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“OS and mapping of tram routes”

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The Charles Close Society was founded in 1980 to bring together all those with an interest in the maps and history of the Ordnance Survey of Great Britain and its counterparts in the island of Ireland. The Society takes its name from Colonel Sir Charles Arden-Close, OS Director General from 1911 to 1922, and initiator of many of the maps now sought after by collectors.

The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

The Ordnance Survey and the mapping of tram routes

John Ambler

As a railway enthusiast and informal student of railway history, as well as a mapaholic, I was interested to read Richard Oliver's preliminary observations on tramways.¹ As alluded to by Richard, there is potentially much confusion generated by the lack of standardisation in nomenclature and duplication, the same terminology (tramway) being used for different types of system. For myself I try to simplify things by using the generic term *railway* to refer to any system where a vehicle is guided on a low friction solid surface, guided and restrained from straying off the track or rail by some form of flange. Historically rails were L-shaped and made from wood with plain unflanged wheels, the flanges in this instance being the upstands of the rails which were generally on the outside edges of the track. As loads increased in weight, wear and tear increased, and so more durable materials were used, cast iron replacing wood, wrought iron replacing cast and ultimately steel being the material of choice. On Dartmoor a system employing granite 'rails' carried granite from Hay Tor quarries to the Stover Canal, and many of these can still be seen on the moor. Eventually the rail format was changed to an edge rail system with the guiding flanges being on the wheels as we see in modern railway vehicles. The advantage was reduced friction and rails which could be made stronger and longer.

Prior to the opening of the first passenger carrying railways all railways were of an industrial nature and carried freight exclusively. Many of the early railways in the eighteenth century served the canal system, short feeder railways carrying materials from the likes of mines, ironworks and other manufactories to canal wharves for onward, long distance transportation by boat. Motive power was by gravity, human, horse or rope/cable initially and locomotives began to be introduced in the early nineteenth century. I think of these systems as industrial tramways or mineral railways, though there was a wide range of other terms, sometimes regionally based, in use to describe essentially the same thing. Terms include waggonway, wagonway, dramway, plateway, and wainway.

The evolution of industrial tramways ultimately led to what Richard refers to as 'heavy rail' or in my terminology main line public railways which were classified as common carriers and transported both freight and passengers over long distances. Both industrial tramways and the main line railways operated with different track gauges to further confuse the issue. There can be no doubt for example that the Lynton and Barnstaple Railway with its narrow track gauge of just under two feet should be classified with the main line railways – it was simply a narrow gauge main line railway in my eyes. Similarly the standard gauge (4 feet 8½ inches) Bowes Railway in Durham was exclusively a coal carrying mineral railway with connections to the main line railway network; it was a feeder for the main line system just as the early wagonways fed into the canal system.

¹ *Sheetlines* 116, 5.

Now the nomenclature becomes even more confused. Some street tramways were referred to as railways (see the example below) and some proper railways were referred to as tramways. The Selsey Tram is an example of the latter. The promoters of the Selsey Tramway originally planned their line as a multi-purpose public light railway; however finances were tight. As the 1896 Light Railways Act was not yet in place, the promoters saw an opportunity and set up the company in April 1896 as The Hundred of Manhood and Selsey Tramways Company and obtained permission to open their line as a tramway under the Railway Construction Facilities Act of 1864. This allowed the line to be constructed and operated to lower standards which were cheaper and less restrictive to implement than those required for a normal main line railway, which also needed a costly full Act of Parliament. As the line was wholly within its own reservation, and not running in the streets, the wheels and other moving parts of the locomotives did not need to be boxed in as required for street locomotives (and traction engines) to avoid scaring horses. Later when the company was seeking to be taken over by a larger concern and directly linked to the main line railway system, it changed its name to West Sussex Railways. However the cost of upgrading the line to full railway status was seen as prohibitive to prospective purchasers, and the line closed in 1935.

Richard's suggestion of restricting attention to passenger carrying street tramways, makes the proposed analysis of the depiction of tramways on OS maps significantly simpler than it would be if everything named as a tramway were included. Like the industrial tramways, street tramways also had an evolution in terms of motive power, starting with horse haulage of a single carriage, followed by special steam tram engines hauling one or more passenger carriages and finally settling on the more convenient option of electric traction integrated into the carriage itself which on some urban systems may occasionally have hauled an unpowered trailer.

I offer three case studies to illustrate some of these points. The first was a passenger street tramway which also served in part as an industrial tramway; the second was a light railway by name but was actually an electric street tramway; and the third was also a tramway by name but might be considered to be a hybrid of a light railway and a street tramway which has an interesting history of depiction by OS. Extracts from six-inch and 25-inch plans and Revised New Series one-inch maps are from the National Library of Scotland website. Extracts from Popular Edition and Fifth (Relief) Edition maps are from my personal collection.

Camborne and Redruth Tramways

The Camborne and Redruth Tramway was an electric street tramway of 3ft 6in track gauge which was unusual in that it also carried freight in the form of tin ore along part of its length. The tramway was opened for passenger traffic in 1902 and for freight in 1903. The route closed to passenger traffic in 1927 due to competition from bus services, but the carriage of tin ore continued to 1934 when an aerial ropeway replaced the tramway. The main line ran 3.7 miles from Trelowarren Street in Camborne to West End on the western edge of Redruth. The tramway depot was located close to the mid-point of the system in Pool, on

the northern side of the line. The passenger carrying line was wholly on the street, however there were three off-street branches which dealt with mineral traffic. Short trains of mineral wagons were hauled by special electric locomotives from the two very short branches (sidings really) serving East Pool Mine to the south of the main line in Pool and Wheal Agar on the north side almost opposite. Tin ore was hauled from the mines half a mile westwards on the main line to the tramway depot where a longer (half mile) branch left the main line, ran behind the depot, then down the Red River valley to Tolvaddon Stamps where the tin ore was processed. The main line including single and double track sections, passing places and the branches are depicted in full on the 25-inch plan published 1908 (*figures 1a and 1b*).

