Scottish Ambulance Service

FULL BUSINESS CASE

For

Ambulance Telehealth Phase 1

Version 1.8

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Section 1: Executive Summary

1.1 Introduction

The Scottish Ambulance Service (the Service) introduced Cab Based Terminals in all frontline A&E vehicles between April and October 2007. The cab based solution includes a front and rear computer terminal, providing allocation, mobilisation and satellite navigation facilities in the front of the vehicle and an electronic patient reporting system in the rear of the vehicle. Since the introduction of the electronic patient reporting form (ePRF), more than 5 million patient records have been uploaded to the ePRF database and data warehouse.

A revised hardware solution was identified and purchased to cater for the smaller Paramedic Response and Urgent Tier vehicles. These were provided with a smaller 8" front terminal and an updated central communications unit.

The proposed Ambulance Telehealth Programme will upgrade and improve the current emergency ambulance technology to provide a better user and patient experience and a faster, more reliable communications infrastructure. This will also provide a platform for additional clinical support through information and diagnostic tests to be provided to front line staff, thus supporting the overall organisational strategy *Towards 2020: Taking Care To The Patient*.

The programme is fully aligned with the Scottish Government 2020 vision for healthcare as it will facilitate the use of new technologies to improve patient care, and will simplify the patient reporting process. The new systems will provide a central point for collection and distribution of all electronic patient monitoring data from any patient monitoring tools that are available within the vehicle e.g. defibrillators.

The Ambulance Telehealth Programme also supports the delivery of the Healthcare Quality Strategy for NHS Scotland. This strategy identified six dimensions (person-centred, safe, effective, efficient, equitable and timely) which define quality healthcare. The Ambulance Telehealth Programme has used these dimensions as the basis for its investment objectives. This has ensured that the evaluation of the options available for delivery of the programme have taken consideration of these dimensions and the preferred option selected provides the Service with a solution that delivers the best quality healthcare to all patients in Scotland.

The Ambulance Telehealth Programme will be delivered in two phases to match the funding profile offered by the Scottish Government Capital Investment Group (CIG). Phase 1 will deliver the hardware and communications solution, while Phase 2 will deliver the associated software and relevant diagnostic equipment.

When this programme is completed patients will be treated in the most appropriate environment and where possible this will be at, or near, their home or in a homely setting this is in line with NHS Scotland's 2020 Vision for the delivery of healthcare.

This will be achieved by giving staff access to key patient information, clinical guidance, integrated diagnostic devices and will provide the capability to exploit advances in decision support which rely on technology, e.g., video conferencing, electronic access to patient records. This will enable the Service to work together with health, social care and emergency service partners to maximise clinical quality and deliver the best result for the patient in terms of their care and safety.

Staff in the ambulance will also have access to the Service's 'back office' systems such as incident reporting, intranet/internet, eLearning etc. This will enable them to do their job as efficiently as possible.

Following approval of the Initial Agreement in April 2013 and the Outline Business Case (OBC) in March 2014, an Invitation to Tender for Phase 1 of the solution was issued and included an operational requirement borne out of discussion with representatives from key stakeholders who may be affected by the introduction of the new system.

As part of the OBC approval process, the CIG, allocated £6m to the Telehealth Programme. As part of the OBC approval, the funding profile given by the CIG split the £6m over two phases resulting in £3m being allocated to Phase 1 in 2014/15 and £3m being allocated for Phase 2 in 2016/17. Phase 1 of the programme is covered in this Full Business Case (FBC). A second FBC will be prepared and submitted for Phase 2.

1.2 Strategic Case

1.2.1 Strategic Context

There continues to be a strong strategic and operational case for change. Investment in the Ambulance Telehealth Programme addresses the weaknesses and criticisms of the current systems available to ambulance crews.

As outlined in Section 3 of this document, cognisance has been taken of relevant local and national policy and strategy including the following:

- External Strategy:
  - Scottish Government and NHS Scotland eHealth Strategy
  - NHS Scotland 2020 Vision
  - National Delivery Plan for Telehealth and Telecare
  - Spending Review / Austerity

- Internal Strategies and Plans:
  - The Scottish Ambulance Five Year Strategic Framework
  - HEAT Targets (Health, Efficiency, Access and Treatment)
  - eHealth ICT Strategy 2012 – 2017

1.2.2 Investment Objectives

The investment objectives for this programme have been developed from the premise that it is essential for the Service to have access to enhanced mobile data services in order to continue to meet the demands placed on it by the Scottish public.

Investment objectives have been developed to ensure that the Service has access to improved mobile data services through 2016 and beyond. These objectives have been aligned to the NHS Scotland Healthcare Quality Strategy Ambitions and Triple Aims:

Programme Objective	Summary of Strategic Programme Objectives	Strategic Links	2020 Priority Areas for Improvement	Quality Ambitions	Triple Aim
1	To deliver an updated user interface for the mobile data terminals by March 2017	Healthcare services are more efficient. Healthcare workers have better access to the information they need.	Person-centred care Unscheduled and Emergency Care Innovation Efficiency and Productivity	Person-centred Effective	Quality of Care Value and Sustainability
2	To deliver faster mobile data connections to the mobile data terminals supporting 3G, 4G and, where applicable, satellite communications by March 2016	Healthcare workers have better access to the information they need.	Innovation Unscheduled and Emergency Care Efficiency and Productivity	Effective	Value and Sustainability
3	To deliver compliance with Vehicle Type Approval guidelines issued by the Vehicle Certification Agency under the CEN standard (BS EN 1789:2007) for Medical Vehicles and their Equipment from 2015.	Not applicable to eHealth delivery plan but delivers on the SAS HEAT target to provide a safe environment for the delivery of healthcare services.	Safe Care	Safe	Quality of Care
4	To deliver a robust and reliable hardware solution which supports wireless data communications outside of the dock providing connectivity to remote clinical information at the point of care by March 2016.	Healthcare services are more efficient Healthcare workers have better access to the information they need	Person-centred care Safe Care Unscheduled and Emergency Care Care for Multiple and Chronic Illnesses Innovation	Person-centred Safe Effective	Quality of Care Value and Sustainability
5	To provide a solution which supports access to external clinical information to aid clinical decision making and access to Back Office systems for incident reporting, eForm completion and accessing business information by March 2017	Healthcare services are more efficient Healthcare workers have better access to the information they need Improve the safety of people taking medicines and their effective use	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability

6	To deliver a solution that will provide data link capability to connect to patient monitoring equipment at the point of care, allowing automatic population of clinical data within the ePRF by March 2017	Healthcare Services are more efficient Performance data is readily available to proactively improve service delivery	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability
7	To enable electronic data sharing between responding vehicles to reduce duplication of effort and to allow responding Service clinicians to review the full treatment record for the patient by March 2017.	Healthcare services are more efficient Healthcare workers have better access to the information they need. People with long term conditions are better supported	Person-centred care Safe Care Unscheduled and Emergency Care Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability
8	To deliver a mobile Telehealth capability that supports video connections to health care professionals from within the ambulance environment (dependant on bandwidth availability) by March 2016.	Healthcare services are more efficient Healthcare workers have better access to the information they need People with long term conditions are better supported People will be treated at home or in their own community	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Health inequalities Workforce Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Health of the Population Value and Sustainability
9	To deliver a solution that will reduce like-for-like revenue costs in comparison to the current solution by March 2017.	Healthcare services are more efficient	Efficiency and Productivity	Effective	Value and Sustainability

1.2.3 Existing Arrangements

As described in Section 1.1, The Service introduced Cab Based Terminals in all frontline A&E vehicles between April and October 2007. The current supplier is responsible for the supply, installation and maintenance of the Cab Based Terminals and the related hardware and software.

Since its introduction, the allocation & mobilisation and ePRF applications have been subject to continual software updates to improve health & safety, clinical recording and to introduce aids to clinical decision making.

The existing supplier contract has reached the end of its primary contract term and continues on a rolling year-on-year basis. Further software enhancements to the existing platform have now ceased, with the exception of urgent clinical developments, in anticipation of this redevelopment programme.

The Service are dealing with an increasing number of faults related to poor battery performance on the existing tablets and whilst these are continually refurbished as part of the maintenance contract, there is reluctance from staff to carry the units outside of the vehicle as they have no confidence in the battery life.

A full operational requirements determination and analysis has been completed and documented in support of this programme. This document was used to compile the functional specification document issued to all interested suppliers at the invitation to tender stage.

The Initial Agreement in support of the Ambulance Telehealth programme was approved by the Service Board in April 2013 and was tabled at the CIG meeting in May 2013. The consequential OBC V2.3 was approved by CIG in March 2014. In April 2014, CIG approved a request from the Telehealth Programme to progress to full business case using a 2 phased approach to match the funding profile offered. Phase 1 covering vehicle hardware procurement and installation. Phase 2 covering software procurement, implementation and integration.

1.3 Economic Case

1.3.1 Main Business Options

The OBC presented 3 main options, short listed from the Initial Agreement for consideration:

Option 1 Update the system software but not the hardware (option 2 in the OBC)

Option 2 Update the rear terminal hardware and software to improve electronic patient reporting platform only (option 4 in the OBC)

Option 3 Update the full mobile data solution within the vehicle to provide end-to-end Ambulance Telehealth solution (option 5 in the OBC)

As part of the development work for the FBC, the economic cases contained within both the Initial Agreement and OBC have been reviewed to identify whether any changes to the underlying assumptions have arisen as a result of more detailed information being available.

There have been no changes which have affected the identification of the critical success factors or the evaluation of the short-listed options which were assessed as part of the economic case in the OBC.

1.3.2 Risk and Benefit Appraisal

The benefits, risk analysis and scoring were revisited at a workshop with key stakeholders held in August 2014. During this workshop it was identified that a new risk assessment model had been adopted by the organisation which uses a different scoring technique from the one used to assess the risks at OBC stage. The risk appraisal was therefore re-run to determine the result using the new model.

The outcome of the revised risk analysis showed that option 3 remains the option which carries the least risk and brings with it clear strategic, operational and business benefits.

The results of the revised benefits and risk scoring are shown in Sections 4.7 and 4.8 of this document.

1.3.3 Economic Appraisal

The economic appraisal completed at OBC staged considered the benefits, costs and risks of the shortlisted options to inform a value for money assessment and arrive at a rank order of the options in terms of value for money. Using the revisited benefits and risk analysis scoring as described above, the economic appraisal was re-run to determine what the outcome would have been at OBC if these scores were used. In addition, the costs used for Phase 1 in the revised economic analysis were the preferred solution costs as determined by the outcome of the procurement evaluation. Full details are given in Section 7.1. The costs used for Phase 2 remained the same as in the OBC. The results are shown in the table below:

Option	BENEFITS	COSTS	Costs per Benefit	Costs per Benefit	RISK
	Weighted Benefit Score	Equivalent Annual Charge	£000 / Points	Rank Order (lowest cost per benefit first)	Median risk quotient
	Points	£	£		
Option 1 Update System software but NOT hardware	107	[redacted]	[redacted]	**3**	15
Option 2 Update rear terminal HW and SW for ePRF only	497	[redacted]	[redacted]	**2**	15
Option 3 Update the full mobile data solution for full Telehealth system	761	[redacted]	[redacted]	**1**	12

The table above shows that Option 3 is the highest ranking option and therefore the preferred way forward. The conclusion was subjected to sensitivity analysis to verify the robustness of the preferred option and to determine the level of increase in costs or decrease in benefits required to amend the rank order of the options. The outcome of the sensitivity analysis showed that costs would have to increase by 206% and benefits would have to decrease by 41% to amend the rank order of the options. This proves that Option 3 is not very sensitive to fluctuation and remains best value for money.

1.3.5 Preferred Option

The preferred option for investment is **Option 3** as this option fully meets the operational, clinical and technical requirements of the Service while maximising benefits to staff, patients and healthcare partners and carrying the minimum business risk.

The preferred option was taken forward to the procurement strategy stage to determine the solution that will deliver Option 3 and realise the benefits.

1.4 Commercial Case

1.4.1 Agreed Scope and Services

Following a series of workshops with key stakeholders the scope and services for Ambulance Telehealth Phase 1 were agreed and formed part of the Invitation to Tender (ITT) documentation. A detailed description of the full scope and services is available at section 5.1 of this document.

1.4.2 Agreed Risk Allocation

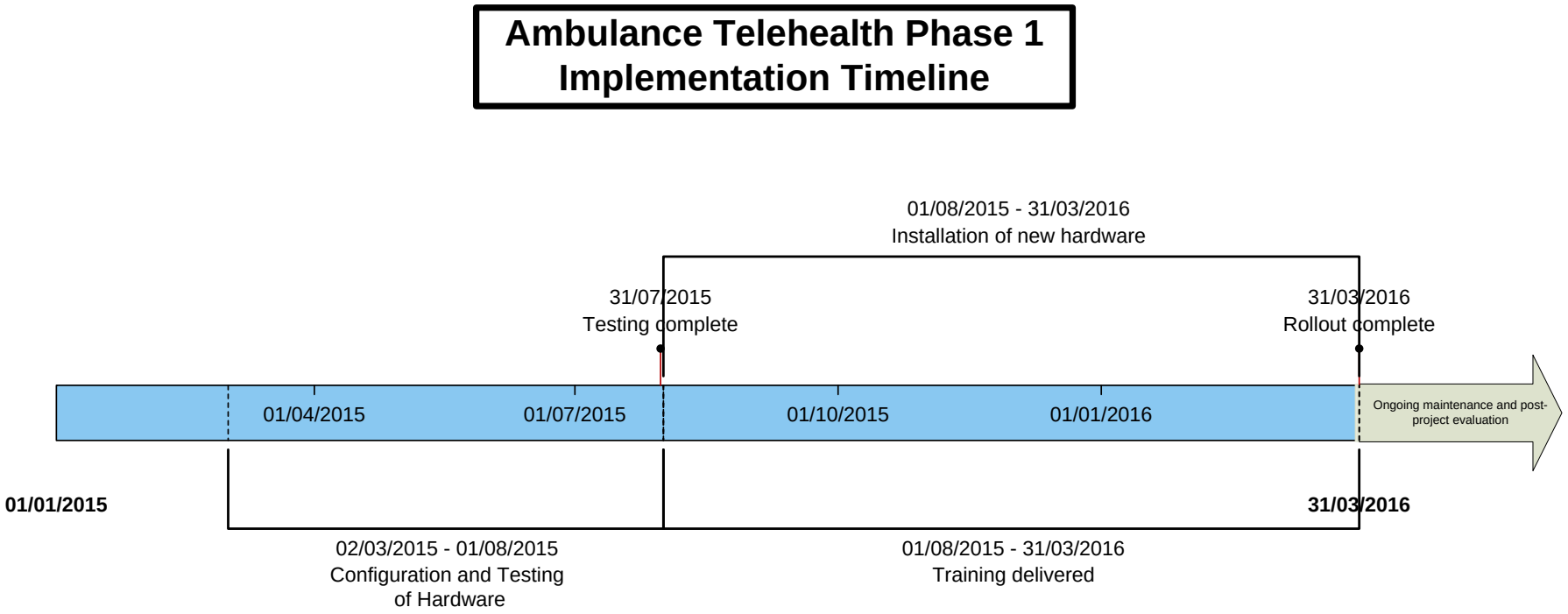
It is important in any programme of considerable investment to ensure that risks are allocated and apportioned to the party best able to manage that risk. Consequently, the Ambulance Telehealth programme has done this through the ITT specification which transfers appropriate risks in the following areas to the supplier:

- Installation and de-installation of all vehicle based hardware
- Built in 5 year support & maintenance contract
- Test & Commissioning of systems prior to implementation across the Service

Service risks will be allocated and managed through the development and management of Risk Logs throughout the life of the Programme.

