



Introduction

Australians are familiar with the variety of track gauges adopted by prototype railways around the country and the world. Victoria and New South Wales chose incompatible gauges to deter cross-border trade while Queensland and other states minimised costs with narrow gauge lines.

Cost is likely the decider for industrial, plantation and shire railways. Thus our cane and shire railways generally adopted a two foot gauge while a few used the same gauge as the connecting mainline railway.

Modellers follow a similar logic (see their personal comments in *italics* below). The gift of a train set or the local availability of ready-to run models and kits may influence the choice, especially in Australia where most models are imported.

Modellers of narrow gauge railways have to make a deliberate choice as the availability of commercial materials is often very limited, particularly if you model in a niche area such as sugar cane railways.

Before making a scale/gauge decision it helps to ask yourself some basic questions:

What gauge was/is the cane railway (prototype or fictional) you want to model? Narrow or standard?

What scale/gauge combination do your friends use?

Have you seen a scale/gauge combination at a home, club or exhibition layout that you liked? Why?

What is the availability of resources (locos, rolling stock, track materials, etc.) in each scale/gauge combination?

Do you have any personal constraints—perhaps poor eyesight or a limited space available for your layout?

Brian Millar's One Foot Rule

The bigger the scale the more detail you'll need to show, so if your abilities are limited an obvious choice would be to model in a smaller scale where you won't need to show as much detail. The 'One Foot Rule' works for any scale to help determine the amount of detail needed

1 Foot Rule

Whatever distance 1 foot equals in your chosen scale (eg in 1/48th scale 1 foot = 48 feet), the detail you can see when you look at the prototype whilst standing that distance from it (48 feet in this example) is the amount of detail you'll need to show on your model.

It's a good benchmark... if you add too much detail to a small scale loco, for instance, you might end up

with one that looks more like a porcupine than a loco because you tried to show too much rivet detail. Likewise a large scale model without enough detail will look very ordinary and appear as though there is something missing. It won't capture that realism that we all try to get in a scale model.

What do you want to model?

The first thought most people have of modelling a cane tramway is building a sugar mill with number of locos and hundreds of cane bins or trucks. This might decide you to choose a smaller scale, so as to fit it into the space you have to build a layout.

However, in the early days it was common for small tramways to haul cane to a QR siding using one loco and to be completely separate from any other tramway system. So you don't need to build a sugar mill, you can build a small tramway, or just model a section of one branch line if you want to and not even have any sign of a sugar mill. In this way you could build an impressive layout and only need 1 loco and 20 or 30 cane trucks/bins.

Small Queensland Cane Tramways

A Marian Mill line ran about 3 miles south from Tannalo, becoming part of Cattle Creek system in 1958.

The Tannalo Tramway Company line originally supplied cane to the railway at Tannalo. This line was later extended to Cattle Creek Mill and most of its original right of way is still used today.

The Gorge tramway was owned by Racecourse Mill and ran from the railway at Finchatton up into Finchatton Gorge. Its cane was loaded onto the railway at Finchatton and set to Racecourse Mill.

The Silentgrove Tramway, also owned by Racecourse Mill, ran from Mt Ossa south towards Mt Charlton for about 8 miles. It closed in 1947 after the St. Helens bridge was washed away but you can still see most of its formation and even some of the bridge posts. Cane from this line was loaded at Mt Ossa and railed to the Mill. Its loco is Dreamworld's Baldwin steam loco.

The St Helens Tramway was another small line. Located a few miles north of the Silentgrove Tramway it connected with QR at Kolijo.

Plane Creek Mill had a separate tramway which ran west of Carmila. It was operated by a single loco until the early 70s when chopper cane came into being. Cane was then transported by Zarb's transport using special containers loaded onto FJS class QR wagons (2 x 5 tonne containers per wagon).

CaneSIG: Scale/Gauge Choices

When you consider that the tramway was often the only form of local transport, and that some shire railways also carried cane, you could even include basic general freight and passenger services and still be prototypical.



