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THE CHANNEL TUNNEL RAIL LINK: OPPORTUNITIES AND PROBLEMS FOR REGIONAL ECONOMIC DEVELOPMENT

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**THE CHANNEL TUNNEL RAIL LINK: OPPORTUNITIES AND
PROBLEMS FOR REGIONAL ECONOMIC DEVELOPMENT.**

David Matthew Smith

**Thesis Submitted to the University of Plymouth
in Partial Fulfilment of the Requirements for
the Degree of Doctor of Philosophy**

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University of Plymouth

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THE CHANNEL TUNNEL RAIL LINK: OPPORTUNITIES AND PROBLEMS FOR REGIONAL ECONOMIC DEVELOPMENT.

David Matthew Smith

ABSTRACT

The regional economic impact of the Channel Tunnel has engendered much public and private sector interest. Previous studies examining the regional implications of the Tunnel have argued that related development pressures will be largely confined to South East England, further widening the "North-South" divide. Economic Potential Analysis was earlier employed by Clark et. al. (1969) and Keeble et. al. (1982a) to model the geographical impact of the Tunnel on the relative accessibility of the UK regions. The conclusions drawn from these studies support the proposition that the South East would gain at the expense of the more peripheral regions. However, the important implications of a rail-only Tunnel have yet to be modelled. The results of the present study show that opportunities created by the Tunnel could be spread more evenly than had previously been predicted. However, following a review of the legislative and policy environment of the Tunnel and related infrastructure, it is argued that as a result of British Government inaction the more peripheral UK regions are likely to be unable to maximise any potential benefits created. Nonetheless, the overall regional economic impact of the Tunnel will depend ultimately on the reactions of the business community (Pieda 1989a&b). The findings of a questionnaire survey carried out for this thesis reveal a considerable degree of similarity in perceptions and anticipated usage of the Tunnel for companies in the South East and South West, including the "Far South West". If this similarity is apparent after the Tunnel opens, the regional economic structure of the UK might only be marginally affected.

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CONTENTS

	Page Number
CHAPTER 1: INTRODUCTION	1
1.1. Aims and Objectives	1
1.2. The Channel Tunnel Project	2
1.2.1. The History of the Fixed Channel Link	3
1.2.2. The Present Scheme	6
1.3. The Scope of the Study	14
1.4. Research Philosophy	20
1.4.1. The Positivist Approach	20
1.4.2. The Humanistic Approach	21
1.5. Research Methodology	22
 CHAPTER 2: THE LITERATURE REVIEW	 25
2.1. The National Economic Impact	26
2.1.1. The Opportunities	26
2.1.2. The Problems	29
- The opportunity cost	29
- Who benefits and how?	30
- Supporting transport infrastructure	32
2.2. The Regional Economic Impact	33
2.2.1. The Potential Impact on the South East	34
- Constrained optimism	35
- The continental threat	39
- A direct link to the Continent	40
- The tourist trade	42
- The South East: a summary	43
2.2.2. The Potential Impact on the "North"	44
- Rail links to the "North"	44
- The landbridge market	49

CHAPTER 2 (CONT'D):

- The short-term impact	51
- The "double-edged sword"	52
- The "Third Market" impact	54
- The "North": a summary	55
2.3. Conclusion	55

CHAPTER 3: ECONOMIC POTENTIAL ANALYSIS 60

3.1. Aim of the Model	60
3.2. Economic Potential	62
3.3. Keeble, Owens and Thompson's 1982 study - 'Economic Potential and the Channel Tunnel'	64
3.4. Methodology	65
3.4.1. The Scope of the Model or 'Universe'	66
3.4.2. The Mass Mj Term	68
3.4.3. The Distance Dij Term	69
3.4.4. The Distance Exponent	71
3.4.5. Self Potential	72
3.5. Regional Accessibility within the EC	73
3.6. Analysis of the Results	80
3.6.1. Simulation 1	81
3.6.2. Simulations 2 and 3	90
3.7. Critique	96
3.8. Conclusion	98

CHAPTER 4: THE LEGISLATIVE AND POLICY FRAMEWORK 101

4.1. Introduction	101
4.2. The Tunnel and Government Policy	103
4.2.1. The Pre-Selection Stage: the politics of rival schemes	104

CHAPTER 4 (CONT'D):

4.2.2.	The Parliamentary Stage: a Hybrid Bill	107
4.2.3.	The 1987 Channel Tunnel Act: implications for the UK	111
4.2.4.	Overall Tunnel Philosophy	113
4.3.	The High-Speed Rail Link	114
4.3.1.	The Recent History	115
4.3.2.	'Wider Considerations' Lead to a Further Delay	118
4.4.	Post 1979 Railway Policy: implications for international rail services	124
4.4.1.	Financing of the Railways in the 1980s	125
4.4.2.	Full-Scale Privatisation or 'Creeping Denationalization'	129
4.5.	British Uncertainty Versus French Optimism	131
4.5.1.	French Policy-Making for the Tunnel	132
4.5.2.	The French (and Belgian) High-Speed Rail Network	135
4.5.3.	European Community Policy on High-Speed Rail Travel	140
4.6.	Conclusion	143

CHAPTER 5: THE QUESTIONNAIRE SURVEY 145

5.1.	Objectives of the Survey	145
5.2.	The Methodology and Scope of the Survey	146
5.3.	The Questionnaire	148
5.4.	The Response Rate	150
5.5.	Analysis of the Results	158
5.5.1.	Company Details	159
5.5.2.	The Perceived Impact of the Tunnel	163
	- Impact on company location	165
	- Impact on company competitiveness:	167
	increased accessibility to markets	
	- Impact on company competitiveness:	170
	vulnerability to increased competition	

CHAPTER 5 (CONT'D):

- Tunnel usage and company perceptions	172
- Comparison of the results with the LCCI (1989), BR and Eurotunnel (1988) surveys	173
- A migration of industry?	175
- Company perceptions: a summary	176
5.5.3. Potential Usage of the Tunnel	177
- The business trip market	179
Comparative findings	179
The current cross-Channel market	183
The estimated future usage of the Tunnel	188
Factors likely to influence planned Tunnel usage	189
- The freight market	191
Comparative findings	191
The current cross-Channel market	193
The estimated future usage of the Tunnel	193
Factors likely to influence planned Tunnel usage	195
- Anticipated Tunnel usage: a summary	197
5.5.4. Wider Considerations	198
5.6. Conclusion	201

CHAPTER 6: A COMPARATIVE ANALYSIS OF THE QUESTIONNAIRE RESULTS 206

6.1. Regional Analysis	206
6.1.1. The Regional Company Base	207
6.1.2. Perceptions of "Peripherality" or "insulation"	215
- The Tunnel and company location	215
- Regional competitiveness: increased accessibility to markets	219

CHAPTER 6 (CONT'D)

- Regional competitiveness:	221
vulnerability to increased competition	
- The threat of company relocations	223
- Regional perceptions: a summary	223
6.1.3. Planned Usage of the Tunnel and its Services	224
- The business trip market	225
The attraction of the Tunnel	225
The current cross-Channel market	227
Factors influencing company plans	233
- The freight market	235
The attraction of the Tunnel	235
The current cross-Channel market	238
Factors influencing company plans	239
6.1.4. A South East Bias?	241
6.2. Conclusion	245

CHAPTER 7: THE HOMOGENEOUS SOUTH EAST - THE QUESTION OF EAST KENT

7.1. Introduction	248
7.2. The Short-Term Impact	250
7.2.1. Local TML Recruitment	250
7.2.2. The Local Orientation of Construction Contracts	254
7.3. The Medium-Term Impact	256
7.3.1. The Net Employment Implications	256
7.3.2. A Complete Collapse of the Short-Sea Ferry Industry?	259
- Market size and patronage levels	260
- Market structure	262
7.3.3. The proposed Merger of P&O and Sealink	265
7.4. The Long-Term Impact	267

CHAPTER 7 (CONT'D):

7.4.1.	The Kent Impact Study: 1991 Review	267
	- Employment implications for the county	270
	- Employment implications for East Kent	273
7.4.2.	The Theoretical Perspective	277
7.4.3.	Nord-Pas de Calais	281
7.4.4.	The Tourism Industry	283
7.5.	Summary and Conclusion	285

CHAPTER 8: THE "FAR SOUTH WEST" (DEVON & CORNWALL) 288

8.1.	The Long-Sea Ferry Industry	290
8.1.1.	Existing Ferry Services	290
8.1.2.	The Post-Tunnel Western Channel	296
8.1.3.	A Westward Redeployment of Ferry Services?	298
8.2.	Transport Links to the Far South West	299
8.2.1.	International Rail Services	299
8.2.2.	Road Links to the Tunnel	304
8.2.3.	An Inadequate Transport Network: a summary	305
8.3.	Regional Implications	306
8.3.1.	Local Industry	306
8.3.2.	The Tourism Industry	312
8.3.3.	The "Third Market" Impact	315
8.4.	Conclusion	317

CHAPTER 9: SUMMARY AND CONCLUSIONS 319

9.1.	Summary of the Results	319
9.1.1.	Improved Accessibility to the Periphery?	321
9.1.2.	A Policy of Inaction	322

CHAPTER 9 (CONT'D):

9.1.3.	Company Perceptions of and Likely Reactions to the Tunnel	323
9.1.4.	Local Considerations	325
	- Implications for East Kent	325
	- Implications for the Far South West	326
9.2.	The Conclusion: A Case of Missed Opportunities?	327
9.3.	Future Research	329

APPENDICES

Appendix 1:	Bibliography - Pre 1986	331
Appendix 2:	Potential Analysis Results	335
Appendix 3:	Questionnaire	354

LIST OF ABBREVIATIONS	361
LIST OF ABBREVIATED REGIONAL CONSULTANCY REPORTS	363
LIST OF REFERENCES	365

LIST OF TABLES

PageNumber

CHAPTER 2

2.1:	Impact of the Tunnel on company competitiveness: all respondents.	36
2.2:	Impact of the Tunnel on company competitiveness: respondents anticipating using the Tunnel.	36

CHAPTER 3

3.1:	Absolute and relative potential values for the UK and Eire - Simulation 1 (no delay).	82
3.2:	Absolute and relative potential values for the UK and Eire - Simulation 1 (no delay): pre- and post-Tunnel.	83
3.3:	Absolute and relative potential values for the UK and Eire - Simulation 1 (6hrs delay).	86
3.4:	Absolute and relative potential values for the UK and Eire - Simulation 1 (18hrs delay).	87
3.5:	Relative potential values (and rank orders) for the UK and Eire - Simulation 1.	88
3.6:	Percentage changes in relative potential values (and rank orders) for the UK and Eire - Simulation 1.	89
3.7:	Absolute and relative potential values for the UK and Eire - Simulation 2 (no delay).	90
3.8:	Relative potential values (and rank orders) for the UK and Eire - Simulation 2.	93
3.9:	Absolute and relative potential values for the UK and Eire - Simulation 3 (no delay).	94
3.10:	Relative potential values (and rank orders) for the UK and Eire - Simulation 3.	95

CHAPTER 5

5.1:	Percentage (and number) of companies surveyed and respondents by county/region.	151
5.2:	The significance of the response rate by county/region.	152
5.3:	Percentage (and number) of companies surveyed and respondents by industrial classification.	154
5.4:	Percentage (and number) of companies surveyed and respondents by industrial classification for the South East and South West.	155
5.5:	Percentage (and number) of companies surveyed and respondents by size of workforce.	156
5.6:	The significance of the response rate by size of workforce.	156
5.7:	Percentage (and number) of companies surveyed and respondents by size of workforce for the South East and South West.	157
5.8:	The number of years companies have been operating at their present location.	162
5.9:	Percentage of company sales dependent on exports.	162
5.10:	Importance of location and the impact of the Tunnel.	167
5.11:	Importance of location and company accessibility to both UK and continental markets.	169
5.12:	The significance of company location on perceptions of improved competitiveness on the Continent.	169
5.13:	Importance of location and company vulnerability to increased competition.	171
5.14:	Exports as a percentage of total sales and company vulnerability to increased competition.	172
5.15:	Perceptions of companies currently anticipating using the Tunnel.	173
5.16:	Estimated Tunnel traffic.	178
5.17A:	Planned usage of the Tunnel: percentage of all respondents.	180
5.17B:	Planned usage of the Tunnel: percentage of respondents currently using cross-Channel services.	181

CHAPTER 5 (CONT'D)

5.17C: The level of 'interest' expressed in the Tunnel for future business trips.	181
5.18: Frequency of business trips with respect to size of workforce.	183
5.19: Significance of size of workforce on the frequency of business trips.	184
5.20: Frequency of business trips with respect to company exports.	185
5.21: Estimated usage of the Tunnel for future business trips: percentage of all respondents.	188
5.22: Estimated usage of the Tunnel for future business trips: percentage (and number) of companies planning to use the Tunnel.	189
5.23: The level of 'interest' expressed in the Tunnel for future freight exports.	192
5.24: Estimated usage of the Tunnel for future freight exports: percentage of all respondents.	194
5.25: Estimated usage of the Tunnel for future freight exports: percentage (and number) of companies planning to use the Tunnel.	195

CHAPTER 6

6.1: Industrial classification: percentage (and number) of companies in the South East and South West.	212
6.2: The number of years companies have been operating at their present location: percentage (and number) of companies in the South East and South West.	213
6.3A: Exports as a proportion of total sales: percentage of companies in the South East and South West.	213
6.3B: Destination of exports: percentage of companies in the South East and South West.	214

CHAPTER 6 (CONT'D)

6.4:	Factors influencing company location: percentage of companies in the South East and South West.	216
6.5:	Importance of location as a component of overall business strategy: percentage of companies in the South East and South West.	217
6.6:	Significance of location for companies in the South East and South West.	218
6.7:	Improved accessibility to UK and continental markets: percentage of companies in the South East and South West.	220
6.8:	Vulnerability to increased competition: percentage of companies in the South East and South West.	221
6.9:	The influence of exports on feelings of vulnerability to increased competition: percentage of companies in the South East and South West.	222
6.10:	Estimated future usage of the Tunnel for company business trips: percentage of all respondents in the South East and South West.	226
6.11:	Estimated future usage of the Tunnel for company business trips: percentage of companies currently planning to use the Tunnel in the South East and South West.	226
6.12:	Significance of regional location on frequency of business trips.	230
6.13A:	Preferred mode of transport for current business trips to the Continent: percentage of companies in the South East and South West.	231
6.13B:	Preferred mode of transport for current business trips to the Continent: percentage of companies anticipating using the Tunnel in the South East and South West.	233

CHAPTER 6 (CONT'D)

6.14A: Factors influencing the planned usage of the Tunnel for business trips: percentage of companies in the South East and South West.	234
6.14B: Factors influencing the planned usage of the Tunnel for business trips: percentage of companies anticipating using the Tunnel in the South East and South West.	234
6.15: Estimated future usage of the Tunnel for company exports: percentage of companies in the South East and South West.	236
6.16: Estimated future usage of the Tunnel for company exports: percentage of companies anticipating using the Tunnel in the South East and South West.	237
6.17A: Preferred mode of transport for current freight exports to the Continent: percentage of companies in the South East and South West.	238
6.17B: Preferred mode of transport for current freight exports to the Continent: percentage of companies anticipating using the Tunnel in the South East and South West.	239
6.18A: Factors influencing the planned usage of the Tunnel for freight exports: percentage of companies in the South East and South West.	240
6.18B: Factors influencing the planned usage of the Tunnel for freight exports: percentage of companies anticipating using the Tunnel in the South East and South West.	240
6.19: Strategies perceived as necessary to increase the anticipated usage of the Tunnel: percentage of companies in the South East and South West.	242

CHAPTER 7

7.1:	TML employment at the end of 1988.	251
7.2A:	Expected 'run-down' of the TML construction workforce.	252
7.2B:	Proportion and number of TML redundancies which are Kent residents.	253
7.3:	Distribution of TML (UK) contracts: up to March 1989.	254
7.4:	Employment in the East Kent port and ferry industry: with and without the Tunnel.	257
7.5:	Estimated job losses in the East Kent port and ferry industry.	258
7.6:	The potential composition of the Tunnel's cross-Channel market.	260
7.7:	Ferry and port-related employment in the 'five ships' scenario.	266
7.8:	Estimated employment change in Kent resulting from the Tunnel, related infrastructure and the SEM, 1991-1996.	269
7.9:	Anticipated net employment effects of the Tunnel and related infrastructure within Kent.	273
7.10:	Estimated net employment effects of the Tunnel, related infrastructure and the SEM, 1991-1996, and the change in the supply of labour, within the six districts of East Kent.	274/ 275

CHAPTER 8

8.1:	Cross-Channel traffic by sector.	292
8.2:	Employment by industry.	307
8.3:	Unemployment rate.	307
8.4:	Percentage of companies anticipating using the Tunnel for freight exports.	310
8.5:	Percentage of companies using existing cross-Channel modes of transport for freight exports.	310
8.6:	Percentage of companies anticipating using the Tunnel for future business trips.	311

CHAPTER 8 (CONT'D):

8.7:	Company perception of the regional economic impact of the Tunnel.	316
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LIST OF FIGURES

Page Number

CHAPTER 1:

Figure 1.1:	Eurotunnel project: key dates.	5
Figure 1.2:	Cross-section of the Tunnel.	7
Figure 1.3:	The Shuttle train.	8
Figure 1.4:	Eurotunnel termini: Cheriton and Coquelles.	9
Figure 1.5:	Organisational structure of the Tunnel.	10
Figure 1.6:	The UK and continental road and rail networks.	12
Figure 1.7:	The revised pattern of international passenger services.	13
Figure 1.8:	The revised proposals for freight terminals.	15
Figure 1.9:	Thesis structure.	16

CHAPTER 3:

Figure 3.1:	Inter-nodal rail network.	67
Figure 3.2:	Relative Potential Values - Ferry 30 mph (no delays).	76
Figure 3.3:	Relative Potential Values - Tunnel 30 mph.	77
Figure 3.4:	Relative Potential Values - Ferry 75 mph (no delays).	78
Figure 3.5:	Relative Potential Values - Tunnel 75 mph.	79

CHAPTER 4:

Figure 4.1:	The Rail Link Key Dates.	116
Figure 4.2:	The Original Route Options.	117
Figure 4.3:	The Amended Route 2.	117
Figure 4.4:	The BR and Ove Arup Route Proposals.	120
Figure 4.5:	The Residential and Environmental Impact.	121
Figure 4.6:	The Political Implications.	120
Figure 4.7:	The Paris-Brussels-Koln-Amsterdam High-Speed Rail Network (PBKA).	136

CHAPTER 4 (CONT'D)

Figure 4.8:	TGV Nord.	138
Figure 4.9:	The Belgian High-Speed Rail Link: the original route options.	139
Figure 4.10:	The European High-Speed Rail Network.	141

CHAPTER 5:

Figure 5.1:	Ownership Status of Companies.	160
Figure 5.2:	Size of Company Workforce.	161
Figure 5.3:	Destination of Exports.	164
Figure 5.4:	Frequency of Company Business Trips to the Continent.	182
Figure 5.5:	Destination of Company Business Trips.	186

CHAPTER 6:

Figure 6.1:	Ownership Status of Companies in the South East and South West.	208/ 209
Figure 6.2:	Size of Company Workforce.	210/11
Figure 6.3:	Frequency of Business Trips for Companies in the South East and South West.	228/ 229
Figure 6.4:	Destination of Business Trips.	232

CHAPTER 7:

Figure 7.1:	The sub-regions of Kent.	249
-------------	--------------------------	-----

CHAPTER 8:

Figure 8.1:	The Far South West: Devon and Cornwall.	289
Figure 8.2:	Cross-Channel ferry services.	291

CHAPTER 8 (CONT'D):

Figure 8.3:	Rate of growth on the Roscoff and Santander routes: passenger traffic.	293
Figure 8.4:	Rate of growth on the Roscoff and Santander routes: car-accompanied traffic.	294
Figure 8.5:	Rate of growth on the Roscoff and Santander routes: freight traffic.	295
Figure 8.6:	Road and rail links to the "Far South West".	300

CHAPTER 1: INTRODUCTION

This chapter first establishes the main aims and objectives of the study. There then follows a brief introduction to the Channel Tunnel project, in terms of both its historical evolution and the operational characteristics of the present scheme. The 'Scope of the Study' is then set-out, relating the central hypothesis to the thesis structure. The following section on 'Research Philosophy' highlights the essentially empirical nature of the current research project. Finally, discussion of the research methods will focus primarily on the Economic Potential Model developed for this thesis, as well as primary data collection and interpretation issues.

1.1. Aims and Objectives

The basic aim of the current research project is to examine the impact of the Tunnel on the so-called "North-South" divide. To this end the regional and local consequences of such a major transport infrastructure project are analyzed. The central hypothesis of the present thesis is that the Tunnel represents an opportunity to redress the economic imbalance between the "North" and "South". The "North-South" divide has generated a great deal of academic and political interest and it is not surprising, therefore, that the regional economic impact of the Tunnel is considered to be of great importance. This study utilises the commonly favoured "North-South" terminology to emphasize the diverse regional economic implications of the Tunnel.

The economic implications of the Tunnel, particularly for the more peripheral UK regions, are still very uncertain. Except for Kent, no national and/or regional impact studies have been commissioned by the British Government. Existing academic involvement is also generally regarded as 'highly speculative' (Gibb, Knowles and Farrington 1992). The present thesis therefore aims to fill the gap in the existing literature by providing a

substantive study on the regional economic implications of the Tunnel. Its originality can be identified in four main respects: firstly, the voluminous amount of literature on the present Tunnel project is drawn together for the first time; secondly, it questions the usual premise that the South East will be the main beneficiary; thirdly, Economic Potential Analysis is employed in a novel manner in order to quantify the impact of the Tunnel on regional accessibility within the UK and on the Continent; and finally, a large amount of primary data is generated by a questionnaire survey and interviews with representatives of local economies.

Even though the hypothesis states that the Tunnel represents an opportunity to narrow the "North-South" divide, it is also argued that this opportunity is likely to be missed as a result of present Government policy. The Government's non-interventionist 'market solutions' approach to the Tunnel and related transport infrastructure has been criticised as an excuse for inaction (Comfort 1987). Unlike the policies adopted in France, especially within Nord-Pas de Calais, no attempt has been made in the UK to augment the opportunities created by the Tunnel. Therefore, a comprehensive review of the legislative and policy environment of the Tunnel within the UK and on the Continent is also an important component of the present study. The 'Scope of the Study' (section 1.3) will discuss the structure of the current thesis in more detail, but first a brief introduction to the Channel Tunnel project is provided.

1.2. The Channel Tunnel Project

Even though the history and operational details of the Tunnel are well known, it is useful to set out the history of the fixed Channel link. Also aspects of the present scheme, especially the international train and so-called "Shuttle" services, need to be outlined so that the reader is clear about the benefits offered by the Tunnel. As recognised by the House of Lords (1987), the regional economic impact of the Tunnel 'lies in the hands' of British Rail (BR). Thus, the current chapter also outlines the proposed level of service to

the regions provided by international through trains, as well as the 'rolling road' offered by Eurotunnel.

1.2.1. The History of the Fixed Channel Link

'In 1751, a report landed on Louis XV's desk in which the author, one Nicholas Desmaret, claimed that "England and France were linked by a spit of land". His proof? "The wolves found in England could not have swum there...". Consequently, "we must restore that communication by requiring either a bridge, tunnel or dike".'

(Conseil Regional Nord-Pas de Calais 1991, P.5)

The earliest recorded scheme to link Britain and France by a permanent Channel crossing is attributed to Albert Mathieu, a French mining engineer, who in 1802 proposed that a submarine tunnel should be built for horse drawn carriages. Several other schemes were advanced in the following 80 years, before Thome de Gammond, another French mining engineer, submitted the first practical plans for a rail tunnel to the French and British Governments. Actual construction commenced in 1881, with limited boring of the pilot tunnel at Shakespeare and Abbots Cliffs, near Dover, and Sangatte, near Calais. Political and strategic concerns led the British Government to abandon the project in 1883 (Gibb 1986a). Following a revival of interest in the 1920s, the then Labour Government set-up a Committee of Inquiry in 1929. A 'double barrelled' rail tunnel was favoured, only to be later rejected by the House of Commons in 1930.

Interest again revived after the Second World War, with an Anglo- French Channel Tunnel Study Group established in 1958. The former defence objections to a fixed Channel link had now largely disappeared (Comfort 1987). In 1960, the Study Group (a British-French-American group of companies, in which BR and SNCF were indirectly involved) submitted a proposal for twin single-track rail tunnels, with a smaller service tunnel. Normal BR/SNCF services and a vehicle-carrying Shuttle would be run through the tunnels. A road and rail bridge was proposed in the following year by an all-French Channel Bridge Study Group, which planned for 140 spans, mostly of 738 feet, but with 10 spans of 1447 feet over the shipping lanes. The British and French Governments set-up a joint working group to examine both schemes. The bridge was regarded as costly and a danger to shipping. The

Tunnel was believed to offer cheaper services over existing modes of cross-Channel transport. However, Government fiscal guarantees were seen to be necessary to ensure financial backing. In November 1973, after extensive geological and technical feasibility studies, a treaty was signed by both Governments and an agreement made with the newly formed British Channel Tunnel Company and the Société Française du Tunnel sous la Manche. Economic problems of the era led to the unilateral abandonment of the project by the British Government (Gibb 1986a). The escalating cost of the high-speed rail link between London and the Tunnel portal made the Government unwilling to proceed with the project as originally proposed. The private developers, as a result of the favourable escape clauses, exercised their right to withdraw from the entire tunnel project.

However, a number of other proposals were subsequently put forward and, in 1981, a summit meeting between the British and French Governments agreed that a joint study group should examine the technical and economic aspects of a fixed link. From the outset it was made clear that any future scheme would have to be privately financed without call on public money or even Government guarantees (Comfort 1987). The group's report (Department of Transport 1982) concluded that a fixed link could be economically advantageous. A twin-bored rail tunnel, with a vehicle Shuttle, again found support. In 1984 both Governments reaffirmed their willingness to take the necessary steps to facilitate construction of a fixed link. The main dates in the evolution of the present Eurotunnel project are shown in Figure 1.1.

A joint working group of officials was commissioned to draw up guidelines setting out in detail the undertakings the Governments would be prepared to give, the legal and commercial framework, and the various requirements (technical, safety, financial, environmental and, where applicable, maritime) which the promoters would need to satisfy. The guidelines were published in April 1985, entitled the 'Invitation to Promoters' (Department of Transport 1985) and submissions requested by 31 October. By 20 January 1986, the two Governments announced their support for the Channel Tunnel Group-France Manche (CTG-FM) rail tunnel scheme: two single-track bored rail tunnels for through services and shuttles (essentially a resumption of the 1972/1975 project). Construction began just over a year later on the CTG-FM (now Eurotunnel) rail tunnel.

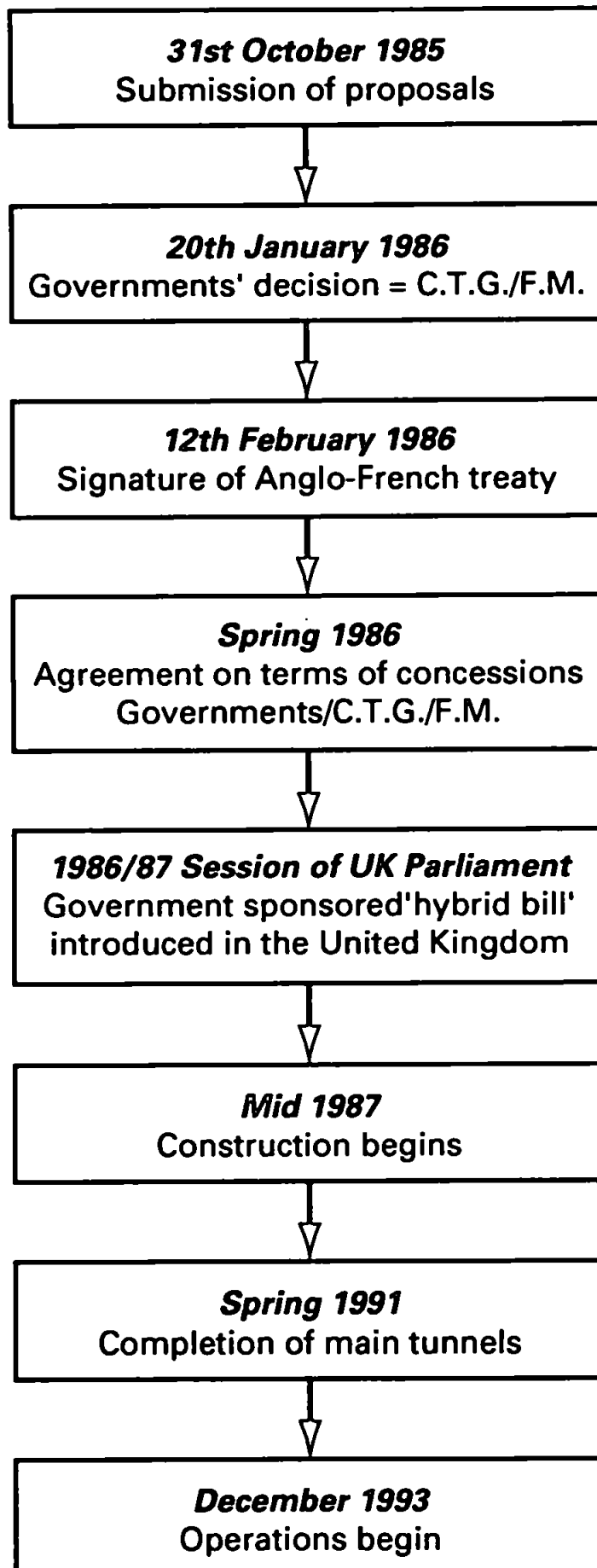


Figure 1.1 Eurotunnel Project ; key dates

1.2.2. The Present Scheme

The Channel Tunnel project involves the construction of twin rail tunnels, to carry both through rail services and the Shuttle service (see Figure 1.2). In addition, supporting infrastructure includes the terminals at Cheriton, outside Folkestone, and at Coquelles, near Calais, with associated road and rail connections. The purposely designed Shuttle train is set out in Figure 1.3 and the general lay out of the terminals and freight depots is shown in Figure 1.4.

