ID	Category	Project Life-Cycle Stage	Situation/Description/Impact	Impact Category (Time/Cost/Quality)	Lesson Learned	What could be done differently next time / Recommendation
LL-01	1. PPM	Delivery (post OBC)	Due to the small market in ITSO expertise and the delays in commercial cycle of agreement of DoAs, the programme resource levelled technical teams to fit with forecasted DoA approval schedules. This included defining slots for TOC migration and onboarding activity. Subsequently, a decision was made to support and accelerate LSER's early onboarding activity. This resulted in an overlap in LSER onboarding and c2c migration activity, which resulted in the technical and test teams being overloaded.	Quality	Recognise that it is not always possible to quickly supplement resources in a highly technical specialist area. Therefore it is not possible to respond rapidly to changes to increase resource requirements to accommodate unplanned overlaps in programme delivery.	Recognise that teams can become inefficient when having to switch between tasks. It may be beneficial to restrict workload in crucial times.
LL-02	1. PPM	Delivery (post OBC)	In smart ticketing in general, and ITSO specifically, there is a limited market of technical specialists. Most specialists are already engaged in other client projects. This resulted in the continual shortage of technical resource.	Time	Where there is a shortage in technical resource it can be necessary to recruit consultants to fill the skill gap.	Continual shortage of technical resource means that you may have to actively recruit, via headhunting for example.
LL-03	1. PPM	Delivery (post OBC)	The SEFT programme followed industry best practice with a highly structured programme approach, and followed system engineering principles, PRINCE2 and Managing Successful Programmes. The experience was that through working with the TOCs, the assumptions that was made was that they would have similar professional approaches to project management. The experience has been that each TOC has had a different approach that uses the language of industry methodologies but does not follow the spirit or the practice. This resulted in project leadership challenges. To a ensure quality approach to project management, SEFT created a delivery template which was issued to TOCs but was not followed, resulting in a lack of formal medium, longer term planning by TOC leading to reactive rather than proactive working.	Time/Quality	Do not assume that because a methodology is quoted, that a common approach to quality and practice is adopted.	The DoAs should mandate that the TOCs should follow a clear and consistent project management approach as defined by the programme.
LL-04	1. PPM	Delivery (post OBC)	Suppliers were late in delivering their functionality, and combined with poor quality documentation meant that the technical team could not finish that stage of the project and move on to the TOC onboarding stages. This resulted in technical team members being pulled between working on the technical functionality and working with the TOCs to migrate/onboard them. This led to a loss of focus and efficiency.	Time	More thought should be given to the payment milestones in contracts with suppliers to align it with the quality deliverables, not just the delivery of the required functionality in the specification, but also the associated quality deliverables, such as design documentation.	More thought should be given to the payment milestones in contract with suppliers to align it with the quality deliverables, not just the delivery of the required functionality in the specification, but also the associated quality deliverables, such as design documentation.
LL-05	1. PPM	Delivery (post OBC)	A mandated change in document management software by ATOC resulted in some inefficiencies in team working.	Time	Bodies that mandate IT change must consider the impact of software change and ensure mitigating activities are in place.	Bodies that mandate IT change must consider the impact of software change and ensure mitigating activities are in place.
LL-06	1. PPM	Delivery (post OBC)	Awareness of detailed system functionality wasn't consistent across the CDT which meant the technical team had to directly field questions from external stakeholders regarding functionality, such as flexi seasons.	Time	Ensure there are tools and processes in place to ensure team members of the programme have appropriate understanding of technical aspects of the system and the functional capability of all devices and back office systems.	If a significant volume of external technical explanation is expected, conduct workshops to explain specific areas of functionality to management, considering the existing capability of each system component (including devices and POSTs).
LL-07	1. PPM	Delivery (post OBC)	The workload and time pressures that were placed on the technical team, meant they had less time to look at strategic plans and tended to work on what was tactically necessary to keep delivery on track and support the operational system.	Time	Provide support to technical teams to do more tactical planning and explore opportunities to increase resources to address strategic planning activity.	Provide support to technical teams to do more tactical planning and explore opportunities to increase resources to address strategic planning activity.
LL-08	1. PPM	Delivery (post OBC)	Assumptions were made around capability and capacity of TOC resources around the specialist area of delivery and testing. This resulted in unplanned activity by the SEFT team to compensate for deficiencies in TOC teams. In particular: - TOC priorities were not clear - TOC had a lack of basic travel/ticket knowledge/experience - TOC test quality was poor	Time/Quality	Before initiating a contract with a TOC to deliver within a quality programme framework, consideration must be given to ensuring TOCs have appropriately skilled staff and commit to delivering key programme processes and methodologies.	Before initiating a contract with a TOC to deliver within a quality programme framework, consideration must be given to ensuring TOCs have appropriately skilled staff and commit to delivering key programme processes and methodologies.