On30 model of BFC 0-6-0: kit from Hanovale Castings and Berg's, professionally assembled and painted for the 1970s era by The Model Works Australia and displayed on hand laid 16.5 mm track.

Some modellers want to create an absolutely realistic model/layout; others simply want a representation of the real world. Everyone likely has a limit to the amount of compromise they will accept, but we all have to accept some. We generally don't, after all, have the space, time or finances to completely model even a very short tramline.

The amount of compromise is sometimes made more acceptable by modelling a 'freelance' or fictitious railway. My modelling interests are broader than just sugar cane railways, thus my railway, owned by the Capricorn Sugar Refinery, is located in Central Queensland as if one of the early 1900 mills had continued to operate in conjunction with a local shire tramway.

Likewise I'm willing to compromise on the size of a model, mixing 009 with HOn30 or On30 with O-16.5 items. Thus I might have a tiny 009 diesel hauling a string of HOn30 wagons or a On30 loco hauling an O-16.5 cane bin. Yes, I want things to look reasonable, especially for my museum exhibits, but it's the overall impression I'm after.

Lynn Zelmer

Using what's available...

Most of the scale/gauge combinations in regular use to model Queensland's cane railways depend on track components, wheel sets and mechanisms from other scales to provide kit bash and scratch building materials that would otherwise be too expensive or difficult to fabricate. Standards from the smaller scale, such as coupling heights, are also generally adopted, although clearances must be adjusted for the larger scale.

Thus 009 and HOn30 modellers build on N scale and many of the others utilise HO/OO components. It's relatively easy, for example, to build a diesel body but much more difficult to build the mechanism. Manufacturers have recognised the largest of these niche markets and make track with appropriate gauge and sleepers for 009/HOn30 and On30.



CaneSIG clinic display showing relative sizes of HOn30 and On30 models. The small diesel is from a 009 white metal kit (Chivers), followed by a scratch-built wagon and two of Bob Dow's 6 ton cane bins. The Malcolm Moore loco is scratch-built in brass (7mm, John Burgess), followed by a generic 1:48 flat wagon (Chivers kit) and a cane bin loosely modelled on Moreton Mill bins (7 mm, Ian Lindsay kit).

Why 009/ HOn30 (HOn2.5)?

Narrow gauge modeling in 009 means 4mm to the foot using 9mm gauge track (N gauge). A closely related scale is HOn2.5 using 3.5 mm to the foot and 9mm track. In exact scale for 009 this represents a track gauge of 2' 3", and in HOn2.5 2' 7". These are comprises worth making considering the relative low cost and availability of N scale mechanisms, wheels, bogies etc.



This is the main advantage of using these scales - attractive narrow gauge modeling can be undertaken for a relatively low cost. Commercial narrow gauge track is available suitable for 009 and HOn2.5, or alternatively track may be hand laid. Large layouts can be built in a limited space, and with attention to balance and weight of rolling stock, large prototype trains typical of the sugar cane tramways are possible, as well of course the more typical narrow gauge short trains. Super detailing is generally not routinely possible in these scales, although a level of basic detailing will produce pleasing results. Another huge advantage is that one can use/adapt the enormous range HO/OO scale detail parts, and other accessories that may be available.

Bob Dow

The drawing (left) shows the size relationship between 009 and HOn30, both on 9 mm gauge track. The gray foreground image is 3.5 mm and shares the 9 mm wheelset spacing with the larger 4mm 009 image. The light gray between the wheelsets indicates the original two foot gauge spacing for 3.5 mm.

Several Brisbane area modellers had been in 009/HOn30 when I started modelling cane trains in the mid-90s, a number of bin kits and other resources were readily available, Peco track and points looked realistic, the models didn't need a lot of detail to be reasonably realistic, and I had prior experience with 3.5mm models.

Some of the finest models in the world have been built in 3.5/4 mm scales and the nature of cane railways (small

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equipment, sharp curves, etc.) means that an excellent layout can be built in a relatively small space.

