

Subway Modernisation - progress update

Date of meeting 15 December 2017

Date of report 27 November 2017

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 6 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 June 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 nine out of the total of fifteen stations have now been refurbished, these include; Hillhead, Partick, Ibrox, Kelvinhall, St Enoch, Buchanan Street, Govan (including the Bus Interchange), Cessnock and Kelvinbridge.

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

- Shields Road and Bridge Street station refurbishment contracts have commenced on site following the completion of Kelvinbridge station refurbishment. These have been staggered by one month to minimise impact on Subway operations. Works at Shields Road are therefore further advanced than Bridge Street with both stations operating supported by temporary ticket offices. Internal fit out and finishing works are ongoing and the works are on programme to complete by summer 2018. Both stations are being refurbished while the system remains open to passengers at all times.
- The design contract for the final four stations to be refurbished (St Georges Cross, Cowcaddens, Kinning Park and West Street) is currently progressing with AHR Architects appointed via the SPT Design and Technical Services framework. The architects are interfacing with the new Rolling Stock & Control Systems (RS&CS) contractor to capture any (RS&CS) requirements within the final designs. Design will be concluded by Summer 2018, followed by tender process to procure the delivery contractor for works in late 2018.
- Prior to the refurbishment works at St Georges Cross, there has been a requirement to investigate and consider options to address the significant groundwater ingress issue at this station. Mackenzie Construction was appointed in October 2017 following a mini tender and has undertaken water sealing works in passenger areas (passageway concourse and fire escape). In addition, trials have been carried out at platform level to identify the source of the water ingress and test methods to provide a water seal. Trials are due to conclude by the end of the year and a plan for implementing the successful methodologies will be developed and implemented during 2018/19 in advance of the refurbishment works.
- A new training and development area for Operations staff has been completed within the first floor office space above Govan Subway Station. This is a purpose built replacement for 'Station 16' ticketing system training facility which was previously housed within the Broomloan Workshop building.

3.2 Ticketing

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

Working with Nevis Technologies, SPT's joint venture with Rambus, we are now looking to further develop ticketing options using mobile phone technology to deliver secure mobile ticketing using Android smart phones across all mobile networks so that travellers can securely select, purchase, download and use their mobile device to tap through the gates on the Subway. It is our aim to launch this new technology in early 2018.

In the last year, we have achieved an integrated ticketing option for those who travel by both Subway and rail as users now have the option of adding both operator's tickets to either their Subway or ScotRail Smartcard.

Since the introduction of our "online top-up" facility, which offers Smartcard users the option of topping up their card value or buying season tickets online, the number of online sales continues to grow month-on-month.

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:

- The Tunnel Lining Improvement project completed the initial contract scope in Autumn 2017, as previously advised. The initial scope was focussed on the high priority areas of the Subway system and in all, has substantially improved the structural integrity of ten of the tunnel sections via a programme of annulus grouting, repairs to the tunnel lining and improved management of water ingress. During the contracted works, other areas in need of priority remediation were identified and additional budget agreement was sought to undertake these works whilst the expertise of Freyssinet was still mobilised, and acknowledging the future constraint to tunnel access due to new train testing. This additional repair work is expected to conclude by the end of this financial year. Members are also requested to note that the project received a Commendation at the Saltire Civil Engineering Awards for Infrastructure Innovation in October this year.
- The Ramps & Turnouts Renewal works were delivered during the Subway Suspension last year. As previously reported, following the return to service, some non-service affecting defects have arisen. The resolution plan for these defects has been more complex than originally envisaged and remain on-going with the contractor, Colas.
- Our internal infrastructure team continues to make significant progress on major improvement activities within the system. A total of 11.2km of rail baseplates have been replaced in the last year, resulting in 85% of the baseplate renewal programme being complete. The remaining baseplate renewals will be completed in early 2018. Re-railing works continue at various locations throughout the system to address material degradation and corrosion. By the end of year, it is expected that new rail totalling 2.3 km in length will have been installed in the system. Procurement of new rail delivery plant (long welded rail) to facilitate and accelerate rail replacement has progressed. A working prototype has been developed and operational instructions and risk assessments have been undertaken to support implementation. Delivery is expected in Spring 2018.

