



Subway Modernisation - progress update

Date of meeting 26 June 2020

Date of report 05 June 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;
- 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 December 2019.

During this time period, the COVID-19 pandemic took hold. This has had a significant impact on modernisation progress as all site activity was put on hold in March 2020 as the UK entered lockdown, though the supply chain experienced impacts as early as January 2020, as lockdown measures were implemented across the globe. Home working has allowed design and preparation activity to continue.

The progress updates given within this report cover achievements prior to lockdown and those made in spite of the impacts of the pandemic. A full restart and re-planning exercise is underway on all modernisation activity, based on expected lockdown easing stated by government to date, with some critical activity linked to modernisation having re-started at the time of writing. As such, any general dates/timeframes are indicative and pending confirmation against the expected further COVID-19 government guidance and phased lockdown release plans across, Scotland, UK and Europe.

3. Progress to date

3.1 Stations and accessibility

Key areas of progress on this workstream since the last update are:

- Refurbishment work at West Street station has completed on budget though 6 weeks later than programmed, mainly due to design interfaces with the Rolling Stock & Control Systems (RS&CS) contractor (ANSTA JV). The completion of this fifteenth station saw the successful end of the station refurbishment workstream.
- 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 has progressed to meet the needs of the ANSTA JV programme
- The RS&CS install works continued across all stations, with civil enabling works and cable containment installation being progressed in line with expectations, prior to going on hold in March 2020. Installation of the new signalling and control equipment had also commenced in some stations on the south side of the system.
- The call off contract with MacKenzie Construction to address water ingress at stations continued with further resolution measures being scoped, but not yet delivered, for West Street platform area and the fire escape at Kelvinbridge.

3.2 Infrastructure

Works have continued 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 train testing. Key progress made since the last update is as follows:

- Works to improve tunnel clearance in advance of train testing continue with the majority of civil works now complete. Bespoke solutions are being prepared by specialist contractors for a small number of outstanding locations. Work continues by the internal track team to improve conductor rail alignment and optimisation.
- Other works to improve the tunnel segregation in advance of train testing are also underway. Risk reviews have been undertaken to consider measures necessary to enhance physical segregation of inner and outer circle tunnels. The first phase action is a programme of work to close off the interconnecting cross passages, where safe to do so. These works have commenced on site using in-house resources and are on-going. Further assessment, survey and design is planned to define safe measures for larger open areas including certain stations and the turnout chambers.
- Activity to improve the condition of the tunnel lining continues following on from the previous large scale investment in 2015-2018. A prioritised work bank has been defined and a design specification developed for further tunnel lining improvement works. Procurement of a contract with a works contractor has commenced and is expected to result in contract award in Autumn 2020. The focus of the works contract will be to address defects identified within the prioritised work bank in order improve tunnel integrity, reduce on-going maintenance costs, and minimise associated risks of service disruption.
- A prioritised programme of track geometry improvements has been developed. This work is necessary to ensure the system is the best design it can be and plans are being prepared to implement prior to, and beyond, introduction of new trains. As part of this, SPT has been working with our track fastening suppliers to identify new designs that can be implemented safely and efficiently within the

constraints of the system. Potential solutions have been identified and it is hoped that some prioritised sites will be addressed in the last quarter of 2020, with further sites being addressed through a multi-year programme delivered by internal resource. These works aim to improve ride quality and reduce whole life costs.

- Testing of the functionality of the long welded rail carrier (LWRC) was successfully completed along with manoeuvres around the yard at the Broomloan Depot. Introduction to the Subway system will be undertaken later in the year when current working restrictions allow.
- As previously reported investigations, assessments and work activity are ongoing to confirm and assure the condition and longevity of legacy electrical, telecoms and IT assets to ensure readiness for interface or integration with the new RS&CS equipment and systems. Since the last update, a tender has been issued to develop a conceptual holistic design for a phased approach to the replacement of the Traction Power Substations to address identified integration and condition issues and achieve secure and improved traction power for the future.

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 preparedness for new asset introduction, continues. The key areas of progress on this workstream are:

- The issues regarding the foundation design of the stabling shed extension being delivered under the RS&CS by the ANSTA JV as previously reported was resolved, with the minimum scope solution being taken forward. Acceptance of the full design submission is expected in July 2020, with works commencement now targeted for Autumn 2020.
- ANSTA JV continued to deliver new equipment to the Operational Control Centre in readiness for install in conjunction with snagging works on the building construction. This work is pending an indicative restart date, given some of the current COVID-19 restrictions.
- Since the last update, one of Subway's key suppliers, Wabtec confirmed they would be closing their Kilmarnock facility and would no longer be able to provide wheel and bogie maintenance to SPT. The installation of the wheel lathe therefore became an essential activity to allow SPT to cover the wheel turning aspects of this service, sooner than expected. The new lathe was installed in February 2020 and subsequent activity to complete associated track and safety works was undertaken in May 2020. Testing, commissioning and training of the operators of the wheel lathe are all currently nearing completion, which will deliver a new and historic 'in-house' capability for Subway.
- Works to construct a new siding to increase capacity for rail mounted vehicle storage were progressed to a point of site start readiness but were put on hold and a restart date is pending.
- As previously reported the new carriage wash has been installed though still requires works on the Automatic Train Inspection (ATI) equipment, which is located in close proximity on the same track to the wash, to fully complete to allow testing and commissioning to progress. ATI works had been delayed and had only just started on site as lockdown subsequently put this work on hold. Due to the 'in-line' nature of the ATI/wash with one of our operational roads, elements of this work have now restarted.

3.4 New Rolling Stock and Control Systems

All of the following activity is being delivered by the ANSTA JV and their sub-contract/supply chain:

- The Manufacturer Depot and Testing Facility at Edmiston Drive became a fully operational live third rail site in March 2020, once safe traction power connections and control protocols were agreed with SPT.
- Prior to traction power being available at the site, ANSTA JV continued with the off-line static testing programme for the three new train units stored at the site. A number of the previously identified design modifications have been completed on site, with further modifications pending review following dynamic testing results. The off-line dynamic testing commenced just prior to lockdown and is currently forecast to restart in July 2020.
- The on-going design of the signalling, telecoms and control systems of the new integrated system has continued to progress. Following previously reported delays; development of the migration installation and strategies for the various control systems has progressed but remains a challenging part of the design delivery and remains behind programme. However, design activity has and is still progressing.
- As noted in the last report, the ANSTA JV has continued factory acceptance, functional and integration testing for a number of new assets which, until the turn of the year had involved attendance of SPT staff and specialist resources. As COVID-19 restrictions began to apply, ANSTA JV and their supply chain began to limit attendance, and ANSTA JV themselves also stopped attending some supplier testing. Tests not attended by ANSTA or SPT were deemed non-critical or will be re-verified by follow up inspections when possible. The off-site testing phase is however past its peak.
- Following the commissioning of the CCTV system installed at SPT's 131 SVS office, Seaward Street facility and in the bus stations as reported in the last update, removal of the old system at these locations had commenced but was put on hold. Restart plans are still to be confirmed in conjunction with the re-forecasting for the replacement of the Subway CCTV and access systems.
- SPT continues to challenge and monitor the evidence provided by ANSTA JV to demonstrate the safety argument required under SPT's Safety Verification (SV) Scheme. The SV team regular review cycle has continued throughout and progress has been made in line with the on-going design development. A number of planned workshops and review meetings, requiring multiple attendees, were however placed on hold as a result of COVID-19, and are pending re-scheduling.

3.5 Manufacturing & Supply Agreement (MSA)

As reported in the last update, progress on the ANSTA JV delivery of the Manufacturing & Supply Agreement contract has been subject to a number of delays on a number of issues and a re-baseline of the programme was being requested by ANSTA JV.

ANSTA JV issued their re-baseline proposal to SPT in February 2020. Following detailed analysis and challenge by SPT and our specialist consultant support, there were quality and logic issues flagged that were critical to the confidence in the submission and understanding, reasoning and justification behind projections. The submission did however confirm the broad extent of the previously reported slippage to key dates, against the original contract dates. The current programme update is being

used as the 'working programme' for monitoring and reporting and agreement around any new, forward looking, contract dates remain to be agreed.

ANSTA JV has also been pursuing a number of claims that are linked to their views on the overall programme delay. 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. ANSTA JV may however continue to pursue these in the future. These issues have been and continue to be subject to focussed and regular discussion at board level between the organisations.

ANSTA JV has however proposed a part mitigation to their reported delays, which considers a significant change to the approach to migrate from existing to new rolling stock fleet. Their proposal would introduce the new fleet to service in a modified mode using the existing signalling and control systems to replicate our current automatic train operation, in advance of the new control and signalling systems going live. This will recover some of their delay to the introduction of new rolling stock into passenger service, but would not shorten the overall project timeline to achieve full Unattended Train Operation. The proposal was tabled in outline in February 2020 and following further definition, SPT continues to critically review to confirm whether this is a safe and technically feasible proposal that does not increase or import unreasonable risk to SPT. There is a target of agreeing whether this mitigation is to be fully adopted by late June/early July 2020. This proposal would likely have an impact on the contract and would require changes to key dates and commercial arrangements. The on-going challenge involving both technical and contract specialists however requires to be completed to confirm the SPT position.

The contractual delay position has also been further impacted and complicated by COVID-19. The pandemic effectively led initially to a total stop on all physical MSA activity and like all organisations, affected ANSTA JV's ability to perform effectively. ANSTA JV submitted a 'Force Majeure' claim under the MSA contract in March 2020 and has routinely followed this up with further claims evidence and 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 is not yet 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.

