



Subway Modernisation - progress update

Date of meeting 11 December 2020

Date of report 25 November 2020

Report by Director of Subway

1. Object of report

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

2. Background

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, namely:

- Stations and accessibility improvements (complete);
- New Ticketing System (complete);
- 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 2020.

The COVID-19 pandemic continued to have a significant impact on modernisation progress with all site works initially stood down until the easing of the UK national lockdown on essential construction activity. The restrictions on international travel during this time also impacted our contractors and suppliers, which affected design and equipment factory testing activity in support of modernisation also being delayed or prolonged. By July 2020, works deemed essential recommenced with COVID secure measures in place. The additional safety measures have meant that site progress has been slower than originally planned. The vastly reduced Subway passenger base in August did however permit SPT to take the opportunity to apply a weekend service suspension to fast track and complete complex works in the depot yard. Remote working is still in place for the majority of SPT staff and our supply chain resources are working on modernisation design or office based activity. Whilst remote working has now become effective for most, where practical activity or training is required, this has generally been delayed or prolonged.

The on-going effects of COVID-19 result in new management and project issues arising frequently. There is substantial effort being made across SPT and its supply chain to manage the emerging issues and minimise impacts to delivery.

With the challenges experienced, there has been less progress overall than anticipated. The updates given within this report focus on the achievements and progress made despite the realised impacts of the pandemic. Given the unstable nature of restrictions, guidance and requirements in support of public health protection, the forward forecasting for elements of the modernisation programme remain uncertain.

3. Progress to date

3.1 Existing Infrastructure (Stations)

Whilst the programme of work to modernise the station environments and improve accessibility is now complete, there are works still on-going on the station buildings & infrastructure to be ready for the installation of the new control and signalling system equipment. Key areas of progress on this workstream since the last update are:

- The programme of activity to strip out legacy redundant equipment and cabling in all stations to create space and clarity of what remains live and in use continues and has progressed in line with the needs for the install of new equipment.
- The call off contract with MacKenzie Construction to address water ingress at stations continued with further measures at West Street platform area and the fire escape at Kelvinbridge now complete.

3.2 Existing Infrastructure (Tunnels & Track)

Works have resumed on the infrastructure workstream with an on-going focus to complete key activities and remedial works across tunnel, track and line assets, in readiness for new system and mainline train testing. Key progress made since the last update is as follows:

- Works to modify tunnel clearance in advance of train testing continue with the last of the discrete locations identified approaching completion. Similarly work continues by the internal track team to finalise improvements to conductor rail positioning.
- Works to gain segregation between the tunnels in advance of train testing are also continuing. The first phase of work to close off the interconnecting cross passages is now complete. Works to close off larger open areas are also underway, whilst areas remaining (including station platforms and the turnout chambers) are being risk assessed to establish and install physical control measures and procedures.
- As noted in the last update, a programme of further tunnel lining improvements has been defined and procurement for a works contract was completed during the summer. Freyssinet Ltd was the successful bidder and was awarded the contract in autumn 2020. Construction preparation is currently underway for works commencing this financial year.
- Planning for delivery of the first sites of a prioritised programme of track geometry improvements is underway via our internal track maintenance team.
- Works are on-going to confirm and improve the condition and longevity of legacy electrical, telecoms and IT assets to ensure readiness for interface or integration with the new equipment and systems. Since the last update, a number of suppliers have been identified to provide technical support for the legacy Control System. This will require a strategy of extending existing contracts and issuing of new contractual arrangements.
- Design assessments are also on-going to assess the necessary improvements or upgrades of the Subway substations. This work is timely, irrespective of

modernisation, and will be undertaken by AECOM. This work will look to define what is required in order to utilise the new trains regenerative braking system; align with other modernisation needs, improve long-term maintainability, lifecycle costs and improve safety controls.

