

APPLICATION OF HIGHWAY LEGISLATION TO TRAMCARS



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Introduction

This guidance is issued by the Office of Rail Regulation. Following the guidance is not compulsory and you are free to take other action. If you do follow the guidance you will normally be doing enough to comply with the law. Railway inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.



Author

Stephen J Firth

with contributions from members of UKTram, Activity Group 3

At the request of HM Railway Inspectorate and with the assistance of the members of -

- The Light Rail Engineer's Group
- The ORR Tramway Standards Group
- HM Railway Inspectorate.

1. Background

The process of incorporation of second generation street running light rail into highway legislation has been ongoing since the 1990s when it became apparent that the provisions for tramcars remaining in the current legislation might be insufficient for the emerging systems.

The first new system, Manchester Metrolink, went into service in 1992 with a number of provisions already in place to facilitate its operation in the street. These included:

- Revisions to highway legislation - notably the Tramcars and Trolley Vehicles (Modification of Enactments) Regulations 1992 (S.I. 1992/1217) which came into force on the first of July that year (just a few weeks after trial running began through the streets of Manchester).
- Clauses in the Greater Manchester (Light Rapid Transit System) Act 1988.
- Special authorisations (particularly for signs, line markings, signals and road traffic controller functionality).

NOTE

Historically, tramcars had been incorporated in the highway legislation in this country but, as the first generation systems progressively closed, the emphasis weakened and there was no progressive development of the legislative provisions so a process of “catch-up” had to begin.

Section 141 of the Road Traffic Regulation Act 1984 (“the 1984 Act”) as originally enacted had, like previous Acts, included that certain of its provisions did not apply to tramcars or trolley vehicles operated under statutory powers and Section 193 of the Road Traffic Act 1988 (“the 1988 Act”) contained a similar provision. These sections were repealed by the Road Traffic Act 1991 (“the 1991 Act”).

However, the 1991 Act amended the 1984 Act and the 1988 Act giving power to the Secretary of State to make regulations providing that certain sections in those Acts are not to apply to tramcars or trolley vehicles. He was also given power to modify the application of those sections to tramcars or trolley vehicles, also by making regulations.

Such regulations were made just in time for the “second generation systems” (as referenced above) as the *Tramcars and Trolley Vehicles (Modification of Enactments) Regulations 1992*.

2. Legislation

Tramcars and Trolley Vehicles (Modification of Enactments) Regulations 1992 (S.I. 1992/1217)

NOTE

As the name suggests these regulations either exempt trams from certain things that apply to other vehicles or make changes to accommodate trams. The primary purpose was to remove trams from the scope of inappropriate parts of the prescriptive legislation and leave it to the tramway-specific statutory approval régime to provide an alternative more suited to trams.

These Regulations provide that certain sections of the 1984 and 1988 Acts are not to apply to tramcars or trolley vehicles. They also provide that other sections of those Acts are to apply to tramcars or trolley vehicles only with modifications.

Part V of the Regulations amends the Motor Vehicles (Tests) Regulations 1981 (S.I. 1981/1694), the Motor Vehicles (Construction and Use) Regulations 1986 (S.I. 1986/1078) and the Road Vehicles Lighting Regulations 1989 (S.I. 1989/1796) as a consequence of the amendments to the 1988 Act made by the 1991 Act.

PARTS II & III of the Regulations detail the modification to each Act as follows:

a. PART II - Modifications to the 1984 Act relating to Tramcars

NOTE

Primarily this exempts trams from Speed Limits set for other vehicles by TROs or the "London Equivalent" and certain other prohibitions and restrictions,

3.—(1) *Subject to Part IV of these Regulations,¹ the following sections of the 1984 Act—*

- (a) section 1 (traffic regulation orders),*
- (b) section 6 (orders similar to traffic orders in London),*
- (c) section 9 (experimental orders), and*
- (d) section 18 (one-way traffic on trunk roads),*

shall have effect in relation to tramcars so that such vehicles are exempt from any order under any of those sections.

4.—(1) *Save as provided below, section 14 (temporary prohibition or restriction of traffic on roads) shall have effect in relation to tramcars so that such vehicles are exempt from any order or notice under that section.*

— (2) Nothing in paragraph (1) above shall affect the operation of any provision in an order or notice under that section restricting the speed of vehicles.

b. PART III - Modifications to the 1988 Act relating to Tramcars

NOTE

Primarily this exempts trams from requirements regarding dangerous or unfit/unroadworthy vehicles, weighing, reflector provision and places a requirement on tram drivers to have a category B driving licence.

7. *The following provisions of the 1988 Act shall not apply to tramcars—*

section 40A (using vehicle in dangerous condition etc.);

section 68 (inspection of public passenger vehicles and goods vehicles);

¹ Part IV keeps duo-buses outside the scope of the exempting provisions in this section 3(1)

sections 69 to 73 (prohibition of unfit vehicles);

section 75 (vehicles not to be sold in unroadworthy condition or as altered so as to be unroadworthy);

section 76 (fitting and supply of defective or unsuitable vehicle parts);

section 77 (testing condition of used vehicles at sale rooms etc);

section 78 and 79 (weighing of motor vehicles);

section 83 (offences to do with reflectors and tail lamps).

section 190 (method of calculating weight of motor vehicles and trailers); and

section 191 (interpretation of statutory references to carriages).

8. *Section 87 of the 1988 Act (drivers of motor vehicles to have driving licences) shall apply to tramcars as if after subsection (2) there were added the following subsections—*

" (3) A licence authorising a person to drive a motor vehicle in category B within the meaning of the Motor Vehicles (Driving Licences) Regulations 1987³, shall be regarded as authorising that person to drive a tramcar.

