

# Section 11

## Network Capability

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# Introduction

The capability of the network determines the speed and type of trains that can operate. Capability is defined as a function of the assets as well as operating instructions used to ensure safety. It is described by the following measures, which are detailed in the maps and tables below.

- **Linespeed:** the maximum speed that at which it is safe for trains to travel.
- **Loading gauge:** the maximum dimensions of vehicles and load that routes can carry, as determined by the clearances to structures and passing trains.
- **Axle Load:** the maximum axle load that the route can carry, as determined by the strength of underline bridges.
- **Electrification:** the extent of the network for electrically hauled trains.

We have also added a map to show a broad classification routes according to traffic. This classification will provide a framework for the development of appropriate asset stewardship regimes.

A map showing capacity utilisation is included in section 1 of the route plans.

The Rail Regulator's target for network capability measures is for no functionality reduction, against 1 April 2001, subject to contractual and safety procedures such as network change.

Our maintenance and renewal activities are expected to maintain the capability of the network. Enhancements may result in increased capability. Also, there are circumstances where we can legitimately make permanent reductions in capability, but only by complying with contractual and safety procedures.

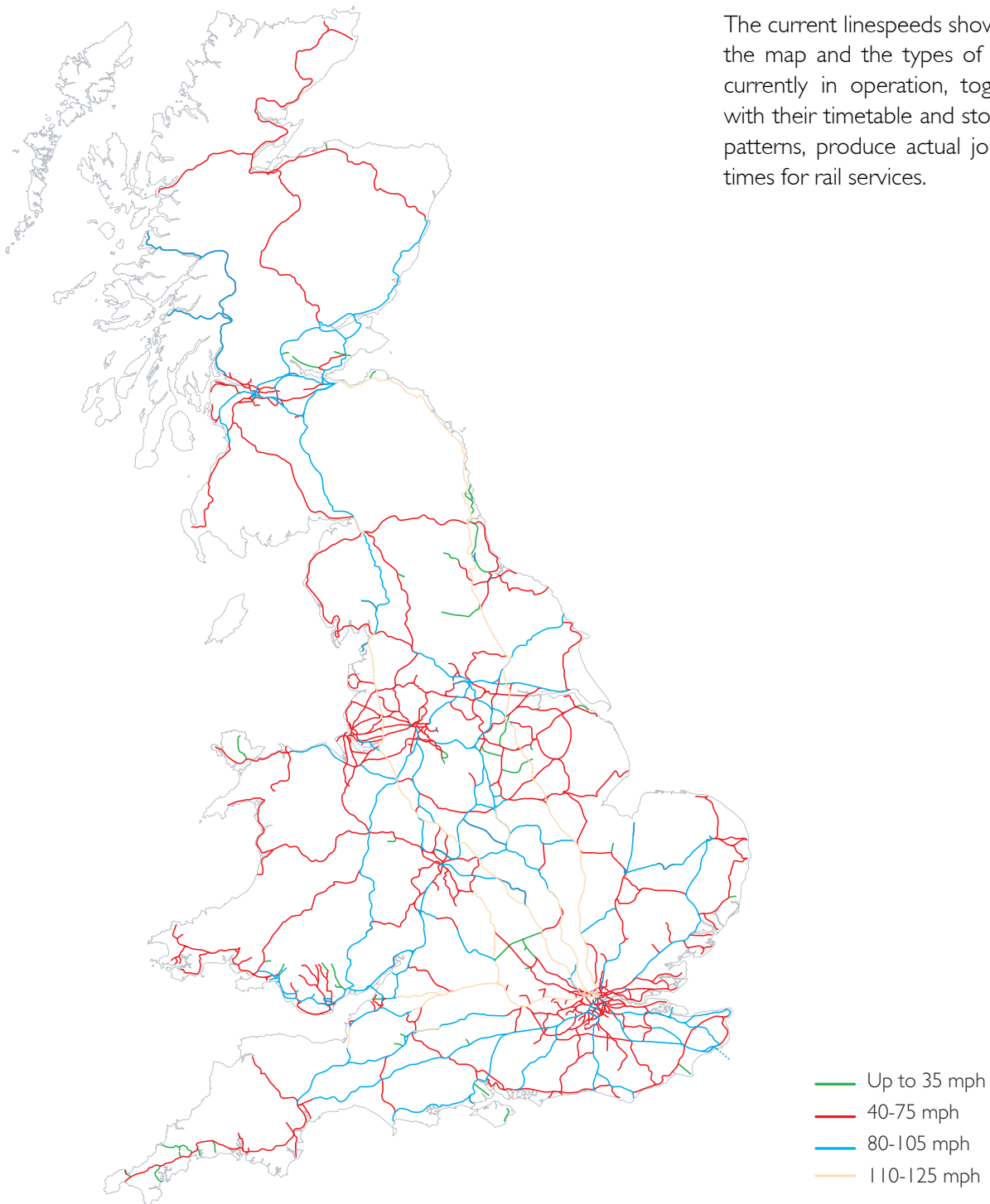
Enhancement projects have been classified into the following categories, as described in section 1 of the route plans:

- A. Enhancement schemes, where an implementation and funding agreement has been concluded with the SRA or others;
- B. Enhancement schemes, where a funding agreement for the development phase only has been concluded with the SRA or others;
- C. Safety enhancement schemes, for which a funding agreement may not have yet been concluded;
- D. Other enhancement schemes, for which no agreement or commitment has yet been concluded.

The capability tables in this section show forecast capability changes for the next 3 years, resulting from those schemes that are currently committed to implementation (category A above), and from those that we agreed with SRA should be assumed for the purpose of this business plan (category B above).

# Linespeeds

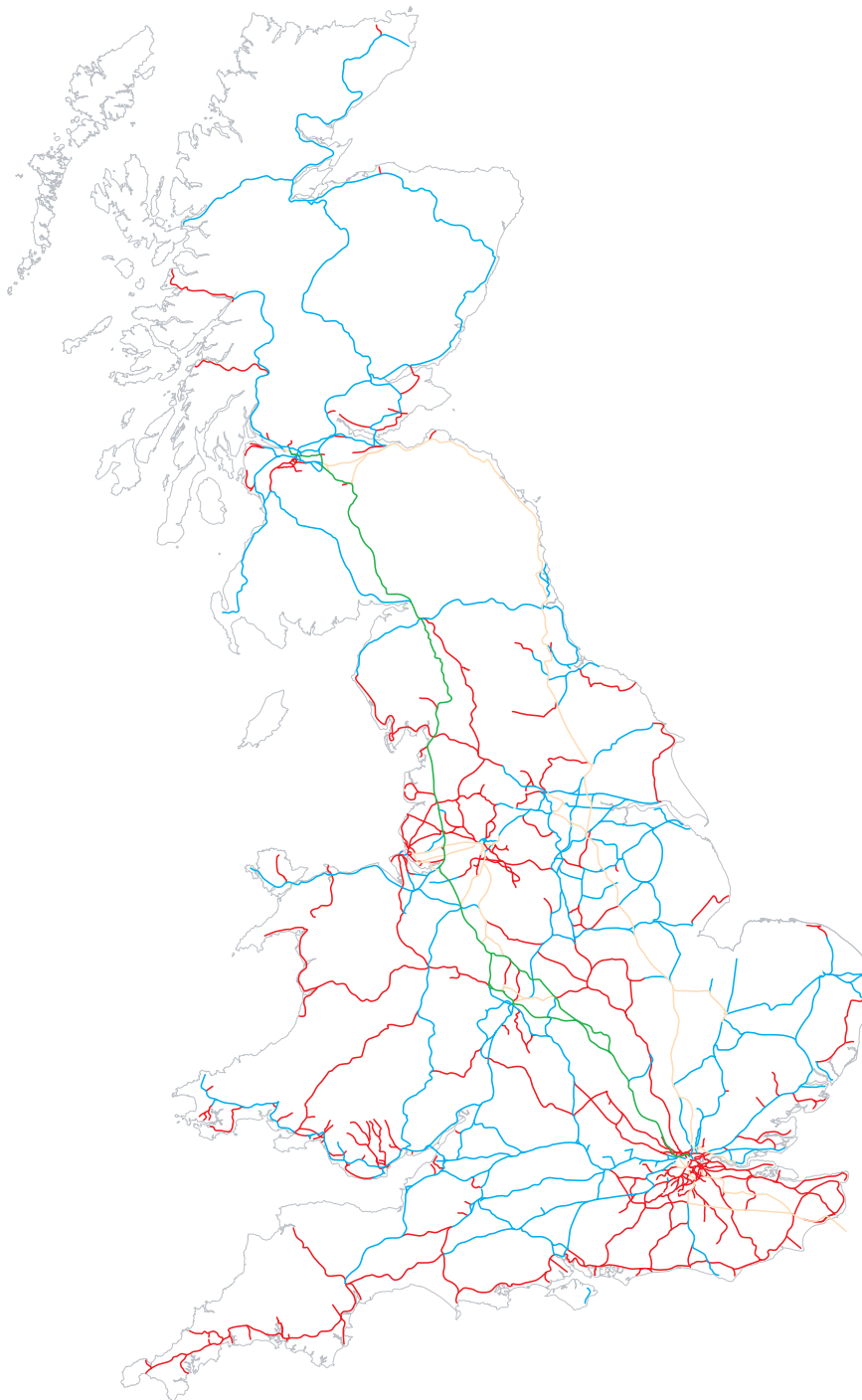
The current linespeeds shown on the map and the types of trains currently in operation, together with their timetable and stopping patterns, produce actual journey times for rail services.