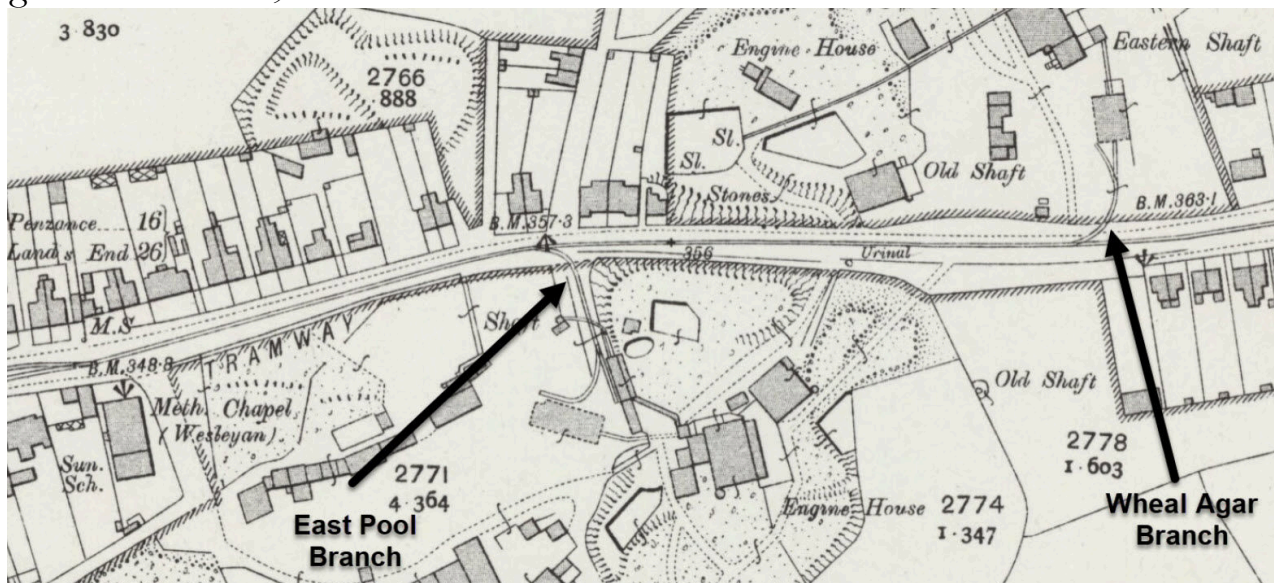


Fig 1: OS 25-inch 1908 showing the Camborne and Redruth Tramways branches to East Pool Mine and Wheal Agar

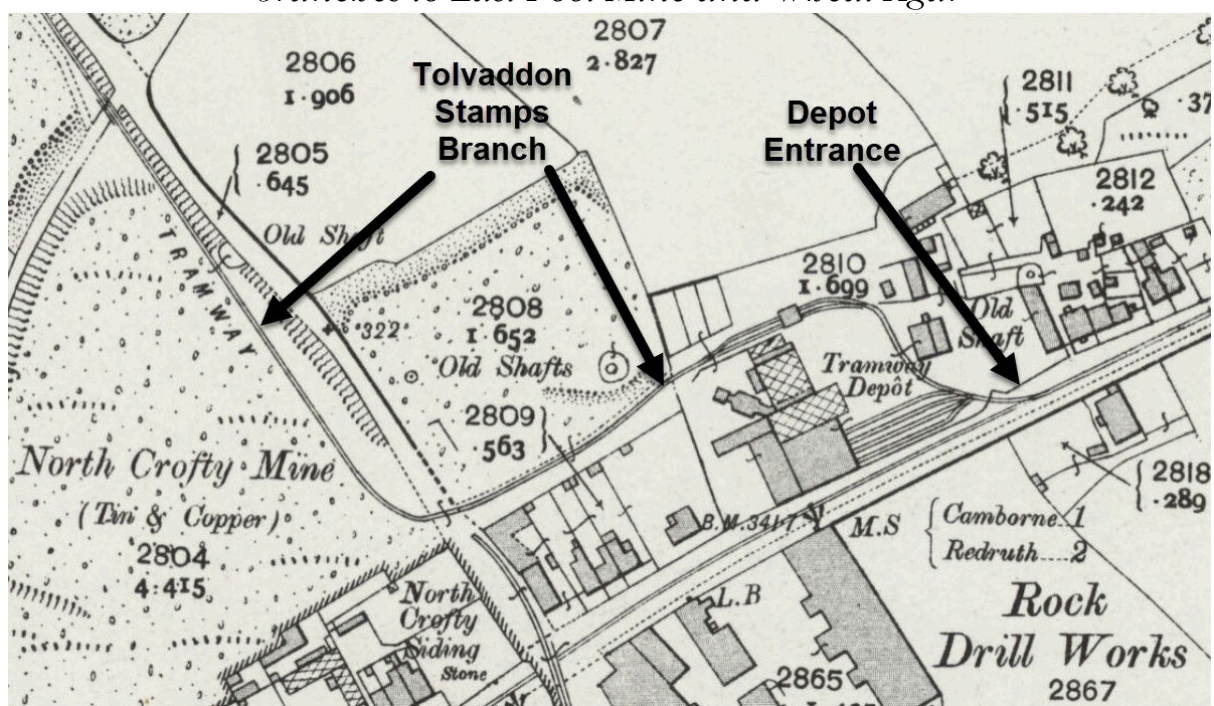


Figure 1b: OS 25-inch 1908 showing the Camborne and Redruth Tramways Depot in Pool and the Tolvaddon Stamps Branch

Depiction on the six-inch map (*figures 2a and 2b*) also published in 1908 corresponds with Richard's case studies in that the on-street portions are not shown, but the off-street branches and lines into the tramway depot are shown. The long branch to Tolvaddon Stamps and lines within the depot are depicted as a single line with crossbars and marked as 'Tramway'. The branch to East Pool Mine is in a cluttered area on the plan, but the line symbol appears to have crossbars. The branch into Wheal Agar is clearly depicted by a single line but with no crossbars (engraving error?).