1.4.3 Agreed Implementation Timescales

The timeline below outlines the key milestones for the delivery of the goods and services of Phase 1 of the Ambulance Telehealth Programme.



1.4.4 Agreed Charging Mechanisms

The proposed payment mechanism is as follows:

- Payment for goods after delivery in accordance with the proposed conditions of contract.
- Installation and ongoing support and maintenance payable after delivery of the relevant services in accordance with the proposed conditions of contract.

These payments will relate to the operational and extension phases of the contract. There will be no pre-delivery payments, as this is not considered necessary for the subject matter of the contract. This is subject to agreement with the successful supplier.

1.4.5 Agreed Key Contractual Arrangements

The contract will be for an initial period of 5 years with the option to extend for a further 2 years. The contract will be based on NHS conditions of contract.

Overall, the successful supplier is expected to provide the specified goods and services in exchange for the appropriate remittance paid in accordance with the contract.

1.5 Financial Case

1.5.1 Capital and Revenue Requirements

The financial appraisal assesses the net impact of the programme on the Service's Balance Sheet and Income and Expenditure Account.

The Service and Scottish Government CIG have previously approved the OBC for the Telehealth Programme. As part of the OBC approval process, the CIG allocated funding of £6m to the programme, which was to be split over the two phases resulting in £3m being allocated for Phase 1 and £3m being allocated for Phase 2 in 2016/17.

The results of the procurement process show that there is an indicative capital requirement of £3.804m for Phase 1. This figure includes irrecoverable VAT. New VAT rules are planned for the end of November 2014 which may mean that some or all of the VAT would be recoverable. If this is the case the capital requirement would be £3.187m While £3.804m is in excess of the anticipated funding allocation from the CIG, the preferred solution, as determined by the procurement process established the following benefits which demonstrate better value for money and reduced risk for the organisation:

- The preferred tablets are inherently ruggedized and are specifically built for challenging environments. They are designed to withstand drops, shocks, spills and vibration. In a vehicle environment, the tablets will be subjected to heavy handling and the design of these tablets should mean that there is a limited risk of faults and damage occurring, thereby reducing ongoing repair and

replacement costs. It will also minimise any operational difficulties crews face that might impair their ability to deliver care due to issues with the tablets.

- The integrated casing means that staff can easily dock and undock the tablet without having to open casing ports to insert charging cables. This will minimise any issues with damage to charging cables and ensure the tablet does not have its IP65 rating compromised by having parts of the protective casing open during charging.
- The tablets are capable at operating at very low temperatures (to -21C) meaning staff will be able to fulfil their duties without having to wait for the tablets to heat up before they become operational.
- Having the same model of tablet in both the front and rear of the vehicle offers potential for swapping the tablets in business continuity situations, i.e., if a fault occurs on one unit the other can be used in its place, thereby reducing downtime and the need to revert back to paper patient record forms.
- The solution has been specified to utilise standard connectivity and communication platforms that will enable any future devices and systems to integrate with the solution.

The estimated revenue costs for Phase 1 of the programme for option 3 are as follows:

Financial Appraisal (contains all irrecoverable VAT)	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Phase 1 Core Revenue Costs	565,291	610,640	521,505	537,515	554,017	570,637	587,756
Current revenue expenditure associated with Phase 1	538,619	554,778	571,421	588,564	606,220	624,407	643,139
Estimated additional funding required/(savings generated)	26,672	55,862	(49,916)	(51,048)	(52,203)	(53,770)	(55,383)

[1] Year 1 costs includes current maintenance costs pro-rata to accommodate implementation timescales

Phase 1 revenue costs include a 3% allowance for indexation from Year 2 onwards.

The core revenue costs for Year 1 and Year 2 include salary costs for the in-house Project Team. These costs will be funded from e-Health budget and it is therefore expected that Phase 1 will generate savings of £4.5k in Year 1 and £48.8k in Year 2.

The OBC estimated savings in like-for-like revenue costs of around £260k from Year 4 onwards. The remaining savings will be derived from Phase 2 of the Ambulance Telehealth Programme.

The assets procured as part of Phase 1 will capitalised upon implementation and depreciated over a 7 year life. This will result in depreciation charges of around £544k per annum. In comparison, at the outset, the current cab based system incurred annual depreciation charges of £582k. Thus a saving of £38k per annum should be acknowledged.

1.6 Management Case

1.6.1 Procurement Strategy

The Service's sourcing strategy followed Route 3 of the Procurement Journey which resulted in the selection of the Restricted Procedure as the most appropriate method for undertaking this procurement. Following a publication of a contract notice in the Official Journal of the European Union (OJEU), 16 Pre-Qualification Questionnaires were received in response. Following a short listing process, 5 suppliers were invited to submit a full tender.

The ITT was published on 19th August 2014. Out of the 5 suppliers invited to tender, only 3 submitted a response. However, each of the 3 suppliers presented several different solutions within their bids, particularly with regard to the choice of tablets offered for consideration. This resulted in 19 options being reviewed and scored by a cross-functional evaluation team in a desktop evaluation process. Suppliers were given the opportunity to present to the evaluation team and demonstrate their solution as part of this process.

The top scoring option was Option 1 from [redacted] which supplies [redacted] specifically designed for challenging environments. All bidders will be advised of the outcome of the process by the end of November 2014, and the mandatory standstill period will commence on 1 December 2014.

It is anticipated that the contract will be awarded in early January 2015, with goods being delivered by 31st March 2015.

1.6.2 Agreed Arrangements for Programme Management

As with all large complex programmes undertaken by the Service, the Ambulance Telehealth Programme will be managed and governed in line with the principles of Managing Successful Programmes (MSP) as well as PRINCE2 project management guidance.

A dedicated Programme Board has been established to oversee the Programme for the remainder of its lifecycle from the approval of the FBC through procurement and implementation to benefits realisation and programme closure.

1.6.3 Agreed Arrangements for Change Management

The deliverables of Phase 1 will be thoroughly tested to ensure they are fit for purpose and meet the expectations as described in the tender specification. Key stakeholders will be fully involved in the testing cycle, which will include a trial period in a live environment prior to rollout.

The implementation of the new solution will be carefully managed to enable seamless parallel running alongside the existing solution with no degradation to the operational capability of the Service during the transition phase.

A Business Change Manager (BCM) will be appointed to lead the change process within the programme, with benefits realisation as a key responsibility. These costs will be funded from the Service's e-Health budget.

1.6.4 Agreed Arrangements for Benefits Realisation

The BCM will be primarily responsible for the realisation of the programme benefits. A benefits realisation plan has been developed and will be monitored regularly to ensure the programme is on track to realise the benefits it has set out to achieve. A benefits register has been created for Phase 1 of the programme. This sets out the benefits and how they will be measured, tracked and realised. The register will be reviewed regularly at Project Team, Programme Team and Programme Board meetings.

1.6.5 Agreed Arrangements for Risk Management

Through effective use of Managing Successful Programmes (MSP) and PRINCE2, the corresponding Programme and Project risks will be managed through identification and subsequent mitigation as described in the risk log/register. The Senior Responsible Owner (SRO) is the risk owner for the programme.

Workshops with key stakeholders were held to identify and score risks in terms of likelihood and impact applicable to the success of the project. (See section 4.8 for details). Project Risks and Programme Risks will be standing agenda items at Project and Programme Board meetings. Where appropriate, risks will be escalated to executive level through the reporting structure.

1.6.6 Agreed Arrangements for Post Phase 1 Evaluation

Throughout the programme a lessons learned log will be maintained and regularly reviewed. The Programme Manager will produce a lessons learned report to be available no later than 6 months after the conclusion of the Phase 1.

1.7 Conclusions and Recommendations

1.7.1 Conclusions

The delivery of the Ambulance Telehealth Programme will provide the crews with the right equipment to enable working practices to change to deliver the 2020 Vision for Healthcare and ensure that appropriate care is given to the patient in the most suitable location for the patient. It will also enable electronic collection of data to inform other Health and Social care staff and facilitate community based treatment and where possible avoid hospital admissions. For those patients still requiring hospital care, these technological enhancements will improve the pre-hospital treatment provided and be more efficient in terms of avoiding duplicate diagnostic testing.

This FBC has revisited the outcomes of the OBC and reviewed the three available options.

Risks, benefits and operational requirements workshops have been held with key stakeholders to ensure that any changes to data used in the OBC have been identified and considered fully in the FBC and ITT.

The results of this exercise have shown that solution Option 3, update the full mobile data solution within the vehicle to provide end to end Ambulance Telehealth solution, continues to present a value for money proposal whilst presenting the least risk to the organisation.

Solution option 3 delivers on the benefits derived from the objectives of the programme whilst also providing a platform for future technical and operational developments which will further benefit the Service.

The Procurement Evaluation has determined that procurement option 1 from [redacted] delivers the solution which best meets the service requirements of Phase 1 of the Ambulance Telehealth Programme. This solution includes the provision of [redacted] for both the front and back terminals. These tablets are specifically designed for challenging environments, and while they are more expensive than non-specialised commercially available tablets, due to their inherently ruggedized designed there will be reduced repair and replacement costs associated with them. This will also minimise any clinical downtime due to technology issues.

1.7.2 Recommendations

It is recommended that the Service Board and Scottish Government CIG approve the outcomes of the FBC and support continued progress towards procurement and implementation of Phase 1 of the Ambulance Telehealth Programme.

It is further recommended that the Service Board and Scottish Government CIG mandate the Programme Manager to begin work on the FBC for Phase 2 of the programme.

Section 2: Introduction and Purpose

2.1 Introduction

2.1.1 Programme Description

The Service has commissioned a new programme named 'Ambulance Telehealth' to refresh the mobile data technology currently used on the frontline A&E ambulance fleet. It will provide updated and improved systems for electronic allocation and mobilisation to emergency, urgent and routine patient incidents and electronic patient reporting tools to record relevant clinical information in relation to the care of those patients.

The programme will facilitate the use of new technologies to improve patient care, and will simplify the patient reporting process. The programme is fully aligned with the Scottish Government's 2020 Vision for healthcare in that it will support Telehealth connections from within the ambulance environment to allow patients to connect with health care professionals (HCP) without the need to travel long distances to hospital when physical contact between an HCP and the patient may not be necessary. Where possible, video communications may also be established from the mobile data terminal out with the vehicle. The new systems will provide a central point for collection and distribution of all electronic patient monitoring data from any patient monitoring tools that are available within the vehicle e.g. defibrillator, blood testing devices, ultrasound etc.

The Ambulance Telehealth Programme also supports the delivery of the Healthcare Quality Strategy for NHS Scotland. This strategy identified six dimensions (person-centred, safe, effective, efficient, equitable and timely) which define quality healthcare. The Ambulance Telehealth Programme has used these dimensions as the basis for its investment objectives. This has ensured that the evaluation of the options available for delivery of the programme have taken consideration of these dimensions and the preferred option selected provides the Service with a solution that delivers the best quality healthcare to all patients in Scotland.

It has been agreed that, in line with the funding profile offered, the Ambulance Telehealth solution will be delivered in two phases. Phase 1 will consist of the procurement and installation of ambulance hardware and communications equipment. Existing software will be used on the new hardware during Phase 1. Phase 2 will cover the software procurement, integration and implementation. The programme will run from 2014 to 2017.

In agreement with the Scottish Government Capital Investment Group, and to reflect the phasing of the Programme, this Full Business Case will focus predominantly on the Phase 1 of the Programme with a further Full Business Case to follow for Phase 2 of the programme in 2015/2016.

The Initial Agreement in support of the Ambulance Telehealth programme was approved by the Service Board in April 2013 and by the Scottish Government's Capital

Investment Group (CIG) in May 2013. The consequential Outline Business Case V2.3 was approved by CIG in March 2014. In April 2014, CIG approved a request from the Telehealth Programme to progress to Full Business Case using the 2 phased approach described above.

This Full Business Case (FBC) will document the justification for the undertaking of the Ambulance Telehealth programme based on the costs (of development, implementation and incremental ongoing operations and maintenance costs) against the anticipated benefits to be gained and offset by any associated risks. It will focus on Phase 1 deliverables, i.e. vehicle hardware procurement and installation.

The full programme (i.e. Phase 1 and Phase 2) covers the procurement of a replacement hardware and software solution for allocation & mobilisation, automatic satellite navigation and electronic patient reporting in the unscheduled care environment. The programme also covers installation of vehicle based mobile data terminals (MDTs), robust and secure mobile data communications, customised application software and support for appropriate clinical devices.

The hardware procurement and services covered by Phase 1 are summarised below:

- *Implementation scope:* Fixed Mobile Data Terminals (MDTs) installed as 'front terminals' running a modified version of the current Allocation & Mobilisation software in all unscheduled care vehicles in accordance with Vehicle Type Approval;

  Robust, dockable/un-dockable MDTs installed as 'rear-terminals' in all unscheduled care vehicles running a modified version of the current electronic patient reporting software.

  A fixed communications hub will provide the technical capability for the vehicle to act as an interface for ambulance telehealth communications.

  In - vehicle printers interfaced through the communications hub.

- *Timeframe:* Phase 1 consisting of the procurement and subsequent installation of ambulance hardware and communications equipment will run from 2014 - 2016 with Phase 2 following in 2016/17.

- *Technology scope:* Tablet computers, communications hub and printers replaced in all A&E frontline vehicles.

- *Staff affected:* Unscheduled care frontline operational staff, who will be the primary users of the hardware.

- *System Installation, Configuration and Acceptance Testing:* Installation to agreed quality and health & safety standards and complete end to end acceptance testing.

- *End User Training:* Delivery of end user training course for all relevant staff, to ensure familiarity of the Ambulance Telehealth equipment. A blended learning approach is expected using eLearning tools and local "champions" to deliver training.

