Stirling Dunblane Alloa Electrification Project

Deliverability Review

25 July 2017

Executive Summary
Job No: JN5316

Summary

Introduction

The electrification of the Stirling – Dunblane – Alloa lines (SDA) is a component project of the Rolling Programme of Electrification, a key part of the Scottish Government's future transport strategy. During development and delivery in Control Period 5 (CP5) costs increased significantly as the project progressed. In April 2017 the project identified[1] that it was not able to complete the project by the Regulated Milestone of March 2019[2] without additional expenditure and a significantly increased amount of disruptive access to do the work. The Office of Rail and Road (ORR) monitors and reports on Network Rail's delivery of its regulated outputs. ORR initiated this independent 'deliverability review' to assess whether Network Rail is doing everything reasonably practicable to deliver the regulated milestone in accordance with best practice and in a timely and efficient manner.

The Independent Reporter (the Reporter) is appointed by ORR to undertake independent reviews. This is the report from the deliverability review undertaken by the Reporter between 22 May and end of June 2017. The mandate for the review specified three questions for the Reporter to answer:

1. Is Network Rail doing everything reasonably practicable to deliver the outputs of the SDA project in line with its regulated milestone?

2. What are the issues that have affected the delivery of this project and has Network Rail taken reasonable and timely steps to resolve these?

3. What are the lessons learned from this project, that Network Rail should consider for other projects in the enhancements portfolio?

The geographic context for the SDA project is depicted in Figures 1 and 2 below.

---

[1] A quote from the ORR Mandate explaining the origins of this review.
[2] Enhancements Delivery Plan, Network Rail, page 174, available at https://16cbgt3sbwr8204sf92da3xxc5m-wpengine.netdna-ssl.com/wp-content/uploads/2017/06/Enhancements-Delivery-Plan-June-2017.pdf

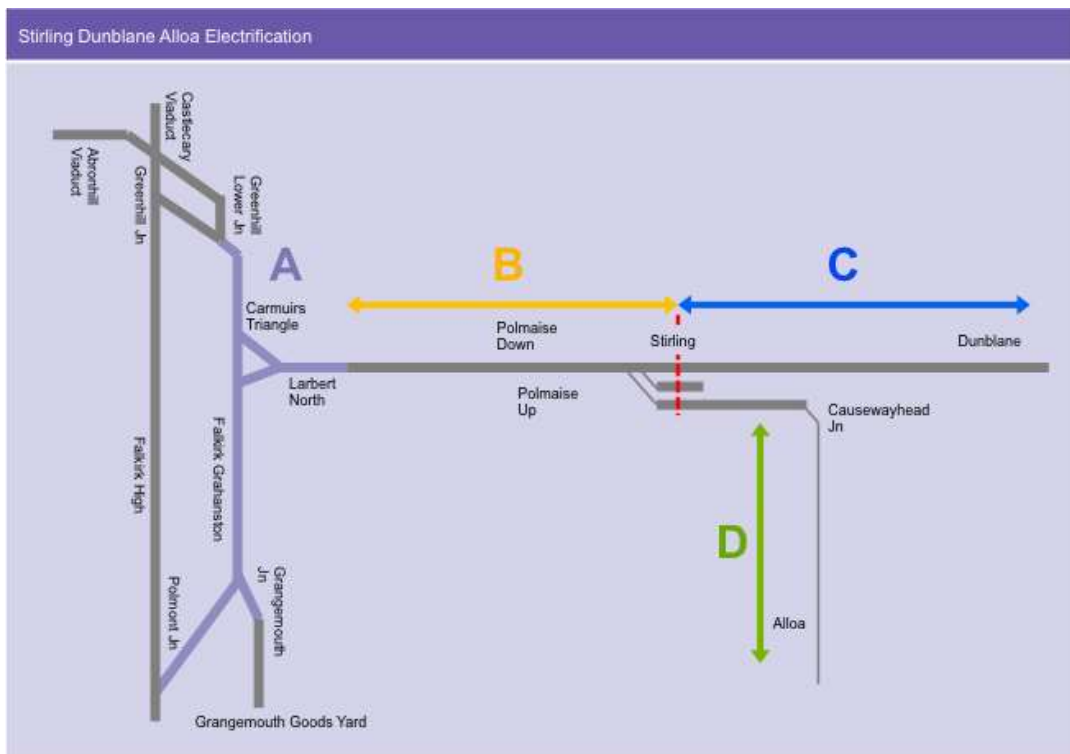Figure 1: Edinburgh to Glasgow Improvement Programme and Stirling Dunblane Alloa project route map

