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Office of Rail Regulation and Network Rail

Independent Reporter (Part C) Mandate CN/027
Audit of £250m Fiscal Stimulus Civils spend

Summary Report
7 March 2014



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Introduction

Mandate CN027 was undertaken by Nichols Group as a Part C Independent Reporter (IR) review for the ORR. The purpose of CN027 was to audit the £250m civils fiscal stimulus works programme being undertaken by Network Rail. The purpose of the fiscal stimulus is to provide additional funding to stimulate the economy by accelerating civils works planned for Control Period 5 (CP5, April 2014 – March 2019) to be completed earlier by April 2014 i.e. the end of Control Period 4 (CP4).

In response to the provision of the additional funding Network Rail developed a programme strategy, which is referred to as the CP4 Civils Enhanced Spend (CCES). The CCES strategy outlines the programme of works to be undertaken and the asset management policy justification for schemes delivered under the enhanced spend programme.

The objectives of the CN027 audit are to provide:

- confidence that the works are being delivered effectively and provide long term value for money
- an independent high level review of the use of the stimulus expenditure to confirm that the selected schemes have a valid need, complementing a Management Review of the CCES programme to be undertaken by Network Rail.



Scope of the audit

The mandate specified that the audit was to be undertaken by sampling projects from 5 of the 9 Routes within England and Wales. The audit sample was to be between 50 and 100 projects from an overall 1200 projects within the CCES programme. A total of 80 schemes were selected for the audit sample and each was to include a site visit to gain an appreciation of the works, a desk review of relevant project documentation and liaison with project staff.

The Reporter selected the 5 Routes in the sample based on them having a higher proportion of overall spend and the total number of schemes within the CCES programme, as illustrated in Table 1 below. The total number of sites in the audit for each route is in column 2 with the total number of projects for that route in column 3. The fourth column shows the total planned cost expenditure for that route and what proportion this is of the overall £250m fiscal stimulus.

Route	No. sites audited	Route Total	AFC Authority July 2013 £000s	AFC Authority % of total budget
Kent	17	164	41,423	17
LNE	16	175	36,940	15
LNW	30	280	85,144	34
Wessex	6	96	11,757	4
Western	11	115	33,239	13
Total	80	830	208,503	72¹

Table 1 - Audit sample spread across the five routes

The mandate required the audit sample to also cover between 10 and 20 of each of the 5 types of civil engineering works and this split is shown in Table 2 and Table 3.

¹ Percent of total estimated target budget of £288m @ Period 4 2013/14



The five work types are:

- Bridge painting
- Earthworks
- Spandrel walls Stabilisation
- Scour Protection
- Hidden Critical Elements

Scheme Type	Number in the Sample	Overall Total
Bridge Painting	24	232
Earthworks	18	170
Spandrel Wall	15	189
Scour Protection	17	137
Hidden Critical Elements ²	06	298
Total	80	1026

Table 2 - Coverage of the five work types

Route	Bridge painting	Earthworks	Spandrel Wall	Scour Protection	HCE
Kent	4	3	6	4	-
LNE	6	4	2	3	1
LNW	11	7	4	5	3
Wessex	-	2	-	2	2
Western	3	2	3	3	-
Total	24	18	15	17	6

Table 3 – Spread of work types by Route

² Sample of HCE schemes audited was constrained by access to sites



Methodology

A kick off meeting was held with Network Rail and the ORR on 7 August 2013 to agree the terms of reference of the audit and the deliverables. Network Rail identified the CP4 Civils Enhanced Spend Strategy Document (March 2012) as the approved programme that outlines the criteria for scheme selection, details of the delivery and procurement strategy, an initial list of schemes and a baseline budget. The Routes Asset Managers (RAM) were consulted on the baseline list of schemes selected.

Further meetings were held between the IR and the asset specialists for structures and earthworks, from Network Rail's technical services division, to gain a background to the CCES Strategy and a wider appreciation of the asset policy objectives that influenced the schemes selected for the programme. In developing the baseline CCES strategy and programme, Network Rail developed criteria for selecting schemes for inclusion in the programme which were consistent with its Asset Management policy for structures and earthworks.

Meetings were also held between the IR and the each of the Route Asset Managers for structures and earthworks of the five Routes included in the audit sample. The purpose of the meetings was to get a progress update of delivery of schemes in the CCES strategy from the Routes, to agree the sample of schemes for audit and a programme of site visits. The IR found that some of the high priority schemes on the busy mainline routes initially identified for audit from the CCES strategy were not being progressed by the Routes due to difficulties in planning access for the works.