- *Maintenance Services:* Establishment of an appropriate support and maintenance contract that fully underpins the operational and contractual requirements of the unscheduled care service and, at a minimum, meets the threshold requirements identified in the Operational Requirements.

Phase 1 of this programme will deliver a number of benefits including an improved, simplified interface for ambulance staff, via a solution that will be more efficient to manage, support and maintain. Staff will use modern, robust technology that will have greater connectivity enabling staff to deliver the best care to the patient. Phase 2 will build on the benefits from Phase 1 improving the patient experience by creating access to alternative healthcare support from within the community, reducing the need to transport and admit patients to hospital unnecessarily, which will in turn provide additional benefits in terms of efficiency savings and improved patient safety.

The programme will be governed in accordance to the OGC guidelines for programme and project management as detailed in Section 7.2 of this document.

Production of this FBC has been carried out with reference to the guidelines in the Scottish Capital Investment Manual with care being taken to consider not only the financial aspect of the investment but to also consider the non-financial aspects inclusive of user requirements and benefits for patients and staff. Evidence of this can be found throughout the document.

The remainder of this document will set out in detail the:

- Strategic Case (section 3)
- Economic Case (section 4)
- Commercial Case (section 5)
- Financial Case (section6)
- Management case (section7)
- Conclusions and Recommendations (section 8)

Section 3: Strategic Case

3.1 Review of Strategic Case within the Outline Business Case

Since the approval of the Telehealth Initial Agreement and OBC, there has been no change to the strategic context of the proposal. However, given the time elapsed since the development and subsequent approval of the OBC, it was considered prudent to carry out a series of workshops involving key stakeholders to confirm that the scope of requirements and underlying assumptions have not altered to ensure that the outcome continues to satisfy the strategic requirements of the Service. The workshops also revisited the benefits and risks detailed in the OBC, to confirm their current relevance.

The outcomes from the following events have been used to inform this report:

- Workshops held to define the requirements for the OBC, 2013.
- Collaborative workshops with the Digital Health Institute, March 2014
- Telehealth Specification Workshop for the Communications Hub, May 2014.
- Telehealth Specification Workshop for Mobile Data Terminals/Tablets, June 2014.
- Online consultation with staff, July 2014.
- Objectives and Benefits Workshop, July 2014.
- Risk and Benefits Workshop, August 2014.

3.2 Organisational Overview

The Scottish Ambulance Service (the Service) is one of eight Special Health Boards within NHS Scotland. It is also one of the three emergency services. With over 4,300 staff and an overall budget of over £220million, the Service is at the frontline of the NHS in Scotland providing an emergency ambulance service to a population of over 5 million people serving all of the nation's mainland and island communities. In addition, the Patient Transport Service (PTS) undertakes over 1.3 million journeys every year. The PTS provides care for patients who need support to reach their healthcare appointments due to their medical or mobility needs.

3.3 Business Strategy & Aims

3.3.1 The Scottish Ambulance Service Five Year Strategic Framework

The Service is nearing the end of a five year strategic framework *Working Together for Better Patient Care* which was published in January 2010. *Working Together for Better Patient Care* established the vision to deliver the best patient care for people in Scotland, when they need it, where they need it putting our patients at the heart of everything the Service does.

This strategy was, and continues to be, focused on three main goals:

1. To improve patient access and referral to the most appropriate care

2. To deliver the best service for patients
3. To engage with all of our partners and communities to delivery improved healthcare.

The Telehealth Programme is also in line with *Towards 2020: Taking Care to the Patient* the discussion document that proposes the strategic direction for the forthcoming 5 years to 2020, published by the Service in 2014. This builds upon the existing strategy *Working Together for Better Patient Care* and sets out the proposed contribution to the delivery of the 2020 Vision.

3.3.2 HEAT Targets (Health, Efficiency, Access and Treatment)

Each NHS Board must set out in a Local Delivery Plan (LDP), an annual delivery agreement with the Scottish Government Health Department, based on key Ministerial targets. LDPs reflect the HEAT Core Set – the key objectives, targets and measures that reflect Minister's priorities for the Health portfolio. The key objectives are as follows, with the HEAT acronym derived from the initials:

- *Health Improvement* for the People of Scotland – improving life expectancy and healthy life expectancy
- *Efficiency* and Governance Improvements – continually improve the efficiency and effectiveness of the NHS
- *Access* to Health Services – recognising patient's need for quicker and easier use of NHS services; and
- *Treatment* Appropriate to Individuals – ensure patients receive high quality services that meet their needs.

Building upon the recommendations contained within the Scottish Government *Healthcare Quality Strategy for NHS Scotland, May 2010*, and more recently, the Scottish Government paper on *Achieving Sustainable Quality in Scotland's Healthcare – A '2020' Vision*, the Service revisited, and revised its mission statements, long term corporate objectives, and key result areas. This resulted in the development of the Service's HEAT Delivery Plan and Corporate Plan in order to fully support the Healthcare Quality Strategy ambitions for NHS Scotland which are:

- *Person-Centered –* mutually beneficial partnerships between patients, their families and those delivering healthcare services which respect individuals needs and values and which demonstrate compassion, continuity, clear communication and shared decision-making.
- *Clinically Excellent –* the most appropriate treatments, interventions, support and services will be provided at the right time to everyone who will benefit, and wasteful or harmful variation will be eradicated.
- *Safe –* there will be no avoidable injury or harm to people from healthcare they receive, and an appropriate, clean and safe environment will be provided for the delivery of healthcare services at all times.

3.3.3 eHealth ICT Strategy 2012 – 2017

In 2012, the Scottish Government published a revised eHealth Strategy 2012-2017 and, to ensure that the Service was fully aligned with this strategy, it was decided to review the existing eHealth ICT Strategy and produce a new five year strategy covering the period, April 2012 to March 2017.

The Service firmly believes that eHealth has a vital role to play in shifting the balance of care as timely information on a patient's condition will allow them to be appropriately cared for in their own environment. The Service also believes that eHealth can assist with diagnosis and treatment performed through Telehealth and decision support from distant clinicians, especially in the remote and rural parts of Scotland. In support of this belief, the Service has developed a 5-year eHealth Strategy and will:

- Continue to develop 'See and Treat' technology to enable people to be treated in their own community supported by access to an appropriate and secure communications infrastructure without the need for an A&E attendance or admission. In particular the service wishes to expand near patient diagnostic testing where it is safe and effective to do so.
- Aim to improve the availability of appropriate securely held information for its clinicians and to provide the tools to use and communicate that information effectively to improve the quality of care it provides to patients.
- Continue to develop access to ECS and KIS for frontline clinicians, and will continue to develop interfaces which pass information to A&E departments electronically prior to the patient's arrival, thus improving the outcome for patients and developing a system that is streamlined and reduces waste and harmful impacts on patients.
- Continue to work with Scottish Government and Healthcare Partners to develop its mobile voice and data strategy for both the Unscheduled and Scheduled Care Services and to facilitate the secure exchange of patient centred care information through better use of integration technology.
- Ensure all systems are as efficient as possible, and that waste and inefficiency is minimised, producing cash savings. Benefits will be measured to enable value for money to be demonstrated as part of the aim.
- Progress the development of mobile broadband solutions, in order that it can contribute to enhancing overall patient care in the local communities, through the transmission of Clinical Telemetry, Telehealth and Telemedicine applications and exploitation of mobile communication device technology and on-line services.
- Support people to manage their own health and wellbeing, and to become more active participants in the care and services they receive through better use of information systems. The Service recognises however that eHealth is only one aspect of the support individuals require to enable them to manage their own health and well-being and will continue to provide links to other support

mechanisms as not all patients have access to e-systems.

Through the Ambulance Telehealth Project, the Service aims to develop a secure communications capability that will underpin the various integrated eHealth applications delivered through the eHealth Strategy.

This will be an innovative programme, utilising new technologies and fit-for-purpose system interfaces to provide a system which not only meets the needs of the ambulance service in the short term, but assists in future-proofing the development capabilities of the ambulance service to continually enhance the in-vehicle technology throughout the lifecycle of the hardware to meet demand for new services.

3.4 Other Organisational Strategies

3.4.1 NHS Scotland 2020 Vision

The NHS Scotland 2020 Vision is:

'Our vision is that by 2020 everyone is able to live longer healthier lives at home, or in a homely setting.

We will have a healthcare system where we have integrated health and social care, a focus on prevention, anticipation and supported self-management. When hospital treatment is required, and cannot be provided in a community setting, day case treatment will be the norm. Whatever the setting, care will be provided to the highest standards of quality and safety, with the person at the centre of all decisions. There will be a focus on ensuring that people get back into their home or community environment as soon as appropriate, with minimal risk of re-admission.'

The Ambulance Telehealth programme fully supports the 2020 vision by enabling access to healthcare services within the community by delivering the capability to utilise the ambulance vehicle as a technology hub for real-time data sharing and live patient consultation with remote healthcare professionals. Ambulance Telehealth will contribute to the Service Strategy *Towards 2020: Taking Care to the Patient* new working model through the use of technology to,

- Increase the percentage of Hear and Treat
- Increase the percentage of See and Treat
- Decrease the percentage of the need for conveyance

3.4.2 National Delivery Plan for Telehealth and Telecare

A National Delivery Plan for Telehealth and Telecare for Scotland to 2015 was published in December 2012 to drive improvement, integration and innovation through partnerships with NHS Boards, Local Authorities and other key stakeholders supported by the SCTT and Joint Improvement Team.

The National Delivery Plan sets out four strategic ambitions for the next three years:

- Telehealth and Telecare will enable choice and control in health, care and wellbeing services for an additional 300,000 people;
- People who use our health and care services, and staff working with them, will increasingly demand the use of Telehealth and Telecare as positive options;
- Establish a Centre of Excellence, where an interacting community of academics, practitioners and industry innovate to meet future challenges and provide benefits for Scotland's health, wellbeing and wealth; and
- Ensure Scotland is recognised worldwide as a chosen location for trialling innovative Telehealth and Telecare services products.

This programme is fully focused on utilising advanced Telehealth technologies to deliver care to patients within their home setting, whenever possible. It will also deliver enhanced integration with our partner organisations and is therefore aligned with the strategic ambitions set out in the National Delivery Plan.

3.4.3 Spending Review / Austerity

The Ambulance Telehealth Programme will take the current financial landscape into account and in particular, the current Spending Review which requires difficult decisions to be taken if public services are to be maintained as available funds decrease. As a result, there will be considerable emphasis placed on cost-effectiveness and value for money throughout the programme lifecycle.

3.5 Investment Objectives

The investment objectives for this programme have been developed from the premise that it is essential for the Service to have access to enhanced mobile data services in order to meet the demands placed on it by the Scottish public in an efficient and effective manner and thereby protect patient safety and care. The current systems for providing these services have been in place since 2007 and are now in need of replacement due to the age of the system hardware and the need to advance towards use of newly available technology to improve communications and enhance patient care. The following investment objectives have been aligned to the NHS Scotland Healthcare Quality Strategy Ambitions and Triple Aims and have been developed to ensure that the Service has access to improved mobile data services through 2016 and beyond:

Programme Objective	Summary of Strategic Programme Objectives	Strategic Links	2020 Priority Areas for Improvement	Quality Ambitions	Triple Aim
1	To deliver an updated user interface for the mobile data terminals by March 2017	Healthcare services are more efficient. Healthcare workers have better access to the information they need.	Person-centred care Unscheduled and Emergency Care Innovation Efficiency and Productivity	Person-centred Effective	Quality of Care Value and Sustainability
2	To deliver faster mobile data connections to the mobile data terminals supporting 3G, 4G and, where applicable, satellite communications by March 2016	Healthcare workers have better access to the information they need.	Innovation Unscheduled and Emergency Care Efficiency and Productivity	Effective	Value and Sustainability
3	To deliver compliance with Vehicle Type Approval guidelines issued by the Vehicle Certification Agency under the CEN standard (BS EN 1789:2007) for Medical Vehicles and their Equipment from 2015.	Not applicable to eHealth delivery plan but delivers on the SAS HEAT target to provide a safe environment for the delivery of healthcare services.	Safe Care	Safe	Quality of Care
4	To deliver a robust and reliable hardware solution which supports wireless data communications outside of the dock providing connectivity to remote clinical information at the point of care by March 2016.	Healthcare services are more efficient Healthcare workers have better access to the information they need	Person-centred care Safe Care Unscheduled and Emergency Care Care for Multiple and Chronic Illnesses Innovation	Person-centred Safe Effective	Quality of Care Value and Sustainability
5	To provide a solution which supports access to external clinical information to aid clinical decision making and access to Back Office systems for incident reporting, eForm completion and accessing business information by March 2017	Healthcare services are more efficient Healthcare workers have better access to the information they need Improve the safety of people taking medicines and their effective use	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability

6	To deliver a solution that will provide data link capability to connect to patient monitoring equipment at the point of care, allowing automatic population of clinical data within the ePRF by March 2017	Healthcare Services are more efficient Performance data is readily available to proactively improve service delivery	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability
7	To enable electronic data sharing between responding vehicles to reduce duplication of effort and to allow responding Service clinicians to review the full treatment record for the patient by March 2017.	Healthcare services are more efficient Healthcare workers have better access to the information they need. People with long term conditions are better supported	Person-centred care Safe Care Unscheduled and Emergency Care Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Value and Sustainability
8	To deliver a mobile Telehealth capability that supports video connections to health care professionals from within the ambulance environment (dependant on bandwidth availability) by March 2016.	Healthcare services are more efficient Healthcare workers have better access to the information they need People with long term conditions are better supported People will be treated at home or in their own community	Person-centred care Safe Care Unscheduled and Emergency Care Integrated Care Care for Multiple and Chronic Illnesses Health inequalities Workforce Innovation Efficiency and Productivity	Person-centred Safe Effective	Quality of Care Health of the Population Value and Sustainability
9	To deliver a solution that will reduce like-for-like revenue costs in comparison to the current solution by March 2017.	Healthcare services are more efficient	Efficiency and Productivity	Effective	Value and Sustainability

3.6 Existing Arrangements

3.6.1 Summary of History

The Service introduced Cab Based Terminals in all frontline A&E vehicles between April and October 2007. The cab based solution includes a front and rear computer terminal, providing allocation, mobilisation and satellite navigation facilities in the front of the vehicle and an electronic patient report form system (ePRF) in the rear of the vehicle. Since the introduction of the electronic patient reporting system, more than 5 million patient records have been uploaded to the ePRF database and data warehouse.

The ePRF system in the rear of the vehicle records relevant clinical observations and treatments undertaken during the period of care by ambulance service staff. The ePRF system was designed in partnership with the software supplier and was built as a patient-centred application which should be quick and easy to complete without the need to access drop-down lists or excessive typing.

