GOODS TRAFFIC ON THE NARROW GAUGE CANE AND SHIRE TRAMWAYS

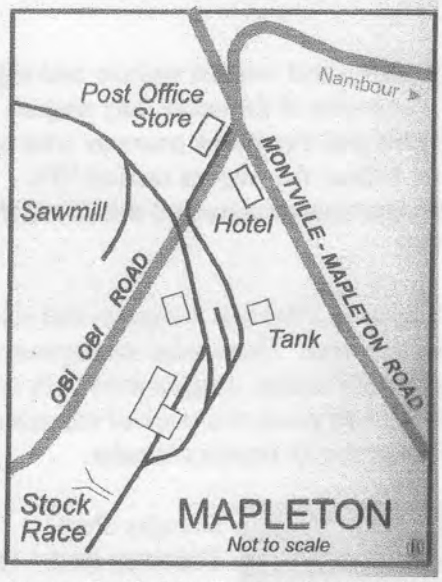
By Greg Stephenson

Part One – Shire Tramways

In the late 1800's and early 1900's, railways were seen as the preferred choice of transport for existing and developing areas. Many Councils lobby the government of the day to extend the QGR to serve their towns. The government could not hope to fund all the requests and had no desire to build what it considered would be unremunerative branch lines. A number of Councils used the provisions of the *Tramway Act* to build their own tramways. The majority were built to 3'6" gauge. However, some were built to 2' and 2'6" gauge.

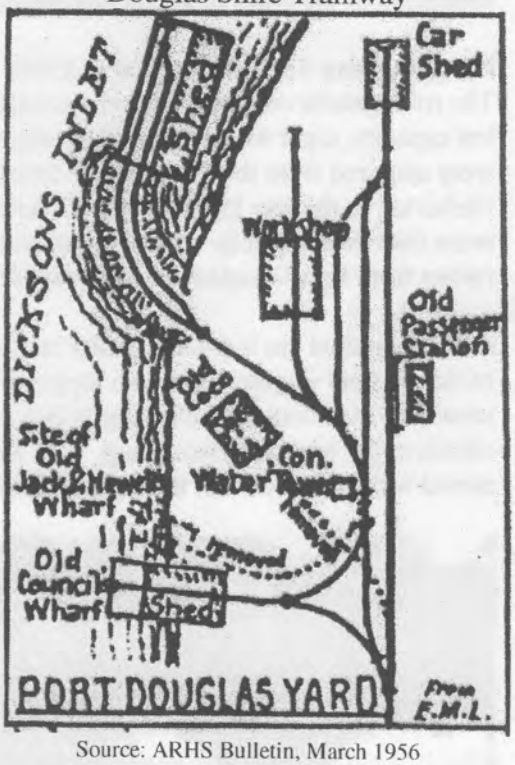
Many of these tramways acted as feeders to other railways or serviced ports. They make excellent subjects for modellers. The tramways were self-contained with most routine repairs being undertaken by tramway staff, often with limited facilities. As can be seen from the following layout plans of the principal stations on two tramways, station and yard facilities were also very limited and often very compact.

Mapleton Tramway



Source: *The Mapleton Tramway*, John Knowles

Douglas Shire Tramway



Source: ARHS Bulletin, March 1956

Most operated with minimal amounts of equipment. Both the Mapleton and Buderim Tramways only had two locomotives each. Those of the Mapleton Tramway were 2 truck Shays whilst the Buderim Tramway used a Krauss 0-6-2T and a 2 truck Shay. As can be seen from the following timetable, most services operated as "mixed" trams

trams with one return service each day. Typically, short trains were operated consisting of locomotive, covered wagon, open wagon/s and passenger coach.

BUDERIM—PALMWOODS TRAMWAY.

Miles from Buderim.	Stations.		Mixed. Ex. Sat. and Sun.	Mxd. Sat. only.	—	Fares from Bud'im. Single.	Stations.		Mixed. Daily, except Sat. and Sun.	Mxd. Sat. only.	—	Fare from Palmwoods. Single.
			p.m.	a.m.		s. d.			p.m.	a.m.		s. d.
...	BUDERIM ...	dep	‡2 0	*7 0	...	...	PALMWOODS ...	dep	4 30	*11 20	...	...
3	Telko	...	2 20	7 20	...	0 6	Chevallum ...	...	4 40	11 30	...	0 6
4	Forest Glen ...	...	2 40	7 40	...	1 0	Forest Glen ..	...	4 55	11 45	...	1 0
5	Chevallum ...	...	3 0	8 0	...	1 6	Telko	...	5 10	12 0	...	1 6
7	PALMWOODS...	arr	3 15	8 15	...	2 0	BUDERIM ...	arr	5 40	12 30 p.m	...	2 0

‡ Connects at Palmwoods with the train leaving Gympie for Brisbane at 1.14 p.m.