The scheme project documentation was also requested and provided by the Routes in advance of the site visits.



Value for Money Test

As part of the Mandate the Reporter was to agree, with Network Rail and the ORR, a proposal for assessing Value for Money (VfM) during the audit. The proposal was submitted to Network Rail and the ORR in early October 2013 and this was subsequently approved on 29 October 2013. The Reporter proposal was to base the assessment of VfM on the principles of the VfM test used by the National Audit Office (NAO).

The NAO define good value for money as “the optimal use of resources to achieve the intended outcomes”.

Using the intended outcomes of the fiscal stimulus, the Reporter proposed to assess VfM by answering five questions:

1. Are the works additional to schemes in the CP4 Business Plan?
2. Have the works generated or saved jobs for contractors/suppliers?
3. Are the works addressing a valid need i.e. there is a benefit in doing them?
4. Are the works undertaken to a good standard of quality?
5. Are the works delivered at reasonable cost?

For each sample site visited a summary report was provided. Additionally, a summary report table for each Route was created to capture the assessment against the VfM Test.



Summary of VfM Assessment

This section summarises the assessment criteria for each of the five questions and an analysis of the assessment results.

Question 1 – Are the works additional to schemes in the CP4 Work Bank?

Assessment Criteria:

1. Is the scheme listed in the CCES Strategy?
2. Was the scheme listed in the Route's CP5 Business Plan prior to April 2012?
3. Was the scheme not in the Route's CP4 Business Plan prior to April 2012?

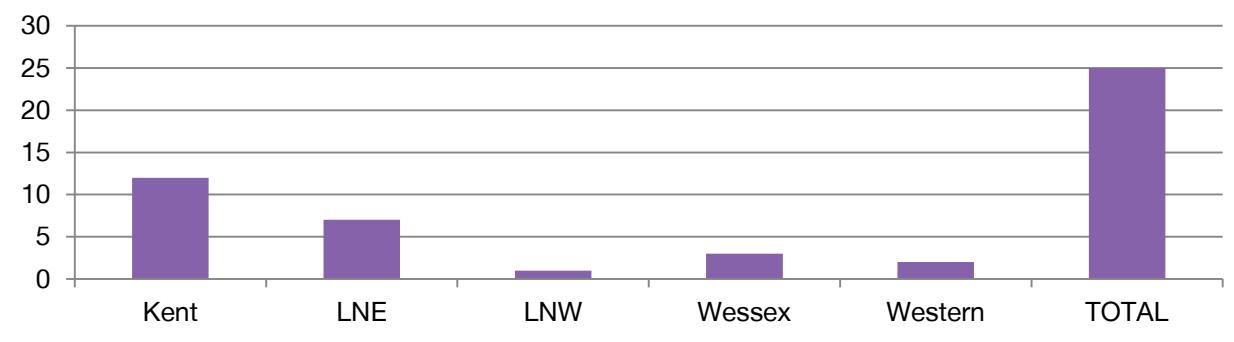
The basis of this question is to confirm that schemes included in the CCES programme are new to the CP4 Business Plan and have been brought forward from CP5 Business Plan. The IR made an underlying assumption that Network Rail had verified that schemes included in the CCES strategy were new schemes and not already part of the CP4 Business Plan.

If the IR found evidence of any one of the three above assessment criteria, then the works were assessed as being additional.



Question 1 Assessment Results

Q1 - New to CP4 Work bank (No Evidence Provided)



Although we found evidence that most schemes were additional to the CP4 work bank, no evidence was presented for 25 schemes (31% of sample) to justify that they were indeed new to the CP4 work bank.

Question 2 –Have the works generated or saved jobs for contractors/suppliers?

Assessment Criteria:

1. Is the scheme's delivery contractor listed in summary report ³ on the new jobs created?
2. Was there evidence from the site visit that a number of jobs were sustained during the period of site delivery of the scheme?

A survey undertaken by Network Rail of the jobs created by the CCES programme by the framework contractors engaged on the programme is summarised in Table 4 below. The evidence of jobs created was verified during the site visits by confirming that the framework contractor was the nominated main contractor responsible for delivering the scheme. Where the information was available, the number of people working on site during duration of works was also recorded in the site reports.