The ePRF application uses a series of selection tools to record patient observations. There is no requirement to record negative observations as only the positive selections made will be printed to the final ePRF.

The information collected in the ePRF is stored in a centralised clinical database for clinical reporting and audit.

Since its introduction in 2007, the allocation & mobilisation and ePRF applications have been subject to continual software updates to improve health & safety, clinical recording and to introduce aids to clinical decision making.

In addition to the software updates, improvements have been made to the hardware installed in the vehicles by introducing a cable-free docking solution with an improved rubber-casing to protect the unit in the rear of the vehicle.

A revised hardware solution was also identified and purchased to cater for the Paramedic Response and Urgent Tier vehicles. These were provided with a smaller 8" front terminal and an updated central communications unit.

The Service won the E-Health Insider (EHI) 2010 award for 'Best Use of Technology in Healthcare' and took the 'Overall Winner' award at the EHI 2010 awards ceremony based on the mobile data technology and the advancements made in linking our electronic clinical reports with other systems.

3.6.2 Current Situation

The current supplier is responsible for the supply, installation and maintenance of the Cab Based Terminals and the related hardware and software. The existing contract with the supplier has reached the end of its primary contract term and continues on a rolling year-on-year basis. Further software enhancements to the existing platform have now

ceased, with the exception of urgent clinical developments, in anticipation of this redevelopment programme.

The Service are dealing with an increasing number of faults related to poor battery performance on the existing tablets and whilst these are continually refurbished as part of the maintenance contract, there is reluctance from staff to carry the units outside of the vehicle as they have no confidence in the battery life.

Previous developments, such as the early warning alert for sepsis which was trialled with NHS Fife, produced disappointing results due to the lack of data communications when the unit is undocked. Feedback from staff highlighted that they are unable to trigger the sepsis alert as they are often unable to re-dock the unit whilst the vehicle is travelling on route to the hospital, for health and safety reasons. Future developments of real-time data transfer will also be dependent on this type of wireless communication.

A full operational requirements determination and analysis has been completed and documented in support of this programme. This document was used to compile the functional specification document issued to all shortlisted suppliers at the invitation to tender stage.

The Initial Agreement in support of the Ambulance Telehealth programme was approved by the SAS Board in April 2013 and was tabled at the Scottish Government CIG meeting in May 2013. The Outline Business Case V2.3 was approved by CIG in March 2014. In April 2014, CIG approved a request from the Telehealth Programme to progress to full business case using a 2 phased approach to match the funding profile they had offered. Phase 1 covering vehicle hardware procurement and installation. Phase 2 covering ePRF and other software procurement, implementation as well as the introduction of integrated clinical devices.

3.7 Business Needs – Current & Future

3.7.1 Improved Patient Care Through the Use of Technology

One of the primary drivers for change is the desire to improve patient safety and care through the use of enhanced in-vehicle technology including, but not limited to, improved navigation aids to get to patients faster, improved decision support tools to ensure patients get the most suitable treatment or intervention and improved clinical tools to assist diagnosis and monitoring.

3.7.2 Scottish Government 2020 Vision

Another primary driver for change is the Scottish Government 2020 Vision, the Ambulance Telehealth programme aims to enable access to healthcare services within the community by utilising the ambulance vehicle as a technology hub for real-time data sharing and live patient consultation with remote healthcare professionals.

3.7.3 Cost Savings for NHS Scotland Partners

A further driver for change is the requirement to provide healthcare more efficiently. The Ambulance Telehealth Programme will form an integral part of the Scottish Ambulance Service strategy to significantly reduce unnecessary conveyance to hospital. This will be achieved by providing our staff with access to viable and reliable alternative care pathways. This in turn will reduce the demand for hospital services and provide our Partners with cost saving opportunities.

3.7.4 Existing Contracts

A significant driver for change is the fact that the existing contract to supply the Service with mobile data services continues on a rolling, year on year basis. This is not considered to be best practice and the new system will be bound by long term support contracts following a robust and approved procurement process.

3.7.5 Ageing Technology & Equipment

Another significant driver for change is the need to replace the ageing equipment currently used in the ambulances as it has been in continuous use for the past 7 years. The hardware is becoming increasingly unreliable, particularly in regard to poor battery performance. There are also limitations in further developing the software due to the constraints imposed by aging hardware.

3.7.6 Greater Data volume Services

Mobile data transmission services are currently limited to GPRS on the Vodafone mobile telephone network. One of the main drivers for the Ambulance Telehealth Project is to support frontline ambulance services and improve the scope and quality of patient care through the provision of mobile broadband speed data services.

3.7.7 Type Approval Legislation for Ambulance Vehicles

The Vehicle Certification Agency has issued a new CEN standard (BS EN 1789:2007) for Medical Vehicles and their equipment which includes a new Vehicle Type Approval guideline to ensure the safety of both patients and ambulance crews. This is a voluntary standard but given its importance, it is adopted across the health industry as a requirement when buying new vehicles.

This new guideline is widely expected to impact on the choice and fitting of mobile data equipment in the driver cabin of the ambulance. It is anticipated that our current standard hardware will not comply with this new standard due to the size of the terminal and the fixed docking station.

3.7.8 Existing Costs

The Service currently spends circa £1m per annum on all A&E mobile data services, through the existing supplier contract. This is the total current cost of the cab based terminal hardware and software technology and which will be replaced by both Phase 1

and Phase 2 of the Ambulance Telehealth Programme. Given the current economic climate, the Service are keen to explore all potential options for reducing like for like costs and containing overall costs.

3.8 Business Scope & Key Service Requirements

3.8.1 Business Scope

Phase 1 of the Programme covers the supply, installation, test and commissioning of vehicle based hardware including communication hubs, mobile data terminals/tablets, printers and an ongoing support and maintenance contract.

3.8.2 Resultant Service Requirements

In terms of mobile data, current services are considered to be inadequate due to network coverage and bandwidth (data-rate) limitations, ageing hardware and out-dated software platforms. Therefore the high-level service requirements being addressed in Phase 1 of the programme can be summarised as:

- More robust and reliable communications infrastructure and tablets.
- More user friendly version of the current ePRF system using App based software.
- Increase coverage compared to current arrangements.
- Increase bandwidth compared to current arrangements.
- Enhance the services and capabilities available in the Ambulance environment.
- Enhance the services and capabilities at point of care out with the ambulance using wireless mobile technology.
- Enhance satellite navigation that can be updated regularly and simply.
- Improved printers with better print speeds and legibility of print quality.

3.9 Benefits Criteria

The overall aim of the programme is that the Service will be able to offer all of Scotland's residents and visitors efficient and effective A&E Ambulance services with more care provided locally.

Patient safety will be improved due to the availability of real-time data for use by HCPs and ambulance crews will be better supported in patient-centred clinical decision making.

Benefit and efficiency gains will potentially be seen in the wider NHS economy in terms of enhanced information sharing of patient data, reduced hospital admissions and reduced attendance at A&E. There is also evidence to support the claim that by treating patients in the most appropriate care setting, clinical outcomes will improve, and patients will be treated in an environment they prefer.

A full benefits appraisal is set out in Section 4.7 of this document.

3.10 Strategic Risks

Risks to the programme will be identified, mitigated and controlled in accordance with NHS Scotland risk management models methodology using both a "Likelihood" and "Impact" assessment. The main high level risks identified at this early stage are:

- That the programme does not deliver within the required timescales
- That the programme is not provided with the level of resources it requires
- That the programme does not deliver a solution that meets the user requirements

A full risk assessment is included in Section 4.8 of this document.

3.11 Constraints & Dependencies

3.11.1 Constraints

The main constraints related to this programme that have been identified are:

- Logistics – the complexity of fitting the entire SAS fleet whilst maintaining normal operations.
- Procurement legislation – e.g. OJEU thresholds.
- Technical – e.g. the ability of suppliers to deliver all of the operational requirements.
- Commercial / Legal / Contractual – e.g. the appropriateness of continuing with a year-on-year rolling contract.
- Resources – e.g. financial envelope, complexity of splitting the spend profile across 2 phases.
- Timescales.

3.11.2 Dependencies

The key dependencies related to this programme have been identified as:

- Fleet Replacement Programme
- SAS 2020 Vision
- Government Strategy
- Availability of Mobile Network Provision

The Programme Board and Programme Manager will closely monitor the above constraints and dependencies throughout the lifecycle of the programme.

Section 4: Economic Case

4.1 Review of Economic Case detailed in the Outline Business Case

As part of the development work for the FBC, the economic case contained within both the Initial Agreement and OBC have been reviewed to identify whether any changes to the underlying assumptions have arisen as a result of more detailed information being available.

There have been no changes which have affected the identification of the critical success factors or the evaluation of the short-listed options which were assessed as part of the economic case in the OBC.

The benefits and risk analysis and scoring were revisited at a workshop with key stakeholders held in August 2014. During this workshop it was identified that a new risk assessment model had been adopted by the organisation which uses a different scoring technique from the one used to assess the risks at the OBC stage. The economic case contained in the OBC was therefore re-run to determine the outcome using the new model. The outcome of value for money assessment using the new risk model confirmed that option 3 remained the preferred option.

The results of the revised benefits and risk scoring are shown in Sections 4.7 and 4.8.

4.2 Critical Success Factors

The following critical success factors have been identified for this programme:

- Availability of sufficient funding to support development, training and implementation.
- Organisational support for the programme.
- Availability of dedicated programme resources throughout the programme lifecycle.
- Ability of suppliers to provide a solution that meets the identified Operational Requirements.
- Availability of public communications networks in Scotland to support the solution nationally.
- Availability of proven and trusted technology to meet the Operational Requirements.

4.3 Main Business Options

The Outline Business Case presented 3 main options, short listed from the Initial Agreement for consideration. These options were subject to a full economic and financial analysis in the OBC.

- **Option 1. Update the system software but not the hardware**

    - This option provides an updated software interface which gives an improved look and feel to the allocation & mobilisation, satellite navigation and patient reporting software. However, this option would not meet the Service and Scottish Government aspirations of delivering locally based care without the need for transportation to hospital. This option would deliver limited functional benefits to users due to the technology limitations of the existing hardware i.e. while clinical diagnostic equipment can be interfaced into this option, it would be limited by the capability of the existing hardware and would require significant additional investment.

- **Option 2. Update the rear terminal hardware and software to improve electronic patient reporting platform only**

    - This option will deliver a revised hardware and software solution to replace the existing tablet used in the rear of ambulance vehicles for recording a clinical patient record using the [redacted] software platform. However this is a solution which will tie the Service into a single supplier given the essential requirement for total technical and operational compatibility between the front and rear cab systems. Option 2 would not provide a solution for the requirements of the Vehicle Type Approval legislation. This option would not allow for a full Telehealth video solution to be implemented and will therefore not provide the most effective remote clinical support to patients and paramedics to reduce the need for transport to hospital and to support the 2020 vision of healthcare provision at home or in a homely setting.

- **Option 3 *(preferred option).* Update the full mobile data solution within the vehicle to provide end to end Ambulance Telehealth solution**

    - This option updates the front and rear terminal hardware and software and implements a true broadband and wireless communication infrastructure. It will enable clinical diagnostic equipment to be interfaced with the software and hardware to meet the strategic objectives of the 2020 vision and means the Service will be able to further develop the solution as technology advances. The decision to split the programme into two phases means that only the hardware elements of option 3 will be delivered in Phase 1 with the software elements following in Phase 2.

4.4 Economic Appraisals

The economic appraisal completed at OBC staged considered the benefits, costs and risks of the shortlisted options to inform a value for money assessment and arrive at a rank order of the options in terms of value for money. Using the revisited benefits and risk analysis scoring as described above, the economic appraisal was re-run to

determine what the outcome would have been at OBC if these scores were used. In addition, the costs used for Phase 1 in the revised economic analysis were the preferred solution costs as determined by the outcome of the procurement evaluation. Full details are given in Section 7.1. The costs used for Phase 2 remained the same as in the OBC. The results are shown in the table below:

Option	BENEFITS	COSTS	Costs per Benefit	Costs per Benefit	RISK
	Weighted Benefit Score	Equivalent Annual Charge	£000 / Points	Rank Order (lowest cost per benefit first)	Median risk quotient
	Points	£	£		
Option 1 Update System software but NOT hardware	107	[redacted]	[redacted]	**3**	15
Option 2 Update rear terminal HW and SW for ePRF only	497	[redacted]	[redacted]	**2**	15
Option 3 Update the full mobile data solution for full Telehealth system	761	[redacted]	[redacted]	**1**	12

The table above shows that Option 3 is the highest ranking option and therefore the preferred way forward. The conclusion was subjected to sensitivity analysis to verify the robustness of the preferred option and to determine the level of increase in costs or decrease in benefits required to amend the rank order of the options. The outcome of the sensitivity analysis showed that costs would have to increase by 206% and benefits would have to decrease by 41% to amend the rank order of the options. This proves that Option 3 is not very sensitive to fluctuation and remains best value for money.

4.5 Benefits

The benefits that will be derived from investment in Ambulance Telehealth are shown in Appendix A. There are clear strategic, operational and business benefits which give rise to a mix of quantitative and qualitative measurements.

4.6 Risk Assessment

The risk assessment was carried out by on all of the short-listed options as part of the OBC process. All 3 options have been re assessed for the FBC by the stakeholder group. The risk assessments scores are shown in Appendix B.

The outcome of the risk analysis is detailed below:

- Option 1 presents a Median Risk Quotient of 15 which is regarded as HIGH. Based on risk assessment alone this would not be a recommended option.

- Option 2 presents a Median Risk Quotient of 15 which is regarded as HIGH. Based on risk assessment alone this would not be a recommended option.

- Option 3 presents a Median Risk Quotient of 12 which is regarded as HIGH. This has the lowest risk score and therefore based on risk assessment alone this would be a preferred option and will be further assessed in terms of benefits and costs.

As described in Section 4.1, the Service has adopted a new risk assessment model. This new model is more risk averse than the previous one and has resulted in Options 2 and 3 being reclassified as high risk options as opposed to moderate risk options under the previous model. The Programme Board and Programme Team are continually reviewing and mitigating these risks throughout the duration of the programme and it is anticipated that the level of risk associated with the preferred option will fall as the programme develops.

4.7 Optimism Bias

As part of the review of the Economic Appraisals, the optimism bias appraisal was also reviewed. All contributory factors applicable to this programme were assessed to ensure the mitigation applied to each factor reflects the most up to date information available.

Optimism bias has been taken into consideration when calculating the equivalent annual charge, as shown in the economic appraisal table above.