3.3 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. The key areas of progress on this workstream are:

- Excavation and installation of new cable ducts and draw pit chambers through the operational yard area re-commenced after lockdown and continues. These significant excavation works are to facilitate the installation of new cable and trackside equipment as part of the new signalling and control system works. Undertaken by Story Rail Ltd on behalf of ANSTA JV, this is a major civils construction activity, requiring excavation under the yard tracks, all whilst maintaining track access for passenger trains. Given low passenger numbers at the end of lockdown and the complexity of this work, the decision was made to undertake a weekend service suspension to fast track the most complex under track crossings.
- Designs for the stabling shed extension were progressed and final designs have now been agreed with ANSTA JV. The traction power electrical isolation arrangements to the existing shed were modified over the summer to segregate the building traction power from the yard, in preparation for construction and to enhance safety. Site mobilisation, clearance work and utility diversions commenced in November 2020, in advance of construction of the new shed foundations in the new year.
- Works to construct a new siding road to provide additional stabling space for track based vehicles commenced after lockdown and is well underway. This is being delivered by Volker Rail Ltd.
- The civils works for both the new train wash and the Automatic Train Inspection (ATI) equipment is now complete. The mechanical and electrical fit out for the train wash is also complete with ATI equipment installation programmed for summer 2021. Testing and commissioning of both will then follow.
- As reported in the last update, the closure of Wabtec (Kilmarnock) impacted the established maintenance programme for train wheel sets. In response to this, a new maintenance plan has been put in place. The new wheel lathe has been commissioned and training has been provided to allow SPT to use on existing fleet. Building of competence is underway and it is expected that the lathe will be in operational use on existing fleet by the turn of the year. For wheel set overhaul activities not able to be undertaken in-house, a market sounding exercise was completed and a trial with a preferred supplier on-going since July 2020. This is due to conclude shortly and will be followed by agreement of a long term service contract.

3.4 New Rolling Stock and Control Systems

All of the following activity is delivered by ANSTA JV and their sub-contracted supply chain, under the Manufacturing & Supply (MSA) Contract.

- Off-line dynamic testing of the first three trains delivered to Glasgow last year restarted during the summer, on the test track at the Manufacturer Depot and Testing Facility at Edmiston Drive. Off-line testing has flagged design snags, as

would be expected, and remedial works have been undertaken on site as required.

- The testing also brought to light an issue with traction power when new trains were deploying their electrodynamic brakes. ANSTA JV has defined a technical solution which will require a retrofit of additional components on the trains. This is expected to be completed in early 2021 and until that time only selective tests will be undertaken.
- The on-going design and factory testing work for the various signalling, telecoms and controls systems and software has progressed albeit with the continued impacts of COVID-19 travel restrictions, as reported in the previous update.
- ANSTA JV has also progressed their proposal to change the sequence of migration to the new system to allow SPT to initially run the new trains on the existing signalling and control systems, until the new control system is installed and tested. This requires some additional trackside equipment and some software changes for the new trains. Design work is on-going and the additional equipment installation plans are being developed.
- The civil enabling works and cable containment installation for new cabling and equipment within stations completed during the autumn. Installation of the new signalling and control equipment has recommenced, with works progressing at Partick and Govan stations.
- The delivery and install of new equipment into the Operational Control Centre (OCC) has continued with ANSTA JV undertaking their site acceptance testing of new equipment as initial installation and commissioning of the discrete subsystems is completed.
- Replacement of the Subway CCTV system has commenced with platform camera installation being prioritised in support of mainline testing.
- SPT continues to challenge and monitor the evidence provided by ANSTA JV to demonstrate the safety case required under SPT's Safety Verification (SV) Scheme. SPT's regular SV review cycle has continued throughout and progress has been made in line with the on-going design development.

3.5 Manufacturing & Supply Agreement

As previously reported, progress on the ANSTA JV delivery of the Manufacturing & Supply Agreement contract remains subject to significant delays and ANSTA JV has previously sought agreement to re-baseline the contract programme. The proposed revised forecasts were unacceptable to SPT, given the significant impact to the new integrated system going live and the introduction of new trains into service.

As reported in the June update, to part mitigate the impact of their delays on SPT, ANSTA JV has proposed to change the integrated system migration sequencing. This proposal introduces the new fleet to service, in a modified mode, using the existing signalling and control systems to replicate our current automatic train operation. The new trains would then latterly be migrated to the new control and signalling systems once live. In the original migration strategy, the new trains would not be introduced into service until after integration with new signalling and systems. This proposal does not shorten the overall programme delay but does introduce new trains into service earlier than would otherwise be possible. The safety and associated risks of moving to this revised delivery model was both internally and independently assessed.