³ Report compiled by Network Rail's Delivery Enhancement Reporting Team from survey of approved framework contractors



Route	Total No of Jobs	Authority (end P1)
LNW	302	88,443,000
LNE	113	31,564,000
East Midlands	65	13,098,200
Western	133	33,240,002
Wales	97	30,822,999
Kent	62	41,423,000
Sussex	165	7,233,000
Anglia	21	19,089,000
Wessex	101	11,117,000
Total	1059	276,030,201

Table 4 - Summary of the Jobs Created/ Sustained by framework contractors @ P13 2012/13

Question 2 Assessment Results

Apart from verifying that the schemes in the audit sample were delivered by an approved CCES framework contractor and estimating the average numbers of workers on site for the duration of the works no further evidence was available. The IR considers that the Network Rail survey summarised in Table 4 represents a reasonable estimate of jobs created by the CCES programme.

Question 3 –Are the works addressing a valid need i.e. there is a benefit in doing them?

Assessment Criteria:

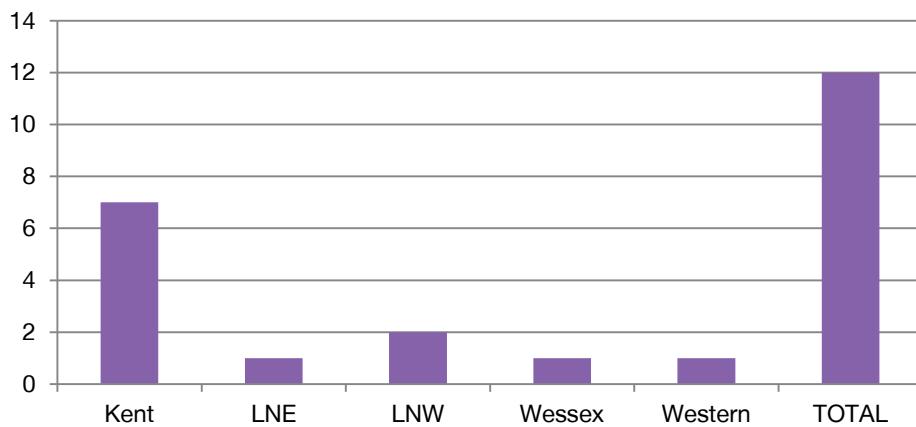
1. Is the scheme included in the approved list in the CCES strategy?
2. Was other technical evidence provided to justify including the scheme in the CCES programme e.g. bridge or earthwork examination report?
3. Was there evidence from site visit that the scheme was required and improves long-term asset life?

A scheme scored 2 if it met criteria 3 and either one of criteria 1 or 2. If a scheme only met one of the criteria it scored 1.



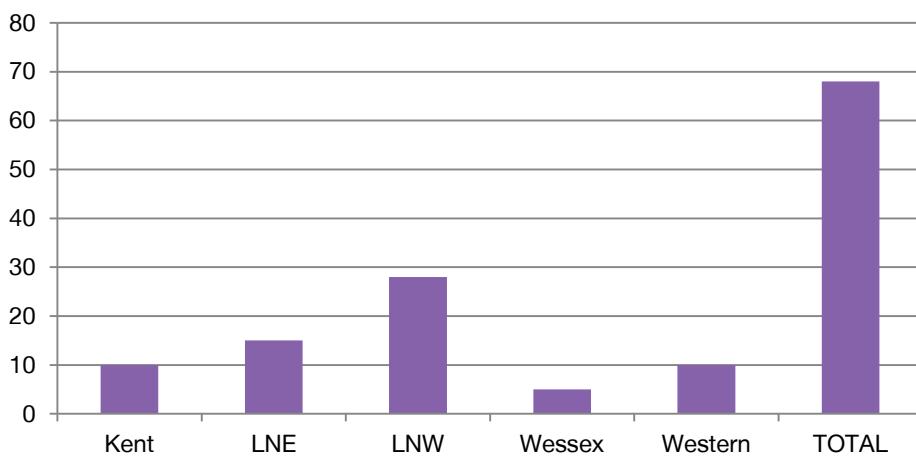
Question 3 Assessment Results

Q3 - Scheme Addressing a Need (No. score = 1)



The chart above summarises the number of schemes with an assessment score of 1 i.e. the least evidence of addressing a need. Out of a total of 80 schemes assessed, 12 schemes in the audit sample were assessed as scoring 1.

Q3 - Scheme Addressing a Need (No. score = 2)



Most of the schemes that were in the approved CCES were also found to address a demonstrable need from the site visits. The chart above shows that 68 schemes out of 80 were assessed as scoring 2.

In the sample of sites audited, all the schemes were assessed as addressing a valid need based upon either site or desktop evidence.



Question 4 – Are the works undertaken to a good standard of quality?