LL-09	1. PPM	Delivery (post OBC)	The SEFT programme was the vanguard of delivery of a large rail smart ticketing scheme, and there was no clear endorsed smart ticketing strategy. Therefore the programme had to spend much time engaging with external stakeholders in order to deliver to the agreed scope.	Time/Cost	Where the programme is a component of a wider strategy, have an appropriately skilled resource within the DfT to manage external stakeholders to allow the programme to deliver agreed scope.	Where the programme is a component of a wider strategy, have an appropriately skilled resource within the DfT to manage external stakeholders to allow the programme to deliver agreed scope.
LL-20	1. PPM	Delivery (post OBC)	TOC committed obligations and timescales were not cascaded to SEFT, which made it difficult for the SEFT team to plan for migration/onboarding/change.	Time	Ensure the franchise commitments are understood at all levels, especially in the delivery teams.	Franchise managers should develop mechanisms to share and clearly articulate committed obligations with the delivery programme at the earliest opportunity.
LL-30	1. PPM	Delivery (post OBC)	Lack of access to TOC SMEs for existing back office, Flexi-seasons and ADR design functions extended timescales and costs associated with achieving required functional requirements.	Time/Cost	It is valuable for TOCs to clearly identify stakeholders and communicate this with the programme. However TOCs must ensure access to these stakeholders and ensure they are available to support programme delivery.	Ask for the TOCs to share a stakeholder map with the programme to ensure the programme is aware of all stakeholders (current and future). Ensure TOCs grant sufficient access to key stakeholders.
LL-32	1. PPM	Delivery (post OBC)	Senior level supplier engagement was required to resolve engagement issues at a more junior level with some suppliers.	Time	Where appropriate consider engaging senior level stakeholders within suppliers to mitigate risks and address issues as they arise.	This was done very well with Worldline as there were delivery issues from the out-set. Senior level escalation should be considered as issues arise across all suppliers.

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LL-33	1. PPM	Delivery (post OBC)	The programme was re-booted due to the industry's inability to agree the shape, structure and design of the SEFT scheme. During the re-boot phase, although there was a shared vision for an ITSO scheme, the requirements for the CBO were never going to be universally shared as there were divisions within industry on this approach. This meant that the SEFT programme had to drive the build of a scheme that involved CBO and non CBO TOCs. This resulted in TOCs perceiving the programme as one that was working in isolation and providing instruction, not a programme that was working with them to deliver a shared vision. This meant that non CBO TOCs were reluctant to engage.	Time	Recognise that it will always be difficult to enforce change where there is no DfT or industry strategy. Also recognise that a programme will therefore be unable to present itself as servicing the TOCs, which is likely to lead to reluctance from TOCs to fully endorse the programme and engage effectively.	Ensure there is clear DfT strategy and that the implications of executing that strategy are understood.
LL-70	1. PPM	Delivery (post OBC)	In order to initiate a TOC onboarding project, the following prerequisites must be satisfied: 1. PID approval and TOC commitment to an implementation plan 2. TOC infrastructure design must be compliant with the industry smart ticketing standard and therefore the CBO. Due to external dependencies, the first pre-requisite was not fulfilled by both SWT and GTR, and the second was also not fulfilled by GTR. Despite this, the programme initiated and started reporting on projects for both TOCs against plans which were 'aspirational'. As the listed pre-requisites were not fulfilled by the TOCs, these plans were not followed resulting in continuous slippage.	Time	Ensure that the prerequisites for project initiation are fulfilled by the TOCs before initiating and reporting on project plans to avoid premature project initiation.	Ensure that the prerequisites for project initiation are fulfilled by the TOCs before initiating and reporting on project plans to avoid premature project initiation.
LL-11	2. Behavioural - Team Working	Delivery (post OBC)	Significant investment in team dynamics and team building over long period of time led to commitment across all workstreams in achieving the intended outcomes for key go-live events. For example, the team regularly worked above and beyond expectations.	Time/Cost/Quality	Significant investment in team dynamics and team building results in team comradery and much commitment to programme outcomes.	Ensure there is significant investment in team dynamics and team working to ensure commitment to the programme outcome.
LL-12	2. Behavioural - Team Working	Delivery (post OBC)	SEFT were effectively acting as System Integrator for a complex technology system. This requires Technical and Test teams to work closely together in order to deliver a robust and efficient programme of integration and acceptance testing. Close working between the teams through all phases of testing enabled the CBO (and CBO integration with external systems such as WebTIS and POSTs) to be delivered on time.	Time/Quality	Close cooperation between Technical and Test teams ensures effective identification and resolution of functionality oddities/bugs.	Ensure Technical and Test teams work together closely in future, using similar tools (e.g. QC). Some improvement could be achieved if the teams had been located even closer together physically and had access to collaborative open work spaces at an earlier stage of the programme.