3.4 Broomloan depot facilities

As highlighted previously, 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:

- The Stabling Shed roof has not been accessible in recent years due to its poor condition, but structural and water ingress issues were evident. A design contract was awarded to Austin Smith Lord to assess options for repair or replacement of the roof. As part of their investigation and option appraisal, surveys revealed historic structural problems with the building (dating back to the last modernisation) which require structural repairs and improvements to be made to the walls and roof supports before any roof works can be undertaken. Following the first phase of the structural repairs at the north gable end of the building, a further phase of works to west wall has now commenced and is expected to conclude in spring 2018. The final design for the replacement roof has concluded. A

contract to deliver the remaining structural repairs, strengthening works and roof replacement is currently being developed, and will go out to tender in early 2018. The replacement works will also ensure safe access is provided for future maintenance.

- The Main Electrical Distribution Board at Broomloan Depot is life expired and not in line with current standards and also does not have the functionality required to operate the Depot once new Rolling Stock and Control Systems are in operation. After a period of investigation and scoping, a contract was awarded in April 2017 to Edmiston Brown to undertake the design and installation of the required electrical equipment replacement. Works commenced on site this summer and have been carefully managed given the criticality of the electrical systems to depot day to day operations. Works are expected to conclude in early 2018.
- The Gatehouse at Broomloan Depot is no longer fit for purpose. The building is too small to provide both a good working environment, welfare facilities and reception for visitors. Tender designs have been developed to replace the facility with a pre-fabricated building unit meeting the operational needs and modern standards. Contract documentation for tender is being prepared for issue with a target of completing the works before the end of Spring 2018.

3.5 New Rolling Stock and Control Systems

Progress continues on the Manufacturing and Supply Agreement (MSA) contract for the new rolling stock and control systems being delivered by the Ansaldo-Stadler (ANSTA) joint venture (JV). To remind members, the contract, in summary, will deliver:

- 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.

During the period since the last update, the JV has continued to grow and mobilise its delivery teams with a number of key resources co-located with the SPT project management team at the Broomloan Depot office.

Progress on the vehicle designs have continued apace, with the detailed design gateway being achieved in October 2017, and final design approval targeted for December 2017. This is a challenging target and SPT is working closely with ANSTA to achieve this as this is the approval gateway required to allow vehicle fabrication to commence.

The virtual reality (VR) mock-up for the train designs has also undergone further development, in line with the vehicle design development. Whilst the main purpose of the VR mock-up is to aid design development, it is continuing to be used to assist with familiarisation of the upcoming fleet for staff engagement and consultation exercises. It is also used regularly as part of the wider modernisation communication plan for external stakeholders and interested third parties.

Design development of the signalling and telecoms systems has progressed, although this has proven to be a challenging part of the project delivery since the last update. ANSTA has now appointed their key suppliers for this part of the scope and the suppliers are engaged in the on-going detailed design. Close out of detailed design is forecast by Spring 2018, which will allow the final design phase and installation programme to commence as planned, later in 2018.

Design development of the new OCC has also progressed well and the detailed design phase is expected to close out in early 2018. ANSTA have progressed their procurement of their civils subcontractor for the new building. It is anticipated that construction on site will closely follow on from the completion of detailed design.

PSD design development has progressed but has been slowed down due to outstanding information and outputs from other parts of the JV system design. This element is however not on the critical path as it is the last aspect of the system upgrade to be installed.

During the concept design development for the yard automation, the construction complexity and impact on day to day yard movements and Subway operations was assessed and challenged. Given the risks posed and robustness of proposed mitigations, an alternative, lower impact, design has been proposed. The revised concept design is currently under review and is anticipated to be approved and progressed to the detailed design early 2018.

Progress on the Depot Equipment elements of the contract delivery (inc. new carriage wash and wheel lathe) has been good with strong engagement and collaboration with the SPT maintenance teams on the required changes to the depot to allow the installation of this new equipment. The introduction of the wheel lathe will allow SPT to undertake wheel maintenance in-house. This is currently a contracted service that requires SPT to transport the wheel sets off site. Development of these designs is on track for site implementation towards the end of 2018.