The Concessionaires, Eurotunnel (originally a consortium of banks and construction companies) are responsible for the design, construction and operation, initially for 55 years, of the Tunnel. Investment capital of over £8,100 million has been raised by Eurotunnel, £7,000 million through credit facilities arranged by an international banking consortium of more than 200 banks and £1,100 million from a shares issue. The contractor for the project is Transmanche Link (TML), a joint venture of ten major construction companies: from Britain, Balfour Beatty Construction Ltd, Costain Civil Engineering Ltd, Tarmac Construction Ltd, Taylor Woodrow Construction Ltd and Wimpey Major Projects Ltd; and from France, Bouygues SA, Dumez SA, Société Auxiliaire d'Entreprises SA, Société Générale d'Entreprises SA and Spie Batignolles SA. TML operates under the supervision of Eurotunnel and an independent 'Maître d'Oeuvre' (comprised of two companies of consulting engineers). The Maître d'Oeuvre reports to Eurotunnel, the Inter-Governmental Commission and the lending banks. The relationships between the major actors in the Tunnel project are depicted in Figure 1.5.

Shuttle trains will be operated by Eurotunnel between the terminals either side of the Tunnel, the journey taking 33 minutes. The Shuttle service is being designed for convenience, with no pre-booking necessary and departing every 20 minutes for passenger Shuttles and 30 minutes for freight Shuttles (every 12 and 15 minutes respectively during peak periods). The track lay-out incorporates a 'return-loop' at both terminal sites to simplify continuous running. Shuttles can therefore arrive and depart without reversing (see Figure 1.3). At both terminals new road connections will be built giving direct access to and from motorways. All vehicles will drive on/off Shuttles through special

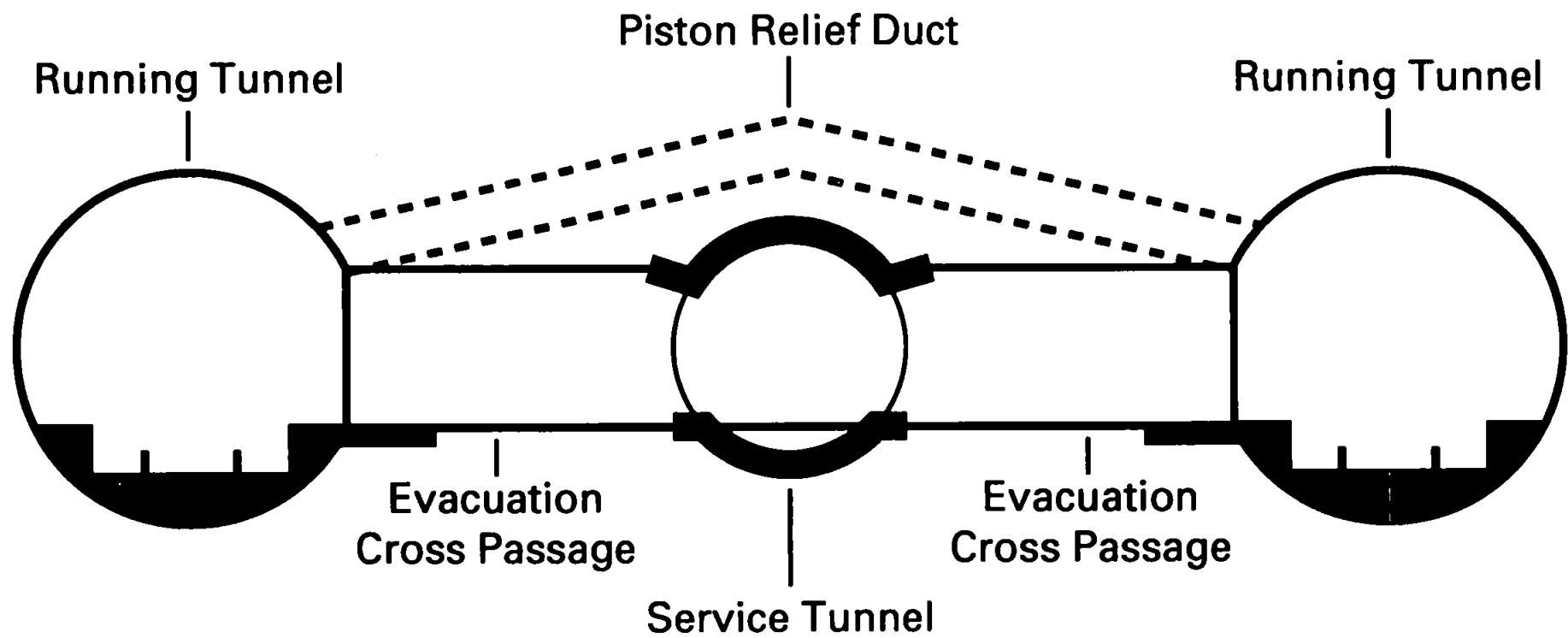


Figure 1.2 Typical tunnel cross section

Source ; TML 1991

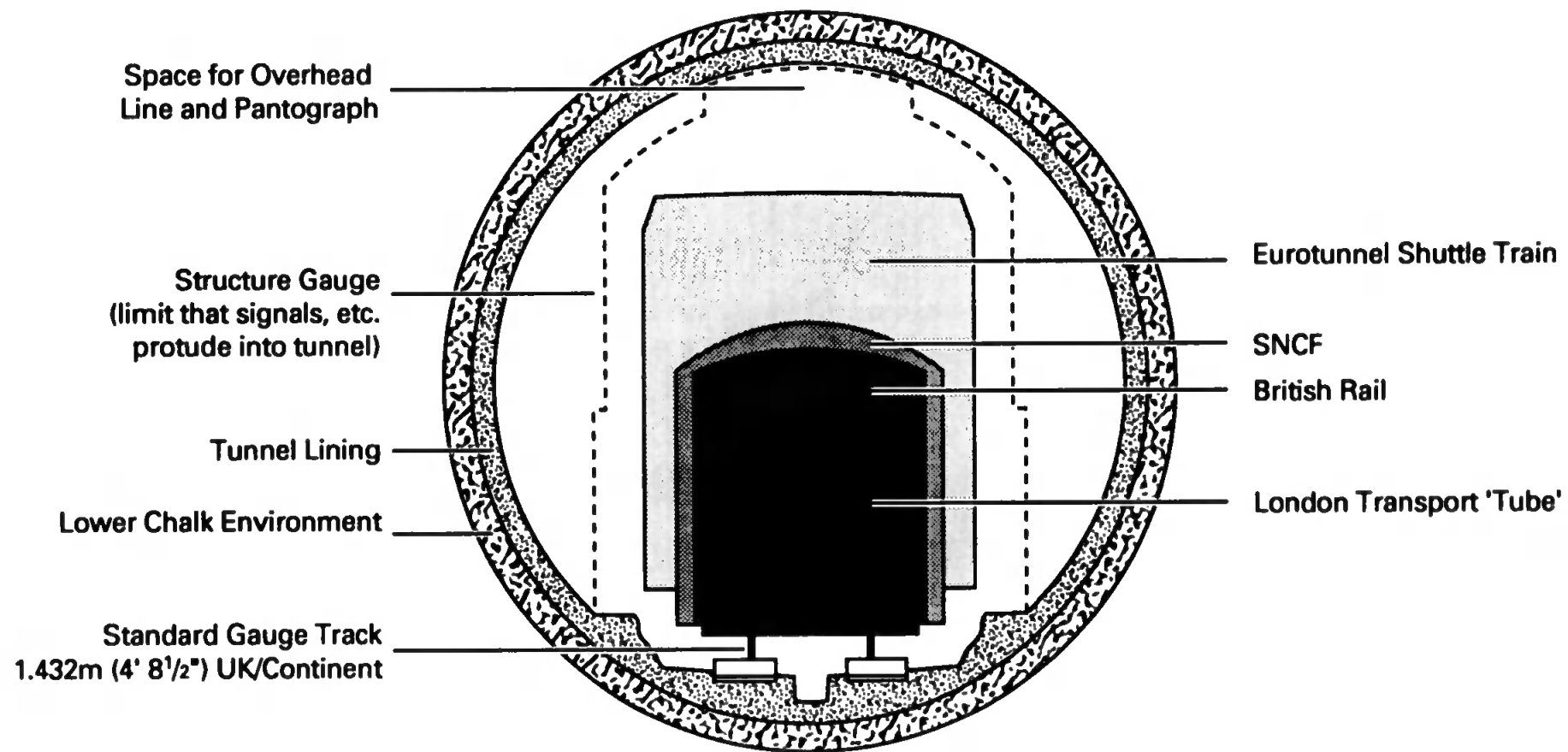


Figure 1.3 The Shuttle Train

Source ; TML 1991

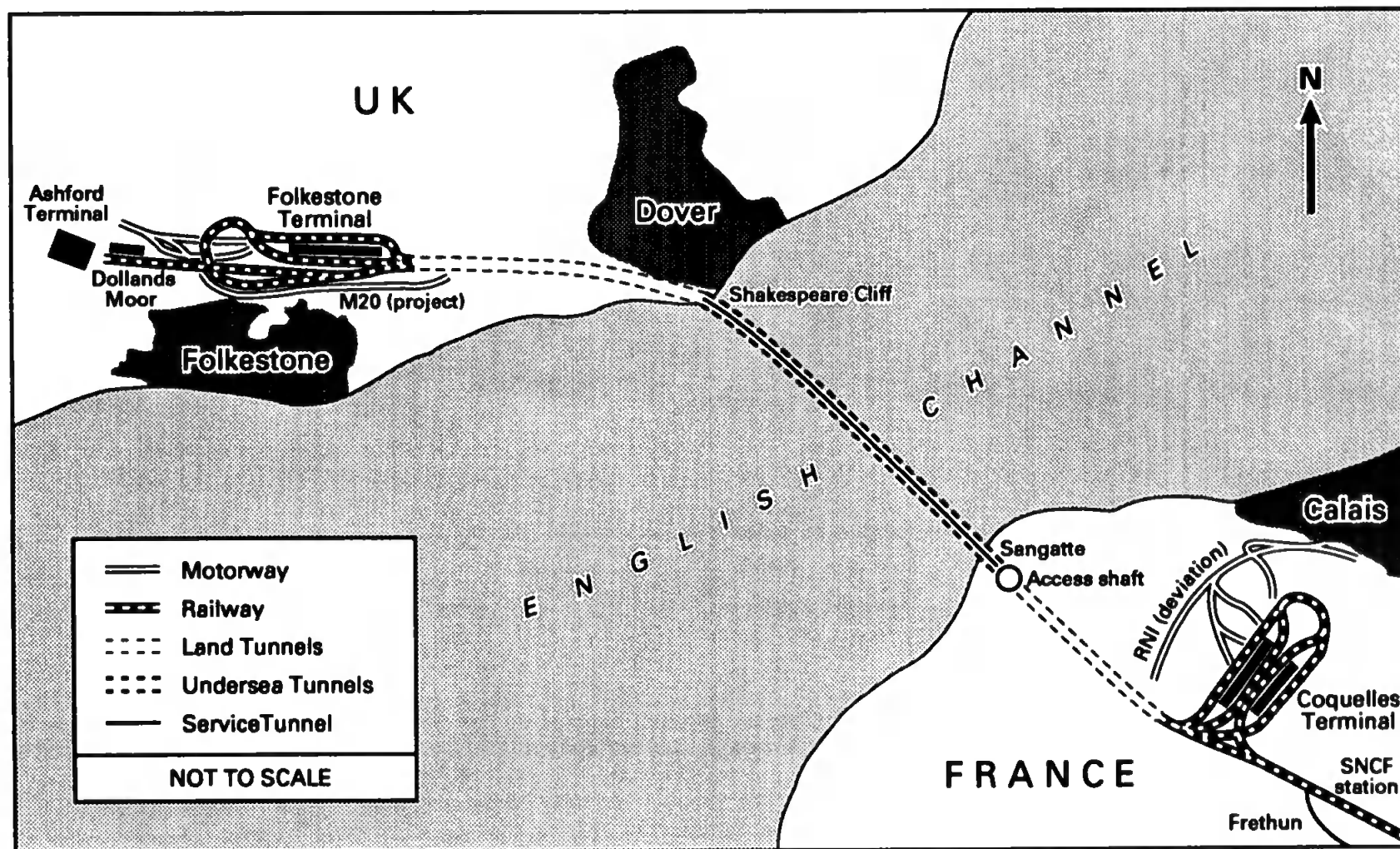


Figure 1.4 Eurotunnel termini : Cheriton and Coquelles

Source ; TML 1991

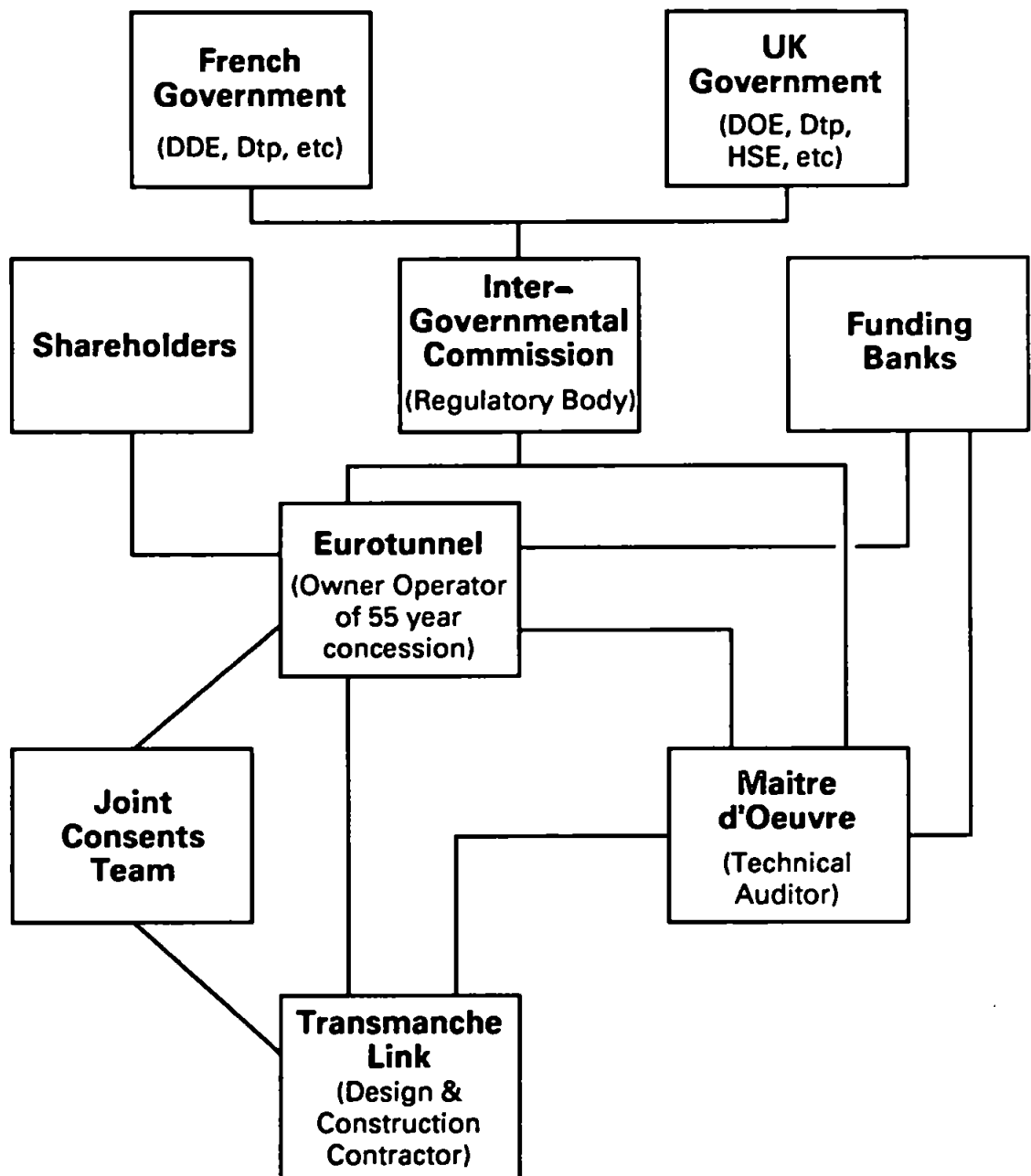


Figure 1.5 Organisational structure of the tunnel

Source ; TML 1991

loading/unloading wagons at the rear end of each "rake" (normally 13 carrier wagons for a passenger Shuttle). All frontier controls will be carried out prior to departure, allowing vehicles to join immediately the national road network on leaving the Tunnel. The capacity of the Tunnel, at opening, will be 20 "paths" an hour in each direction, allowing a three minute "headway". During peak periods, 10 paths an hour will be allocated to passenger and freight Shuttles, half the normal capacity. International through trains run by BR and SNCF will occupy the other half. The capacity of the Tunnel, through technological improvements, is expected to increase to 30 paths an hour in each direction.

The Tunnel will link-up, for the first time, the national rail networks of Britain and the Continent, allowing direct international passenger services to run between the major cities (see Figure 1.6). Locomotives have to be specially designed for international day-time services, permitting speeds of up to 300 kms/hr and compatibility with the electrification systems in Britain, France and Belgium. However, as a result of delays associated with the construction of these locomotives, the introduction of international through trains has been postponed until 1994. BR (1989b) expects a typical summer service to consist of 15 passenger trains per day in each direction between London and Paris (3 hrs), and London and Brussels (2 hrs 45 minutes). In addition, a number of beyond London international through services are envisaged. However, instead of the original proposal for an 18-coach train which was designed to split into two separate sections, BR adopted a cheaper 14-coach basic train for international rail services. Thus, BR's (1989b) original plans for international services to the regions have had to be altered. Figure 1.7 sets-out the revised pattern of day and night-time beyond London international services. The East Coast Main Line (ECML) will be served between Edinburgh and the Tunnel by a return daily service to both Paris and Brussels (Gibb et. al. 1992). The West Coast Main Line (WCML) will be served by a similar service from Manchester but only one of these trains will go via Birmingham. Night-time services for more distant journeys are planned for Glasgow and Swansea/Plymouth. Where possible, BR also plan for domestic InterCity services to connect up with international services. BR's proposed level of service to the regions outside the South East has been strongly condemned and is a primary focus of the present thesis.

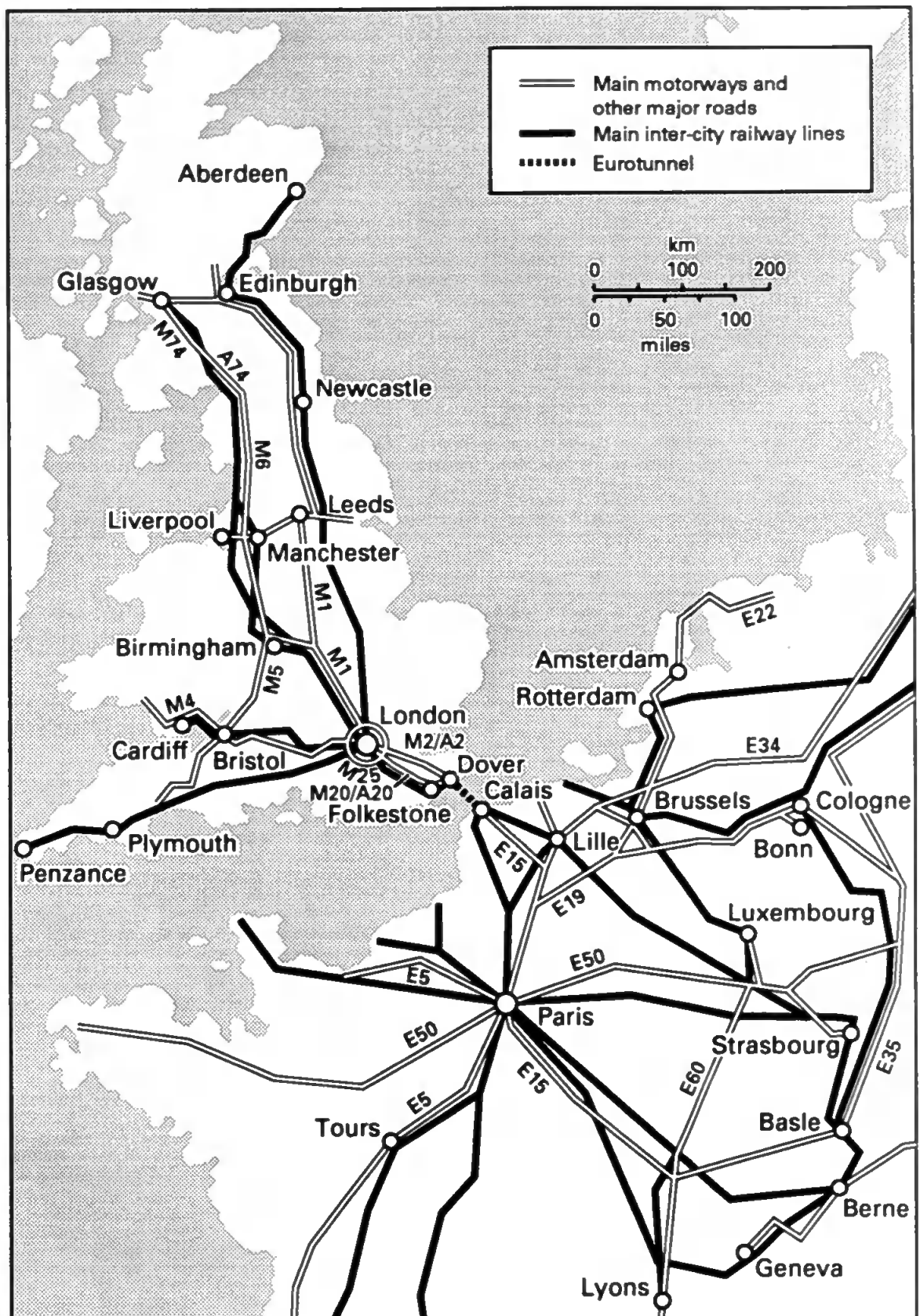


Figure 1.6 The UK and continental road and rail networks
 Source ; Foreign and Commonwealth Office, 1988



Figure 1.7 The revised pattern of international passenger services
Source ; Gibb et al 1993

Three types of through rail freight service are planned: trainload; wagonload, extending the former Speedlink's network of high-speed freight services to the Continent; and intermodal container services. In the years immediately following the opening of the Tunnel, BR's freight sector, Railfreight Distribution, expect to treble its current European business from approximately 2 to 6.1 million tonnes per year, of which more than 70 percent originates from beyond London (BR 1989b). BR is currently investigating the feasibility of new electric locomotives operating between the UK and Fréthun, in Northern France. A much larger diesel locomotive fleet will handle international freight traffic with Britain. To carry the estimated 6.1 million tonnes of international freight per annum, BR initially plan for 27 trains per day in each direction. In addition, BR proposed a system of 12 regional freight terminals, see Figure 1.8, to serve the main industrial and population centres of the UK. However, as a result of economic recession only nine are now envisaged, with the East Midlands, South Midlands and Avon terminals no longer regarded as viable (Gibb et. al. 1992). Independent consultants' reports (for example: Kent County Council (KCC) 1989; Pidea 1989a&b) regard BR's freight forecasts as too conservative and proposed service levels as inadequate, hence capacity constraints are predicted as soon as the Tunnel opens. However, before examining such issues, it is first appropriate to discuss the 'Scope of the Study', as well as outline the 'Research Philosophy' and 'Research Methodology' of the current project.

1.3. The Scope of the Study

Figure 1.9 sets-out the organisational structure of the present thesis. Following the Literature Review in chapter 2, which identifies the issues raised at the national and regional level of analysis, the study will then divide into three strands of research; theoretical modelling, policy review, and primary data collection and interpretation. An Economic Potential Model is employed to quantify the impact of the Tunnel on the relative accessibility of UK regions vis-a-vis the Continent. These theoretical results are then tested in the "real" world. Both the policy and legislative environment of the Tunnel, as well as the perceptions and reactions of companies, will influence the regional economic impact

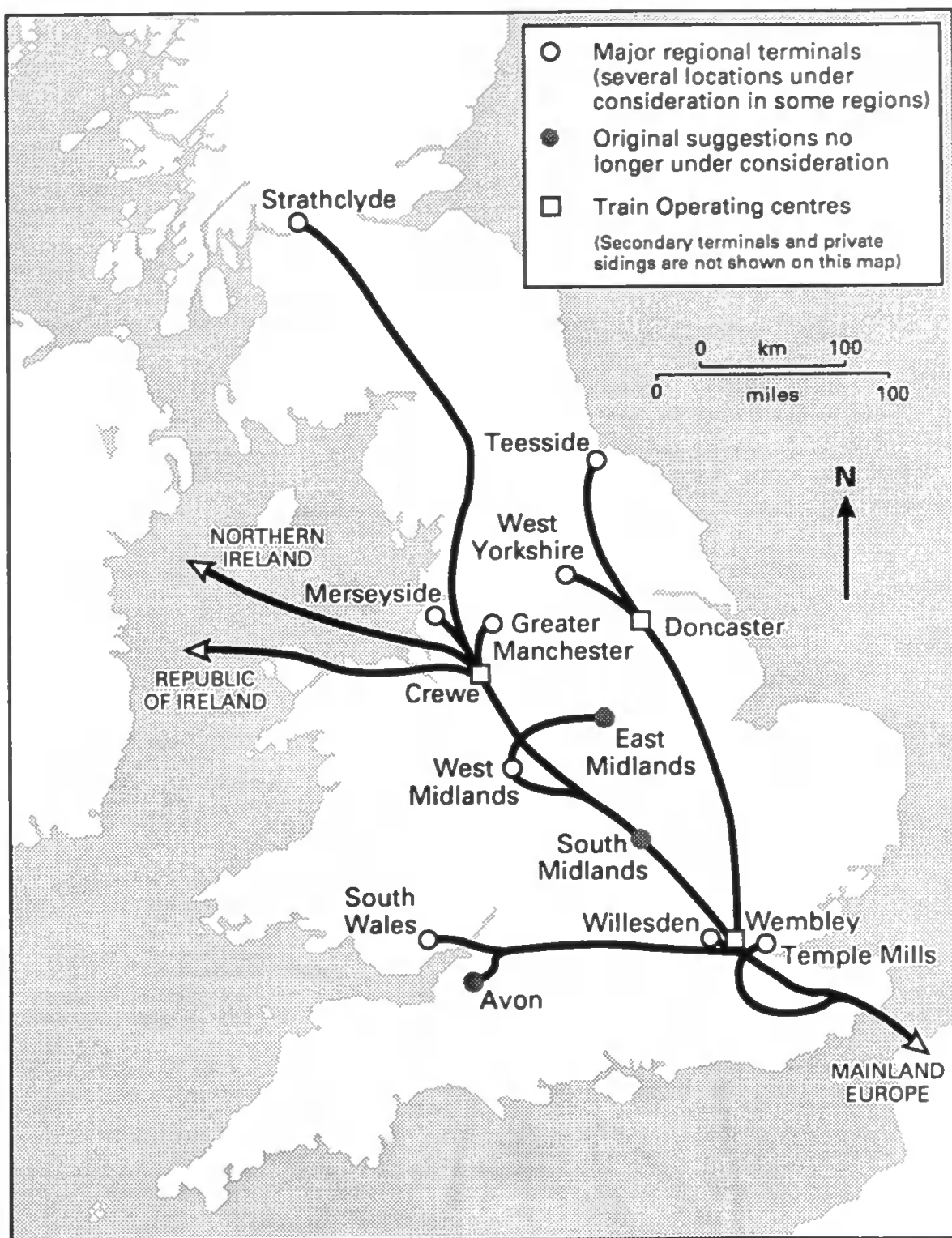


Figure 1.8 The revised pattern of freight terminals.
 Source ; BR 1989b

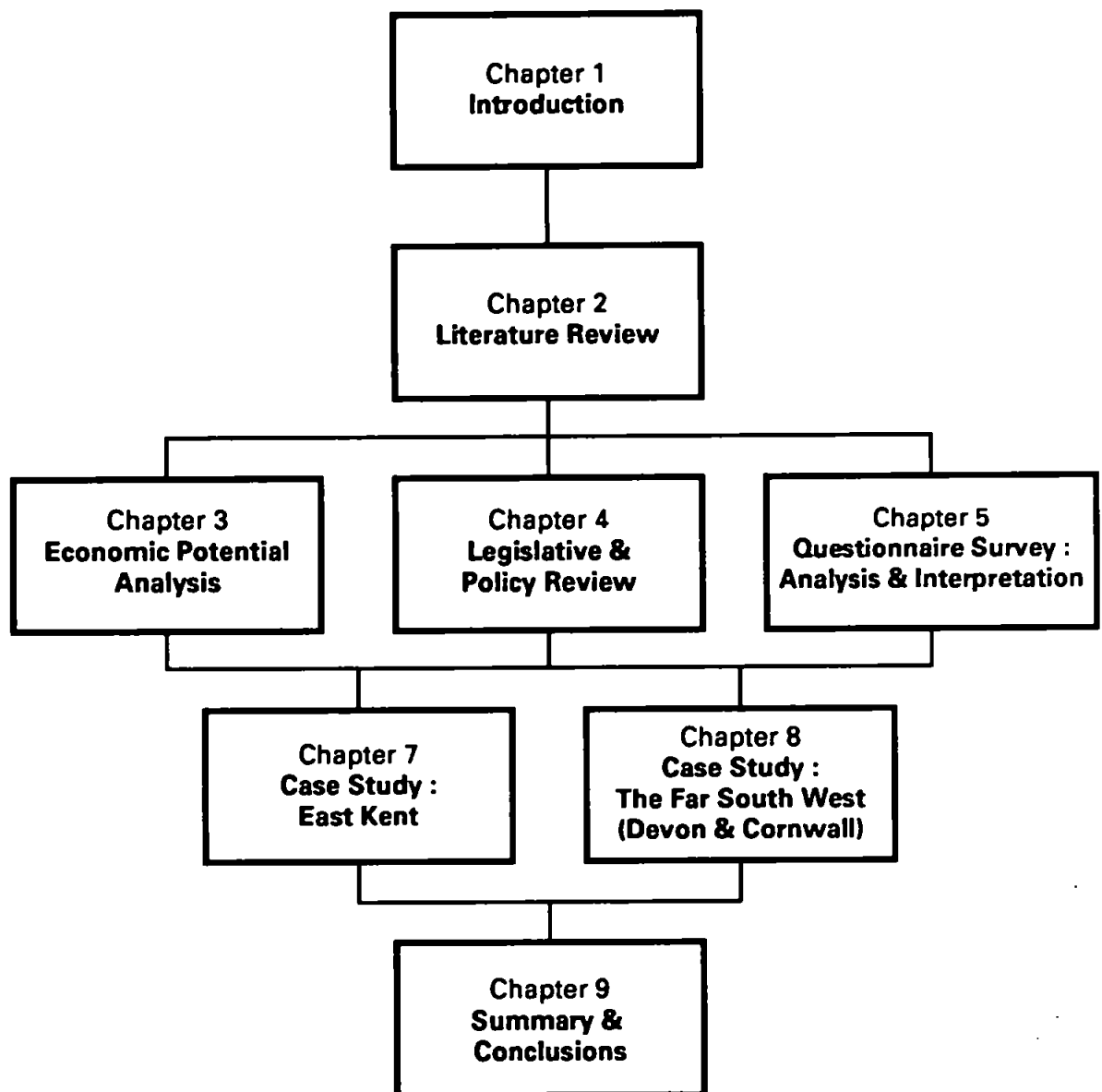


Figure 1.9 Thesis structure

of the Tunnel. Therefore, a critical review of the British Government's policy stance on the Tunnel and related transport infrastructure is undertaken. A questionnaire survey of large and/or exporting companies within the South East and South West then examines the perceived impact of the Tunnel and likely reactions of companies towards it. As Figure 1.9 shows, attention then focuses on specific case studies. Case studies of East Kent and the "Far South West" (Devon and Cornwall) relate the findings discussed earlier in the study to the local level. Regional consultancy reports were drawn on, as well as information obtained through attendances at conferences and interviews, primarily with representatives of County/District Councils and local Chambers of Commerce and Industry.