(4) Notwithstanding subsection (1) above, a person may drive or cause or permit another person to drive a tramcar if the driver was employed on duties which required the driving of tramcars on a road at any time during the one year period ending immediately before 1st July 1992."

Road Traffic Act 1991

NOTE

This was the Act that took out the historical exemptions and modifications for trams in the previous road traffic acts themselves and instead permitted the making of regulations to do it. Most of what was provided for as regulations was realised soon after when the *Tramcars and Trolley Vehicles (Modification of Enactments) Regulations* were put in place in 1992.

This Act modified (by insertion of new sections) the following Acts:

Road Traffic Regulation Act 1984	new s.141A
Road Traffic Act 1988	new s.193A

Both new sections permitted the Secretary of State:

by regulations provide that such of the provisions mentioned in subsection below as are specified in the regulations shall not apply, or shall apply with modifications—

- (a) to all tramcars or to tramcars of any specified class, or*
- (b) to all trolley vehicles or to trolley vehicles of any specified class.*

The existing sections of each Act which may be not applied or applied with modification by such regulations are then listed as subsection 2 of the new section. [The list of provisions in this subsection has been widened to include s. 16A to 16C of the 1984 Act. This was done by the Road Traffic Regulation (Special Events) Act 1994, s 3(1), Schedule, para 4. So the full list is now sections 1 to 14, [16A to 16C] 18 and 81 to 89 of this Act. The additional section 16A to 16Cs deal with the power to make orders in relation to special events such as the London Olympic Games and Paralympic Games Act 2006, s 16(1), and the London Local Authorities and Transport for London Act 2008, s 12.]

In subsection 3 further provisions are made to:

- allow regulations to be “case specific” (may make different provision for different cases).
- allow transitional provisions
- allow amendments to any special Actnecessary or expedient in consequence of the regulations or in consequence of the application to any tramcars or trolley vehicles of any of the provisions mentioned in subsection (2).....

The "special Act" referred to means a local Act of Parliament passed before the commencement of this section which authorises or regulates the use of tramcars or trolley vehicles i.e. a system Act such as the Greater Manchester (Light Rapid Transit System) Act 1988.

The Tramcars and Trolley Vehicles (Modification of Enactments) Regulations 1992 (S.I. 1992/1217) were made under the above powers in the Road Traffic Act 1991 in that the Regulations provide that certain sections of the 1984 and 1988 Acts are not to apply to tramcars or trolley vehicles and ..also provide that other sections of those Acts are to apply to tramcars or trolley vehicles with modifications. However, no “case specific” regulations or amending regulations to special Acts have yet been put in place.

Developments Since 1992

As mentioned above, the Metrolink system as the first of the “second generation” tramways relied on certain provisions in the Greater Manchester (Light Rapid Transit System) Act 1988.and on special authorisations by the Department for Transport and the local government office to “regularise” much of the early operation on highways, and other new systems like Sheffield followed suit. However, over time, much provision has been made by revisions to highway legislative mechanisms and official publications. These are outlined below.

The Traffic Signs Regulations and General Directions 2002 (S.I. 2002/3113)

NOTE

This comprehensive set of regulations, which specifies road signs, signals and lines for all highways and types of vehicles, was amended to include the re-introduction of tramways and trams.

As the name suggests, in this enactment Regulations for Traffic Signs, Signals and Lines are set out, followed by Directions on their application. The current 2002 version replaces an earlier version from 1994, which itself superseded a 1981 edition, and so on into history. The 1994 version was the first to incorporate “second generation” tramway specific signage, signals and special provisions (much earlier signs had existed specifically for “first generation” systems – e.g. the old “tram pinch” sign). The “second generation” tramway specific signage was carried forward into the expanded 2002 (current) version of the Regulations. Salient points from the *Traffic Signs Regulations and General Directions* in terms of tramcar and tramway operation are explored below (these all feature in the Regulations rather than the Directions part of the enactment):

3. Interpretation (meanings of terms)

NOTE

Most Acts and Regulations have an Interpretation section that sets out the precise meanings of terms used in them. These may vary between different types of legislation, so it is extremely important to know the meanings that apply to a particular piece of legislation.

First of all, it is important to note that the meaning of a specific term, as set out in the Interpretation section of one piece of legislation, may differ from the meaning of the same term set out in and applying to other legislation. Also a definition of a term may be restricted in its application to only a particular section of an act or of a regulation.

In the **Traffic Signs Regulations and General Directions 2002** Section 4, *Interpretation – general* the following meanings are assigned:

- **"level crossing"** means a place where a road is crossed by a railway or a tramway on a reserved track on the same level;
This definition includes any crossing on the level and the inclusion of the words "or a tramway" means that tramway crossings are included within the scope of "level crossing" for the purposes of the 2002 Regulations and Directions. Note that this differs from the more restricted meaning of a level crossing for the purposes of making level crossing orders under the Level Crossings Act 1983, since in that Act a level crossing is "any place where a railway crosses a road on a level".
- **"passenger vehicle"** means a vehicle constructed or adapted for the carriage of passengers and their effects;
- **"public service vehicle"** has the meaning given in section 1 of the Public Passenger Vehicles Act 1981, *that is "a motor vehicle (other than a tramcar)" which also meets other conditions. So tramcars are not public service vehicles for the purposes of the 2002 Regulations and Directions.*
- **"road maintenance vehicle"** means a vehicle which –
(a) in England and Wales is specially designed or adapted for use on a road by or on behalf of a highway authority for the purposes of the Highways Act 1980 for the purposes of road maintenance; or
(b) in Scotland is specially designed or adapted for use on a road by or on behalf of a roads authority for the purposes of the Roads (Scotland) Act 1984 for the purposes of road maintenance.
Some rail based maintenance, special purpose vehicles may fall into this category;
- **"road works"** means works for the improvement, alteration or maintenance of a road and includes, in relation to England and Wales, street works as defined by section 48(3) of the New Roads and Street Works Act 1991 and, in relation to Scotland, road works as defined by section 107(3) of that Act;

