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TERMINAL ACCESS TIMES IN NORTH-WEST ENGLAND

by

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ABSTRACT

An exercise was carried out on access times by rail and road links to mainline railway terminals in North-West England. The average rail journey time to London was calculated by two methods. Firstly, it was assumed that all trips were made via a single centre, and secondly, the region was divided into 4 or 8 zones, each with its own railhead. The conclusion was that using a single centre over-estimates the journey time, but the average time with a small number of centres tends to agree with the average times to the railheads.

1. INTRODUCTION

The OECD Action 33 study team carried out an exercise[1] on terminal access times in the Rhone-Alpes region of France, to determine whether journeys between the region and Paris could satisfactorily be assumed to pass through the nodal town of the region (Lyon), and concluded that this could not be done.

We have carried out a similar exercise, using one of the regions of Britain selected for the Action 33 study. North-West England was chosen, for a number of reasons; it is an economically important region, it contains a mixture of industrial and agricultural land uses, it is well served by public transport, and it contains two large conurbations (Manchester and Liverpool) but is not dominated by either (as South-East England is by London). The main transport routes (by rail and road) do not pass through either of the conurbations but go between them, through Warrington and Preston in the middle of the region. Thus a traveller to London from the region would not normally travel via Manchester or Liverpool unless he lived in the conurbations themselves. At first sight, therefore, it does not look as though a single acceptable centre could be chosen for the region.

2. METHOD

We have calculated an average rail journey time from the region to London by two methods. Firstly we assume that travellers go to the nearest railhead (i.e., the nearest town with a direct train service to London) and travel to London by rail from there. There are eight railheads in the region, namely Manchester, Liverpool, Crewe, Stockport, Preston, Warrington, Lancaster and Carnforth. This assumption should give a good approximation to the journeys which people actually make. Secondly, we assume that all journeys are made via a single centre, which is taken to be Manchester; this should show the effect of choosing one nodal city. In each case the access time to the terminal (railhead or Manchester) by car and by local rail services was estimated. For car journeys we assumed an average speed of 25 mile/h (40 km/h), and for rail journeys we took the time from published timetables[2] and added 30 mins to allow for the journey from home to the local station.

The region was divided into 26 districts which were roughly the areas of influence of the major towns (see Fig 1). The population of each district was obtained from the 1971 Census[3] by adding the populations of each local authority area within the district. The railway journey time between London and the major town in each district was obtained from the ABC Rail Guide[4] which gave the total time including connections, if any, and also indicated the appropriate railhead where there was no direct London service. The details are given in Tables 1 and 2.

3. RESULTS

An average journey time to London (weighted by the population in each district) was calculated, using the times for journeys via the nearest railhead and via Manchester; this was done for both local rail and car access journeys. The following average times were obtained:-

Using local rail to nearest railhead:	3 h. 43 min
Using local rail to Manchester:	4 h. 24 min
Using car to nearest railhead:	3 h. 12 min
Using car to Manchester:	3 h. 50 min

Therefore, if we assume that all trips go via a single centre (Manchester), the average journey time is over-estimated by about 40 mins or (roughly) 25%. This difference is similar to the result obtained in the Rhone-Alpes region, although the latter region is appreciably larger (see Fig. 2), but it is perhaps not so bad as might be expected from the distribution of population and transport in North-West England.

Because the use of 1 centre over-estimates access times, a further calculation was made. The region was divided into 4 sub-zones with centres at Preston, Manchester, Liverpool and Crewe, and a new average journey time to London was calculated by assuming that travellers went to the nearest sub-zone centre by car (again with an average speed of 40 km/h). The details are shown in Table 3. This gives the following result:-

Using car to sub-zone centre, average time to London = 3 h. 12 min.

This agrees well with the average time using car to the nearest railhead, and suggests that in this case it is acceptable to divide the region into four sub-zones instead of the eight which would be required if all the railheads were used.

4. CONCLUSION

The conclusion from this study, therefore, is that it is not sufficient to use a single centre for the region, but a small number of centres may be sufficient and it is probably not necessary to represent all the transport facilities in a model.

5. ACKNOWLEDGEMENTS

The work described in this Report was carried out in the Advanced Systems Division (Leader: Dr. M H L Waters) of the Transport Systems Department of the Transport and Road Research Laboratory.

6. REFERENCES

1. Data regarding accessibility to mainline termini inside study zones. OECD Paper DAS/BTV/73.17. (Oct. 1973, English translation).

