



Cowra Lines Feasibility Study

Executive Summary

Contents

1	Introduction	3
2	Feasibility Study Objective	4
3	Background.....	5
4	Strategic Importance of the Project	6
5	Options Considered	7
6	Assessment Criteria	8
7	Key Findings	9
7.1	Demand for usage of the line.....	9
7.2	Engineering Assessment	9
7.3	Land Use and Environmental Assessment	10
7.4	Economic and Financial Analysis	10

Author: Sharon Bennett – Director Freight Strategic Initiatives
Date: January 2019
Version: 1
Reference: CST19/10135
Division: Customer Strategy and Technology
Review date: January 2021

1 Introduction

The Blayney to Demondrille (179km), Koorawatha to Grenfell and Cowra to Eugowra rail lines (collectively referred to as the Cowra Lines) total approximately 310km and were progressively suspended from operation between 2007 and 2009 due to low traffic volumes, high maintenance costs and safety concerns.

The Cowra Lines form part of the NSW Country Regional Network (CRN) and are managed by John Holland Rail (JHR).

Since the suspension of services on the Lines a number of studies have been conducted considering their partial or complete reopening. Generally, these previous studies have focused on reopening the Lines at lower axle loads.

Transport for NSW (TfNSW) in recognition of the continuing significant potential benefits and opportunities to businesses and communities in the region resulting from the Lines reinstatement, commissioned a new investigation into the feasibility of reinstating the Lines.

The Base Case for the assessment is the reinstatement of all Cowra Lines including Branch Lines, with focus on the Blayney to Demondrille Line to an operational standard allowing for 25 tonne axle load (TAL) freight at 80 kph, considered most feasible and other regional lines at 19 tonne axle load (TAL).

This Executive Summary outlines the findings of the assessment undertaken between June and November 2019 on the project's viability.



Figure 1 Section of Washaway at approximately 402.300km

2 Feasibility Study Objective

The objective and scope of the Feasibility Study included a detailed analysis of the demand for usage of the line, in addition to an economic and financial analysis to determine the strength of the case for reopening. In assessing the economic case, an analysis of the existing infrastructure and upgrade requirements was required, including the identification of potential land use and environmental issues.

The study included:

- Investigating the layout, design and cost of reinstatement works
- Undertaking a detailed assessment of the project's viability on environmental, social and economic criteria, including an economic cost benefit evaluation
- Identifying any preconstruction requirements to guide the construction of the project, should it proceed.



Figure 2 – Cowra viaduct iron lattice spans

3 Background

The Cowra lines in their entirety comprises the following sections:

- Maimuru to Demondrille
- Koorawatha to Maimuru
- Koorawatha to Grenfell
- Cowra to Koorawatha
- Cowra to Eugowra, and
- Blayney to Cowra.

The Blayney to Demondrille section obtained approval from the NSW government to commence construction in 1881 and was progressively opened between 1885 -1888. The Blayney to Demondrille line was predominately utilised to transport grain and produce from the region, but also served to provide a cross-country route to bypass the Blue Mountains.

The Koorawatha to Grenfell section opened in 1901 and it formed part of the public transport network and was used to transport grain.

The Cowra to Eugowra section was opened in stages and became fully operational by 1922 and this part of the rail network was utilised for freight and passenger services.

The lines sections were progressively suspended from service between 2007 and 2009. The non-operational lines remain part of the Country Regional Network and John Holland Rail continue to manage the Lines. The entire Cowra Lines are shown below.



Figure 3 – Cowra Lines

4 Strategic Importance of the Project

The Local Government Area's within the Study area include Hilltops (Young), Cowra, Blayney, Weddin (Grenfell) and Forbes and are not well serviced by road or rail networks. The Great Dividing Range separates the regions from the Sydney basin and impact the cost of import and export freight.

Road has become the predominant mode of transport within the region for general freight based on limited rail options. Bulk goods such as coal, grain and concentrates use rail services either through the Main West or the Main South.