Given the reality of the delays experienced to date, SPT accepted that there was no mitigation possible to recover all lost time. SPT agreed to ANSTA JV progressing their migration proposal in summer 2020. ANSTA JV is currently re-submitting designs and

re-planning works on this basis. Contractual negotiations related to the change continue with the support of specialist consultants although SPT has been clear that costs for this delay mitigation remain the responsibility of ANSTA JV.

ANSTA JV has also been pursuing a number of claims that are linked to their views on the overall programme delays to date. SPT has undertaken the necessary review and challenge of these claims, in line with the contract, and has rejected the claims on the basis that they are either invalid or unjustified. These issues continue to be subject to discussion at corporate board level across the contract parties.

SPT continues to monitor any impacts COVID-19 may have in the contractual delay position. ANSTA JV submitted a 'Force Majeure' claim under the MSA contract in March 2020 and has routinely followed this up with further statements as the impact to themselves and their supply chain has emerged. Given that the impact of COVID-19 is expected to last for some time and with some significant constraints, the true impact to the ANSTA JV programme cannot yet be fully understood. SPT has worked closely with ANSTA JV to assess, agree and mitigate against known impacts for near sighted activity to restart in line with government guidance.

ANSTA JV has again recently proposed that SPT accept the dates within their latest high level programme on a contractual basis, and SPT has declined to do so. SPT will inform the Partnership on further progress to agree a workable and realistic forward programme and advise on how delays and mitigations are being dealt with contractually in due course.

Further variation proposals have been submitted by ANSTA JV and are under review in line with the defined contractual process.

3.6 Technical Support and Spares Supply Agreement (TSSSA)

The on-going delays to the MSA contract delivery continues to limit required progress on Technical Support and Spares Supply Agreement contract activity. There has been limited progress this year, mostly attributable to MSA delays, but there are also some underlying ANSTA performance issues being flagged that are being actively challenged.

The TSSSA contract programme and commercial forecasting will remain closely monitored and under review until the MSA programme and delay mitigations are agreed. Given progress to date, there has been an agreement that the contract payment schedule will be further adjusted to account for the low activity now expected in the year to come.

3.7 Organisational Change and Employee Relations (including operational readiness)

The Subway Modernisation operational readiness plans are being progressively developed to align with planned significant changes to the current operation. Progress, risks and issues are actively managed to ensure appropriate prioritisation and to protect continuity of revenue service. Focus is currently on readiness planning for new train testing starting in the tunnels (mainline testing).

There has been a significant effort to map all activity and impacts to be addressed across changes to the tunnels, safety procedure, training and safety assurance to facilitate the safe access for new trains into the tunnels for testing. This is now established as the monitoring tool for progress reporting.

In addition to physical preparations for mainline testing, the following is key progress and activity on people and procedure focussed workstreams since the last update:

- Authorisation & Certification
 - Engagement with the Office of Road and Rail (ORR) has continued on a regular basis. The specific bi-annual ORR update on modernisation and transformation progress was also held. The ORR notification requirements and expectations for mainline testing have also been under discussion.
 - Further development of SPT's technical and safety assurance processes continues to ensure that assurance evidence in support of ORR requirements is robustly managed and captured in a timely fashion.

- Rules, Regulation & Procedure
 - Critical work to review and revise the Subway operational rule book, regulations, process and procedure has continued, with a number of the new Operational Procedures modules now progressed to final or working drafts. The Rail Safety and Standards Board (RSSB) is undertaking this specialist work for SPT and has been able to maintain required levels of progress, despite remote working restrictions.
 - There has been a need to strengthen and fully revise certain process and procedures to ensure continued safe system access and control during mainline testing, given part of the system will require traction power energised during nightshift, and with test trains moving around the system. Given this is a significant change to the normal working environment, frontline staff from all Subway departments have been involved in the development of the revised procedures by either being seconded into a specific change team or being involved in facilitated and structured workshops. Works to finalise and establish the new working arrangements continues.