Assessment Criteria:

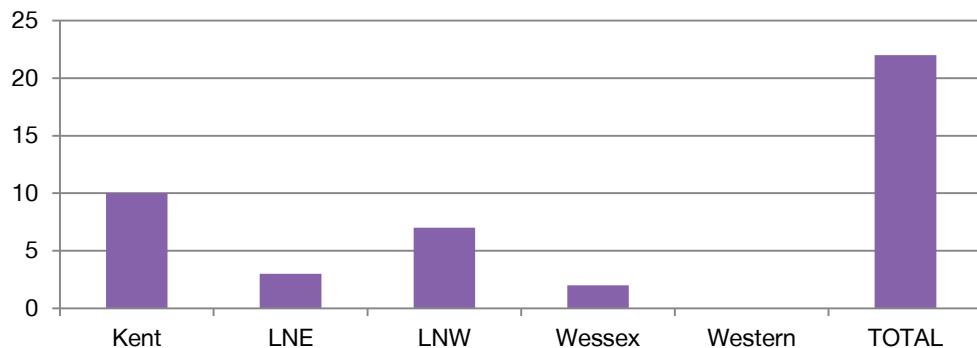
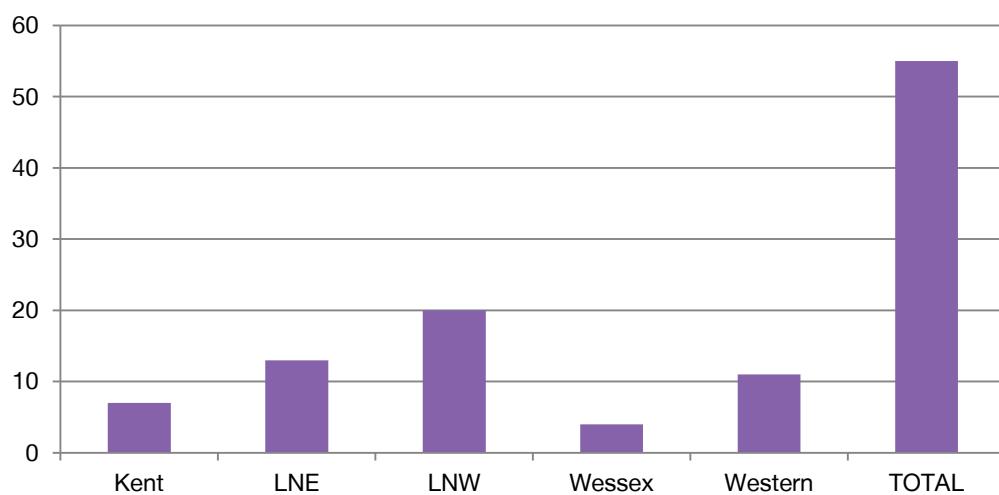
1. Has the contractor provided an approved Form 3 Design / Network Rail Completion Certificate
2. At the site inspection was it evident that the works were delivered in accordance with both the design and good industry practice?

Question 4 aims to identify schemes that are considered to be delivered to good quality based on the technical assurance provided and site observations of the works delivered on site. A stronger weighting was given to site observation of the works being delivered than to providing an approved scheme design. Site observations on quality takes into consideration the methods of construction and the potential whole life cost of the asset renewal scheme.

A scheme gained a score of 1 if it met assessment criteria 1. For assessment criteria 2, a scheme could score either 1 or 2 depending on whether it met it 2 partially or fully. So a scheme could score up to a total of 3.

Question 4 Assessment Results



**Q4 - Schemes Delivered to Good Quality (No. score = 2)****Q4 - Schemes Delivered to Good Quality (No. score = 3)**

With the exception of 3 schemes, the schemes audited were found to be of good quality based upon both Design and Site evidence as reflected in the charts above. The 3 schemes in the audit sample for which the quality of the works could not be verified from Site evidence are:

- Arkenside Street, HXS3/21 – Hidden Critical Element, LNW Route
- River Tame, RJW1/149 – Hidden Critical Element, LNW Route
- Hyde Viaduct, RHY2/8 – Spandrel Wall Stabilisation, LNW Route



Question 5 –Are the works delivered to a reasonable cost?