* Connects at Palmwoods with the 8·20 a.m. Train from Brisbane to Gympie, and the Train leaving Gympie for Brisbane at 6·35 p.m.

MAPLETON TRAMWAY.

Trains runs daily, except Sunday, as follow :—Mapleton depart 8·30 a.m., Nambour arrive 10·30 a.m. Nambour depart 12·30 p.m., Mapleton arrive 2·15 p.m. Fares, 2s. 6d. each way.

The Commissioner for Railways is not responsible for the running of Trams over the Buderim and Mapleton Tramways.

Source: Queensland Railways Timetable effective from 28th October 1934

The goods rollingstock has generally received a low priority from railway historians and researchers. Most equipment was operated by private companies and Shire Councils and archival information either does not exist or is not available in the public domain. The following information from a variety of sources gives an indication of the types of goods rollingstock used on some of these tramways.

Douglas Shire Tramway (1900 to 1959)

The rollingstock consisted of four-ton capacity, four wheel wagons and six- and eight-ton capacity, eight wheel bogie open wagons. A number of the heavy duty wagons were acquired from the Boonmoo to Stannary Hills and Irvinebank tramway west of Herberton in the late 1930's. When loaded with ballast, the wagons carried 50% more than their capacity of raw sugar, and the bogie wagons conveyed the 12-ton mill rollers from Port Douglas to Mossman until 1945.

O & K supplied the 0-4-4-0T Mallet named *Douglas* in 1903 and it appears that some of the 4 wheel wagons were also supplied about this time. These were subsequently rebuilt by the council. Following WW2, and probably earlier, wagons were built or rebuilt in the tramways workshop. The woodwork was given two coats of red oxide mixed with boiled oil and the steel parts were painted with bitumastic paint.

Douglas Shire Tramway steel 4 ton open wagon displayed at Mossman Mill

Whilst, the majority of the goods rollingstock was open wagons, photographs indicate that at least one 4 wheel covered wagon with an end platform existed and in later years, this platform was enclosed to increase capacity. No. 43 was a 4 wheel wagon with open crate formed by two horizontal 1" bars. No. 56 was a Grovers bogie wagon.

When the tramway was sold to the Mossman Central Mill on 1st January 1959, there were 55 – 4 ton wagons, 2 – 6 ton wagons and 3 – 8 ton wagons.

Geraldton (later Innisfail) Shire Tramway (1900 to 1914)

Initially, the main traffic was bananas, timber, firewood, arrowroot and corn as well as passengers. The Shire owned very little rollingstock. Government statistics first published in 1907 stated there were 17 pieces of rollingstock, increasing to 21 in 1913. There appears to be some doubts about the statistics and it appears that there were 11 wagons with the balance being made up of 21 log bogies (approximately equal to 10½ wagons).

These wagons were manufactured from silky oak and are credited with having been built by A. Koppel. The open wagons were fitted with seats when needed for excursions. They carried the initials "G. T." prominently on their sides. All were transferred to the QGR in 1914. Brief details are included in the following table.

Number	No. Built	Length (Body)	Width (max)	Gross Weight	Notes
1	1	16ft	5ft 6in		16ft door each side
2, 3, 6*, 10, 11	5	20ft	5ft 6in	12 tons	20ft door each side
4, 8*, 9*	3	20ft	5ft 6in	12 tons	8ft door each side
5, 7	2	20ft	5ft 6in		8ft door each side
Total	11				