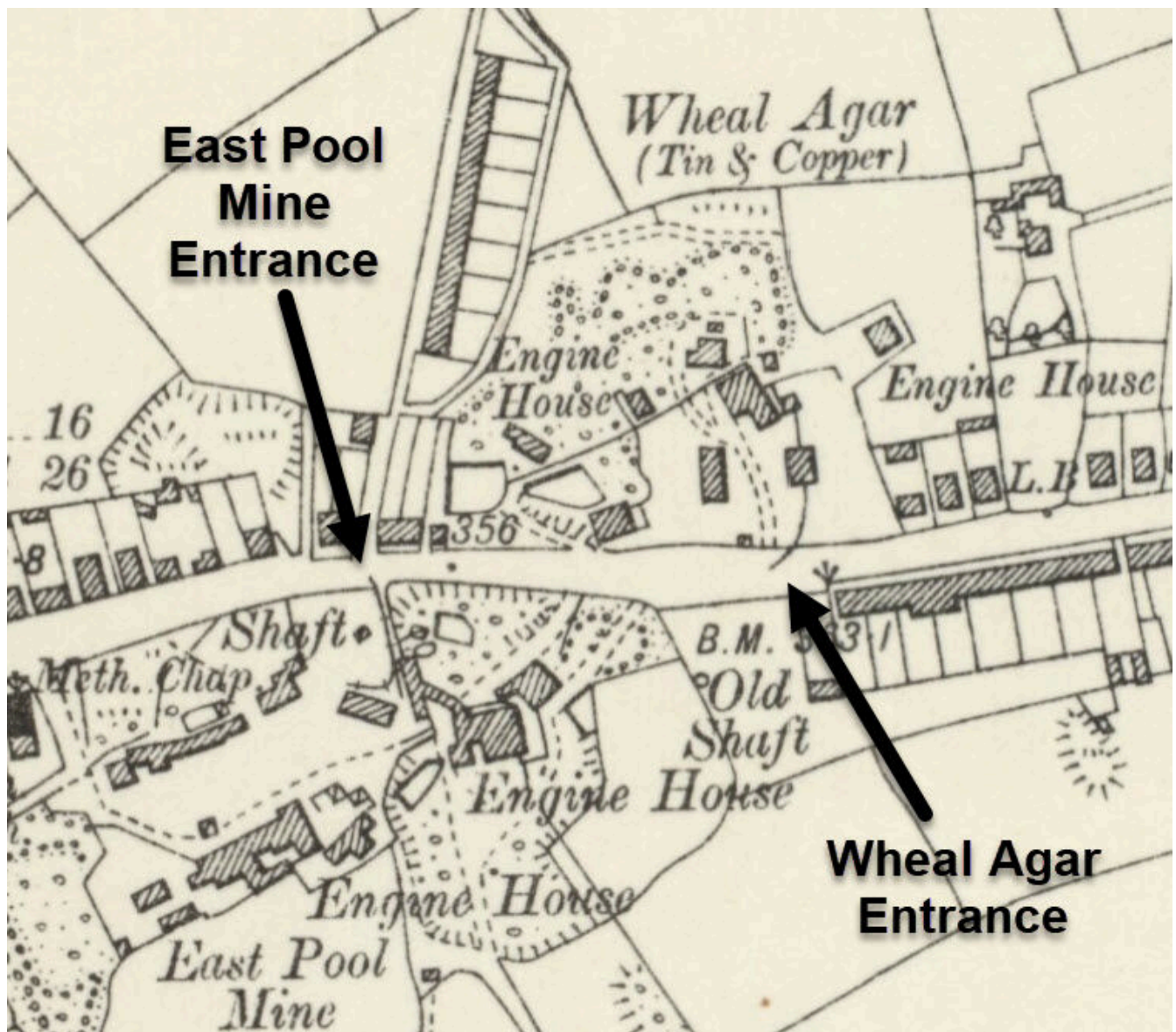


Figure 2a: OS six-inch 1908 showing the Camborne and Redruth Tramways branches to East Pool Mine and Wheal Agar

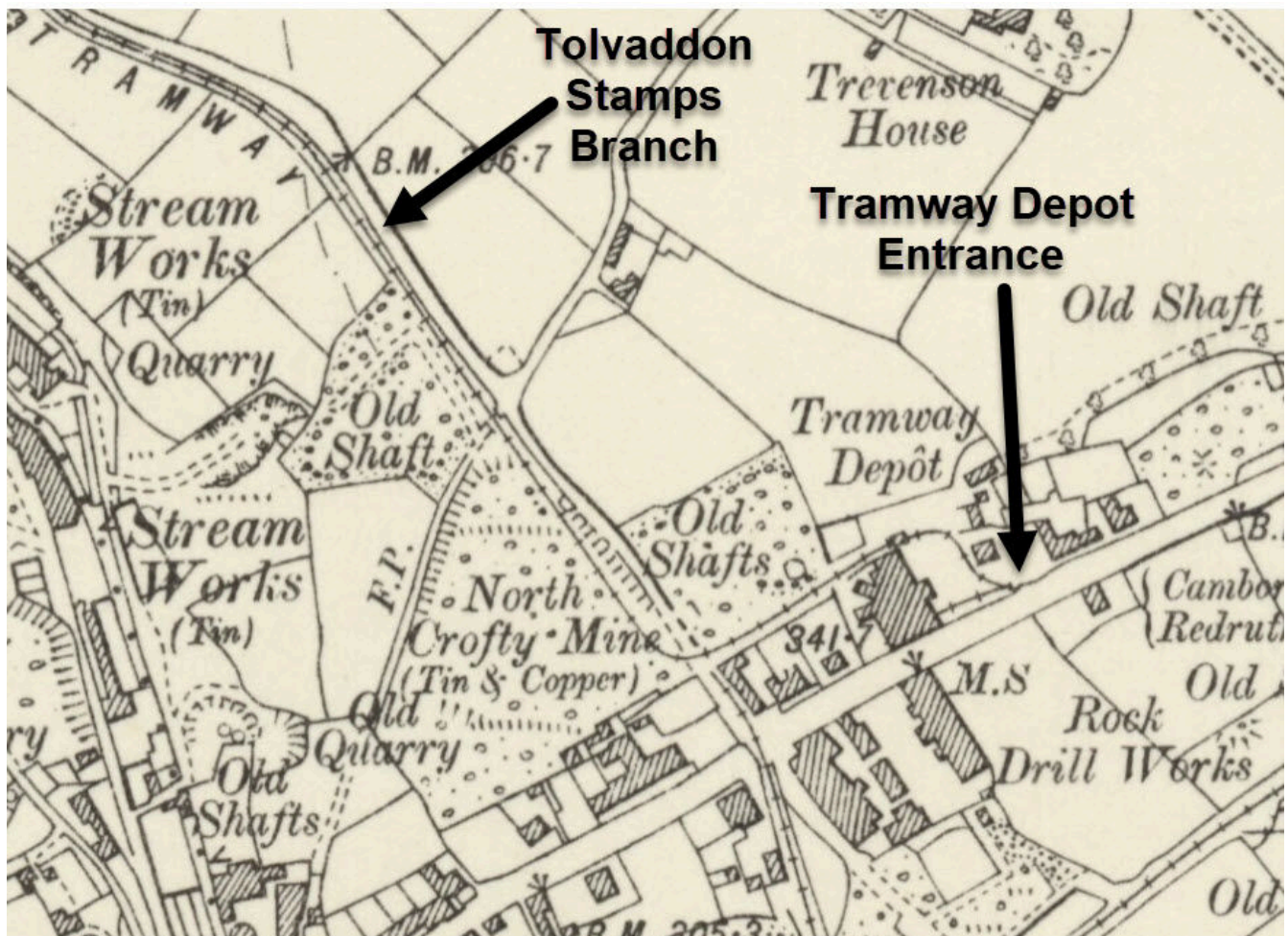


Figure 2b: OS six-inch 1908 showing the Camborne and Redruth Tramways Depot in Pool and the Tolvaddon Stamps Branch

Interestingly on the 1938 revision (published in 1945, presumably delayed due to the war), the tramlines into the depot and the branch to Tolvaddon are still shown in full with crossbars, some four years after freight traffic had ceased (*figure 3*). The branches into East Pool Mine and Wheal Agar also remain depicted, but some details of structures associated with them have been altered suggesting that the rails may still have been in place when the revisors visited. I have not been able to discover when the rails were taken up. On the Revised New Series (Hills Edition) one-inch map published in 1907, the main line of the tramway is indicated by the words 'Electric Tramway' printed above the Camborne-Redruth road at Pool, and the Tolvaddon Stamps branch is depicted using the 'Mineral line and tramway' symbol of single line with crossbars but the two smaller branches cannot be seen (*figure 4*). On this map it would be easy to see the tramway as part of the North Crofty Branch of the GWR which reaches the area from the south and is shown using the same symbol, however consultation of the 25-inch plan shows the line to terminate a few yards south of the tramway where it turns north-westwards on its path to Tolvaddon Stamps.