4.8 Preferred Way Forward

The preferred option for investment is **Option 3** as this option fully meets the operational, clinical and technical requirements of the Service, maximising benefits to staff, patients and healthcare partners alike whilst carrying the minimum business risk. This option meets the 2020 aspirations of the Service and the Scottish Government by enabling more people to be cared for at home or in a homely setting and provides a full Telehealth solution to enhance clinical decision support and to facilitate patient referral to community based care providers rather than an unnecessary conveyance to hospital. The technology will be future proof as far as possible to allow further development of the system as technology advances and matures to ensure that the Service provides the best possible service to patients through ongoing technology innovation.

The Service has consulted internally and externally (through appropriate Stakeholder events) about these proposals and the Service's stakeholders are fully supportive of the preferred option.

The OBC, as approved, highlighted that the preferred option was the procurement of a full software and hardware solution. This was deemed to be the only option that was feasible, affordable and represented value for money.

4.9 Preferred Option (Description)

Detailed Description: ***Option 3.*** The following description of the preferred option covers both Phase 1 and Phase 2 deliverables. It should be noted however that this FBC only covers delivery of Phase 1.

This option will enable the ambulance vehicle as a wireless communications hub to support allocation & mobilisation technology in the front of the vehicle, electronic patient reporting and data sharing in the rear of the vehicle and to enable wireless communications both inside and outside the vehicle to support Telehealth and external data sharing connections to healthcare partners.

A mobile broadband communications capability will be provided in all frontline A&E vehicles. In order to maximise the potential for data coverage in remote areas where mobile broadband coverage is most likely to be limited, a small number of vehicles may be fitted with satellite capability, where feasible.

Allocation & Mobilisation: The allocation & mobilisation solution will integrate new and existing communication systems to provide automated dispatch information to ambulance crews to support rapid response and attendance to emergency and urgent incidents.

The new allocation & mobilisation system will provide the following capabilities:

- An interface with the command and control system to provide allocation messages presented via an audio or visual interface
- Automatic updates to incident and location information
- Crew warning facility to advise of potential dangers on scene
- A communication interface between the ambulance and control room to support inbound crew contact via a voice or text solution
- Modern, commercially available Satellite Navigation application
- Automatic Satellite Navigation to incident address via an audio or visual interface
- Automatic passing of patient demographics and incident details to ePRF
- Pre-arrival patient information from ECS/KIS records via an audio or visual interface
- Provision of a mapping update system to ensure satellite navigation data and maps can be maintained effectively.

Electronic Patient Reporting: The new ePRF will integrate new and existing communication systems to provide automated patient information and support to responding resources, receiving clinicians and direct to the patient's GP (where possible). The system will also support the effective and efficient delivery of health care for all patients.

The new ePRF will provide the following capabilities:

- Electronic data recording of all patient observations
- Data links to automatically record output from patient monitoring and diagnostic equipment

- Data sharing between responding resources to provide a single patient ePRF with input from multiple clinicians.
- Access to clinical support tools
- Access to patient history information both internal and external
- Access to internal resources including incident reporting tools and Service policies
- Intuitive interface based on patient age, gender and chief complaint
- Clinical decision support with automatic warning flags for out-of-parameter observations
- Support real-time data links to receiving hospitals for electronic patient handover
- Support data transfer to patients' GP
- Accurate clinical data for reporting and auditing

Telehealth: The Telehealth solution will provide a new communication system to link ambulance staff and patients with external healthcare providers to enhance clinical decision support and to facilitate patient referral to community based care providers as opposed to hospital.

The Telehealth solution will provide the following:

- Enable the ambulance vehicle as a secure communications hub supporting mobile wireless broadband for data and video streaming, backed up by the existing communication technologies.
- Access to a database holding accurate information about local facilities, contacts and operating times.
- Video conferencing facility provided via a portable video camera, preferably tablet based.
- Full audit trail of Telehealth connections and clinical decisions taken.
- Still image capture and transfer facility.
- Secure storage facility for images.
- A robust, secure and reliable hardware platform to enable mobile working
- ePRF data transfer facility in support of still or live video images, possibly via an email facility.
- Visible communications display to allow users to determine whether video connections can be achieved.
- Automatic switch to voice/radio communications facility.
- Provide access to back office systems from the tablet.
- Provide the capability of access to a directory of services from the tablet.
- Provide the capability of wireless connectivity with on board clinical devices.
- Provide the capability to interchange the front and rear tablets if required during a situation where one or the other had failed

Section 5: Commercial Case.

5.1 Agreed Scope and Services

Following a series of workshops with key stakeholders the following are the agreed scope and services for Ambulance Telehealth Phase 1:

5.1.1 Vehicle-based mobile communications hub

The communications hub should provide the following:

- External wireless data communications including access to mobile broadband.
- Alternative mobile broadband capability where there is no mobile phone signal e.g. in vehicles based in rural areas, where feasible.
- Wireless communication with tablets and diagnostic medical devices within the ambulance, including via Wi-Fi and Bluetooth.
- GPS capability to provide vehicle tracking data to the Service's Ambulance Control Centres as well as satellite navigation in the vehicle.
- Secure communication with remotely located Scottish Ambulance Service servers for data transfer.
- The ability to provide the best possible mobile network infrastructure coverage and mobile signal strength throughout Scotland, including the Highlands and Islands e.g. through bandwidth aggregation.
- Should be bearer independent, although this would initially be expected to work with the Service's current bearer provided by Vodafone.
- Capability for a wired link to the in-vehicle printer.
- All necessary vehicle wiring and external accessories such as antenna must be included.
- Scope for future expansion as new technologies come onto the market

5.1.2 Tablets

The tablets will be:

- A commercially available 'off the shelf' product.
- Ruggedised for use in a challenging operational environment e.g. either inherently or by using a compatible ruggedised cover.
- Charged from a 12 volt supply provided by the vehicle power management system (via a fixed power feed in the front of the vehicle and a docking station with a reliable and robust power connector in the rear of the vehicle).
- Capable of being installed in a fixed position in the dashboard (front tablet) and in a suitable docking station or bracket for easy removal in the rear the vehicle or in the case of PRUs, held securely in a harness (rear tablet).
- Easily cleaned for infection control purposes.

5.1.3 Printers

The printers will be:

- A commercially available 'off the shelf' product.
- Suitable for use in a moving vehicle.
- Powered from 12 volt supply via the vehicle power management system via a fixed power feed in the back of the vehicle.
- Easily cleaned for infection control purposes.
- Directly wired to the communications hub.

5.1.4 Installation and support

The contract will include installation of all supplied equipment in the Service's A&E fleet. The contract will also include the de-installation of the current equipment and its return to an agreed location for disposal by the Service. The Service will work with the successful supplier to coordinate the abstraction of operational vehicles for equipment to be fitted. The vast majority of installations will be carried out at the Service's own facilities at locations throughout Scotland.

In cases where new vehicles are being fitted, the supplier will work with the Service's contracted vehicle converter(s) to ensure that vehicles are pre-prepared during conversion, e.g. wiring, bracket etc., so that the installation of the tablets and communications unit requires the minimum re-fitting on delivery. There may be a transition period during 2015 where new vehicles require full installation but no de-installation, depending on the delivery timescale for new vehicles relative to the installation plan for this programme.

The contract will also include ongoing maintenance and repair of this equipment for a minimum of 5 years, with a two year optional extension. The Service has approximately 140 locations throughout Scotland (including islands), and the service provider will be required to provide an acceptable standard of support and maintenance across the country to support our 24/7 operations.

5.2 Agreed Risk Allocation

It is important in any programme of considerable investment to ensure that risks are allocated and apportioned to the party best able to manage that risk. Consequently, the Ambulance Telehealth programme has done this through the Invitation to Tender which transfers appropriate risks in the following areas to the supplier:

- Installation and de-installation of all vehicle based hardware
- Built in 5 year support & maintenance contract
- Test & Commissioning of systems prior to implementation across the Service

Service risks will be allocated and managed through the development and management of Risk Logs thought the life of the Programme.

5.3 Agreed Charging Mechanisms

The proposed payment mechanism is as follows:

- Payment for goods after delivery in accordance with the proposed conditions of contract.
- Installation and ongoing support and maintenance payable after delivery of the relevant services in accordance with the proposed conditions of contract.

These payments will relate to the operational and extension phases of the contract. There will be no pre-delivery payments, as this is not considered necessary for the subject matter of the contract. This is subject to agreement with the successful supplier.

The ongoing support and maintenance element of the contract will be subject to a service level agreement, and service levels will be monitored to ensure compliance. This will not be subject to service credits as it is unlikely that this would be effective given the expected annual value. However, persistent failure to achieve the contracted service levels will enable to Service to terminate the contract if required.

Change related charges will be managed through a change control process contained in the contract. This will enable changes to be priced prior to acceptance to ensure ongoing affordability. Limited changes to the infrastructure over the duration of the contract are anticipated.

It is anticipated that the contract will be priced and paid in sterling.

5.4 Agreed Key Contractual Arrangements

The contract will be for an initial period of 5 years with the option to extend for a further 2 years. The contract will be based on NHS conditions of contract.

Overall, the successful supplier is expected to provide the specified good and services in exchange for the appropriate remittance paid in accordance with the contract. The only exceptions to this are:

- The Service has stated that it will provide an asset coordinator to assist the successful supplier during the implementation phase of the contract; and
- The Service has stated that the supplier may use its premises for carrying out services related to this contract providing these premises meet the supplier's health and safety and any other necessary requirements.

The contract will provide a mechanism for dealing with disputes in line with NHS terms and conditions of contract.

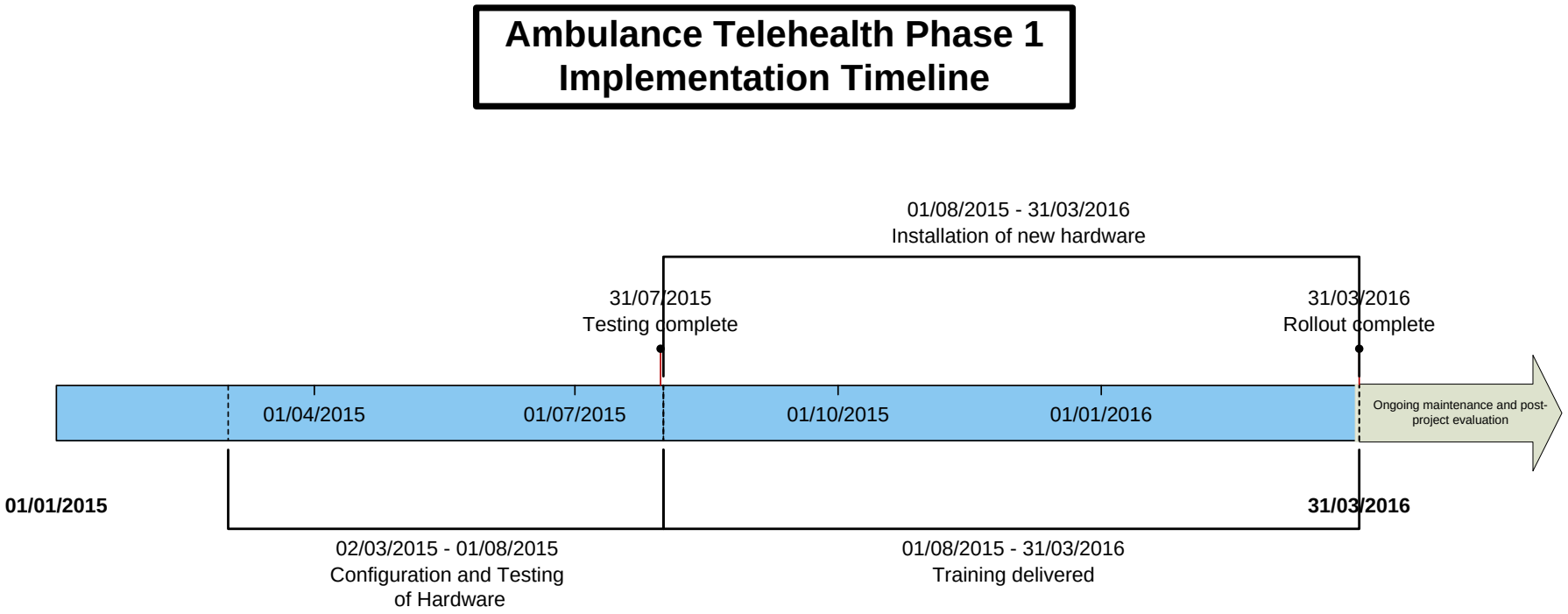
The transfer of risk in the goods occurs on delivery in line with NHS terms and conditions of contract.

5.5 Agreed Personnel Implications

There is potential for changes to Standard Operating Procedures which will be agreed through Staff Partnership. The Programme will have Staff Partnership representation to ensure that all personnel issues are identified and managed effectively.

5.6 Agreed Implementation Timescales

The timeline below outlines the key milestones for the delivery of the goods and services of Phase 1 of the Ambulance Telehealth Programme.



5.7 Agreed Accountancy Treatment

The capital costs associated with the Ambulance Telehealth Programme will be capitalised and depreciated over the useful life in line with all appropriate accounting standards and this FBC is predicated on the appropriate level of Capital Funding being made available from the Capital Investment Group.

Section 6: Financial Case

6.1 Capital and Revenue Requirements

The financial appraisal assesses the net impact of the programme on the Service's Balance Sheet and Income and Expenditure Account.

The Service and Scottish Government Capital Investment Group have previously approved the OBC for the Telehealth Programme. As part of the OBC approval process, the CIG allocated funding of £6m to the programme, which was to be split over the two phases resulting in £3m being allocated for Phase 1 and £3m being allocated for Phase 2 in 2016/17.

The results of the procurement process show that there is an indicative capital requirement of £3.804m for Phase 1. This figure includes irrecoverable VAT. New VAT rules are planned for the end of November 2014 which may mean that some or all of the VAT would be recoverable. If this is the case the capital requirement would be £3.187m While £3.804m is in excess of the anticipated funding allocation from the CIG, the preferred solution, as determined by the procurement process establishes the following benefits which demonstrates better value for money and reduced risk for the organisation:

- The preferred tablets are inherently ruggedized and are specifically built for challenging environments. They are designed to withstand drops, shocks, spills and vibration. In a vehicle environment, the tablets will be subjected to heavy handling therefore the design of these tablets should mean that there is a limited risk of faults and damage occurring, thereby reducing ongoing repair and replacement costs. It will also minimise any operational difficulties crews face that might impair their ability to deliver care due to issues with the tablets.
- The integrated casing means that staff can easily dock and undock the tablet without having to open casing ports to insert charging cables. This will minimise any issues with damage to charging cables and ensure the tablet does not have its IP65 rating compromised by having parts of the protective casing open during charging.
- The tablets are capable at operating at very low temperatures (to -21C) meaning staff will be able to fulfil their duties without having to wait for the tablets to heat up before they become operational.
- Having the same tablet in both the front and rear of the vehicle offers potential for swapping the tablets in business continuity situations, i.e., if a fault occurs on one unit the other can be used in its place, thereby reducing downtime and the need to revert back to paper patient record forms.
- The solution has been specified to utilise standard connectivity and communication platforms that will enable any future devices and systems to integrate with the solution

The estimated revenue costs for Phase 1 of the programme for option 3 are as follows:

Financial Appraisal (contains all irrecoverable VAT)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Phase 1 Core Revenue Costs	565,291	610,640	521,505	537,515	554,017	570,637	587,756
Current revenue expenditure associated with Phase 1	538,619	554,778	571,421	588,564	606,220	624,407	643,139
Estimated additional funding required/(savings generated)	26,672	55,862	(49,916)	(51,048)	(52,203)	(53,770)	(55,383)

[1] Year 1 costs includes current maintenance costs pro-rata to accommodate implementation timescales

Phase 1 revenue costs include a 3% allowance for indexation from Year 2 onwards.