LL-13	3. Organisational	Delivery (post OBC)	Many of the suppliers are small firms and are resource limited, in comparison to the major IT outsource service providers and system integrators.	Time/Quality	Recognise the risk of delivery through small, resource constrained suppliers, and consider appropriate mitigation strategies.	Recognise the risk of delivery through small, resource constrained suppliers, and consider appropriate mitigation strategies.
LL-14	4. Commercial	Delivery (post OBC)	Due to complexities of the landscape at the time of contract award, there was ambiguity around supplier requirements following initial implementation. It was therefore not possible to fully contract 'BAU' requirements at the point of contract award. Following implementation, this ambiguity resulted in additional resource commitments from the SEFT and supplier teams which were not budgeted for.	Cost	If the commercial risk associated with the ambiguity is to be retained by the programme it needs to be fully budgeted for.	If the commercial risk associated with the ambiguity is to be retained by the programme it needs to be fully budgeted for.
LL-15	4. Commercial	Delivery (post OBC)	Test tools were available in the 'staging' IT environment but were not available in 'live' due to budget constraints. The efficiency of testing could have been increased if both environments were available.	Time/Cost/Quality	Where there are budget constraints, it is common for one of the first areas of compromise to be in testing as it is difficult to quantify and justify the benefits of various test tools and environments required to fully satisfy complete test cycles. However, as integration problems become apparent in testing, the need to run multiple environments in parallel becomes easy to justify in terms of time, quality and delays to programme.	Ensure there is sufficient budget to support multiple testing environments at the same time. Or, extend the timescales for test to allow build and tear-down of different test environments to accommodate a full test cycle.
LL-21	4. Commercial	Delivery (post OBC)	Some TOCs have different franchise requirements which drives differing alignment to and support of programme goals, such as take-up targets as defined in the OBC.	Quality	Successful smart ticketing take-up involves multi-year and multi-franchise change that bills upon existing and future technologies. Therefore there should be a UK wide strategy and franchising should consider alignment to this as new franchises/agreements are prepared.	Ensure franchise agreements align a UK wide strategy for smart ticketing.
LL-22	4. Commercial	Delivery (post OBC)	GTR have a complete step 1 and 2 product set as part of its new franchise. AGA could only be given step 1 product sets due to the roll-out of the programme delivery constraints as defined in the RIB paper. This resulted in AGA refusing to allow GTR to launch its step 2 product sets. This could be repeated at other TOCs.	Quality	In franchise change must consider the impact to adjacent TOCs where stations are shared and ensure alignment with programme strategy.	In franchise change must consider the impact to adjacent TOCs where stations are shared and ensure alignment with programme strategy.
LL-23	4. Commercial	Delivery (post OBC)	Customer take-up, driven by TOCs, has varied widely, with CBO TOCs achieving significantly higher take-up levels then non-CBO TOCs. However, take-up overall is much less than anticipated with a slower rate of growth than was originally forecast. This impacts the achievement of OBC benefits realisation targets. During the DoA process, TOCs would not agree to either firm or high-levels of take-up necessary to achieve OBC benefits realisation targets.	Quality	Ensure that high take-up targets that align with OBC expectations are specified in new franchise agreements as it is very difficult to get TOCs to sign up to firm or high-level take-up targets.	Ensure that high take-up targets that align with OBC expectations are specified in new franchise agreements as it is very difficult to get TOCs to sign up to firm or high-level take-up targets.
LL-24	4. Commercial	Delivery (post OBC)	There has been a disconnect between DfT Franchising and DfT SEFT programme objectives. Mandating to join the scheme, use the Central Product set and the CBO through franchise agreements would have made it a lot easier to ensure SEFT objectives were met.	Time/Quality	Ensure SEFT objectives are reflected in franchise agreements. Better clarity around requirements for smart ticketing from the DfT would have been beneficial to the programme.	Ensure there is a shared smart ticketing strategy and a dedicated group within the DfT responsible across ticketing, and ensure franchising teams work better together to execute the strategy.
LL-25	4. Commercial	Delivery (post OBC)	In order to keep the programme on track, the programme took managed risk to let the CBO contracts early. This risk was low because HOPS and ITSO technology was mature. This resulted in the contracts being let before use-cases were fully confirmed and requirements and functionality had to retrospectively be aligned. This demonstrated that with a mature technology platform an acceptable level of risk can be accommodated to keep overall programme delivery on track.	Time	Maximise the level of business scheme and technical design requirements before initiating a large scale procurement, but recognise that with a mature technology platform (e.g. ITSO) an acceptable level of risk can be accommodated to keep overall delivery on track.	Maximise the level of business scheme and technical design requirements before initiating a large scale procurement, but recognise that with a mature technology platform (e.g. ITSO) an acceptable level of risk can be accommodated to keep overall delivery on track.