Category 1 –Schemes within CCES approved strategy

1. Is the scheme's AFC within reasonable tolerance (20%) of the CCES baseline budget estimate (yes – green⁴)
2. If the AFC is greater than budget, is there a valid justification for variance in costs (yes – green) or (no – amber)

Category 2 –Schemes not within CCES approved strategy

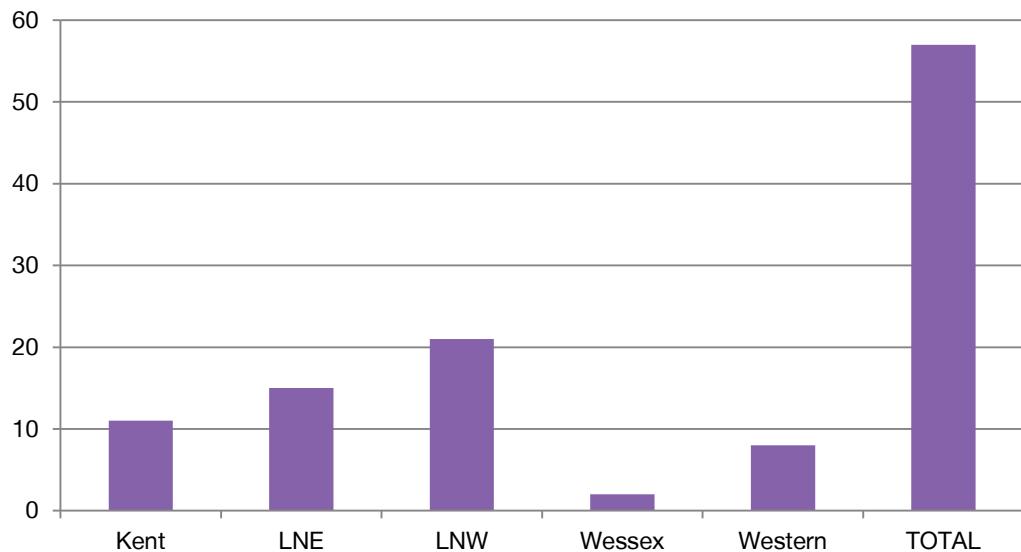
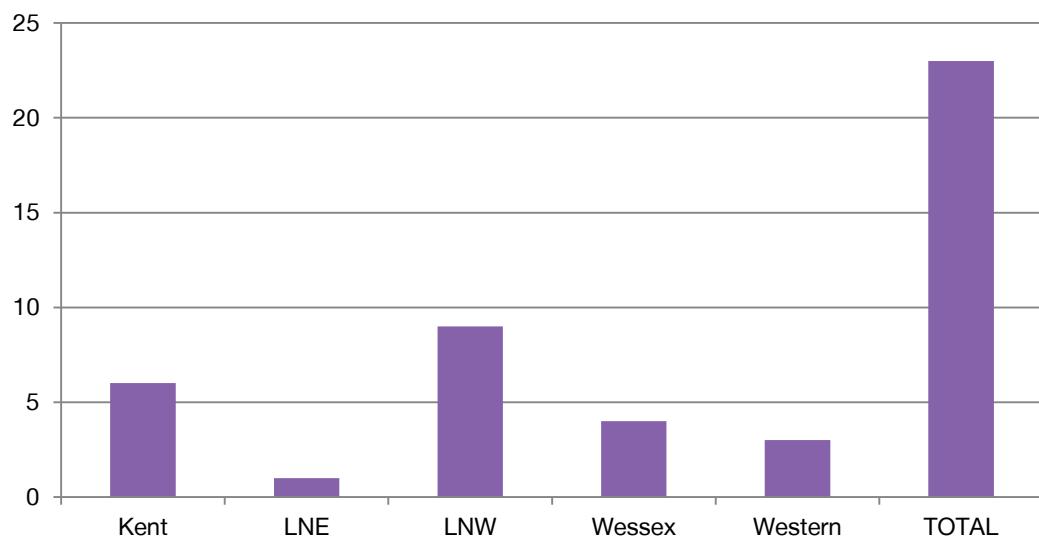
1. Has the Route provided evidence of an approved budget for the scheme? ((No – NE) ; If Yes then:
2. Is the scheme's AFC within reasonable tolerance of the baseline budget estimate? (yes – green)
3. If there is a variance on the approved budget, is there a justifiable reason for the variance? (yes – green) or (no – amber).

Question 5 Assessment Results

The cost assessment was based on a comparison between the volumes, baseline budget and the Anticipated Final Cost (AFC) provided by the Routes for Period 7/8 in 2013/14. Where there is reasonable tolerance between CCES baseline budgets and the AFC for the same work scope and in situations in which the scope increase is comparable with budget and volumes for other CCES schemes, then the scheme was assessed as being to reasonable cost.