2. British Rail Passenger Timetable: London-Midland Region 1973.

3. Census 1971 (England and Wales) Preliminary Report. Office of Population Censuses and Surveys (HMSO, 1971).

4. ABC Rail Guide (December 1971).

TABLE 1

North-West England Area. (Population from 1971 Census)
Access to railhead and to Manchester by local rail service

District		Centre	Pop	Dist. (miles)	Travel time to London	Via	Access time	Access time to (hrs) Manchester
Southport		Southport	237	211	3.49	Wigan	0.82	0.82
Manchester	a	Wigan	328	194	3.18		0.88	0.88
	b	Bolton	261	194	4.02	Manchester	1.33	1.33
	c	Bury	177	193	3.58	Manchester	0.90	0.90
	d	Rochdale	203	194	4.03	Manchester	1.35	1.35
	e	Salford	279	184	3.18		0.50	0.50
	f	Manchester	541	184	3.18		0.50	0.50
	g	Oldham	203	189	3.48	Manchester	0.80	0.50
	h	Altrincham	216	192	3.68	Manchester	1.00	1.00
	j	Stockport	291	178	3.05		0.50	0.50
	k	Hyde	220	182	3.52	Manchester	0.83	0.83
Merseyside	a	Bootle	155	197	3.75	Liverpool	0.60	1.38
	b	Liverpool	607	194	3.65		0.50	1.23
	c	St. Helens	149	204	3.98	Liverpool	0.83	1.23
	d	Kirkby	244	201	3.98	Liverpool	0.83	1.38
	e	Birkenhead	355	193	4.38	Crewe	2.32	1.37
Warrington		Warrington	266	182	3.30		0.50	0.87
Chester		Chester	176	179	3.32	Crewe	1.23	1.55
Cheshire		Crewe	421	158	2.57		0.50	1.10
Derbyshire		Buxton	79	197	4.17	Stockport	1.63	1.48
Fylde		Blackpool	289	227	5.02	Preston	2.03	1.65
Mid Lancashire		Preston	328	209	3.48		0.50	1.20
Blackburn		Blackburn	245	208	5.25	Preston	2.27	1.42
East Lancashire		Burnley	212	212	4.77	Preston	1.78	1.42
North Lancashire		Lancaster	146	230	3.55		0.50	1.72
Furness		Barrow	107	265	6.18	Carnforth	0.50	3.02

Total population = 6735

Total hours x population = 24173

Average time to London = 3.720 h
= 3 h. 43 min

Average time to London via Manchester = 4 h. 24 min

TABLE 2

North-West England Area. (Populations from 1971 Census)
Access to railhead and to Manchester by car

District		Centre	Pop	Dist. (miles)	Travel time to London	Via	Access time	Access time to (hrs) Manchester
Southport		Southport	237	211	3.49	Wigan	0.52	1.17
Manchester	a	Wigan	328	194	2.93		0.25	0.68
	b	Bolton	261	194	3.20	Manchester	0.52	0.52
	c	Bury	177	193	3.08	Manchester	0.40	0.40
	d	Rochdale	203	194	3.08	Manchester	0.40	0.40
	e	Salford	279	184	2.93		0.25	0.25
	f	Manchester	541	184	2.93		0.25	0.25
	g	Oldham	203	189	2.93	Manchester	0.28	0.28
	h	Altrincham	216	192	2.93	Manchester	0.25	0.25
	j	Stockport	291	178	2.93		0.25	0.28
	k	Hyde	220	182	2.97	Manchester	0.28	0.28
Merseyside	a	Bootle	155	197	3.40	Liverpool	0.25	1.33
	b	Liverpool	607	194	3.40		0.25	1.20
	c	St. Helens	149	204	3.52	Liverpool	0.37	0.83
	d	Kirkby	244	201	3.40	Liverpool	0.25	1.00
	e	Birkenhead	355	193	3.43	Crewe	0.28	1.50
Warrington		Warrington	266	182	3.05		0.25	0.72
Chester		Chester	176	179	2.97	Crewe	0.88	1.33
Cheshire		Crewe	421	158	2.40		0.33	1.17
Derbyshire		Buxton	79	197	3.07	Stockport	0.52	0.67
Fylde		Blackpool	289	227	3.55	Preston	0.57	1.67
Mid Lancashire		Preston	328	209	3.25		0.25	1.17
Blackburn		Blackburn	245	208	3.47	Preston	0.48	0.83
East Lancashire		Burnley	212	212	3.82	Preston	0.83	0.92
North Lancashire		Lancaster	146	230	3.30		0.25	1.88
Furness		Barrow	107	265	6.65	Carnforth	0.80	2.43

Total population = 6735

Total hours x population = 21242

Average time to London = 3.20 h
= 3 h. 12 min

Average time to London via Manchester = 3 h. 50 min

TABLE 3

North-West England Area. (Populations from 1971 Census)
Access to sub-zone centre by car