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LL-26	4. Commercial	Delivery (post OBC)	Delay was caused as the procurement team were located in a different room that could not be accessed readily for security reasons. This increasingly became an issue once the contracts were in place with suppliers and the procurement role became more of contract management. At this time the separation led to less efficient engagement with suppliers. It's difficult to retain a single team dynamic when teams are physically separated.	Quality	It is better for the procurement team to be co-located with the rest of the programme team, but provision must be made for procurement teams to have a secure space for commercially confidential discussions and documents. On balance the latter must take priority. Recognise that it's difficult to retain a single team dynamic when teams are physically separated. This is currently a risk with the PMO being physically separated from the rest of the team.	When procurement is involved in a programme, ensure the procurement team is closer to the rest of the team whilst not compromising any sensitive material or discussions. This could be done by separate secure IT access, separate secured cupboards, using meeting rooms for procurement discussions, etc. Separating groups entirely from the rest of the team should be avoided.
LL-29	4. Commercial	Delivery (post OBC)	Commercial sensitivities prevented some TOCs (e.g. AGA and c2c) from allowing their suppliers to engage with the programme effectively. This lengthened timescales for closing out crucial go-live activities. For example, AGA and c2c did not facilitate the programme's communication with their suppliers, hindering accurate planning and project management. LSER are inviting suppliers to these meetings and this is working well.	Time/Quality	It is essential for TOCs to invite suppliers to weekly delivery review meetings to ensure sufficient resource allocation and ensure commitment to programme delivery timescales. Without this there will be consequential delays to the programme.	It is essential for TOCs to invite suppliers to weekly delivery review meetings to ensure sufficient resource allocation and ensure commitment to programme delivery timescales. Without this there will be consequential delays to the programme.
LL-36	4. Commercial	Delivery (post OBC)	The absence of a DfT strategy has meant that the development of scheme agreements is challenging.	Time	A clear strategy would have enabled the DfT to apply pressure to ensure that TOCs could develop the scheme agreement earlier. This strategy should ensure clarity on whether SEFT is seen as a CBO supplier or a scheme.	Ensure there is a clear smart ticketing strategy.
LL-28	5. Project Communications	Delivery (post OBC)	Lack of visibility of issues within existing scheme (e.g. TVM's not working as specified on ACT back office). TOCs were resistant to any disclosure of existing issues of system design issues or performance. This made it difficult to integrate TOC systems into the CBO as a certain amount of guess work was needed by the technical teams. Many issues manifested themselves during the testing cycles which resulted in delays and re-work. All TOCs consistently displayed this behaviour to varying degrees potentially driven by cultural issues.	Time/Cost	System defects will always be discovered in test. Time and cost will increase if these defects are not disclosed up front.	Ensure early and full disclosure by all parties (TOCs and suppliers) of all known and reported defects of system components over the last 12 months, and in particular any unresolved defects.
LL-34	5. Project Communications	Delivery (post OBC)	Although there was regular senior engagement with RSP, key messages were not always cascaded down to RSP staff at working level. It appeared therefore that at times, more junior RSP staff felt they did not have a say in programme activities despite the fact that the programme is to be handed over to them.	Quality	Because of lack of wider smart ticketing strategy RSP were not in a position to proactively support programme's approach. This resulted in a lack of communication cascade.	Ensure there is a strategy in place that enables RSP to fully support the programme and cascade all key messages to impacted staff.
LL-35	5. Project Communications	Delivery (post OBC)	Although there were clear lines of communications considered for engagement between the programme, TOCs and suppliers, these were not always followed. TOCs and suppliers approached the wrong people at times resulting in the task being dropped, handled by not necessarily the most appropriate person, or time lost passing the request around until it reached the appropriate person.	Time/Quality	The lines of communication must be regularly communicated, and behaviours that do not follow the approach should be addressed.	The lines of communication must be regularly communicated, and behaviours that do not follow the approach should be addressed.
LL-39	5. Project Communications	Delivery (post OBC)	Until the programme had high level support from the DfT, engagement with TfL was only at the working level. This led to continued delays as TfL prioritised their own projects over anything relating to ITSO. TfL sees no future of ITSO in its scheme and has only implemented ITSO following DfT instruction.	Time	Without senior level DfT and TfL engagement, TfL will always prioritise work on its scheme over work on the ITSO scheme.	Without senior level DfT and TfL engagement, TfL will always prioritise work on its scheme over work on the ITSO scheme.
LL-40	5. Project Communications	Delivery (post OBC)	We had really good engagement from customer experience representatives across all TOCs, but found that some of the topics discussed and agreements reached were not always cascaded up and down their organisations or across the programme stakeholder group.	Quality	Increase intra and inter TOC communications.	Make sure that the governance structure includes a clear set of responsibilities for information sharing within and across TOCs, and hold internal working group chair meetings regularly to ensure that discussions and decisions across different working groups are aligned, and escalate if not.
