



Subway Modernisation - progress update

Date of meeting 22 June 2018

Date of report 7 June 2018

Report by Senior Director

1. Object of report

To provide to the Partnership a 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 business case for this investment was approved by the Scottish Government in 2012, with an overall aim, once complete, of increasing passenger numbers and usage of the subway whilst at the same time reducing whole life costs. The programme was scoped for delivery under five principle workstreams, namely:

- Stations and accessibility improvements;
- New Ticketing System;
- Renewal and Upgrade of Existing Infrastructure;
- New Rolling Stock, Signalling and Automated Control Systems; and
- Organisational Change and Employee Relations.

As part of the internal governance of the modernisation programme, a formal update is provided to the Partnership board every six months in addition to the day-to-day operations performance which is reported to the Operations Committee and financial performance to the Strategy and Programmes Committee.

This report provides an update on the key areas of progress since the last written report to the Partnership board in December 2017 which was supported by a short presentation on the background to the existing Subway operation and an overview of the modernisation programme.

3. Progress to date

3.1 Stations and accessibility

Members are asked to note that 11 out of a total of 15 stations have now been refurbished, including; Hillhead, Partick, Ibrox, Kelvinhall, St Enoch, Buchanan Street, Govan (including the Bus Interchange), Cessnock, Kelvinbridge, Shields Road, and Bridge Street.

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

- Shields Road and Bridge Street station refurbishment contracts have been completed on programme and on budget;
- The design for the final four stations to be refurbished (St Georges Cross, Cowcaddens, Kinning Park and West Street) has been completed by AHR Architects. The architects have interfaced with the new Rolling Stock & Control Systems (RS&CS) contractor to capture any (RS&CS) requirements within the final designs. Contract documents are currently in preparation for tender during the summer in order to appoint a delivery contractor for works in late 2018; and
- Prior to the refurbishment works at St Georges Cross, investigation and methodology trials have been undertaken to allow water sealing works in passenger areas (passageway concourse and fire escape) and platform level to be completed over winter 2017/18. The works were undertaken by MacKenzie Construction.

3.2 Ticketing

SPT continues to develop smart ticketing and work with partners to develop a fully integrated system for the benefit of passengers.

- The Subway Smartcard continues to be a popular choice for customers with more than 161,000 cards in use and more than £4.2m of Subway Pay As You Go credit purchased on smartcards in 2017/18;
- Passengers can now load Tripper multi-operator bus tickets onto a Subway Smartcard as well as ScotRail smart tickets;
- Online sales have more than doubled in 2017/18. More than a quarter of all annual and six-month Subway season tickets are now purchased online;
- Working with Nevis Technologies, SPT's joint venture with Rambus, we are testing the Subway SmartApp, an Android app which emulates a plastic smartcard, the first application of its type to be used in Scotland; and
- Nevis Technologies has also provided services to ScotRail, McGill's, Glasgow SmartZone (Tripper card), Edinburgh SmartZone and Lothian Buses, highlighting the position of SPT and Nevis at the cutting edge of smart and integrated ticketing in Scotland.

3.3 Infrastructure

Works have continued on the infrastructure workstream with a focus to complete the key activities and major works prior to the arrival of the new trains for testing on the system. Key progress made since last update is as follows:

- As previously advised, the Tunnel Lining Improvement project being delivered by Freyssinet, completed the initial contract scope in Autumn 2017 and other areas identified in need of priority remediation were completed by February 2018. The contract was fully closed out by the end of the 2017/18 financial year.
- The on-going work with Colas to close out defects in the Ramps & Turnouts following the renewal works in that area have progressed well and are expected to complete by Autumn 2018. It has been necessary

to replace a proportion of the rail blocks as part of this activity, which has proved beneficial to prove and test the integrity and maintainability of the installed system.