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.

3.6 Technical Support and Spares Supply Agreement (TSSSA)

The delays to the MSA delivery limits progress on Technical Support and Spares Supply Agreement contract activity therefore there has been no significant TSSSA progress by ANSTA JV in the last six months.

Also due to the COVID-19 working restrictions, a planned site visit to Mersey Rail Liverpool store (managed by one ANSTA JV partner, Stadler) was put on hold.

The TSSSA contract programme and commercial forecasting is currently under review in order to align with the current MSA programme and any delay mitigations agreed. Until resolved there has been an agreement that the payment schedule will be adjusted to account for the low activity now expected in the year to come.

Progress of the MSA and interaction with the TSSSA contract programme remains closely monitored, and therefore the TSSSA programme will be fully reviewed in due course.

3.7 Organisational Change and Employee Relations (including operational readiness)

The Subway Modernisation operational readiness plans are aligned to the key Configuration Points (significant changes to the current operation) and progress, risks and issues are actively managed to ensure appropriate prioritisation and to protect continuity of revenue service. The following is key progress and activity since the last update:

- The operational readiness focused Transformation Team set up in December 2019 has consolidated activities to date and re-assessed the priority actions required on the people and process change requirements across the Subway. The team structure and remit was presented to the Operations Committee in February 2020. The team is currently building a detailed programme of activity required in advance of the start of train testing in the tunnel system (Configuration Point 1). The team has also worked with sponsors and stakeholders to progress a number of readiness activities since the last update.
- Engagement with the Office of Road and Rail (ORR) has continued on a regular basis. SPT has now held two knowledge share sessions with the ORR to better familiarise ORR staff with the technology and systems being introduced to Subway to assist with ORR preparedness to review our eventual revised authorisation and certification submissions. Further sessions are expected over the next year. The specific bi-annual ORR update on modernisation and transformation progress was also held.
- Site visits and liaison meetings have also been held throughout the last six months with the Department for Transport, Transec, British Transport Police and the Fire Service to provide on-going familiarisation and awareness of the new and modified operational facilities and new train units.
- Work to review and revise the Subway operational rule book, regulations and process and procedure has progressed, with a focus on the safe operational procedures that are required to control new train testing and fleet introduction. The Rail Safety and Standards Board (RSSB) is undertaking this specialist work for SPT and has completed a number of new Operational Procedures modules, for SPT review and acceptance.
- Works to assess and mitigate the legacy condition risk of existing assets to acknowledge the slippage in the project delivery timeline is also on-going, with assessments and activity now live for the fleet and all critical control systems.
- The secondment of two maintenance personnel to the ANSTA JV to develop a working knowledge of the new fleet continues but has been impacted due to site works going on hold. Discussions are on-going with the Joint Venture to achieve similar maintenance staff secondment or early access opportunities for the control and signalling systems.
- Secondments for SPT drivers to support the Joint Venture's train testing and commissioning process are also being sought and taken forward (early discussions with staff have been positive). This will allow us to improve on our experience and knowledge of the new fleet to help our trainers better develop and roll out training to the wider driving staff pool. The ability to arrange secondments from our current pool of driving staff has been made possible from the activity undertaken and reported previously, to develop flexibility and capability throughout the operational staff, by becoming proficient in more than one skill set. Eight more drivers have also been recruited to support the expected resource demands from mainline train testing. These drivers are

currently being trained to drive the existing fleet, which will enable them to have the pre-requisite experience of driving in the system, prior to new fleet testing.

- Work is on-going to look at the future staffing needs and structures required to run the new 'digital' railway'. A consultant led predictive workload study has been undertaken to inform future operational roles and structure ahead of migrating to the new Operational Control Centre. This has been undertaken with involvement and consultation with Control Room and Operational staff. The plan to ensure multi-skilling with the operational team continues with a focus on the plan to build flexible resource bases within Control and Driver functions. This is to ensure resilience through migration phases and capacity to run day to day services whilst training staff and building confidence in new systems.
- Employee engagement across Subway continues. With the installation of new depot equipment, including the newly commissioned wheel lathe, the arrival of physical equipment within the depot has allowed our maintenance staff visibility and opportunities to learn about the new equipment, prior to handover to SPT. As the ANSTA JV is preparing for train testing, plans are on-going to provide familiarisation access during this phase. The first versions of the train and control simulators have also been presented to operational staff, with some staff being involved in the testing and trialling with the manufacturer, which has helped ensure our staff system knowledge is incorporated into the design. Modernisation continues to be visible on a daily basis to staff. Following the station refurbishment, works to install new signalling and control equipment in stations is now underway, which requires our staff to interact and work alongside the Joint Venture staff. Works are also underway in the depot to install new cabling and the new carriage wash, which has allowed the staff first hand opportunities to see modernisation in progress.
- Trade Union and Safety representatives continue to be regularly briefed on progress as part of our standing local Information and Consultation of Employees (ICE) meetings and Safety Committee.
- Subway Maintenance continues to develop and maintain the current competencies of maintenance staff with a robust plan in place based on improved record-keeping. A systematic review of the competence assessments is on-going, aligning safety critical tasks to National Occupational Standards (NOS). This alignment will make the transition from the current systems to the new technologies a smoother process. Further external funding was also gained through the Flexible Work Force Development Fund (FWDF) which has provided base electrical skills training, used for introductory up-skilling and broadening basic skills for mechanically-biased technicians. The FWDF also enabled over 20 individuals across Subway maintenance and engineering to update their electrical knowledge of current regulations. The maintenance apprentices are now in their second year and continue with their academic and training qualifications. A structured placement programme has also been put in place to ensure all five gain the practical work experience required to support their qualification. The two first year mature apprentices have also progressed well in the period.