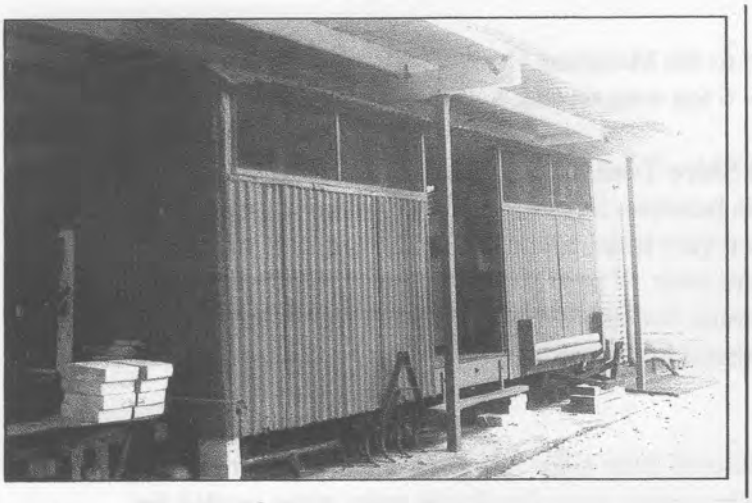
* No's 6, 8 and 9 fitted with iron framed bogies, remainder fitted with timber frames bogies.

Mapleton Tramway (1914 to 1944)

In 1914, the Maroochy Shire Council purchased from the Moreton Mill, the tramways to the west of the mill. It appears that most of the rollingstock was that taken over from the mill with the line. This included 11 goods and livestock wagons. Their builders are unknown. It appears that two cane trucks and a 4 wheel tank wagon were included with the remainder of the vehicles riding on two 4 wheel bogies. Rollingstock was of timber construction. A vertical hand brake lever at one end of each vehicle operated on the wheels of the bogie at that end.

There were 7 flat wagons 20ft long and 5' 5" wide. Bolster and chain sets for carrying timber could be placed on these wagons and pinned to the floor. Some of the flat wagons had a wall, three or four planks high, on one end with the hand brake lever attached. Photographs suggest that this was always at the Nambour end. Temporary roofs and seating could be fitted to some of these wagons for use on excursions. One vehicle fitted with a canvas roof and sides ran as a supplemental covered wagon at times.

There was a 20ft long covered wagon with central doors. Originally, it had louvred sides and ends. The doors were split in half vertically and opened outwards. It was partially rebuilt, probably following an accident, with weatherboards replacing some of the louvres and the doors removed.

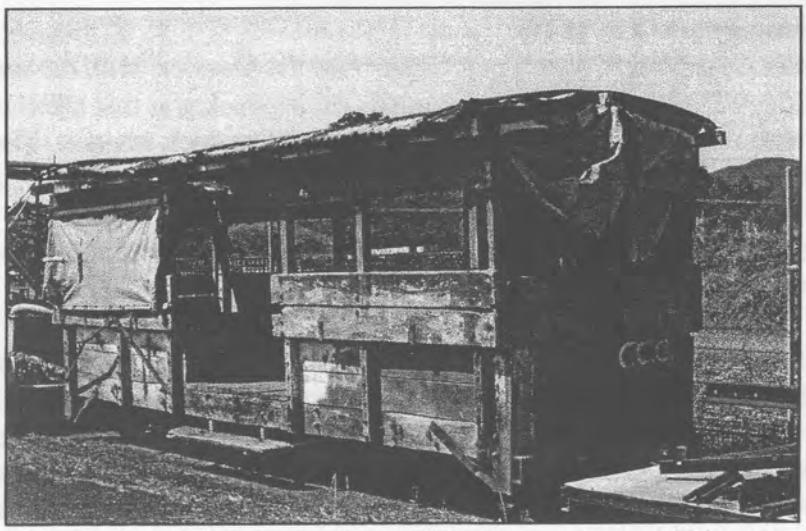


Ex Nambour Mill and ex-Mapleton Tramway covered wagon preserved by Clive Platter, Eudlo

A single livestock wagon, with a galvanised iron roof, half height slatted sides and a wide gate at one end was used for the transport of pigs and calves. Cream cans and general goods were carried in the two passenger brakevans. It appears that one and probably both of these brakevans were converted to flat wagons by the late 1930's.

Buderim Tramway (1915 to 1935)

When the line opened in 1915, there were 7 x 4-wheel open wagons with a 5' 0" wheelbase. Locomotives and the bogie passenger carriage and bogie guard's van were fitted with Westinghouse brakes. The open wagons were only fitted with handbrakes but were fitted with the necessary piping to carry the compressed air through the train. Rollingstock was built by Shillito and Sons of Ipswich.



Navvies wagon at South Johnstone Sugar Mill shows a typical Shire tramway type conversion of a bogie open wagon.

Part Two – Sugar Industry

Sugar mills are self-contained factories situated close to the farms that supply them with sugar cane. Cane railways have long been used to deliver the cane to the sugar mill. The longevity of cane railways is in no small part due to their being an economical solution to the combined functions of collection, transport and storage of a relatively low value, low density bulk commodity.