LL-10	6. Technical	Delivery (post OBC)	The ITSO standard for RSPS3002 was open to interpretation - the industry refined the standard in an attempt to remove inconsistencies. It was then assumed that the consistencies had been removed. However, as technical discussion progressed it became clear that there remained inconsistencies around the technical interpretation of the standard.	Time	The programme should be run in a defensive manner - do not assume that wider infrastructure consistently adheres to industry standards.	Where standards exist, mandate compliance in a consistent manner across the industry. Allocate sufficient contingency to mitigate risk of non-compliance.
LL-16	6. Technical	Delivery (post OBC)	Supplier documentation supplied was not fit for purpose - they were often incomplete, incorrect and contained an inappropriate level of detail.	Time/Quality	Do not assume that suppliers share the same view on the quantity and quality of documentation required to support design, build, test and operations of the system.	Supplier documentation should be made an explicit item in contracts and a formal acceptance process established. For example, the production of supplier documentation could be linked to payment milestones.
LL-17	6. Technical	Delivery (post OBC)	Inability of TOC community and SEFT to drive responsiveness and efficiency of suppliers - this led to below-par supplier performance and delays, as TOCs failed to manage suppliers effectively to deliver functionality that is needed before TOCs can onboard to the CBO. The technical and test team have had to resolve these problems.	Time	Do not assume that TOCs can manage their supply chains to deliver against planned timeframes to specification and quality or that the supply chains can meet TOC requests.	Work closer with TOCs and their supply chains. Expectation setting should be performed up front with regular face-to-face quality reviews.
LL-18	6. Technical	Delivery (post OBC)	Defects raised by the SEFT team relating to external system issues e.g.: TOC POST or TOC WebTIS suppliers, were sometimes ignored and not proactively managed by the TOC. In some cases, this led to a number of TOC issues immediately after go-live.	Quality	Do not assume that TOCs will proactively manage external system defects and consider alternative escalation routes if the programme deems a defect is sufficiently large and not being addressed appropriately.	Work closer with TOCs and their supply chains. Expectation setting should be performed up front with regular face-to-face quality reviews. Facilitate sharing of known problems between TOCs.
LL-19	6. Technical	Delivery (post OBC)	Suppliers released code that was not completely tested due to the lack of their test environments and test harnesses. This resulted in a reliance on the SEFT team for "bug finding" in their code when the SEFT team was expecting quality code ready for system test. E.g.: obvious defects were release in code by the supplier for SEFT to test which resulted in complete rejection of the code release and programme delays. Additionally, code releases and system changes occurred without knowledge which meant testing was done on a non-stable base (i.e.: the system baseline was not defined).	Time/Quality	Do not assume that suppliers would follow accepted industry best-practice in code development, test and release.	Expectations of supplier requirements should be defined in detail and contracted up-front.
LL-27	6. Technical	Delivery (post OBC)	In some areas of the contract there is a lack of clarity of technical requirements. This led to delays as the technical team and suppliers had to resolve their differences of opinion as to what the requirements in the contract meant.	Time	There should be enough technical detail of the requirements in the contract to remove any ambiguity about when requirements have been met.	Include more technical detail in contracts

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LL-31	6. Technical	Delivery (post OBC)	Due to the commercial landscape, TOCs were responsible for resolving issues with devices owned by their supply chain. This meant the TOCs were delivering solutions that were not to the same standard of other devices used in the scheme.	Quality	There must be full recognition of the commercial landscape in which the programme operates along with an understanding of the compliance requirements within the overall scheme design. TOCs must then recognise the level of compliance they must adhere to, to ensure compliance across the scheme, and recognise and accept primacy of the design authority on all scheme and compliance issues. For example, the design authority would ensure that all devices (e.g.: TVMs and gates) are treated as equal parts of the system architecture, as all items are required to ensure success of the scheme.	TOCS should keep detailed configuration and defect management records for the smart ticketing assets on their estate. This information should be regularly shared with the programme.
LL-37	6. Technical	Delivery (post OBC)	The transition into BAU once the TOC was launched/migrated on the CBO went smoothly with minimal issues arising as the TOC service team understood the systems and processes, and effective working relationships between the teams had already been established.	Quality	Early engagement of Service Management with the TOCs is helpful in ensuring the transition to BAU Operations once a TOC has onboarded successfully.	Follow the same model for future TOC onboardings. The TOC needs to commit its people to be involved from an early stage.
LL-38	6. Technical	Delivery (post OBC)	Early engagement with LSER on design worked well.	Time/Cost/Quality	Early engagement with TOCs on design allows for efficient and effective progress.	Ensure there is early engagement with a TOC to agree scope at the earliest opportunity to ensure design is completed collaboratively which reduces the risk of the need for later re-work.