Figure 2: Stirling Dunblane Alloa project sections

Q1. Is Network Rail doing everything reasonably practicable to deliver the outputs of the SDA project in line with its regulated milestone?

Clarification of Milestones

For our deliverability assessment we have considered the following two milestones:

1. May 2018 timetable change for SDA Section A (see Figure 2).

   Entry into Service for SDA Section A in May 2018 to support the timetable change is not a regulated milestone or a pre-agreed configuration state, but is considered by Transport Scotland, Network Rail and ScotRail as a desirable target to achieve. This milestone is subject to a change control decision.

2. December 2018 timetable change for SDA Sections A, B, C and D (see Figure 2)

   Although not a regulated milestone for the SDA project, these sections must be complete for Entry into Service by December 2018 to meet a regulated milestone for the Edinburgh to Glasgow Improvement Programme (EGIP) referred to as Key Output 3 (KO3). EGIP is being delivered in a number of phases with the initial phase comprised of four Key Outputs (KO1, 2, 3 and 4). Overall, the infrastructure element of the initial phase comprises the electrification of the Glasgow to Cumbernauld and Greenhill Lower Junction and the Edinburgh to Glasgow via Falkirk High (E&G) routes and a smaller number of infrastructure and station projects.[3]

The regulated milestone for completion of the SDA project (Sections A to D) is March 2019, however, delivery by this date would be too late to facilitate the dependent EGIP regulated milestone KO3. As a consequence, the SDA project must be completed approximately six months earlier than its regulated milestone. We therefore refer to milestones 1 and 2 in this report as the 'required by' milestones, as distinct to the regulated milestone.

What is driving the project's schedule?

According to Network Rail's schedule risk assessment (on the programme dated 25 May 2017) successful delivery of the SDA project to the 'required by' milestones appears to be unachievable. We have considered if Network Rail is doing everything it can to mitigate risks and accelerate the project to recover the schedule. We analysed the critical path in the current schedule and met with the project team to identify the key factors driving the project schedule. They include the amount of access needed to the operational railway to do the work, procurement of the remaining works, unresolved design and consents

---

[3] For full details of Network Rail's obligations see Enhancements Delivery Plan, Network Rail, June 2017, available at: https://16cbgt3sbwr8204sf92da3xxc5m-wpengine.netdna-ssl.com/wp-content/uploads/2017/06/Enhancements-Delivery-Plan-June-2017.pdf EGIP obligations are stated at pp 167-170. The SDA project obligations are stated under the Rolling Programme of Electrification (Scotland) at pp 174-175.

issues, better management of design and installation quality and resource conflicts with completion of EGIP.

Network Rail is aware of the factors driving the schedule and has undertaken Quantified Schedule Risk Assessments (QSRA) to determine the impact of them. There is clear evidence that Network Rail is currently making a concerted effort to recover the schedule and is planning to make changes to mitigate schedule risks. For example, Network Rail has already made changes to the management of design, assurance and supervision of physical works delivery that appear to be benefitting the delivery on Section A. Network Rail needs to ensure it has adequate resources to undertake this increased emphasis on assurance and to maintain this to the end of the project.