Raw sugar is produced from milling and processing the sugar cane. Tramways have been used in the transport of raw sugar to the ports. Whilst this function has largely been superseded by QGR and trucks, the Hebert River region still sees the transport of raw sugar on the cane railway system.

Cane Trucks and Cane Bins

Traditionally, the cane was cut manually by gangs of canecutters using long handled broad blade knives. The cane stalks were cut at ground level and the leafy tops trimmed. The resulting wholesticks were loaded transversely across the wagons. Some of the earlier mechanical harvesters replicated the wholestick method of cutting. However the chopper-type has proved superior and is now used exclusively.

Mechanical harvesting commenced around 1960 - 5.3% of the 9.4 million ton cane crop was mechanically harvested in 1961. By 1974, 98.5% of a total crop of 20.4 million tons was harvested mechanically and, of that, only 1% was by wholestick harvesters. A few more statistics before we progress. In 1961, there were 44,810 rail trucks in use in the sugar industry, with the majority being of the wholestick type. By 1974, this had increased to 50,000 with nearly all of them being bulk bins.

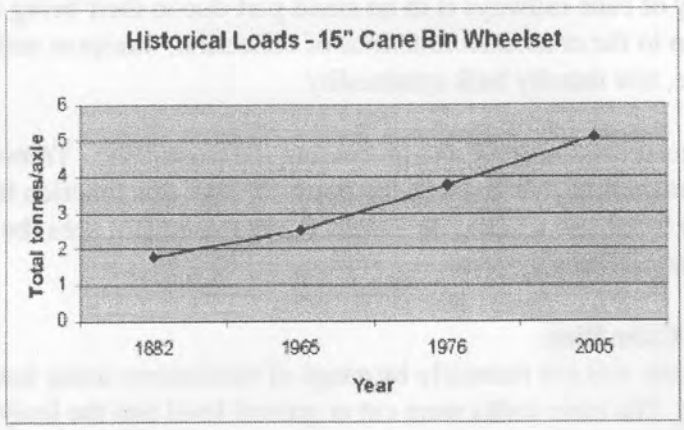
Wholestick wagons are small, low, unbraked 4 wheeled wagons. They have small wheels - typically 1'3" diameter. The cut sugar cane is loaded transversely across the wagon. It is held in place by vertical stanchions on the wagon ends. A steel rope or chain was placed over the cane and tightened by a ratchet type winch.

Given that there were over 40,000 wholestick wagons in use, there is considerable variation; not only from mill to mill but within the fleet of each mill. The wagons were made from either steel or wood. John Fowler marketed a steel version with curved angle iron ends. These typically appear at the CSR owned mills. Many were fabricated at the mills using hardwood timber. Bundaberg Foundry also supplied quantities of cane trucks. Generally, they were undecked. However, some did have open transverse decking in the Bundaberg and Mossman areas.

Some of the first generation cane bins used the wholestick wagons as their underframes. The occasional wholestick wagon can still be seen in navvy use where they are typically used for carrying sleepers. However, these have been largely replaced by cut down cane bins.

Over time, there has been an increase in the capacity of cane wagons due to a number of reasons including harvesting methods, locomotive capacity, bearing types, track standards, milling methods etc. This trend for loads to increase with time is shown in the following graph.

15" WHEELSET LOAD TREND



Source: Robert Johnson & Lino Santarossa, *'Way Forward' for Rolling Stock in the Sugar Industry*

Recent figures from CSR show that across their 7 Queensland mills, they have 20,141 cane bins with an estimated replacement value of $96M and an annual maintenance cost of $7M. The following table gives the break up of types of bins in use by CSR.

Bin Size	Typical Build Cost	No. of Bins
4 tonne	$4,500	10,835
5 tonne	$4,500	4,098
6 tonne	$4,700	4,809
11 tonne	$13,500	399
Total		20,141

Source: Robert Johnson & Lino Santarossa, *'Way Forward' for Rolling Stock in the Sugar Industry*

The major introductions of diesel locomotives commenced in the mid-1950's with the 0-6-0 diesel mechanicals and diesel hydraulics. E M Baldwin and Sons of Castle Hill in Sydney introduced their bogie design around 1972 however these were not in regular use until the mid-1970's. CSR retired their fleet of Hudswell Clarke 0-6-0 steam tender locomotives at the end of the 1976 season. The last steam locomotives were withdrawn from active cane haulage at QUNABA and Millaquin Mills, Bundaberg in 1979.