<b>Figure 11.1 Line speeds (km of track in each speed band)</b>			
<b>Line speed</b>	<b>1 April 2003</b>	<b>1 April 2004</b>	<b>1 April 2005*</b>
km of track up to 35mph	3502	3502	3502
km of track 40-75mph	17189	17188	17090
km of track 80-105mph	7422	7422	6878
km of track 110-125mph	2647	2647	3276
<b>Total</b>	<b>30777</b>	<b>30777</b>	<b>30764</b>

\* Changes are due to WCRM (route 1), Probus Burngullow redoubling (route 4), and transfer of Oldham Loop to Metrolink (route 33).

# Loading Gauge



Loading gauge stipulates the maximum height, length and width of a vehicle that can travel on the network. The size varies by route, primarily because of bridge and tunnel clearances.

All passenger-carrying vehicles are constructed to a similar height and width, although their length can vary, most carriages are usually between 20m and 23m long.

Generally, there are few restrictions on passenger vehicles, but for freight vehicles, the capability of the network in ascending order of size is shown on the map.



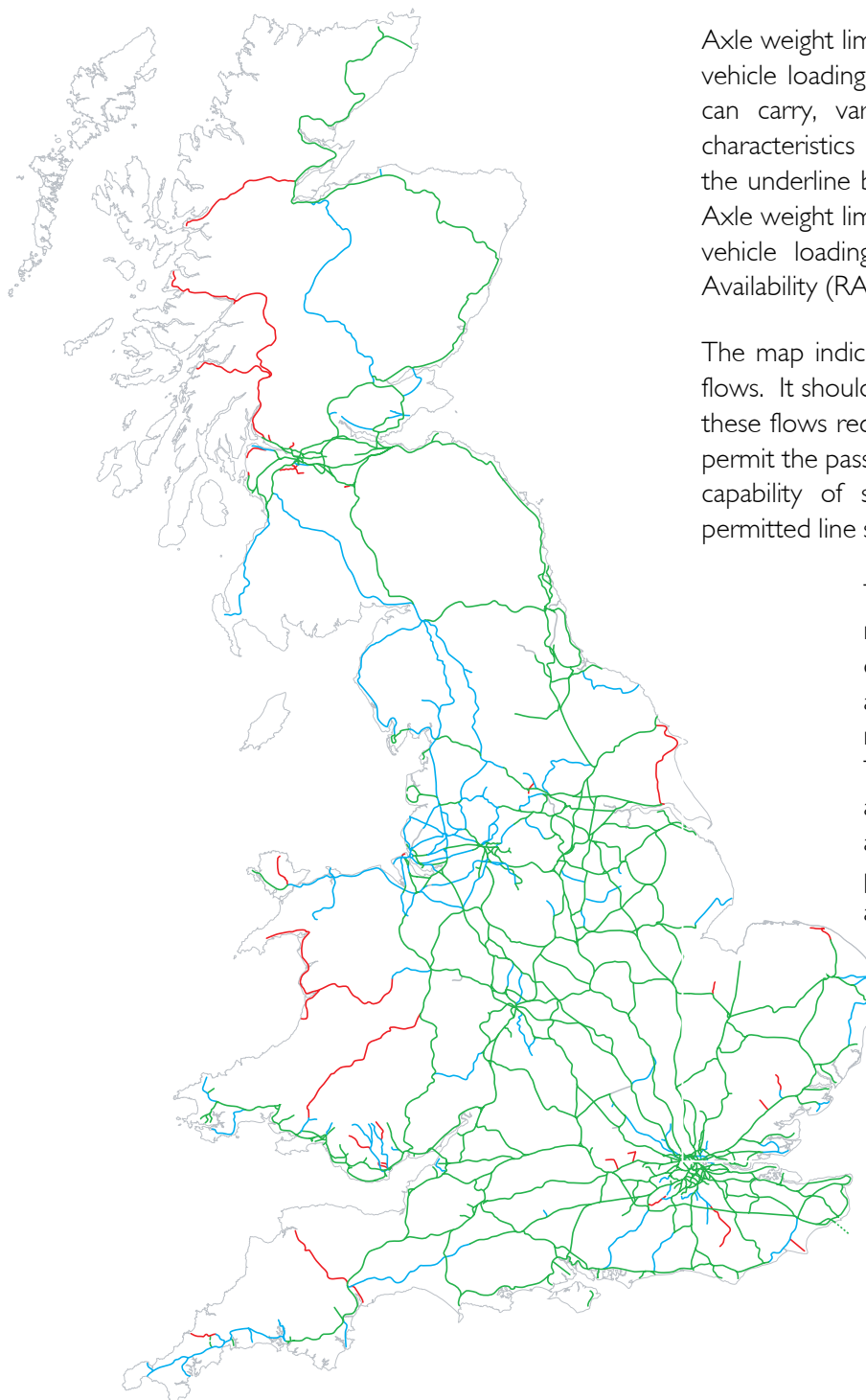
**Figure 11.2 Loading gauge (km of route by loading gauge)**

Loading gauge	1 April 2003	1 April 2004	1 April 2005
km of route W6A <sup>1</sup>	16522	16522	16503
km of route W7	13097	13097	13097
km of route W8	10476	10467	10467
km of route W9	2338	2338	2338
km of route W10	800	800	1025

<sup>1</sup> This is the standard gauge for freight vehicles

<sup>2</sup> Changes are due to WCRM (route 1) and transfer of Oldham Loop to Metrolink (route 33),

## Axle Weights



Axle weight limits and equivalent distributed vehicle loadings which the current network can carry, vary according to engineering characteristics of each route, particularly of the underline bridge and viaduct structures. Axle weight limits and equivalent distributed vehicle loadings are classified into Route Availability (RA) values between 1 and 10.

The map indicates current permitted traffic flows. It should be noted that in some cases these flows require operating restrictions to permit the passage of traffic heavier than the capability of structures at the maximum permitted line speed for the route.

The capability of track on a route to carry traffic is dependent on its construction and the maintenance and renewal regime in place. There are some routes where an increase in traffic can be accommodated only with a prior increase in maintenance and renewal activity.