57 out of a sample of 80 schemes audited were found to be within reasonable cost, see chart overleaf.

⁴ The colours referred to in this section are used to indicate status of reference in the Route summary report. Green indicates scheme passes reasonable cost test and amber indicates scheme's AFC requires further scrutiny.

**Q5 - Scheme Delivered to Reasonable Cost****Q5 - Schemes not Delivered to Reasonable Cost
(No. schemes with not enough data)**

However, there were some schemes the IR did not find that work volumes and scheme cost information consistent with CCES baseline budgets. There were 23 schemes out of 80 with insufficient evidence to demonstrate reasonable cost. These schemes are summarised by Route in the chart above.



Examples of Question 3 – does the scheme address a valid need?

We have included a few example schemes from the audit in this section to illustrate some of our findings when assessing Question 3 - are the schemes addressing a valid need? The examples are:

- Earthworks LNE - Warmsworth Cutting - scheme was found to address a valid need
- Spandrel Wall Stabilisation LNE - Frodingham Viaduct – scheme was found to address a valid
- Scour Protection LNW - Banbury DCL 73 – scheme was found to address a need but did not meet the CCES Strategy criteria.



Earthworks - LNE Route - Warmsworth Cutting

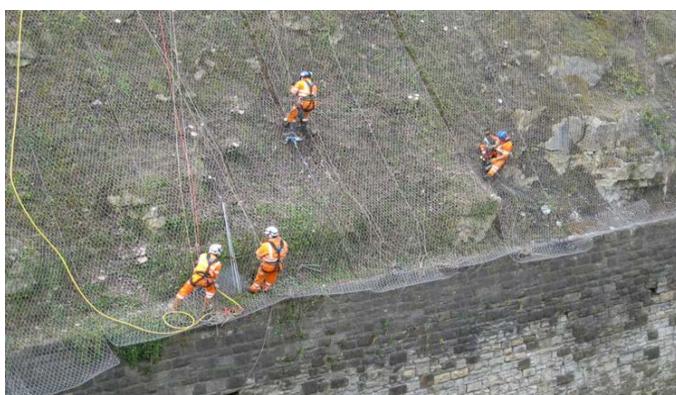
The IR's site visit and further information on a detailed examination provided by Network Rail has supported the inclusion in CCES programme as addressing a valid need. The works at Warmsworth Cutting were triggered by earlier rock fall and given the narrow, near vertical faces of the cutting, the work at this site was designated as a priority. The Warmsworth Cutting scheme was not included in the CCES baseline programme but due to recent rock fall it was added to the CCES programme. A rock anchor and netting scheme was required and should improve the Rock Stability Index and reduce risk of further rock falls at this location.



LNE/E/01/08 Record photo showing typical condition of the cutting faces prior to the works



LNE/E/01/01 View of cutting facing west from Mill Lane Bridge.



LNE/E/01/10 Record photo showing the sides of 2m wide mesh rolls being stitched together.

Spandrel Wall Stabilisation LNE Route - Frodingham Viaduct

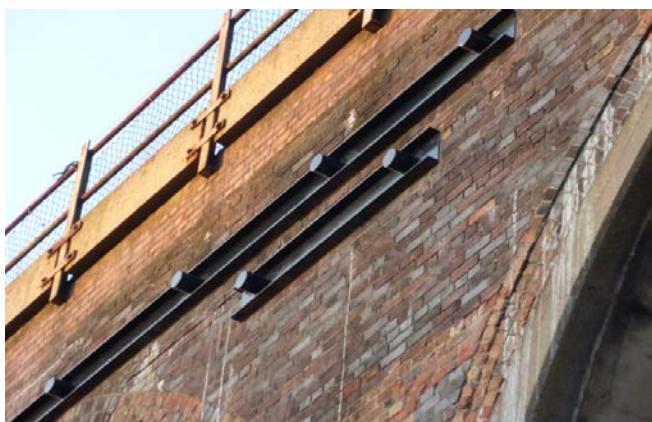
The Frodingham Viaduct scheme was found to address a valid need by the IR. Frodingham Viaduct is a multi-arch Victorian viaduct with several areas of the brickwork in an advanced state of deterioration, various previous schemes of strengthening and re-casing were evident in the area of spans 73 to 83. The reinforcing work is on-going and is obviously a priority to Network Rail as this is a heavily used freight route as well as being justifiable under the Enhanced Spend Programme. However, given the different degrees of difficulty with access, establishing consistent unit rates for the elements of the work was difficult at this site.