Our internal infrastructure team continues to progress and close out improvement activities within the system:

- The baseplates renewal programme is now complete. Re-railing works continue at various locations throughout the system to address material degradation and corrosion.
- Manufacture of a new rail delivery plant (long welded rail) to facilitate and accelerate rail replacement has completed and was delivered to site in April 2018. Testing and commissioning, prior to full use is planned over the summer.
- A strategic condition survey has completed within Broomloan yard to determine priorities for asset maintenance and improvement for the coming year.

3.4 Broomloan depot facilities

To enable and accommodate the expected changes planned by the rolling stock and control systems contract, the existing facilities at Broomloan have been assessed to ensure integrity, reliability and longevity. The key areas of progress on this workstream are:

- As previously reported, the Stabling Shed roof has not been accessible in recent years due to its poor condition, but structural and water ingress issues were evident. The second phase of small scale remedial works has now been completed, which sought to address brickwork condition and improve drainage at the west wall. The main works tender has also been completed and approval has been given to award the contract to Clarks Contracts Ltd. The works are due to start in Autumn 2018 and will consist of major structural repairs, strengthening works and a full roof replacement. These replacement works will also provide safe maintenance access. These works will be undertaken whilst keeping the building in use and a period of detailed planning is now being undertaken to ensure construction safety and that temporary train stabling and electrical isolation arrangements are fully prepared for and managed.
- The contract awarded to Edmiston Brown in June 2017, to replace the life expired Main Electrical Distribution Board at Broomloan Depot was completed by February 2018. This replacement now provides the functionality required to operate the Depot once new Rolling Stock and Control Systems are in operation. During this work, there was also an issue with a main feeder cable to the rail shed was identified and the contract was varied to also replace this critical asset.
- Work to replace the old brick Gatehouse at Broomloan Depot with a pre-fabricated building which provides both a good working environment, welfare facilities and reception for visitors is now complete. These works were completed by Portakabin and Luddon construction with the functionality of the Depot security access being maintained throughout the works.
- A new training and development area for Engineering & Maintenance staff has been built in the depot workshop. This is a dedicated

classroom and practical training area to support the new skills development of the maintenance staff as we introduce the new fleet and signalling/control system technology.

3.5 New Rolling Stock and Control Systems

Delivery of the new rolling stock and control system continues to progress, despite ANSTA JV forecasts not being met as planned. This has been escalated to the ANSTA executive board. Discussion and agreement is on-going with ANSTA to assess and agree revised forecasting in their programme as it is now clear they are unable to recover the slippage experienced to date through the various design phases. A draft revision has indicated that there may be up to 12 months' impact to some key milestones, though there is potential that there may be some recovery, but this will not be known until evidenced through performance on preceding activities. The decision to agree to a reforecasting has been taken to ensure that there is a realistic and achievable plan to accurately monitor progress as the project moves into the manufacturing and construction stages. The update in the following sections identifies the areas of delivery where the main programme challenges and impacts have been experienced.

To remind members, the MSA Integrated System includes the delivery of:

- 17 train sets (vehicles);
- Integrated Control System (Signalling and Telecoms);
- New Operational Control Centre (OCC);
- Platform Screen Doors (PSD);
- Part automated depot (stabling and dispatch);
- New Depot Equipment; and
- Temporary Manufacturing Depot and Test Track.

Members of the ANSTA team remain co-located with the SPT project management team at the Broomloan Depot office. The JV is currently growing their construction team again after a number of the UK resources previously appointed, left their business at the turn of the year. There was also a need to increase design resource during the period. Assigning and maintaining resource on the project has been a challenge for ANSTA, however they have now re-assessed their resourcing strategy and delivery performance is improving.

As recorded during the last update, final design of the vehicles was scheduled for completion in December 2017; however, the design submission made by ANSTA was deemed insufficient by SPT's Client Technical Advisor and the Independent Competent Person. While the technical design of the vehicle had progressed significantly, there were gaps in the safety argument required to justify that design risk had been managed to a level 'As Low As Reasonably Practicable' (ALARP), as required under SPT's Safety Verification Scheme and in line with Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) requirements. This has resulted in significant delay to the completion of final design.