The development of cane trains can be seen from the following information on trains operated by CSR.

Standard Train

- 40t loco + 166 x 6t cane wagons + 30t brake wagon = 1,360t
- Train Length = 655m

Slave Train

- 40t loco + 120t x 4t cane wagons + 40t loco + 180 x 4 tonne cane wagons + 28t brake wagon = 1,620t
- Train Length = 1,050m

So what does this mean to a railway modeller?

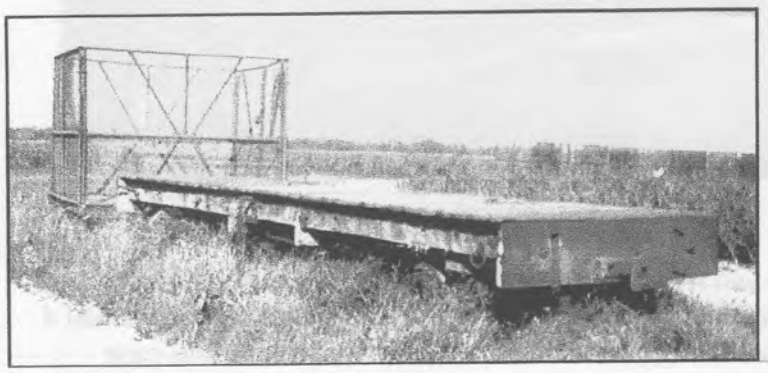
For a layout set in a period prior to 1960, cane bins would not have existed. If the period is set after the mid-1970's then only cane bins would be in use. Between these two periods, both wholestick wagons and cane bins would be in use. By the late 1960's, the mix could be about 50% of each. Steam locomotives would be used to haul either wholestick wagons or cane bins as would the smaller 0-6-0 diesel locomotives. It is unlikely that bogie diesel locomotives hauled wholestick wagons in any great quantity. Wholestick wagons were a thing of the past by the time remote controlled brake wagons were introduced.

During the transition period, a mixture of wholestick wagons and cane bins might appear on the one train. However, they would be marshalled with all the cane bins together and the wholestick wagons together. It is unlikely that the one farmer would require a mixture of wagon types. The mill may have different methods of handling and unloading the two types of loads.

Raw Sugar Wagons

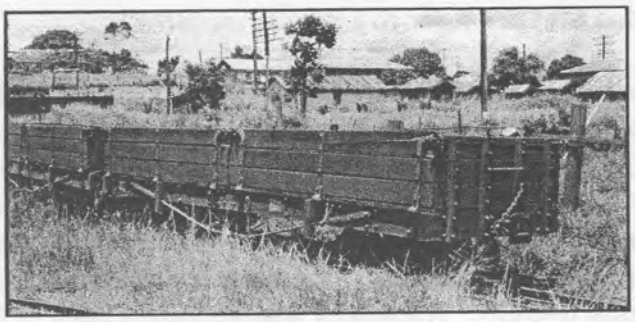
Raw sugar is the principal product of the sugar manufacturing process. Originally sugar was packed in jute bags. Where the sugar mill was located on the QGR, it was the major method for transport of raw sugar. However, at a number of mills, the sugar bags were manually loaded onto tramway wagons for transport to a convenient waterway where they were transferred to lighters for transport to major ports served by larger ships.

At some mills, wholestick cane trucks fulfilled this role early in the life of the mill. In the bagged sugar era, the Douglas Shire Tramway fulfilled this role for the Mossman Central Mill between Mossman and Port Douglas using largely 4 wheel open wagons. Mourilyan and South Johnstone Mill's sugar was delivered to Mourilyan Harbour by the Innisfail Tramway in 8 wheel bogie open wagons. CSR used 8 wheel bogie flat wagons between Victoria and Macknade Mills and Lucinda Point. Fairymead Mill purchased a number of 10tonne and 15tonne capacity 8 wheel bogie wagons that had previously been used in the construction of the Bunninjuck Dam in NSW. It is believed these arrived in Bundaberg about 1929 along with the Krauss locomotive "JACK".



Left: Ex Burrinjuck Dam 15 tonne flat wagon at Fairymead Mill.