LNE/SP/02/07 South of viaduct showing western pier of road span 78



LNE/SP/02/10 Record photo showing access scaffolding to south side spans 76-77



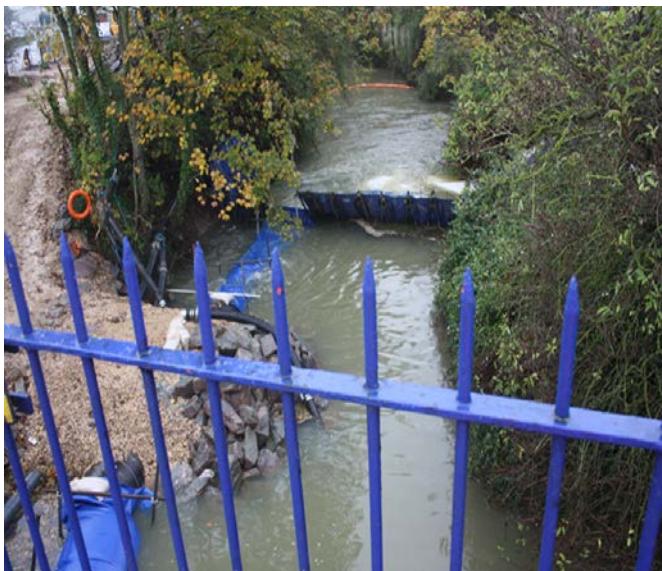
LNE/SP/02/06 Viaduct south side showing walings on span 76-77



Scour Protection LNW Route - Banbury DCL 73

Although this scheme was found to address a valid need, the scour protection scheme at Banbury DCL73 did not confirm its priority criteria in the CCES Strategy. The Banbury DCL73 is a carriageway bridge forming the main access into the Network Rail station car park.

Furthermore, the scour protection works between two schemes in the Banbury area DCL75A and DCL73 had not been co-ordinated to achieve efficiency in procurement and planning the delivery of the works. The IR understands that a request was made to the Environment Agency by the contractor to divert the river by pumping over both bridges at the same time which was turned down. This would have allowed both relatively small schemes to be delivered at the same time.



LNW/SC/05/01 flooding to river diversion caused by prolonged period of rainfall



LNW/SC/05/02 view of bridge with carriageway access to Banbury station car park



Examples of Question 4 – are schemes delivered to good quality?

We have included a few example schemes from the audit in this section to illustrate some of our findings when assessing Question 4 - are schemes being delivered to good quality? The examples are:

- Bridge Painting Western Route Bourne End – scheme was found to be delivered to good quality
- Hidden Critical Element (HCE) schemes on the LNE LNW and Wessex Route – all schemes were found to be delivered to good quality but the IR found a difference in overall quality of the HCE scheme designs between the Routes

Bridge Painting Western Route Bourne End

The Bourne End bridge painting scheme was found to be delivered to good quality. From the IR site visit supported by photographs taken by the contractor during the survey of the viaduct indicates that the repair and re-painting work was appropriate to halt any further corrosion and improve the BCMI score with consequential reduction in future maintenance liability. This is further reinforced by the fact that public interest is high in this area of the Thames. The single track passenger line carried by the viaduct is relatively lightly used.



WTN/P/01/04 Bottom chord of trusses were particularly corroded prior to re-painting



WTN/P/01/03 Record photo showing typical condition of piers prior to re-painting.



WTN/P/01/07 Encapsulated central span serviced by floating craft



WTN/P/01/09 View of typical rivet replacement by high tensile bolts and like –for- like splice plates to restore an area where there has been a loss of section due to extensive corrosion of the bottom chord of the trusses.



Hidden Critical Element schemes on the LNE LNW and Wessex Route

From the site visits undertaken, the IR found a difference in the overall quality of the HCE schemes delivered. There were the 3 different types of HCE scheme designs used on the 3 Routes. We found the GRP retention board scheme offered a more long term solution as the galvanised steel option (photo LNW/HCE/01/03) would be vulnerable to rusting and corrosion. The requirement for an endoscopic camera inspection chamber (photo WEX/HCE/02/03) as a standard design solution should be further investigated to determine an optimum standard design. However, IR considers that the grid cover illustrated on photo LNE/HCE/01/05 allows for more regular and quicker inspections.

LNW – Knowsley Road (Photo Ref.LNW/HCE/01/03)

The HCE works completed are delivered in accordance with design. The provision of a galvanised steel enclosed inspection chamber over a substantial section of the girder for the disused track is questioned as alternative means of accessing the centre main girder for examination could be achieved at this location without disruption to the operating railway.