Network Rail also plans improvements in its contract management of the EGIP Alliance, which was appointed to deliver key physical infrastructure works required to meet Network Rail's obligations in relation to EGIP. The EGIP Alliance has also been undertaking works on Section A of the SDA project. The EGIP Alliance is comprised of Network Rail and two contractors. Network Rail is the client of both contractors and, in its Alliance role, provides facilities and services to enable delivery. One contractor undertakes civil engineering works (such as bridge reconstruction) to 'clear the route' ahead of installation of the new overhead line electrification system by the other contractor. Outside of the EGIP Alliance, Network Rail also procures and manages other contractors to undertake related works, for example alterations to track and signalling.

Implementing the improvements are linked to resolving procurement of the remainder of the SDA works. To date design and enabling works have been procured on a staged basis with the specific aim of protecting the critical path. In turn the procurement approach is linked to the agreement of the access arrangements to complete the works.

What is required to improve the project schedule?

We are supportive of Network Rail's effort, however, it is clear that confidence and trust in Network Rail has diminished, primarily through experience of EGIP KO1 delivery. Network Rail's EGIP Key Output 1 obligation is to deliver the necessary infrastructure to facilitate a minimum of one electric train (with 7 cars) operating in each direction during peak times on the Edinburgh to Glasgow via Falkirk High route. This was originally planned for the December 2016 timetable change and is now scheduled for October 2017.

In addition, recent improvements need to be further improved and sustained through collaborative and transparent governance involving Transport Scotland and ScotRail as stakeholders for SDA specifically.

There will be little confidence in achieving the 'required by' date until key matters are resolved and there is limited time remaining to do so, particularly in respect of access and procuring the works. We are

concerned that unless all parties – Network Rail, Transport Scotland and Abellio ScotRail – commit to making key decisions on access soon then recovery of the project schedule will become unachievable. Given the respective positions of Network Rail and ScotRail, as reported to us in early June, on the extended access request, we suggest that engaging independent facilitation is considered to agree a new access plan.

In the immediate term, resolving with stakeholders an access agreement to complete the project is the most urgent action. At the time of this review, a justification for additional extended access for Section A only (see Figure 2 above) had been put forward for agreement and if agreed would start 8 weeks later. A further separate access proposal for Sections B, C and D may be required that is dependent on the resolution of the procurement strategy for the remainder of the works. This proposal may also result in further disruptive access being sought.

Given the history of the project so far, diminished stakeholder confidence and trust in Network Rail appears to be a factor in gaining this initial agreement. Network Rail has requested extended access hours and agreement to this constitutes a significant commitment by operators; as it will cause passenger disruption for a further 8 months. The operator ScotRail is yet to be convinced of the justification for the additional access and also that Network Rail will do everything possible to ensure that access is effectively used. Equally, ScotRail has a major interest in the project being completed on time; the consequences of not achieving SDA electrified services by December 2018 are significant, as we understand there could be adverse impact on rolling stock availability. [4]

Additional access alone will not guarantee delivery of the SDA project by the 'required by' dates. We note other actions, particularly in respect of how the works will be procured and resolution of remaining design and consents matters with third parties, as being particularly critical to success.

Is Network Rail doing everything reasonably practicable?

The concept of reasonably practicable is typically used to provide a numerate comparison of the cost required to achieve a reduction in safety risk. Used in this context of delivering a regulated milestone it is a subjective assessment.

The Reporter's view is that Network Rail is making a concerted effort to deliver the outputs of the SDA project in line with the 'required by' milestone of December 2018 for Entry into Service (EiS) to support Edinburgh Glasgow Improvement Programme (EGIP) Key Output 3. It has implemented improvements, in comparison with the delivery of EGIP KO1, with the EGIP Alliance. They include better planning, project control, delivery and commercial management. Network Rail is also maintaining momentum through

---

[4] ScotRail and other operators will also require compensation for the additional disruptive access now sought.

procuring design and physical works via the EGIP Alliance on a staged basis with the specific aim of protecting the critical path.