The core revenue costs for Year 1 and Year 2 include salary costs for the in-house Project Team. These costs will be funded from e-Health budget and it is therefore expected that Phase 1 will generate savings of £4.5k in Year 1 and £48.8k in Year 2.

The OBC estimated savings in like-for-like revenue costs of around £260k from Year 4 onwards. The remaining savings will be derived from Phase 2 of the Ambulance Telehealth Programme.

6.2 Impact on Balance Sheet

The current cab based terminals and software will be fully depreciated by 31st March 2015, therefore there will be no additional impact on the Service's Balance Sheet from these assets.

The Telehealth Programme will be capitalised in line with the Scottish Government's Capital Accounting Manual. As the deployment and operation of the technology in Phase 1 is not dependent upon the completion of Phase 2, the assets procured as part of Phase 1 will be capitalised upon implementation and depreciated over 7 years from the date of capitalisation. The 7 year life is based on the life of the existing cab based terminals and is a reasonable estimate of the useful life of the new equipment.

This will result in the Service's Fixed Assets increasing by an anticipated £3.682m from the date of full implementation of Phase 1.

Phase 2 will be treated as a separate asset from Phase 1 and again will be capitalised in line with the Capital Accounting Manual. This will result in an expected increase of £3m onto the Fixed Assets balance from implementation of Phase 2.

These capital costs have been built into the Service's 5 Year Financial Plan and are affordable within the approved capital allocation from SG.

6.3 Impact on Income and Expenditure Account

As shown in the table above, the revenue costs for Phase 1 will result in savings to the Service . This is as a result of reduced support and maintenance charges associated with the hardware.

The assets procured as part of Phase 1 will capitalised upon implementation and depreciated over a 7 year life. This will result in depreciation charges of around £544k per annum. In comparison, at the outset, the current cab based system incurred annual depreciation charges of £582k. Thus a saving of £38k per annum should be acknowledged.

Section 7: Management Case

7.1 Procurement Strategy

The Service's sourcing strategy followed Route 3 of the Procurement Journey. This strategy resulted in the selection of the Restricted Procedure as the most appropriate method for undertaking this procurement. The Service published a contract notice in the Official Journal of the European Union on 4th June 2014. There were 16 Pre-Qualification Questionnaires received in response to the notice, and this was shortlisted to 5 suppliers.

The Invitation to Tender was published on 19th August 2014. Out of the 5 suppliers invited to tender, only 3 submitted a response. However, each of the 3 suppliers presented several different solutions within their bids, particularly with regard to the choice of tablets offered for consideration. This resulted in 19 options being reviewed and scored by a cross-functional evaluation team in a desktop evaluation process. Suppliers were given the opportunity to present to the evaluation team and demonstrate their solution as part of this process.

Each option was scored against the following criteria, with each option receiving a score of 1, 3 or 5 depending on how well the option met the criteria:

Ambulance Telehealth (Phase 1) tender evaluation	Score Weighting
Technical merit	
Overall technical solution	**14.0**
Technical - other	**3.5**
Aesthetic and functional characteristics	
Tablet	**7.5**
Printer	**2.5**
Communications hub	**7.5**
Price (max 25 points awarded)	**5.0**
After sales service	
Warranty	**2.5**
Support & maintenance proposals	**17.5**
Technical assistance	
Project management proposals	**2.5**
Installation proposals	**5.0**
Documentation & training	**2.5**
Period of completion	**5.0**
Delivery date	**5.0**

The final scoring of all options was as follows:

Supplier	Option	Total Score	Rank Order by Total Score	Total Capital Costs £
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Commercial in confidence data removed

While the option ranked number 1 is around [redacted] more expensive than the second ranked option, the tablets supplied with the option offer a number of benefits that make them superior:

- The tablets are inherently ruggedized and specifically built for challenging environments. They are designed to withstand drops, shocks, spills and vibration. In a vehicle environment, the tablets will be subjected to heavy handling therefore the design of these tablets should mean that there is a limited risk of faults and damage occurring, thereby reducing ongoing repair and replacement costs. It will also minimise any operational

difficulties crews face that might impair their ability to deliver care due to issues with the tablets.

- The integrated casing means that staff can easily dock and undock the tablet without having to open casing ports to insert charging cables. This will minimise any issues with damage to charging cables and ensure the tablet does not have its IP65 rating compromised by having parts of the protective casing open during charging.
- The tablets are capable at operating at very low temperatures meaning staff will be able to fulfil their duties without having to wait for the tablets to heat up before they become operational.
- Having the same tablet in both the front and rear of the vehicle offers potential for swapping the tablets in business continuity situations, i.e., if a fault occurs on one unit the other can be used in its place, thereby reducing downtime and the need to revert back to paper patient record forms.

In contrast, the tablets supplied with the options ranked 2 -5 have a number of risks associated with them:

- They are only guaranteed to operate to 0 degrees C. Given that during the winter months, the temperature in most parts of Scotland will be below 0 degrees C, there is a risk that the tablets will not work and will result in operational inefficiencies and Ambulance Crews having to revert to paper patient record forms.
- These tablets are not designed for heavy use and it therefore likely that ongoing repair and replacement costs will be substantial.
- The casing on these tablets is not integrated, meaning staff will have to open the casing port covers to dock the tablet. This is likely to lead to damage to the casing and potentially the cables over time. Also, when these tablets are in a docked position, the IP65 rating is compromised because the casing port has been opened.

As shown in the table above, the top scoring compliant bidder was [redacted]. All bidders will be advised of the outcome of the process by the end of November 2014, and the mandatory standstill period will commence on 1 December 2014.

It is anticipated that the contract will be awarded in late December 2014 / early January 2015, with goods being delivered by 31st March 2015.

7.2 Agreed Arrangements for Programme Management

As with all large complex programmes undertaken by the Service, the Ambulance Telehealth Programme will be managed and governed in line with the principles of Managing Successful Programmes (MSP) good practice as well as PRINCE2 project management guidance. As opposed to replicating the detail in the body of this FBC document, further information on the various roles, structures and governance arrangements recommended by MSP and PRINCE2 can be accessed if required by following the links provided in Appendix B.

A dedicated Programme Board has been established to oversee the Programme for the remainder of its lifecycle from the development of the FBC through procurement and implementation to benefits realisation and programme closure.

The remit of the Programme is as follows:

The Ambulance Telehealth Programme Board is authorised by the Scottish Ambulance Service Board to act on behalf of the Board and to monitor, control and report progress and governance on all Ambulance Telehealth developments.

The Ambulance Telehealth Programme Board will:

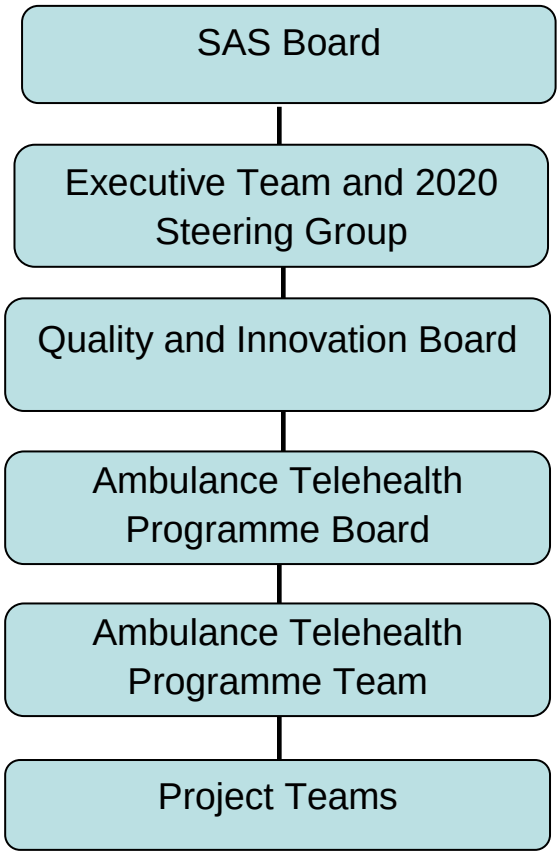
- Provide strategic direction and guidance
- Ensure the programme remains aligned to SAS strategy
- Ensure the Business Case remains valid
- Monitor the programme progress at key intervals through regular highlight reports
- Review risks and issues and provide guidance where necessary on resolution
- Report progress to the Strategic Implementation Programme Board

The full membership of the Programme Board:

TITLE	FUNCTION	NAME
Director of Finance & Logistics	Senior Responsible Owner (SRO), Accountable for the programme, ensuring that it meets its objectives and realises expected benefits. The responsibilities of the SRO include: • Securing the investment required to set up and run the programme • Providing clear leadership and direction to the programme • Charing the Programme Board • Monitoring the key strategic risks facing the programme Managing the Business Changes that occur as a consequence of the Programme.	Pamela McLauchlan
Programme Manager	Programme Manager, responsible for the day-to-day management of the programme. Other responsibilities include: • Planning and designing the programme • Effective co-ordination of the projects and their interdependencies • Managing and resolving and risks and issues • Managing the programme's budget • Managing programme communications • Managing the programme team	Liam Coughlan
General Manager ICT	Programme Director, provides the link between the SRO and Programme Manager. The responsibilities of the Programme Director include: • Day-to-day leadership of the programme • Maintaining the interface with key senior stakeholders, keeping them engaged and informed	John Baker

	• Establishing the programme's governance arrangements and ensuring appropriate assurance is in place • Ensuring the programme delivers what it has set out to achieve and corrective action is taken where necessary	
Director of Service Delivery	Responsible to the SRO to ensure that the programme remains aligned to the Business Case and continues to meet the strategic requirements of the programme from a service delivery perspective.	Daren Mochrie
Programme Administrator	Responsible to the Programme Manager for the maintenance of a programme information hub.	Loraine Jackson
General Manager Finance	Responsible to the SRO to ensure that the programme remains aligned to the Business Case and continues to meet the strategic requirements of the programme from a financial perspective.	Jim Dall
Head of Procurement	Responsible to the SRO to ensure that the programme remains aligned to the Business Case and continues to meet the strategic requirements of the programme from a procurement perspective.	Jenny Neville
Medical Director	Responsible for ensuring that all clinical aspect of the programme are considered and managed appropriately.	Jim Ward
Employee Director	Responsible for ensuring that all employees affected by the programme outcomes are treated fairly and equitable and are not disadvantaged in any way.	Alan Bickerstaff
Patient Representative	Responsible for ensuring that the patient needs remain at the very heart of the programme and that maximum benefit for the patient is derived from the outcomes.	Martin Hunter
Communications & Engagement Manager	Responsible for ensuring an effective communications strategy.	Claire Smillie

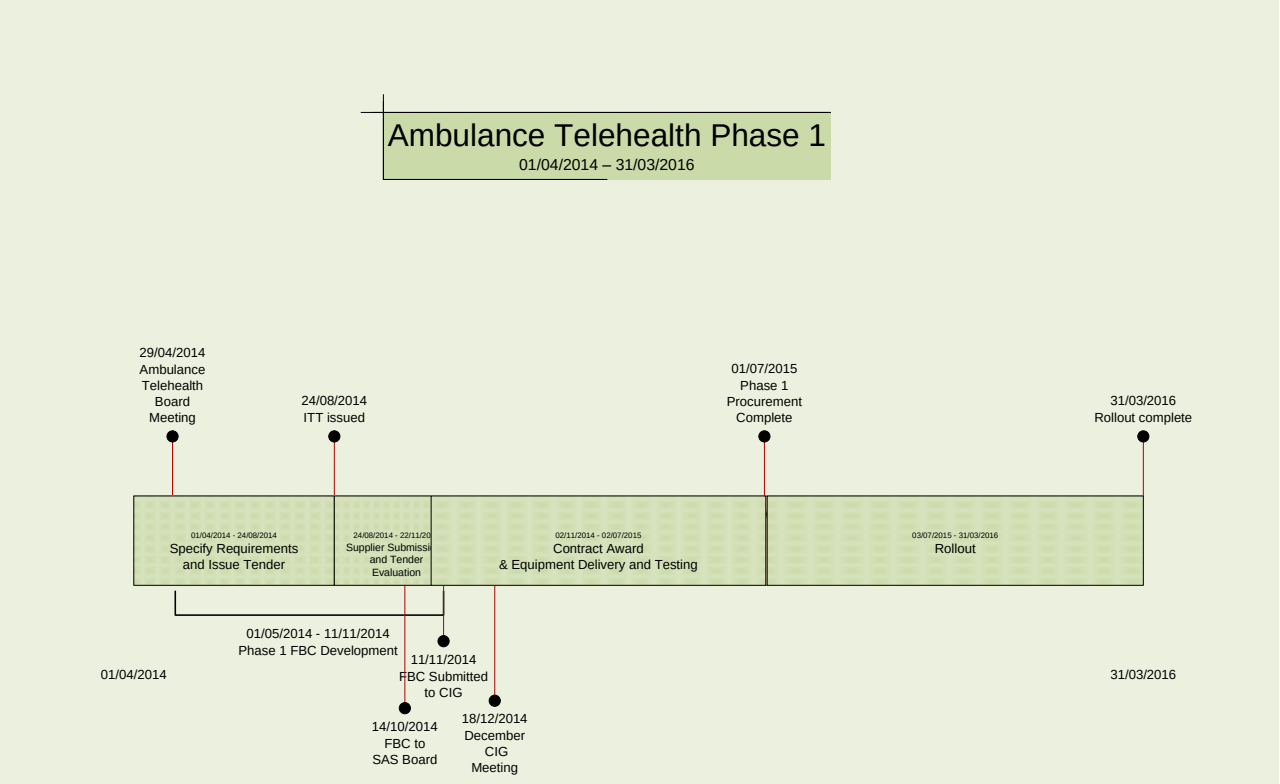
The Ambulance Telehealth Programme Board will sit within current Service programme governance structure as outlined in the diagram below:



The Programme has appointed a Project Manager to oversee the development of Ambulance Telehealth Phase 1. The Project Manager will be responsible to the Programme Manager for the day to day issues of the project. The project will be managed in line with the de facto PRINCE2 methodology using the following tools where appropriate:

- Highlight Reports
- Exception Reports
- Risk Logs
- Risk Registers
- Issue Logs
- Issue Registers
- Lessons Learned Reports
- Quality Log
- Quality Plan
- Request for Change
- Work Packages
- Project Plan
- Project Initiation Document

The high level project timeline is indicated below for Phase 1 of the Programme:



7.3 Agreed Arrangements for Change Management

The deliverables of Phase 1 will be thoroughly tested to ensure they are fit for purpose and meet the expectations as described in the tender specification. Key stakeholders will be fully involved in the testing cycle, which will include a trial period in a live environment prior to rollout. The Service will use a gateway process to ensure all stakeholders are comfortable with the solution before commencing rollout.

