“The OS and the mapping of tram routes”

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The Ordnance Survey and the mapping of tram routes: some preliminary observations

Richard Oliver

An enquiry in mid-August 2019 on the Ordnancemaps.io discussion group on the depiction of ‘busways’ on 1:25,000 Explorer mapping led to an extension of the topic to ‘trams’. I put it in quotes as the extended discussion highlighted the problems in defining a ‘tramway’ or ‘tramroad’. Here I will use the term ‘tramway’ to cover the mainly on-street systems of the sort that first appeared in Britain in 1861, and ‘wagonway’ to cover other sorts of ‘tramway’, which served collieries and other extractive industry. I will also use the relatively recent term ‘heavy rail’ to cover what are sometimes called ‘main-line’ railways, and otherwise approximate to what was nationalised as British Railways in 1948. The precise definition of ‘tram’ and ‘rail’ is rather tricky, and therefore what follows may not please everyone.1 The whole question of the depiction of rail transport, however defined, on Ordnance Survey maps is worthy of an extended study such as has been accorded to windmills.2 What follows therefore is very much a preliminary foray, which will certainly be found to be incomplete and to need correction in detail; readers will no doubt be able to draw attention to further additions and anomalies. This article is confined to Great Britain: Irish practice remains to be explored.3

Early ‘railways’ and the early Ordnance Survey

The first ‘tramways’ and ‘railways’ were effectively the same thing: rails of L-section on which horse-drawn wagons ran. The Surrey Iron Railway, opened in 1803, has claims to be the world’s first public railway: be that as it may, it had L-shaped rails, and it differed in function, carrying a variety of minerals and other freight, rather than physical form from wagonways or ‘tramroads’ elsewhere. It is the first ‘railway’, in the broadest sense, to be clearly identified as such by the Ordnance Survey, as ‘Iron Road Way’ on sheet 8 (published 1816) and ‘Iron Railway’ on sheet 7 (published 1822) of the one-inch (1:63,360) Old Series. Otherwise its depiction was that of a minor road, and around Mitcham and Tooting its course is not at all obvious. (figure 1). The Survey continued to show non-passenger railways in a similar manner on the one-inch map until about 1887, when it introduced a far more comprehensible line-and-crossbars symbol: map legends, introduced at the same time, described this as ‘Tramway’, though in fact some ‘heavy rail’ branches which did not carry passenger services were treated thus. In this context ‘Tramway’ really meant ‘non-passenger’ (figure 2).

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1 As may the comparative lack of references to railway literature for opening and closing dates and modes of operation.
3 It also largely ignores the 1:25,000 family.
A distinction between ‘tramways’ or wagonways and ‘railways’ or ‘heavy rail’ first appears around 1836-7 on Old Series sheet 72, with the introduction of a distinctive ‘ladder’ symbol, first used for the Grand Junction Railway. This was a ‘trunk railway’ using edge-rails, steam-worked, which in principle would handle all the traffic that was offered to it, conveyed in vehicles with flanged wheels. The rapid extension of ‘heavy rail’ was reflected in an almost equally rapid extension of the ‘ladder’ symbol across the one-inch maps of Great Britain, on both existing sheets as they were revised, often just for new railways, and on newly-published sheets as cover extended. The ‘tramway’ symbol looked subordinate both in quantity and quality: the mileage depicted was much less, and even the later line-and-crossbar symbol was far more discreet than the ‘ladder’ symbol. A variation on the line-and-crossbar symbol was used on the one-inch New Series, and up to 

Figure 1. The Surrey Iron Railway on one-inch Old Series sheet 8 (1816). The course is not at all obvious through Mitcham.

Figure 2. Railways in the legend of one-inch New Series sheet 220 (1889): the ‘Tramways’ are evidently a late insertion.
the Third Edition, to show London underground lines: this never appeared in map legends, and will not be discussed further here.\textsuperscript{4}

In 1841 six-inch (1:10,560) mapping began in Britain, in Lancashire, which was already well supplied with both wagonways and ‘heavy rail’. The procedure that developed was to map double-track railways with the ‘ladder’ symbol, though with wider-spaced ‘rungs’ than on the one-inch, and both single-track railways and ‘tramways’ with a line-with-crossbars symbol (figure 3). ‘Tramways’ (wagonways) were distinguished by annotation thus, and ‘heavy rail’ usually had the owning company’s name.