- People, Resources and Structures
 - In the autumn, both a new Head of Service Availability & Maintenance and a new Head of Engineering joined the organisation. Both individuals are currently assessing their respective department structures and work priorities.
 - Work is also on-going to develop the future staffing needs and structures required to run the new 'digital railway'. Initial assessment of the 'as-is' structures has been completed and in order to create a solid baseline framework, role and responsibility mapping against the ORR Rail and Other Guided Systems (ROGS) requirements is underway, which is clarifying ownership and responsibility lines between both SPT Subway and Corporate departments for the safe operation of the system.
 - Work has also continued to develop the conclusions and recommendations from a predictive workload study for future operational roles and structure for migration to the new Operational Control Centre. Control Room and Operational staff have continued to be involved and consulted in this on-going work. Staff visits to the new OCC building over the year has assisted with ensuring this staff engagement feels real and tangible.
 - Since the last update, a legacy fleet reliability action plan has been agreed to improve the condition of the existing fleet with the aim of increasing the reliability of the fleet until new trains are in service. A group of contracted agency resources has been sourced to provide a skilled team dedicated to overhaul activities to improve the fleet. This team is supported with a supply chain that is providing the appropriate spares and refurbished materials.

- Competence, Development & Engagement
 - The new train drivers recruited earlier in the year to gain resilience to the expected resource demands from system train testing have completed their training and are now gaining practical in-system experience on the existing fleet as part of the current service driver's pool. Completion of training was impacted by COVID-19 restrictions, but through close working between Operations management and existing driving staff, safe measures were put in place to re-start and complete practical training to meet service needs. This was not without significant operational difficulty, but demonstrates our ability to deliver through ingenuity in the face of emerging challenge.
 - Efforts to mitigate the impacts to training from COVID-19 restrictions, also saw plans to move some elements of core competence training (such as COVID awareness, personal track safety and parts of train driving theory) to virtual classrooms and online courses completed over the summer.
 - Contract agreement with ANSTA JV was achieved in early autumn to allow SPT trainer and some of our train drivers to support the off-line train testing. This allows our staff to gain early exposure and develop experience in driving the new trains in advance of system testing, where SPT is required to provide driving resources to ANSTA JV. On the back of experience gained over the autumn, SPT trainers have developed and delivered initial training and inductions for the drivers began in November 2020.
 - Two Maintenance personnel remain on full secondment to ANSTA JV in support of the TSSSA. They are also involved in the off-line train testing and commissioning and are developing a working knowledge of the new fleet and are involved in rectifying snags and defects. Discussions have continued with ANSTA JV to achieve similar staff secondments or early access opportunities for the control and signalling systems, though progress and roll out has been slower than anticipated resulting from various restrictions experienced over the last six months.
 - Efforts continue to further develop and maintain the current competencies of Maintenance staff with a robust plan in place based on improved record-keeping. Maintaining mandatory training has proven to be challenging in the period as the majority is delivered by external providers, all of whom were or remain furloughed. A proposed alternative approach based on HSE COVID-19 guidance and expectations of the ORR is currently being reviewed in consultation with staff and Trade Union representatives. This will enable the use of different competence assessment methods and in particular the use of naturally occurring evidence and witness testimonies for competence refreshers. The review of the competence assessments is now nearing completion and will align current safety critical tasks to National Occupational Standards. The Maintenance apprentices have continued with their academic and training qualifications, albeit working remotely at times due to COVID-19 restrictions. The remote working has impacted this year's practical work experience knowledge build, however they have now returned to the depot on a part-time basis and efforts are being made to recover lost time. The two first year mature apprentices have also progressed similarly in the period.
 - Employee engagement across Subway continues. Staff newsletters have been refreshed and a regular programme of issue re-established, combined with regular face to face communication with Maintenance staff. As noted, staff are being actively involved in the development of new processes and procedures, as well as being party to on-going design reviews and site visits (where currently possible). Testing of the train and

control simulators continues with some staff being involved trialling the equipment, whilst gaining familiarisation. Modernisation continues to be visible on a daily basis to staff, through works in the depot and within stations. Frontline staff are also involved in supporting the control and management of these works. As we progress further towards the start of mainline testing, there will be a need for further and more detailed engagement to ensure those who need to know are trained on the changes and all other staff are fully aware and informed. An internal communication plan for this activity is currently being refreshed.