Other than the short-term construction impact, the economic benefits resulting from the Tunnel are primarily dependent on British companies taking advantage of improved accessibility to the Continent. It is therefore important that the geographical impact of the Tunnel on regional accessibility is incorporated into any theoretical model. Economic Potential Analysis will measure the impact of the Tunnel on the relative accessibility of all UK regions vis-a-vis the Continent. Potential values can be used as a proxy measurement for regional economic development, identifying each region's comparative advantage for economic growth. Potential analysis can accommodate changes in the transport network, allowing the re-evaluation of a region's relative accessibility. It is widely considered that the more distant regions of the European Community (EC) have been disadvantaged by their location in relation to the major Community markets, further peripheralising their regional economies (Keeble, Owens and Thompson 1982b). However, it is hypothesized in chapter 3 that the more peripheral UK regions could experience gains in relative accessibility the same as, or higher than, the South East. This assumption is based on the present pattern of trade between the UK and the Continent, with more than 75 percent of UK exports to the Continent originating from outside the South East (Pieda 1989b). The Tunnel may encourage British companies to change their distribution practices in favour of the rail network, since rail freight is able to compete more effectively with road haulage over distances in excess of 250/300 kms (Pieda 1989a&b). The Economic Potential Model is therefore intended to test the usual assumption that the South East will benefit the most from the Tunnel.

However, the limitations of Britain's supporting transport infrastructure and the Government's present "hands-off" approach to the Tunnel could work to the detriment of the regions. It is argued in the present study that the ability of the regions to maximise the benefits offered by the Tunnel will be restricted by Government policy, particularly through the tight control of the railways. The post-1979 Conservative Government proved to be a strong advocate of a fixed Channel link. The then Prime Minister, Margaret Thatcher, even added her personal support to the proposed scheme. Nevertheless, after hastily passing the necessary legislation, the Government has avoided any form of direct intervention, especially in the case of the high-speed rail link between London and the Tunnel portal. A comprehensive review of the British Government's policy towards the Tunnel is therefore fundamental to any examination of the regional economic implications of the Tunnel. Such a critique becomes even more vital in the light of the pro-active policies favoured on the Continent. The British Government's market solutions approach to the Tunnel contrasts strongly with the interventionist strategies promoted in France. The British Government is also at odds with the European Commission's (1990) proposed pan-European high-speed rail network. The policy review will address the perceived inadequate nature of Britain's supporting transport network and services, especially in terms of the rail network. Section 40 of the 1987 Channel Tunnel Act, which established a series of regional consultations between BR and local government, commerce and industry, highlights concerns that the benefits created by the Tunnel will be confined to the South East, and not spread throughout the UK, as a result of an inadequate transport network (Farrington, Gibb and Knowles 1990).

The third strand of research identified in Figure 1.9, incorporates the analysis and interpretation of primary data generated by a questionnaire survey. Prior to the present study, only two published surveys of company attitudes toward the Tunnel were carried out: Eurotunnel and BR (1988) commissioned a survey of all UK regions, except for the South East; and the London Chamber of Commerce and Industry (1989) conducted a survey of London's business community. The usefulness of both surveys is limited due to the lack of inter-regional comparisons. The questionnaire survey undertaken for the current research project targeted 1,500 companies within the South East and South West, the aim being to provide information on the general perceptions of British companies

toward the Tunnel and the wider regional economic implications, and to determine the anticipated demand for the Tunnel, via BR's international through services and Eurotunnel's Shuttle service. The questionnaire survey constitutes an important part of the present study, not only because of the original nature of the data produced but also in terms of how the data support the aims of the thesis. The overall findings are analyzed and discussed in chapter 5 and a regional analysis of the results in chapter 6.

The questionnaire survey focused on the South East and South West to identify inter- and intra-regional similarities and differences in terms of company reactions to the Tunnel. As stated earlier, this project will examine the economic implications of the Tunnel on both core and peripheral UK regions. The South West, particularly the "Far South West", exhibits characteristics usually associated with the "North" (Champion and Green 1988, Green 1989). The Town and Country Planning Association (TCPA - 1990) also considers Cornwall, Devon and Somerset as part of the "North". Although "spatially" in the South, the "Far South West" is generally regarded as part of the "economic" North. Thus, it is apparent that analysis of the questionnaire results will allow important "Core-Periphery" comparisons to be made. Furthermore, the incorporation of companies in the South West region as a whole enabled any transition of perceptions as distance increases away from the Tunnel to the (South) West to be highlighted. Chapter 8 analyzes in more detail the economic structure of the "Far South West", drawing further comparisons between this peripheral part of the South West and the "North" in general. However, it must be stressed that time and financial restrictions prevented other peripheral UK regions being targeted. In addition, the questionnaire survey represents only one component of the present thesis, with Economic Potential Analysis (chapter 3) and the legislation and policy review (chapter 4) focusing attention on the broad regional economic implications of the Tunnel for both "North" and "South". Hence, the implied constraints of targeting only two regions are not consistent throughout most of this study.

Following analysis of the questionnaire results, the present thesis then focuses on the case studies of East Kent and the "Far South West". Issues raised in the preceding chapters will be applied at this "local" level of analysis so that the specific hopes and fears of these two regions can be examined. East Kent was chosen as a case study since it is likely to be

affected significantly by the Tunnel in the short, medium and long-term. East Kent lies within the "prosperous" South East but is considered unlikely to benefit from the Tunnel to the same extent as the region as a whole (Gibb 1986b). The medium-term impact of the Tunnel on the existing cross-Channel ferry and port industry is of particular concern to East Kent. The Tunnel will detrimentally affect the largest, and only growing, industry within East Kent, stunting future growth in the industry. However, East Kent is expected to benefit from improved accessibility to the Continent just like the South East in general. The impact of the Tunnel on the Far South West is likely to contrast sharply with the situation in East Kent given its isolation from the Tunnel. This isolation exists, not only as a result of pure geographical distance but also because of poor road and rail links. The implications of the Tunnel for the Far South West will therefore be "typical" of the prospects for many of the UK's peripheral regions. The direct impact of the Tunnel on the local economies of Devon and Cornwall is likely to be limited, since both counties are considered to be "insulated" from the adverse effects. However, the "Third Market" impact of the Tunnel is of particular concern to such "isolated" regions because increased foreign competition in UK domestic markets is likely to affect detrimentally local manufacturers. The two case studies will therefore address the wide spectrum of hopes and concerns aroused by the Tunnel.

1.4. Research Philosophy

Having established the research objectives and structure of the present thesis, it is now appropriate to discuss the research philosophy underpinning the project. Essentially the study has been based on an empirical analysis of the regional economic implications of the Tunnel. However, this needs to be put in a wider context. The empirical nature of the present study is undertaken within an eclectic philosophical framework, utilising both positivist and humanistic schools of thought. Therefore, any dogmatic dependence on one particular philosophy, and its implied limitations, is avoided. An empirically based positivist approach was considered necessary for the examination of the likely impact of the Tunnel on UK regional accessibility. However, when analyzing the legislative and policy environment, and the perceptions and likely reactions of companies toward the Tunnel, a humanistic approach was regarded as more appropriate.

1.4.1. The Positivist Approach

Empiricism is a philosophy of science which places emphasis on the importance of observations over theoretical statements (Bird 1979), only accepting theories as valid once they are empirically proven. However, the present study departs from pure empiricism. As argued by Johnston (1986), empirical observations do not always 'speak for themselves', since the methodology of empirical analysis only requires presentation of the experienced facts. Nonetheless, empiricism is a fundamental assumption of positivism. The positivist approach to research is concerned with empirical questions, exploring the 'direct, immediate and empirically accessible experience of the world' (Johnston 1986). Positivism also assumes that methods usually associated with the natural sciences can be incorporated within the social science arena, and even the humanities, leading to a unitary scientific method and eventually universal laws.

The present study is based on conventional hypothesis testing which depends ultimately upon empirical validation. No attempt will be made to establish universal scientific laws based on empirically recognised generalisations. The central hypothesis of the present research project that the Tunnel represents an opportunity to redress the economic imbalance between "North" and "South" is tested within a theoretical framework, using Economic Potential Analysis (chapter 3). Economic Potential Analysis utilises primary and secondary data to quantify the impact of the Tunnel on the relative accessibility of the UK regions vis-a-vis the Continent. The present thesis is therefore grounded in both deductive-mathematical and inductive-statistical methods of analysis. A criticism of the positivist philosophy stems from its dependence on the principle of verification, since verification, in turn, requires additional quantitative measurement of the observed. Hence, the information upon which a study is based becomes greatly increased, without necessarily improving the explanation.

1.4.2. The Humanistic Approach

The current research project therefore avoids the dogmatic and 'unreflective' approach of positivism (Johnston 1986). A humanistic approach within the study is also required to analyze the subjective nature of questionnaire results and the implications of the legislative and policy environment. The reasons behind company perceptions toward the Tunnel and their current plans to use its services need to be examined in detail. Furthermore, an analysis of the legislative and policy environment of the Tunnel both within the UK and on the Continent enables a more comprehensive understanding of the regional economic implications of the Tunnel. Government policy on the Tunnel and supporting transport infrastructure cannot be examined in isolation from the effect of the Tunnel on regional accessibility and/or the perceptions and likely reactions of companies. So the relationship between the policy environment and the potential regional economic impact is a primary focus of the present thesis.

Humanistic geography is distinguished firstly, by the central role played by "man" and, secondly, by the subject matter under investigation. It is predominantly of a "subjective" nature and is suspicious of claims made about "objectivity". Humanistic philosophy

encompasses 'an expansive view of what the human person is and can do' (Tuan 1976). Examination of human activity and the cognitive processes emphasizes the individuality of the "place" and not just the spatial aspects of the location. The present thesis incorporates this approach in studying perceptions/beliefs of the main actors influencing the regional economic impact of the Tunnel (i.e. central and local government, as well as individual companies).

Fieldwork is therefore an important element within the humanistic philosophy, as well as the interpretation of the findings. Fieldwork undertaken for the current study involved a questionnaire survey as well as both structured and unstructured interviews. The case studies of both East Kent (chapter 7) and the "Far South West" (chapter 8) both rely on interviews carried out with representatives of local government and/or industry. Such humanistic techniques of analysis can lead to ambiguities in the interpretation of the data generated since subjectivity and bias may well exist. An additional problem is that the researcher can influence the data gathering process. However, the questionnaire incorporated structured questions to avoid bias and subjectivity in the interpretation of the responses. Increasing objectivity is a primary aim of all research projects, the present one being no exception. The research methods employed in the current study, particularly the questionnaire survey, are discussed in more detail in the next section and relevant chapters.

1.5. Research Methodology

After critically reviewing the relevant literature concerning the national and regional economic impact of the Tunnel (chapter 2), emphasis shifts towards finding a suitable regional economic development model and the generation of original data using questionnaire and interview techniques. A critique of the policy environment of the Tunnel and related transport infrastructure is essentially based on an analysis of published statistics, Government and private sector consultancy reports and relevant legislation. Thus,

the present thesis will contribute to the debate about public and private sector policies towards the Tunnel as well as its regional economic implications.

An appropriate regional economic development model has to assess the economic implications of the Tunnel for the UK, both nationally and regionally, vis-a-vis continental regions. As a direct result of earlier work by Keeble et. al. (1982a), Economic Potential Analysis was adopted as the most suitable technique, enabling new and comparative results to be analyzed. Economic potential is a measure of the nearness or accessibility of a given volume of economic activity to a particular point/region and can be interpreted as the volume of economic activity to which a region has access, after the cost/time of covering the distance to that activity has been accounted for. The potential model calculates the impact of the Tunnel on the relative accessibility of UK and continental regions, and thus regional proximity to European activity. For example, the relative accessibility of Scotland, before and after the Tunnel, to European-wide economic activity can be quantified and compared to regions such as the South East. Potential values can be interpreted as a measure of regional advantage for economic development in terms of relative accessibility in geographic space to economic activity. Potential analysis can accommodate new developments in the transport network, and thus re-evaluate a region's changing relative accessibility. The potential model will therefore provide a useful theoretical framework from which to quantify the impact of the Tunnel on regional accessibility and a region's comparative advantage for economic development. The standard potential equation, as advanced by Rich (1980), is set-out in chapter 3, as is a detailed account of the modelling procedures and methodological issues.

The questionnaire survey was carried-out in May/June, 1991, with more than 1,500 companies within the South East and South West targeted. The methodological issues raised by the questionnaire survey are discussed in detail later on in the thesis, see chapter 5. A postal survey of large and/or exporting companies was undertaken to target companies more likely to be affected by the Tunnel. The initial criterion employed specified that companies should be involved in industrial/distribution activities, with an annual turnover in excess of £20 million. Along with an introductory letter, stressing the importance of the survey and an assurance of complete confidentiality, a secondary letter was sent out to

encourage a higher response rate. A pilot survey was carried-out and the necessary amendments made to the questionnaire. Standard statistical techniques, including Chisquare X^2 test, are used to analyze the results. The questionnaire was designed to simplify computation and analytical procedures, see Section 5.3. The results are interpreted in the light of the theoretical and policy framework established earlier in the present thesis.

For the purposes of the case studies, the original data generated by the questionnaire survey was supplemented with interviews carried-out among representatives of the local economies of East Kent and the Far South West. County and District Council officials were interviewed to determine the likely reactions of the regions to the challenges created by the Tunnel. It was decided that these interviews should be "open", i.e. the interviews were unstructured. Due to the wide ranging implications of the Tunnel, open interviews allow the localised hopes and fears to be properly addressed. Interviews were also undertaken in France and Belgium to ascertain the policy responses of the two Governments, as well as with the national railway companies (SNCF and SNCB). A ERASMUS grant was obtained to finance fieldwork in both France and Belgium. Attention is focused on the Nord-Pas de Calais region, which has benefited from large-scale investment in the economic and transport infrastructure. Again, open interviews were preferred. It was also necessary to conduct a series of interviews with BR Project Management to substantiate certain parameters used in the potential analysis. Pre-determined questions were asked to satisfy the specific requirements of the interviews. Several regional conferences have been attended, particularly in the South West. These conferences proved useful in discussing the broad subject of the regional economic impact of the Tunnel. The interface between national, regional and local policy makers, industrialists and academics enabled a broad spectrum of opinions to be heard and analyzed.

Notes

1. Capacity of a railway line is determined by the number of "paths". Each path allows trains to operate unaffected by the train in front. The time between successive trains, passing a given point, is termed the "headway".

CHAPTER 2: THE LITERATURE REVIEW

A synthesis of the existing literature will underline the high degree of confusion that is still commonly associated with the regional economic impact of the Tunnel. On the whole, academic involvement has tended to be 'highly speculative' (Gibb et. al. 1992), generating very little original data. This is very apparent for the national review of the literature, where the general assumption that the Tunnel will be good for the UK is unsubstantiated. The need for a comprehensive study on the regional economic impact of the Tunnel in the UK, based on empirical evidence, is therefore apparent. Nonetheless, the Tunnel has engendered a voluminous amount of academic and official publications. It is therefore practicable to concentrate only on the literature concerning the present Tunnel project. A recommended reading list for pre-1980s fixed link schemes is provided in Appendix 1.

The lack of consultation between national and local government has led to much anxiety about the economic implications of the Tunnel, particularly for the more peripheral UK regions. As will be examined in more detail in chapter 4, the British Government has not conceded to the calls for national and/or regional impact studies, except for the adjacent county of Kent. The use of a Hybrid Bill for the 1987 Channel Tunnel Act also removed the need for a public enquiry, the usual platform for consultation needed for major infrastructure projects. Regional interest groups fear that the economic benefits created by the Tunnel will be predominately located within the South East, to the detriment of the more peripheral UK regions. It is widely argued that the inadequate nature of Britain's transport infrastructure, particularly south of London, will act as a barrier to the spreading of these benefits (Simmons 1985, 1989, Gossop 1987, Harmen 1989, Town and Country Planning Association (TCPA) 1990). This issue is of fundamental importance to the regions and as such represents the main theme extrapolated throughout the literature review.

As stated earlier, the aim of the current research project is to examine the potential regional economic impact of the Tunnel. It is generally assumed that the Tunnel will further exaggerate the "North-South divide" (Campaign for the North 1981, North of

England Regional Consortium (NOERC) 1988, Centre for Local Economic Studies (CLES) 1989, Pidd 1989a&b, South East Economic Development Strategy (SEEDS) 1989, South East Regional Planning Conference (SERPLAN) 1989). The Literature Review will therefore concentrate on the regional economic implications of the Tunnel, initially identifying the perceived opportunities and problems within the South East, before examining the main concerns of the more peripheral UK regions. However, it is first appropriate to discuss the potential impact of the Tunnel on the UK economy as a whole. Numerous national overviews are confident that the Tunnel will be good for Britain. However, the South East is generally regarded as the main potential beneficiary. It is therefore necessary to question whether regional considerations have been outweighed by the national interest.

2.1. The National Economic Impact

As a direct consequence of Government policy, the construction benefits brought about by the Tunnel have been spread throughout the UK. It is therefore appropriate to discuss the short-term implications of the Tunnel in the regional review of the literature. This section will focus on the long-term effects of the Tunnel on the British economy. Proponents of the Tunnel argue that increased efficiency and reduced operating costs for cross-Channel traffic will not be regionally biased but open to all UK manufacturers. However, it is important to highlight the perceived limitations of Britain's supporting transport network. The national review of the literature will therefore initially concentrate on the potential opportunities created by the Tunnel, before focusing attention on the likely problems.

2.1.1. The Opportunities

It is generally assumed that the Tunnel will provide a much needed impetus for British commerce and industry and thus, numerous opportunities for the UK economy (CTG 1985a&b, BR 1987, Eurotunnel 1987, Banham 1988). The importance of the improved cross-Channel communications even encouraged BR to suggest that:

'....Great Britain, if it is to retain the word "great" in its title, can no longer afford to be an off-shore island of Europe.'

(BR 1987, P.4)

The Tunnel will link for the first time the road and rail networks of the UK and the Continent, considerably improving access between the main European markets. As reported by Kay, Manning and Szymanski (1989), the European Commission also regards the Tunnel as symbolic of its aspirations to bind Europe closer together. Moves toward a pan-European high-speed rail network are a broader expression of the Commission's objective to achieve greater integration (European Commission 1990). The British Government's reluctance to commit public funds to the high-speed rail link between London and the Tunnel portal conflicts sharply with wider Community policy. Fyson (1991) argues that Britain's 'off-shore island' status within the EC is therefore likely to evolve into little more than 'branch line' mentality. Hence, the failure of the British Government to invest in the supporting transport network is generally considered as a missed opportunity (Gossop 1987, TCPA 1990). The perceived inadequate nature of the supporting transport infrastructure is the central issue examined in this literary review.

The Concessionaires, Eurotunnel (1987), have stated that through reduced transit times and costs for cross-Channel traffic, the Tunnel will stimulate economic development and encourage increased trade with the Continent. Eurotunnel found enthusiastic support from the highest offices of Government, with the Secretary of State for Transport announcing during the franchise award that:

'The link in operation will bring direct benefits....these benefits can be expected to increase the level of UK's trade with continental Europe and contribute to economic growth and employment throughout the UK.'

(Kay et. al. 1989, P.75)

However, Pida (1989a&b) believes that the lack of acknowledgement of the similar potential for continental imports penetrating UK markets is an all too common omission. The "double-edged" nature of improved accessibility and the "Third Market" impact will be discussed later in the regional analysis of the literature. Chapter 8 also examines the implications of increased continental penetration of domestic UK markets for the "Far South West".

In the British Business Supplement on the Tunnel, the Chairman of the Confederation of British Industry (CBI), John Banham affirms his confidence in the potential which the Tunnel offers British companies:

'By ensuring stronger geographical links between the UK and the continent, the Tunnel will represent another step along the path to European economic integration.'

(Banham 1988, P.8)

According to Banham, the Tunnel, in conjunction with the SEM, could revolutionise European industry, encouraging specialisation which would in turn permit the achievement of economies of scale. Four main benefits are identified by Banham which could accrue to British commerce and industry after the Tunnel becomes operational in 1993:

- (1) A revitalised UK rail freight industry;
- (2) A fillip for Britain's tourism and related industries;
- (3) An alternative transport mode for the business traveller; and
- (4) The diversion of traffic away from the existing 'congested' modes of transport.

Banham points out that the Tunnel will allow rail freight to utilise its competitive advantage over road haulage for distances in excess of 300 kms. The close proximity of Britain's major cities in relation to each other is seen to limit the scope for domestic rail freight. As for tourism, Banham believes those travelling to the UK will benefit from a more direct mode of transport, which is unaffected by the weather. Also business travellers to Europe are expected to enjoy faster services to near continental cities, such as Paris and Brussels. The advantages accorded to British tourism are generally seen as the main benefit of the Tunnel, especially in the South East (British Tourism Authority (BTA) 1988, 1989, SEEDS 1989, SERPLAN 1989). Finally, Banham regards the Tunnel as a means to relieve congestion in the air and on Britain's motorway network, which costs British industry an estimated £15 billion every year.

However, Banham is aware that certain factors could dampen these potential benefits. Thus, it is argued that if British business is to benefit fully, an adequate network of

supporting transport infrastructure has to be in place by 1993. The central hypothesis of the present thesis states that the Tunnel represents an opportunity to narrow the North-South divide, with improved rail access for freight exports seen as paramount for the more peripheral UK regions. But it is also recognised that the Government's policy of non-intervention is likely to limit this opportunity and even accentuate the regional economic divide. The constraints imposed on the regionalisation of potential benefits created by the Tunnel are discussed in the next section and the regional review of the literature.

2.1.2. The Problems

The problems associated with the Tunnel in part relate to the question who gains and how? But, more importantly, an inadequate supporting transport network is generally regarded as the obstacle preventing regions maximising the potential benefits created by the Tunnel. However, before focusing attention on these issues, it is first interesting to explore briefly the counterfactual argument postulated by Button (1989).

The opportunity cost

Even though Button accepts that the Tunnel could be advantageous to British industry, the construction of the Tunnel and related infrastructure is seen to represent a redeployment of resources from elsewhere in the economy:

'At the national level it (the Tunnel) stimulates employment and production, although there is an obvious opportunity cost to be set against this in that resources are taken from other productive activities.'

(Button 1989, P.10)

The concept of opportunity cost, in the case of the Tunnel, implicitly assumes that the £8.1 billion needed to finance the project would have been productively used elsewhere in the economy. This approach is highly questionable. An international banking consortium made available loans of £7 billion and a further £1.1 billion was raised through a shares issue, of which more than 50 percent was accounted for by non-UK residents. Thus, the monies used to build the Tunnel, on the whole, represent a net addition to the UK economy. Hence, the counterfactual argument posed by Button does not apply.

Who benefits and how?

In terms of "who" benefits, Eurotunnel (1987) maintains that improved accessibility to the Continent will promote economic growth and employment throughout the UK. However, Eurotunnel's predecessor, the CTG (1985a&b), recognised that a region's relative accessibility to the Continent may prove to be more important. It is generally accepted that the South East by virtue of its geographic position will experience the greatest increase in accessibility relative to other UK regions. In addition, the CTG (1985b) quite correctly point out that the UK would not be the only European country to benefit from the Tunnel. Hence, France and other near continental countries may be in a stronger position to augment the advantages offered by the Tunnel. Within the UK, the South East's proximity to the Continent is also more likely to be enhanced to the detriment of the more peripheral regions. The impact of the Tunnel on regional accessibility within the UK and on the Continent is an important component of the present thesis (see chapter 3).

The generally accepted benefits of the Tunnel for British industry, as outlined above, also need to be examined, i.e. how? Most commentators agree that the long-term impact of the Tunnel will be primarily determined by British companies realising the anticipated savings on journey time and cost over existing modes of cross-Channel transport. As observed by Piedad (1989a&b), this is dependent on companies sending freight exports via the rail network. EC legislation on permitted daily driving hours increases the attraction of rail freight over the road haulage sector, at least for regions outside the South East. While ferry crossings allow drivers their legally required rest period, Eurotunnel's Shuttle service does not. Thus, any initial time savings enjoyed by road hauliers when using the Shuttle service will in all probability be lost. Thus, to exploit the advantages created by the Tunnel most British companies will have to send freight exports via the rail network. However, Knowles, Farrington and Gibb (1989) highlight concerns, expressed in the Section 40 regional consultations, about inadequate investment in rail infrastructure. Furthermore, Kent County Council (KCC - 1989) forecast capacity constraints on Kent main line tracks as soon as the Tunnel opens or shortly after. Companies are therefore less likely to adapt their distribution policies in favour of rail haulage.

Reduced transport costs are also expected to improve British competitiveness and increase UK trade with the Continent. However, Szymanski and Manning (1988) argue that the Tunnel is likely to result in higher prices. The Tunnel's escalating debt burden is seen to restrict Eurotunnel's ability to set competitive tariff rates, at least as originally proposed by the CTG (1985a&b). Flexilink, a consortium of port and ferry interests, also stresses the positive response by P&O and Sealink to the challenge created by the Tunnel (Hall 1987). Through a policy of rationalisation, and the introduction of new 'Super' ferries and new port technology, Hall points out that ferries will significantly lower their operating costs before the Tunnel opens, by up to 40 percent. It is therefore believed that the ferries will meet the increased competition 'head-on' (Hall 1987). Hence, the reduction in cross-Channel tariff rates via the Tunnel is likely to be much less than originally anticipated by Eurotunnel. But if Szymanski and Manning's (1988) analysis is proved to be correct, a general rise in the level of cross-channel tariff rates could be the result. Since Szymanski and Manning assumed that the opening of the Tunnel would be delayed until January 1994, it would seem that their predictions cannot be easily overlooked.

Notwithstanding the above, it would be against the interests of the consortium of lending banks, or even the ferries, to make Eurotunnel uncompetitive (Kay 1989). It is reasonably safe to assume that the Tunnel will be able to undercut prices charged by the ferry companies, albeit less than initially planned. Even so, Kay et. al. quite correctly argue that cross-Channel crossings account for only a small fraction of total company costs. Hence, the impact of the Tunnel on the level of UK trade to the Continent is not expected to be significant. This assumption is supported by the European Commission's document on 'The Economics of 1992' which states that transport costs will only play a very minor rôle in the determination of Community trade (Kay et. al. 1989). However, Vickerman (1989a) considers the possibility that transport costs could be influential in the size of company profit margins. It follows therefore that even though transport costs represent usually less than three to five percent of company costs, and cross-Channel costs much less, any cost savings could be important, particularly if the Tunnel offers an improved service quality and reliability. Nonetheless, it can be seen that the general benefits of the Tunnel, as expressed by its proponents, are not definite or void of problems. The ability of British industry to maximise the opportunities created will also be limited by the perceived

inadequate supporting transport network. This issue is examined briefly in the next section and in detail in the regional review of the literature.

Supporting transport infrastructure

The Campaign for the North (1981) is concerned that as a result of inadequate transport infrastructure certain UK regions would be disadvantaged. It is considered that London acts as an effective barrier between the regions to the north and west and Continental Europe. In a petition to the House of Commons Transport Committee, the Campaign for the North states that:

'....any fixed Channel link scheme which removes the Channel barrier between London and the Continent without also removing the London barrier....will greatly worsen the position of the regions of Britain north and west of London relative to that of London and South East England in respect of social and commercial intercourse with the Continent.'

(House of Commons (Vol.III), 1981, P.93)

It is therefore argued that consideration must be given to the overall financial benefit or cost of the Tunnel for the UK economy as a whole. Since no quantitative assessments are possible until after the Tunnel becomes operational, the Campaign for the North believes that any generalisations would depend on:

- (1) The net generated flow of tourists between the UK and the Continent;
- (2) The net level of generated trade between the UK and the Continent;
- (3) Whether the sum of (1) and (2) was a generated net Balance of Payments surplus or deficit.

Concern over the regional implications of the Tunnel led the Campaign for the North to focus attention on the potential adverse effects of the Tunnel:

'If the answer to (3) was a trade deficit, then the question must be asked as to whether the country as a whole could afford to pay in this way for the consequent non-material benefits to those Britons who would enjoy greater ability to travel abroad or to acquire foreign imported goods or services.'

(House of Commons 1981, P.95)

Not surprisingly, the Campaign for the North concluded that the Tunnel represented a 'gamble' for the UK. Furthermore, it was considered that the peripheral regions would have to bear the brunt of the ensuing adverse effects if the gamble failed. Gossop (1987) considers Government policy to have done little to appease the fears of regional interest groups. The ability of the regions to take advantage of the benefits created by the Tunnel has been severely limited by the Government's apparent inaction.

Nevertheless, national overviews generally portray an optimistic scenario of improved competitiveness and increased exports for British companies. The Tunnel's greater efficiency and lower marginal operating costs are expected to stimulate economic activity within the UK. However, it has been shown that this optimism could be misplaced, particularly with regard to the problem of a perceived inadequate transport network and the threat posed by continental imports. Whether this optimism is more or less applicable at the regional level can now be examined. The question marks raised by Banham (1988) and the Campaign for the North (1981) need to be more fully addressed. In addition, attention will focus on the concerns of regional interest groups, particularly the fear that the benefits created by the Tunnel will be confined to south east England, further widening the economic divide that separates 'North' and 'South'.