\textbf{Figure 3. Railway symbols used on early six-inch maps of Britain: from an untitled legend sheet.}

Whereas these symbols were appropriate to the six-inch, they were not to larger scales. Parallel to the adoption of the six-inch, larger towns were mapped at a scale of five feet to one mile (1:1056) and all railways, of whatever sort, were effectively drawn to scale, with pairs of rails – or, for mixed-gauge lines, three rails. In 1853-4 the 1:2500 scale was adopted, and on this scale, too, rails were drawn to scale.

\textbf{The ‘street railway’ complication}

So far development was fairly tidy, both of the transport mode(s) and of the cartography. The upset came in 1861, when GF Train tried out the first ‘street tram’ in Britain. Within ten years ‘street tramways’, mainly for passengers, were spreading rapidly – as was confusion of the language, as the ‘street tramway’ was quite a different affair from industrial wagonways. The term ‘street railway’ was a better reflection of their function: they were oriented towards the carriage of people rather than of things, and they were predominantly urban. It was decidedly confusing that they were known as ‘trams’. As the Ordnance Survey encountered them in the course of urban survey, they were recorded as ‘tramways’; in this the Survey was simply reflecting general usage. At scales smaller than 1:2500 they presented a cartographic problem, as on the six-inch they were likely to ‘clutter’ the map, and still more so on the one-inch; on the latter scale there was also the problem of a line-and-crossbars symbol being used for underground lines in London, which tended to run under streets. Street tramways were never mapped on the one-inch scale, and they were omitted from the six-inch once fully revised editions at this scale started to appear from 1891.\textsuperscript{5}


\textsuperscript{5} This generalisation is one that needs to be tested more thoroughly than was possible in the preparation of this article.
'Tramways' for minerals continued to be shown: perhaps map-users were expected to infer function from geographical context.

These early 'street tramways' were invariably laid along public highways, and were usually horse-worked, though some were worked by small steam locomotives, and a few were cable-worked. The only surviving example of this type of tramway is that at Douglas in the Isle of Man. Legislation enabled tramways to be built and operated without much of the regulation entailed in 'heavy rail'. Rural examples of tramways were few, and had mixed success: generally, they handled both passengers and freight. The narrow-gauge Alford and Sutton Tramway in east Lincolnshire operated only from 1884 to 1889, so its appearance on one-inch New Series sheet 104 in 1891 was too late to be of use for journey-planning. The standard-gauge Wisbech and Upwell Tramway, opened in 1883-4, was effectively a branch of its 'heavy rail' owner, the Great Eastern Railway: it closed to passengers in 1927 and to freight in 1966. Both the Sutton and the Upwell tramways used locomotives with boxed-in wheels and motion; by contrast, the standard-gauge Wantage Tramway (1875-1945) used ordinary locomotives.

Another 'tramway' variation was represented by the Hundred of Manhood and Selsey Tramway, which ran from Chichester to Selsey. It was opened in 1897: it ran wholly on its own reservation, used ordinary rather than 'tram' locomotives, and in many ways resembled 'heavy rail', though several of the 'stations' were little more than a name-board on a pole. Before its closure in 1935 the distinctly 'heavy rail' Southern Railway contemplated taking it over.

A third variety of 'tramway' that came close to 'heavy rail' was that represented by the Weymouth Tramway, along the quay, over which passed boat trains from London conveying Channel Island steamer passengers. The line was worked by ordinary locomotives, equipped with warning bells. The Ordnance Survey usually mapped it as a 'tramway', but the one-inch Seventh Series showed it as a 'railway'.