The major limitation of the scale is its small size; it's almost impossible to build an accurate, operating scale model of a wholestick cane truck, for example.

Lynn Zelmer

Why On24?

On24 (or On2 to North American modellers) is 1:48 scale (1/4" to the foot) with an exact width gauge for two foot cane modelling. A limited number of two foot components are commercially available, including a Moreton Mill bin kit from Ron Aubrey, and modellers use a wide variety of O scale items.

My very first model trains were Hornby clockwork in O gauge. From this beginning I have never lost interest in the larger gauges. When I wanted to model Queensland sugar trains many years ago I looked at O-16.5 but just could not accept that scale/gauge combination with it's obvious errors. I then considered building in 8mm scale to run on the 16.5mm track but decided against this as it would have made me a real loner at that time.

When I looked at QGR modelling in 1/48th scale and found that the S gauge track at 7/8" was exactly correct for 3' 6" gauge, the scale was set for me. Since then I have found that a lot of components are readily available in this scale for the 1/2" gauge necessary for 2' gauge sugar trains. Thus my commitment to On24 and On42 in 1/48th scale was established.

I have not been sorry for this decision and now of course 1/48th scale is growing at a rapid rate all over the world. What I like in particular is that the track gauge 'looks right' and of course it is, and this scale is much easier on my eyes.

Ron Aubrey

Why On30?

Like On24, On30 (or On2.5) is 1:48 scale, but has a much larger selection of commercial items available since it uses 16.5 mm track.

I've switched from HO/HOn3 and 009/HOn30 to On30 for very pragmatic reasons. First, my eyesight seems to be getting weaker and my fingers larger as I get older. Second, visitors have made comments about my HOn30 museum exhibits being too small for good viewing. Third, I wanted to retain as much use of my existing HO/HOn3 equipment as possible.

I can build a reasonable On30 layout in my existing space and the models are big enough to have reasonable detail while not being so large as to require my becoming a fanatical 'rivet counter'. Finally, the increasing popularity of On30 overseas has resulted in many new models and other modelling resources.

Lynn Zelmer

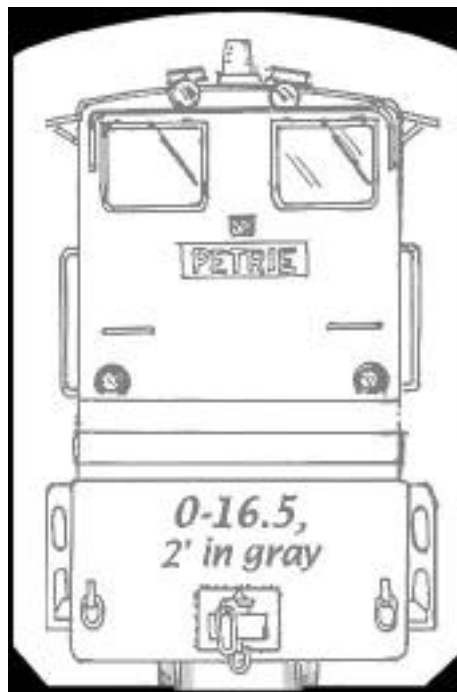
Why O-16.5?

O-16.5 also originated in the UK and is 1:43 scale (7 mm to the foot) using a 16.5 mm track gauge.

The availability of easily modified British and European locos and other 7 mm resources is a significant reason for selecting O-16.5. HO/OO mechanisms,

wheelsets, etc., are also readily available when commercial 7 mm products are not available.

Brisbane area modellers also have the advantage of a major club with a significant number of 7 mm cane modellers. They've adopted clearances to allow 7 mm equipment to operate on the HO club layout.



Loading or clearance gauge (left) based on AMRA-Brisbane's gauge is 60 mm x 90 mm.

A 7 mm generic cane bin (eg Ian Lindsay kit) or 7 mm BFC 0-6-0 steam loco will just fit the gauge. It also works quite well for On30.