2.2. The Regional Economic Impact

Consultancy reports recognise that in order to maximise regional opportunities, Britain needs an efficient supporting national transport network. The need to improve Britain's road and rail networks has been consistently stressed by academics and regional interest groups alike in an attempt to allow each region to fully realise the potential offered by the Tunnel (Simmons 1985, 1989, Gossop 1987, Harmen 1989, Knowles et. al. 1989, Farrington et. al. 1990, TCPA 1990). Several reports highlight the inadequacies of the South East's transport infrastructure, as a result of the 'over-heated' nature of the region's 1980s 'economic boom' (KCC 1989, SEEDS 1989, SERPLAN 1989). However, it is also

recognised that the repercussions of such an inadequate transportation system would not be confined just to the South East (NOERC 1988, CLES 1989, Piedad 1989a&b).

The British Government's view that the Tunnel will be 'good' for Britain as a whole is at odds with the widely held Continental belief that the Tunnel's hinterland in Britain does not stretch beyond north London (Holliday and Vickerman 1989). In fact, Holliday and Vickerman argue that cities outside the South East are generally expected to be adversely affected by the Tunnel. However, Piedad (1989a&b) points out that the reactions of Britain's business community to the challenges created by the Tunnel will ultimately determine the regional economic impact. Vickerman and Flowerdew (1990) do not foresee the Tunnel affecting significantly 'the location or relocation of existing or new businesses within the UK'. The manifestation of a southwards drift of industry as a result of the Tunnel, as feared by regional interest groups, is therefore considered unlikely. The opportunities for rail freight are likely to be spread throughout the UK, probably more so in the peripheral regions. Companies would therefore gain no competitive advantage by relocating closer to the Tunnel portal. However, the South East is generally seen as benefitting most from improved access to the Continent. Hence, attention will first focus on the implications of the Tunnel for the south east corner of England. It is then possible to examine the perceived prospects for the more peripheral UK regions. It is widely believed that the short-term impact of the Tunnel will be advantageous to the more peripheral UK regions, albeit less than predicted. In the long-term, many anticipate the widening of the North-South divide. On the whole, regional interest groups believe that the national interest has eclipsed the potential adverse regional effects that the Tunnel could induce.

2.2.1. The Potential Impact on the South East

First, the findings of the survey undertaken by the London Chamber of Commerce and Industry (LCCI - 1989), which analyses the perceived impact of the Tunnel on London's business community are examined. These findings will then be contrasted with the main conclusions reached by SERPLAN (1989). Within the South East, London is regarded as the main recipient of the opportunities created by the Tunnel. The critique of the LCCI

report will provide a useful insight into the perceptions of London's business community. The confident forecasts as reported by the LCCI have to be analyzed in the light of the threat posed by the near Continent, in terms of both the attraction of Nord-Pas de Calais to British companies and likelihood of increased import penetration of UK markets. In addition, the adequacy of the region's transport network has to be examined. The South East's tourism industry is expected to receive a major 'fillip' from the Tunnel, and thus requires consideration. It should be again stressed that regional reports for the South East, on the whole, also disregard the prospect of increased import penetration by continental companies as a result of the Tunnel. Quite rightly, the main concern identified is the inadequate nature of the region's transport infrastructure, particularly the rail network.

Constrained optimism

According to a survey of London's business community, carried out by the LCCI (1989), the majority of respondents anticipate that the Tunnel will positively affect the South East. In addition, a significant proportion of companies surveyed intend to use the Tunnel:

'A third of respondents in the production sector plan to use the Channel Tunnel for freight and a quarter plan to use it for passenger trips. The respective proportions in services are a fifth and a quarter.'

(LCCI 1989, P.3)

The LCCI expect these proportions to increase closer to the opening of the Tunnel. Of the 170 companies that responded to the LCCI survey (a response rate of 36 percent) the majority anticipate 'positive effects on competitiveness in the European market and the level of foreign business', more so in the production sector. There is greater optimism in the service sector about the impact on domestic business and home competitiveness. But as pointed out by the LCCI this could intensify labour market and other pressures which the Capital is already facing.

It is encouraging that, in both the production and service sectors, the anticipated negative impact on home competitiveness is much lower than the expected positive effect on European competitiveness, see Tables 2.1 and 2.2. This suggests that companies in London

believe that their export business will benefit more from the Tunnel than their domestic business will be harmed.

	<u>Production (%)</u>		<u>Services (%)</u>	
	Positive	Negative	Positive	Negative
Level of Domestic Business	12.0	7.2	11.5	3.4
Level of Exports/ Foreign Business	33.7	1.2	17.2	6.9
Competitiveness in UK Market	10.8	13.7	9.2	8.0
Competitiveness in European Market	36.1	1.2	18.4	4.6

Table 2.1: Impact of the Tunnel on company competitiveness: all respondents.

(Source: LCCI 1989, P.11)

	<u>Production (%)</u>		<u>Services (%)</u>	
	Positive	Negative	Positive	Negative
Level of Domestic Business	20.6	14.7	17.9	3.6
Level of Exports/ Foreign Business	58.8	2.9	25.0	10.7
Competitiveness in UK Market	20.6	23.5	25.0	7.1
Competitiveness in European Market	67.6	2.9	37.3	3.6

Table 2.2: Impact of the Tunnel on company competitiveness: respondents anticipating using the Tunnel.

(Source: LCCI 1989, P.12)

No explanations are given why companies in London tend to be so confident. It is therefore necessary to be cautious when interpreting these findings. Again, the need for a

substantive study on the regional economic impact of the Tunnel, based on sound statistical evidence, is highlighted. However, the report went on to explain that the Tunnel and 1992, at the time of the survey, were still regarded as distant events. Priority was still given to the routine day-to-day difficulties of high costs and staff shortages.

SERPLAN (1989) predicts that the economic impact of the Tunnel itself may have only a 'modest effect' on the South East, except possibly for the tourism industry. It is considered that the Tunnel will be largely neutral in its impact on the overall balance of trade between Britain and the Continent, improving speed and accessibility equally in both directions, and hence, only accelerating existing trends in imports and exports. Vickerman (1989a) is also of the opinion that the regional economic impact of the Tunnel will be neutral. Proponents of the Tunnel, and even the Government, have stressed the beneficial impact that the Tunnel will have on the UK's trade with the Continent. Thus, it seems that any positive effect on British exports will depend on which region and industry they originate from. Regional interest groups regard the benefits of increased trade with the Continent as being seriously flawed.

However, SERPLAN does believe that:

'....the 'combined effects' of the Tunnel, "1992" and other trends in production methods and in the region's economy could lead to significant economic growth in the South East; the region's economic geography is likely to alter, as the south east quadrant will benefit most from these factors.'

(SERPLAN 1989, P.7)

In terms of growth within the South East, SERPLAN has stated that:

'If growth occurs as a result of the Tunnel, the eastern part of the region will be well placed to benefit, subject to possible labour and transport constraints. Transport links of good quality and adequate capacity are seen as a necessary condition for achieving economic growth in areas which can accommodate it.'

(SERPLAN 1989, P.18)

Simmons is also in agreement:

'The possibilities for economic growth transferring to eastern London and adjacent areas of Kent and Essex is steadily increasing. An adequate development structure, relating infrastructure to site provision to labour is, however, needed.'

(Simmons 1985, P.18)

It follows therefore that the Tunnel is seen as a means to transform areas to the east of London but only if the transport network is improved accordingly. The announcement in September 1991 giving the go-ahead for the East London River Crossing, the extended runway for London City Airport and several road improvement schemes, forms part of the Government's strategy to attract investment to the east of London (Hall 1991a&b). Furthermore, it has been shown by Gibb and Smith (1991) that the decision in favour of Ove Arup's proposed eastern route for the high-speed rail link between London and the Tunnel portal is an important component of Government policy to create a 'linear city' in the East Thames corridor. Simmons (1985) argues that any such development in the east of the region would relieve pressure to the west of London along the M4 corridor, where there are problems associated with rapid and prolonged growth such as rising costs, congestion and encroachments on to the Green Belt. The CTJCC (1991a&b) shows that any such optimism would be misplaced for East Kent since the area will have to absorb most of the medium-term adverse effects. The Port of Folkestone has already ceased to operate traditional ferry services, even though the new SeaCat is in service to Boulogne. The problems and opportunities facing East Kent will be discussed in more detail in chapter 7.

According to the LCCI (1989) report, only a low proportion of the respondents stated that the Tunnel would improve accessibility to Europe. This is surprising since improved accessibility is the main advantage of, and whole reason for, the Tunnel. This would imply that London's business community did not, at least in 1987, regard improved accessibility between the UK and the Continent as important to them. If European companies react quicker and more favourably, the Tunnel could do more than accelerate existing trade patterns. Such a non-neutral effect would be detrimental to the South East and to the UK as a whole with more continental imports penetrating the home market.

The continental threat

Both the reports by SEEDS (1989) and SERPLAN (1989) agree that the prospect of UK firms migrating to the near Continent to realise the opportunities created by the Tunnel and 1992, as well as the potential southward drift of industry within the UK, is groundless. But SERPLAN does expect companies with British and European interests, wishing to expand or diversify their activities, to realise the attractions of areas close to the Tunnel. However, SERPLAN neglects to outline these supposed attractions. Vickerman (1989a) argues that the perceived increase in accessibility could be more important than any actual improvement in cross-Channel transportation. It follows therefore that if companies believe the Tunnel will improve accessibility to-and-from the Continent, they will respond in such a way to realise this improvement.

If the South East's supporting transport network does prove to be inadequate and a hindrance to growth, then industrialists may perceive the Continent as a more optimal location (Harmen 1989, Simmons 1985, 1989). As pointed out by Simmons (1985), northern France, as a relatively depressed region, is in receipt of Government and EC assistance. Hence, Nord-Pas de Calais and possibly even northern Belgium, with adequate inland transport infrastructure and sufficient development land, will have a comparative advantage over the South East. The Nord-Pas de Calais Regional Council aims to transform the region into the 'crossroads' of Europe, with good road and rail links spreading out to all parts of the Community. The Regional Council (1991) is confident that they will be able to create the right commercial environment to attract companies, needing a continental base, to locate within the region. The comparative advantages of Kent and Nord-Pas de Calais are examined in chapter 7. Whilst Nord-Pas de Calais aims to become the 'crossroads' of Europe, the capacity constraints on the road and rail networks in the South East will become more pronounced as the Tunnel encourages increased international traffic.

A direct link to the Continent

BR's (1989b) proposed international freight services will offer vast opportunities for British industry, with reduced transit times, reduced costs and improved reliability:

'For many, the most exciting potential created by the Tunnel is for rail-hauled freight. This is where the effect of pulling the British and continental conurbations together in journey-time terms will be most significant.'

(Simmons 1985, P.18)

Pieda (1989a&b) expects regions outside the South East, which at present account for approximately 75 percent of all UK exports to the Continent, to be in a strong position to capitalise from increased accessibility to European markets. As discussed in chapter 3, rail hauled freight is more competitive than road haulage over distances in excess of 250/300 kms. It is therefore argued that the South East will be unable to benefit fully from the advantages offered by rail freight, particularly to the near Continent. However, as argued by SERPLAN (1989), the South East will be the main beneficiary from Eurotunnel's shuttle service, for both passenger and freight traffic. Time and cost savings via the Shuttle service will be negligible for traffic originating from outside the South East. It is also believed that the advantages from BR's (1989b) proposed international passenger services are also likely to be concentrated within the South East, particularly London. Regional interest groups regard BR's plans for international passenger services to the regions as inadequate (Pieda 1989a&b, Farrington et. al. 1990). BR is confident that international passenger services from London Waterloo and King's Cross to other European capital cities, especially Paris and Brussels, will be highly competitive with existing air and ferry services. London to Paris in three hours and London to Brussels in two hours and 45 minutes, should prove to be attractive to London's business community, as well as companies throughout the South East. However, the deregulation of the European air industry could undermine BR's ability to offer competitive prices, as well as journey times. The 'Open Skies' policy recently endorsed by the EC, June 1992, will result in immediate price reductions after 1 January 1993, and enable more carriers to operate on previously restricted routes (Graham 1992).

Nonetheless, the advantages brought about through improved accessibility to the Continent, via the international through trains and the Shuttle service could be dissipated if the independent traffic forecasts prove to be correct. KCC (1989) commissioned a consultancy report which identifies capacity constraints for both passenger and freight traffic on existing Kent main line tracks by 1993 or shortly thereafter. The need for a high-speed rail link between London and Cheriton has been expressed in most relevant publications. Improved rail services are already needed for central London, which forms the heart of the UK's service economy and draws the majority of its workforce from outer London or beyond. Harmen (1989) also recognises that any potential for diverting air traffic growth away from crowded airport lounges on to the rail network could be missed if the British Government fails to complement TGV Nord. In addition, the opportunity to relieve congestion on the South East's road network could also be wasted if adequate international rail services are not provided. Most commentators therefore regard the high-speed rail link as essential if an effective international passenger and freight service is to be operated while maintaining domestic rail services within Kent. Harmen concludes that the problem is one of 'culture'; British planning is considered as indecisive and unco-ordinated as compared to the French corporate planning apparatus. Both Harmen (1989) and Simmons (1985, 1989) argue for transport planning to be incorporated within an holistic regional plan:

'It is surely vital that in the South East, which is at the same time Britain's most economically dynamic region but is also becoming increasingly congested and overheated, new transport infrastructure is conceived as an integral part of future development strategy. Only in this way will the future economic prosperity of the region be secured, so that it is not marginalised by Continental regions securing greater comparative advantage for future growth sectors of the economy.'

(Simmons 1989, P.8)

Hence, even for the South East certain constraints, such as the supporting transport infrastructure, could seriously disadvantage the region's companies; making the threat from the Continent even more real, in terms of both import penetration and the relocation of British companies. The contrasting policies of the British and French Governments are discussed in detail in chapter 4. However, an inadequate supporting transport network within the South East will also seriously disadvantage regions to the north and west of

London. Before it is possible to review the implications of the Tunnel for the more peripheral UK regions, attention will first focus on the impact of the Tunnel on the South East's tourist industry.

The tourist trade

The Tunnel will provide a faster, more reliable and possibly cheaper, cross-Channel mode of transport for both the 'classic' and vehicle accompanied passenger. SERPLAN (1989) stated that the greatest opportunities for the South East lay in the tourism and leisure related sector. The BTA (1988, 1989) also foresees opportunities in the tourism industry for the whole of the UK but more so in the South East:

'the impact of the Tunnel, and the opportunities it presents, will be obviously greatest in the Tourist Board regions of London and the South East, especially in Kent.'

(BTA 1989, P.2)

The South East and London specifically are seen as the main beneficiaries as a result of the region's proximity to the Tunnel and the attraction of the capital and the heritage that goes with it. However, the BTA points out that London is already deficient in the capacity of hotel/guest house rooms, especially budget accommodation. Present developments in East London could help to alleviate part of the shortage.

The South East's tourism industry has also, on the whole, experienced years of under-investment, primarily due to the decline in the number of tourists visiting the region each year (BTA 1989). This spiral of decline is particularly true of the coastal towns. The continued under-investment and the developments taking place across the Channel could lead to a further demise of the regions tourist trade. The BTA highlights the case of northern France, where there has been substantial investment in the tourism industry: for example; the new resort at Le Touquet; the National Sea Centre at Boulogne-Sur-Mer; the proposed leisure park on the theme of the wind near the Tunnel entrance; and several other theme park/exhibition centres. In addition, Eurodisney, outside Paris, has its own TGV station and hence direct access to London. The Nord-Pas de Calais Regional Council (1991), as with economic and transport infrastructure, has been active in promoting

investment in the region's tourist attractions. The Regional Council has co-ordinated investment to allow the region to maximise the opportunities created by the Tunnel and the European high-speed rail network, the tourism industry included.

Although more European tourists are likely to visit London and the South East after the Tunnel becomes operational, there could be a disparity in the number of UK residents travelling to France and the Continent in general. If the Tunnel encourages more British residents to travel to the Continent, the South East could lose traditional visitors to the region. However, the BTA does believe that the South East is well positioned relative to other UK regions to benefit from any increase in the numbers of foreign tourists visiting the region. There is therefore general agreement that the Tunnel will further advantage the South East's tourism industry, even if more intense foreign competition and inadequate investment do create some cause for concern.

The South East: a summary

In terms of the overall impact on the South East, the state of the transport network is considered as the main obstacle against the Tunnel becoming a catalyst for increased economic growth within the South East. After establishing Parliamentary approval, SEEDS (1989) argues that the Government restricted its role to providing new roads and delegating other responsibilities to 'separate profit orientated enterprises', the result being the total disregard for the need for a co-ordinated development plan. SEEDS contrasts the different approaches of the British and French Governments:

'....the U.K. government seems to regard the Tunnel part of the project as the first priority, and the road and rail infrastructure as secondary....In contrast, the French government regard the completion of the TGV i.e. development of the overall rail infrastructure, as a priority. The Tunnel is seen as an inter-dependent part of an integrated transport strategy.'

(SEEDS 1989, P.9)

SEEDS is in agreement with SERPLAN's (1989) conclusion that the Tunnel on its own will have only a marginal impact on the South East, since real reductions in transport costs will be negligible. The positive effects created by the Tunnel as identified in the LCCI

report (1989), seem to be at odds with the more modest impact predicted by SERPLAN and SEEDS.

The Literature Review will now focus attention on the implications of the Tunnel for the more peripheral UK regions. The perceived inadequate nature of the supporting transport network and the heavily criticised plans for international passenger services are again highlighted.

2.2.2. The Potential Impact on the "North"

This section will focus attention on the common fears and hopes for the more peripheral UK regions, as expressed in the regional consultants' reports. Several issues are considered to be of prime importance, namely: the adequacy of the railway infrastructure and the proposed level of international services; the "double-edged" nature of improved accessibility; and the "Third Market" effect. Since the latter two are affected by the level of service provision and the general quality of the railway infrastructure, this issue requires investigation first. Related to the question of railway infrastructure and service provision, is the perceived opportunity to develop the "landbridge" market. The landbridge concept, for both transatlantic and Irish freight, has been advanced by Pidea (1989a&b) mainly for the Port of Liverpool, but their argument is applicable to all west coast ports. The short term impact of the Tunnel on the regions will also be examined before looking at the long-term effects of increased foreign competition.

Rail links to the "North"

Regional consultancy reports are highly critical of BR's attitude towards international rail services for regions to the north and west of London. BR's proposals, published in December 1989, for 'International Rail Services for the United Kingdom' fall short of expectations cited in the numerous regional reports (1989b). The Section 40 consultation process further highlights the limitations of BR's proposed international services for regions outside the South East, albeit due to the strict financial remit imposed on BR by the present Government. It is generally regarded that the level of railway infrastructure and

service provision beyond London will restrict development pressures radiating out from the Tunnel:

'A major concern with the infrastructural plans relating to the Channel Tunnel is that inadequate links with the North will severely limit any benefits from the Channel Tunnel.'

(CLES, 1989, P.43)

The proposed denationalization of BR also casts considerable doubt over existing plans for international services but this will be examined in detail in chapter 4.

Nonetheless, Pieda correctly points out that the economic impact of the Tunnel will ultimately:

'....depend upon decisions made by indigenous firms and 'outside' firms in response to the new pattern of costs and competitiveness generated by the Tunnel.'

(Pieda 1989b, P.5)

However, the reactions of the business community throughout the UK will be determined by the level of service provision and the quality of the rail infrastructure. Alastair Morton (1988), Co-Chairman of Eurotunnel, in his speech at 'The Channel Tunnel Conference: Making the Most of the Link in the North', argued vehemently about the limitations of the rail network. To realise the potential created by the Tunnel, Morton believes that the North will require: the high speed rail link between London and Cheriton; better across-London rail links to the North; the development of intermodal road-rail interchanges, planned at the regional level; and further investigation into intermodal technology. As outlined by BR (1989b), advances in intermodal technology/facilities have been made but the postponement of the high-speed rail link and poor across-London rail links are still a cause of much concern:

'National government must recognise the crucial importance of enabling key rail infrastructure improvements to come about in the interests of economic prosperity.'

(Morton 1988, P.6)

However, as pointed out by Gibb and Smith (1991), the Ove Arup east of London route could prove to be more advantageous to the peripheral UK regions, as compared to the rejected "New Kent Main Line" (NKML). The East London route incorporates better links with the East and West Coast Main lines, if not to the South West (see chapter 8). The East London route also encompasses a freight dimension which the NKML failed to do. But the Ove Arup proposal is still in the draft stage and a long way from receiving Parliamentary approval.

In a report commissioned by the Scottish Development Agency, Pidea re-asserts the importance of rail freight to regional manufacturers:

'....exploiting the advantages of the Channel Tunnel is, for Scottish firms, synonymous with exploiting the advantages of enhanced rail freight services.'

(Pidea 1989a, P.47)

The advantages offered by the Tunnel for passenger traffic and road-hauled freight originating from beyond London are seen to be negligible. The Tunnel has been heralded for its employment creating opportunities but as CLES (1989) states, such optimism assumes that exporting companies will be encouraged to export freight by rail and that other companies will be persuaded to enter the export market. Post-1993, the rail industry will be in a position to achieve economies of scale with the direct haulage of freight to all the major cities in continental Europe. Railfreight Distribution, BR's freight division, will be able to offer quicker and more reliable services at much lower rates of tariff. Pidea (1989a), however, points out that continental firms have already 'geared up' to rail freight and so pose a real threat to the regions. The criteria for Section 8 grants which enable companies to attract up to 60 percent of Government financial assistance for private rail freight facilities have proven to be too strict (see chapter 4). Very few companies have successfully applied for the grant, thus companies in the UK compared to companies on the Continent are much less likely to operate their own private rail freight facilities.

CLES (1989), and the other regional studies, have echoed the calls by Alastair Morton for Government and related public bodies to guarantee that adequate rail infrastructure is provided for regions north and west of London. It would be impracticable here to list the

problems as perceived by the consultants' reports with the rail infrastructure and service offered by BR. Nonetheless, this issue is of fundamental importance to each region. CLES (1989) regards the Tunnel as potentially a major contributor or antidote to the North-South divide. Inadequate rail services to the North could therefore exaggerate the economic disparity that exists between the South East and the rest of the UK.

BR (1989b&c) is aware of the vast opportunities offered by the Tunnel for the development of inward tourism and increased trade for British commerce and industry. However, BR quite rightly emphasizes its responsibility, under Section 42 of the 1987 Channel Tunnel Act, to operate international services on a fully commercial basis, with no subsidies available from public funds. Therefore, certain parameters have to be placed on any proposed investment, namely an eight percent annual rate of return. BR, unlike SNCF, is restricted by Section 42, setting-up a classic Catch-22 situation. BR has to base its plans on existing demand, while the commissioned regional reports state that better service provision would create its own demand. This argument would seem to be supported by the financial success of the provincial TGV services in France, i.e. TGV Sud Est (see: Berlioz et. al. 1985, Frybourg and Moisi 1985, Bonnafoous 1987). NOERC therefore concludes that:

'The North is likely, once again, to be trapped by the classic 'chicken and egg' situation. The regions cannot justify investment due to the high demand criteria practised by BR and yet due to a consistent lack of investment over many years the rail system offers little attraction, particularly to Northern companies.'

(NOERC 1988, P.8)

In fact, Pidea (1989b) regards BR's passenger forecasts as too low for the North West region, arguing that they should be increased by one third. Pidea was even more critical of BR's forecasts for unitised freight traffic, believing them to be 'extremely low'. The North West could represent the most important region in the UK for international rail freight services since a quarter of the UK market lies within 40 miles of Manchester. NOERC (1988) could only conclude that inadequate rail links would further peripheralise the North. The results from two surveys of regional business communities, carried out independently by BR and NOERC, support NOERC's conclusion and highlight the need

for a massive programme of investment in the rail network. From the preliminary results of BR's survey, NOERC shows that:

- 45% of companies considered more rail investment would be required,
- 44% considered more localised customs facilities would be necessary, and
- 46% considered more road investment would be needed.

BR did respond to these results by establishing a system of regional freight depots with customs facilities but the Section 40 consultation process re-affirms the perceived inadequacy of BR's international services, for both passenger and freight traffic. The above results show that nearly half of the companies surveyed believe they will be disadvantaged in some way. As a consequence of the extreme inflexibility of BR's investment criteria, CLES is pessimistic about the prospects for the regions:

'....there seems to be little indication that BR will be able to make the necessary improvements although this will depend to some extent on the ability of the northern regions to continue to successfully lobby BR and to raise public awareness of their cause.'

(CLES 1989, P.47)

In conjunction with the perceived inadequate provision of rail infrastructure and services, load gauge differences between the UK and the Continent are also seen as reducing the relative accessibility of the North (Pieda 1989a). Backler's Ph.D thesis (Backler 1982) estimates that a Berne gauge trunk route would cost only £20,000 per mile (at 1983 prices). Pieda is therefore dubious of BR's calculations that priced a Berne gauge trunk route from London to Scotland at £1,600 million, equalling £4 million per mile. A Berne gauge trunk route serving all the regions of Britain would be the optimal solution for the regions. Unfortunately for the North this is highly unlikely. Private wagon hire companies have examined the possibility of establishing a single gauge route, connecting the Tunnel to the main industrial centres of Britain, with extra vertical clearance to cover the 2.5 metre width of a road trailer (NUR 1987). The NUR identifies a potential 'Intermodal Corridor', from the Tunnel to Glasgow, which meets the necessary criterion, where Leeds would act as the linchpin for intermodal activity to the North and South. This proposal has

remained at the draft stage even though EC funds could be used to partly finance the cost of such a massive undertaking.

Therefore, under present legislation, there seems to be little hope that the expectations of regional interest groups will be satisfied:

'Let us say to the Government that if they do not take proper notice of the lessons offered by the French to exploit the Tunnel and give BR a greater ability to fulfil its potential for the whole nation, then we may see an erosion of economic disparities in France accelerating the parallel disparities on our side of the Channel.'

(NOERC 1988, P.9)

The Government has ignored the calls by regional interest groups for improved rail services, believing current proposals to be more than adequate. The Government's refusal to allow rail investment criteria to encompass social and environmental considerations, and the generative demand effect of new services is likely to affect adversely the regions, more so than the South East. The fear that London will act as an effective barrier against any benefits created by the Tunnel being spread to the "North", as a result of an inadequate transport network, becomes ever more realistic as 1993 approaches. The present perception of regional interest groups is that the Government is not doing enough to ensure that such benefits are spread evenly around the regions. Increased investment in the rail network is considered necessary for regions outside the South East to benefit fully from the Tunnel, since infrastructural limitations and inadequate services could prevent companies realising the advantages of reduced journey times and cost to the Continent. The long-term impact of the Tunnel depends ultimately on the reactions of the business community. Therefore, if companies perceive international rail services as inadequate, regions to the north and west of London will not be in a position to maximise the opportunities created. The delays associated with the high-speed rail link, poor across-London rail links and the lack of private sidings in the UK, will place constraints on the potential offered by the Tunnel. These, and other infrastructural limitations, will directly affect international rail services, and thus the regionalisation of Tunnel benefits.

Chapter 4 examines the legislative and policy framework of the Tunnel and related transport infrastructure in more detail. However, it is now appropriate to concentrate on several particular issues that have implications for most, if not all, regions; these are, the "Landbridge" concept, the short-term impact, the "double-edged" nature of improved accessibility, and the "Third Market" impact.

The landbridge market

Related to the level and quality of railway services and infrastructure, is the 'Landbridge' concept. Pineda (1989b) is of the opinion that the Tunnel will offer opportunities for a landbridge service for high value North Atlantic traffic, but volumes are estimated to be

small. However, an 'Irish Landbridge', from the ports of Liverpool and Holyhead, is seen as offering more potential.

'A 'landbridge' is typically an overland haul of freight which would otherwise have made the journey by sea.'

(Pieda 1989b, P.68)

Since the Port of Liverpool is the closest landfall port to North America, Pieda maintains that the Tunnel could make Liverpool more attractive as a hub port for North Atlantic container traffic. Hub ports generate considerable vessel time savings for shipping lines over multiport itineraries, although transshipment times to final destinations are longer. Furthermore, once a landbridge service is established, economies of scale would also make Liverpool more attractive to container traffic from Central and South America. However, shipping lines remain sceptical that the Tunnel would significantly alter the economics of US-European container traffic to such an extent that a hub port, such as Liverpool, would be financially preferable or logistically superior to a multiport itinerary. The basis of the Liverpool landbridge concept, as advanced by Pieda (1989b), is that shipping lines would save on steaming time over other European ports and, in particular, over Rotterdam, approximately 12 hours. Pieda's analysis shows that Liverpool could compete on time but not on cost, for both Atlantic and Irish traffic. In addition, the threat of the reverse landbridge effect was 'briefly' referred to:

'The danger for UK ports is that the Channel Tunnel could result in a reverse landbridge effect, with UK import and export containers being moved by rail to Continental ports and a reduction in calls at UK ports by transatlantic container carriers.'

(Pieda 1989b, P.85)

BR is not impressed by the landbridge concept, and so no specific Rail Freight services will be allocated to accommodate any transatlantic container traffic.

'These (landbridges) were discussed at all working parties with major West or South Coast deep sea port interests. It was acknowledged that ports on the West Coast of Great Britain which already attract trans-atlantic calls could, in combination with the Tunnel, offer a time advantage over direct shipping between the United States and mainland Europe....However, it was agreed that the likely economics of deep sea shipping compared with

movement overland make it improbable that large volumes of traffic would pass through British ports in this way.'

(BR 1989c, P.6)

The scope for a dedicated rail service for a transatlantic cargo from west coast ports to the Continent would seem limited but the potential to develop an Irish landbridge market can not be totally disregarded. As with international services to the regions, BR, under Government guidelines, are unable to base investment decisions on future demand levels. The current market is too small to justify a dedicated service but the SEM is likely to increase Irish trade with the rest of the Community. An Irish landbridge market could therefore be a realistic possibility in the long-term but only if necessary investment is forthcoming.

The short-term impact

Due to reasons of political acceptability, the CTG (1985a) announced that the South East would only receive 7.25 percent of the construction contracts, with 65 percent being placed in the Midlands. However, CLES (1989), utilising work carried out by Vickerman (1989), shows that, by January 1989, the South East accounted for 40 percent, by value, of the £451 million of UK-placed contracts of over £50,000. The Midlands received only 14 percent of such orders but Scotland and the North accounted for 17 and 19 percent respectively. Contracts for rolling stock and locomotives have now been predominately won by the Midland's engineering industries.

CLES supports Vickerman's conclusion that in any event the distribution of construction orders throughout the country would be spread too thinly to be of any real significance:

'....the benefits from construction are only expected to have a short-run effect and it is unlikely that they will be concentrated enough to lead to an upturn in regional activity in any one region.'