**Electric tramways: a further complication**

In 1893 work began on a revised version of the one-inch mapping of Great Britain, to a modified specification. The legend (figure 4) distinguished single and double-track railways and 'Mineral lines and tramways'; the latter embraced a wide range of engineering and function, from 'heavy rail' lines with impressive earthworks that had no passenger service (the Lincoln 'avoiding line' and (later) the Gowdall and Braithwell line in south Yorkshire come to mind), to wagonways that dated from, and had scarcely changed since, the eighteenth century, and very narrow-gauge lines in gravel-pits. Street tramways wholly in built-up areas were simply not mapped. By itself this was a natural extension of Ordnance Survey practice since 1836, but now a complication presented itself.
That was the ‘electric tramway’, which had begun to develop in the 1880s. Although various other methods were tried, the preponderant method of working was by current collection from overhead wires, suspended from or between poles: both the horizontal and the vertical features of this system were conspicuous in streetscapes of larger urban areas in Britain in the first forty years of the twentieth century.

The introduction of electricity enabled both faster transit times and more ambitious networks, and tramways extended in a way that would not have been practicable with horse traction. At one time it was possible to travel all the way from Liverpool to Manchester by electric tram, albeit with several changes and a good deal more slowly than by any of the three ‘heavy rail’ alternatives. This in turn produced a new phenomenon: the extension of a ‘street tramway’ that did not always follow a road, but struck out on a route of its own: an early example of this was the Blackpool and Fleetwood tramway, opened in 1898. Some of these tramways were constructed under earlier legislation designed to facilitate the construction of street tramways; others were built under the auspices of the Light Railways Act of 1896.

It took some time for the Ordnance Survey to come to terms with the electric tramway. None of the infrastructure for electric working was recorded by the Survey, which continued to show only what had been depicted hitherto: rails and depots. The vertical supports for the overhead wires were evidently treated similarly to telegraph poles, as street furniture that was not mapped; the overhead equipment of electrified ‘heavy rail’ was and continues to be treated similarly. The instructions for one-inch revisers of 1901 laid down that: ‘Tram and mineral lines are to be distinguished by writing “Tram” or “Mineral” line, and the gauge… Termini of tram or mineral lines should always be described, e.g., “Colliery”, “Lead Mine”, so that they may if possible be described on the 1-inch.’ This indicates that ‘tram’ was still being thought of in the ‘wagonway’ rather than the ‘street railway’ sense. By 1909 the latter were being taken account of, and field revisers were instructed that: ‘Electric tramways are to be shown by writing the name along the line of route where they follow the road, and by adding the symbol … where they leave the road. The symbol is not to be shown along the roads.’ This policy was broadly followed up to the near-demise of first-generation ‘street railways’ in the early 1960s: in 1936 draughtsmen were

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6 ‘Instructions to One Inch Field Revisers’, 1901, sections 84, 85: copies at British Library Maps 207.d.14 and Maps 207.b.34, and at The National Archives [UK] (TNA) OS 45/2.
instructed that ‘where they run along country roads the symbol is not shown, but the words “Tramway” or “Electric Tramway” are written’. In 1961 – by which time ‘street railways’ were practically obsolete – revisers were told: ‘Tramways in towns are not shown, but where trams or railways run along country roads write the description along the road. Show sections that leave roads by appropriate conventional signs and annotate. Show other tramways such as those inside large quarries, but ignore temporary portions near working faces. Distinction in annotation must be made between normal tramway and very narrow gauge.’ The instructions about temporary tramways simply codified for the one-inch revisers what had always been the Survey’s practice at larger scales. The practical result of these and other instructions was that much of the urban tramway system was never depicted at the one-inch, 1:25,000 or six-inch scales: collectively, they are a ‘silence’, though one that can be explained by the limitations of scale rather than any intention to suppress information.

It is possible that the 1909 instructions arose from problems encountered in field revision, and were designed to regularise the position, but, be that as it may, the one-inch Third Edition, revised 1901-12, shows things than merit further investigation, not least taking into account the legal status of individual lines. One might expect the line-with-crossbars symbol to be used consistently for both the descendants of wagonways and for extensions of street tramways ‘off-road’, but this was not always so, as the following examples will illustrate.

