

Bush Tramways in New Zealand: an Unrecognised Historic Resource

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The timber industry in New Zealand was important and had a substantial impact on the country, both positive and negative. However, compared with some industries, for example mining, it has left few physical traces, the routes of bush tramways being the most common.

Bush tramways were lightly constructed railways used for transportation by the timber industry. They were the main method of timber transportation from at least the 1870s until the 1940s. The earliest record of a tramway is in 1858. A Government report in 1873 stated that no miller would contemplate working the bush without one. The demise of bush tramways began in the 1930s as trucks and roads improved. Many tramways closed in the period 1945-1955 but the very last remained until 1977.

Early bush tramways were laid with wooden rails. The first known use of steel rails was in 1873. It was not until this century that steel rails became widely used. Wooden railed tramways continued to be used by some smaller operations, and the last wooden tramway closed in 1966. The gauge used on the big trams was the same as the main railway system; 3 feet 6 inches. However, a significant number of trams were laid to 3 feet gauge.

Most bush trams were designed for a temporary existence and so more liberal specifications were used than for Government railways. Steep grades and tight curves were common. Field measurements reveal grades as steep as 1 in 6 and curves as tight as five metres radius being worked by locomotive. This compares to ordinary railways maximum grades of 1 in 30 and curves of 100 metres radius. The use of switchbacks to maintain grade was unusual. However, one tramway featured a complete spiral including a tunnel and bridge. Even steeper grades were worked as inclines using winding engines. One incline is reported to have a section of 1 in 2.

Earthworks were kept to a minimum, and low bridges were often used in place of fills. One six-kilometre section of tramway included three kilometres of such bridges. A few trams had sections of heavy side and block cuts, involving considerable expense. Tunnels were not common, the longest being 80 metres.

Bridges were often used. They were mostly simple beam and pile structures, but there were some notable engineering feats. The largest viaduct, the Percy Burn, was 120 metres long and 35 metres high. It stands today.¹ The longest truss span was 25 metres over the Waikato River. Some of these larger bridges are known to have been designed by engineers.

Early rolling stock consisted of four wheel trollies. This necessitated crosscutting the logs into short lengths in the bush. The use of log bogies later became almost universal. These had a short wheelbase and wooden chassis. They were not sprung, and so deep flanged wheels were fitted to avoid derailments on uneven track. A swivelling bolster was mounted centrally on each bogie. The bogies were used in pairs and were spaced apart to suit the length of the logs which could then be brought out full length.

A critical aspect of bush tramway operation was braking. A typical loaded set of bogies weighed 8 tonnes. Runaways were all too frequent, at times resulting in destruction of equipment and even death. The common brake systems used were sprags, shoe brakes applied to the tread of the wheel, board brakes applied to the face of the wheel, and centre rail brakes.

Horses provided haulage on early trams, in teams of up to eight. The first steam locomotive was introduced in 1873. It was not until this century that steam locomotives became widely used by big and medium sized operations. Of special interest are the geared locomotives built especially for bush tramways. The development of rail tractors in the 1920s enabled small operations to replace horses. The last new geared locomotive was built in 1943 and the last rail tractor in 1957. New Zealand has a particularly distinctive and interesting history of geared locomotives and rail tractors.

New Zealand's most extensive bush tramway was operated by the Taupo Totara Timber Company at Mokai. At its peak had a 120 kilometre mainline, 40 km of branches, and employed six locomotives.

NOTE

1. Mahoney, Paul J., *et al.* 1990. *A Report on the Port Craig Sawmill Wooden Viaducts: History Engineering Drawings*, New Zealand Historic Places Trust, Wellington.