- Up to RA 6
- RA 7-9
- RA 10
- Unclassified/ routes currently not in use

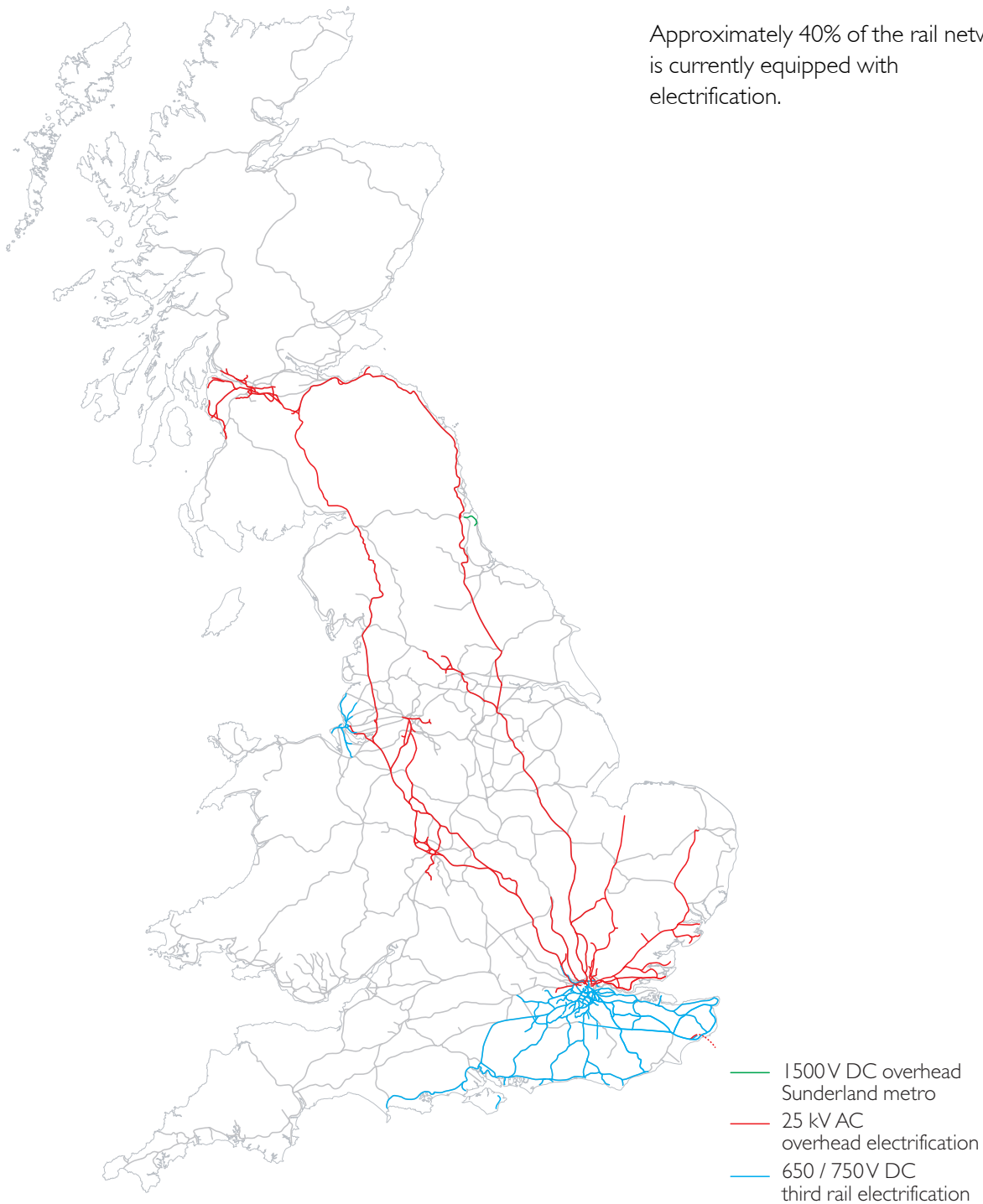
**Figure 11.3 Permitted axle weights (km of track by axle weight band)**

Axle weights	1 April 2003	1 April 2004	1 April 2005
km of track up to 20.3 tonnes (RA1-6)	2725	2725	2725
km of track 20.4–24.1 tonnes (RA 7-9)	14886	14886	14863
km of track 24.2–25.4 tonnes (RA10)	13166	13166	13175
<b>Total</b>	<b>30777</b>	<b>30777</b>	<b>30764</b>

The change is due to the transfer of Oldham Loop to Metrolink (route 33),

# Electrification

Approximately 40% of the rail network is currently equipped with electrification.