The delay to final design, and a short term material supply issue, resulted in slippage to the '1st Train Car-body Welded' milestone from 2017/18 into 2018/19. This weld activity was completed and witnessed in May 2018, though at ANSTA JV risk, as it was in advance of final design close out. SPT continues to work closely with ANSTA to ensure the acceptance of final design can be attained as

quickly as possible and risk to the vehicle manufacturing schedule is mitigated as far as possible.

Design of the signalling and telecoms systems is now progressing well, having required additional challenge and direction from SPT for a significant period of time. The detailed design sign-off for both systems were attained successfully in the last two months, with the progression through to final design expected in line with the latest schedule dates in 2018.

The development of the installation drawings for the Integrated System is also now progressing, with continued collaborative working between ANSTA and SPT's project teams delivering the new rolling stock and control systems and buildings and station refurbishment. This approach has been adopted to ensure efficiencies continue to be attained, particularly in the refurbishment of the remaining stations.

Detailed design for the new OCC was completed in the first quarter of 2018, as predicted in the last update. Following a longer than anticipated procurement process for the key sub-contractor, on-site preparation for the construction of the new OCC commenced in May 2018. Awarded by ANSTA to Graham Construction as a design & build contract, the final contractor design will be progressed in the coming months, with construction of the OCC scheduled for completion by Summer 2019.

As reported previously, the design of the Manufacturing Depot and Test Track continues to be the most difficult Manufacturing and Supply Agreement (MSA) deliverable to progress; with further ground investigations at Edmiston Drive identifying shallow mine workings, methane gas pockets and solvent contaminants resulting in ANSTA taking time to consider the new survey information and re-assess their design and works methodology proposals for this area. All ground investigations are now complete and the design of the Manufacturing Depot is progressing, however the significant delay to the design has had a consequential delay in the appointment of a 'design and build' sub-contractor by ANSTA. Story Rail has now been appointed (currently on a phased basis) as the key sub-contractor for this work. The first phase of their appointment is for ground re-profiling and bulk excavation of the site commenced in May 2018 with the second phase award for the new installation works expected imminently. The SPT project team continues to have a key focus on this scope element due to it being on the programme critical path, as access to the site and its test facility is required prior to the delivery of the first train.

To deliver the full automated system, the original MSA concept design was to reconfigure the yard layout to allow segregation of automated and manual train movements within the yard. Extension of the existing stabling shed over existing tracks was also proposed. Hazard analysis for construction and future operation has been undertaken since the last update, with a focus on reducing the construction and operational risks inherent in the original proposals. This has resulted in significant changes to the proposed design. Despite having taken some time to reach agreement, the designs for the yard and stabling shed are now progressing towards detailed design, with a lesser risk and impact to yard day to day operations.

Changes required to the maintenance workshop in preparation for the delivery of key elements of the depot equipment (including wheel lathe and lifting jacks) are being managed through direct collaboration with the Subway engineering and maintenance teams. The reconfigured workshop designs consider the requirements for maintenance to be performed on both old and new vehicles.

Detail designs are progressing to allow ANSTA to procure a work sub-contractor by Autumn 2018. This should allow the building works to be completed in time for the installation of depot equipment, starting with the lifting jacks in early 2019. This element of delivery has progressed well since the last update. The delivery and installation of the wheel lathe is being managed particularly closely by the project team, as this will allow SPT to perform train wheel maintenance in-house, which could result in a considerable operational cost saving when it becomes available.

The design of the depot equipment being installed in the yard (carriage wash and automatic train inspection) is also progressing, with both targeting final design approval by Autumn 2018.

Another aspect of the delivery that has proved to be challenging is the design of the Platform Screen Doors (PSD), due to this aspect of the scope requiring information inputs from other parts of the system design, most significantly the new vehicle design, which as noted has been in delay. ANSTA has provided assurance that the required information is now available and that the design will progress significantly over the summer. Whilst this did not deliver against original forecasts, this is not seen as a significant issue by the project team at this stage, as PSD are not on the programme critical path, as it is one of the last modernisation activities to be undertaken.