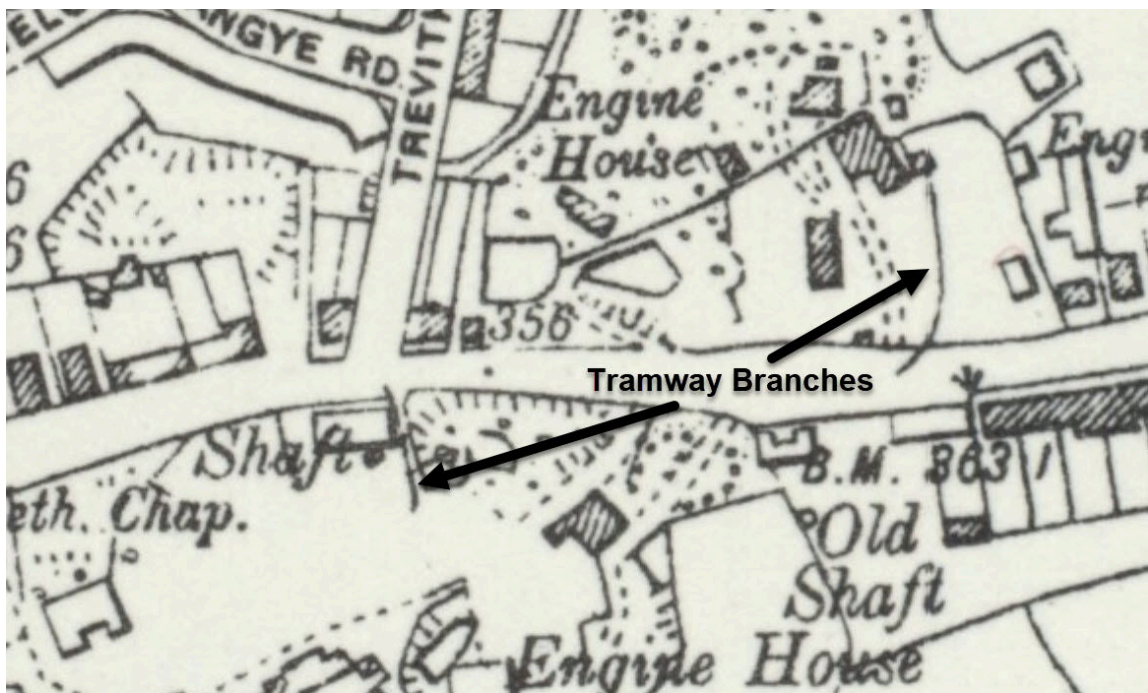


Figure 3: OS six-inch 1945 showing the Camborne and Redruth Tramways branches to East Pool Mine and Wheal Agar still depicted, four years after the closure of the tramway

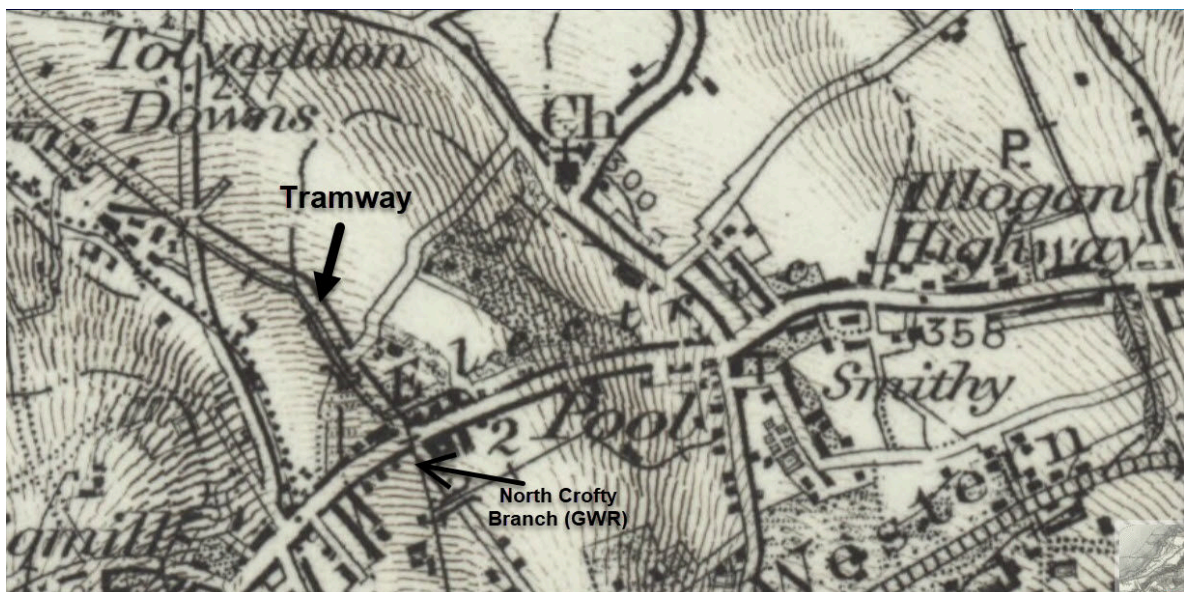


Figure 4: OS one-inch Revised New Series (Hills Edition) 1907 showing the tramway branch to Tolvaddon Stamps

I have two copies of OS one-inch Popular Sheet 146 printed in 1921, 1933 and a copy of the Fifth Relief Edition of 1934. The Popular Edition of the map is virtually a coloured version of the Revised New series map with the on-street sections depicted by printing the text *Electric Tramway* beside the route. The mine branch to East Pool Mine was too small to be depicted, the longer branch to Wheal Agar is possibly there, but is not easily seen due to that area of the map being cluttered, being over printed with the name of the locality 'Illogan

Highway'. The longer branch to Tolvaddon however is clearly shown adjoining a minor road using the 'Mineral line and tramway' symbol. On the Fifth Relief Edition of 1934 there is no *Electric Tramway* text, reflecting the closure of the line; however both the Wheal Agar Branch and the Tolvaddon stamps branch are depicted using the 'Mineral Line and tramway' symbol as on the Popular maps (figure 5). The New Popular Edition published 1946 (Full revision 1931 with later corrections) is virtually identical to the Fifth Relief Edition. Unsurprisingly nothing of the tramway is depicted on the Seventh Series map of 1961 (Fully revised 1958).