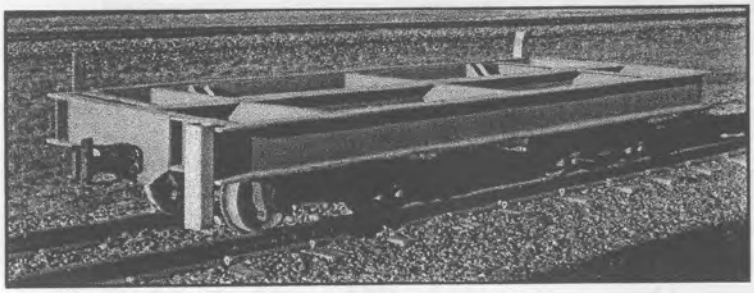
Greg's HOn2.5 wholestick trucks are actually on HOe chassis.



Right: Innisfail Tramway "H" wagon used for carting bagged sugar from South Johnstone and Mourilyan Mills to Mourilyan Harbour. Photo: D. Sheehan

With the conversion to bulk handling of raw sugar, sugar "boxes" were added to the 8 wheel bogie flat wagons between Victoria and Macknade Mills. Later, underframes were purpose built for sugar wagons. These mills are the only ones where raw sugar is currently undertaken by narrow gauge railway.

On the Innisfail Tramway, 40 open "H" wagons had their sides and ends removed and were fitted with a steel frame and sugar box in 1960. At the time of the sale of the Innisfail Tramway to Mourilyan mill in 1977, there were a total of 68 "H" wagons with 12'6" sugar boxes, 30 "HH" wagons with 19' sugar boxes and 12 "HHB" fitted with large sugar boxes and air brakes. Road transport has now taken over and most of these wagons were scrapped.



Left: New bulk sugar wagon underframe at Victoria Mill in 2000.

Left: In 2000, the ex-Innisfail Tramway bulk sugar wagons were stored at the former Goondi Mill site where they were later scrapped.

Ration Wagons

In the era before good roads and widespread use of motor cars, the mill tramways were also used to carry other supplies. CSR Victoria Mill (Ingham) operated a small 4 wheel enclosed wagon for delivering provisions, mainly meat, to the various cane cutters barracks in the district. This has been preserved by ILRMS since 1973.

The Mossman Central Mill provided a ration train to Saltwater, north of Mossman. It ran for free until 1911, when a charge of £1 was made for each trip, shared by those making use of it, but later the charge was dropped. From 1915, the ration train was run in the off season, on the Friday nearest the full moon. In 1925, the ration runs were limited to the off season. W.A. Frost took over running the Saltwater ration train from 1927 using a converted motor truck to haul a few cane trucks. Following failure of the motor, he used a series of small second-hand steam locomotives, taking on contract cane haulage from 1931 to 1950.

CSR Victoria Mill "Meat Wagon" preserved at ILRMS, Albion Park, NSW.

Small rail mounted tank wagon near South Johnstone, North Qld.

Molasses

Molasses is the second product of sugar manufacture. It was transported in either 4 wheel or 8 wheel bogie track wagons. The 4 wheel wagons were similar to cane trucks and many were converted from cane trucks. Older tanks are more likely to have been of riveted construction and more recent tanks fully welded.

A principal use of molasses is as stock feed. At North Eton Mill, the farmers' rail mounted tank wagons were collected from their sidings on Friday afternoons and taken to the mill. An employee, working on overtime, filled the wagons on Sunday and they were returned to the farmers' siding on Monday morning.

Molasses is no longer carted by tramway.

Other Products

Mossman Central Mill due to its remote location used timber to fire the mill boiler and locomotives. Wholestick cane trucks were collect the cordwood from the cutting areas. Timber was also used to fire the mill boilers in a number of other locations.

A by-product of sugar-manufacture is the "mill mud" left of the mills' large rotary rollers. This is used as a fertiliser and was carted away in a variety wagons with the typical "V" dump wagons being common.

"Trash" – the extraneous material in the cane – was collected and carted away in a variety of small 4 wheel open wagons typically of timber construction.

Part Three – Modelling the Wholestick Cane Truck

I chose to model a generic type of wholestick wagon in HO scale using the HOe Minitrains / Roco / Eggerbahn / Jouef small 4 wheel wagons as a basis. I had 14 assorted open, flat and box type wagons that were used. The original bodies and couplers were removed and the raised coupler hooks cut off. Where necessary, I replaced some of the wheelsets with ones with finer flanges.

A new body was fabricated from styrene strip. The dimensions were chosen so that the new bodies would fit over the chassis. The sizes that I used are shown in the attached sketch. In HO scale, they scale out towards the high end of the range of typical sizes of wholestick wagons. The same dimensions can be used for OO scale and would represent the more typical size range.