LNE – Huddersfield Narrow Canal (Photo Ref. LNE/HCE/01/05)

Based on the site criteria for HCE Priority 1 schemes, the Huddersfield Narrow Canal, STR 44: MVL3/44 fulfils the criteria for HCE Type 1 Priority schemes. The proposed scheme will reduce overall maintenance cost from fabrication in GRP.

Wessex – Lower Ham Road (Photo Ref. WEX/HCE/02/03)

The Lower Ham Road, STR 5/11: NMS1 fulfils the criteria for providing an inspection hatch for regular examination of hidden critical elements to the centre main girder and outer girder.

The structural repair work was a significant element of the work scope and has constituted a large proportion of the overall scheme cost. The scope of metal structural work repair could not be verified at the site visit and the cost value exceeds the recommended total proportion of structural work recommended within the CCES strategy.



LNW/HCE/01/03 – close-up view on inspection chamber



LNE/HCE/01/05 – typical GRP ballast board retaining proposed for site (installed around web stiffeners)



WEX/HCE/02/03 – centre main girder with inspection hatches at either side of the GRP ballast plate



Overall findings

Jobs Created

Based on the estimates from Network Rail's survey of framework contractors, approximately 1000 jobs were created or retained by Network Rail's BCDP contractors as a result of the fiscal stimulus provided by the CCES programme.

The contractors managed the enhanced CCES workload well but the client and delivery function provided by Network Rail appeared stretched on some of the Routes which impacted on their ability to monitor, plan and co-ordinate the works.

Work banks

Some routes (LNE, LNW & Western) had developed CP5 Work banks and it was therefore easier to bring forward schemes to CP4, and be confident that they will offer value for money, as demonstrated by:

- a higher compliance with CCES strategy
- validated schemes in strategy with the CCES approved baseline budgets

Addressing a Need

We are satisfied that all the schemes in the sample were demonstrated as addressing a valid need. Furthermore the majority (namely 85%) addressed an immediate and clearly demonstrable need.

We noted some variance between the delivered programme and the CCES strategy, because some high priority schemes on the mainline routes could not be delivered due to limited access booking.



Quality

The overall quality of work of the schemes audited was good and was generally on course to be delivered by the CCES programme deadline of April 2014, end of Control Period 4, without adversely impacting quality.

With the exception of very few schemes we received design drawings, plans and assurance documents in advance of site visits, indicating a good overall level of quality control.

Reasonable Costs

The delivery of some schemes was affected by track possession access, client management resources and booking of engineering trains. This was generally as a result of works being planned and delivered over a short timescale.

There were a few instances in which Network Rail did not optimise the use of shared resources (e.g. possessions, access, site compounds) in the delivery of schemes.

The work volumes and costing information provided to the Reporter varied in quantity and quality between the schemes. This made it difficult to compare unit rates both within the Routes and across the CCES programme.

For schemes exceeding the baseline budget and for which volume unit rates were found not to be proportionate with AFC for the scheme delivered, factors such as method of construction, access and effects of bad weather were significant contributors to the scheme's overall cost. There were approximately 29% of sample schemes in this category.



Recommendations

Network Rail should include in their Management Review of CCES programme the 23 schemes identified from the audit sample for which there was insufficient evidence to determine reasonable cost and also the 25 schemes for which there was insufficient evidence that they were new to the CP4 Work Bank, in order to either provide retrospective evidence that the criteria are met, or identify any lessons arising.

Network Rail should set up inter-Route groups to ensure the Routes and their framework contractors share innovation and best practice in design and implementation techniques. This should help to maintain and improve overall quality and efficient delivery of schemes.

Observation

Network Rail should identify, plan and deliver the high priority schemes during CP5 that were originally within the CCES programme that could not be delivered due to access constraints on the busy mainline routes. Priority should be given to produce a detailed delivery schedule of the Work Bank programme in CP5 and monitor its implementation to ensure a more even spread of resources throughout the Control Period and that the high priority schemes in the CCES baseline programme are delivered. This observation supports the ORR recommendation in Chapter 8 of the Final Determination that Network Rail should achieve efficiencies in CP5 from its renewal programme through better scheduling of works.



Conclusions

The conclusions from the sample of schemes audited from the CCES programme are:

- approximately 1,000 jobs for the framework contractors were protected and created over the period of the programme by the CCES programme
- high priority schemes were brought forward from CP5
- schemes were delivered to good quality and should enable long term value for money.