Why 1:38?

1/38th scale (8 mm to the foot) uses HO 16.5 mm gauge track as two foot gauge. Don't worry about the extra .5mm on the gauge, two foot gauge tramways are laid at 24 1/2" on the curves anyway.

Prior to 1980 sleepers were often buried in ballast or trash, and some mills still bury their track, so you may be able to use ready-to-run HO track without relaying with scale sleepers since code 100 scales out quite realistically to roughly 42 lb rail.

If space is a problem remember that Mackay Sugar still has places within its system where the curves are less than 16 metre radius, although obviously only 0-6-0 or smaller locos traverse these lines.

The first consideration in choosing any scale is to see what is available in that scale to use to 'kitbash', wheelsets, etc.

If you are a typical model train buff and have a moderate HO scale collection put together over a number of years you can use much of what you already have: standard HO 33" wheelset, for example, are just right for cane bin wheels in 1/38th scale. [The average wheel diameter varies from mill to mill but is around 14".]

If you already own any F7s, F9s, SD9s or even SW7s these locos would be good for modelling Bo-Bo Baldwin's or even a Bo-Bo Comeng, not to forget a converted DH, although you will need larger wheels (18.7 mm to be correct). If steam is more your style then 0-4-0 and 0-6-0 HO models make great kitbashing projects.

CaneSIG: Scale/Gauge Choices

Coupling height is approximately the same as standard HO for modelling 2 foot gauge in this scale.

Smaller first and second generation diesel locos are about 40-50mm wide by 120-265 mm long, depending on what loco you build.

Cane bins will be roughly 64mm wide (8') and 64mm long plus couplings (4 tonne bins), the same width but longer for larger bins. A 40' USA gondola/boxcar chassis makes a very acceptable 12 tonne bogie bin chassis.

British or Australian four wheel wagons can be used to model early loaded cane trucks (the wholestick cane overhangs the sides and obscures details) by simply removing the brake gear and buffers. Use similar methods to model ballast hoppers and other wagons built from former wholestick trucks.

Brian Millar

Why 1:35?

1:35 scale is convenient for the scale narrow gauge modeler to model 24 inch gauge prototype railways as 16.5 mm gauge track (HO/OO) = 22.73 inch gauge.

Scale unit	Fractional	Decimal	Metric
1 inch	1/35 inch	0.0286 inch	0.726 mm

Modelers use HO/OO width track and mechanisms, modified military figures, detail sets, vehicles etc. to create large scale models requiring little space for layouts.

This is a relatively large scale and excellent detailing of models is possible without straining the 'eyes'. A particular characteristic of 1:35 is the very true gauge to scale ratio, so that the narrow gauge nature of locomotives and rolling stock is highlighted, even accentuated.

Smooth running of locomotives and rolling stock is easily achieved compared to OO9. There is not much available railway wise in 1:35 so most items (locomotives and rolling stock) need to be scratch built but of course HO/OO mechanisms and wheels can be utilised. This is both the challenge and the enjoyment of this scale.

Bob Dow

Why 1:32

One very obvious benefit is that in 1/32nd scale, which is a traditional architectural and engineering scale, an inch is 1/32nd of a real inch and is therefore viewable. No need to purchase an expensive scale model scale rule with lines invariably thicker than an inch of the scale itself! In 7mm and smaller scales, don't we usually approximate inches because they are really too small to see with normal vision?

I wanted to model as close to 24" gauge as possible, without bankrupting myself with the purchase of expensive commercial parts. American On3 would be the best 'scale' choice of gauge at 3/4", in 1/32nd scale On3 is 2ft gauge, while 16.5, HO gauge is an actual 21" gauge. I chose the compromise, 16.5mm gauge, because of the high cost of On3 wheel sets and locomotive mechanisms. As we all know the price and availability of 16.5mm gauge items is unsurpassed in both reasonableness of cost and quantity of items. As it turns out I, apparently, made the right choice, because

today there are kits being manufactured for this scale/gauge combination.