(CLES 1989, P.10)

From the CTG's (1985b) calculations, the North and North West would probably gain respectively only 780 and 230 jobs in 1989, as a result of construction orders. Furthermore, the NUR (1987) estimates that only 1000 jobs will be created in the rail industry by

mid-1993 for the whole of the UK. Therefore, CLES could only conclude that the short-term impact would at best be limited:

'....the total job creation benefits for the North resulting from the building of the Tunnel and additional infrastructural projects are likely to remain on a small scale.'

(CLES 1989, P.10)

The Government's pre-occupation with highlighting the construction benefits of the Tunnel for all UK regions has been based on political expediency not economic reality. More attention should have been placed on the long-term impact, particularly the threat posed by Continental imports in local and "Third" markets.

The "double-edged sword"

The construction benefits of the Tunnel are therefore too thinly spread to be of any real significance to the more peripheral UK regions. Other than the constraints imposed on these regions by an inadequate transport infrastructure, increased import penetration by continental companies poses a serious threat to their already depressed economies. The Tunnel is expected to improve the efficiency and competitiveness of all UK manufactures, as a result of increased accessibility to European markets. However, as regional reports correctly point out it is relative, and not absolute, accessibility changes that are of fundamental importance to the regions (see for example: NOERC 1988, CLES 1989, Pida 1989a&b). The Henley Centre (see: Ormerod 1988 - a paper presented at 'The Channel Tunnel Conference - Making the Most of the Link in the North'), analyzed trade flows to and from the Continent in textiles, metal manufacturing, chemical and mechanical engineering. Two clear qualitative statements are made:

'First, the North would suffer a decline in prosperity relative to the South. Second, some industries concentrated in the North would suffer absolute declines in output.'

(Ormerod 1988, P.2)

Such definite predictions conflict sharply with the Government's view that the Tunnel will be 'good' for Britain as a whole. Of the four sectors, textiles and metal manufacturing are

the most concentrated in the North. The Henley Centre found that with a hypothesized one percent reduction in costs, as a result of the Tunnel, there would be a negative effect on the balance of trade in these products. However, chemicals and mechanical engineering, less prominent but still important in the North, are expected to benefit from a reduction in costs. A telephone survey also carried out by the Henley Centre (1988) indicates that the South would benefit more from the Tunnel than the North, and that even though the North is not expected to suffer comprehensive losses, some detrimental effects are perceived. The Henley Centre therefore concludes that:

'These two methods of analysis show that the Channel Tunnel will lead to a further widening of the gap in prosperity between the North of England and the South East.'

(Ormerod 1988, P.3)

Pieda (1989b) believes that for British and European exporters the opportunities are 'symmetrical' but fears that, since European firms already 'geared-up' to rail distribution, the outcome to be not so symmetrical.

'Regional differences in 'import impact' are likely to arise only to the extent that industries vulnerable to foreign competition are concentrated in particular regions.'

(Pieda 1989b, P.7)

The "double-edged" nature of improved accessibility will also affect tourism to peripheral regions. An increased number of tourists from near European countries will visit the more peripheral UK regions but the reverse is also true, with:

'....an increase in UK residents taking short-break holidays on the near Continent, possibly at the expense of traditional short-break destinations in the UK.'

(Pieda 1989b, P.12)

Peripheral UK regions with daytime international services to and from the Continent are likely to fair better in terms of the number of foreign visitors to their regions. The South West, however, will have to rely on a single nighttime service to and from the region. Nonetheless, the real threat is posed by the proportion of domestic tourists from the South

East who usually travel to the West Country, the Lake District, the Scottish Highlands etc., that will be encouraged to take future excursions/holidays on the Continent. Thus, even for the tourism industry, the "Third Market" effect is of prime importance.

The "Third Market" impact

'Third market effects' within the UK will operate to the disadvantage of the North West.'

(Pieda, 1989b, P.8)

Since European firms will become more competitive in all UK regions, peripheral regions' industries may not only lose contracts within their own regions but, more importantly, they could also lose contracts within other UK domestic markets. This is particularly important in relation to the South East market because of the scale of that market in the UK context. Pieda believes that:

'....the adverse impact of the Tunnel on the relative competitiveness of Scottish firms in this market (the South East) would certainly be increased if a 'continental railhead' with a Berne Gauge link to the Tunnel was established in the South East.'

(Pieda 1989b, P.46)

A high-speed rail link between London and the Tunnel portal will improve the accessibility of continental companies to the South East relative to the more peripheral UK manufacturers. This is likely to accentuate the "Third Market" impact. However, it must be stressed that the regions have continually argued in favour of the high-speed rail link (Knowles et. al. 1989, Farrington et. al. 1990). For the regions to the north and west of London, the high-speed rail link is vital to spread the opportunities created by the Tunnel, namely improved access to continental markets. Even though the writer is of the opinion that the "Third Market" impact is of fundamental importance to peripheral regional economies, it has thus far failed to receive the attention necessary. Chapter 8 will focus attention on the "double-edged" nature of improved accessibility and the "Third Market" impact.

The "North": a summary

The inadequate nature of Britain's railway network has dominated the majority of regional reports. In addition, BR's proposals for international services to the regions, outside the South East, are strongly condemned. A less stringent financial remit would allow BR to employ investment strategies commonplace on the Continent; instead of waiting for an identified demand, BR could attempt to reproduce the success experienced by SNCF in terms of their TGV services. Hopes of developing a landbridge market from one of Britain's west coast ports seem to have faded as a result of the lack of forthcoming investment. More importantly, the threat of increased foreign competition in domestic markets will have serious repercussions on Britain's manufacturing industry. Nonetheless, the impact of the Tunnel on regions to the north and west of London will depend ultimately on the reactions of the business community to the challenges created by the Tunnel, even though some would argue that the North has to compete from a disadvantaged position.

2.3. Conclusion

This Literature Review has highlighted the considerable degree of uncertainty that still exists about the economic impact of the Tunnel, especially at the regional level. The Government's rather ambiguous assertion that the Tunnel will be 'good' for the UK as a whole (Jones 1987) does not stand up to too much scrutiny. There is an obvious case for national and/or regional impact studies to be carried-out, allowing each region to maximise the advantages offered by the Tunnel and minimise any adverse effects. The hypothesis of the present thesis states that the Tunnel could bring about a narrowing of the North-South divide. But it is also recognised that this opportunity to revitalise the economic fortunes of the more peripheral UK regions will be missed as a result of the Government's policy of inaction. A considerable amount of original data will be generated to support any conclusions reached in the current research project.

Through increased efficiency and reduced operating costs, the Tunnel is expected to improve the competitiveness of British products in continental markets and thus, spread employment opportunities throughout the UK (CTG 1985b, Eurotunnel 1987, Banham 1988). The review of the literature at the national level examined these suggested benefits and questioned their magnitude. However, it did not doubt the overall significance of improved accessibility to the Continent for British manufacturers. It is therefore important to model the impact of the Tunnel on regional accessibility, distinguishing between absolute and relative accessibility (see chapter 3).

Most relevant publications point to the inadequate state of Britain's transport network, regarding the over-congested rail network in Kent and the planned level of international services to the more peripheral UK regions as a threat to the spreading of any benefits created by the Tunnel (Campaign for the North 1981, NUR 1987, NOERC 1988, CLES 1989, KCC 1989, Pida 1989a&b, TCPA 1990). The case for a high-speed rail link between London and the Tunnel portal is constantly put forward by regional interest groups. However, except for the Section 40 consultation process, the Government has avoided any form of intervention (TCPA 1990). The absence of any form of strategic planning adopted by the Government has led to the series of problems and delays now associated with the high-speed rail link.

The Section 40 consultation process underlines the gulf that exists between perceived regional needs and identified commercial possibilities for BR (Knowles et. al. 1989, Farrington et. al. 1990). Pida (1989a&b) correctly argues that the more peripheral UK regions are caught in a Catch-22 situation because decades of under-investment have prevented existing demand levels justifying extra services or investment. The policy and legislative environment of the Tunnel is examined in depth in chapter 4, including rail policy during the 1980s and early 1990s.

It is feared that as a result of an inadequate supporting transport network, the Tunnel will lead to a further weakening of the more peripheral regional economies:

'....the positive employment effects of the Channel Tunnel are likely to be outweighed by the longer term disadvantages that the North is likely to suffer....'

(CLES 1989, P.2)

CLES are particularly pessimistic about the prospects of the traditional, stagnating or declining, northern industries, such as textiles and mechanical engineering. The Henley Centre (1988) also regards the future of these traditional industries as unfavourable but sees the Tunnel, and not an inadequate transport infrastructure, as leading to a further decline of these industries. The Tunnel is expected through improved accessibility to the Continent, and thus lower costs, to work to the detriment of the more uncompetitive traditional industries, as European imports increase. Uncompetitive industries in the UK and on the Continent are likely to face more intense competition as a result of the SEM, more so than the Tunnel, with the removal of 'all' artificial barriers to trade, including State subsidies. Vickerman and Flowerdew (1990) believe that the Tunnel is regionally 'neutral', improving accessibility for all UK regions. However, an inadequate supporting transport network could prevent the more peripheral UK regions from benefitting from improved accessibility to the Continent; while the South East's proximity to the major European markets will be further enhanced by the Tunnel (NOERC 1988, CLES 1989). The over-congested transport systems in the South East poses as much of a threat to peripheral UK manufacturers as companies within the South East. Regional interest groups therefore call for the Tunnel to be incorporated in an integrated infrastructure-led growth plan for the regions, removing any barriers, such as across-London rail links, to economic development in the North (Campaign for the North 1981, NOERC 1988, CLES 1989, Pida 1989a&b, TCPA 1990).

The perceived threat from the Continent for both the "North" and "South", as a result of the Tunnel, also receives attention in regional consultancy reports and academic articles. Within the South East, the prospect of companies relocating to the near Continent has almost been completely ruled out (SEEDS 1989, SERPLAN 1989). However, Simmons (1989) presents a strong case why companies in the South East, and the UK in general, could be attracted to the northern region of France. The Nord-Pas de Calais Regional Council has ensured that the Tunnel will form only a part of the good international

transport links which will radiate out from the region. Considerable investment has also been directed at the region's industrial base, with sizeable areas of land developed into business parks and industrial estates. Nonetheless, the threat of companies migrating to the near Continent is not considered to be serious. A southwards drift of industry within the UK, again as a result of the Tunnel, is also seen as unlikely. The questionnaire survey undertaken for the current research project examined this issue in more detail (see chapters 6 and 7).

In addition, the continental threat encompasses increased import penetration in both local and "Third" markets. The Tunnel will improve accessibility between the UK and the Continent in both directions. Continental companies will therefore become more competitive in the UK as British companies expect to become more competitive on the Continent (Eurotunnel and BR 1988). The "double-edged" nature of improved accessibility is seen to work particularly against the more peripheral UK regions. However, turning the above argument in on itself, regions could be 'insulated' from increased foreign competitiveness as a consequence of inadequate transport infrastructure and services. The "Far South West", in terms of transport links, is one of the most isolated regions from the Tunnel. Chapter 8 will explore the potential opportunities and problems created by the Tunnel in Devon and Cornwall. The "Third Market" impact could therefore prove to be a more serious concern, particularly for the more peripheral UK regions.

However, the overall regional economic impact of the Tunnel will ultimately depend on the reactions of the business community. Pidea highlights the significance of companies' reactions for Scotland:

'It follows that if Scottish firms do not take where appropriate, positive action, there is a high probability that the economic impact of the Tunnel will be adverse so far as Scotland is concerned. Scotland would stand to lose in terms of domestic market share and market share in 'third markets'.'

(Pidea 1989b, P.47)

Dourmashkin (1989) is in agreement with Pidea (1989b), that for (Scottish) industry to maximise any advantages from the Tunnel there would have to be a switch from road to

rail hauled freight. Gossop tries to focus on 'how the Tunnel could "boost" the regions' but is aware that:

'Without suitable action to counteract it, the Channel Tunnel will lead to a further widening of the gap between south and north - though with London rather than Watford as the dividing line.'

(Gossop 1987, P.330)

The short-term construction benefits of the Tunnel for the more peripheral UK regions have been shown to be much less than as originally suggested by the Government (CLES 1989, Vickerman 1989a). The regional potential of the Tunnel dictates that an adequate supporting transport network needs to be in place by 1993. This is now extremely unlikely. Gossop (1987) criticizes the Government's 'hands-off' attitude to the spreading of the benefits created by the Tunnel, echoing calls from the TCPA (1990), and numerous other organisations, for a 'UK Impact Study'.

CHAPTER 3: ECONOMIC POTENTIAL ANALYSIS

Economic Potential Analysis is employed for the first time by the present study to quantify the impact of the rail-only Tunnel on regional accessibility within the UK and on the Continent. The conventional understanding that the South East will be the main beneficiary from the Tunnel is questioned. The results of the study provide strong empirical evidence to support this approach. The originality of both the Model and its findings represent the theoretical foundations of the present thesis.

First the main aims of the model are outlined. Then Economic Potential Analysis is defined and its use justified. Also the methodology supporting the earlier study by Keeble, Owens and Thompson (1982a) will be set out, although emphasis is placed on the results and conclusions derived from this research. The potential model employed in the present thesis will then be discussed and the results analyzed. The effect of the Tunnel on regional accessibility within the EC in general will be briefly examined. However, the analysis of the results will focus on the likely impact of the Tunnel on the UK regional economic structure; namely, the "North-South" divide. A critique of the methodology will then follow, outlining the specific technical problems encountered when setting-up the model. The conclusion will identify policy implications, suggesting any possible courses of action that may be necessary.

However, before proceeding to evaluate the Potential Model, it is important to summarise briefly the vast field of regional economic development theory and its relevance to the present thesis. On the whole, regional development theory can be divided into either equilibrium or disequilibrium theories. Both schools of thought have far reaching implications for regional policy. The present Conservative administration is strongly influenced by neo-classical economics, favouring non-interventionist and laissez faire policies. As will be discussed in detail in chapter 4, the Government has adopted a 'market solutions' strategy for the Tunnel itself and associated regional economic impacts.

3.1A. Regional Development Philosophy

It is not possible here to provide a full analytical account of regional economic development theory. This section will outline the two main schools of thought and discuss briefly their relevance to regional policy and Channel Tunnel issues. Attention focuses first on neo-classical equilibrium theory before concentrating on the basic "Core-Periphery" model, which attempts to explain the causation process of regional inequality.

Regional equilibrium theory asserts that in the long-term regional economies will converge. Central to this theory is the belief that the self-correcting mechanism of the marketplace will result in regional economic equilibrium. However, equilibrium theory, and neo-classical economics in general, is dependent on assumptions which depart from the real world. Historical evidence also suggests that regional economies do not converge through the free play of market forces (Armstrong and Taylor 1985).

Myrdal (1957) questioned equilibrium theory, believing that Multiplier effects would accentuate regional inequalities. Myrdal's theory of 'Cumulative Causation' shows how flows of capital, labour and goods, through 'backwash' or 'polarisation' effects, work to the disadvantage of weaker peripheral economies. Although 'Spread' effects are identified, which could lead to regional convergence, Myrdal concluded that the core region was unlikely to stimulate economic development in the periphery. Instead Myrdal believed that the periphery would suffer a 'vicious circle' of decline: i.e. labour migration to the core causes consumption to decrease in the periphery, which in turn leads to the contraction of existing industry and the reduced likelihood of new industrial activity locating within the area.

Hirschman (1958) was more optimistic, stating that, even though divergence is initially inevitable, 'trickle down' (or 'spread') effects would bring about regional economic convergence:

'thereby firmly establishing the movement towards equilibrium.'

(Pinder 1983, P.27)

Certain regions benefitting from comparative advantage will develop first but through external stimulation, the core region is expected to encourage growth within the periphery.

Hirschman, however, considered regional equilibrium possible only if there existed complementarity between regions, to the extent that the core was to an important degree reliant on the periphery. As Pinder (1983) points out, the liberalisation of international trade and modern transportation systems mean that polarisation effects are likely to dominate. In which case, Hirschman predicted a prolonged division between a 'progressive and a depressed area' (Pinder 1983; after Hirschman 1958). This would seem to be reflected by the apparent similarity between the economic divisions experienced in the UK during 1930s and the present "North-South divide", with the important exception of the West Midlands (Armstrong and Taylor 1985). On the otherhand, the present Government argues that the static nature of regional imbalance signifies the failure of traditional regional policy to alleviate regional inequalities.

The 1944 White Paper on Employment Policy represents the start of a concerted Government regional intervention. Traditional regional policy incorporated both "carrot and stick" measures, by means of financial incentives to encourage development in Assisted Areas and strict controls on the location of new manufacturing and office investment. Moore, Rhodes and Tyler (1986) estimate that regional policy led directly to the creation of 784,000 jobs in Assisted Areas between 1960 and 1981, with over 600,000 still in existence in 1981. However, as pointed out above, regional divisions in the UK have remained fairly constant. The post-1979 Conservative Government did not consider traditional regional policy as cost-effective (Armstrong and Taylor 1985). Controls on the location of industry were withdrawn, Assisted Area status was granted only to "hard core" problem regions and the regional policy budget was to be cut from £700 million in 1983/84 to £400 million by 1987. The Government's neo-classical/monetarist philosophy meant that the factors of demand and supply were expected to bring about regional economic convergence, not State intervention. A strong correlation can be drawn between the present Government's regional policy, and economic policy as a whole, and their 'market solutions' strategy towards the Tunnel (see chapter 4).

While recognition of regional development theory is important, this research project is concerned with examining the specific impact of a new transportation system, namely the Tunnel, on the existing regional economic structure of the UK. Economic Potential Analysis allows the impact of the Tunnel on regional accessibility to be quantified, while the broad nature of regional development theory could only permit wide sweeping generalisations to be made with respect to the effect of the Tunnel on the "North-South divide". Furthermore, any attempt to apply regional development theory would be fraught with difficulties, since as Law (1980, P.15) states:

'In the field of regional development theory there is no universally accepted model, but only a collection of ill-fitting ideas.'

A major criticism of both Myrdal's and Hirschman's theories, and regional development theory in general, is that inter-regional systems are treated as a 'set of spaceless points separated by unspecified distances' (Richardson 1973). The Economic Potential Model employed in this thesis will relate inter-regional rail freight journey times to Gross Domestic Product values for 90 regions, within seven EC countries.

The remaining sections of this chapter will focus entirely on Economic Potential Analysis, setting out the methodology supporting the Model and examining the results generated. First, however, the main aims of the Potential Model will be outlined.

3.1B. Aim of the Model

Two earlier attempts to quantify the regional economic impact of the Tunnel both concluded that the South East would experience significantly higher gains in economic potential compared to regions to the north and west of London (Clark et. al. 1969, Keeble et. al. 1982a). Both studies employ Economic Potential Analysis to highlight the divergence in relative accessibility gains between UK and continental regions. It is shown

that the South East records the highest increases in absolute and relative accessibility, thus possessing greatest potential for economic development.

Contrary to Keeble et. al.'s (1982a) findings, it is hypothesized in the present thesis that the rail-only Tunnel will have a beneficial effect on the more peripheral UK regions. The aims of the Model are therefore twofold: firstly, to compare and contrast the conclusions reached by Keeble et. al. (1982a) with the findings of the current study; and secondly, to interpret the implications of these findings in accordance with the legislative and policy framework.

Keeble et al.'s analysis (1982a) needs a critical updating for several reasons. Firstly, they argue that the incorporation of 'shortest road distance' as a measure of the distance factor (see Potential equation, P.56) was the most appropriate at the time of study. However, the Tunnel project, awarded to the Eurotunnel Consortium in 1986, involves the construction of a twin-bore rail tunnel. It is true that the Tunnel will provide a quicker and more reliable mode of transport for road hauliers via the high frequency Shuttle service or 'rolling road'. But EC legislation on permitted daily driving hours will considerably reduce any time savings because of its requirement for rest periods. So while ferry services take longer they do provide the opportunity to take a legally recognised rest period. Therefore, any advantages gained by road hauliers as a result of the Tunnel are likely to be limited. Thus, the railway, not the road, will allow regions to benefit fully from improved relative accessibility to the Continent.

Secondly, more than 75 percent of UK freight destined for European markets originates from outside the South East, with up to 25 percent coming from within a 40 mile radius of Manchester (Gossop 1987, BR 1989b, Dourmashkin 1989, Pineda 1989a&b). Therefore, improved links with the Continent should not only prove to be of considerable benefit to the South East but to the rest of the UK as well. Finally, railway economics dictates that rail freight, as compared to road haulage, becomes increasingly competitive over distances in excess of 250/300 kms (Pineda 1989a&b). The Tunnel will join the UK and continental railway networks, reducing the peripheral nature of some of the UK's more distant regions to the European market. Thus, rail freight should become relatively more attractive to

companies in these more peripheral regions than their counterparts in the South East, especially in terms of exports to the near Continent.

It is therefore hypothesized that certain peripheral UK regions will experience increases in relative accessibility similar to or higher than the South East. Since more freight for the Continent originates from outside the South East, the "North" will gain comparatively more. However, it is worth pointing out here that due to data limitations, it was not possible to reflect the pattern of UK regional trade with the Continent in the potential equation (see Section 3.4). Instead, regional Gross Domestic Product (GDP) values are incorporated into the current model. The critique (Section 3.7) will discuss the limitations of the data in more detail, as well as other methodological problems.

3.2. Economic Potential

Economic potential is a measure of the nearness or accessibility of a given volume of economic activity to a particular point/region and can be interpreted as the volume of economic activity to which a region has access, after the cost/time of covering the distance to that activity has been accounted for (Clark et. al. 1969, Rich 1980, Keeble et. al. 1982a,b&c). Potential analysis is closely related to the Gravity Model, in that both relate mass (the volume of economic activity or population) to distance. The gravity model is primarily concerned with analyzing the actual pattern of spatial flows, whereas 'the potential model is more concerned with the opportunity for interaction between groups, created by their size and location, than with interaction itself' (Rich 1980).

The concept of regional potential was first proposed by Stewart (1947) in his analysis of the distribution of population in the United States in 1940. Harris (1954) adapted potential analysis to study industrial location and regional development. Clark, Wilson and Bradley (1969) were the first to apply economic potential to locational issues in a European context, measuring the attractiveness, in terms of accessibility, of different regions to manufacturers, as well as the likely effect on this accessibility of an enlarged Customs

Union. More recent work has been carried-out under the auspices of the 'EEC Centrality-Peripherality Project' (Keeble, Owens and Thompson 1982b).

The potential model employed in the current research project calculates the impact of the Tunnel on the relative accessibility of UK and continental regions; thus regional proximity to economic activity is assessed. For example, the relative accessibility of Scotland, both before and after building of the Tunnel, is quantified and compared to regions such as the South East. Potential values can be interpreted as a measure of regional advantage for economic development in terms of relative accessibility in geographic space to economic activity. However, the potential model does suffer from problems associated with all macro-analytical techniques, namely the aggregation of results. Furthermore, the potential model does not represent any single process but instead links the volume of economic activity to spatial/temporal data, producing a generalised account of regional accessibility and the likelihood of economic development. Economic potential analysis also considers only demand-side factors, ignoring important supply-side considerations such as; labour skills, entrepreneurship, supply of capital and non-transport infrastructure.

Nevertheless, potential analysis does relate relative accessibility to the level of economic activity and can accommodate changes in the transport network, thus allowing a re-evaluation of a region's relative accessibility. Potential analysis therefore provides a useful theoretical framework from which to quantify the impact of the Tunnel on regional accessibility and a region's comparative advantage for economic development. Before examining the methodology of the current model and the results produced, it is first useful to discuss the study carried-out by Keeble et. al. (1982a) because of the comparative nature of the results.

3.3. Keeble, Owens and Thompson's 1982 Study - 'Economic Potential and the Channel Tunnel'

Keeble et. al.(1982a) consider economic potential analysis to be the only technique available which explicitly incorporates the geographical impact of the Tunnel. In their study, the methodology proposed by Rich (1980) is utilised, with his standard regional economic potential formula applied to 1977 GDP (SOEC 1979) and road distance data for 108 of the Eurostat Level II regions. Their analysis assumes that road distance data are the most appropriate measure of the distance term, since road transport dominates the freight haulage market both domestically and on a pan-European basis. A distance matrix based on shortest road distance was constructed, and after an examination of actual sea and land transportation costs, Keeble et. al. used the following formula to convert ferry distances into road kilometres:

$$R = 150 + F/1.5$$

where F is the ferry crossing in kilometres and R is the road distance equivalent. The actual sea crossing of 35kms became the weighted value of 173 (road) kms. The Tunnel simulation is set-up at varying degrees of efficiency, at 10 percentile intervals (0-100 percent). Assuming a 'Replacement Efficiency' of 100 percent the Channel crossing is reduced to 35kms, i.e. the Channel crossing became the land equivalent.

At the upper limit of a 100 percent replacement efficiency, the South East records an increase of just over 10 percent in absolute economic potential. However, in terms of relative potential (relative to the maximum potential value, Rheinhessen-Pfalz), the South East experiences a gain of just below 5 percent, while the average for British regions as a whole is less than 2 percent. The attainment of 100 percent replacement efficiency is regarded as unlikely. At an 80 percent replacement efficiency the South East is shown to record increases of 7.25 percent in its own potential and 3.58 percent in relative potential. Keeble et. al. found that their estimates were roughly in line with Clark et. al.'s (1969) 'finding that with a Tunnel the South East would gain 3 percent on the average of the

highest potential group in Europe'. The conclusions drawn by the study are consistent with the earlier, non-quantitative, assessments of Wise (1965) and Thompson (1973), namely that any benefits created by the Tunnel would be confined to the south east corner of England. Nonetheless, Keeble et. al. regard the gains in regional accessibility for UK regions, even for the South East, to be small, with any direct benefit centred on the mass of individual users not the regions.

The conclusions reached in the present study, however, conflict sharply with these earlier findings. It is shown that certain peripheral UK regions could experience fairly uniform increases in relative accessibility as compared with the South East. The Tunnel could therefore lead to a narrowing of the so-called "North-South" divide, as companies exploit the opportunities created by the Tunnel in terms of rail freight. Improvements to the rail network and the introduction of newer and faster locomotives are likely to be significant, further increasing the advantages offered by the Tunnel. However, before analyzing the results and interpreting the main findings, it is first important to outline the methodology supporting the current model.

3.4. Methodology

This section will highlight the technical and methodological problems encountered during the setting-up of the model and which are commonly associated with potential analysis. Determined by the main objectives of the model, several subjective decisions have to be made. The component structure of the model will be discussed in detail but it is first necessary to set-out the standard formula for regional economic potential analysis, as given by Rich (1980):

$$P_i = \sum_{j=1}^n M_j / D_{ij}^{-\alpha}$$

where P_i is the economic potential for region i ; M_j is the measure of the volume of economic activity in region j ; D_{ij} is the measure of the journey distance/time or transport cost between region i and region j ; and $-\alpha$ is the distance exponent. The potential value for region i is calculated by summing for all n regions and is expressed in units of economic activity per unit of distance/time or transport cost. The potential value of region i is the summation of the potential exerted on it by all regions n , including region i 's self or own potential:

$$P_i = M_1/D_{i1} + M_2/D_{i2} + M_3/D_{i3} + M_4/D_{i4} + M_5/D_{i5} + M_6/D_{i6}$$

Potential values are then made relative to the region with the highest potential value and suitable contour intervals chosen so that isolines of equal potential can be drawn. The contour maps will be used to show how the Tunnel affects regional accessibility in the EC.

Before it is possible to elaborate on the characteristics of the component parts of the model, the so-called "Universe" has to be defined. The Universe is the area over which potential values are to be calculated and has to be divided into regions, each with an identified node. The mass M_j term or the unit of economic activity has to be measured, usually regional GDP values are employed in economic potential analysis. The distance D_{ij} term measures the distance between each of the nodes and can represent either journey distance/time or transport cost. A suitable distance exponent $-\alpha$ has to be chosen, depending on the particular requirements of the research project, to relate the importance of distance to the amount of interaction between regions.

3.4.1. The Scope of the Model or 'Universe'

The earlier work by Keeble et. al. (1982a) shows that only countries within close proximity to the Tunnel could experience gains in relative accessibility, especially the UK and France. For this reason it was decided that the area of study would be restricted to only seven of the 12 EC countries: the UK, Eire, France, Belgium, Luxembourg, the Netherlands and (West) Germany¹. The Tunnel is unlikely to have any significant beneficial effects on the relative accessibility of the remaining countries of the EC; namely, Denmark, Greece, Italy, Portugal and Spain. However, single representative nodes are

Figure 3.1 Inter-nodal rail network



node

- 1 Scotland
- 2 North
- 3 Yorkshire & Humberside
- 4 North West
- 5 East Midlands
- 6 West Midlands
- 7 Wales
- 8 South West
- 9 East Anglia
- 10 South East
- 11 Northern Ireland
- 12 Eire
- 13 Basse Normandie
- 14 Haute Normandie
- 15 Nord-pas de Calais
- 16 Picardie
- 17 Champagne Ardenne
- 18 Ile de France
- 19 Bretagne
- 20 Pays de la Loire
- 21 Centre
- 22 Poitou Charentes
- 23 Limousin
- 24 Aquitaine
- 25 Midi Pyrenees
- 26 Languedoc Roussillon
- 27 Provence Alpes Cote
- 28 Auvergne
- 29 Rhone Alpes
- 30 Franche Comte
- 31 Bourgogne
- 32 Lorraine
- 33 Alsace
- 34 Groningen
- 35 Friesland
- 36 Drenthe
- 37 Overijssel
- 38 Gelderland
- 39 Utrecht
- 40 Noord Holland
- 41 Zuid Holland
- 42 Zeeland
- 43 Noord Brabant
- 44 Limburg

node

- 45 West Vlaanderen
- 46 Oost Vlaanderen
- 47 Hainaut
- 48 Namur
- 49 Liege
- 50 Brabant
- 51 Antwerpen
- 52 Limburg
- 53 Luxembourg
- 54 Luxembourg (Grand Du)
- 55 Rheinhessen Pfalz
- 56 Karlsruhe
- 57 Saarland
- 58 Trier
- 59 Koblenz
- 60 Koln
- 61 Dusseldorf
- 62 Munster
- 63 Weser Ems
- 64 Bremen
- 65 Schleswig Holstein
- 66 Hamburg
- 67 Luneberg
- 68 Braunschweig
- 69 Hannover
- 70 Detmold
- 71 Kassel
- 72 Amsberg
- 73 Giessen
- 74 Darmstadt
- 75 Unterfranken
- 76 Oberfranken
- 77 Mittelfranken
- 78 Oberpfalz
- 79 Neiderbayern
- 80 Oberbayern
- 81 Schwaben
- 82 Stuttgart
- 83 Tuingen
- 84 Frieberg
- 85 West Berlin
- 86 Lombardie
- 88 Hovedstadsregionen

Data was available for the following nodes but excluded from the map. Inclusion of these nodes was deemed to adversely affect accuracy due to their isolated occurrence.