**Some case-studies in depiction**

The Portsdown and Horndean Light Railway (1903-35) was built using the 1896 Act, although in operation it was really just another street tramway. Most of its course was alongside the main road from Portsmouth to London, later A3, but at its south end, at Cosham, it ran on an independent course, and was shown on the one-inch Third Edition as a single-track railway. It was named in lower-case Roman in the style used for ‘heavy rail’ (figure 5). On the successor one-inch Popular Edition it was shown using the ‘tramway’ symbol, but named discreetly as ‘Electric Tram’ only towards the Horndean end (figure 6); unlike on the Third Edition, there was no indication that it continued south of Cosham. The treatment on the six-inch was similar to the Popular Edition, with no hint whether or how the system extended south of its reservation at Cosham (figure 7). The depiction on the half-inch (1:126,720) and quarter-inch (1:253,440) Second Edition followed that of the one-inch Third Edition, except that it was named simply ‘Electric Ry’; on the quarter-inch Third Edition (published 1920) the treatment followed that of the Popular Edition.

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8 *Instructions for revision and drawing of the one-inch (Fifth Edition) map*, Southampton: Ordnance Survey, 1936, 11, section 42: copy at TNA OS 45/26
10 The possible ramifications of this are another reason to keep the present article within strict limits.
Figure 5 (top left). The Portsdown and Horndean Light Railway at Cosham, from Third Edition (Large Sheet Series) sheet 135 (1908). The full name is spread out along the course of the tramway, with the addition of ‘(Electric)’.

Figure 6 (left). The Horndean tramway at Cosham, from one-inch Popular Edition (England & Wales) sheet 135 (1921). The name is placed further north along the line.

Figure 7 (above). The Horndean tramway at Cosham, from six-inch ‘Town Map’ of Portsmouth (1933/35): observe the abrupt termination of the line where it joins a public road.
The Blackpool and Fleetwood tramroad remains the only ‘first generation’ electric ‘street railway’ to have lasted into the twenty-first century, and provides a good example of the varying practices of depiction – or otherwise. Blackpool town had acquired a very early example of the electric tramway, opened in 1885, which was duly mapped by the Ordnance Survey a few years later at 1:2500 and 1:500, but not at smaller scales, and this treatment was followed when the 1:2500 was revised in 1910. The Blackpool and Fleetwood was until 1920 independent of the municipal system: it began at the then north end of the built-up area of Blackpool, and mostly ran alongside or very close to public roads, but south of Fleetwood it ran for about a mile or so on an independent course. On the one-inch Third Edition, revised 1911-12, the whole route was shown except in the built-up part of Fleetwood, as a ‘tramway’, and named thus, with ‘halts’. On the one-inch Popular Edition, revised in 1920, the ‘halts’ were omitted. On the Seventh Series, revised in 1950-1, only the short off-road section south of Fleetwood was shown, annotated ‘Tramway’. On the half-inch map the route was shown by the ‘tramway’ symbol, without stations. The quarter-inch second edition omitted the line completely.\textsuperscript{11} The Third Edition, published in 1921, showed the Fleetwood tramway with the ‘Mineral line and tramway’ symbol and the stations indicated: these last were so close together that the depiction was effectively by a sequence of red discs (figure 8). On the Fourth Edition, first published in 1935, the stations were omitted, and on the Fifth Series, published in 1957, the tramway was omitted completely.

The Selsey Tramway was steam-operated. On the one-inch Third Edition and Popular Edition and on the half-inch it was shown with the ‘tramway’ symbol, with stations. On the quarter-inch Second Edition it was shown with the ‘railway’ symbol, perhaps in recognition that, whatever its title, it was an appendage of the ‘heavy rail’ system. On the Third Edition it was shown similarly to the Fleetwood tramway, though the ‘stations’ were further apart.

The electric ‘street railway’ went into a gradual decline in Britain from the late 1920s onwards; the motor-bus had reached maturity, was more flexible, and could be extended to fast-growing suburbs without any special infrastructure.