I made the wagons in a batch and started by cutting the components for all the wagons. I used Evergreen HO Scale styrene strips. The following table sets out the components for each wagon.

WHOLESTICK WAGON COMPONENTS PER WAGON

COMPONENT	SIZE	LENGTH	NUMBER/WAGON
Longitudinal beams	8"x4"	26 mm	4
End beams	8"x4"	23 mm	2
Dumb buffer	8"x4"	8 mm	2
Corner posts	4"x4"	16 mm	4
Transverse decking	4"x1"	23 mm	13
Longitudinal decking	4'x1"	28.5 mm	2

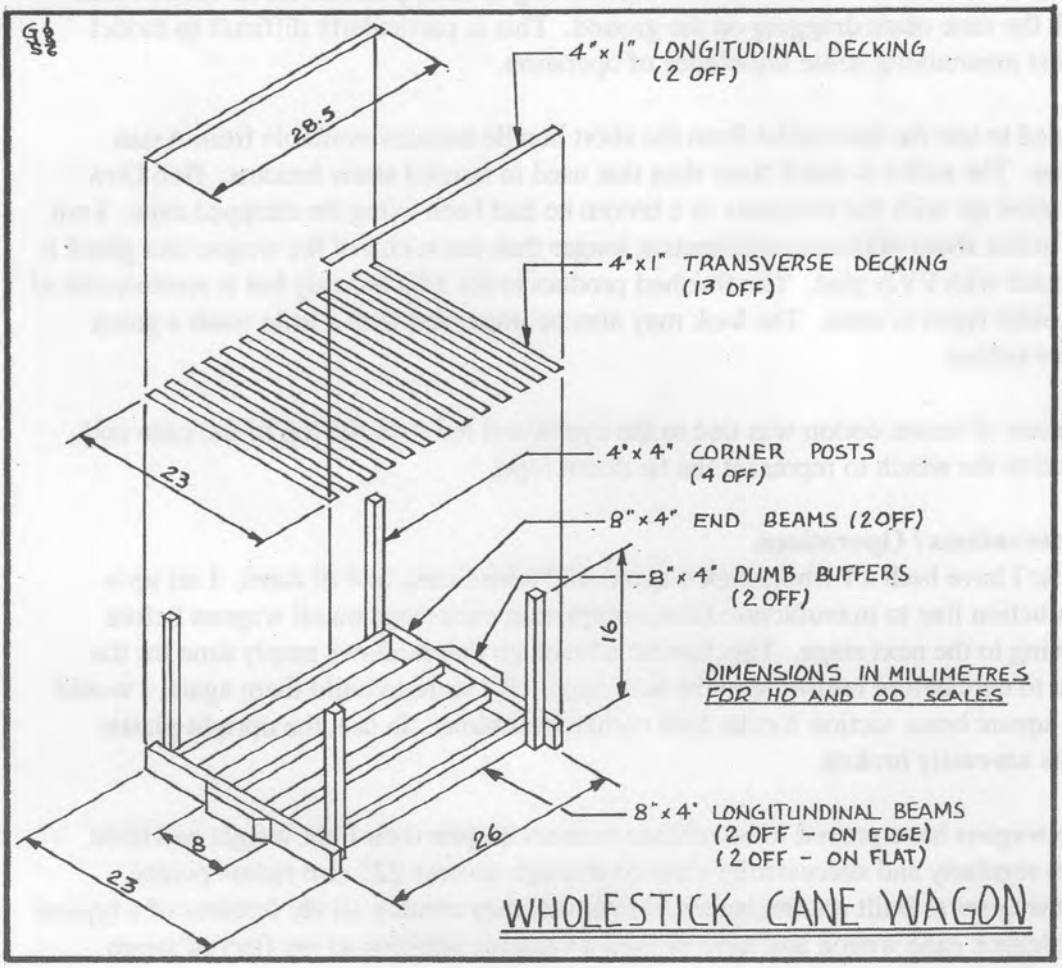
The next step is to assemble the basic wagon. I made a simple jig from timber and pins to locate the longitudinal and end beams before gluing with MEK. The two outer longitudinal beams are placed "on edge" and the two inner beams "on the flat". This is to allow the underframe to sit up into the new body. Because we want a flat top surface, this stage was assembled upside down. When the solvent had set sufficiently the frame was removed from the jig and set aside to cure whilst the next wagon was set up.