District		Centre	Pop	Dist. (miles)	Travel time to London	Sub-zone centre	Access time (h)
Southport		Southport	237	211	3.60	Preston	0.60
Manchester	a	Wigan	328	194	3.36		0.68
	b	Bolton	261	194	3.20		0.52
	c	Bury	177	193	3.08		0.40
	d	Rochdale	203	194	3.08		0.40
	e	Salford	279	184	2.93	Manchester	0.25
	f	Manchester	541	184	2.93		0.25
	g	Oldham	203	189	2.93		0.28
	h	Altrincham	216	192	2.93		0.25
	j	Stockport	291	178	2.93		0.25
	k	Hyde	220	182	2.97		0.28
Merseyside	a	Bootle	155	197	3.40		0.25
	b	Liverpool	607	194	3.40		0.25
	c	St. Helens	149	204	3.52	Liverpool	0.37
	d	Kirkby	244	201	3.40		0.25
	e	Birkenhead	355	193	3.43		0.28
Warrington		Warrington	266	182	2.87	Crewe	0.80
Chester		Chester	176	179	2.97	Crewe	0.88
Cheshire		Crewe	421	158	2.40	Crewe	0.33
Derbyshire		Buxton	79	197	3.39	Crewe	1.32
Fylde		Blackpool	289	227	3.55	Preston	0.57
Mid Lancashire		Preston	328	209	3.25	Preston	0.25
Blackburn		Blackburn	245	208	3.47	Preston	0.48
East Lancashire		Burnley	212	212	3.82	Preston	0.83
North Lancashire		Lancaster	146	230	3.80	Preston	0.80
Furness		Barrow	107	265	4.60	Preston	1.60