LL-41	6. Technical	Delivery (post OBC)	Inconsistency in test processes and the requirement to build a centralised scheme, meant that leveraging the existing TOC test facilities would have exacerbated the existing challenges of a geographically dispersed TOC test facilities, with varying configuration inconsistencies. Without the Test Facility there would have also been a lack of knowledge about other parties' processes and functionality. It allowed for ITSO to be tested in a near real environment across the scheme.	Time/Quality	Testing is not only about the physical attributes of the equipment, but also of the data that is produced as the test cycle progresses. The test equipment, the test team and the design team need to be closely located to reduce the amount of time it takes to resolve inevitable testing issues.	Build a business case further to allow for a variety of different test environments to further improve efficiency of programme delivery.
LL-42	6. Technical	Delivery (post OBC)	This is a very complex novel project so it is crucial that key technical experts are employed. Although the required technical roles for the programme were understood very well, it was difficult to find candidates of suitable quality in the permanent and contract market place. It took a long time to realise that suitable candidates could not be found, and an alternative strategy had to be employed to keep the programme on track.	Time/Quality	It is crucial to employ and engage key technical experts for a highly technical and specialist programme. Where these experts are not available in a contract or permanent market place, full use needs to be made of the consultancy market to drive the technical aspects forward to ensure progress is made while seeking lower cost alternatives. Our experience suggests that it would be a poor investment to accept lower quality staff because the right ones can't be found in the desired timescales.	It is better to invest in creating a high performance team as the investment pays off in the quality and timeliness of the programme deliverables.
LL-43	6. Technical	Delivery (post OBC)	As SEFT had a third party relationship with POST suppliers, it was difficult to manage delivery and defect management of POST equipment. This resulted in: - Lack of clear management and ownership of POST supplier defects - Inefficient tool used for tracking issues led to poor value and lack of consistent use of Quality Centre tool by suppliers - Quality Centre was used to log both cosmetic defects as well as logging systemic design issues. Although both classes of issues are equally valid, both types of issues being logged into the same tool encouraged confusion and impedes usage.	Time	Ensure that all parties accept the creation of the Technical Defects Manager role and ensure that all parties agree that a defects management process should be followed.	Ensure that all parties accept the creation of the Technical Defects Manager role and ensure that all parties agree that a defects management process should be followed.
LL-44	6. Technical	Delivery (post OBC)	Late addition of 247 products onto gate profile caused delays and extra workload.	Time	Agree full ISAM profiling with POST suppliers in advance of deployment.	Agree full ISAM profiling with POST suppliers in advance of deployment.
LL-45	6. Technical	Delivery (post OBC)	The programme wished to have a document sharing library, and investigated several potential solutions. There were stakeholder concerns over commercial sensitivity, ability to get access through their networks and the need to comply with data protection principles. At the same time, RSP was changing its IT systems and the programme team had to adhere to RSP's policy. The resulting lack of document sharing tool hindered efforts to collaborate in the production and updating of documents and in version control, particularly with regard to technical notes. Technical notes require distribution and sharing. This was very time consuming.	Time	Recognise that it may be difficult to meet all stakeholder's expectations for document sharing and management. Adopt a solution that provides the most gain to the widest group of stakeholders at the earliest opportunity.	Use a document sharing tool to allow for collaboration where constraints, such as security, permit at the earliest opportunity.
LL-46	6. Technical	Delivery (post OBC)	Across the full development lifecycle, there was a lack of clarity and consistency around supplier release management processes. This resulted in: - Configuration differences between theoretically identical systems (production and test environments) - this meant that the test environment could not be effectively used to reproduce issues seen in Live - SEFT having no visibility of release information. For example, no release notes (which highlight the difference between the old and new releases) were shared for releases that were planned. This led to a lack of confidence and clarity in contents of each release.	Quality	Do not assume that suppliers will have quality comprehensive configuration, change management and corresponding processes (such as vendor release and change management). In addition, do not assume that suppliers will document individual configuration item changes.	Define and stipulate compliance to a Configuration and Change Management Strategy and define a System Integrator early on to manage this. This should be backed up by contractual obligation where necessary.
LL-47	6. Technical	Delivery (post OBC)	The SEFT programme operated at three levels: 1. Building a scheme that adhered to DfT funded objectives 2. Onboarding/migrating TOCs into this scheme 3. As a supplier of a Central Back Office Service. Although the Central Back Office Service was well understood, critical success factors from a TOC perspective were not clarified by the TOCs. This resulted in the programme not understanding what 'success' looks like for them. This lack of clarity meant the programme was unsure at times as to how it could best support the TOCs.	Quality	TOC critical success factors become apparent in the closing stages of the delivery and test cycle. The late sharing of these requirements usually resulted in re-work or unplanned activities that put excessive pressure on the team and the programme.	TOC critical success factors become apparent in the closing stages of the delivery and test cycle. The late sharing of these requirements usually resulted in re-work or unplanned activities that put excessive pressure on the team and the programme.