The region supports a diverse range of products including high value mineral concentrates, coal bound for export and domestic power consumption, export and domestic grain, quarry products, pulpwood used for paper and timber products and a wide variety of fruit, vegetables and meat products. The region is rich in natural resources and highly productive farmland and supports the development of value-add industries.



Figure 4 – Young Platform (439.985km)

5 Options Considered

In summary a total of four upgrade options were considered for reinstatement of the Cowra Lines during the assessment process. The options considered are listed below:

- **Option 1** (Base Case) – Reinststate all lines on the Cowra Network (Blayney to Demondrille at 25 TAL 80kph and the Branch Lines at 19 TAL)
- **Option 2:** Re-instate Blayney to Demondrille at 25 TAL, 80kph
- **Option 3:** Re-instate Blayney to Demondrille at 25 TAL, 60kph
- **Option 4:** Re-instate Blayney to Demondrille at 19 TAL (matching line classification prior to line closure).



Figure 5 – Cutting with significant vegetation (approximately 447km)



Figure 6 – Underbridge cut at Bulkhead Road Cowra (369.5km)

6 Assessment Criteria

The feasibility study included:

1. Demand for usage of the line
2. Engineering assessment
3. Land use and environmental assessment
4. Economic and financial analysis.



Figure 7 – Washaway (389.900km)

7 Key Findings

The following summarises the key findings of the study:

7.1 Demand for usage of the line

The key outbound commodities (more than double inbound) generated in the region, which contribute to the majority of the annual tonnages are mineral concentrates, coal, pulpwood, quarry product, grain, meat, wine, fruit and vegetables. No single product is dominant within the region.

Demand for imports into the region from Port Botany vary depending on construction activity. Products which would potentially be captured on rail include construction materials (solar power and mining plant and equipment) are currently in strong demand as well as farm machinery, fertilizer and packaging materials used in the packaging of products (particular dairy/food).

Overall growth of 1.1% to 2036 and 1.0% to 2056 is expected.

Based on Scenario 1 annual volumes of 2.2 million tonnes were used in the assessment and for Scenario 2, annual volumes of 1.2 million tonnes were used. It is estimated that an additional 1 million tonne could be attracted to the reinstated line under Scenario 1, whereby existing rail freight could be diverted to the Blayney to Demondrille line. This freight includes mineral concentrates bound for Port Botany, grain bound for Port Kembla and/or Nowra and containerised general freight import/export through Port Botany.

Regional demand was assessed using both a statistical model and detailed stakeholder consultation. Approximately 46 stakeholders were identified and approached for the study. Around fifty percent of freight stakeholders would likely to use the line subject to future restrictions being imposed on freight through the Main West. There is considerably less demand from stakeholders for the reopening of the line if the Main West is able to comfortably accommodate rail freight services on an ongoing basis.

7.2 Engineering assessment

The rail infrastructure is mostly intact, although several rail bridges and track sections have been removed to accommodate main roads primarily on the Branch lines. The condition of the Blayney to Demondrille line has been assessed in relation to its ability to support the base case requirements of 25 TAL @ 80 kph. Cost options to restore the line to a lower standard have also been considered, with the aim of sustaining the infrastructure in a fit for purpose condition to accommodate low to medium volumes of traffic. The condition of the Branch Lines has been assessed in relation to their ability to support restoration of services at 19 TAL.

Rail is predominately 80 lb rail jointed and in reasonable condition, although approximately 30% of the Blayney to Demondrille line is higher than 80lb (a mix of 94lb, 90lb and 47kg/m). The existing 80lb rail could support operations of 19 to 21 TAL but not 25 TAL.

Sleepers are generally timber and in poor condition however some could be retained for lower axle load scenarios. For 25 TAL all rail, sleepers and ballast need to be replaced and the construction of 2 new crossing loops (east and west junctions) at either end of the Blayney to Demondrille line will be required and some level crossings will require upgrade. Timber bridges are all considered life expired and

need replacement under all scenarios and improved clearance works in the Carcoar tunnel (281m) are also required.