N.B. The guidance issued by DfT to the *New Roads and Street Works Act* has portions applicable to tramways. (See <http://www.dft.gov.uk/pgr/roads/network/local/streetworks/>)

4. Signals

NOTE

Signals for trams have been made distinctly different from the standard form of signals for other vehicles. The standard form of signals no longer applies to trams. Also, tram signals do not apply to any other vehicles.

Regulation 33(1) of the 2002 Regulations and Directions prescribes light signals for the control of vehicular traffic in their standard form for the control of vehicular traffic (other than tramcars) at junctions, at places where the headroom or the width of the road is permanently restricted, or at signal-controlled crossing facilities. Regulation 35 does the same for portable light signals, again for the control of vehicular traffic other than tramcars. However, Regulation 41(1) prescribes a specific type of light signals for the control of tramcars. Therefore the standard signal controls set out in Regulation 33(1) are not applicable to tramcars; instead tramcars must use the signals set out in Regulation 44(1).

Regulation 43(1) (*Meaning of stop line and references to light signals*) ascribes a meaning for a "stop line" in relation to light signals for the control of vehicular traffic as –

- a. in relation to any vehicle except a tramcar the road marking shown in diagram 1001 (standard form of stopline) placed in conjunction with the light signals;
- b. in relation to a tramcar, the road marking shown in diagram 1001.1 (tramcar stopline) placed in conjunction with those light signals, or when that marking has not been so placed, the marking shown in diagram 1001 so placed.

So the road marking in diagram 1001.1 should be used in relation to tramcars, but where there is no tramcar stop line then the marking in diagram 1001 is to be used.

Further, **Regulation 43(3)** provides that where no stop line has been provided in conjunction with light signals, or where the stop line is not visible, references in relation to those signals to the "stop line" are –

- a. in a case where the sign shown in diagram 7011, 7011.1 or 7027 ("*when red light shows wait here*" or "*wait for green light*" types of sign) is placed in conjunction with the light signals, to be treated as references to that sign; and
- b. in any other case, to be treated as references to the post or other structure on which the primary signals are mounted.

Warning Signs and Other Traffic Signs

Regulation 15(1) of the 2002 Regulations and Directions supports the requirement conveyed by the sign shown in diagram 610 that vehicular traffic passing the sign must keep to the left of the sign where the arrow is pointed downwards to the left, or to the right of the sign where the arrow is pointed downwards to the right i.e. KEEP LEFT & KEEP RIGHT signs.

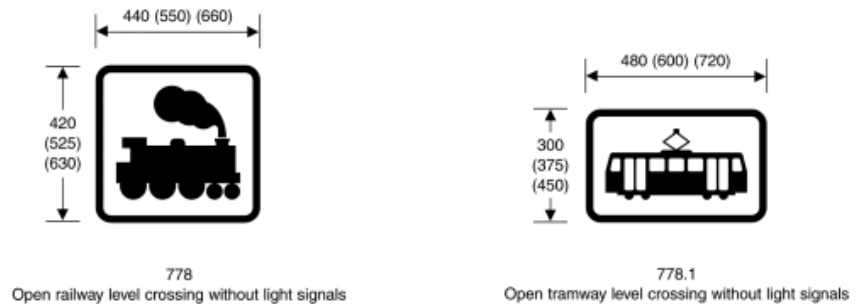
However, **Regulation 15(3)** specifies that the requirement in 15(1) above does not apply to a tramcar or trolley vehicle.

It is important to be aware of the requirements conveyed to vehicular traffic by signage at places where tramways cross the road – since tramcars are within the definition of "level crossings" for the purposes of these 2002 Regulations and Directions whereas they may not be within the definition of "level crossing" for the purposes of making level crossing orders (see earlier).

Regulation 16(1) dictates the requirements conveyed to vehicular traffic on roads by the STOP & GIVE WAY signs:

- "STOP" sign (diagram 601.1) when used at a level crossing:

- a. every vehicle shall stop before crossing the transverse line shown in diagram 1002.1 (“Stop” line) or, if that line is not clearly visible, before entering the level crossing; and
- b. no vehicle shall cross the transverse line shown in diagram 1002.1 or, if that line is not clearly visible, enter the level crossing, so as to be likely to endanger the driver of or any passenger in any railway vehicle or tramcar or to cause that driver to change the speed of his vehicle in order to avoid an accident.
- “GIVE WAY” sign (diagram 602) when placed in combination with 778 or 778.1: No vehicle shall cross the transverse line shown in diagram 1003 (“Give Way” lines) nearer to the level crossing at the side of which that line is placed, or if that line is not clearly visible, enter that level crossing, so as to be likely to endanger the driver of or any passenger in any railway vehicle or tramcar or to cause that driver to change the speed of his vehicle in order to avoid an accident.



Note the different plates for what are defined as railway and tramway open level crossings. Provision is made in the 2002 Regulations and Directions for signage for more “elaborate” tramway level crossings using railway solutions such as automatic barrier or open crossings. Thus far in practice these have only been used on metro signalled sections of tramway such as Manchester – Bury or on parallel running sections next to heavy rail such as Basford to Hucknall (Nottingham).