Total population = 6735

Total hours x population = 21642

Average time to London via sub-zone centre = 3.21 h. = 3 h. 12 min

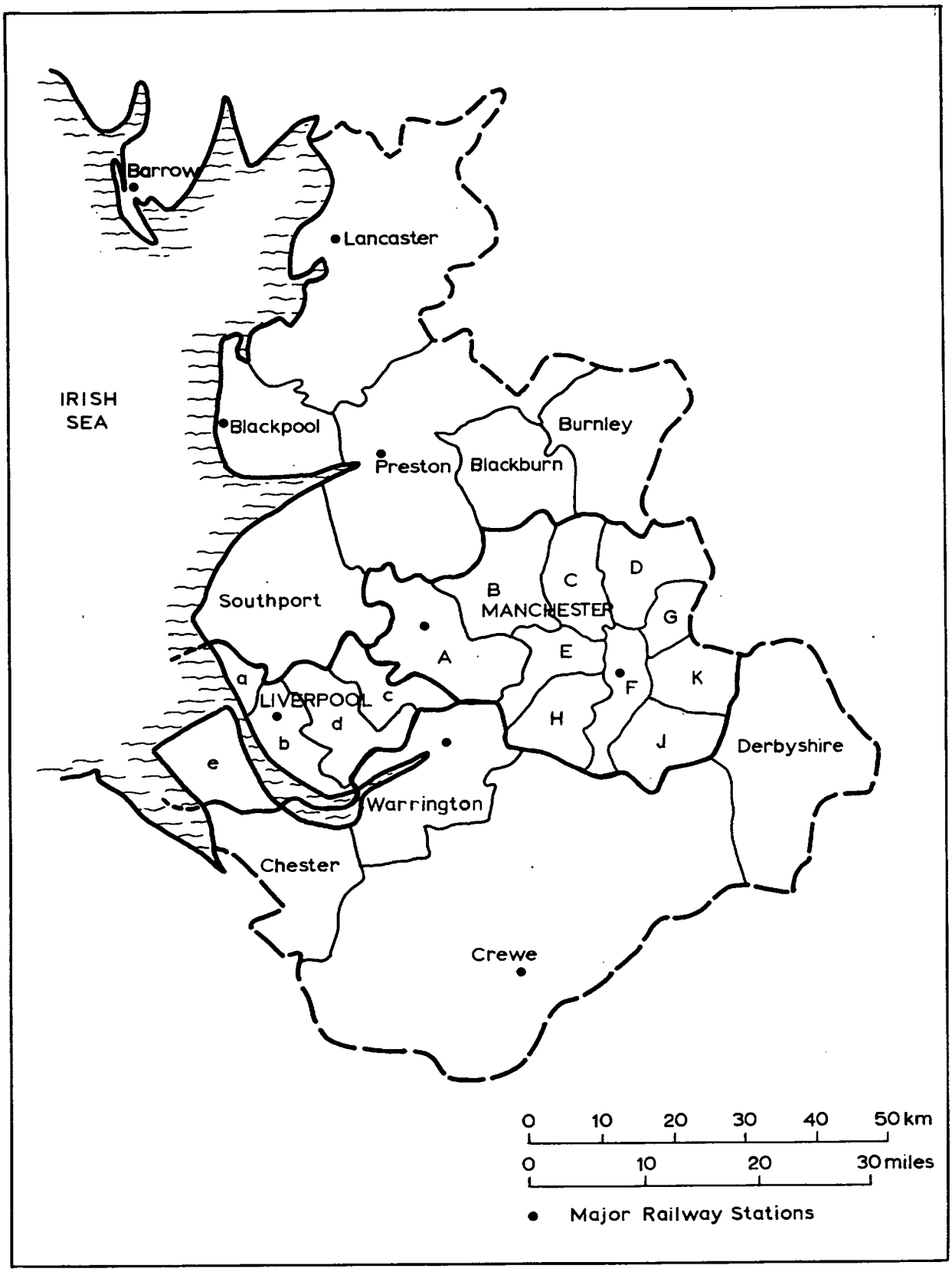

Fig.1 NORTH-WEST ENGLAND SHOWING DISTRICTS

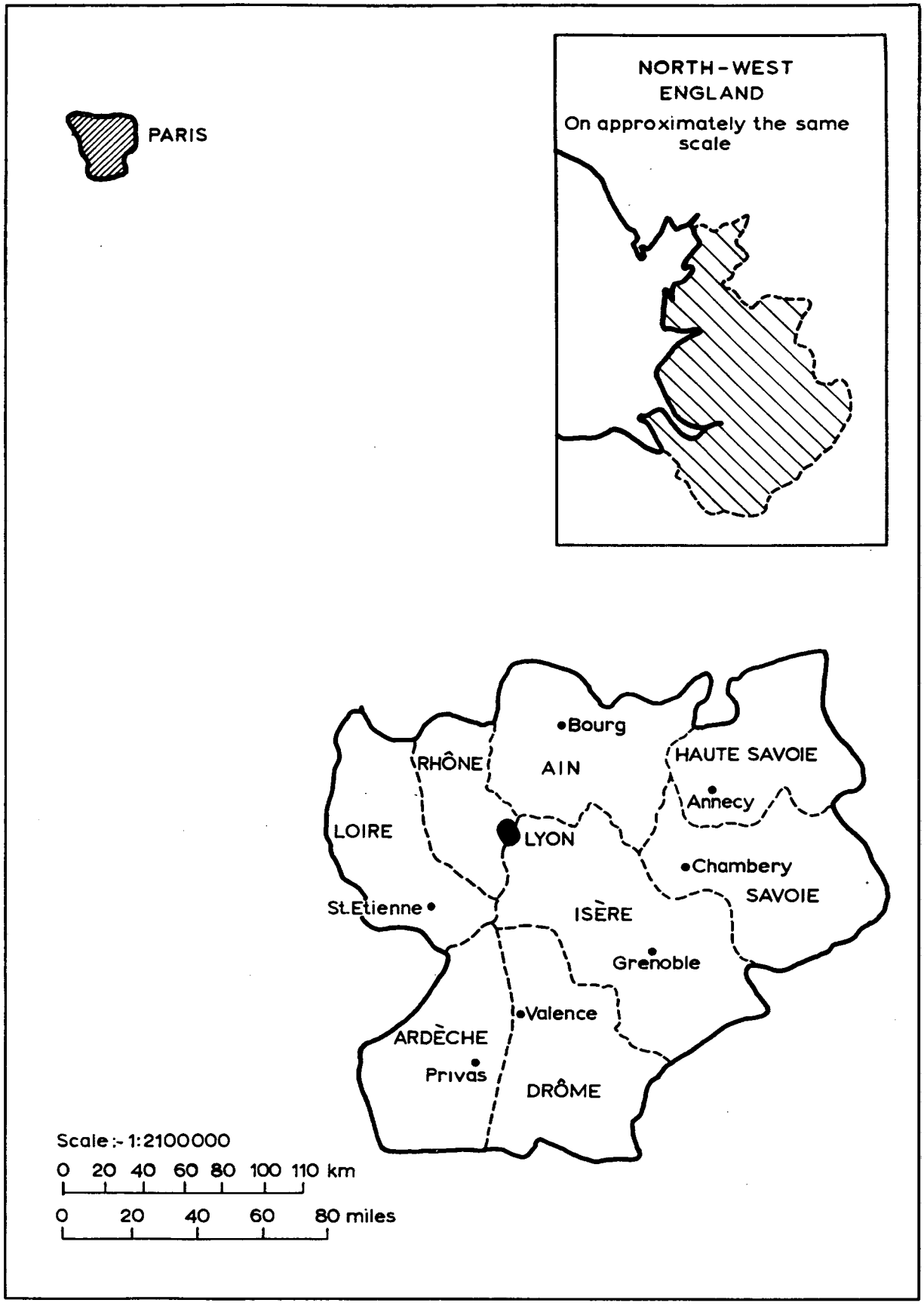

Fig. 2 RHÔNE-ALPES REGION

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