Good progress has also been made on the replacement of the CCTV system across the SPT estate. The installation of the new fully digital CCTV system in Bus Facilities and corporate locations (which includes 131 St Vincent St offices and the Seaward St facility) is nearing completion, with handover to SPT expected towards in Autumn 2018. The bus operation and facilities teams continue to be directly involved in every decision made, more lately in the specification of training and migration requirements to move to the new system. The detailed design for the Subway CCTV and security systems has been completed and is now progressing into final design.

The Technical Support and Spares Supply Agreement (TSSSA) contract with the ANSTA JV also continues to progress. The TSSSA team continue to provide expert support to the SPT team and have undertaken a 'deep dive' review of our stores and material management arrangements, providing recommendations for improvements against their TSSSA 'best practice' processes found in other Stadler maintenance facilities as we prepare for an amalgamated stores incorporating spares and material for the new RS&CS under the TSSSA contract in late 2018. Work progresses with 'Phase 2' of the asset management system development (Infor EAM), focussing on the interface between SPT Infor system and the TSSSA Stadler Infor procurement systems for TSSSA material management and warranty management workflows. A review of Stadler TSSSA Quality Management System ISO9001:2015 approach and how this interfaces with the SPT Quality Management System has been completed. SPT maintenance and operations teams have now met with ANSTA JV training delivery teams to review training plans and prerequisite training course qualifications to help inform immediate staff learning and development plans. SPT has been in discussions with the Trade Union representatives about TSSSA contract preparations including opportunities to involve our maintenance staff in early technical support secondments and to collaborate with the TSSSA to deliver this partnership to our best advantage. This will require some variation to the TSSSA contract which are under discussion and commercial/contractual review.

3.6 Organisational Change and Employee Relations (including operational readiness)

As previously advised, a key part of our modernisation programme is ensuring operational readiness. Plans are being continually developed and implemented for all internal Operations and Engineering & Maintenance activities required to prepare teams to operate and maintain our new assets safely. As key activity since the last update was the commencement of a full review of our business Safety and Quality Management Systems (SMS/QMS) to ensure our working procedures are capable of supporting future operation. As part of this activity, in March 2018 SPT achieved ISO9001:2015 accreditation with British Standards Institute as part of this QMS improvement work.

Open dialogue with staff across all areas of the subway to keep them informed as key work progresses is ongoing and will continue to be over the programme duration. Engineering and maintenance staff workshops are planned for late June/early July and staff have now had two rounds of 1-2-1 meetings with Supervisors/Managers supported by HR to formulate learning and development plans. Progress updates are given at regular ICE meetings and through staff briefings about changes in the depot workplace or opportunities arising for training/development or new roles aligned with modernisation delivery. Job role descriptions are currently being drafted for future maintenance roles aligned with ANSTA JV recommendations, these will then form part of early consultation discussions with Trade Union representatives from Autumn 2018.

The Modern and Mature (Adult) apprenticeship schemes launched in January 2018 are progressing well with good feedback from the apprentices on the programme. They are enjoying the experience of both academic learning at college and shadowing the 'skilled' maintenance teams on site. Meetings have been held with West of Scotland College to review the curriculum for our apprenticeship programme and to align this with the requirements emerging from the RS&CS prerequisite training plan skills/qualification requirements to ensure our apprentices have a route from their college qualifications to new maintenance Technician job roles in the future. A fifth apprentice will join us in summer 2018 to stagger our intake.

Engagement with the Office of Road and Rail (ORR) has continued on a regular basis. The key activity since the last update was progressing the application for renewal of our Safety Certification and Safety Authorisation to operate Subway. This was submitted to the ORR and to all affected parties in April 2018 and is now under review by the ORR. Our current certification expires in August 2018. No issues are expected on the submission as it is a recertification for the current operation.

3.7 Further information

As Partnership Board members will be aware, the ANSTA JV comprise of two organisations (Ansaldo and Stadler) that have their design and production facilities in mainland Europe (including Switzerland, France and Italy). The JV supply chain is predominantly European, but some suppliers are located worldwide.