\textsuperscript{11}Earlier editions of the quarter-inch, up to the Second Edition, omitted non-passenger ‘heavy rail’ lines, which explains the omission of lines such as the Cromford and High Peak Railway, but hardly explains the omission of the Fleetwood line.
Some smaller systems closed altogether – Luton’s lasted only from 1908 to 1932 – or else were gradually converted to trolleybus operation, as in Grimsby and Cleethorpes.\textsuperscript{12} Larger systems did better for a while – Birmingham’s was actually extended as late as 1938 – but after 1945 the decline was more rapid: the last London trams ran in 1952, the last in Sheffield in 1960 and the last in Glasgow in 1962. The Blackpool and Fleetwood line became thus a solitary relic. A late closer, in mid-1961, was the Grimsby and Immingham tramway, opened in 1912 and owned by the Great Central Railway and its successors. It was intended to link up with the Grimsby corporation system but never did so.\textsuperscript{13} It was unusual in that much of its route ran alongside one of its parent’s ‘heavy rail’ lines; at the Grimsby end it ran along streets.\textsuperscript{14}

At the same time there were some modifications to Ordnance Survey practice. On the one-inch Fifth Edition, of which publication began in 1931, the line-with-crossbars symbol was used for ‘Sidings and Tramways’ and, in principle, the single- and double-track symbols were used for all ‘heavy rail’ lines. A separate symbol was used for narrow gauge lines (figure 9). This treatment was followed on the Seventh Series and on the 1:50,000 First Series, but on the 1:50,000 Second Series, later \textit{Landranger}, on which work began in 1969, there was a reversion to earlier practice, with the distinction of ‘Track multiple or single’ and ‘Freight line, siding or tramway’\textsuperscript{15} (figure 10). The ‘quarter-inch’ (actually 1:250,000) Fifth Series and its successors followed the method introduced on the one-inch Fifth Edition.\textsuperscript{16}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure9.png}
\caption{Railways in the legend of one-inch Fifth Edition sheet 127 (1934).}
\end{figure}

\textsuperscript{12} Trolleybuses had the advantage of being able to reuse the overhead apparatus of tramways, but the disadvantage of being confined to electrified routes. Those in Grimsby were typical in that they lasted until 1960.

\textsuperscript{13} The existing Corporation Bridge needed rebuilding before trams could run over it; it was duly rebuilt in 1928, but by that time Grimsby was inclining towards trolleybuses.

\textsuperscript{14} The different depictions of ‘heavy rail’ lines at Immingham by the Ordnance Survey and by Bartholomew are another matter that should be investigated by a study of depiction of ‘railways’ on topographic maps in these islands. The treatment of the ‘heavy rail’ direct line between Grimsby and Immingham on the Seventh Series is also ‘interesting’.

\textsuperscript{15} This distinction was not adopted immediately, but was by 1977. For problems of ‘freight’ line depiction on the Second Series see Richard Oliver, ‘Railways, cyclists and the purple plague’, \textit{Sheetlines} 53 (1998), 37-45, esp pp 37-8; this difficulty was addressed in the partial redesign of the 1:50,000 in 2000-1, discussed later.

\textsuperscript{16} The half-inch Second Series, under development from 1946-7 but abandoned in 1961, did not mention ‘tramways’ in its legends, and it is unclear how such systems might have been treated at this scale.
The practice of not showing ‘street railway’ tramways on the six-inch was varied after 1919. On the series of ‘Town Maps’ at this scale produced between 1919 and 1924, street tramways were indicated by purple lines (figure 11). On the six-inch mapping of Blackpool consequent on the 1:2500 revision of 1930 the system was shown complete, except that at Fleetwood the on-street section was omitted. At Grimsby, revised shortly afterwards, the on-street section of the Grimsby and Immingham tramway was also omitted. At Blackpool, the 1:25,000 Provisional Edition mapping produced from 1945 followed the six-inch in showing the system complete, except for the northern part in Fleetwood.

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17 Lancashire six-inch sheets 38 SW (Fleetwood), 50 NE and 50 SE (Blackpool); Lincolnshire sheet 22 NE. One possibility is that there was a short-lived policy in favour of showing on-street sections, which was in force when the Blackpool sheets were being drawn, but had been reversed shortly afterwards when the Fleetwood and Lincolnshire sheets were in hand.
An interesting anomaly appears on the six-inch National Grid Provisional Edition mapping of Grimsby, published in 1956, and using revision of 1951 made primarily for the one-inch. On TA 20 NE, the on-street portion of the tramway is omitted, but on TA 21 SE this section of line is shown (figure 12). TA 21 SE was immediately out of date, as the on-street section of the tramway was closed in mid-1956 and the rails soon removed.

