

## VI - Selection of trunk routes

As a prelude to the selection of trunk routes to carry the expected traffic flows, the flows of various forms of traffic were converted into trainloads, so as to establish the rail route capacity necessary to handle them. This information is shown in matrix form in Appendix 'D', which gives particulars of the daily number of trunk trainloads likely to require movement between the traffic centres.

The forecast demand for route capacity was then considered in relation to the potential capacity of the existing through routes, shown in Map 1, in order that the routes which could best provide the required capacity might be chosen. For this purpose, it was necessary to consider the individual characteristics and physical condition of routes in detail, particularly where a choice between alternatives had to be made.

The process of selection involved consideration of the following factors:—

- (i) the extent to which existing routes coincide with the principal traffic flows of the future,
- (ii) the comparison of the workable capacity of the alternative routes with the number and type of trains expected to arise from the future area to area flows,
- (iii) the service of important intermediate centres,
- (iv) recent expenditure on route modernisation, such as track improvement, electrification and resignalling projects,
- (v) the necessity for large items of future expenditure on trunk routes,
- (vi) physical characteristics of the routes: the incidence of bridges, tunnels, viaducts, of ruling gradients, and features likely to restrict speeds permanently,
- (vii) 'network' considerations: the way in which routes selected fit into the future railway trunk network,
- (viii) the extent to which changes in the trunk system may result in greater lengths of haul.

The table of area to area flows of trainloads (Appendix 'D') shows that substantial movements are expected to occur between London and Scotland, London and Manchester/Liverpool, London and Birmingham, as well as movements between the Manchester/Liverpool area and Scotland. The demand for trunk trainload movement amounts to about 240 trains per day in each direction at the southern end near London, decreasing to about 130 trains on the section north of the border.

As will be seen from Map 2, a number of possible routes exist. In the case of traffic from London to Glasgow, three through routes are available:—

- (a) the East Coast route passing through Peterborough, York, Newcastle and Berwick,
- (b) the Midland route passing through Leicester, Leeds and Carlisle,
- (c) the West Coast route passing through (or close to) Birmingham, Liverpool/Manchester, Preston and Carlisle.

For traffic between London and Manchester/Liverpool three possible through routes are available:—

- (a) the Great Central route passing through Leicester, Nottingham and Sheffield,
- (b) the West Coast route passing through Rugby and Crewe,
- (c) the Midland route passing through Leicester, Derby and the Peak Forest line.

Traffic between London and Birmingham has the choice of two existing trunk routes, namely:—

- (a) the former Great Western route via High Wycombe and Banbury,
- (b) the West Coast route as far as Rugby, then branching to Birmingham, Wolverhampton and serving the West Midlands area.

In considering the above groups of 'trainload flows' it was clearly sensible to select the West Coast route as it is able to fulfil the needs of the trunk flows between all the centres discussed. It is also able to cater for the needs of flows from the Manchester/Liverpool area and Scotland. This route connects the five largest cities of the country, London, Birmingham, Liverpool, Manchester and Glasgow, and also gives access to 'the Potteries', the West Midlands, and Lancashire. The southern section of this route (hereinafter referred to as the West Coast route) is in the process of being electrified between London and Manchester/Liverpool, and will soon be at a point of high operating efficiency. It is sensible, therefore, to select this route as it offers such good scope for the concentration of through traffic over it.

Another flow of traffic which stands out is that passing from London, through the main areas, East Midlands and South Yorkshire, on to the Tyne and Tees area. The daily number of trunk train movements expected will be in excess of 100 at the southern end, with rather less north of York.

In this case Map 2 demonstrates that a choice of four existing routes are available. The routes are:—

- (a) the East Coast route described above,
- (b) the line which passes through Cambridge, March, Spalding and Lincoln, joining the East Coast route at Doncaster,
- (c) the Midland line passing through Leicester and Nottingham,
- (d) the Great Central line described earlier.

The route selected to cater for the traffic flows in this group is the East Coast route. It serves Sheffield and the West Riding, as well as providing direct through links with the important industrial areas of Tees-side and Tyneside. Also, connecting links exist between this trunk route and Nottingham (via Grantham), the steel producing area of North Lincolnshire, and the Humber ports. It is a fast route with opportunity for a profitable passenger business in the middle-distance range. Scope exists for channelling on to this route freight traffic now passing to the South via the Doncaster—Cambridge—London line, and some from the Midland route. It is needed to serve as a route between London and Newcastle, whilst connecting many of the traffic centres not served by the West Coast route. The data of

area to area movement of trainloads of traffic indicate that the route would be less heavily used North of Newcastle, and that through movements to and from Scotland could be provided for by development of the Newcastle—Carlisle line.