Another important point in the 2002 Regulations and Directions relates to signage of overhead line safe heights. Regulation 17(5) requires that in each of the signs shown in diagrams 780A, 780.1A and 780.2A (the variants of the sub plates for use beneath the “flash bang” electrified overhead warning triangle) the safe height shown on the sign shall be varied where necessary so that it is “*between 380 and 600 millimetres less than the height of the lowest part of the overhead wire, of which the sign gives warning, over the highest part of the surface of the carriageway beneath that wire*”.

The range has been calculated to permit the worst case scenario of maximum permitted sag curve on highway and the overhead following the same vertical profile with a long, high rigid vehicle still being able to maintain clearance at the 600mm positioning.

5. Lines

Regulation 25(1) of the 2002 Regulations and Directions puts in place similar requirements to be conveyed to vehicular traffic on roads by the GIVE WAY road marking (diagram 1003) as does the sign in Regulation 16(1) above.

Regulation 32(2) specifies the **maximum height of road markings** and size of studs as follows: *“No road marking or stud shall project above the surface of the adjacent carriageway more than 6 millimetres at any point except ...”*

It goes on to define certain types of marking and stud. The defined studs and markings are to prescribed profiles which avoid “step” edges.

This “default” 6mm stud and line limit along with the 3mm overbanding limit* were significant influences in the rationale used on second generation tramway systems to determine practical rather than theoretical rail height differentials to carriageway surfaces.

Note

Overbanding is permitted within the New Roads and Street Works Act 1991 approved "Specification for the Reinstatement of Openings in the Highway" Code of Practice.

S.6.5 (6) of the Code of Practice states: Any overbanding or coating of the road surface, at the interface between the existing road and the reinstatement edge, shall not exceed 3mm thickness nor 40mm width. The minimum skid resistance value of the material used shall be 55 SRV, as determined by the TRRL portable Skid-resistance tester used in accordance with Road Note 27 : 1969 (to be found through HMSO).

6. More on signals

Regulations 33 – 35 of the 2002 Regulations and Directions describe standard red amber green light signals, filters and temporary traffic signals.

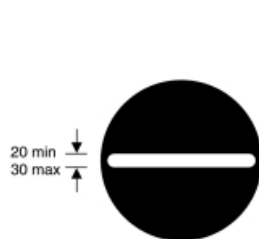
Regulation 36 goes on to describe the significance of the signals prescribed by regulations 33 - 35 in terms of prohibitions and permissions with respect to signals and ends: “36 (3) *In this regulation the expressions "vehicle" and "vehicular traffic" do not include tramcars.*” i.e. the Regulation **expressly excludes tramcars** from the observance of red amber green light signals.

Regulation 41 then prescribes light signals for the control of tramcars. Under Regulation 41(1) these “shall –

- a. *be of the size, colour and type shown in diagram 3013; and*
- b. *display the aspects shown in diagrams 3013.1, 3013.2, 3013.3, 3013.4 and 3013.5 in the sequence prescribed by”... 41(2).*

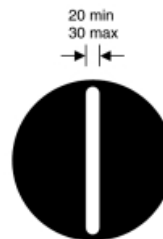
Regulation 41(2) defines the sequence as follows:

- a. *“the horizontal line shown in diagram 3013.1;*
- b. *the vertical line shown in diagram 3013.2 or either of the diagonal lines shown in diagram 3013.3 or 3013.4;*
- c. *the central circle shown in diagram 3013.5.”*



3013.1
As diagram 3013, conveying the prohibition prescribed by regulation 42(a)

Item	
1	Regulations: 10(1), 41, 42
2	Directions: 46, 56
3	Diagrams: None
4	Permitted variants: None



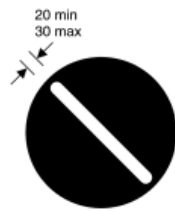
3013.2
As diagram 3013, conveying the indication prescribed by regulation 42(b)

Item	
1	Regulations: 41, 42
2	Directions: 46, 56
3	Diagrams: None
4	Permitted variants: None



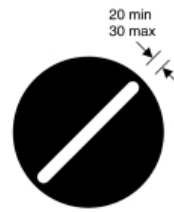
3013.5
As diagram 3013, conveying the requirement prescribed by regulation 42(e)

Item	
1	Regulations: 41, 42
2	Directions: 46, 56
3	Diagrams: None
4	Permitted variants: None



3013.3
As diagram 3013, conveying the indication prescribed by regulation 42(c)

Item	
1	Regulations: 41, 42
2	Directions: 46, 56
3	Diagrams: None
4	Permitted variants: None



3013.4
As diagram 3013, conveying the indication prescribed by regulation 42(d)

Item	
1	Regulations: 41, 42
2	Directions: 46, 56
3	Diagrams: None
4	Permitted variants: None

Importantly **Regulation 41(3)** requires that:

“When the light signals prescribed by paragraph (1) (“tram signals”) are affixed to the light signals mentioned in regulation 33 (“standard signals”) their aspect may be such that they convey to the driver of a tramcar a different significance from that conveyed at the same time in accordance with regulation 36 to the drivers of other vehicular traffic by the aspect of the standard signals to which the tram signals are affixed.”

This rather lengthy part of the regulation is very important because it facilitates signals on the same head showing different things at the same time (e.g. a tram signal may revert to a stop as a tram clears a junction but the equivalent green for other traffic may continue for some time after). In traffic engineering terms this regulation permits the tram to have its own phase within a stage for a movement through the junction which may be exactly the same as a similar phase for general traffic.