Figure 12. The Grimsby and Immingham Tramway on the six-inch National Grid Provisional Edition (1956): above, TA 21 SE, showing the tramway running along Gilbey Road; below, TA 20 NE, with no hint of the tramway, which actually ran along Corporation Road to the west end of Corporation Bridge.
The ‘LRT’ era

After 1962 Blackpool had the only remaining urban ‘tram’ system in Britain. Between 1970 and 1980 a narrow-gauge tramway was opened between Seaton and Colyton in Devon along the course of a closed ‘heavy rail’ branch line. This has been consistently mapped by Ordnance Survey with the line-with-crossbars symbol and the ‘station’ symbol for the three stopping places on the line, which nowhere runs ‘on-street’. At the same time as the Seaton line was being developed there was growing interest in ‘Light Rapid Transit’ (LRT) systems, and in 1981-2 a ‘Metro’ system was opened on Tyneside: the above-ground sections were almost all ‘heavy rail’ taken over from British Railways, and indeed some sections continued to carry ‘heavy rail’ trains, both passenger and freight, but the basic concept was ‘LRT’. Before 2002 Ordnance Survey showed these lines as ‘heavy rail’, in the same manner as the above-surface sections of the London underground system, which indeed in many ways the Tyne & Wear Metro resembles, save that far less is in tunnel. In 1992 the whole of the Blackpool system appeared, using the ‘tramway’ symbol but without ‘stations’, on the fully-revised 1:50,000 sheet 102; it may be that showing all other above ground ‘railways’ was felt to make its omission hitherto inconsistent.

But there may be another explanation: the development of the LRT, which the Blackpool system certainly was, in function if not in name. The year 1992 also saw the opening of another LRT system, the Manchester Metro. Like the Tyne & Wear system, it mostly used ‘heavy rail’ routes taken over from British Railways. However, through the centre of Manchester the Metro ran along streets, and operation was by tram-cars that imitated contemporary mainland European practice. The cartographic treatment was interesting: on the 1:50,000, as on Tyneside, the former ‘heavy rail’ section continued to be shown as before, with stations, whereas the street section was shown using the ‘Freight line, siding or tramway’ symbol, with no indication of the various stations in the city centre: to be fair, to attempt to show them would have been to ‘clutter’ the map.

In 2000-01 the 1:50,000 underwent some redesign, and this included the treatment of railways. Freight ‘heavy rail’ lines were once more treated as they had been on the one-inch Seventh Series, and the single-line-with-crossbars symbol was now used for ‘Light rapid transit system, narrow gauge or tramway’: perhaps the thinking that the aggregate mileage of these was modest. A separate symbol for ‘Light rapid transit system station’ was also introduced (figure 13). In practice treatment was not always consistent: on sheet 88 the ‘heavy rail’ symbol was retained for the Tyne & Wear Metro, though the stations were infilled yellow. On sheet 109 the Manchester Metro was now shown by the LRT symbol, but still no on-street stations were shown in the city centre. On the 1:25,000 Explorer sheet 277, produced nearly simultaneously, the system was shown using the established ‘tramway’ symbol for this scale, with stations – including those ‘on-street’ – indicated by a ‘Metro’ symbol (figure 14). This symbol was also used on Explorer 316, although the ‘heavy rail’ symbol was retained for the tracks.
Space constraints may account for LRTs being treated as ‘heavy rail’ on the 1:250,000 Travelmaster series, introduced in 1993. In 2001 this mapping was republished as a Road series, which included symbols for LRT lines and stations.

**Conclusion: ‘the usual’**

‘How does Ordnance Survey show tramways?’ If the question is posed of current mapping, then the answer appears to be that they are ‘Light Rapid Transit systems’, and are shown as fully as the scale permits. If the question is, ‘How were they shown in the past?’, then the answer is ‘apparently not entirely consistently’. I am rather tired of reading it, as well as writing it, but ‘further work needs to be done’.