Raymond O Lantz (downloaded 6 Jan 2004 from <http://members.aol.com/abantock/fs32ngmr/why.html#WHY>).

Why 1:19 (16mm = 1foot)?

My first experiences of modelling a cane tramway were when I was about 8 years old and I was using a Triang (Hornby) 0-4-0 yard shunter, bright yellow in colour with black and yellow stripes on the headstocks (rather ironic when you consider I now model Cattle Creek Mill with the same paint scheme with some added red and white). When I started firing at Marian Mill on the Perry I was amazed at just how the locos jerked and slapped around on the rails—just like the model yard shunter had—and it was then that I started to plan for a realistic model loco with a torque-converto drive system powered by a electric motor and a smoke unit to blow smoke whenever the motor revved up.

I tried building in 1/38th scale but found I couldn't get suitable motors with enough power at the time. Another problem was having enough room inside the engine canopy to fit everything. So I opted to go to 1/19th scale—twice the size I had been working in. It does have its drawbacks, you have to make everything in this scale.

My dream cane loco blows smoke and actually idles, it has a miniature torque-converto and a fully working suspension as per the prototype. Its handbrake even works: you can wind it on or off. The brake blocks double for electrical pick-up and there's a small spring inside brake cylinder that applies a constant pressure of the blocks onto the wheels. It has an overall ratio of 34:1 constant flow gearbox, which means that when you are going down grade the bins will push the loco and I need to use the electric brake to hold the rake.

The electric brake lowers the idle speed of the motor by lowering the voltage going to the motor, thus creating a back load through the torque-converto. This means that you can't open the throttle and drive it like an ordinary model; you really have to pay attention to what you are doing or you'll derail the train, especially when I'm using the old 'X' bins Cattle Creek and Marian once had. These bins climb over each other (or piggyback each other as we used to call it) when loaded (one buffer goes under the other) if you try to stop too quickly.