Regulation 42 defines the significance of light signals prescribed by regulation 41 as:

“(a) the aspect shown in diagram 3013.1 (STOP BAR) shall convey the prohibition that a tramcar shall not proceed beyond the stop line;

(b) the aspect shown in diagram 3013.2 (VERTICAL BAR) shall indicate that a tramcar may proceed beyond the stop line and proceed straight ahead;

(c) the aspect shown in diagram 3013.3 (DIAGONAL LEFT) shall indicate that a tramcar may proceed beyond the stop line and proceed to the left;

(d) the aspect shown in diagram 3013.4 (DIAGONAL RIGHT) shall indicate that a tramcar may proceed beyond the stop line and proceed to the right; and

(e) the aspect shown in diagram 3013.5 (CLUSTER) shall convey the prohibition that a tramcar shall not proceed beyond the stop line except that, as respects a tramcar which is so close to the stop line that it cannot safely be stopped without proceeding beyond the stop line, it shall convey the same indication as the aspect which was shown immediately before it.”

The above are important and are the legal requirements that should be enshrined in tram driver training.

Regulation 43 deals with stop lines for signals.

43(1) prescribes that a "stop line" in relation to light signals for the control of vehicular traffic means –

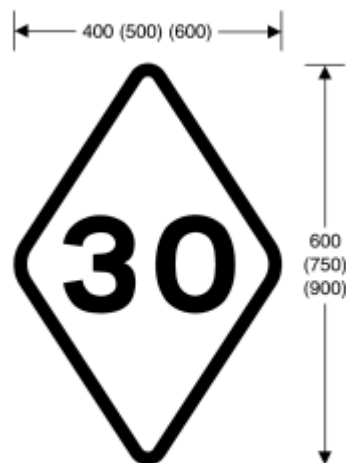
- a. in relation to any vehicle except a tramcar the road marking shown in diagram 1001 (STANDARD STOP LINE) placed in conjunction with the light signals;
- b. in relation to a tramcar, the road marking shown in diagram 1001.1 (TRAM STOP LINE) placed in conjunction with those light signals, or when that marking has not been so placed, the marking shown in diagram 1001 so placed.

43(3) requires that where no stop line has been provided in conjunction with light signals or the stop line is not visible, references in relation to those signals to the "stop line" are taken as:

- a. "in a case where the sign shown in diagram 7011, 7011.1 or 7027 ("when red light shows wait here" or "wait for green light" types of sign) is placed in conjunction with the light signals, to be treated as references to that sign; and
- b. in any other case, to be treated as references to the post or other structure on which the primary signals are mounted."

Part (b) is particularly apt for tramway ballasted approaches etc.

Schedule 5 of the 2002 Regulations and Directions prescribes the form of signs to be used exclusively for tramcars. The "default" diagram 976 is for tramcar maximum permitted speed in km/h.



976
Maximum speed limit for tramcars
in kilometres per hour

Because tramcars are exempted from speed limits set by Traffic Regulation Orders and a number of other Road Traffic and Road Traffic Regulation Act requirements (see Tramcars and Trolley Vehicles (Modification of Enactments) Regulations above), the Secretary of State for Transport has traditionally set speed and other requirements specifically for tramcars through the system and vehicle approval process. This remains the case today although the future mechanism for this is currently under review.

To facilitate maximum flexibility in this process, the following wording was inserted into **Schedule 5** to the 2002 Regulations and Directions, at diagram 976:

Permitted variants:

The numeral "30" may be varied.

Other information may be substituted for "30" in accordance with the requirements of Her Majesty's Railway Inspectorate.

The background, border, symbol and lettering may be in any colour in accordance with the requirements of Her Majesty's Railway Inspectorate

The Railway Inspectorate has then set out the recommended “accepted” standard signs in Railway Safety Publication – Appendix A. These are:



Figure 8:
To indicate
to tram traffic the
requirement to stop,
and not to proceed until
it is safe to do so

Figure 9:
To indicate
to tram traffic the
requirement to give way
to other trams or other
road vehicle traffic

Figure 10:
To indicate the
maximum permissible
speed of tram operation
until amended by
another speed variation
instruction

Figure 11:
To indicate to tram traffic
the requirement to
observe the instruction
conveyed by the
accompanying plate. The
plate conveys a specific
instruction to the tram
driver. Permitted variants
include: other letters, or
text conveying other
meanings

7. Traffic Signs Manual

Chapter 5: Road Markings²

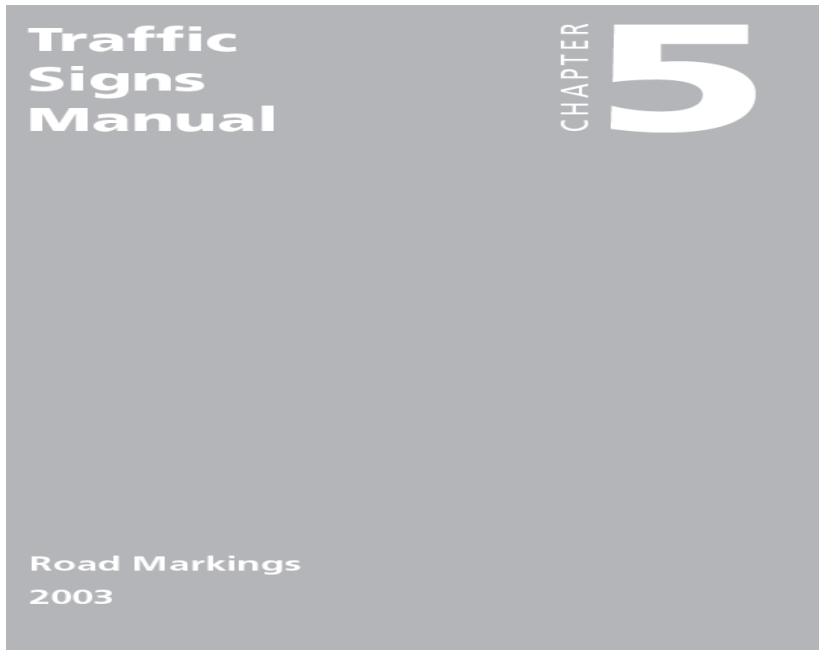
This “working document” forms an important part of application of the statutory requirements. An extract including the short section specific to tram markings (section 18) is at Appendix 1 along with comments.