The matrix of area to area flows in trunk trainloads (Appendix 'D') shows substantial future movements between Leeds, Sheffield, Nottingham, Leicester and London. Between Sheffield and Chesterfield the route is expected to carry some 130 trunk trains daily each way. The number of services continuing South from Chesterfield towards Leicester will be of the order of 80 trunk trains per day each way.

These centres represent the heavy industrial belt in the centre of the country, and routes available to cater for this traffic are:—

- (a) the Midland route passing through Sheffield, Nottingham and Leicester,
- (b) the Great Central route from Sheffield through Nottingham and Leicester.

The route best equipped to meet the demands is the Midland route, and it is selected as a route for development between Sheffield and Leicester. At the Northern end, the route selected between Leeds and Sheffield is that from Leeds to Moorthorpe and thence from Moorthorpe via the 'Swinton and Knottingley' route into Sheffield. The first part of this route is selected, in any event, as a link between the West Riding and the East Coast route. At the Southern end, the centre section of the Midland route selected for development is connected to the West Coast electrified route at Nuneaton, with the object of achieving a concentration of the available trunk trainloads on that route.

Trunk trainload movement between the London area and the traffic centres in South Wales and the South West is expected to give rise to some 80 trunk trains per day each way.

A number of routes is available to cater for this demand:—

- (a) the route via Reading and Swindon dividing at Wootton Bassett to serve:—
  - (i) South Wales via the Severn Tunnel,
  - (ii) Bristol via Bath,
- (b) the route passing through Reading, Newbury and Westbury to Taunton and Exeter,
- (c) the route passing through Basingstoke, Salisbury and Yeovil to Exeter.

The anticipated demand, plus consideration of intermediate centers located on each of the routes described, points to the need to select one route for development. The route via Reading, capable of serving South Wales and the South West (via Bristol and Taunton) provides the best means by which the principal traffic flows can be concentrated whilst, at the same time, connecting all the main centres involved.

The table of area to area movement of trainloads indicates the need to select a route for development which joins the North East and the South West of the country. This movement reaches a peak of about 130 trunk trainload movements per day in the section between Derby and Birmingham.

As illustrated on Maps 1 and 2, a number of possible routes exist. These are:—

- (a) the route passing through Leeds, Sheffield, Derby, Burton, Birmingham and Gloucester, at which point diverging lines continue into South Wales and to the West Country via Bristol and Exeter,
- (b) the route passing from Leeds via Manchester and thence South via Crewe, Shrewsbury, Hereford and Pontypool Road into South Wales,
- (c) the alternative route between Birmingham and Gloucester which passes through Stratford-on-Avon and Honeybourne, joining route (a) again at Gloucester.

Route (a) is selected in this case. Between Leeds and Chesterfield it is common with the route between Leeds and Leicester described above, and already selected. By its selection the industrial centres in the North East and the West Riding are joined with the Black Country, South Wales, and the South West, in the most direct fashion. All the principal centres of population and industry on the N.E.-S.W. axis of the country are thus served by one route. At different stages, good possibilities exist for the concentration of through traffic flows at present passing on other routes. For example between the South West and Birmingham, the through movement over the routes:—

- (a) via Barnt Green
- (b) via Honeybourne
- (c) via Worcester and Hereford

can be concentrated with advantage on the route selected. Technical improvements, in power, rolling stock and signalling, combine to reduce the restrictive effect of the Lickey incline south of Birmingham, which today inhibits the loading of the route.

The forecast of train movements from East to West across the industrial middle of the country reveals how substantial these movements are expected to be—amounting to some 160 trunk trainloads daily.

Five main routes cross the Central Pennines today:—

- (a) from Leeds to Manchester via Hebden Bridge,
- (b) from Leeds to Manchester via Diggle,
- (c) from Sheffield to Manchester via Woodhead,
- (d) from Sheffield to Manchester via the Hope Valley,
- (e) from Derby to Manchester via Peak Forest.

The demand for trunk trainload movement each way is expected to be approximately equal to the future workable capacity of one trans-Pennine route. Nevertheless, because of the shortness of the trunk haul relative to the size of the catchment areas at each end, adoption of one route only would necessitate considerable extra train mileage. For that reason it is prudent to select two routes for long term development.