However, Network Rail also needs to address how it can re-build stakeholder confidence and trust and to maintain it throughout the rest of the project. We have made some recommendations for actions that Network Rail can take which are designed to build trust; by Network Rail being clearer and more transparent with stakeholders on their progress, performance and schedule issues.   Our view is that Network Rail should address actions in two tranches:

1. **Immediate actions required to make the case for, and agree, revised access arrangements.** With reference to recommendations 1 to 4 of this report, we consider there is a need to finalise the justification for the additional access requirement (for Section A now and Sections B, C and D once Network Rail has developed its delivery and procurement proposals sufficiently) – along with a commitment to providing on-going demonstration of the effectiveness of access usage and also a comprehensive schedule risk mitigation plan; this is an action plan that can be monitored as opposed to a QSRA.

2. **On-going transparency to stakeholders of active mitigation of other risks to the schedule.** With reference to recommendations 5 to 10 of this report, Network Rail must address key actions with the operators (in particular ScotRail), third parties from which consents remain outstanding (in particular Stirling Council), and its supply chain. In view of the time taken to make a decision about the need for additional disruptive access on Section A we consider that effectiveness of current project governance should be reviewed to ensure that it provides a proactive challenge forum at which Network Rail should report clearly and transparently on its progress, performance and against its schedule risk mitigation plan. This forum should be crucial to the Network Rail project team building and maintaining trust and commitment from its key stakeholders. We also include Network Rail maintenance as a key stakeholder. Equally, the governance arrangements must ensure in future that timely decisions are made on the basis of clear decision criteria.

All ten recommendations under tranches 1 and 2 are collated at the end of this summary. As the current request for extending access relates to Section A (and part of Section B) only, actions under the first tranche will have to be repeated, as necessary, to complete agreement of the disruptive access required to complete Sections B, C and D.

Network Rail must also urgently resolve its approach to procuring the works. We note options for procurement are being assessed, including different supply chain solutions for the May 2018 and December 2018 'required by' dates. These options present different risks and potentially very different project completion milestones.

Given the remaining risk that needs to be addressed, we recommend that contingency planning for the operation of train services over SDA project infrastructure be considered now to mitigate the potential for not achieving Entry into Service by December 2018.

It is the Reporter's view that for Network Rail to demonstrate to ORR that it is doing everything reasonably practical then it would need to address the issues we have set out above.

Q2. What are the issues that have affected the delivery of this project and has Network Rail taken reasonable and timely steps to resolve these?

This part of the review has been constrained by the availability of personnel who have full knowledge of the history of decision-making. We consider that the delivery of this project has been affected by the following factors:

1. The scope and requirements of the project were not sufficiently understood when the project cost estimate was submitted to ORR under the Efficient Cost Assessment Mechanism (ECAM) in February 2014. At the time this was reported as a GRIP 3 stage completion estimate.

2. There was an apparent delay mobilising the project after ORR had concluded its assessment of Network Rail's cost estimate for this project in April 2014 and the instruction to 're-fresh' the design 18 months later in October 2015. Design work had already been undertaken previously in 2012, however it needed to be refreshed to ensure it met the approved scope and standards.

3. Changes to 'electrification legislation and standards'[5] impacted the re-fresh of the design that commenced in October 2015.

4. The knock-on impact of the delays to EGIP project and concerns over the performance of the EGIP contractors' alliance which is also delivering this project.

There is evidence that Network Rail was engaged in a series of discussions with Transport Scotland during 2015 concerning the cost of the Rolling Programme of Electrification, of which the SDA project is a key component. We have not seen any evidence that instructed Network Rail to slow down or cease development of the SDA project.

---

[5] Network Rail's obligations in respect of addressing the hazards introduced by installing 25kV electrification to the SDA electrification route arise from: 1) legislation, including a) Electricity at Work Regulations 1989 (EaWR); b) Railway (Interoperability) Regulations (RIR) 2011; and 2) Standards and specifications, including c) Energy Technical Specification for Interoperability (TSI) and d) National Notified Technical Rules.