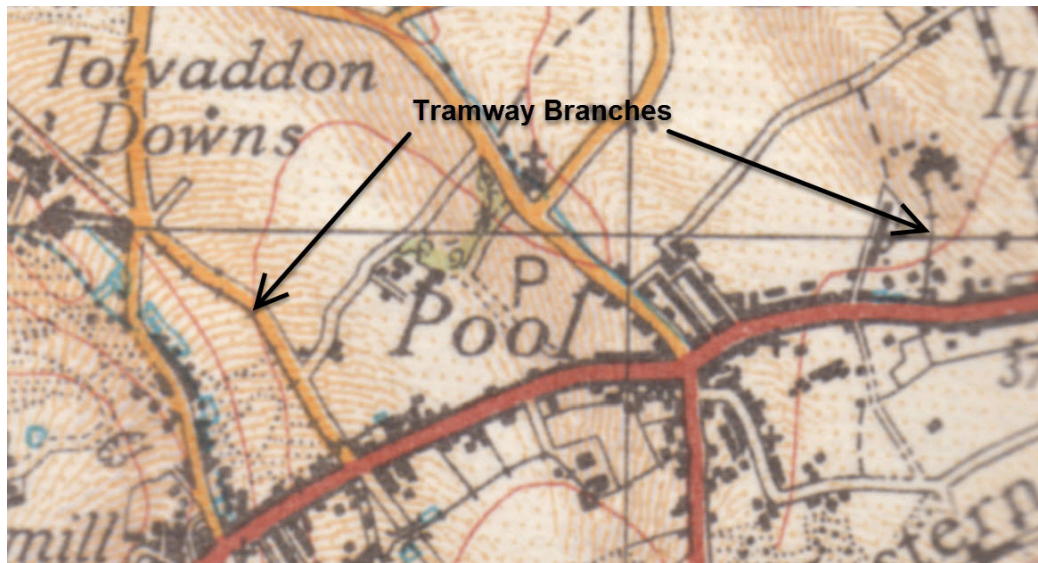


Figure 5: OS Fifth Relief Edition 1934 showing the Tolvaddon Stamps and Wheal Agar branches



Camborne and Redruth Tramways, circa 1907 (Geof Sheppard Collection)

Dearne District Light Railways

The Dearne District Light Railways (DDLR) system was located in the Dearne Valley coal mining area of what is now South Yorkshire, but at that time was the West Riding. The standard gauge tramway connected Barnsley to Thurnscoe via Wombwell, Wath-upon-Deane, and Bolton-upon-Deane (12 miles), with branches from Wath to Manvers Main Colliery (0.7 mile) and to an interchange with the Mexborough and Swinton Tramways system (1907 to 1928 as a tramway) near the Woodman Inn (1.5 miles) at the northern end of Warren Vale, the road linking Swinton to Rawmarsh. Interchange between the two systems was possible, but infrequently practised. A much shorter route from Barnsley to Thurnscoe was already available by motor bus at the time the route was being planned. The tramway was promoted by the local authorities of the towns served by the route. Despite its “light railway” name, this was a classic example of a passenger carrying electric street tramway with only a very short section of reserved track. Its claim to fame, or perhaps notoriety, is that it was the last street tramway of the old era to be opened, and it was also one of the first to be closed. The line was authorised under the Light Railways Act of 1896, the draft Light Railway Order being issued in 1915. Construction was delayed due to the First World War and in the face of so much competition from motor buses it is surprising that the project was progressed after the war. Progress it did however, and the line was eventually opened in July 1924. By 1933, the line which had never been profitable and was a burden on local ratepayers succumbed to motor bus competition and closed.

With such a short lifespan, the DDLR was lucky to be depicted at all on OS mapping; however revisions were carried out at the right time to capture it for posterity. The tramway is depicted in full on the 25-inch plan surveyed in 1928 and published in 1930 (*figures 6a, 6b, 6c and 6d*). However the six-inch plan surveyed 1928 to 1929 and published in 1932 only depicts the earthworks (cutting) associated with the off-street section of the tramway in Bolton-upon-Deane, a revision to the originally planned route which was entirely on-street (*figure 7*). To avoid very tight corners in the heart of Bolton, the tramway was routed through a new cutting which was deeper than the height of the single deck trams. The cutting linked Wath Road with Station Road, crossing Thurnscoe Road on the level in the process. The tramway was still operational when the survey was carried out, so it is a mystery why the off-street tracks were not shown in the same way as on the Camborne system. My copy of the one-inch Popular Edition map of the area, marked as ‘Published 1923 with periodical corrected reprints’ is a 1935 reprint, so postdates the closure of the tramway, of which there is no sign whatsoever. The neighbouring Mexborough and Swinton Tramway is indicated by printing the text ‘*Elec Tram*’ beside the route along Warren Vale which links Swinton with Rawmarsh, though that had been converted to a trolley bus route in 1928-29. The Barnsley and District Tramways system (1902 to 1930) which is also not depicted on the 1935 reprint of the Popular Edition map almost met the DDLR near the Market Place in Barnsley but there was never an interchange despite both being standard gauge. Perhaps

somebody who has an earlier reprint of the Popular Edition, within the lifetime of these tramways could let me know if anything is depicted (Sheet 37 Barnsley and Sheffield had a major revision in 1920-21 and was reprinted in 1929 and 1931. Sheet 38 Doncaster had a major revision in 1920 and was reprinted in 1929).

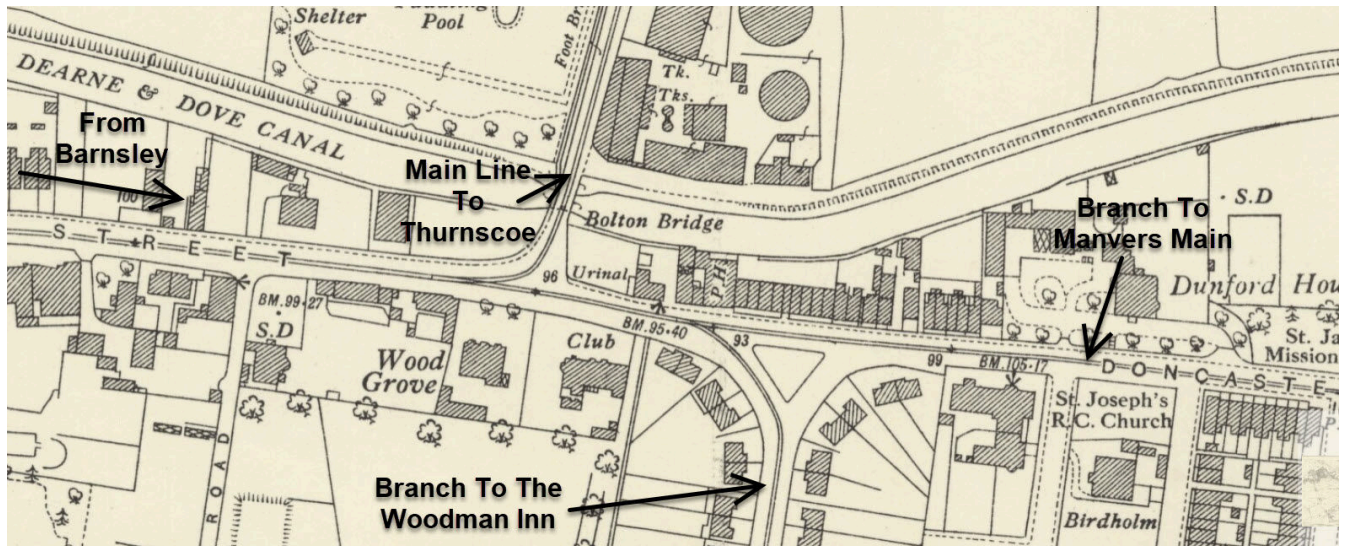


Figure 6a: OS 25-inch 1930 showing the DDLR just east of Wath town centre where the branches to Manvers Main Colliery and the Woodman Inn diverge from the main line to Thurnscoe