Since the last update, SPT project, operations and engineering staff, in conjunction with the Client Technical Advisor, have attended a number of design, manufacturing and site visits to aid the project delivery across the following UK and international locations: Lewes (UK), Rome (Italy), Altenrhein (Switzerland), Genoa (Italy) and Les Ulis (France).

This is essential for the progression of the project sign off processes, with the additional benefit of helping our teams gaining first hand early knowledge of the new system particulars, prior to introduction in Glasgow.

3.8 Programme budget

Within the overall £288.7m budget, the 2017/18 budget for subway modernisation was set at £61.65m. The outturn position (subject to final audit) of £22.8m reflects the updates in sections 3.1 and 3.5 of the report, with significant financial slippage experienced in the New Rolling Stock and Control Systems workstream. This expenditure will be funded by £19.3m ring-fenced contribution from the Scottish Government and £3.5m contribution from general capital.

The 2018/19 budget for subway modernisation of £52.9m included an anticipated level of slippage from 2017/18 albeit the final outturn was lower than forecast. The 2018/19 budget will be reviewed in conjunction with the ANSTA JV programme revision noted in section 3.5. Scottish Government ring-fenced funding for 2017/18 and 2018/19 have been received in full and therefore no funding issues in relation to the programme revision are anticipated.

Overall, the subway modernisation capital programme remains within the approved budget of £288.7m and available funding.

In addition, the final budget for Subway Infrastructure for 2017/18 was set at £4.8m with the final outturn (subject to final audit) of £5.1m. The increased expenditure was as a result of greater than anticipated delivery of re-railing activity in the last quarter of the year.

4. Conclusions

- good progress continues to be made across a number of workstreams, though delivery for the New Rolling Stock and Control Systems has required a re-baselining to ensure risk to the overall modernisation timeline for completion is mitigated as far as possible and budget forecasting is accurate. The forecast overall spend still remains within the budget allocation
- the station refurbishment works continue to progress with works now completed at 11 of the 15 stations and design for the remaining four stations completed and tender preparation is underway
- the uptake and usage of smart ticketing continues to grow with online sales exceeding expectations
- progress on the infrastructure workstreams continues as planned with tunnel lining improvements and baseplate renewals activity now complete
- improvements at Broomloan Depot continue with works to replace the gatehouse building and main electrical distribution system now complete and the contract to refurbish the stabling shed roof now awarded
- the new rolling stock and control systems contracts (MSA & TSSSA) are progressing through the detailed design phases, with initial site works and train manufacture now underway. Works delivery to date has faced some delay and challenges and the JV have re-assessed their delivery structure to improve performance, though there is now slippage to some key milestone delivery dates, that may have up to a 12-month impact in some cases

- in-house activity towards operational readiness continues and implementation of identified activity is ongoing
- 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 progress made since the last written update to the Partnership in December 2017;
- the on-going programme of design and implementation of station improvements;
- the on-going and planned expansion of customer options for smartcard;
- the completion of the tunnel lining improvement contract;
- the delivery of internal infrastructure improvements;
- the planned works to improve the stabling shed roof, and the completed works to replace the gatehouse and electrical distribution systems in Broomloan Depot in advance of major change under the new rolling stock and controls system contract;
- the current status of the new rolling stock and controls system design delivery and impacts to programme forecasting;
- the progress of the operational readiness plan;
- the activities in relation to engaging with our employees including the commencement of discussions with trade union representatives on staffing changes with engineering and maintenance;
- the engagement with the ORR;
- the programme is within overall budget and funding; and
- the necessary travel by the SPT team in support of RS&CS project delivery requirements.

6. Consequences

Policy consequences	<i>The subway modernisation is a key objective of the Regional Transport Strategy.</i>
Legal consequences	<i>None identified within this report.</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>None within this report although significant changes will be required as the operational readiness programme is developed.</i>
Equalities consequences	<i>None within this report.</i>
Risk consequences	<i>None within this report. A detailed risk register is available for individual projects and the modernisation programme as a whole.</i>

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