The implementation of the new solution will be carefully managed in such a way as to enable parallel running alongside the existing solution with no degradation to the operational capability of the Service during the transition phase.

The programme will take a blended learning approach with both hands-on and eLearning training available.

A Business Change Manager (BCM) will be appointed to lead the change process within the programme. With benefits realisation as a key responsibility, the BCM will work with stakeholders to ensure the smooth transition of new Telehealth solution into the frontline operations. The BCM will be responsible for embedding and sustaining the benefits post-implementation.

A Communications and Engagement Plan has been created to ensure that key stakeholders are involved in, and made aware of, the change process and the impact it will have on them at key stages in the programme.

7.4 Agreed Arrangements for Benefits Realisation

The BCM will be primarily responsible for the realisation of the programme benefits. A benefits realisation plan has been developed and will be monitored regularly to ensure the programme is on track to realise the benefits it has set out to achieve. A benefits register has been created for Phase 1 of the programme. This sets out the benefits and how they will be measured, tracked and realised. The register will be reviewed regularly at Project Team, Programme Team and Programme Board meetings.

7.5 Agreed Arrangements for Risk Management

Through effective use of Managing Successful Programmes (MSP) and PRINCE2, the corresponding Programme and Project risks will be managed through the identification and subsequent mitigation as described in the risk log/register. The Senior Responsible Owner (SRO) is the risk owner for the programme.

Workshops with key stakeholders were held to identify and score risks in terms of likelihood and impact applicable to the success of the project. (See section 4.8 for details). Project Risks and Programme Risks will be standing agenda items at Project and Programme Board meetings. Where appropriate, risks will be escalated to executive level through the reporting structure.

The risk log for Option 3, as shown in Appendix B, highlighted 5 high risks specifically related to Phase 1 of the programme. The current and planned controls in place to mitigate these risks are as follows:

Risk	Risk Category	Risk Description	Current risk ranking	Mitigation
Business	Strategic	There is a risk that the investment might not deliver the expected outcomes	**High**	Staff have and will continue to be involved in specifications. Suppliers are provided with a clear specification which defines SAS needs. There is a change control process in place. Test plans are developed for all implementations.
Project	Operational	There is a risk that the need to manage several suppliers will lead to disputes in the project	**High**	Single supplier chosen to deliver hardware in Phase 1. Tenders have and will include requirements to work with the Service and other suppliers during the life of the contract. Helpdesk scripts will be developed and agreed to help route faults to the correct supplier. Regular contract review meetings will be held to resolve any issues.
Project	Operational	There is a risk that the complexity of the procurement process and multi supplier management might adversely affect the tolerances of the project	**High**	Mitigated by having only one supplier
Project	Strategic	There is a risk that the complexity of the technical requirements of the proposed solution might adversely affect the tolerances of the project	**High**	Specifications will be clearly defined and suppliers asked to respond to every requirement and include a project plan for delivery. Costs will also be provided for each of the elements of the project and agreed prior to contract award. Quality acceptance criteria will also be defined and agreed.
Project	Operational	There is a risk that ineffective management of the install / deinstall programme for rolling out the new equipment will impact performance of frontline services	**High**	Experienced personnel will be used to plan and manage the implementation process. There will be clear protocols and procedures agreed regarding what should be installed, where it should be installed and how long it should take. A&E performance will be given priority in case of conflict and suppliers have acknowledged this in the tendering process. It has been agreed that the Service will not incur any penalties if there is a late cancelation due to operational pressures. Roll-out plans will be agreed at divisional and station level. Where feasible replacement vehicles will be provided while other vehicles are being worked on

7.6 Agreed Arrangements for Post Phase 1 Evaluation

It is important at the conclusion of any programme to review the lifespan of the project and identify what went right, what went wrong and what would have been done differently in hindsight. Throughout the programme a lessons learned log will be maintained and regularly reviewed. The Programme Manager will produce a lessons learned report to be available no later than 6 months after the conclusion of the Phase 1. A full programme evaluation encapsulating Phase 1 and Phase 2 will be completed after the delivery of the full programme.

7.7 Contingency Plans

The Ambulance Telehealth Project Phase 1 is effectively a replacement and enhancement of the hardware currently in use to support ambulance mobilisation and allocation. Failure, for whatever reason, to deliver Phase 1 will necessitate the continued use of the current vehicle equipment until a resolution for the failed delivery can be found and implemented.

Section 8 Conclusion and Recommendation

8.1 Conclusions

The delivery of the Ambulance Telehealth Programme will provide the crews with the right equipment to enable working practices to change to deliver the 2020 Vision for Healthcare and ensure that appropriate care is given to the patient in the most suitable location for the patient. It will also enable electronic collection of data to inform other Health and Social care staff and facilitate community based treatment and avoid hospital admissions. For those patients still requiring hospital care, these technological enhancements will improve the pre-hospital treatment provided and avoid duplicate diagnostic testing.

This FBC has revisited the outcomes of the OBC and reviewed the three available solution options.

Risks, benefits and operational requirements workshops have been held with key stakeholders to ensure that any changes to data used in the OBC have been identified and considered fully in the FBC and ITT.

The results of this exercise have shown that solution option 3, “Update the full mobile data solution within the vehicle to provide end to end Ambulance Telehealth solution” continues to present a value for money proposal whilst presenting the least risk to the organisation.

Solution option 3 delivers on the benefits derived from the objectives of the programme whilst also providing a platform for future technical and operational developments which will further benefit the Service.

The Procurement Evaluation has determined that procurement option 1 from [redacted] delivers the solution which best meets the service requirements of Phase 1 of the Ambulance Telehealth Programme. This solution includes the provision of [redacted] for both the front and back terminals. These tablets are specifically designed for challenging environments, and while they are more expensive than non-specialised commercially available tablets, due to their inherently ruggedized design there will be reduced repair and replacement costs associated with them. This will also minimise any clinical downtime due to technology issues.

8.2 Recommendations

This FBC has been produced in accordance with the guidance issued by the Scottish Government Capital Investment Group and the outcome has shown that solution option 3 is the preferred way forward as it presents value for money and is affordable. It has also demonstrated that the procurement exercise has resulted in a solution which meets the service requirements of Phase 1 of the Ambulance Telehealth Programme.

It is therefore recommended that the Service Board and CIG approve the outcomes of the FBC and support continued progress towards procurement and implementation of Ambulance Telehealth Phase 1.

It is further recommended that the Service Board and CIG mandate the Programme Manager to begin work on the FBC for Phase 2 of the programme.

Appendices

Appendix A – Benefits

Benefit Category		Benefit Criteria	Benefit Description	Link to Programme Objective	Which phase will they be delivered
Direct benefits for Patients	1	**HEALTH GAIN** To what extent does the option demonstrably promote ***better health outcomes*** for patients?	Increased percentage completion rate of ePRF's resulting in improved clinical audit data, clinical governance and improved patient care based in research of data by end 2017.	Updated user interface	Phase 2
			A reduction in the number of paper PRF's completed by end 2017.	Updated user interface	Phase 2
			The introduction of a Directory of Services will provide more referral options for ambulance crews, allowing patients to be directed to more appropriate care providers. This will be measured through the use of additional stop codes by end 2017.	Access to external clinical information and back office systems	Phase 2
			Time to scene performance should increase based on improved communications between ACC and vehicle, improved maps and improved navigation software.	Updated user interface	Phase 2
			By providing a platform to reduce hospital admissions there will be reduced risks for patients inherent with transportation and proximity to infection (The implementation of clinical pathway for this is out with the scope of this programme)	Access to external clinical information and back office systems / To deliver a mobile Telehealth capability	Phase 2
	2	**EQUITY** To what extent does the option demonstrably promote ***equitable access*** by patients to healthcare. This criterion is about the extent to which the service provided takes account of the needs of the patient.	Reduction in failed data messages between command and control system and vehicles with multi-bearer SIMS offering maximum mobile network coverage in Scotland by March 2016.	Faster Data Communications	Phase 1

Benefit Category		Benefit Criteria	Benefit Description	Link to Programme Objective	Which phase will they be delivered
Staff	3	**BUSINESS CONTINUITY/RELIABILITY OF SERVICE PROVISION** To what extent does the option promote business continuity? How resilient are the business processes and the information technology underlying the option? How ***reliable*** is the option in delivering patient benefit?	The number of hardware related faults to the ICT Service Desk will reduce in the first 2 years from implementation as a result of replacing ageing equipment with new hardware.	To deliver a robust and reliable hardware solution, supporting Wi-Fi	Phase 1
			The provision of video/audio conferencing facilities in every A&E ambulance in Scotland will provide patients with access to remote clinicians/consultants without the need to travel.	To deliver a mobile Telehealth capability	Phase 2
			The minimum data coverage will be as good as the best coverage we have now by locking one SIM in every vehicle to GPRS to ensure there is no degradation of service between the old and new systems by March 2016.	Faster Data Communications	Phase 1
	4	**BENEFITS FOR STAFF** To what extent does the option relieve stress on staff and provide ***job satisfaction***? To what extent is ***health and safety*** maximised under the option?	By linking the PRF's from all responding resources by end 2017, duplication of effort will be reduced, PRF review will be easier with all information held in a single record with all information held at a patient level rather than at an incident level and avoidance of asking patient the same question multiple times. This benefit will be measured via staff survey	Enable data sharing between responding resources	Phase 2
			Increased percentage completion rate of ePRF's resulting in improved clinical audit data, clinical governance and improved patient care based in research of data.	Updated user interface	Phase 2
			Access to a centrally managed Directory of Services by 2017, providing information from a validated source which is kept updated, will give staff confidence to leave patient at home safely resulting in improved job satisfaction. This will be measured through a post implementation staff survey.	Access to external clinical information and back office systems	Phase 2
			Staff will have greater confidence in using tablet outside of vehicle (batteries, smaller/lightweight tablet to carry outside the vehicle, retina display easier to read). This will be measured by the number of connections made via the SIM card by end 2016 rather than the vehicle Wi-Fi and through staff survey	To deliver a robust and reliable hardware solution, supporting Wi-Fi	Phase 1

Benefit Category	Benefit Criteria		Benefit Description	Link to Programme Objective	Which phase will they be delivered
			Access to back office systems by end 2017 from within the vehicle will improve efficiency with staff able to perform admin duties from within the vehicle rather than having to return to station. This will be measured through system accesses from the vehicle	Access to external clinical information and back office systems	Phase 2
			The ability to use the tablet while on-station will make more efficient use of crew downtime and reduce reliance on desk based PC equipment for access to corporate systems.	Access to external clinical information and back office systems	Phase 2
			The equipment will be installed in line with current H&S legislation ensuring the whole fleet is type approval compliant by March 2016 (subject to exceptional circumstances)	To deliver front terminal compliance with Vehicle Type Approval guidelines	Phase 1
			Customisable user display settings on the hardware will ensure that the system is accessible to all ambulance staff by March 2016, enhancing the user experience of the hardware and software by allowing them to personalise the display based on their individual needs and preferences.	Updated user interface / To deliver a robust and reliable hardware solution, supporting Wi-Fi	Phase 1
	5	**PARTNERSHIP/INTER-AGENCY COLLABORATION** To what extent does the option facilitate ***collaboration*** with Scottish Ambulance Service partners such as NHS Boards, GPs, the voluntary sector, local authorities, other emergency services?	The introduction of a new technology platform by March 2016 provides the platform to build on electronic links already made to external NHS Boards and systems i.e. ePRF to Web, ECS + Ensemble. (The implementation of any new data links is out with the scope of this programme)	Access to external clinical information and back office systems	Phase 1
			The introduction of a new technology platform by March 2016 provides the platform to implement new electronic data links with our emergency service partners i.e. Sending electronic declaration of death notices to Police Scotland to replace the current paper process. (The implementation of any new data links is out with the scope of this programme).	Access to external clinical information and back office systems	Phase 1
			The introduction of a new technology platform by March 2016 provides the platform to initial prof-to-prof audio/video consultancy from within the vehicle/at the incident location. (The implementation of clinical pathway for this is out with the scope of this programme)	To deliver a mobile Telehealth capability	Phase 1

Benefit Category	Benefit Criteria		Benefit Description	Link to Programme Objective	Which phase will they be delivered
			The introduction of a directory of services by March 2017 will enable direct access to health & social care pathways for ambulance crews which were not previously available/visible.	Access to external clinical information and back office systems	Phase 2
	6	**EFFICIENCY IN USE OF NHS RESOURCES** To what extent does the option provide ***efficiency in the use of NHS resources*** (Scottish Ambulance Service and other NHS resources)?	Access to back office systems by March 2017 from within the vehicle will improve efficiency with staff able to perform admin duties from within the vehicle rather than having to return to station. This will be measured through system accesses from the vehicle	Access to external clinical information and back office systems	Phase 2
			The automatic population of data from clinical diagnostic devices into the ePRF by March 2017 will improve time efficiency for ambulance crews and reduce data errors	Automatic population of clinical data from diagnostic equipment	Phase 2
			Revenue costs relating to system maintenance and licensing will be maintained or reduced by March 2017	To deliver a solution that will reduce like-for-like revenue costs	Phase 1/2
			By delivering the capability to reduce hospital admissions by March 2015, bed blocking in A&E departments will be reduced and A&E resources will be used more efficiently. (The implementation of the clinical pathway to deliver this is out with the scope of this programme).	Access to external clinical information and back office systems / To deliver a mobile Telehealth capability	Phase 1
			By delivering the capability to reduce hospital admissions by March 2015, ambulance journeys to hospital will be reduced resulting in quicker ambulance turnaround at incidents and more efficient use of the ambulance fleet	Access to external clinical information and back office systems / To deliver a mobile Telehealth capability	Phase 1
			Increased percentage completion rate of ePRF's resulting in improved patient handover information at hospital, improving crew turnaround times by end of 2017	Updated user interface	Phase 2
			By linking the PRF's from all responding resources by March 2017, duplication of effort will be reduced and avoidance of asking patient the same question multiple times. This benefit will be measured via staff survey	Enable data sharing between responding resources	Phase 2
			By utilising the barcode scanning technology on the new equipment, stock control improvements can be made, thereby increasing efficiency and reducing stock waste	Access to external clinical information and back office systems	Phase 1/2