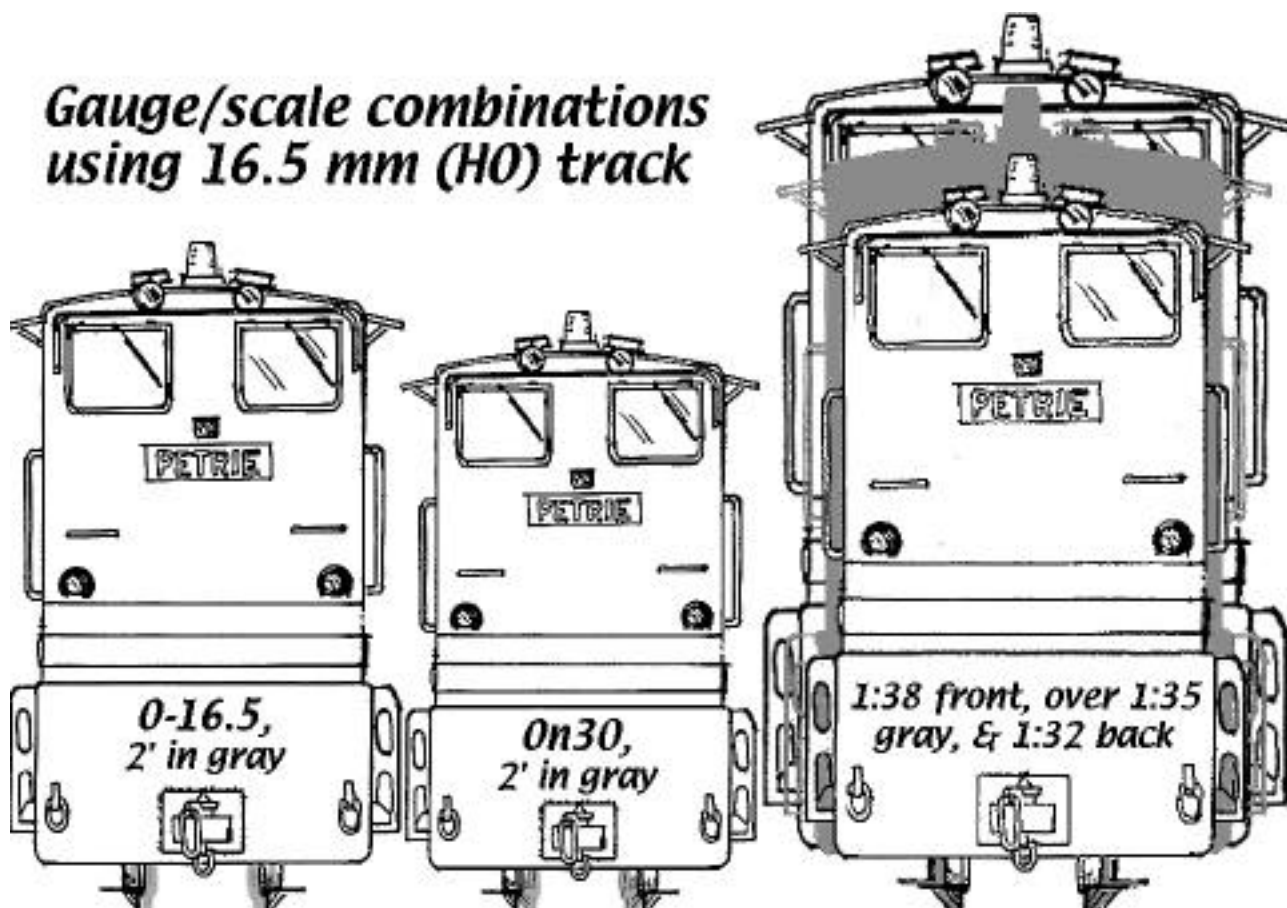
Oh yes, I use hook and ring coupling system as per the prototype. I'm modelling Cattle Creek as it was in the 70s up until 1978. That was the last year they used the 'X' bins and the second year they had the Comeng bogie loco.

Brian Millar

Acknowledgments

This note is the result of input from several sources. Ron Aubrey and Brian Millar pushed this project along by asking questions and then providing help with the content, while Bob Dow, a long time Queensland modeller and OO9 member, explained why he initially choose one scale and then expanded to a second.

Gauge/scale combinations using 16.5 mm (HO) track



HO standard gauge track is 16.5 mm, representing 4' 8.5" at 3.5 mm to the foot. Narrow gauge modellers use a variety of scales with 16.5 mm as a gauge because of the availability of HO track materials, mechanisms and wheel sets. O-16.5 (left) uses a scale of 7 mm to the foot (1:43), resulting in a slightly wide gauge representing two feet (in gray). On30 (centre) uses a scale of 1:48 or 1/4" to the foot, and a gauge of 30" rather than two feet (shown in gray).

1:38 is 8 mm to the foot, resulting in a reasonably correct two foot representation from the 16.5 mm gauge, as does 1:35 (0.0286" or 7.26 mm to the foot, making 22.7" gauge). However, 16.5 mm track represents 21" for 1:32 (3/8" to the foot). Brian Millar's 1:19 locomotive discussed in the text is twice the size of the 1:38 image above and runs on 32 mm gauge track.



This is an early photograph of a 20" x 24" HOOn30 mini-diorama built for public display. This side shows a typical sugar mill, the other a farm scene complete with abandoned truck, sheds and workmen. The cane fields were fabricated from the fine ends of broom straw and painted. The track is a simple loop with one outside spur (on the farm side of the backdrop), allowing for continuous operation with some additional equipment on static display. While modellers of Queensland profile readily recognise both the settings and locos/rolling stock, the general public is more likely to recognise the abandoned farm truck, etc. The diorama now has a plexiglass cover to prevent little hands from reaching the models.