7.3 Land Use and Environmental Assessment

An investigation study area traversed Young, Cowra, Weddin, Blayney, Hilltops and Forbes local government areas.

The main environmental issues associated with reinstatement works of the project within the study area are:

- Construction and operational noise and vibration impacts
- Potential for direct and indirect (e.g. visual/setting) impacts on items of historic heritage
- Discovery of Aboriginal sites and areas of archaeological potential
- Potential for direct impacts on Key Fish Habitat of the Lachlan River and related watercourses
- Potential impacts on existing surface flow patterns and floodplains
- Potential to encounter acid sulfate soils or unexpected contamination finds
- Potential for erosion and sedimentation during construction, and
- Potential for air quality impacts during construction and operation.

7.4 Economic and Financial Analysis

The feasibility study report provided an economic evaluation of the options to reinstate the Cowra Lines.

The economic evaluation combines the project benefits and costs and compares the options to the Base Case. The purpose of the analysis is to compare the costs of providing reinstated rail infrastructure to the benefits of operating on the line. A Discount Rate of 7% was used. Additional sensitivity analysis was completed on discount rates of 4% and 10%, with no BCR achieving greater than 1.

For reinstatement to be economically viable, requires a Benefit Cost Ratio (BCR) greater than 1. None of the options considered achieved a BCR greater than 1.

The options considered are listed below:

- **Option 1** (Base Case) – Reinstatement all lines on the Cowra Network (Blayney to Demondrille at 25 TAL 80kph and the Branch Lines at 19 TAL)
- **Option 2:** Re-instate Blayney to Demondrille at 25 TAL, 80kph
- **Option 3:** Re-instate Blayney to Demondrille at 25 TAL, 60kph
- **Option 4:** Re-instate Blayney to Demondrille at 19 TAL (matching line classification prior to line closure).

Additionally two scenarios were considered:

Scenario 1: Constrained Main West

Economic Outcome	Option 1	Option 2	Option 3	Option 4
BCR	0.8	0.9	0.8	0.3

The Main West / Illawarra Lines become significantly constrained in future and not able to adequately support Central West Freight Rail services.

The results of the economic evaluation at the 7% discount rate, include:

- Present value of the costs is estimated to be between \$156 million and \$335 million over the evaluation period
- Present value of benefits is estimated to be between \$42 million and \$254 million over the evaluation period
- Net benefit (in NPV terms) valued at between -\$114 million and -\$34 million over the evaluation period
- BCR's of between 0.3 and 0.9

The analysis is marginal when considering the upgrade of the Cowra rail lines, Blayney to Demondrille line, at 25TAL at 80kph under a scenario where the Main West and Illawarra Lines become capacity constrained and are unable to practically support Central West freight.

Scenario 2: Unconstrained Main West

Outcomes	Option 1	Option 2	Option 3	Option 4
BCR	0.4	0.4	0.3	0.2

No change to freight path availability for services from the Central West.

The results of the economic evaluation at the 7% discount rate, include:

- Present value of the costs is estimated to be between \$156 million and \$335 million over the evaluation period
- Present value of benefits is estimated to be between \$26 million and \$127 million over the evaluation period
- Net benefit (in NPV terms) valued at between -\$130 million and -\$208 million over the evaluation period
- BCR's of between 0.2 and 0.4

Under the scenario where the Main West and Illawarra Lines are not capacity constrained and continue to support Central West freight none of the upgrade options provide a positive economic return.

There are a number of factors driving the outcomes of the economic analysis:

- Lower and dispersed volumes with multiple destinations within the Cowra region make consolidation for rail services difficult when competing with road
- Alternative paths to port using rail from the Central West currently exist. The feasibility of the Cowra rail lines requires existing freight capacity to be constrained.
- The capital cost associated with line reinstatement is significant. From an economic perspective, these costs are borne upfront, while the benefit stream of the project occurs over a longer period of time.