3.8 Further information

3.9.1 Secure Communications Network

As previously reported, Subway currently uses the Home Office Airwave (Motorola) secure radio communications network for all operational communications to facilitate internal staff and emergency services communications within the system. The Home Office Emergency Services

Network (ESN) programme continues to be developed to replace Airwave but their overall programme is in delay. Due to these published delays to the ESN programme, Subway has extended the current Airwave contract, which expired in December 2019, to align with the ESN switch over programme. Given the age and condition of the existing assets for which the contract extension was agreed, capital investment was identified to replace some of the end of life equipment to ensure a continued service could be provided over the term of the contract. Earlier this year, the Partnership approved the award of this long term extension and upgrade works and arrangements are being put in place for their completion. Options for a future communication system after the end of Airwave are currently being assessed and a transition strategy is being developed.

3.9.2 Existing rolling stock

As noted in the last update, given the delays in delivering the MSA, there is a need to ensure existing fleet condition and reliability is assured for some time yet. A dedicated project has been set-up to identify and deliver options in maintaining and assuring the condition and reliability of the existing operational rolling stock. The project has identified the highest areas of risk and produced a prioritised programme of work into a Life Extension work stream. Project planning and pre-enablement work has been progressed during the COVID-19 restrictions and fleet activity is on course to commence in early July. Further work will be conducted towards the end of the year to enable improved monitoring of fleet performance, the effectiveness of planned improvements and to identify any areas of future concern for remaining service life.

3.9 Programme budget

Within the overall Subway Modernisation budget of £288.7m, the 2020/21 budget was set at £37.917m at the Partnership meeting of 6 March 2020. As noted in section 3.4, COVID-19 has had an impact on project delivery in 2020/21 which will consequently have an impact on milestone payments in the year. The potential financial impact is under review and it is anticipated that a budget amendment will be brought to a future committee.

To the end of financial year 2019/20, £168.7m 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 only.

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 COVID19 has had, and continues to, have an impact on progress, as summarised below:

- Station refurbishment works are now successfully complete;
- Installation of new control and signalling cableways and equipment has progressed;
- Progress on infrastructure has continued with a focus on tunnel and track improvements and electrical and control system resilience activity required prior to the start of new fleet mainline testing;

- Designs for further depot improvements have progressed and the installation of a key piece of new depot equipment, the wheel lathe, was completed although majority of site works have been impacted by being 'on hold' for a number of months;
- With traction power going live on the manufacturer depot site, in conjunction with on-going static testing, off-line dynamic testing of the three new train units commenced just before lockdown;
- On-going progress has been made with the signalling and control systems designs and factory inspections and testing. Site installation works have been impacted by COVID-19;
- Continued progress on operational readiness activity and 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 authorisation and certification of the modernised system, including further liaison with the ORR;
- Following previously reported delays to the key delivery milestones under the MSA contract, discussion and negotiation to agree a new forward looking set of dates with the ANSTA JV remains on-going. A part mitigation to delays to the new fleet entering passenger services has been tabled by ANSTA JV and this is currently under SPT challenge and consideration; 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 December 2019;
- The significant impacts of the COVID-19 pandemic on modernisation activity, with effectively all site works going on hold with re-start and recovery plans still being defined in some areas;
- The action taken to maintain design and preparatory works progress via remote and home working measures;
- Confirmation of previously reported delays 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 review and challenge of the ANSTA JV MSA delay mitigation proposal for an alternative migration plan for new fleet introduction into passenger service;
- Operational impacts of the reported delays continue to be assessed and mitigation plans are underway, including existing fleet maintenance and reliability programmes; and
- The programme remains within overall budget and funding.

6. Consequences

Policy consequences	<i>The Subway Modernisation is a key objective of the Regional Transport Strategy.</i>
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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