The changes in electrification standards have directly led to the identification of sub-standard functional clearances at 12 structures along the SDA project route and, following risk assessment, significant physical intervention has been determined necessary at Kerse Road and Perth Road bridges, and two footbridges at Stirling station. We note the action taken by Network Rail to mitigate Perth Road bridge by instructing enabling works and detailed design via the EGIP Alliance. Kerse Road bridge remains a concern in relation to third party planning consents, but full design has been instructed. We also note that Network Rail had already identified other issues with its proposals at Stirling station in 2015 and Stirling station remains an issue in respect of the design proposals and corresponding consents.

Our main finding is that the additional scope, delivery and access challenges could have been mitigated earlier if the project had commenced its GRIP 4 re-fresh earlier for SDA electrification.

Q3. What are the lessons learned from this project, that Network Rail should consider for other projects in the enhancements portfolio?

We propose the following lessons are considered for other projects in the enhancements portfolio:

1. It is important to commence projects in good time once funding has been determined, whilst recognising the need to prioritise the competing demands this presents for Network Rail and supply chain resources across the delivery portfolio.

2. In any instance where Network Rail detects external changes that affects several projects (in this case electrification standards change), Network Rail centre should be held accountable for providing prompt and clear direction to projects so they are clear about the expectations placed on them and guided on how to respond efficiently. The SDA project appears to have relied on learning from projects ahead of it in delivery to understand the changes to electrification standards.

3. The veracity of GRIP 4 design should be rigorously checked to assure the basis of the cost estimate.

4. Including in the scope of GRIP 4 studies intrusive surveys and some preliminary detailed design on schemes to address key areas of uncertainty, for example at stations or major structures where there are complex interfaces and/or heritage issues.

5. Early 'in-principle' agreement of access requirements should be sought with industry stakeholders to improve delivery and cost certainty and to reduce the need for late requirements for extended access.

7. Where significant performance issues emerge with key suppliers, procurement strategies for projects which are dependent upon those suppliers should be revalidated at the earliest opportunity.

8. Industry governance arrangements should be reviewed to clarify reporting and decision making timescales. Consideration should be given to establishing project specific 'charters', which provide mutual commitments between parties to manage outputs, dependencies, access and critical decision dates collaboratively.

Recommendations

Table 1 lists our recommendations in two groups:

1. Immediate actions required to make the case for and agree a revised access arrangements

2. On-going transparency to stakeholders of active mitigation of other risks to the schedule

No.	Recommendations
Group 1, making a case for additional access with a commitment to active and transparent risk management	
1	Demonstrate to Transport Scotland and ScotRail (the stakeholders) the extent of and impact of common resources between EGIP K01 and SDA project and how this is being planned and mitigated.
2	Demonstrate to stakeholders that providing the additional access combined with active risk mitigation of the other major schedule risks will achieve delivery by the 'required by' milestone.
3	Provide additional metrics to the project delivery group (PDG) to demonstrate that Network Rail is doing everything possible to make effective use of access provided.
4	Clearly articulate to stakeholders the key assumptions made on productivity behind the plan for using the additional access requested, with a supporting comparison against historic, current and forecast productivity.
Group 2, on-going transparency of mitigation of all schedule risks to ensure the project can deliver on time	
5	Strengthen Network Rail resources essential to improve assurance of the quality of design, integration and installation to achieve "right first time" and minimise re-work.

No.	Recommendations
6	Decide procurement approach quickly based on an objective and reasoned case. For example, as the draft procurement strategy paper does not take account of the consequences of missing 'required by' dates (and in particular, the potential non-availability of sufficient DMUs after December 2018), the conclusions reached may not be based on an appropriate weighting for the consequences of delay.
7	Work with stakeholders, to map out clear timelines for decision-making. Clear criteria for addressing matters escalated to governance meetings also require consideration.
8	Work with stakeholders to review and make changes to project delivery review meetings to create a more collaborative arrangement where Network Rail can be more transparent in its reporting and stakeholders can provide support and challenge to help mitigate schedule risks.
9	Create a comprehensive schedule mitigation action plan that is reported against in the revised stakeholder meetings.
10	Work with stakeholders to undertake contingency planning for potential outcomes for December 2018.

Table 1: Summary table of recommendations