The next stage is to fit the four corner posts ensuring that they are vertical. These fit into the outer corner of the outer longitudinal beams and the back of the end beams. The transverse floor decking was then added. I put a piece of decking on either side of the upright corner posts. The remaining boards were evenly spaced in the remaining gap. I used a piece of metal the thickness of the required gap between boards as a spacer whilst these boards were being positioned and glued. I held the wagon against a timber stock to ensure that the ends were all aligned. The two outer longitudinal boards were then added.

The dumb buffers were made from a piece of 8"x4" styrene strip with a 45° chamfer on each end. These were positioned centrally on the end beams.

The representation of the winch is made from two turned handrail knobs, a piece of wire and small gears. The gears I used came from a number of watches I had

disassembled over the years. However, small disks of styrene sheet would suffice. The winch parts were assembled into holes drilled into the top of the end beams. A small eyelet was fitted to the centre of the other end beam. I used Grandtline castings but they could be fabricated from fine wire bent around a former.



The body was painted with Humbrol German Grey to represent weathered hardwood. The winch and eyelet was painted with Humbrol Track Colour.

The body was then glued to the underframe. I found that there are subtle differences in the underframes and wheels from the various manufacturers that I had used. Part of the underside of some of the inner longitudinal beams had to be trimmed to clear the wheels. It would be easier to close up the spacing of the inner longitudinal beams to ensure that this trimming is not required.

The final stage was to add the couplers. I used Unimate N scale dummy knuckle couplers mounted on the end beams. These couple to Kadee / Microtrains N scale couplers which I use. I used a Kadee coupler height gauge to ensure that the couplers were set at the correct height.

Sugar Cane

There are probably as many variations in sugar cane as there are in wholestick wagons. The older varieties such as Badila were short and thick - say 2 metres tall and 50 mm diameter - whereas newer varieties are tall and thin - say 3.5 metres tall and 20 mm diameter. A loaded wholestick wagon disappears under its load of cane with the cane often dragging on the ground. This is particularly difficult to model whilst maintaining some semblance of operation.

I opted to use the fine millet from the short handle brooms available from Asian shops. The millet is much finer than that used in normal straw brooms. Bob Dow supplied me with the remnants of a broom he had been using for chopped cane. I cut the millet about 400 scale millimetres longer than the width of the wagon and glued it in place with PVA glue. The finished product looks a bit too tidy but is reminiscent of the older types of cane. The look may also be improved with a little wash a green water colour.

A piece of brown cotton was tied to the eyelet and fed over the top of the cane and glued to the winch to represent the tie down rope.

Observations / Operations

So far I have built 14 wholestick wagons and added cane to 4 of them. I set up a production line to manufacture them completing each stage on all wagons before moving to the next stage. This has the advantage that it allows amply time for the glue to cure before returning to the next stage. If I were to build them again, I would use square brass section for the four corner stanchions. In use, the upright plastic posts are easily broken.

The wagons have proved to be reliable runners despite their light weight and have been regularly and successfully shunted through reverse 225 mm radius points. The wagons as built are freelanced. However, they contain all the features of a typical wholestick cane wagon and have proved a valuable addition to my fleet of steam locomotives.

Conclusions

This has been a very brief overview of goods rollingstock used on the narrower gauge railways of Queensland. There is a rich and unique heritage with the Council owned and operated tramways. Those that survived the longest relied on the sugar industry for traffic.

I have attempted to show the diversity of equipment used within the sugar industry and highlighted some of the changes over time. There is a wide variety amongst cane bins in use and, I hope, I have helped dispel the myths that all cane trains are the same.

Further Information / References

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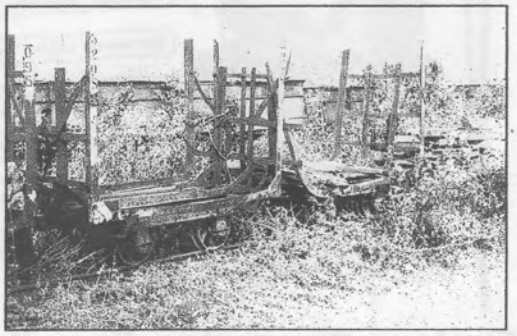
CaneSIG: The Cane Railway (Tramline) Modeller's Special Interest Group, Internet resource available at http://zelmeroz.com/canesig

Personal Communication, Tom Badger, Proserpine.

Left: Privately preserved timber wholestick cane truck near Childers.



Right: Steel wholestick cane trucks on the scrap line at Goondi Mill, 1982.