- 87 Castilla-Leon
- 89 Sterea Ellada
- 90 Lisboa e Vale do Tejo

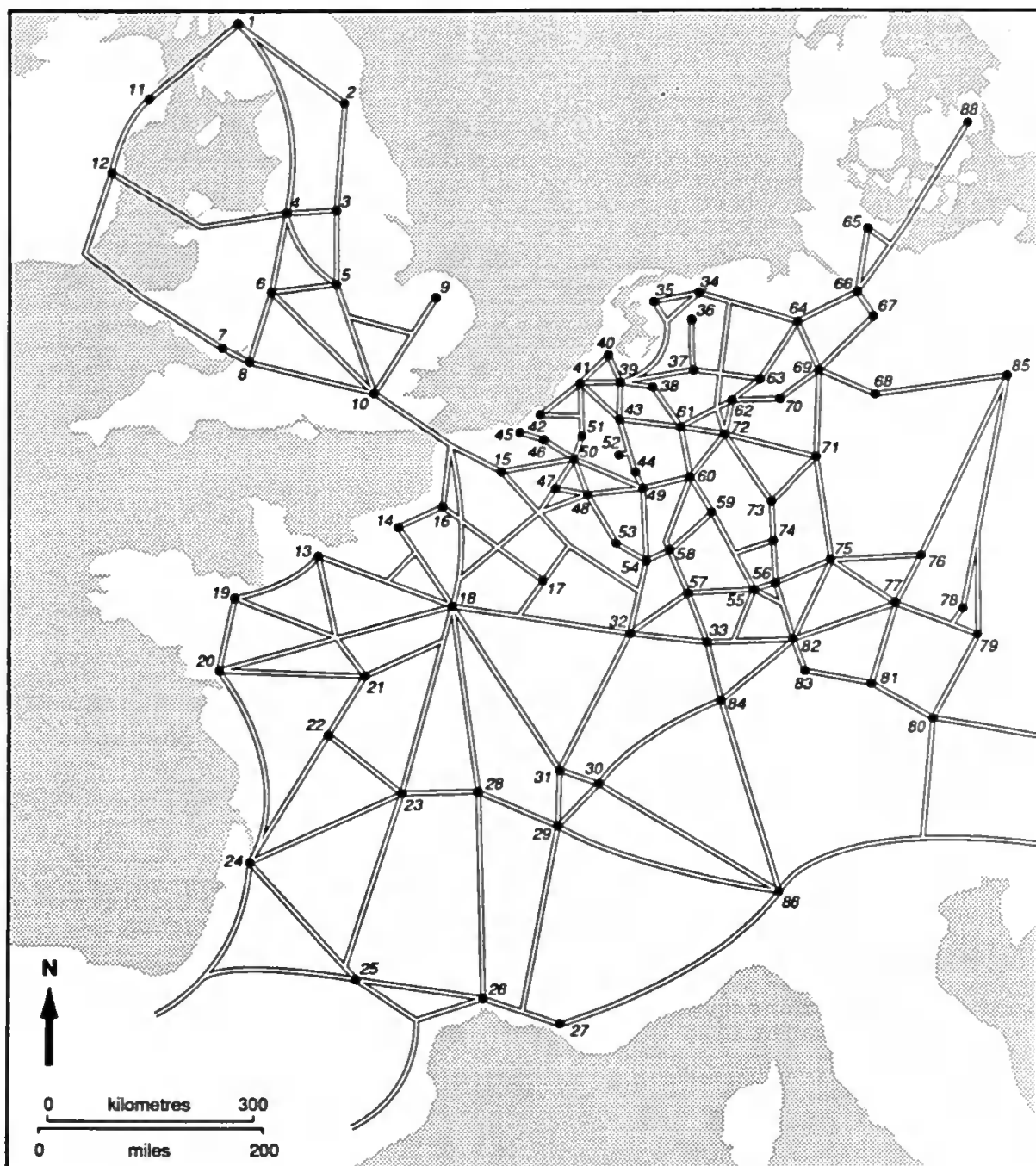


Figure 3.1 Inter-nodal rail network

incorporated into the model for these five member states. The results of the present model show that only UK and near continental regions experience any significant increase in relative accessibility as a result of the Tunnel. The vast majority of continental regions, including all 30 regions of (West) Germany, record negative changes in relative accessibility. The results therefore support the decision to narrow the scope of the present model. The universe was divided into Eurostat level II regions. For each of the 90 regions the regional capital or the major industrial city was chosen as the nodal point of that region (see Figure 3.1). The selection of a regional node reflects the dominance of either the regional capital or the major industrial city within the respective region.

3.4.2. The Mass M_j Term

Eurostat's GDP values for level II regions are used as a measure of economic activity (i.e. the mass term) and are expressed in million ECUs (mil ECU). The data refer to the year 1988 and were the most up to-date at the time of analysis. GDP values in mil ECUs for Eurostat level II regions are widely regarded as the best available measure of the volume of economic activity. However, there are particular problems associated with Eurostat level II data; as Keeble et. al. state:

'Eurostat's regional classification at this level is relatively coarse and uneven....'

(Keeble et. al. 1982a, P.101).

This is primarily a result of the compilation of disparate national statistics. The UK is divided into Standard Economic Planning Regions, which are generally larger than those favoured in other EC countries. This problem is especially highlighted by comparison of the size differences between Scotland and West Berlin, both being level II regions. However, Eurostat level III regional data are still in its infancy, being too inconsistent and inaccurate (Keeble et. al. 1982a).

Data inconsistencies for Eurostat level II regions also prevent the use of a more narrowly defined mass term. A strong case could be advanced for the use of regional industrial output values/exports, instead of regional GDP values, to measure the volume of economic

activity. The Tunnel will make national railway companies more competitive especially in terms of the carriage of unitised freight to and from the Continent, therefore regional industrial output/exports could be a more precise measure of the potential economic advantages created by improved accessibility.

The spatial coverage of the mass term was restricted to only seven EC countries. However, the extent of trade between all 12 member states could justify the inclusion of all EC regions. This argument could also be applied to non-EC European countries, especially members of the European Free Trade Association (EFTA). However the model's application in this instance is concerned with only the impact of the Tunnel on the relative accessibility of regions. It is therefore feasible to restrict the area of study according to geographical and not economic criteria.

3.4.3. The Distance Dij Term

The distance term is the summation of the 'shortest' rail distances (or rail plus ferry) between each of the 90 regional nodes (see Figure 3.1). It is important to qualify the term 'shortest' rail distance since due to the operating practices of national railway companies and the formalities encountered at border crossings the shortest distance haul is not always possible. Certain railway lines are restricted for passenger use only; for example, freight trains are prohibited from using the French high-speed TGV routes. The shortest distance may involve the crossing of several borders, where locomotive changes are necessary and timetabling formalities overcome.

It would be impractical for the purposes of the current research project to attempt to simulate realistically the operational practices of each of the national railway companies. However, rail distances (and therefore times) cannot be so far removed from reality as to jeopardise the usefulness of the data. The project is concerned with relative distances (and times), not absolute values, thus any errors in the procedure will affect most, if not all, regions and approximate relative values obtained. A distance matrix was compiled based on Thomas Cook's 'European Timetable' (1990) and 'Rail Map Of Europe' (1989-1990).

As manufacturers are primarily concerned with the time needed to transport their freight, the distance matrix was converted into journey times. Journey time, not journey distance, is a more precise measure of true accessibility. Following discussions with BR (personal interview: Jenkins 1990), three simulations were set-up based on the average continental and UK freight travel speeds (30 and 40mph respectively) and Railfreight Distribution's currently limited high-value freight service of 75mph. More importantly, BR plans (1989b) for all future international rail freight services to operate at 75mph. Faster freight locomotives, attaining speeds of up to 100mph, have also been introduced on selected services in France and Germany. The results for 'Simulation 3' are therefore based on a 'realistic' post-Tunnel average running speed of 75mph.

The base model is a simulation of the European railway network prior to the opening of the Tunnel. Thus, ferry times have to be incorporated into total journey times as well as the time required for the transshipment of rail freight containers at the ports. The choice of ferry route depends on the overall journey time, with the quickest being chosen. Six hours are allocated for the transshipment of container units (personal interview: Jenkins 1990). A further half an hour is added on to the total journey time to take account of shunting and timetabling. The above simulation assumes 100 percent efficiency, with no delays. Thus, it was necessary to incorporate the possibility, or rather the likelihood, of delays. As a direct consequence of the frequency of daily ferry services for load-on/load-off (LoLo) freight, usually fewer than three sailings per day, and the complexities of national railway timetables and freight handling, any delay would normally involve up to a 12 or 24 hour wait. After the six hours already required for transshipment, a further six or 18 hours have to be added on to the total journey time. An additional two hours also has to be included in the total journey time for each border crossing as a result of the existing operational difficulties and bureaucracy encountered at national frontiers. As pointed out earlier, the model is primarily concerned with relative time differences, i.e. relative accessibility, so it is necessary only to incorporate time factors that are likely to affect the relative journey times between regions.

The alternative model is a simulation of the post-Tunnel European railway network, with all freight diverted through the Tunnel. The fixed link will considerably reduce the

non-transit time requirements of present rail freight operations, the most important of which being the time allocated for transshipment, as well as the ferry crossing time. However, the Tunnel has also led to a new era of co-operation between national railway companies, with plans to implement co-ordinated passenger and freight services. The creation of the Single Market by 1 January 1993 also removes much of the present bureaucracy. Increased co-operation and reduced bureaucracy will therefore reduce time wasted at border crossings by up to 50 percent, so only one hour is added on to the total journey time for each border crossing. In addition, only two hours have to be allocated at the Channel Tunnel Freight Interchange (CTFI). BR has stated that only two hours will be needed to organise their freight operations at the CTFI. A further half an hour is also allowed for locomotive changes at either end of the Tunnel.

It would have been impracticable for the purposes of the present research project to attempt to incorporate the frequency of proposed international freight services to-and-from all 90 regions and within all seven EC countries. BR (1989) is confident that its planned level of service will meet the needs of all regional manufacturers. If BR is to be believed, service frequency should not seriously influence the "accessibility" of a region, at least relative to other regions. The possibility of missed rail freight services from regional terminals was also not incorporated into the potential model because, while this would significantly affect the relative accessibility of individual companies, the impact on a region as a whole would be negligible. International rail freight services will run once-daily, thus companies are likely to ensure that such an eventuality would not occur in order to avoid a 24 hour delay.

3.4.4. The Distance Exponent

The distance exponent is an expression of the importance of distance to the volume of economic activity. Where distance is regarded to be a major impediment to trade, or any form of contact, the potential model would have to incorporate a high value for the distance exponent. Low values, on the otherhand, indicate that trade is little constrained by distance. Empirical research has shown that distance exponents have tended to fall as transportation systems have improved (Rich 1980, Keeble et. al. 1982a).

However, at this juncture it is important to stress that there is no universally accepted exponent, although values between 1.0 and 2.5 are commonly used. Therefore, the selection of a suitable distance exponent does encounter particular problems. One could justify the choice of an arbitrary value or duplicate a value employed in earlier studies. However, Rich argues that:

'A more satisfactory method is to examine suitable interaction data, to fit a gravity model to them using a regression method described by Taylor (1975) and so derive an exponent empirically.'

(Rich 1980, P.20).

Keeble et. al. (1982a) decide that without any clear justification for one particular distance exponent value, the most logical basis for potential analysis is unity.

As a result of the financial and manpower limitations of this research project, it was impossible to collate the necessary data to set-up a gravity model and calculate the distance exponent. No previous research could be drawn on and so sensitivity testing was employed between values of 0.5 and 1.7. It immediately became obvious that values closer to unity were more realistic, in terms of their impact on the results, and so a distance exponent of 1.0 was employed in the potential model.

3.4.5. Self Potential

In addition to the methodological problem posed by the distance exponent, is the concept of Self Potential. Self potential refers to the contribution to the potential of region i of its own mass value. To incorporate region i's self potential into the potential model, the intra-regional transport time would have to be calculated. Earlier models incorporated a fixed or variable value but Rich (1975) proposed the formula:

$$D_{ii} = 1/2 \sqrt{\frac{\text{area of region } i}{\pi}}$$

Calculation of region i's own potential would then be based on a distance value that is one-half of the radius of a circle the same area of region i.

Keeble et. al. (1982a) employ the above formula but find with regard to the small highly urbanised regions, such as Hamburg and Bremen, that a constant term of 0.333 is more appropriate. Sensitivity testing was again used to decide on the most appropriate constant term. The difference in absolute and relative potential values is minimal for the majority of the regions but the lower constant term does enhance the values for the small highly urbanised regions. Therefore, Rich's amended formula is incorporated into the potential model.

A critique of the methodology is undertaken after the analysis of the results. The critique addresses the limitations of the potential model but stresses the strong contribution which the present study makes to the theoretical debate on the regional economic impact of the Tunnel. However, before the results can be examined in terms of the impact of the Tunnel on the relative accessibility of UK regions, it is useful to first discuss the general impact of the Tunnel on regional accessibility in the EC.

3.5. Regional Accessibility within the EC

Keeble et. al. (1982b&c) show that a 'wide disparity in regional accessibility values' exists within the EC, with higher values being associated with the more central regions. Therefore, it is argued that:

'This marked disparity in relative regional accessibility, as measured objectively by the potential index, indicates that if accessibility is important for the location and growth of economic activity, the peripheral regions of the Community are at a considerable disadvantage compared with central regions.'

(Keeble et. al. 1982b, P.44)

Even though a wide disparity in relative potential values is still quite evident from the current results, the potential surfaces produce a much more complicated pattern (see Figures 3.2-3.5). Peripheral locations continue to be disadvantaged by lower levels of regional accessibility but high levels of regional accessibility are restricted to only a few

localised regions; namely Ile de France (France), the South East (UK), Karlsruhe and Rheinhessen-Pfalz (Germany), and Koln and Dusseldorf (Germany). Thus, many central EC regions are shown to have very low levels of regional accessibility, commonly associated with the peripheral regions. This would seem to reflect the influence of frontier zones on regional accessibility and economic performance.

The most striking feature of the contour maps is the dominance of these several key regions, widely perceived as the commercial and industrial centres of the Community. This could be explained by agglomeration tendencies of modern commercial and industrial enterprises, as suggested by Vickerman (1989a), coinciding with the advantages of regional accessibility, to create a Community of several highly industrialised regions. Keeble et. al. (1982b) also identify these dominant regions but with a concentric pattern spreading out from them, highlighting the fall off in regional accessibility as distance progressively increases away from the core. The distance term employed by Keeble et. al. measures pure road distance, in kms, and the universe encompasses all the EC member states, as well as countries belonging to the EFTA. Thus, the most accessible region is shown by Keeble et. al. to be Rheinhessen Pfalz, one of the most central European regions in terms of road distance. However, the present model incorporates only seven member states of the Community and a distance term which measures shortest rail distance in hrs/mins. Border crossing formalities and certain operational practices of national railway companies are also incorporated into the model. Since the shortest route in kilometres was not always possible, the potential map of the EC is significantly changed. No concentric pattern spreading out from the core is apparent, instead a much more complicated pattern focuses on several regional cores.

However, one has to be careful when interpreting these results, particularly if the aim is to assess the importance of location for economic development within the EC. The present potential model was set-up with the specific aim of studying the impact of the Tunnel on the relative accessibility of UK regions vis-a-vis the Continent. Keeble et. al.'s potential model, on the otherhand, was set-up to look at the effect of location within the EC on the level of economic activity, and was then later adapted to study the importance of the Tunnel to regional accessibility. It should be noted that only 25 percent of container freight

is transported by rail throughout the Continent, the corresponding figure being much smaller in the UK. As argued by Keeble et. al. (1982a), road transport dominates the haulage of both domestic and European freight. Thus, pure road distance represents a more appropriate basis for Keeble et. al.'s wider study of accessibility/peripherality in the EC but not when the model is adapted to study the impact of the Tunnel. This argument justifies the use of rail in the current model, since rail journey times are a good basis on which to study the impact of the Tunnel on UK regional accessibility but not on accessibility/peripherality in the EC. The limited effect of the Tunnel on the contour maps would seem to support this argument. Potential models are constructed with specific goals in mind. Their interpretation must therefore recognise this. Analysis of the results will concentrate on the percentage changes in own and relative potential values, highlighting the importance of the Tunnel to regional accessibility.

Figure 3.2 Relative Potential Values - Ferry 30 mph no delays.
All values relative to maximum Ile de France.

node	value	node	value		
1	Scotland	11.653	45	West Vlaanderen	8.096
2	North	7.570	46	Oost Vlaanderen	10.619
3	Yorkshire & Humberside	17.002	47	Hainaut	7.450
4	North West	23.980	48	Namur	2.713
5	East Midlands	15.647	49	Liege	8.197
6	West Midlands	20.047	50	Brabant	22.594
7	Wales	8.607	51	Antwerpen	16.433
8	South West	17.254	52	Limburg	5.432
9	East Anglia	6.662	53	Luxembourg	1.171
10	South East	83.547	54	Luxembourg (Grand Du)	3.514
11	Northern Ireland	2.797	55	Rheinhesen Pfalz	44.303
12	Eire	6.124	56	Karlsruhe	64.403
13	Basse Normandie	5.289	57	Saarland	8.670
14	Haute Normandie	10.447	58	Trier	3.477
15	Nord-pas de Calais	21.729	59	Koblenz	11.566
16	Picardie	9.980	60	Koln	43.264
17	Champagne Ardenne	7.992	61	Dusseldorf	60.813
18	Ile de France	100.000	62	Munster	20.626
19	Bretagne	10.318	63	Weser Ems	17.137
20	Pays de la Loire	11.626	64	Bremen	7.194
21	Centre	11.933	65	Schleswig Holstein	12.763
22	Poitou Charentes	6.273	66	Hamburg	18.349
23	Limousin	2.551	67	Luneberg	7.066
24	Aquitaine	9.572	68	Braunschweig	12.534
25	Midi Pyrenees	6.561	69	Hannover	18.061
26	Languedoc Roussillon	5.944	70	Detmold	15.410
27	Provence Alpes Cote	13.293	71	Kassel	8.857
28	Auvergne	4.856	72	Arnsberg	35.773
29	Rhone Alpes	24.667	73	Giessen	7.606
30	Franche Comte	5.128	74	Darmstadt	45.331
31	Bourgogne	8.002	75	Unterfranken	8.497
32	Lorraine	12.682	76	Oberfranken	5.935
33	Alsace	10.565	77	Mittelfranken	14.324
34	Groningen	7.389	78	Oberpfalz	6.272
35	Friesland	3.177	79	Neiderbayern	5.988
36	Drenthe	3.120	80	Oberbayern	30.090
37	Overijssel	5.734	81	Schwaben	10.797
38	Gelderland	12.102	82	Stuttgart	36.637
39	Utrecht	8.505	83	Tubingen	11.168
40	Noord Holland	21.296	84	Frieburg	11.994
41	Zuid Holland	26.681	85	West Berlin	10.741
42	Zeeland	2.171	86	Lombardie	32.967
43	Noord Brabant	15.661	88	Hovedstadsregionen	8.029
44	Limburg	7.176			

Data was available for the following nodes but excluded from the map. Inclusion of these nodes was deemed to adversely affect accuracy due to their isolated occurrence.

87	Castilla-Leon	2.435
89	Stereia Ellada	0.289
90	Lisboa e Vale do Tej	1.675

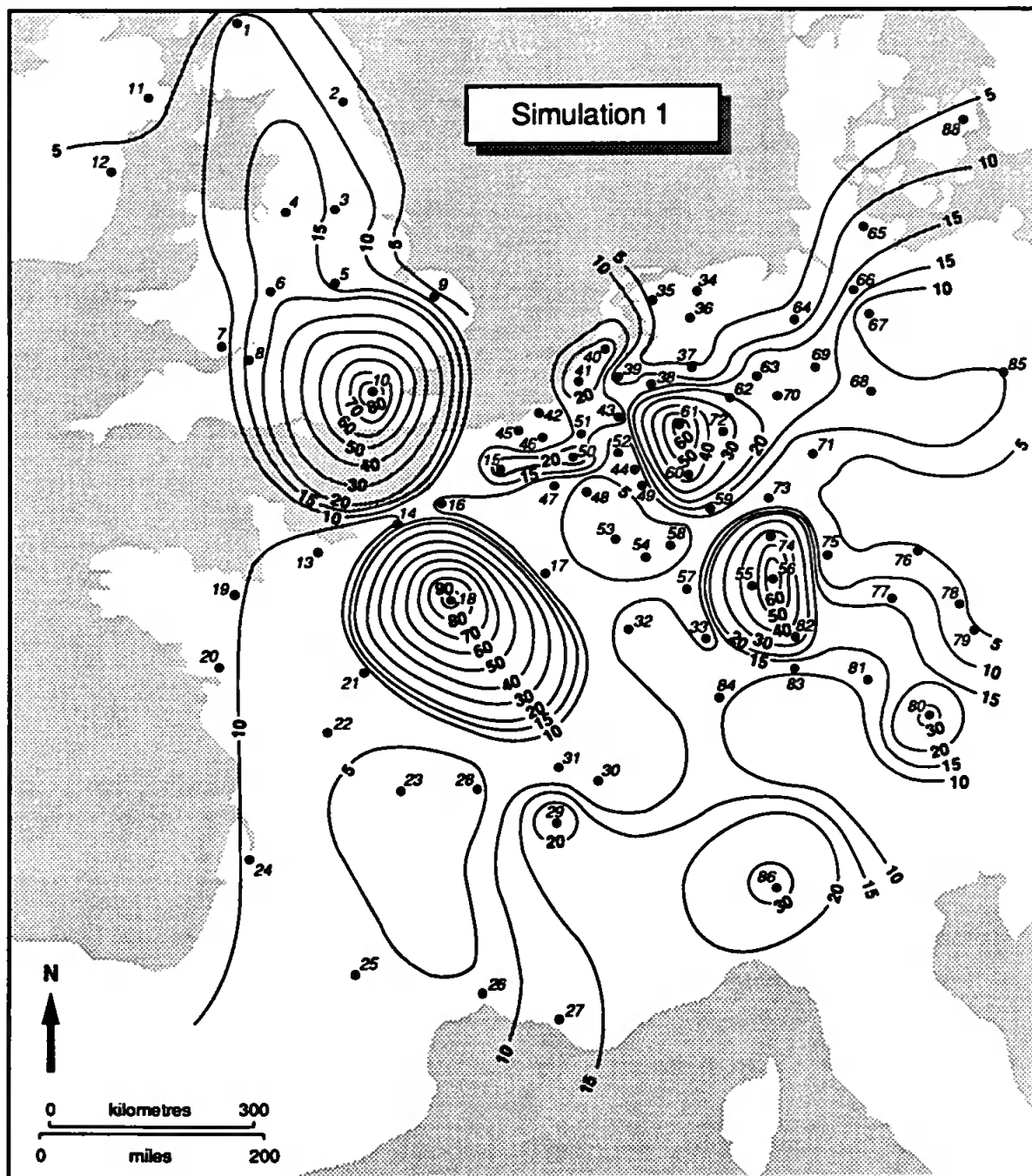


Figure 3.2 Relative Potential Values - Ferry 30 mph no delays.
All values relative to maximum Ile de France.

Figure 3.3 Relative Potential Values - Tunnel 30 mph. All values relative to maximum Ile de France.

node		value	node		value
1	Scotland	12.826	45	West Vlaanderen	8.173
2	North	8.513	46	Oost Vlaanderen	10.736
3	Yorkshire & Humberside	18.860	47	Hainaut	7.641
4	North West	26.914	48	Namur	2.736
5	East Midlands	17.313	49	Liege	8.393
6	West Midlands	22.752	50	Brabant	22.696
7	Wales	9.633	51	Antwerpen	16.649
8	South West	19.617	52	Limburg	5.490
9	East Anglia	7.263	53	Luxembourg	1.174
10	South East	103.615	54	Luxembourg (Grand Du)	3.416
11	Northern Ireland	3.525	55	Rheinhessen Pfalz	41.496
12	Eire	8.605	56	Karlsruhe	60.314
13	Basse Normandie	5.139	57	Saarland	8.516
14	Haute Normandie	10.323	58	Trier	3.405
15	Nord-pas de Calais	23.516	59	Koblenz	11.273
16	Picardie	10.228	60	Koln	42.941
17	Champagne Ardenne	8.172	61	Dusseldorf	60.169
18	Ile de France	100.000	62	Munster	20.051
19	Bretagne	9.842	63	Weser Ems	16.571
20	Pays de la Loire	11.178	64	Bremen	6.963
21	Centre	11.611	65	Schleswig Holstein	12.182
22	Poitou Charentes	6.081	66	Hamburg	17.535
23	Limousin	2.467	67	Luneberg	6.758
24	Aquitaine	9.208	68	Braunschweig	11.959
25	Midi Pyrenees	6.278	69	Hannover	17.236
26	Languedoc Roussillon	5.695	70	Detmold	14.856
27	Provence Alpes Cote	12.743	71	Kassel	8.466
28	Auvergne	4.695	72	Amsberg	34.911
29	Rhone Alpes	23.872	73	Giessen	7.325
30	Franche Comte	4.969	74	Darmstadt	43.426
31	Bourgogne	7.829	75	Unterfranken	8.092
32	Lorraine	12.889	76	Oberfranken	5.633
33	Alsace	10.848	77	Mittelfranken	13.557
34	Groningen	7.229	78	Oberpfalz	5.929
35	Friesland	3.121	79	Neiderbayern	5.665
36	Drenthe	3.053	80	Oberbayern	28.559
37	Overijssel	5.748	81	Schwaben	10.255
38	Gelderland	12.194	82	Stuttgart	34.982
39	Utrecht	8.426	83	Tubingen	10.689
40	Noord Holland	21.085	84	Frieburg	11.711
41	Zuid Holland	26.837	85	West Berlin	10.005
42	Zeeland	2.218	86	Lombardie	33.495
43	Noord Brabant	15.815	88	Hovedstadsregionen	7.220
44	Limburg	7.690			

Data was available for the following nodes but excluded from the map. Inclusion of these nodes was deemed to adversely affect accuracy due to their isolated occurrence.

87	Castilla-Leon	2.367
89	Stereia Ellada	0.288
90	Lisboa e Vale do Tej	1.665

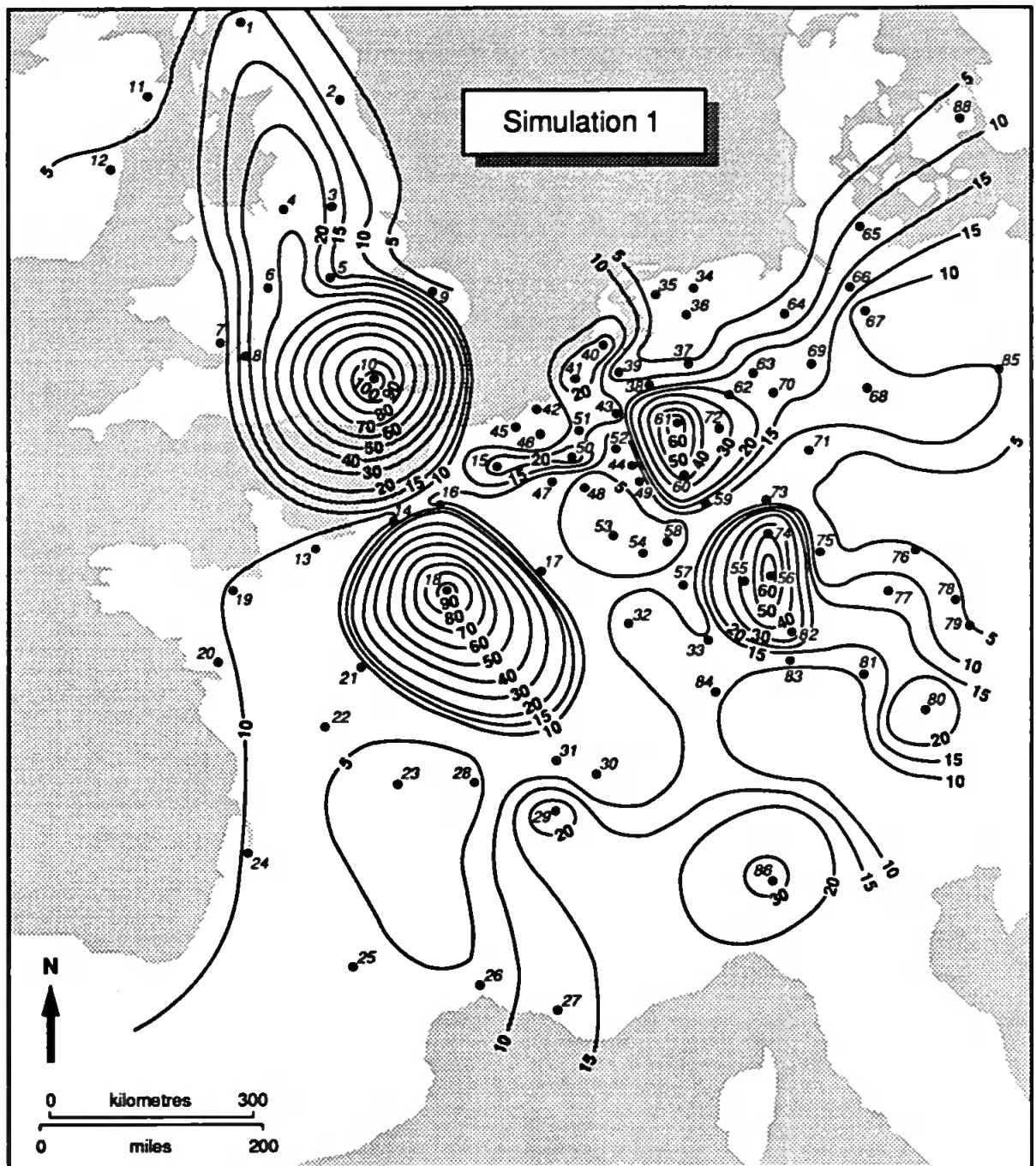


Figure 3.3 Relative Potential Values - Tunnel 30 mph. All values relative to maximum Ile de France.