Benefit Category	Benefit Criteria		Benefit Description	Link to Programme Objective	Which phase will they be delivered
			HEI compliance will be improved through use of an electronic stock control facility to reduce the risk of carrying out-of-date medical stocks in vehicles	Access to external clinical information and back office systems	Phase 1/2
			By implementing an electronic Vehicle and Equipment Check Sheet (VECS), crews will be able to complete daily vehicle checks quicker, audits will be easier and stock control of equipment will be quicker and more accurate.	Access to external clinical information and back office systems	Phase 1/2
			Navigation and mapping software will be faster and easier to update.	Updated user interface	Phase 2
	7	**SERVICE DEVELOPMENT POTENTIAL** To what extent does the option provide a ***platform for further developments*** in ambulance services? To what extent does the option complement other developments in the Service?	From March 2016, care pathways can be implemented post to refer patients to alternative healthcare service providers not currently available to ambulance crews. (The implementation of the clinical pathway to deliver this is out with the scope of this programme).	Access to external clinical information and back office systems / To deliver a mobile Telehealth capability	Phase 1
			From March 2016, Care pathways can be development and implemented to utilise audio and video consultancy sessions for patients in remote and rural locations where a long transfer to hospital may not be necessary. (The implementation of the clinical pathway to deliver this is out with the scope of this programme).	To deliver a mobile Telehealth capability	Phase 1
			From March 2016, it will be possible to allow other HCP's and emergency services partners to access the in-vehicle Wi-Fi to open up communications channels between responders at incidents. (The provision of Wi-Fi access to partner organisations is out with the scope of this programme).	To deliver a robust and reliable hardware solution, supporting Wi-Fi	Phase 1
			From March 2016, the platform will allow for development of targeted resources in line with the Service's 2020 Workforce Vision i.e. more efficient use of Paramedic Response Vehicles and Paramedic motorcycles to respond to expected see-and-treat and treat-and-refer cases where a conveying vehicle should not be required. 2020 workforce vision	Access to external clinical information and back office systems / To deliver a mobile Telehealth capability	Phase 1

Appendix B – Risk Logs

Risk Assessment for Solution Option 1

		OPTION 1	Current Risk	Current Risk	Current Risk	Current	Current Risk
Risk ***(Project or Business)***	**Risk Cat**[2]	**Risk Description** ***(There is a risk of x, because of y, resulting in z)***	**Likelihood of Exposure**	**Impact Consequence**	**Risk Quotient (Likelihood x Impact)**[5]	**Risk Ranking** [5]	**Rationale for scores**
Business	**Strategic**	There is a risk that this investment will be regarded as a holding position only and will provide no real benefit to the organisation	Almost Certain	Major	20	**V High**	Given that this option does not provide any real progress towards the project key benefits or the Governments 2020 vision, it might be regarded as not being the most appropriate use of budget in a climate of austerity
Business	**Operational**	This option will NOT improve the rate of failure of current hardware in the vehicles. There is a risk that fault rates will increase and vehicles will be subject to increasing down time as a result	Almost Certain	Major	20	**V High**	Ambulance hardware will not be replaced in this option. Currently the hardware is six years old and failure is becoming a real issue. This will only increase with time leading to a situation whereby ambulances will be 'out of service' whilst emergency repairs are carried out to ageing hardware.
Business	**Operational**	This option will not answer the requirements of the new Vehicle Type Approval guidelines leaving the organisation at risk of litigation	Almost Certain	Moderate	15	**High**	The VTA is a voluntary standard however, due to the importance of the requirements for ensuring the safety of both patients and paramedics it has been widely viewed as a requirements for ambulances and therefore adopted within the health industry
Business	**Strategic**	This option will not provide any progress towards the 2020 vision leaving the organisation open to criticism	Almost Certain	Moderate	15	**High**	Given that the 2020 vision states that 'Whatever the setting, care will be provided to the highest standards of quality and safety, with the person at the centre of all decisions' this option does not improve patient care within the ambulance or in the home

Business	**Operational**	There is a risk that future system developments cannot be achieved due to technology and comms limitations with the existing hardware and operating system	Almost Certain	Moderate	15	**High**	By retaining the existing equipment, development opportunities will be significantly reduced due to the lack of wireless data communications and constraints around using the Windows XP platform for software development
Project	**Strategic**	This option does not fulfill any of the key objectives of the project	Almost Certain	Major	20	**V High**	The key objectives of the project are all enablers to improved patient care. This option will simply provide a more up to date software application and will not provide the necessary improvements required to move forward towards 2020 and e-health visions
Business	**Financial**	There is a risk that the supplier of this option ceases to do business and leave SAS with no support, maintenance or development opportunitites. Business continuity would clearly be compromised	Unlikely	Extreme	10	**High**	Given the single supplier nature of this option it is possible, although not likely, that they may cease to trade leaving SAS in an untenable position of having no support for a business critical application
						#N/A	
				Median Score for	15	**High**	

Risk Assessment for Solution Option 2

		OPTION 2	Current	Current Risk	Current Risk	Current	Current Risk
Risk *(Project or Business)*	Risk Cat[2]	Risk Description *(There is a risk of x, because of y, resulting in z)*	Likelihood of Exposure	Impact Consequence	Risk Quotient (Likelihood x Impact)[5]	Risk Ranking[5]	Rational for scores
Business	**Strategic**	This option will provide limited progress towards the Governments 2020 vision leaving the organisation open to criticism	Almost Certain	Moderate	15	**High**	Given that the 2020 vision states that 'Whatever the setting, care will be provided to the highest standard of quality and safety, with the person at the centre of all decision', this option only goes some way to improving patient care within the ambulance or in the home but is limited on how far this can be extended
Business	**Financial**	There is a risk that, as this option ties us into a single supplier, there will not be any real possibility for competition reducing the power of the buyer to attain best value	Almost Certain	Minor	10	**High**	As this option is an upgrade to current systems, we are tied into single supplier procurement, thus increasing the risk that best value will not be attained through the normal channels of competitive tendering. This could result in an inferior product at an inflated cost
Business	**Operational**	There is a risk that Vehicle Type Approval will not be fully met by this option	Almost Certain	Moderate	15	**High**	The VTA is a voluntary standard, however, due to the importance of the requirements for ensuring the safety of both patients and paramedics it has been widely viewed as a requirement for ambulances and therefore adopted within the health industry. There is scope to apply approved standards to rear terminal equipment, but front cab terminals will remain the same
Business	**Financial**	Given the likely costs of this option, there is a risk that SAS will see a low return on the investment made	Possible	Moderate	9	**Medium**	The cost for this option will be considerable and given that this option will NOT deliver on Telehealth, there is very little evidence of the potential return on investment.
Project	**Strategic**	There is a risk that failure to meet key project objectives will impact on the overall benefits aimed for	Almost Certain	Moderate	15	**High**	Key objectives 2 and 7 will not be met with this option. Thus both vehicle type approval and the whole telehealth vision would not be possible
Project	**Operational**	As with all change there is a risk that end users may be reluctant to embrace the new technology and processes that accompany the change	Possible	Minor	6	**Medium**	There will inevitably be changes to process as the ePRF system is changed. This will meet some resistance from ambulance staff as they come to terms with the extent of the changes
Business	**Financial**	There is a risk of legislative challenge on the procurement process	Unlikely	Major	8	**Medium**	Given the significant cost involved, it is a risk that under European procurement rules that we may face a challenge in our process leading to lengthy delays in the project

Business	**Financial**	There is a risk that the supplier of this option ceases to do business and leaves SAS with no support, maintenance or development opportunities. Business continuity would clearly be compromised	Unlikely	Extreme	10	**High**	It is possible, although not likely, that the chosen supplier may cease to trade leaving SAS in an untenable position of having no support for a business critical application
Business	**Operational**	There is a risk that business continuity will be compromised due to the age of the front cab hardware which will cease to be supported under a new contract	Almost Certain	Major	20	**V High**	Front cab hardware is old and unreliable. This will lead to increased ambulance 'down time' waiting for equipment to be replaced and increased costs to maintain working spares.
Business	**Operational**	There is a risk that the chosen supplier fails to deliver on the key technical elements of this project leaving SAS locked into a contract with a product which is not fit-for-purpose	Possible	Major	12	**High**	As a result of SAS being ahead of other UK ambulance trusts in terms of mobile technology, there is unlikely to be an off-the -shelf solution available that already meets all our operational requirements leaving a dependancy on the supplier to develop new solutions to meet our needs which they may be unable to deliver.
Project	**Operational**	There is a risk that the front terminal software may not be compatioble with the rear terminal to maintain data sharing between the two leading to a degredation in service to the current system	Unlikely	Major	8	**Medium**	By leaving the legacy hardware and software in the front of the vehicle, and introducing much newer technology in the rear of the vehicle, there may be compatibility issues with sending and receiving data between the two.
Project	**Financial**	There is a risk that additional capaital funding will be required in future to further develop the software to make best use of the technology purchased in this option.	Almost Certain	Moderate	15	**High**	Because this option does NOT deliver on telehealth but the hardware would support the telehealth requirements, future development of the software is inevitable in order to make best use of the technology available
Project	**Operational**	There is a risk that ineffective management of the install/deinstall programme for rolling out the new equipment will impact performance of frontline A&E services	Possible	Extreme	15	**High**	The rollout programme must be effectively managed from a logistical perspective to ensure there is a minimal impact on frontline services.
Business	**Strategic**	There is a risk that the data schema for the ePRF will be incompatible with the SAS data warehouse	Likely	Moderate	12	**High**	The back end-end ePRF databases will be replaced meaning the existing links to the SAS Data Warehouse may need to be rewritten.
Business	**Strategic**	There is a risk that there will be less flexibility to create clinical reports based on new database structures	Likely	Moderate	12	**High**	The back end-end ePRF databases will be replaced meaning the existing links to the SAS Data Warehouse may need to be rewritten.
						#N/A	
				Median Score for Log	12	**High**	

Risk Assessment for Solution Option 3

		OPTION 3 Preferred Option	Current	Current Risk	Current Risk	Current Risk	Current Risk	Current Risk	
Risk *(Project or Business)*	Risk Cat[2]	Risk Description *(There is a risk of x, because of y, resulting in z)*	Likelihood of Exposure	Likelihood of Occurence[3] (Scale 1-5)	Impact Consequence	Magnitude of Impact[4]	Risk Quotient (Likelihood x Impact)[5]	Risk Ranking[5]	Rationale for score
Business	Strategic	There is a risk that this option might once costed prove to be unaffordable in terms of budget awarded from the Scottish Government	Unlikely	2	Major	4	8	Medium	The costs have been estimated based on current contract costs, market rates and experience with similar projects of this size and scale, however, until the formal quotations are received during the tender process, the overall project costs are unknown.
Business	Strategic	There is a risk that the investment might not deliver the expected outcomes	Possible	3	Major	4	12	High	As with any major project, there is a possibility that the overall product does not meet the user expectations.
Business	Financial	There is a risk of legislative challenge on the procurement process	Rare	1	Major	4	4	Medium	Given the significant cost involved, it is a risk that under European procurement rules that we may face a challenge in our process leading to lengthy delays in the project
Project	Operational	There is a risk that the need to manage several suppliers will lead to disputes in the project	Likely	4	Moderate	3	12	High	Due to the two phased approach to this project, the current software supplier will continue to support an maintain the exisiting software on the new hardware platform supplied by the winner of the contract. In phase 2 another supplier may be awarded the contract to replace the software.
Business	Strategic	There is a risk that not all partners will be bought into the project thus affecting negatively on the expected outcomes of the change project	Possible	3	Moderate	3	9	Medium	There are a large number of stakeholders to identify and enagage with over the course of the programme to ensure a successful outcome
Project	Operational	As with all change, there is a risk that end users may be reluctant to embrace the new technology and processes that will accompany the changes	Possible	3	Minor	2	6	Medium	As with any major technology implementation, some end users will require additional training and support to ensure they are confident to use the new systems.
Project	Operational	There is a risk that the complexitiy of the procurement process and multi supplier management might adversly affect the tolerances of the project	Likely	4	Moderate	3	12	High	There is a potential for upto 3 suppliers to be in place at any one time, leading to challenges in managing timescales and relationships.
Project	Strategic	There is a risk that the complexity of the technical requirements of the proposed solution might adversly affect the tolerances of the project	Likely	4	Moderate	3	12	High	As a result of SAS being ahead of other UK ambulance trusts in terms of mobile technology, there is unlikely to be an off-the -shelf solution available that already meets all our operational requirements leaving a dependancy on the supplier to develop new solutions to meet our needs which they may be unable to deliver in the desired timescales.

Project	Operational	There is a risk that ineffective management of the install/deinstall programme for rolling out the new equipment will impact performance of frontline A&E services	Possible	3	Extreme	5	15	High	The rollout programme must be effectively managed from a logistical perspective to ensure there is a minimal impact on frontline services.
Business	Strategic	There is a risk that the data schema for the ePRF will be incompatible with the SAS data warehouse	Likely	4	Moderate	3	12	High	In phase 2, the back end-end ePRF databases will be replaced meaning the existing links to the SAS Data Warehouse may need to be rewritten.
Business	Strategic	There is a risk that there will be less flexibility to create clinical reports based on new database structures	Likely	4	Moderate	3	12	High	In phase 2, the back end-end ePRF databases will be replaced meaning the existing links to the SAS Data Warehouse may need to be rewritten.
				0		0		#N/A	
					Median Score for Log		12	High	

Appendix C - Links to relevant Programme and Project Management Information and Guidance

The following links give information on the various roles, structures and governance arrangements recommended by MSP and PRINCE2:

The Department for Business Innovation & Skills – 'Guidelines for Managing Projects: How to organise, plan & control projects'

https://www.gov.uk/government/publications/guidance-on-organising-planning-and-managing-projects<?xml:namespace prefix = "o" ns = "urn:schemas-microsoft-com:office:office" />

The Department for Business Innovation & Skills – 'Guidelines for Managing Programmes: Understanding Programmes and Programme Management'

https://www.gov.uk/government/publications/guidelines-for-managing-programmes-understanding-programmes-and-programme-management

The Department of Health Informatics Directorate – 'Programme & Project Sponsorship -Building the Right Team'

http://www.connectingforhealth.nhs.uk/systemsandservices/icd/informspec/p3m/resource/capability/sro/building2.pdf

Appendix D Equality Impact Assessment

A copy of the Equality Impact Assessment is attached within the embedded file

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