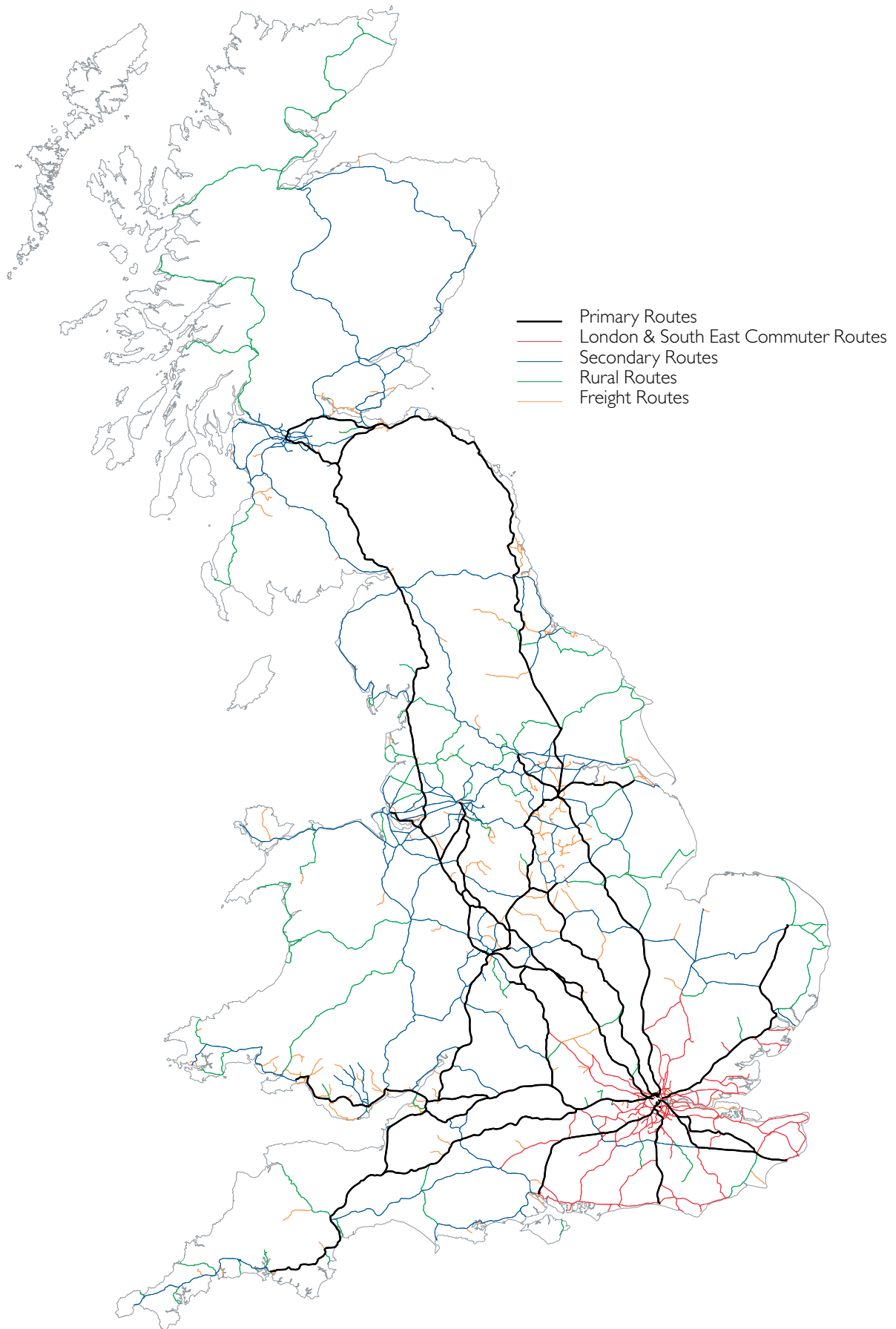


- 1500V DC overhead  
Sunderland metro
- 25 kV AC  
overhead electrification
- 650 / 750V DC  
third rail electrification

Figure 11.4 Electrification (km of electrified track)			
Electrification	1 April 2003	1 April 2004	1 April 2005
km of 25kV AC overhead line	7578	7587	7587
km of 650/750V DC third rail	4285	4285	4285
km of 1500V DC overhead line	28	28	28

The change is due to Crewe - Kidsgrove electrification (route 31).

# Classification of Routes



All routes on the network have been classified as Primary, London and South East, Secondary, Rural, or Freight Only. The criteria for classification are that routes have the following similarities:

- Traffic (mix, type, tonnage);
- Track construction (component types);
- Business value (track access, performance costs etc.);
- Output measure requirements (geometry, broken rails, TSRs etc.); and
- Maintenance and renewal regime requirements (driven by above criteria).

These classifications aid the development and application of appropriate track engineering stewardship regimes on each group of routes, across the network.