To conclude, this short paper is not intended to be an exhaustive examination of every aspect of highway legislation affecting tramway operation but is rather intended as an aid to understanding of what is currently a very complex field of interacting legislative and permissioning regimes.

As a participant in regulatory as well other associated roles over the period since the dawn of the “second generation” tramways, I have landed the task of producing this paper as perhaps a starting point for UKTram’s Working Group 3 to move forward from.

² Available online at
<http://www.dft.gov.uk/pgr/roads/tss/tsmanual/trafficsignsmanualchapter5.pdf>

Appendix 1: extract from Chapter 5



5 DOUBLE WHITE LINES

Extract from Section 5.8:

5.8 Double lines should not normally be used in built-up areas, as preventing vehicles from stopping could be unduly restrictive. They might, however, be required at certain difficult positions, on three-lane hills (see para 5.27 to 5.35) or at level crossings (see paras 19.13 to 19.17).

“Certain difficult positions” have thus far been interpreted for tramways as locations where long (second generation) trams have been introduced and there is no vehicular refuge between trams on a double track system laid within a two lane single carriageway where:

- stopping is prohibited anyway because of the existence of the tramway and
- overtaking a vehicle the length of the tram would expose a driver to misjudgement of its length and the consequential risk of being trapped between two fixed track vehicles.

Mosley Street in Manchester was the pilot for this where the local Highway Authority (Manchester City Council) with the support of RI obtained DfT consent to the principle. The above tramway interpretation has not yet been separately identified in “Chapter 5”.

18 TRAM MARKINGS

18.6 The worded marking to diagram 1048.2 TRAM ONLY or TRAM & BUS ONLY should be laid at the commencement of a segregated length of tramway and after any break where a road crosses the tramway. The marking should be laid so that no part of the lettering is on the running or check rails of the tram track. It should be arranged so that the words "TRAM" and "ONLY" are centred on the tracks with the first and last letters outside the running rails. The ampersand "&" is centred between the running rails and "BUS" needs to be offset, with the first letter outside the left hand running rail and the other two letters between the check rails (see figure 18-1).

OFF-STREET TRAMWAYS

18.7 Where a tramway diverges from an integrated system at a shallow angle onto a reserved length of track or to a tram stop, particular care needs to be taken to ensure that other drivers do not follow the tracks; this is particularly hazardous where it is the road that deviates leaving the tracks to carry straight on. Road markings are essential, in addition to appropriate vertical signing.

18.8 An edge line to diagram 1012.1 (see figure 18-2 and paras 4.31 to 4.38) should be provided, following the edge of the main carriageway at an angle across the tram tracks. The line should be discontinued where it crosses the running and check rails, but resumed in the space between the rails. This line should be supplemented by reflecting road studs of the appropriate colour (see para 6.9). Any stud laid within 2 m of the running rail should be of plastic construction. Physical measures to dissuade other vehicles from being driven along the tram track are recommended, e.g. the edge line may be supplemented by a low kerb painted alternately black and white, or by hostile paving.

18.9 Warning lines to diagrams 1004 or 1004.1 (see paras 4.12 to 4.26) should be laid in the centre of a single carriageway road, and in place of lane lines on multi-lane carriageways, following the line of the main carriageway.

18.10 A minimum of three arrows should be used to guide road vehicles past the divergence. The final arrow (3) should be positioned immediately after the point of divergence. The second and first arrows (2) and (1) should be placed before the point of divergence at distances equivalent to 1 and 3 seconds of travel respectively. These distances and the size of arrows that should be used are indicated in table 18-1. The appropriate type of arrow (diagram 1014 or 1038) depends upon the nature of the divergence, and is indicated in table 18-2 and figure 18-2. If the layout of the road is such that drivers might mistake arrow (1) or (2) as an indication to move to the next lane, then it should be omitted.

Table 18-1 Arrow size and location

Speed limit (mph)	Arrow length (m)	Distance from point of divergence (m)		
		Arrow number		
		1	2	3
30	4.5 (4)	40.5	13.5	0
40	4.5 (4)	54.0	18.0	0
50	6	67.5	22.5	0
60	6	81.0	27.0	0
70	9	94.5	31.5	0

NOTE: The smallest arrows to diagram 1014 and 1038 are 4.5m and 4 m long respectively.