The most challenging part of MSA delivery since the last update is the development of SPT's Edmiston Drive site to become the manufacturer's temporary depot and train testing facility. Delays have been experienced in mobilisation of site and ground investigation activity. This site was known to have former mine workings, but the ground investigation works undertaken to date by the JV have yet to provide sufficient information to advise their site layout design and manage the risk during construction of the site. Construction on site was expected to commence in January 2018, but ground investigation surveys remain on-going. The JV is currently assessing alternative plans for developing this site, and they are hopeful that construction will commence by early Spring 2018, but this will only be known upon the conclusion of the on-going surveys. This is on the critical path for programme delivery, as this site is required to be operational in time for train delivery and testing. Discussions and challenge is on-going between SPT and ANSTA to ensure the risk to the later stages of the programme are understood and mitigated as far as possible.

Members will remember that MSA contract also includes the design and installation of the replacement CCTV across the entire SPT estate including bus facilities, corporate offices and subway (CCTV and security systems on subway). Detailed design has been completed for the initial delivery phase and installation of bus station systems will commence at the first site in December 2017. The roll out of subway systems will be managed to interface with the remaining station refurbishment works.

The Technical Support and Spares Supply Agreement (TSSSA) contract with the ANSTA JV is also progressing. The TSSSA team continue to develop a strong relationship with the MSA delivery team to ensure maintainability and lifecycle cost are considered throughout the design process. Since the last update, the TSSSA team have continued to provide expert support to the SPT team for asset management system development (Infor EAM), with significant elements of the asset management system now complete. Staff training and changes in the SPT team roles have been undertaken to support this, with the TSSSA team providing support in defining role requirements and definitions. The next stage TSSSA activities include undertaking depot capacity modelling, impact assessment on depot integration works (in conjunction with MSA construction and commissioning teams), maintenance skills gap analysis and providing training and development plans to meet the requirements of new technician job roles.

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 implemented for all internal Operations and Engineering & Maintenance activities required to prepare teams to operate and maintain our new assets safely. As part of this we are conducting a full review of our business Safety and Quality Management Systems (SMS/QMS) to ensure our working procedures are capable of supporting future operation.

We have also begun an open dialogue with staff across all areas of the subway to keep them informed as key work progresses and is completed. We have completed initial consultation with trade union representatives on the proposed staffing changes that will be necessary to deliver the new fully automated system, with the first phase focussing on the engineering and maintenance teams, who will be responsible for maintaining this new technology. This dialogue has been positive and progressive and well received by the Union representatives. Engineering and Maintenance staff have participated in information workshops and 1-2-1 meetings with the management team to establish individual's learning and development requirements. The detailed changes and revised staffing arrangements required in this area will be brought forward to a future personnel committee for approval.

As part of this overall approach and looking to the future and how our workforce will evolve during this time, the Engineering and Maintenance team have launched Modern and Mature (Adult) apprenticeship schemes offering future engineers and technicians the opportunity to develop and grow with SPT and the Subway's new way of working. We received over 80 external applications for modern apprenticeship programme for 2 vacancies. The mature apprenticeship programme is designed to offer a formal qualification route and multi-disciplinary engineering training for our existing maintenance staff in line with requirements for new Technician job roles for the new rolling stock and control system assets.

We have also proactively engaged with the Office of Road and Rail (ORR) since the last update to keep them abreast of the progress towards modernisation and unattended train operation (UTO) and also to establish their expectations and requirements for safety certification and authorisation for the modernised system and the existing system re-certification due in Spring 2018. The last engagement meeting in December 2017 went well and we acknowledged the ORR feedback in our on-going delivery planning.

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.

During the design and fabrication process across the contracted scope, there will be a number of inspection and acceptance tests at the manufacturers' local production facilities that will need to be attended and witnessed by SPT project and engineering staff and the Client Technical Advisor.

The project and contract management arrangements for the delivery of RS&CS contracts are specified within the various schedules to the MSA and TSSSA. These arrangements include two key meetings for monitoring the performance of all obligations under the contract. The two key meetings are:

- Project/Contract Review Meetings, which meet every 4 weeks, chaired by SPT Strategic Project Manager (for the MSA) and SPT Head of Engineering and Maintenance (for the TSSSA) and attended by other key SPT team members alongside the ANSTA joint venture team; and
- Project Board Meetings, which meet every 8 weeks (or more frequently if agreed, e.g. around key project milestones), chaired by SPT Senior Director and attended by SPT Director of Finance & HR, senior SPT team members and the ANSTA senior team.