Figure 3.4 Relative Potential Values - Ferry 75 mph no delays.
All values relative to maximum Ile de France.

node	value	node	value		
1	Scotland	9.552	45	West Vlaanderen	7.902
2	North	6.263	46	Oost Vlaanderen	10.451
3	Yorkshire & Humberside	14.685	47	Hainaut	7.216
4	North West	21.627	48	Namur	2.656
5	East Midlands	13.947	49	Liege	7.859
6	West Midlands	17.906	50	Brabant	22.412
7	Wales	7.491	51	Antwerpen	15.992
8	South West	15.115	52	Limburg	5.271
9	East Anglia	5.143	53	Luxembourg	1.144
10	South East	67.036	54	Luxembourg (Grand Du)	3.704
11	Northern Ireland	2.139	55	Rheinhesen Pflaz	49.803
12	Eire	4.436	56	Karlsruhe	72.413
13	Basse Normandie	5.370	57	Saarland	8.977
14	Haute Normandie	10.434	58	Trier	3.610
15	Nord-pas de Calais	19.710	59	Koblenz	12.004
16	Picardie	9.834	60	Koln	43.847
17	Champagne Ardenne	7.795	61	Dusseldorf	61.524
18	Ile de France	100.000	62	Munster	21.359
19	Bretagne	10.720	63	Weser Ems	17.862
20	Pays de la Loire	12.149	64	Bremen	7.412
21	Centre	12.483	65	Schleswig Holstein	13.463
22	Poitou Charentes	6.586	66	Hamburg	19.098
23	Limousin	2.679	67	Luneberg	7.471
24	Aquitaine	10.148	68	Braunschweig	13.345
25	Midi Pyrenees	6.985	69	Hannover	19.241
26	Languedoc Roussillon	6.317	70	Detmold	16.150
27	Provence Alpes Cote	14.090	71	Kassel	9.409
28	Auvergne	5.101	72	Arnsberg	36.879
29	Rhone Alpes	25.712	73	Giessen	8.051
30	Franche Comte	5.237	74	Darmstadt	48.468
31	Bourgogne	8.189	75	Unterfranken	9.167
32	Lorraine	12.130	76	Oberfranken	6.427
33	Alsace	9.866	77	Mittelfranken	15.635
34	Groningen	7.399	78	Oberpfalz	6.863
35	Friesland	3.141	79	Neiderbayern	6.538
36	Drenthe	3.120	80	Ooberbayern	32.761
37	Overijssel	5.414	81	Schwaben	11.733
38	Gelderland	11.627	82	Stuttgart	39.217
39	Utrecht	8.360	83	Tubingen	11.968
40	Noord Holland	20.862	84	Frieburg	12.440
41	Zuid Holland	25.500	85	West Berlin	11.127
42	Zeeland	2.024	86	Lombardie	30.090
43	Noord Brabant	14.869	88	Hovedstadsregionen	6.973
44	Limburg	6.311			

Data was available for the following nodes but excluded from the map. Inclusion of these nodes was deemed to adversely affect accuracy due to their isolated occurrence.

87	Castilla-Leon	2.405
89	Stereia Ellada	0.285
90	Lisboa e Vale do Tej	1.618

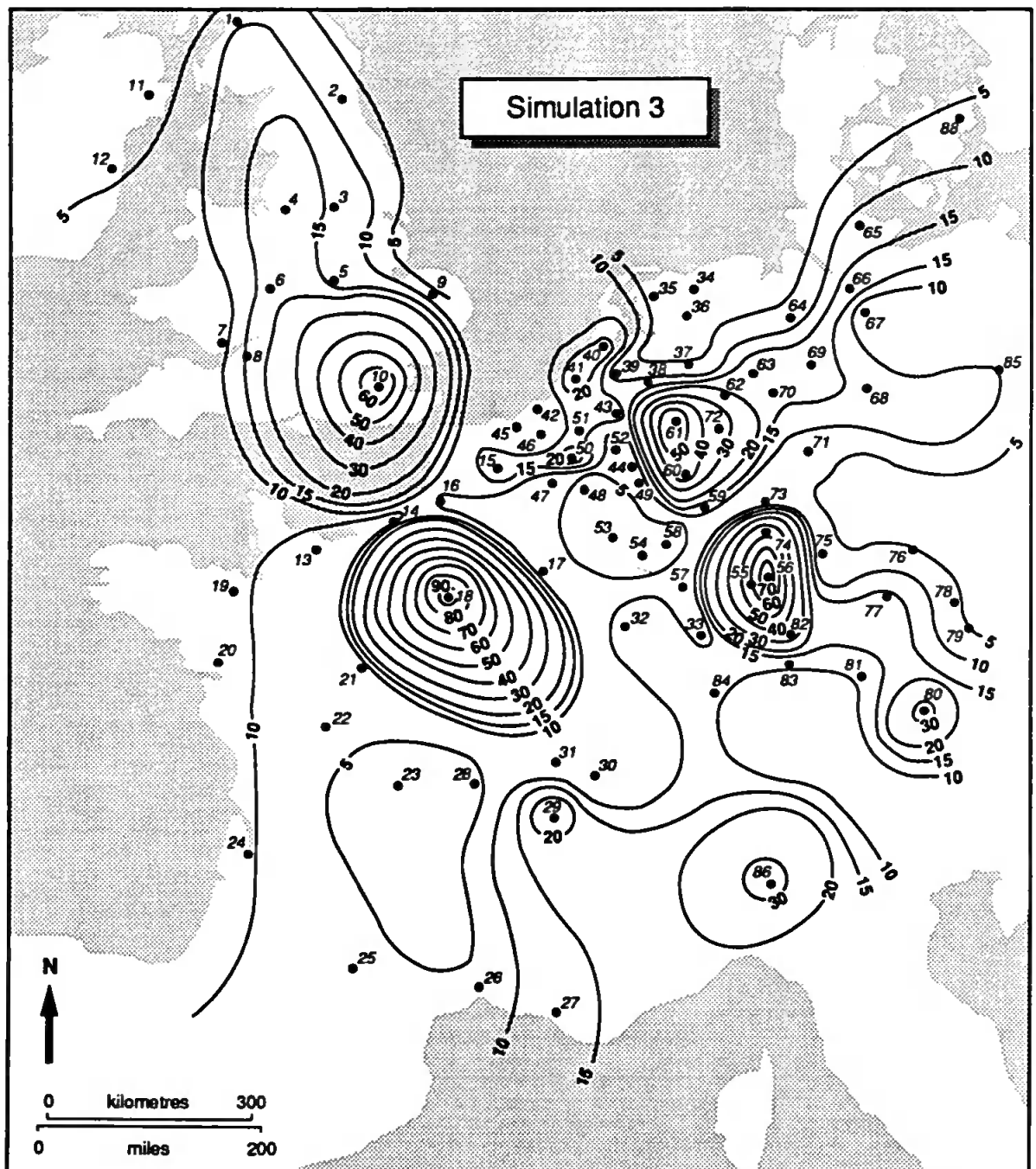


Figure 3.4 Relative Potential Values - Ferry 75 mph no delays.
All values relative to maximum Ile de France.

Figure 3.5 Relative Potential Values - Tunnel 75 mph. All values relative to maximum Ile de France.

node	value	node	value		
1	Scotland	12.481	45	West Vlaanderen	8.012
2	North	8.077	46	Oost Vlaanderen	10.544
3	Yorkshire & Humberside	18.192	47	Hainaut	7.419
4	North West	26.027	48	Namur	2.692
5	East Midlands	16.335	49	Liege	8.080
6	West Midlands	21.209	50	Brabant	22.469
7	Wales	8.972	51	Antwerpen	16.261
8	South West	18.024	52	Limburg	5.371
9	East Anglia	6.451	53	Luxembourg	1.162
10	South East	87.720	54	Luxembourg (Grand Du)	3.529
11	Northern Ireland	3.396	55	Rheinhessen Pfalz	45.071
12	Eire	8.259	56	Karlsruhe	65.522
13	Basse Normandie	5.253	57	Saarland	8.714
14	Haute Normandie	10.357	58	Trier	3.499
15	Nord-pas de Calais	21.282	59	Koblenz	11.598
16	Picardie	9.973	60	Koln	43.138
17	Champagne Ardenne	7.969	61	Dusseldorf	60.448
18	Ile de France	100.000	62	Munster	20.571
19	Bretagne	10.256	63	Weser Ems	17.110
20	Pays de la Loire	11.656	64	Bremen	7.128
21	Centre	12.048	65	Schleswig Holstein	12.828
22	Poitou Charentes	6.333	66	Hamburg	18.196
23	Limousin	2.570	67	Luneberg	7.110
24	Aquitaine	9.678	68	Braunschweig	12.580
25	Midi Pyrenees	6.620	69	Hannover	18.121
26	Languedoc Roussillon	5.997	70	Detmold	15.424
27	Provence Alpes Cote	13.405	71	Kassel	8.891
28	Auvergne	4.896	72	Arnsberg	35.684
29	Rhone Alpes	24.822	73	Giessen	7.651
30	Franche Comte	5.105	74	Darmstadt	45.693
31	Bourgogne	8.027	75	Unterfranken	8.580
32	Lorraine	12.524	76	Oberfranken	5.993
33	Alsace	10.348	77	Mittelfranken	14.484
34	Groningen	7.302	78	Oberpfalz	6.347
35	Friesland	3.135	79	Neiderbayern	6.058
36	Drenthe	3.083	80	Oberbayern	30.491
37	Overijssel	5.584	81	Schwaben	10.927
38	Gelderland	11.912	82	Stuttgart	36.905
39	Utrecht	8.361	83	Tubingen	11.276
40	Noord Holland	20.964	84	Frieburg	12.042
41	Zuid Holland	26.127	85	West Berlin	10.365
42	Zeeland	2.129	86	Lombardie	32.266
43	Noord Brabant	15.348	88	Hovedstadsregionen	7.220
44	Limburg	6.958			

Data was available for the following nodes but excluded from the map. Inclusion of these nodes was deemed to adversely affect accuracy due to their isolated occurrence.

87	Castilla-Leon	2.435
89	Stereia Ellada	0.289
90	Lisboa e Vale do Tej	1.675

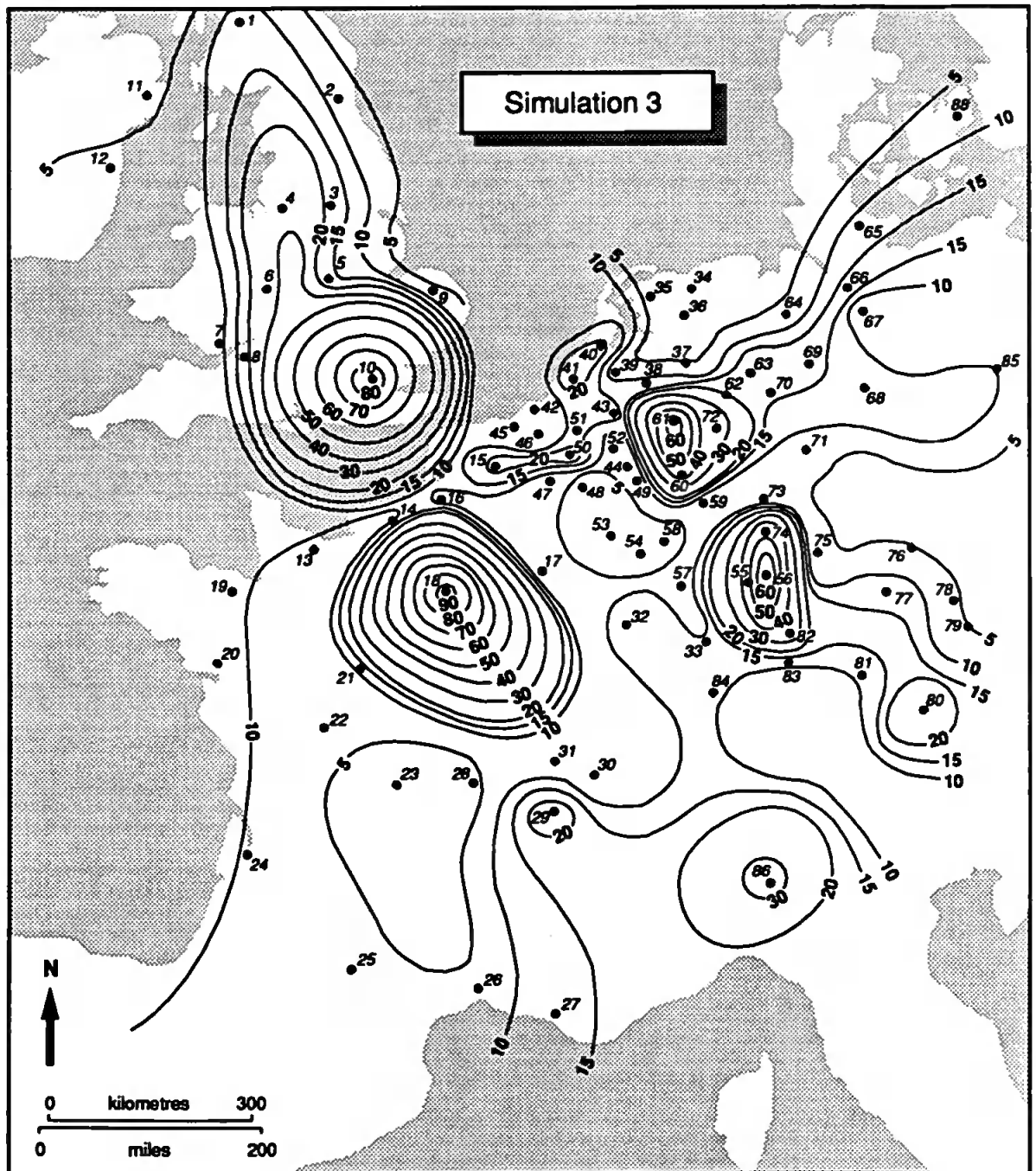


Figure 3.5 Relative Potential Values - Tunnel 75 mph. All values relative to maximum Ile de France.

3.6. Analysis of the Results

The results will be examined individually according to speed (30, 40 or 75mph) and the delay factor (no delay, six or 18 hours delay). To avoid repetition, the results for Simulations 2 and 3 (40 & 75mph, respectively) will only highlight the main findings. Emphasis will also be placed on the 'no delay' simulations since the incorporation of either a six or an 18 hour delay has a limited effect on the relative accessibility of the regions. The 'no delay' simulations compare an efficient pre-Tunnel rail-ferry service with the post-Tunnel service. Thus, any gains in relative accessibility as a result of the Tunnel prove to be more significant. However, it would be unrealistic to assume that the present rail-ferry freight service does not engender delays. As one would expect, the general level of accessibility for all UK regions declines as delays are incorporated into the model. Tables with absolute and relative potential values for all 90 regions, as well as their percentage changes, are presented in Appendix 2.

It was hypothesized that the more peripheral UK regions could experience gains in relative accessibility, as a result of the Tunnel, similar to or even higher than that of the South East. Nevertheless, the initial results for Simulation 1 (30mph) and Simulation 2 (40mph), when taken separately, show that the South East records higher increases in own and relative potential values compared to the rest of Britain. It would seem that the results further support the earlier findings of Keeble et. al. (1982a), that the South East will be the major recipient of any benefits created by the Tunnel, and thus make it impossible to accept the hypothesis. However, Simulation 3 (75mph) shows that fairly uniform increases in relative accessibility are realised by certain peripheral UK regions as compared with the South East; namely, Scotland, the North and East Anglia. A gradual convergence in the percentage increases in the level of relative accessibility for all UK regions, through Simulation 1 to Simulation 3, can also be identified. Furthermore, the increases in relative potential values for N.Ireland and Eire, which are almost consistently higher than the respective values for the South East, also tend to support the basic hypothesis.

However, before any further analysis of the results, it is first appropriate to determine the significance of the apparent differences in the results for Simulations 1 to 3. The non-parametric Mann-Whitney statistical test was employed to show whether or not the results for each of the simulations are significantly different, at a rejection level of $\alpha = 0.05$. The increases in own and relative potential values for Simulations 1 to 3 (no delay scenario) are contrasted against each other:

'no delay scenario'	Level of Significance	
	Increase in own potential	Increase in relative potential
Sim. 1 Vs 2	0.4025	0.6236
Sim. 1 Vs 3	0.0011	0.0051
Sim. 2 Vs 3	0.0029	0.0024

As stated above, analysis of the results will focus on the 'no delay' scenario, thus a statistical test of the two delay scenarios is not needed. It can be seen that the respective increases in the relative potential values for Simulations 1 and 2 are not significantly different at $\alpha = 0.05$. However, the differences between the results for Simulations 1 or 2 and Simulation 3, in terms of both own and relative potential values, prove to be highly significant. It is therefore possible to be confident in the following comparative analysis of the results, since attention is focused primarily on Simulations 1 and 3. Nonetheless, it is important to emphasize that the simulation speeds (30, 40 & 75mph) were not selected at random but are based on the outcome of discussions with BR (personal interview: Jenkins 1990). Thus, the results for each of the simulations are important individually but particularly for Simulation 3, which is representative of the likely running speed of post-Tunnel international freight trains.

3.6.1. Simulation 1

Simulation 1 refers to the lower speed of 30 mph. The 'no delay' scenario will be discussed first, before analysis of the effect of a delay factor of either 6 or 18 hours on the

potential values. When a delay factor is incorporated the English Channel becomes an even greater barrier to trade, thus reducing own and relative potential values. The results for Simulation 1 show that the impact of the Tunnel on regional accessibility outside the South East is quite uniform (see Table 3.1). But the increase in the relative potential for the South East more than doubles that of most of the UK regions. The South West records the largest increase outside the South East, 13.7 percent, in its relative potential value, whilst the lowest increase is that for East Anglia, 9.0 percent.

LEVEL II REGIONS: UK AND EIRE	INCREASE IN OWN POTENTIAL		PERCENT INCREASES RELATIVE TO ILE DE FRANCE
	MIL ECUs/Hr	PERCENT	
SCOTLAND	37850	19.6	10.0
NORTH	27850	22.2	12.5
YORK & HUMB.	57861	20.6	10.9
NORTH WEST	87251	22.0	12.2
EAST MIDLANDS	52474	20.3	10.6
WEST MIDLANDS	74226	22.4	12.6
WALES	30840	21.7	11.9
SOUTH WEST	67322	23.6	13.7
EAST ANGLIA	20395	18.5	9.0
SOUTH EAST	480983	34.8	24.0
N. IRELAND	17118	37.0	26.0
EIRE	53418	52.8	40.5

Table 3.1: Absolute and relative potential values for the UK and Eire - Simulation 1 (no delay).

(Note: Ile de France is the maximum)

Increases in relative potential values, however, had a rather limited impact on the rank order of regions in terms of their total relative potential values (see Table 3.2). N.Ireland and Eire are the only two regions which record higher percentage increases than the South

East (also repeated in Simulations 2 and 3). In terms of relative accessibility to the Continent as compared to mainland Britain, both Eire and Northern Ireland face the additional "disadvantage" of the Irish Sea. The Tunnel, by removing the barrier of the English Channel, has a considerable effect on the relative accessibility of Eire and Northern Ireland, and tends to support Piedad's (1989b) concept of an 'Irish Landbridge', as discussed in the Literature Review (chapter 2).

LEVEL II REGIONS: UK AND EIRE	PRE-TUNNEL SCENARIO		POST-TUNNEL SCENARIO	
	PERCENT	RANK	PERCENT	RANK
SCOTLAND	11.65	7	12.83	7
NORTH	7.57	9	8.51	10
YORK & HUMB.	17.00	5	18.86	5
NORTH WEST	23.98	2	26.91	2
E. MIDLANDS	15.65	6	17.31	6
W. MIDLANDS	20.05	3	22.57	3
WALES	8.61	8	9.63	8
SOUTH WEST	17.25	4	19.62	4
E. ANGLIA	6.66	10	7.62	11
SOUTH EAST	83.55	1	103.61	1
N. IRELAND	2.80	12	3.52	12
EIRE	6.12	11	8.60	9

Table 3.2: Relative potential values for the UK and Eire - Simulation 1 (no delay): pre- and post-Tunnel.

These results, therefore, only produce further theoretical evidence to support the general belief that the Tunnel will help only to enhance the South East's dominance over the British economy to the detriment of the more peripheral regions. The great disparity between the relative potential values for the UK, with the South East recording a value of 83.5 percent in the pre-Tunnel scenario and Northern Ireland only 2.8 percent, highlights the division in the British economy. Northern Ireland is further peripheralised by the Irish Sea but the North West, with the second highest relative potential value for the UK, still

only records 24.0 percent, more than three times less than the respective value for the South East. The relative potential value for the South East in the post-Tunnel scenario is 103.6 percent. The respective values for the North West and Northern Ireland are 26.9 and 3.5 percent. The increase in the absolute potential value for the South East is therefore 28 times greater than that for Northern Ireland, 480983 and 17118 mil ECU's per hour respectively. The increase in absolute potential for the South East is also more than five times that for the North West.

However, one has to be cautious when interpreting these results. The wide disparity in own and relative potential values within the UK is exaggerated by the reliance on shortest rail journey time for the distance term. The vast majority of domestic British/Irish trade is transported by road, reflecting road transport as the more accessible mode of transport for domestic container freight. Thus, the use of shortest rail journey time in the present study acts only to further peripheralise regions to the north and west of London. The potential model is designed to quantify the impact of the Tunnel on the relative accessibility of the UK regions vis-a-vis the Continent. Analysis of the results should therefore be confined to that specific aim. The results can only provide a very general measure of regional economic performance/standing. Nonetheless, the disparity in own and relative potential values within the UK and the EC, as a whole, is consistent throughout each of the simulations, and thus one can have confidence in interpreting percentage changes in own and relative accessibility.

In terms of the Continent, the Tunnel has a limited influence on the relative accessibility of most regions. Only Nord-Pas de Calais (France) and Limburg (Netherlands) record percentage increases in relative potential greater than five percent, 8.2 and 7.2 percent respectively. A further 19 continental regions experience positive increases in relative potential, between 2.7 percent for Alsace (France) and 0.2 percent for Overijssel (Netherlands), see Appendix 2 - Simulation 1 (no delay). Reduced time wasted at border crossings accounts for the majority of these increases, especially since frontier regions predominate. The percentage increase in the relative potential value for Limburg can also be explained by improved efficiency at national frontiers.

Therefore, northern France, and to a lesser extent Belgium, are the only regions to benefit from improved regional accessibility directly as a result of the Tunnel. However, even this has to be qualified. Referring to Appendix 2, it can be seen that the percentage increases in relative potential for all 11 Belgian regions are minimal compared to their UK counterparts and that the frontier regions record higher gains. Nord-Pas de Calais is the only continental region that experiences a significant increase in regional accessibility, which can be attributed primarily to the Tunnel. Continental regions adjacent to the Tunnel do not benefit from the considerable increases in relative accessibility associated with the UK because only a small percentage of their overall economic potential will be affected by improvements in cross-Channel links.

The incorporation of delays into the model, while reducing overall own and relative potential values, has a limited effect on the rank order of regions. The results for Simulation 1 show that the South East's own potential value fell from 1381648, no delay, to 1184065, six hours delay, to 975305 mil ECU' per hour, 18 hours delay. This represents a 29.5 percent reduction in the South East's own potential, other UK regions record similar but smaller reductions. As explained previously, the delay scenarios represent a more realistic account of the pre-Tunnel cross-Channel transport system, and are included in the "ferry" simulations. As one would expect the percentage increases in relative potential values become even greater as the delay factor is increased (see Tables 3.3 and 3.4). The percentage increases in relative potential values for the South East for the two delay scenarios (six and 18 hrs delay) are 42.5 percent and 70.0 percent respectively. These large increases in regional accessibility are not unique to the South East, since they are also recorded for the rest of the UK and Eire. However, an increased delay factor reduces the percentage increase in relative potential for Northern Ireland relative to other UK regions.

LEVEL II REGIONS: UK AND EIRE	INCREASE IN OWN POTENTIAL		PERCENT INCREASES RELATIVE TO ILE DE FRANCE
	MIL ECUs/Hr	PERCENT	
SCOTLAND	55618	31.8	19.4
NORTH	39982	35.4	22.6
YORK & HUMB.	81983	31.9	19.5
NORTH WEST	121636	33.6	21.0
EAST MIDLANDS	77809	33.3	20.8
WEST MIDLANDS	106345	35.5	22.8
WALES	45847	36.0	23.2
SOUTH WEST	97444	38.2	25.2
EAST ANGLIA	36709	39.1	26.0
SOUTH EAST	678566	57.3	42.5
N. IRELAND	21247	50.4	36.3
EIRE	63140	69.0	53.0

**Table 3.3: Absolute and relative potential values for the UK and Eire -
Simulation 1 (6hrs delay).**

LEVEL II REGIONS: UK AND EIRE	INCREASE IN OWN POTENTIAL		PERCENT INCREASES RELATIVE TO ILE DE FRANCE
	MIL ECUs/Hr	PERCENT	
SCOTLAND	79067	52.2	35.5
NORTH	55307	56.6	39.5
YORK & HUMB.	111419	49.0	32.7
NORTH WEST	162877	50.7	34.3
EAST MIDLANDS	107012	52.4	35.7
WEST MIDLANDS	143303	54.6	37.7
WALES	63440	57.8	40.6
SOUTH WEST	132118	59.9	42.4
EAST ANGLIA	54614	71.9	53.1
SOUTH EAST	887326	91.0	70.1
N. IRELAND	26758	73.1	54.1
EIRE	75597	95.6	74.2

**Table 3.4: Absolute and relative potential values for the UK and Eire -
Simulation 1 (18hrs delay).**

The incorporation of a delay factor into the model is shown in Table 3.5 to have a limited impact on the rank order of a region's relative potential value. The inclusion of a six hour delay only causes the rank orders of the South West and Yorkshire and Humberside to change. An 18 hour delay factor also left the majority of regions unaffected. Although there is an apparent reduction in the relative potential values for all UK regions as well as Eire, this reduction is universal. Thus, the rank order of most regions remains constant throughout the three delay scenarios.

LEVEL II REGIONS: UK AND EIRE	NO DELAY		6Hrs DELAY		18Hrs DELAY	
	%	RANK	%	RANK	%	RANK
SCOTLAND	11.65	7	10.74	7	9.46	7
NORTH	7.57	9	6.94	9	6.10	9
YORK & HUMB	17.00	5	15.78	4	14.22	4
NORTH WEST	23.98	2	22.24	2	20.05	2
E. MIDLANDS	15.65	6	14.33	6	12.75	6
W. MIDLANDS	20.05	3	18.38	3	16.39	3
WALES	8.61	8	7.82	8	6.85	8
SOUTH WEST	17.25	4	15.67	5	13.77	5
E. ANGLIA	6.66	10	5.56	10	4.74	11
SOUTH EAST	83.55	1	72.70	1	60.92	1
N. IRELAND	2.80	12	2.59	12	2.29	12
EIRE	6.12	11	5.62	11	4.94	10

Table 3.5: Relative potential values (and rank orders) for the UK and Eire - Simulation 1.

However, the effect of delays on the percentage increases in relative potential values for the UK and Eire can be clearly seen from Table 3.6. East Anglia records the lowest increase in relative potential in the 'no delay' scenario but the fourth highest in both the six and 18 hour delay scenarios. East Anglia already benefits from proximity to Flexistowe, thus the incorporation of delays strengthens the position of the Tunnel compared with the ferries, allowing the region to also benefit from the Tunnel. Even so, the uniformity of the percentage increases for most of the UK regions outside the South East, prevents any noticeable impact on the general level of relative potential values. It is also worth pointing out that the six and 18 hour delay scenarios have a much more limited impact (positive or negative) on the general level of relative potential values, and their percentage changes, for continental regions.

LEVEL II REGIONS: UK AND EIRE	NO DELAY ----- %age RANK CHANGE	6Hrs DELAY ----- %age RANK CHANGE	18Hrs DELAY ----- %age RANK CHANGE
SCOTLAND	10.07 11	19.40 12	35.54 10
NORTH	12.46 6	22.63 8	39.47 7
YORK & HUMB.	10.93 9	19.50 11	32.66 12
NORTH WEST	12.24 7	21.02 9	34.26 11
E. MIDLANDS	10.65 10	20.80 10	35.73 9
W. MIDLANDS	12.60 5	22.77 7	37.69 8
WALES	11.92 8	23.22 6	40.55 6
SOUTH WEST	13.70 4	25.19 5	42.41 5
E. ANGLIA	9.02 12	26.03 4	53.10 4
SOUTH EAST	24.02 3	42.52 2	70.09 2
N. IRELAND	26.03 2	36.31 3	54.13 3
EIRE	40.51 1	53.06 1	74.15 1

Table 3.6: Percentage changes in relative potential values (and rank orders) for the UK and Eire - Simulation 1.

(Note: The rank order of a region reflects the magnitude of the percentage increase in the relative potential value.)

Therefore, based on the results for Simulation 1, it is shown that UK regions gain considerably more, as a result of the Tunnel in terms of increasing relative accessibility, than continental regions. The South East experiences an increase in relative accessibility more than double the increases recorded by other British regions. Hence, it is not possible to accept the hypothesis. However, the results for Simulations 2 and 3 show a gradual convergence in percentage increases in relative accessibility, which tends to support the basic assumptions of the hypothesis of the present thesis. The discussion of the results for Simulations 2 and 3 will concentrate on the changes in relative potential values in the 'no delay' scenario. As shown above, a six or 18 hour delay factor has little effect on the rank order of regions. It will also become apparent that the same conclusion can only be drawn for simulations 2 and 3. However, the influence of speed (30, 40 or 75 mph) is quite considerable and needs to be discussed fully.

3.6.2. Simulations 2 and 3

Simulations 2 and 3 refer to the average freight train speed of 40 and 75mph. As with Simulation 1, the analysis will be primarily concerned with the effect of the Tunnel on UK regional accessibility. The results for Simulation 2, taken in isolation, also add further theoretical evidence to the general belief that the South East is likely to achieve a greater increase in accessibility vis-a-vis the Continent. Even though the South East again benefits more from the Tunnel, the actual increase in its relative potential value compared to the rest of Britain is reduced considerably (see Table 3.7). The South East records an increase of 17.7 percent in its relative potential value; while Scotland, the North and the North West achieve respective values of 12.9, 13.8 and 11.5 percent.

LEVEL II REGIONS: UK AND EIRE	INCREASE IN OWN POTENTIAL		PERCENT INCREASES RELATIVE TO ILE DE FRANCE
	MIL ECUs/Hr	PERCENT	
SCOTLAND	53605	23.1	12.9
NORTH	36236	24.1	13.8
YORK & HUMB.	76232	22.4	12.2
NORTH WEST	105841	21.6	11.5
EAST MIDLANDS	59039	18.6	8.7
WEST MIDLANDS	82559	20.2	10.2
WALES	34460	19.8	9.8
SOUTH WEST	71210	20.4	10.4
EAST ANGLIA	23327	18.0	8.2
SOUTH EAST	465811	28.4	17.7
N. IRELAND	23036	41.9	30.1
EIRE	71309	60.3	46.9

**Table 3.7: Absolute and relative potential values for the UK and Eire -
Simulation 2 (no delay).**

However, the South East still manages to more than double the percentage increases in relative potential compared with East Anglia, the East Midlands and Wales; 8.2, 8.7 and 9.8 percent respectively. It is again not possible to accept the hypothesis of the present study but the convergent trend in the percentage increases in relative potential values for all UK regions does allow some optimism for the more peripheral UK regions. However, one has to be careful when interpreting the results for Simulation 2, as compared to Simulation 1, since it was shown that the respective results were not significantly different.