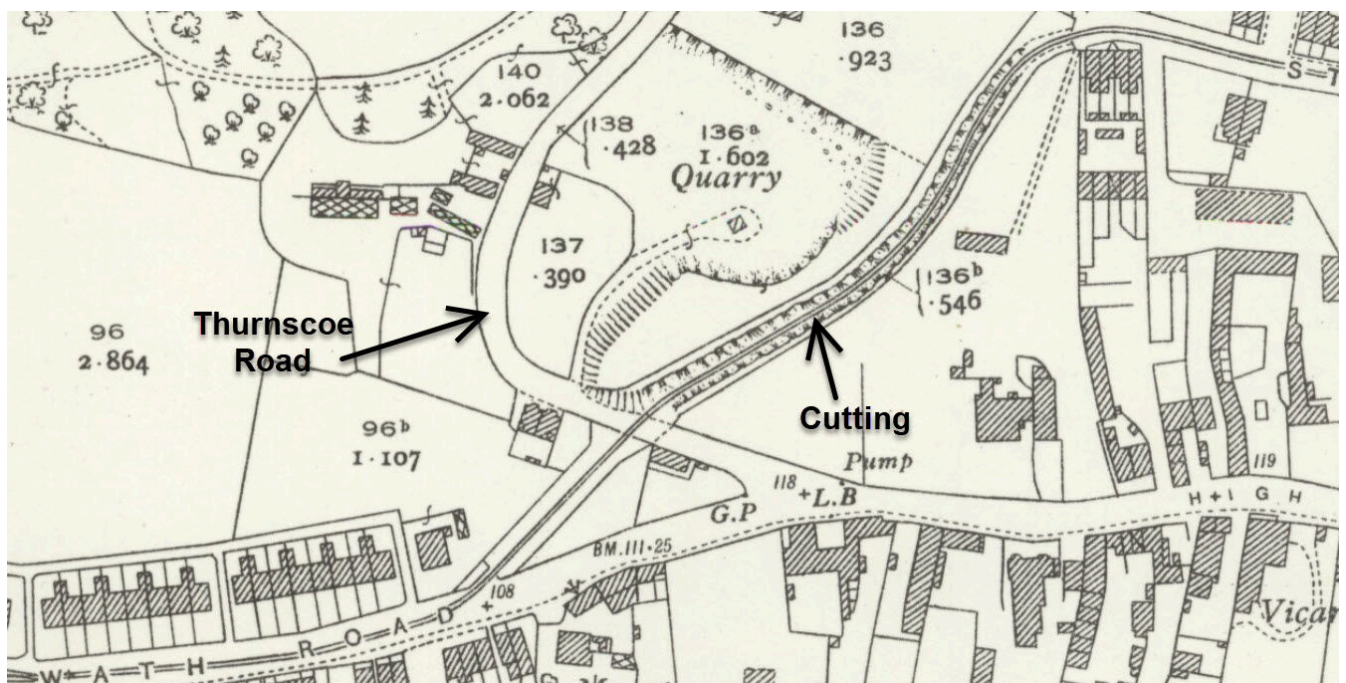


Figure 6b: OS 25-inch 1930 showing Wath Road cutting in Bolton-upon-Dearne

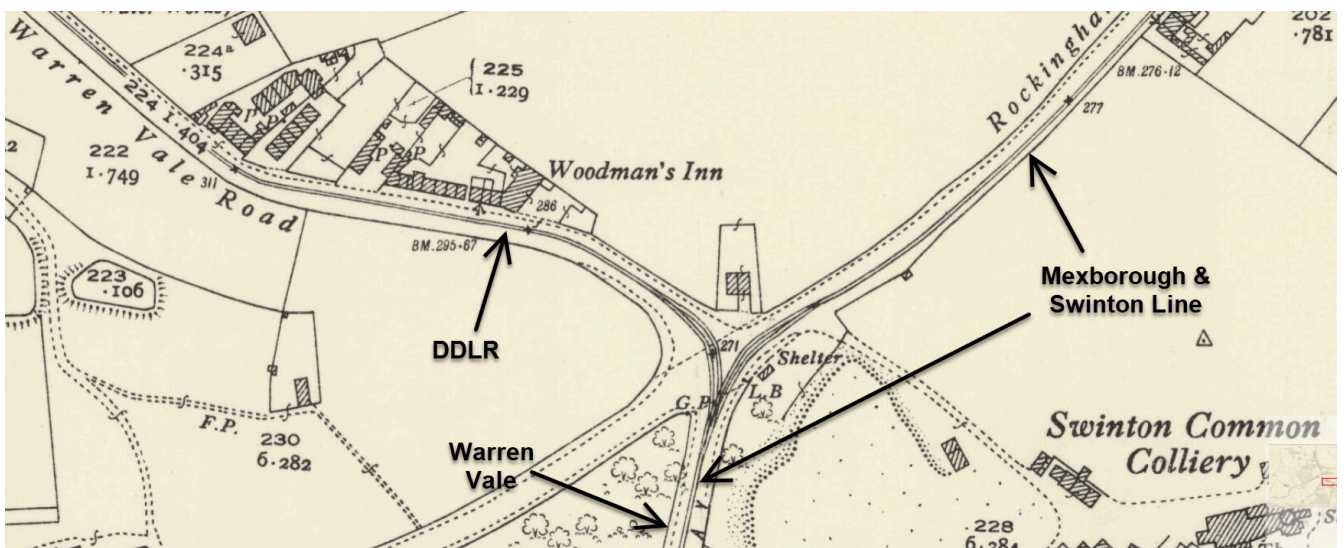


Figure 6c: OS 25-inch 1930 showing the terminus of the branch at the Woodman Inn. The connection to the Mexborough and Swinton system was rarely used