Table 18-2 Arrow type

Description of divergence	Figure	Arrow type		
		Arrow number		
		1	2	3
Tracks diverge from road	18-2a and 2b	1038	1038	1038
Road diverges to the left	18-2c	1014	1014	1014
Road diverges to the right	18-2d	1014	1014	1038

TRAM MARKINGS

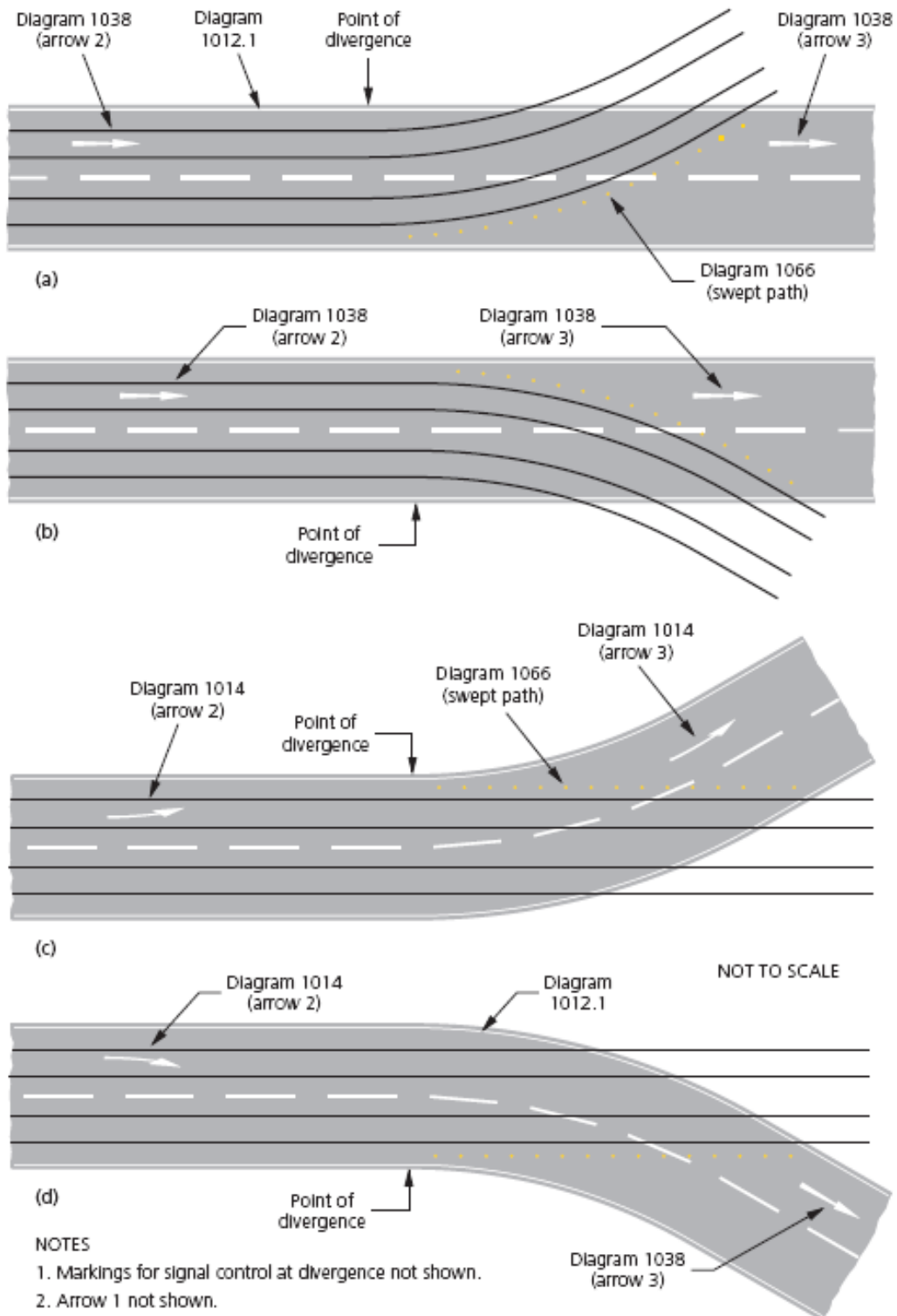


Figure 18-2

ROAD JUNCTIONS

18.11 Where a road is crossed by a segregated tramway which operates as a signalled railway, the junction should be signed and marked in the same way as a railway level crossing (see section 19) using the appropriate vertical tram signs.

18.12 Junctions with heavy traffic flows or restricted visibility (including those which would normally be signed with the diagram 601.1 STOP sign) should be controlled by traffic signals with the special white signals for tramcars (diagram 3013). Where the route is for tramcars only, the transverse tram Stop line to diagram 1001.1 (see figure 18-3) should be provided at right angles to the tracks, positioned a minimum of 1.5 m before the primary tram signal (2.5 m where practicable). If trams are running with other vehicles but not segregated from them with a physical refuge, the Stop line to diagram 1001 should be used from the kerb to the centre line. The tram Stop line may be used in addition, either just in front of or just beyond the Stop line; this might be necessary to facilitate swept paths or where primary tram and other traffic signals are not co-located. If the tram route is segregated from other traffic by a refuge, the respective Stop line is used on each side.

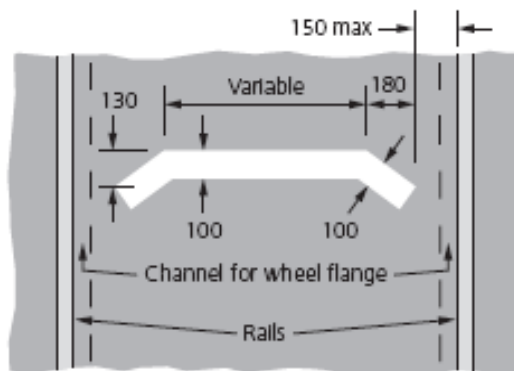


Diagram 1001.1

Figure 18-3

18.13 At priority junctions, roads carrying tramways should always be treated as the major road. Where the minor road would normally be provided with a vertical GIVE WAY sign (diagram 602), as well as the Give Way road markings (diagrams 1003 and 1023, see paras 3.14 to 3.23), this should be replaced with

a STOP sign (diagram 601.1) and transverse Stop line (diagram 1002.1). The use of the STOP sign requires site approval by the Secretary of State (see para 2.1). At all other junctions with a road carrying a tramway, the minor road should have the transverse Give Way line (diagram 1003), the triangular marking (diagram 1023) and a GIVE WAY sign (diagram 602).