The routes selected are:—

- (a) the electrified route between Sheffield and Manchester, passing through Penistone and Woodhead, over which dense flows of freight can be achieved by diverting traffic from alternative routes and by reducing the number of speed bands in which trains operate over it. The route is well sited to cater for most of the flows from the Yorkshire and East Midlands coalfields into Lancashire. The route also gives a good connection to the Liverpool area;
- (b) the route via Hebden Bridge passing through Bradford, Halifax, Sowerby Bridge and Rochdale, is able to carry the flows from the east side of the Pennines to the North Manchester area and Lancashire, and also provide a through link between the West Riding and the main Anglo-Scottish West Coast route at Preston.

The data of area to area flows indicate the need for through trunk routes between the Humber and the Mersey. At the eastern end, scope exists for concentrating flows between the centres of South Yorkshire and the Humber, viz. traffic flowing east to Hull, Immingham and North Lincolnshire. At the western end, through flows between Manchester and Liverpool call for the selection of one or two routes on which trunk traffic might be concentrated instead of perpetuating the five through trunk routes which exist today. In this, as in all cases, it is necessary to consider the way in which the selected routes fit into the trunk system as a whole. It will be seen (from Map 21) that the trans-Pennine routes selected for development are entirely compatible with the provision of throughout Humber-Mersey trunk routes.

Development in the Hampshire area, the expansion of the port of Southampton, and oil refining developments on the Solent, require the selection of a direct route to the Midlands. The route selected follows the line to Basingstoke, thence via Reading and Didcot to Birmingham. The northern part of this route will form part of the link between the Channel Tunnel Terminal and the Midlands, which will be used to by-pass the London area.

The selection of the West Coast line as the main Anglo-Scottish route permits Glasgow, Perth, Stirling, Edinburgh, Dundee and Aberdeen to be served by one route, thus permitting the maximum concentration of Scottish traffic from the south.

Within Scotland, there is a clear need for one route to be developed between Edinburgh and Glasgow. The route via Falkirk and Polmont is selected for development and will permit the concentration of through traffic now passing over three routes.

The foregoing paragraphs have outlined briefly the main cases in which selection had to be made between alternatives. In Appendix 'A', to exemplify the nature of the processes of choice which were followed in all cases, three areas are dealt with in greater detail. The areas are:—

- (i) trans-Pennine routes,
- (ii) routes between Manchester and Liverpool,
- (iii) routes between Birmingham and the South West.

The object of this appendix is to give an indication of the detailed work undertaken during the process of selection and to illustrate the depth of the survey. From the broad description above it will be gathered that some of the selections were simpler to make than others and involved less back-ground work. Nevertheless, in each case, the investigations were carried to a depth sufficient to establish the conclusions beyond reasonable doubt.

The result of the survey was the selection of some 3,000 route miles. The routes are shown on Map 21, and, when developed, they will be capable of handling the freight and passenger traffic flows between main centers forecast for 1984, with a margin of spare capacity which varies from route to route but which is, in no case, less than 25% of the capacity provided. It is of interest to note that the estimated overall effect of cutting out duplicate routes would be to increase total trunk train mileage by only about 3%.

The conclusion with regard to the adequacy of the capacity provided was established, as mentioned above, by assessing the train movements necessary to carry the 1984 flows of various forms of traffic, and then comparing the total train movement requirements to cover each combined flow, with the assessed capacity of the route selected. In the process of assessment, the general factors referred to in a previous section of the report were considered in relation to the individual characteristics of the particular route. The forecast trunk train flow densities over the selected routes in 1984 is shown on Map 22.

The route selections which comprise the trunk network have been made with particular regard to the flows of imports and exports between inland industrial centres and the ports. The provisions made for trunk connections to the Channel Tunnel development, the Port of London, the Mersey ports, the Humber ports, the South Wales ports, the North East ports, as well as to the docks at Southampton and the Scottish ports, are made evident by Map 21.

Checks were also made to confirm that the selected routes gave a good network of connection between such features as:—

- (i) main centres of population,
- (ii) large collieries,
- (iii) principal iron and steel works,
- (iv) electricity generating stations,
- (v) oil refining/distributing centres.

The close agreement between the selected network of trunk routes and the particular features mentioned is shown pictorially in Maps 23 to 27.