LL-48	6. Technical	Delivery (post OBC)	Suppliers were required to deliver documentation in the contracts. However, suppliers had different interpretations as to what quality documentation should contain. This resulted in confusion and disagreement with suppliers over what Technical documentation was required. In addition, suppliers disagreed over the scope and quality of the required documentation. The integration did not proceed as efficiently and effectively, in particular as the team had to help the suppliers complete their own documentation.	Time	Do not assume that suppliers share the same view on the scope and quality of required documentation.	Where documentation is known, ensure it is referenced clearly in the contract, both in terms of scope and quality in as much detail as possible.

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LL-49	6. Technical	Delivery (post OBC)	Poor quality of technical delivery from suppliers meant that risk was carried later into the programme.	Quality	Technical delivery from suppliers often exhibited poor technical quality due to lack of supplier design, testing and understanding of requirements.	Payment milestones should be back-loaded to ensure the bulk of payment is subject to successful testing not successful delivery into test.
LL-50	6. Technical	Delivery (post OBC)	The c2c migration cutover plan was developed online in collaboration with the TOC team which meant teams didn't need to co-locate.	Time	Efficiencies were had in the SEFT Cutover Plan being developed collaboratively online with the TOC.	Use a collaboration tool to develop plans with TOCs
LL-51	6. Technical	Delivery (post OBC)	During c2c cutover, a dashboard was set up to enable team members to see the completion of tasks in real time - this meant instant understanding of the status of the cutover (what tasks have been completed and outstanding etc.).	Quality	The use of a cutover dashboard proved hugely informative and efficient.	Use a dashboard during cutover to allow for real-time updates of status.
LL-52	6. Technical	Delivery (post OBC)	Documentation Flow and Card Collateral Tracker (an online spreadsheet that showed the status and version of each document which could be accessed by all parties) worked well by adding clarity to the workstream and bringing all of the relevant design guides etc. into one place.	Time	The use of a Documentation Flow added clarity to documentation status.	Use a shared Documentation Flow and Document Tracker to ensure all involved parties are aware of the documents required and their status.
LL-53	6. Technical	Delivery (post OBC)	Design and documentation continued into late stage of the project to accommodate compressed delivery timescales as suppliers struggled to meet their contracted commitments to each other.	Time/Quality	Deliver detailed and appropriate requirements and design documentation early in the project to aid with early testing.	Link delivery of documentation, specified in detail up front, to payment milestones for system delivery. Ensure design documents are complete and detailed, and that requirements are produced at the earliest opportunity.
LL-54	6. Technical	Delivery (post OBC)	Sufficient test approach or plans were not provided by TOCs, particularly with reference to (although not limited to) migrated data: plans for migration activities were required in advance to ensure the data was available in a migrate-able state.	Time/Quality	TOC test approach and plan should have been developed and shared earlier.	Specify, in detail, before contracting the TOC obligations for testing and who has what role in the process. Ensure early engagement with TOCs so that complex scenarios are considered for testing.
LL-55	6. Technical	Delivery (post OBC)	An opportunity to take a more measured approach to testing and progression of the programme would have provided greater opportunity to identify and rectify issues prior to going live.	Quality	Stricter technical scrutiny should be applied during early phases of testing.	Devote more time to the earlier stages of testing as this yields a better return on effort when identifying and rectifying defects.
LL-56	6. Technical	Delivery (post OBC)	The programme and TOC/CBO suppliers needed to clearly define and agree what was required to onboard sub-components (gates, TVMs) - time and effort was wasted in defining requirements for onboarding each sub-component, instead of following a standard onboarding process for this. For example, there was absence of a conduit and formal process between TOC POST suppliers and SEFT which led to assumptions being made by TOCs and POST suppliers, leading to last minute configuration changes or compromise.	Time	Time and effort would have been saved if a formal process for capture and approval of requirements by suppliers, particularly for specific "sub-scheme" elements per TOC as part of build process, was followed.	The programme and suppliers should define and agree a sub-component onboarding process to follow to ensure comprehensive capture and approval of requirements and delivery of sub-components.
LL-57	6. Technical	Delivery (post OBC)	Lack of clear system integrator role resulted in poor coordination of POST suppliers. Having a System Integrator role defined would have prevented issues arising by up front definition in holistic documents. For example: - Validity code was set to expect 18 in staging which prevented validation at Cubic gates - SEFT were not always notified of any change to a 3rd party systems which could affect the CBO (i.e. Worldline) - issues therefore became apparent in Staging / Production.	Time/Quality	Having a System Integrator role clearly defined and agreed by all parties would have prevented issues.	Define System Integrator role before contracting to delivery services to prevent confusion and issues in control, testing and interfacing of suppliers. The scheme should determine values for different TYPs and PTYPs depending on validity (peak etc.).
LL-58	6. Technical	Delivery (post OBC)	There was not an S&B TVM present in the Test Facility - this meant issues were uncovered relating to the ISAM profile in Live, meaning Cubic gates could not be commissioned at first attempt, and the ISAMs needed to be re-profiled. These defects would have been identified if all POST providers were represented in the Test Facility to allow for Live testing. S&B were not represented as they significantly delayed installation by refusing to quote to supply equipment.	Quality	Without a fully representative Test Environment, i.e. with every POST provider represented, it is not possible to test all aspects at the required time and to the required level.	Start supplier engagement as early as possible. Ensure there is complete representation of all POST providers to allow for testing prior to commission of gates and early identification and resolution of defects.