18.14 All transverse markings on roads joining a tram route should be placed outside the swept path of the tramcars (see paras 18.19 to 18.23).

18.15 Where yellow box markings (diagrams 1043 or 1044) are laid at a junction in accordance with the guidance in section 12, the yellow marking should not be laid on the running rails or check rails of the tramway (see also para 18.23).

TRAM STOPS

18.16 On modern tramways, tramcars stop at purpose-built platforms to help passengers to board. These are readily recognisable by other traffic and the raised platform makes it unattractive for other vehicles to park there, so there should be no need for clearway markings of the kind used at bus stops.

18.17 Where a tram stop platform is located on a length of road shared with other traffic, it is sometimes necessary for the raised platform to project into the carriageway to ensure that it is close enough to the tram for passengers to board. The end of the platform facing approaching traffic should be protected by kerbing or surface treatment, or by hatched road markings to diagram 1040.4 (see para 4.54) to guide other traffic away from the end of the platform. Hazard reflectors to diagrams 560 or 561 might also be necessary.

18.18 If the tram stop is in a lay-by or on a short length of road reserved for trams only, the TRAM ONLY variant of diagram 1048.2 (see para 18.6) may be used in conjunction with the sign to diagram 953.1 and the plate 953.2 to discourage other traffic from entering the tram stop area. Where the track leading to the tram stop diverges from the main carriageway at a shallow angle, the techniques described in paras 18.7 to 18.10 should be used.

SWEPT PATH MARKINGS

18.19 Tramcars are significantly wider than the tracks on which they run, and the overhang increases on curves. This "swept path" (which is the developed kinematic envelope plus a safety margin, typically 300 mm) may be indicated by the use of colour, texture or differences in level. It may also be shown using road markings to either diagram 1010 or 1066. The size of the safety margin should be agreed with the Railway Inspectorate. The swept path should be shown where it is not apparent from the carriageway or kerbs. Where there is on-street parking, it is essential that the swept path is visible to ensure that vehicles are not left in a position to obstruct trams.

18.20 Where it is important that drivers of both trams and other vehicles can readily identify the swept path, a marking to diagram 1010 is normally used. Where this might cause confusion to other drivers, e.g. where the track passes through a junction or the tramway diverges from the line of the carriageway, the marking to diagram 1066 may be used. The row of dots formed by this marking will be clear to tram drivers, but will not be readily observed by drivers of other vehicles who view them from a

different angle. These marks should therefore be used where the swept path needs to be seen by tram drivers only.

18.21 The markings to diagram 1010 or 1066 should be laid along the edge of the swept path. The former marking should be 150 mm wide, whilst the marks to diagram 1066 should be between 55 mm and 100 mm in diameter and placed at 1.5 m centres, although a spacing of up to 2.5 m is permitted where necessary to avoid conflicting with other markings.

18.22 Where trams run together with other traffic on a two-way road, the centre line marking should be centrally located between the two swept paths. Where these are closely adjacent to each other, the marks next to the centre line should be omitted.

18.23 Where a tramway passes through a yellow box marking, the swept path should be indicated as shown in figure 18-4. The yellow markings should be terminated on either side of the swept path with a 200 mm wide boundary line. In these circumstances, the swept path is for the guidance of tram drivers only, so it is not necessary to continue the marking to diagram 1010 through the box.

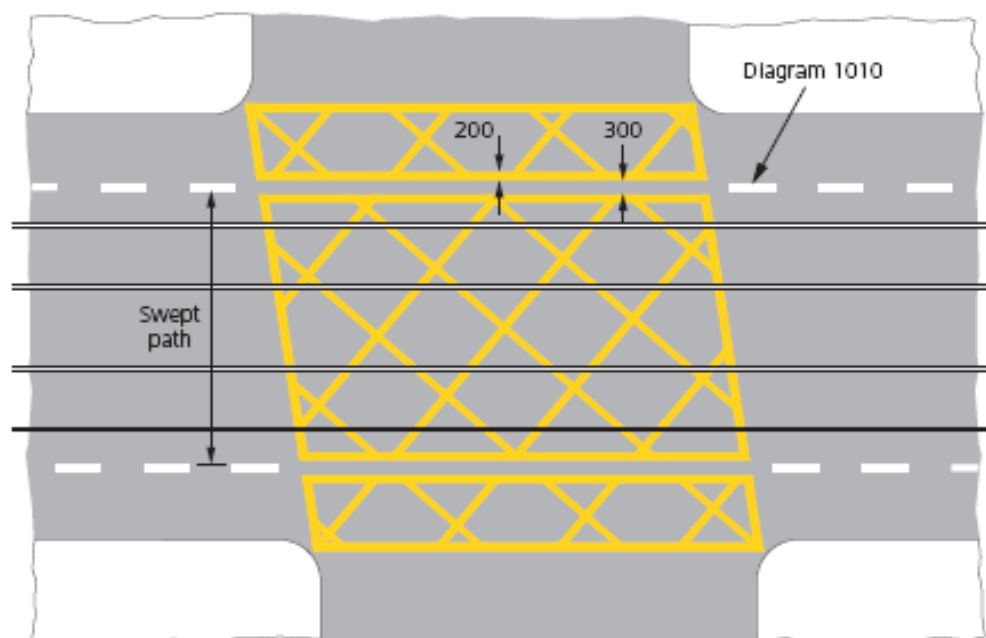


Figure 18-4