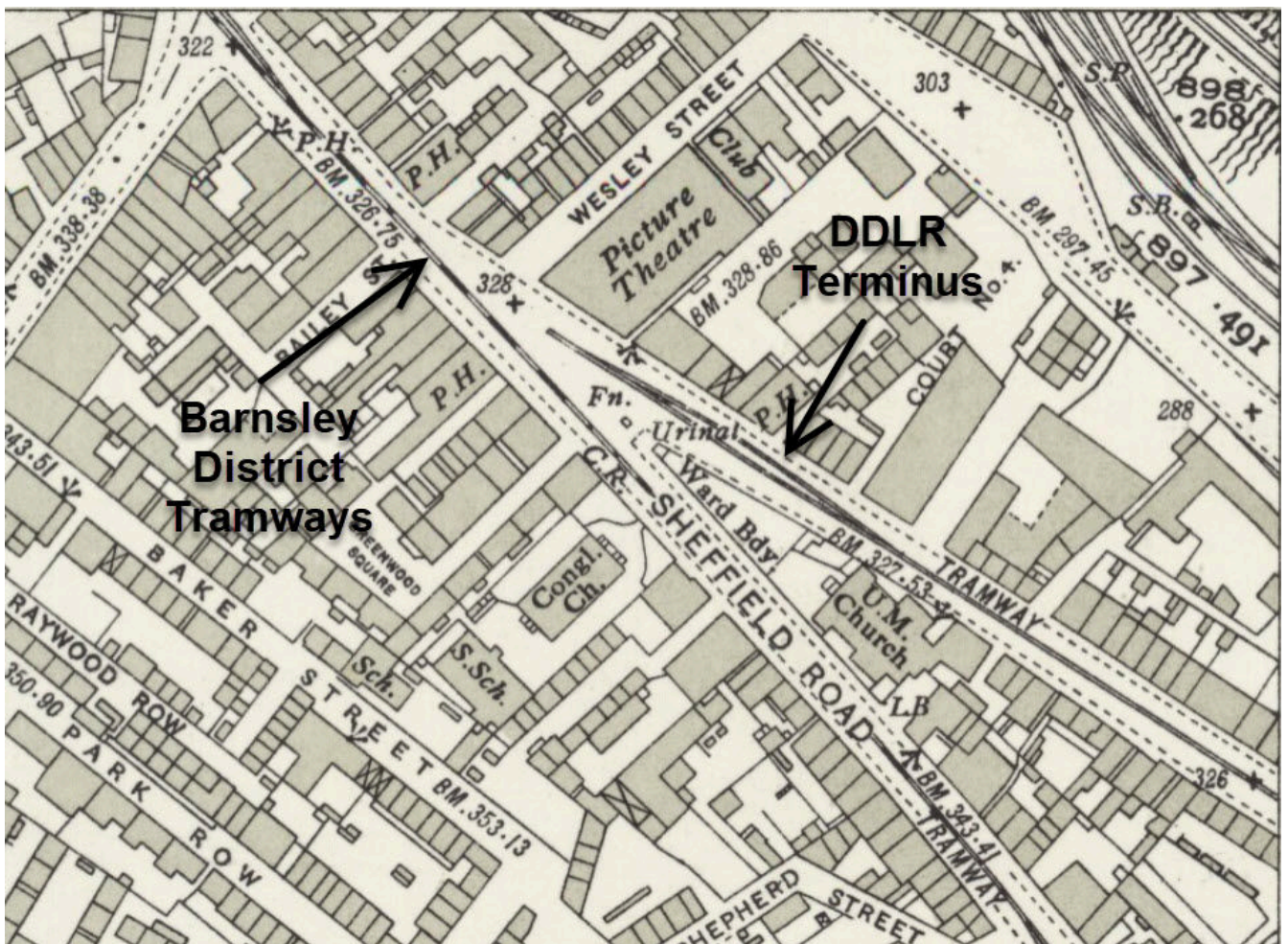


Figure 6d: OS 25-inch 1930 showing the DDLR terminus in Barnsley. The DDLR never made a physical connection with Barnsley District Tramways

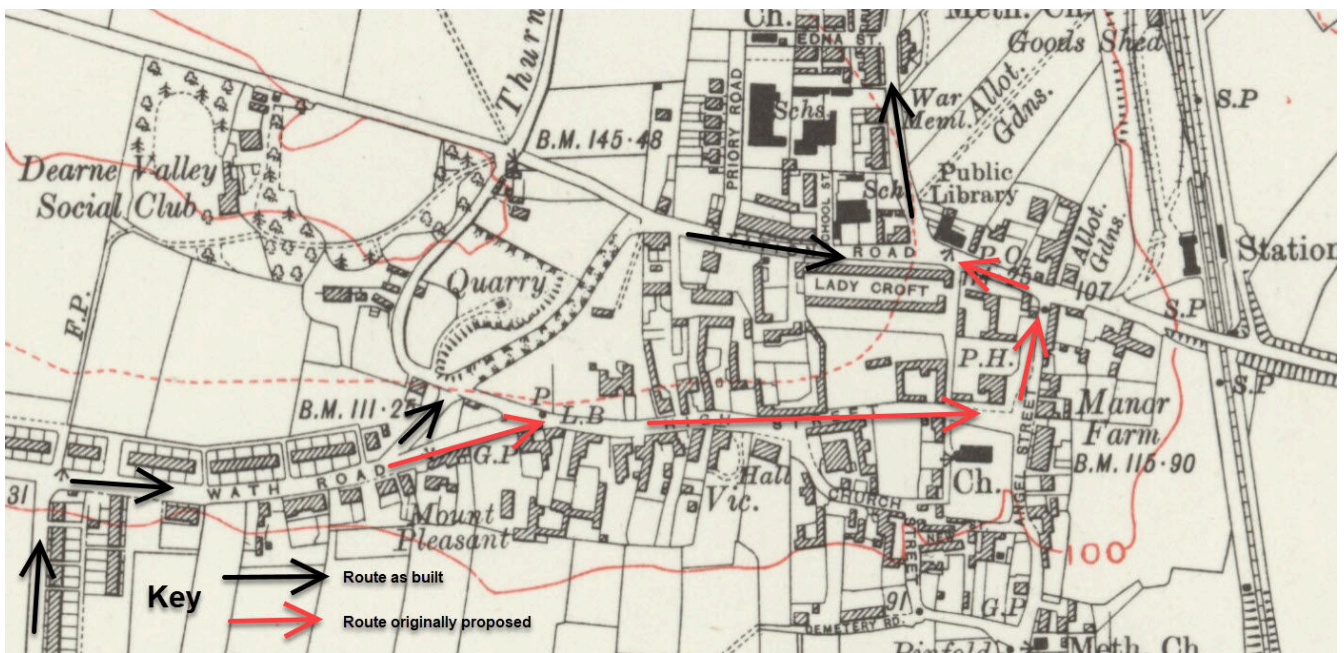


Figure 7: OS six-inch 1932 showing the proposed and as-built route of the DDLR. Note the absence of a tramway symbol in the off-street cutting even though the tramway was still operating

The Wantage Tramway

The Wantage Tramway Company opened its two-mile standard gauge line from Wantage Road Station on the GWR to its terminus in the centre of Wantage, to goods and passengers in late 1875 using horses to haul the rolling stock. The line was authorised under the 1870 Tramways Act. The line was constructed parallel to, but not upon the public road except where the road was crossed on the level on what was then the edge of Wantage, near Elm Cottages. Over the final quarter of a mile from Elm Cottages to the passenger terminus, the route was in its own reservation across fields and in 1905 a branch was constructed to a dedicated goods yard also serving a wharf on the Berkshire and Wiltshire Canal. This branch left the main line just after the level crossing and was entirely within its own reservation. Horse power was quickly replaced by steam driven machines of various types, some typical of street tramway systems and some mainstream light railway locomotives with no modifications to conceal the moving parts from horses on the adjacent public road. A steam tramcar was operated for a time followed by an all enclosed steam tram engine hauling unpowered single and double decked tramcars. Compressed air driven trams were tried briefly but they were not a success. The later motive power was provided by secondhand, four-coupled steam locomotives not modified in any way for tramway use. Declining use due to GWR motor bus competition saw the line close to passengers in 1925, although it remained open for goods traffic until the end of 1945.