The RS&CS project board meetings are normally held in Glasgow, with the ANSTA joint venture team attending to report on progress and discussion on key issues. However, at key milestones in the contract it will be necessary for the Project Board to be held at the ANSTA production locations, due to the availability on site of all JV team resources but also, and more importantly and as required by the key inspection and acceptance stages of the project. For example, the recent project board meeting (November 2017) was, at the request of ANSTA, held at their production facility in Altenrhein, Switzerland to assist in key decision making for the final design of the new trains and was attended by the Senior Director. A short presentation will be provided at the meeting on 15 December 2017 to convey the key update and information gained from this visit.

The next key inspection milestone is the welding of the first vehicle car body in February 2018 and ANSTA has invited the SPT Chief Executive and members of the senior team to visit the manufacturing facility and observe first-hand the progress on unit manufacture at this major milestone.

Given the nature and scale of the contract it will be necessary for senior attendance at further meetings (notably chairing the project board) and key inspection milestones throughout the contract delivery phase for validation of supplier progress and to ensure speed of decision-making for approvals and acceptance. These meetings will be typically in Switzerland for the new trains and France and Italy for the new signalling and control systems. It is currently expected that this will require up to seven visits in 2018/19 for one or two members of the SPT senior management team. The cost of each visit is around £500-£600 per person and the Partnership board is requested to approve these visits to for 2018/19, all of which have been provided for within the project budget.

3.8 Programme budget

Within the overall £288.7m budget, the 2017/18 budget for subway modernisation was set at £61.65m at the SPT Partnership meeting of 10 February 2017. Since setting the 2017/18 budget a more robust delivery programme for the year has been received from ANSTA. Consequently, as reported to Strategy & Programmes, payment milestones to the sum of £13.90m have moved to early 2018/19. The net outturn forecast of £47.74m will be funded by £35.0m ring-fenced contribution from the Scottish Government, £12.32m of grant release (previously received from the Scottish Government) and £0.42m contribution from general capital.

Overall, the subway modernisation capital programme remains within the approved budget and available funding.

In addition, the budget for Subway Infrastructure for 2017/18 was set at £3.85m with the funding being provided from SPT's General Capital Grant allocation. This has subsequently been increased to £4.65m to allow works to be completed as detailed in 3.3.

4. Conclusions

- overall the programme is progressing well, despite some areas of challenge, and is currently within the forecast timeline for completion and budget allocation;
- the station refurbishment works continue to progress with works now completed at nine of the fifteen stations with works on-going at Shields Road and Bridge Street stations and design on-going for the remaining four stations;
- the uptake and usage of smart ticketing continues to grow and the roll out of wider ticket access options is also moving forward;
- progress on the infrastructure workstreams continues well with tunnel lining improvements nearing completion in early 2018 and re-railing activity planned to continue beyond 2017/18;
- works to improve the stabling shed structural integrity and roof condition, modernisation of the main electrical distribution systems and replacement of the gatehouse at Broomloan have been identified and are underway;
- the new rolling stock and control systems contracts (MSA & TSSSA) are progressing through the detailed design phases, with initial site works planned to commence in early 2018. Works delivery to date has faced some delay and challenges but the JV currently have forecast no change to the key milestone delivery dates for the new trains or control systems, though risk remains for the critical path civils works; and
- in-house activity towards operational readiness is focussed and implementation of initial key activity has commenced.

5. Partnership action

The Partnership is recommended to note:

- the progress made since the last written update to the Partnership in June 2017;

- the on-going programme of design and implementation of station improvements including the on-going refurbishment works at Shields Rd and Bridge St during 2017/18;
- the on-going and planned expansion of customer options for smartcard;
- the approaching completion of the tunnel lining improvement contract;
- the on-going delivery of internal infrastructure improvements and re-railing;
- the on-going works to improve the stabling shed, 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 programme challenge in respect to the manufacturer depot;
- 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
- approve the planned overseas senior management travel 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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