages and as the operational readiness programme continues to develop.</i>
Equalities consequences	<i>None within this report.</i>
Risk consequences	<i>Delays impact to forward modernisation delivery, operational service delivery and budgeting. Impacts and risks are under assessment based on available information and mitigations are being continually reviewed and defined as required.</i>
Climate Change, Adaptation & Carbon consequences	<i>Seeks to secure the future operation of a sustainably powered public transport option for west of Scotland communities by delivering a state-of-the-art underground railway within Glasgow City.</i>

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