- Trade Union and Safety representatives continue to be regularly briefed on progress as part of our standing local Information and Consultation of Employees meetings and Safety Committee.
- Routine liaison with the Department for Transport, Transec, British Transport Police and the Fire Service has continued and plans are being developed to ensure upcoming changes as part of system testing are fully communicated and understood.

3.8 Programme budget

Within the overall Subway Modernisation budget of £288.7m, the 2020/21 budget was set at £37.9m at the Partnership meeting of 6 March 2020. As noted, COVID-19 has contributed to delays in project delivery in 2020/21, which has had an impact on achieving milestone payments on the MSA contract. The financial impact is a significant reduction in budgeted spend this year, currently forecast at circa £18.7m to year end.

To mid-financial year 2020/21, circa £171m has been incurred against the total budget of £288.7m on the programme. As previously noted the remaining programme budget, including contingency, will be required and utilised 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. Conclusions

In conclusion, progress continues to be made across all Subway Modernisation workstreams although COVID-19 has had, and continues to, have an impact on progress, as summarised below:

- Overall programme progress is on-going, but behind forecast given COVID-19 restrictions and impacts;
- New control and signalling equipment prep-work is complete and cabling & equipment installation is underway in the stations, depot and tunnels;
- Space clearance activity within the tunnels is nearing completion;
- Works to improve physical segregation between the tunnels is underway;
- The contract for further tunnel lining improvements has been awarded and will commence this financial year;
- Complex works to install new cable crossings and containment within the depot yard has progressed well;
- Final designs for the stabling shed extension are agreed and site enabling works have commenced;

- Equipment installations and prep-work continues for the Automatic Train Inspection system and new train wash;
- The wheel lathe is now installed and initial operator training has been undertaken. The use of this on existing fleet is imminent;
- Off-line train testing continues with the first three train units, though issues with the electrodynamic braking system has delayed progress;
- Proposed change to the signalling migration strategy has been developed including revised designs and equipment specification;
- Designs and factory testing of new system technologies continues;
- New OCC building construction is complete and fit out of operational systems is underway;
- A number of readiness activities are underway to ensure SPT's people and processes are ready and robust for mainline testing starting in the tunnels;
- Continued engagement with staff, trade unions and key external stakeholders regarding future operational changes;
- On-going progress on the safety verification and validation of project and readiness activity in support of future ORR regulatory notification or approval gateways;
- Senior management actions and discussions have continued with ANSTA JV to address and mitigate their forecast delays and cost claims on the MSA contract; and
- The Subway Modernisation capital programme remains within the approved budget of £288.7m and available funding.

5. Partnership action

The Partnership is recommended to note:

- The continued progress made on all Subway Modernisation and improvements since the last written update to the Partnership in June 2020;
- The significant and on-going impacts of the COVID-19 pandemic on modernisation activity;
- On-going delays and cost claims defence on the MSA contract;
- Impacts to the TSSSA contract from MSA delays;
- Impacts and likely further delay and contract claims to both MSA and TSSSA contracts from COVID-19 as a Force Majeure event;
- The on-going contract negotiations of the ANSTA JV MSA delay mitigation proposal for an alternative migration plan, with re-design and works re-planning now underway;
- Operational impacts of the reported delays continue to be assessed and mitigation plans are underway, including existing fleet maintenance and reliability programmes; and
- The modernisation programme remains within overall budget and funding.

6. Consequences

Policy consequences

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

Legal consequences	<i>Reported delays and any proposed mitigation will be managed in accordance with the MSA contract terms and SPT Governance.</i>
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 as the operational readiness programme continues to develop.</i>
Equalities consequences	<i>None within this report.</i>
Risk consequences	<i>COVID-19 and ANSTA JV 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>

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