As might be expected, OS depicted the line in full with passing places on the 25-inch plans of 1878, 1899, 1912 and 1938, the goods-only branch being shown on the later two plans (*figures 8a and 8b*). Interestingly, the 25-inch plan depicts the tracks within the boundaries of the road even though there is much

photographic evidence to show that the tracks were not embedded into the roadway itself, and sleepers can be seen between the rails in many photographs, though there was no physical barrier between road and rail. The six-inch series has an interesting anomaly. The plan published in 1883 (*figure 9a*) shows the entire length of the line including the roadside sections in full as a continuous line with crossbars offset to the eastern side of the road – that is, on the road, not beside it. Even the passing places are depicted using the same symbol. On the revision published in 1900 however, the entire map has been redrawn and there is nothing whatsoever depicted of the roadside sections of the tramway (*figure 9b*). The portions of line in their reserved formations at both ends of the line can be followed as a pair of near parallel lines just like a small road or track, but there is no symbol to indicate any form of railway. The revision published in 1913 however reverts to showing the presence of all sections of the line clearly (*figure 9c*). Both the reserved sections and the roadside part of the tramway are depicted using the line with crossbars symbol, though passing places are not shown. The 1944 plan is virtually identical to that of 1913 in its depiction of the tramway. On the Revised New Series one-inch 'Outline' edition of Sheet 253 published in 1895, only the non-street portions of the line in Wantage and at Wantage Road Station are depicted using the tramway symbol between thin parallel lines delineating the boundaries of its reserved route (*figures 10a and 10b*). The Revised New Series one-inch 'Hills' edition of 1903 is essentially the same as the 1895 map with the exception of the addition of the word '*Tramway*' above the road at Grove (*figure 10c*). The Popular Edition Sheet 105 revised in 1913 (my copy is a 1926 reprint) is in colour but essentially identical to its forerunner of 1903 with the off-road sections shown and the word '*Tramway*' appearing above the road in the same place at Grove. New Popular Sheet 158 published 1947 after the closure of the tramway shows nothing relating to the former tramway.



Figure 8a: OS 25-inch 1878 showing the deviation of the Wantage Tramway from the roadside to its own reservation near Elm Cottages

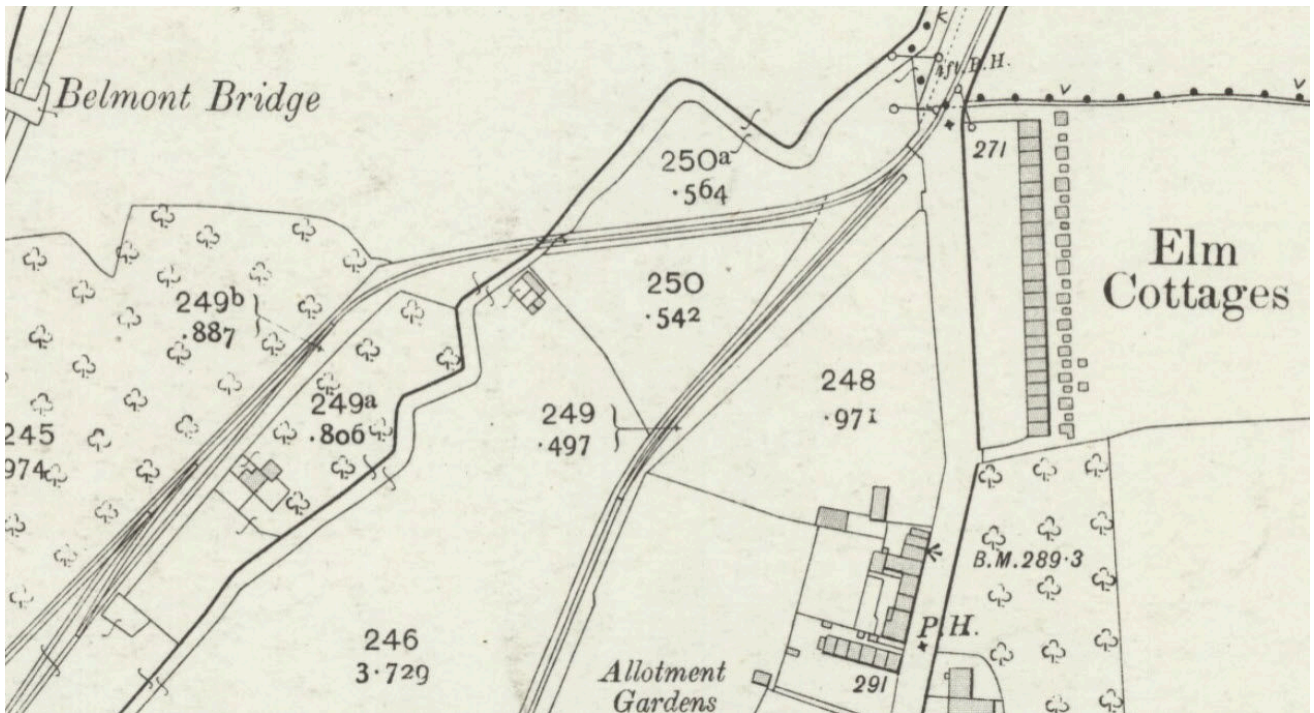


Figure 8b: OS 25-inch 1912 showing the junction of the goods branch of 1905 at the same point as Figure 8a



Figures 9a, 9b, 9c

9a: OS six-inch 1883 showing the tramway symbol for the track both in its own reservation and running along the east of the road to Wantage Road Station.

9b: OS six-inch 1900 showing the trackbed of the Wantage Tramway running along the edge of High Garden but with no symbol to denote the presence of track. There is also no symbol beside the road.

9c: OS six-inch 1913 with track depicted by the tramway symbol for both the reserved sections and to the east side of the roadway.



Figure 10a: OS one-inch Revised New Series 'Outline' edition 1895 showing the tramway symbol for the off-road approach to Wantage Road Station (GWR).



Figure 10b: OS one-inch Revised New Series 'Outline' edition 1895 showing the tramway symbol for the off-road section of track from The Elms to the passenger terminus.



Figure 10c: OS Revised New Series one-inch 'Hills' edition 1903 showing the absence of a tramway symbol on the road to the station, but with the 'Tramway' text beside the road.



Wantage Tramway Company locomotive Number 5 'Shannon' at Didcot Railway Museum (photo: Hugh Llewellyn)