LL-59	6. Technical	Delivery (post OBC)	It was evident that the requirements the programme provided were too generalised, and as such this provided opportunity for suppliers to implement their own interpretation. This resulted in much big-fixing which hindered the ability to spend more time on other areas.	Time/Quality	All requirements need to be non-ambiguous, specific and clearly testable across TOCs and the delivery team.	Specify requirements in greater detail up front in contracts. Ensure at design / early FAT phase, test and technical teams work together to ensure sufficient adherence to requirements and that there is engagement with suppliers and TOCs at the earliest opportunity to flesh-out their requirements to limit the number of requirements missed.
LL-60	6. Technical	Delivery (post OBC)	It took far too long for some TOC test teams to establish a minimum level of system and functional understanding. TOC staff did not entirely grasp the concept/lack of basic travel/ticket knowledge/experience and ignored advise/support from SEFT team. This led to a significantly slower progress in testing than was required.	Time	Quality of domain knowledge and sufficient onboarding of personnel is imperative within TOC test teams to ensure progress can be made at the maximum pace possible.	Test personnel should be sufficiently onboarded into TOC teams and given clear priorities and expectations of outcomes.
LL-61	6. Technical	Delivery (post OBC)	KCOM in particular did minimal testing of releases (due to a lack of integrated development environments). Therefore defects that should have been captured in Unit test (conducted by developer) were delivered into System Integrations Testing thus causing delay.	Time	Enforced collaboration between suppliers should occur earlier to facilitate with early integration testing. This would have made early defect identification easier.	Specify in the contracts in detail the managed collaboration between Suppliers to facilitate early integration, to enable early defect/bug identification and resolution, prior to more intensive integration testing Ensure suppliers correctly quality assure their work – the programme will have a dedicated integration environment for RSPS3002v2.1 development.
LL-62	6. Technical	Delivery (post OBC)	Poor use by suppliers of test support material provided by the programme. E.g.: Regression Packs	Time/Quality	It is important for TOCs to provide test plans that have utilised the support, knowledge base, and material provided by SEFT.	TOCs should focus on conducting testing specific to their business processes, not basic system functionality that has already been extensively tested by the SEFT team.
LL-63	6. Technical	Delivery (post OBC)	Due to time constraints, vendors grew to defaulting to pragmatic solutions resulting in accrue of technical debt throughout delivery of the programme.	Quality	The subsequent project should mandate and align suppliers to high technical standards of delivery. The programme should not have defaulted to accepting pragmatic solutions when a technically correct solution is feasible and within scope.	Specify high standards of delivery up front in contracts and in detail. Ensure that adequate time is available to complete requisite technical design, documentation and comprehensive testing.
LL-64	6. Technical	Delivery (post OBC)	Late bug fixing led to lack of focus on cutover activities.	Quality	Bug fixes should not occur in parallel with go-live.	Stronger commercial liability should be agreed with the vendors to defer risks to suppliers.
LL-65	6. Technical	Delivery (post OBC)	By having distinct workstreams for software delivery, cutover planning and data migration, the programme ensured that work was divided effectively across all teams and ensured that teams were synchronised.	Time/Quality	Segregation of software, cutover and migration worked well.	This is something that should be considered for similar projects.
LL-66	6. Technical	Delivery (post OBC)	Issues have taken too long to analyse and resolve as the programme has had limited access to supplier data.	Time	Need better system wide analysis tools and open data access to supplier data to allow optimal issue resolution.	Test approach and the requirements for test tools should be considered in detail before contracts are awarded. Ensure suppliers are clear on the requirement for them to provide improved monitoring, data analysis capabilities and open data access.

ID	Category	Project Life-Cycle Stage	Situation/Description/Impact	Impact Category (Time/Cost/Quality)	Lesson Learned	What could be done differently next time / Recommendation
LL-67	6. Technical	Delivery (post OBC)	We are struggling to finish off the outstanding processes while Service Management design resource is doubling-up as operation resource.	Time	Service Management and Operations design is a very different skillset to BAU operations.	Complete Service design wherever possible before moving to the service operations phase.
LL-68	6. Technical	Delivery (post OBC)	The programme has a Testing environment (which is a representative environment of an up-version of the current Live environment). However, the programme has been unable to provide a Live-like environment (Pre-Production - an environment that mirrors that which is currently Live) to sign-off releases prior to Live deployment and to test for solutions to issues that occur in Live.	Quality	Lack of Pre-Production environment increases risk, as you are unable to test for solutions to issues that are in Live.	Give more thought to the importance Pre-Production environments during the scoping of the project