Referring back to Simulation 1, the results show that the proximity of each of the 12 UK regions to the Continent has limited importance to their overall regional accessibility. The distance between any two UK regions forms only a small part of the average total journey distance. Furthermore, the journey times of existing ferry services for freight exports also have the effect of reducing the importance of intra-UK distances, especially when delays are incorporated into the model. Therefore, when simulation speeds are increased from 30 to 40 to 75mph, the region, outside the South East, which experiences a relatively higher increase in regional accessibility became progressively further north. The region which records the highest increase in regional accessibility, outside the South East, is the South West at 30mph, the North at 40mph and Scotland at 75mph. It could be argued that the more distant regions would be expected to experience greater increases in relative accessibility as speed increases but this is only apparent in the UK and not for continental regions. In fact, a significant proportion of the more distant continental regions record reductions in relative accessibility as the Simulation's speeds are increased from 30 to 75mph.

The wide disparity in own and relative potential values between UK regions is still very evident (see Appendix 2). The South East's relative potential values in the pre-and post-Tunnel scenarios were 77.6 and 91.3 percent respectively, while Northern Ireland still only records 2.6 and 3.4 percent. Simulation 3 produces similar results but the relative potential values for UK regions and Eire are approximately 15-20 percent lower than respective values for Simulation 1. Therefore, as the simulation speed is increased the general level of relative accessibility of the UK regions and Eire, as compared to Ile de France, declines. The effect of increased speed on the Continent differs between regions

but the majority also experience a fall in their general level of relative accessibility. Therefore, as speed is increased, Ile de France becomes more central in terms of rail freight journey times, and thus benefits relatively more.

Focusing attention on the Continent, 23 regions experience increases in relative accessibility but again only Nord-Pas de Calais (France) and Limburg (Netherlands) record increases greater than five percent (see Appendix 2 - Simulation 2). As the speed is increased from 30 to 40mph, Simulation 1 to Simulation 2, a further two more continental regions experience a positive change in relative accessibility, while the others record higher increases. When the speed component is again increased from 40 to 75mph, Simulation 2 to Simulation 3, 27 continental regions record positive changes in their relative accessibility. Thus, for Simulation 3 a further four more regions experience increases in relative accessibility, while the existing regions again recorded higher increases. Furthermore, Lombardie (Italy) records an increase in relative accessibility greater than five percent. As would be expected, most of the continental regions recording increases in relative potential values for both Simulations 2 and 3 are located in France, particularly northern France, Belgium and the Netherlands.

However, as stated in the previous section, improved cross-Channel transportation links have a limited effect on the level of regional accessibility on the Continent. The frontier region of Limburg benefits from improved efficiency at border crossings, recording the highest increase in relative potential on the Continent at the higher speeds of 40 and 75mph (8.6 and 10.5 percent respectively). As the average speed of freight trains is increased the reduction in the time wasted at each border crossing, from two to one hour, becomes more significant. The same argument can also be applied to the frontier region of Lombardie. Increases in relative potential of 7.6 percent in Simulation 2 and 8.0 percent in Simulation 3 for Nord-Pas de Calais, on the otherhand, are primarily as a result of the Tunnel. The increases in relative potential for Nord-Pas de Calais remain fairly constant; 8.2, 7.7 and 8.0 percent for Simulations 1 to 3, thus ruling out the influence of increased efficiency at border crossings.

The incorporation of a six or an 18 hour delay factor in both Simulations 2 and 3 produces similar results as for Simulation 1. As shown earlier, own and relative potential values for the UK and Eire decline as the delay factor is increased. It is quite evident from Tables 3.8 and 3.10, that a consistent downward trend in relative potential values is recorded for Simulations 2 and 3, as was the case with Simulation 1. Nonetheless the rank order of these regions remain fairly static. Analysis of the results for Simulation 2 shows that when a six hour delay is incorporated into the model only the rank positions of the South West and Yorkshire and Humberside alter. In addition, the rank position of East Anglia fell below that of Eire when an 18 hour delay is included. The delay scenarios for Simulation 3 has even less of an impact on the rank order of the regions.

LEVEL II REGIONS: UK AND EIRE	NO DELAY		6Hrs DELAY		18Hrs DELAY	
	----- %	RANK	----- %	RANK	----- %	RANK
SCOTLAND	10.95	7	10.02	7	8.77	7
NORTH	7.11	9	6.48	9	5.69	9
YORK & HUMB.	16.09	5	14.94	4	13.52	4
NORTH WEST	23.14	2	21.34	2	19.21	2
E. MIDLANDS	15.03	6	13.71	6	12.22	6
W. MIDLANDS	19.28	3	17.60	3	15.71	3
WALES	8.22	8	7.42	8	6.50	8
SOUTH WEST	16.49	4	14.91	5	13.13	5
E. ANGLIA	6.12	10	5.27	10	4.34	11
SOUTH EAST	77.63	1	67.34	1	56.67	1
N. IRELAND	2.60	12	2.37	12	2.07	12
EIRE	5.59	11	5.08	11	4.41	10

Table 3.8: Relative potential values (and rank orders) for the UK and Eire - Simulation 2.

The first two simulations show the South East recording much greater increases in relative potential compared to the rest of the UK. Simulation 3 incorporates an average running speed of 75mph, which at present BR confines to high value freight. However, BR plan

to introduce newer and faster locomotives, with a running speed of at least 75mph, for international freight trains. With reference to Table 3.9, it can be seen that the South East no longer records a significantly greater increase in relative potential compared to the rest of Britain. Scotland, the North and East Anglia record increases in relative potential within five percentage points of that for the South East. More specifically, the increase in relative potential for Scotland, 30.66 percent, was less than 0.2 percent below the respective value for the South East, 30.85 percent.

LEVEL II REGIONS: UK AND EIRE	INCREASE IN OWN POTENTIAL		PERCENT INCREASES RELATIVE TO ILE DE FRANCE
	MIL ECUs/Hr	PERCENT	
SCOTLAND	165264	48.6	30.7
NORTH	104065	46.6	29.0
YORK & HUMB.	213745	40.8	23.9
NORTH WEST	283814	36.8	20.3
EAST MIDLANDS	164806	33.1	17.1
WEST MIDLANDS	221199	34.7	18.4
WALES	96571	36.2	19.8
SOUTH WEST	191614	35.6	19.2
EAST ANGLIA	78121	42.6	25.4
SOUTH EAST	1165189	48.8	30.9
N. IRELAND	61381	80.5	58.8
EIRE	176555	111.7	86.2

**Table 3.9: Absolute and relative potential values for the UK and Eire -
Simulation 3 (no delay).**

LEVEL II REGIONS: UK AND EIRE	NO DELAY		6Hrs DELAY		18Hrs DELAY	
	%	RANK	%	RANK	%	RANK
SCOTLAND	9.55	7	8.65	7	7.59	7
NORTH	6.26	9	5.70	9	5.06	9
YORK & HUMB.	14.68	5	13.73	4	12.64	4
NORTH WEST	21.63	2	19.88	2	18.07	2
E. MIDLANDS	13.95	6	12.74	6	11.53	6
W. MIDLANDS	17.91	3	16.38	3	14.85	3
WALES	7.49	8	6.75	8	6.00	8
SOUTH WEST	15.11	4	13.69	5	12.25	5
E. ANGLIA	5.14	10	4.42	10	3.71	10
SOUTH EAST	67.04	1	58.56	1	50.51	1
N. IRELAND	2.14	12	1.91	12	1.65	12
EIRE	4.44	11	3.95	11	3.39	10

Table 3.10: Relative potential values (and rank orders) for the UK and Eire - Simulation 3.

The results for Simulation 3 therefore support the original hypothesis that the more peripheral UK regions would experience gains in relative accessibility similar to that of the South East. It can be seen that the overall findings of the present study conflict with those of the earlier study by Keeble et. al. (1982a); even though the results for Simulations 1 and 2 when analyzed individually tend to support Keeble et. al.'s main proposition, namely that the South East would experience the greatest gains in relative accessibility. A convergent trend in percentage increases in relative potential values for the UK regions culminates in fairly uniform increases being recorded by the South East, Scotland, the North and East Anglia. These findings have important implications for the "North" since the earlier findings of Clark et. al. (1969) and Keeble et. al. (1982a) show that the Tunnel would further peripheralise regions to the north and west of London. Eurotunnel (1987) has stated that the opportunities created by the Tunnel do not have to be confined to the South East but recognise that action is needed to prevent this from happening. The high-speed rail link is considered to be very important in enhancing the regional distribution of

benefits created by the Tunnel. The results for Simulation 3 show that rail freight speed is critical. Faster locomotives and improved rail infrastructure are therefore of prime importance to the regions.

It can be seen that the hypothesis of the present thesis holds true in certain circumstances. However, it is necessary to point out here that the rather limited nature of the data employed in the model has prevented the hypothesis being fully supported in all circumstances. This issue and other methodological problems are discussed in the critique below.

3.7. Critique

Economic potential analysis provides a very useful tool for assessing the impact of a new transportation system, or an improvement to the existing network, on the general level of regional accessibility, and thus a region's comparative advantage for economic development. However, as with most macro-analytical techniques, there are numerous difficulties associated with the setting-up and interpretation of potential models. This section will outline the methodological and interpretive problems encountered during this study.

The lack of consistent and accurate data sets at the European regional level prevented the hypothesis being tested as had been originally envisaged. The hypothesis was set-up to test whether or not the more peripheral UK regions would benefit proportionately more than the South East from the Tunnel. It is assumed that since more than 75 percent of UK freight originates from outside the South East and that rail freight, as compared to road haulage, becomes more competitive over longer distances (>250/300 kms), the more peripheral UK regions would experience greater increases in relative potential. However, reliance on Eurostat level II GDP data (Eurostat 1989) reflects the dominance of the South East's economy and not the regional distribution of UK freight imports/exports. If regional industrial output or regional exports were incorporated into the model, the dominance of

the South East would not have been as apparent. More "narrow" data sets are available but regional inconsistencies in the compilation of such data sets made their use impracticable.

Certain difficulties are also encountered with the compilation of the distance term. European national railway companies do not possess relevant maps or distance matrices of the European freight railway network (personal interview: Jenkins 1990). Therefore, the distance term is based on the Thomas Cook 'European Timetable' (1990) and 'Rail Map of Europe' (1989-1990). The distance matrix for the 90 regions was personally compiled based on the above two references. A stringent checking procedure was undertaken to minimise human error. The obvious disadvantage associated with the reliance on Thomas Cook data is that it is based on the passenger network. However, most of the European railway network is dual purpose with only a few high-speed lines being restricted for passenger use. High-speed lines, such as the TGV lines in France, are not incorporated into the distance matrix.

More specific problems associated with the potential model revolve around several subjective assumptions. Firstly, the choice of each regional node is important to the respective regions general level of relative accessibility. The regional capital or major industrial town/city was the criterion on which the decision was made. Nonetheless, as can be seen from the results for the UK and Eire for all three simulations, the distance between London and the other regional nodes is important. If, for example, Plymouth or Penzance was chosen as the regional node for the South West instead of Bristol, the South West would have recorded lower levels of relative accessibility. Secondly, the choice of route/port is also important to the overall results, the choice being dependent on the shortest journey time. Manpower and time limitations prevented more accurate criteria being employed. Finally, the post-Tunnel scenario involves all freight going through the Tunnel since great time savings were made on most, if not all, journeys (especially when the delay factor is increased). Obviously more factors, such as cost and reliability, will be important in the choice of route/mode after the Tunnel comes into service.

However, these problems do not affect the overall usefulness of Economic Potential Analysis or the important theoretical contribution the current model makes to academic

involvement in the study of the regional economic impact of the Tunnel. If a more narrow data set was employed, the results may have allowed the hypothesis to be fully accepted. Nonetheless, the results do show that certain peripheral UK regions could experience fairly uniform increases in relative accessibility compared with the South East. The Conclusion will highlight any policy implications based on the new findings of the current model.

3.8. Conclusion

The findings of the present study represent important empirical evidence which for the first time challenge the general assumption that the South East will benefit the most from the Tunnel. Incorporating the proposed average running speed of international freight trains (75mph), the model shows that certain peripheral regions could record increases in relative accessibility of the same magnitude as the South East. However, as pointed out in the critique, the use of regional GDP values for the mass M_j term prevented the hypothesis being fully tested.

Intra-UK distances are shown to be relatively insignificant compared to pan-European distances. The English Channel, at present, forms a significant barrier between the UK and the Continent, especially in terms of the more realistic delay scenarios. This has the effect of emphasizing the importance of the mass term for UK regions in the Economic Potential equation. The consequence of relegating the importance of the distance term, the shortest rail or rail-ferry distance (in hours), is that the dominance of the South East's economy over the rest of the UK is clearly shown and that any improvement in relative accessibility will have a proportionately greater impact on the South East. The results for Simulation 3 can therefore be considered to be even more significant and thus, enhancing the potential of the Tunnel to redress the economic imbalance between "North" and "South".

Since it is unrealistic to assume that the 'no delay' scenario is representative of the real world, a delay factor is incorporated into the model. However, the effect of either a six or 18 hour delay on the results is shown to be rather limited in terms of increases in relative

potential. The influence of speed, on the other hand, seems to be paramount to the results. As stated above, post-Tunnel international freight services will run at 75mph and new locomotives that make possible freight train speeds in excess of 90mph have already been introduced on selected routes in France and Germany (Haydock 1988, Freeman Allen 1990).

This argument can also be extended to the upgrading of railway lines and, more specifically, to the construction of the high-speed railway line between London and the Tunnel portal. The results have shown that improvements to the national railway network will help prevent the South East reaping all the benefits. The freight dimension of the proposed Ove Arup east of London route would seem to be more attractive to regions north and west of London but the effective postponement of the rail link until well into the next century will be of some concern to regional interest groups. These findings could even support the call of the National Union of Railwaymen (1987) for the construction of a high-speed corridor running down the spine of Britain. Nonetheless, BR (1989b) expects its proposed international services to be competitive, particularly with the new electric 75mph locomotives. Haydock believes that it will not be long until the UK joins the "100mph club" and optimistically poses the question:

'Why not Glasgow-Brussels or London-Lyon overnight in a freight TGV network?'

(Haydock 1988, P.411)

Keeble et. al. (1982a) conclude that any benefits created by the Tunnel would be confined to the south east corner of England but that these benefits, even for the South East, would be small. Keeble et. al. did not foresee any significant increases in accessibility for 'firms throughout lowland England and the depressed North and West to European-wide economic activity'. They therefore argue that the apparently poor public return from the Tunnel justified the Government's desire that the project be funded privately.

Regional interest groups are greatly concerned that the opportunities created by the Tunnel to redress the imbalance between north and south will be missed. The postponement of the high-speed rail link between London and Cheriton is primarily the consequence of the

Government's refusal to commit public funds. Section 42(3) of the 1987 Channel Tunnel Act, prohibits the use of public money in connection with Tunnel or related projects. Furthermore, the strict commercial remit imposed on BR (8% internal rate of return) effectively limits any proposed investment in international passenger or freight services via the Tunnel. The results of the present study show that the South East does not have to be the main or only beneficiary from the potential opportunities created by the Tunnel. The Tunnel could offer businesses throughout the UK a quicker and more reliable service to the Continent for their exports. But BR (and the British Government) have to make the necessary investments to encourage firms to switch from road to rail, thus capitalising on the potential accessibility gains that are, on the whole, restricted to the latter. The economic, social and environmental benefits that could be achieved are enormous but the Government and BR need to take action immediately if these benefits are to be fully realised.

The remaining chapters of the present thesis examine the likelihood of the regions taking advantage of the opportunities created by the Tunnel. The following chapter critically reviews the policy and legislative environment within which the Tunnel is being developed as well as its related infrastructure, including the high-speed rail link, both within the UK and France. British Government policy has significantly limited the provision of supporting transport infrastructure. The delays associated with the International Passenger Station (IPS) at Ashford and the rail link are the result of the British Government's 'market solutions' approach to the Tunnel. However if the regions are to benefit from the Tunnel, companies will have to either change their location or switch their distribution practices in favour of rail freight or both. In order to see if they are likely to do so a questionnaire survey was undertaken, the results of which are analyzed in chapters 5 and 6. Case studies of the East Kent and the "Far South West" (chapters 7 & 8) will then examine these broad issues at a more local and regional level.

Notes

1. The potential model was started prior to the 1990 reunification of Germany and no consistent data consistent data were available for the then East Germany.

CHAPTER 4: THE LEGISLATIVE AND POLICY FRAMEWORK

Any examination of the regional economic implications of the Tunnel must be grounded in an understanding of the existing (and future) legislative and policy framework. As outlined in the Literature Review (chapter 2), the Government has been strongly criticised by regional interest groups for neglecting to invest in the supporting transport network. It is considered that as result of Government inaction, the Tunnel is likely to lead to a further widening of the "North-South" divide. The results of the Economic Potential Model (chapter 3) show that certain peripheral regions could experience increases in relative accessibility of the same magnitude as the South East. These findings contradict the general assumption that the South East will be the main beneficiary from the Tunnel. However, these results need to be tested in the "real" world.

4.1. Introduction

The aim of this chapter is to determine whether Government policy will effectively limit the regional spread of benefits created by the Tunnel. It is argued that the lack of a national transport strategy as well as the post-1979 policies of privatisation and deregulation, have significantly influenced Government thinking towards the Tunnel and related infrastructure. The motives behind the Government's support for the Tunnel are set out and their 'market solutions' approach towards the supporting transport network questioned. The British Government's policy on the Tunnel and related transport infrastructure needs also to be contrasted with the interventionist strategies adopted in France. In addition, comparisons will be drawn with the European Commission's proposed pan-European high-speed rail network.

Attention will focus first on specific Tunnel policy in the UK. The Government's enthusiasm for a fixed Channel link, underlined with a guarantee against cancellation on

political grounds, generated considerable private sector interest. However, local government was effectively peripheralised from the decision-making process. The passage of the Channel Tunnel Bill through Parliament also produced limited public consultation. The Government therefore successfully sidelined the regional economic implications of the Tunnel from political debate. The 1987 Channel Tunnel Act has been widely criticised for failing to recognise the need for an efficient supporting transport network, to allow the regions to maximise the opportunities created by the Tunnel and minimise the adverse effects. Thus, the main components of the 1987 Act are analyzed, particularly Sections 40 and 42. The Section 40 amendment represents the only Government sanctioned series of pan-regional consultations.

After establishing the Government's primary objectives in supporting the Tunnel, the wider policy environment, including the Government's handling of the high-speed rail link and railway policy in general, will be examined. The Government's policy on the rail link has resulted in an indefinite postponement of the project. The confusion over the rail link will be used to highlight the "failure" of Government policy. In addition, State financing of the railways during the 1980s and early 1990s could be seen to conflict with the Government's commitment to the Tunnel. International passenger and freight services could also be seriously undermined by the uncertainty generated by the proposed denationalization of the railways.

Finally, international comparisons with France, and to a lesser extent Belgium, will provide a broader perspective in which to assess British policies toward the Tunnel. The relatively "grandiose" plans of SNCF will be contrasted against BR's more conservative proposals. The relationship of SNCF with the national Government and the role of the Nord-Pas de Calais Regional Council will be highlighted. Finally, the British Government's policy on the rail link also has to be set against the European Commission's policy objectives for a pan-European high-speed rail network.

4.2. The Tunnel and Government Policy

The British policy response towards the Tunnel and supporting transport infrastructure has been concerned with establishing the necessary regulatory structures needed during the construction and operation of the Tunnel. The Government has been strongly criticised for the lack of long-term planning, particularly in terms of the regional economic implications of the Tunnel (Gossop 1987, Harmen 1989, Simmons 1989, Holliday et. al. 1991). The regional economic impact of the Tunnel has been left predominantly for market forces to determine. No Government strategy has attempted to enhance the economic benefits of the Tunnel or to ameliorate any adverse effects. Calls for a regional development plan to promote a fairer distribution of benefits to regions outside the South East have invited little response (Campaign for the North 1981, NOERC 1988, CLES 1989, Pidea 1989a&b, TCPA 1990). The Government's view that the Tunnel will be good for the UK as a whole has validated their non-interventionist policies.

The position taken by the Government in support of the Tunnel will be set against the policy "vacuum" on the regional economic implications of improved accessibility to the Continent. Discussion of the British policy response towards the Tunnel will initially focus on the "pre-selection" stage; between 1979 and January 1986 several schemes emerged and by the deadline for 'Invitations' four rival projects were being promoted. This period is marked by intense political lobbying and by early Government support. However, the lack of local government involvement during this developmental stage is all too evident.

The "Parliamentary" stage (from the concession award to Eurotunnel and up to the 1987 Channel Tunnel Act receiving royal assent) will then be critically reviewed. The Government's decision to proceed with a Hybrid Bill, although not uncommon, proved to be highly contentious since the opportunity for public discussion was effectively limited. The desire to avoid unnecessary delays, vital as it was to the success of the project, has to be weighed-up against the apparent neglect of economic issues. Finally, based on the implications of the 1987 Act, the Government's policy on the long-term regional economic impact of the Tunnel will be examined. Investment in necessary supporting transport

infrastructure has been hindered by the strict financial parameters placed on "Public" involvement through Section 42 of the Act. The significance of the House of Lords' Section 40 amendment to the 1987 Act will also be analyzed. The Section 40 consultations identified regional aspirations for the provision of international services and infrastructure.

4.2.1. The Pre-Selection Stage: the politics of rival schemes

The genesis of the present Tunnel project goes back to the BR and SNCF joint proposal for a single rail tunnel in 1979. By September 1981, the British Prime Minister and the President of France met at the London Summit to confirm both Governments' commitment to work towards an agreement on a proposed cross-Channel fixed link. Proponents of a fixed link initially believed that Government support would not be forthcoming:

'The new Prime Minister (Margaret Thatcher) was known to dislike railways, took an abrasive line with the rest of the European Community and was eager to cut public spending; her support appeared unlikely.'

(Comfort 1987, P.47)

Nonetheless, the Prime Minister proved to be a strong advocate of a fixed link. Nicholas Ridley, the former Secretary of State for Transport, hinted that the possible reason for Thatcher's unwavering support was her desire to build 'monuments', as permanent reminders of her Premiership (Jones 1987). The Government's enthusiasm for a fixed link seems surprising following the sceptical Cairncross Report, November 1981, which concluded that there was 'no overwhelming case for a fixed link'. Existing capacity in the cross-Channel port and ferry industry was regarded as sufficient to cope with the increasing demand. However, the Government considered the introduction of a new mode of transport into the cross-Channel ferry industry likely to lead to increased competition, resulting in reduced tariff rates and improved quality.

The Government's support for a fixed link did not extend to the public financing of the project or even financial guarantees to private developers. It was made clear from the out-set that the Government favoured a privately financed scheme. In 1980, the Transport Secretary, Norman Fowler, emphasized this expectation, ruling-out any form of State financial help. According to Bonavia (1987), the cancellation of the 1970s scheme showed

that 'Government's are not particularly good managers of major projects'. Escalating costs led the newly elected Labour Government to abandon unilaterally the project (Gibb 1986a). The favourable escape clauses for the private concessionaires did not lead to any serious protests against the decision to cancel the project. The Government's refusal to underwrite the present Tunnel project can be seen, in part at least, as an attempt to avoid a similar situation recurring.

Several schemes emerged by the early 1980s, notably Eurorail and the CTG's twin-bore rail-tunnel proposal. But as a result of the Falklands War and the 1983 General Election much of the initial momentum was lost. It was not until 14 November 1984, that the Transport Secretary Nicholas Ridley and his counterparts in France, the Transport Minister Jean Auroux and the Planning Minister Paul Quiles, formally agreed on the need for private financing with Government guarantees against the cancellation of the project on political grounds. Margaret Thatcher and François Mitterrand endorsed the agreement on 29 November 1984. Between 30 November and 28 February 1985, the required specifications for any fixed link proposal were drafted. Finally, on 2 April 1985 the Official 'Invitations to Promoters' was published, outlining the specifications such as; the political guarantee, the French statutory procedures, the necessary road and rail improvements, and the environmental assessments.

Opposition to a proposed fixed link had previously been fragmented and unorganised but in April 1985 Flexilink was formed to co-ordinate the fight against a permanent link (Jones 1987)). Flexilink was a consortium representing predominantly port and ferry interests; the former Sealink British Ferries, European Ferries and the Dover Harbour Board. During September 1985, Flexilink launched a £400,000 poster campaign - 'For Cross-Channel Choice' - warning against the adverse consequences of a fixed link (Comfort 1987). This opposition failed to deter the Government. Thus, on 20 January 1986, Eurotunnel won the concession to build the Tunnel.

Local government involvement in the UK, even in Kent, had so far been non-existent. Kent County Council (KCC) did not become active participants until after 1985. The policy stance taken by KCC was not positively in favour or actively against a fixed link. Between

2 April and 31 October 1985, French officials from the Transport Ministry set-up meetings with senior planning officials in Kent. The British Government by this time had made no contact with any of the local authorities in Kent and actively avoided such consultation. Kent had to react to a policy decision taken by central Government. The problem facing the Government was that Kent had nothing really to gain from a fixed link (Comfort 1987). The environmental damage that any of the schemes would entail and the rationalisation of the port and ferry industry, the main employer in a 'depressed' East Kent, would always arouse opposition in the region. The Government was therefore keen to peripheralise local government involvement. It is argued in the 'Kent Impact Study: 1991 Review' (CTJCC 1991a) that local authorities in Kent are still marginalised, with their 'purse strings' tightly controlled by central Government (see chapter 7).

In France, the decision to award the concession to Eurotunnel was made in close consultation with the Nord-Pas de Calais Regional Council (Holliday et. al. 1991). By 20 January 1986, the Regional Council had prepared a list of regional requirements, with at least 75 percent already agreed to (Conseil Regional Nord-Pas de Calais 1986). Holliday et. al. (1991) argue that the high degree of British centralism was at the expense of coherent decision-making. Whereas in France, 'decisive State economic intervention favours rational planning and naked assertion of political will' (Holliday et. al. 1991). Whilst concurring with this argument, it is worth wondering how the French system would have worked in the UK and vice versa. It is important not to lose sight of the overriding aims of the British and French Governments. In Britain, the Tunnel is seen as an end in itself and thus, all effort focused on limiting opposition wherever possible and passing the necessary legislation to allow construction to proceed. In France, economic issues have always been at the forefront, primarily as a result of the depressed nature of the Nord-Pas de Calais regional economy. The governmental systems of the two countries are different but, more importantly, the objectives also significantly diverge in the UK and France.

If a more consultative approach had been undertaken by the British Government, the Tunnel might have still been in the planning stage. A public enquiry, commonly associated with major transport infrastructure projects, would have engendered serious delays, possibly culminating in the cancellation of the Tunnel. However, when the Tunnel opens

in 1993, the lack of long-term regional planning is likely to limit the opportunities available to Britain. Economic Potential Analysis employed in chapter 3 shows that benefits created by the Tunnel could be distributed more evenly than had previously been believed but that improvements to the rail network, including the rail link, are critical. Government policy, developed in the pre-selection stage, has continued to limit the ability of the regions to maximise the benefits created by the Tunnel. Following the Concession award to Eurotunnel, the Government continued to restrict consultation since the Channel Tunnel Bill was to be presented before Parliament in the form of a Hybrid.

4.2.2. The Parliamentary Stage: a Hybrid Bill

The Government made clear in the 1986 White Paper - 'The Channel Fixed Link' - that it did not expect the Parliamentary process to take much longer than 18 months, with the Channel Tunnel Bill receiving royal assent during the summer of 1987. There was concern amongst the Labour opposition that the Government was planning to proceed with 'undue haste' (Comfort 1987). The signing of the Anglo-French Treaty on 12 February 1986 by Margaret Thatcher and François Mitterrand started the British Government's effort to gain rapid Parliamentary approval. The Concession agreement between the two Governments and Eurotunnel was signed on 14 March 1986, granting initially, at least, Eurotunnel the right to operate the Tunnel for 55 years.

The Secretary of State for Transport at the time, Nicholas Ridley, indicated in the official 'Invitations to Promoters' (published in 1985), that the Government would deal with the Tunnel by way of a Hybrid Bill and not through a public enquiry. A Hybrid Bill is a special type of measure used when a matter of public policy directly affects private interests. An aspect of the Bill is that it may be considered by a Select Committee of each House immediately after its Second Reading. Such a committee is bound to hear petitions from anyone directly affected by the provisions of the Bill. The Government's view was that the Bill combined the need for Parliament to determine whether the Tunnel would be allowed to proceed with the right of private citizens to have their say (Comfort 1987). Thus:

'A period of extensive consultation will now follow the decision of principle.'

(Department of Transport 1986, P.11)

However, petitions could only be heard about the details of the scheme, not on the principle of whether the Tunnel should be built or not. Arguments against the Tunnel would not be heard unless directly related to the effect on the individual. Therefore, consultation was strictly limited to the particulars of the Tunnel project, not the cases for and against a fixed Channel link.

The Channel Tunnel Joint Consultative Committee (CTJCC) for Kent was set-up under the 1986 White Paper. The CTJCC was chaired by a Government Minister and became the central institutional device in the months after the selection of the Eurotunnel project. However, the CTJCC was only a consultative forum. Agreements did not commit Government departments and the CTJCC had no executive powers of its own to enforce recommendations. A proposal for an East Kent Development Agency was completely undermined by the refusal by Shepway District Council and Ashford Borough Council to co-operate. A more elaborate East Kent Development Corporation with direct powers from central Government was also suggested but never taken seriously. The CTJCC (1991a) still advocates the need for an East Kent Development Agency but again no advance has been made. Holliday et. al. (1991) believe that 'economic issues never really got a hearing' by the CTJCC, even though one of their main tasks was to commission a more detailed study of the potential impact on Kent. The conclusions reached by the CTJCC and the 'Strategy' implemented, based on the Kent Impact Study (KIS - 1987) and the '1991 Review', will be discussed in more detail in chapter 7.

The Government's general policy towards the Tunnel was one of "dispersion"; that being to spread the construction benefits throughout Britain. In January 1987, a monthly 'Channel Fixed Link Newsletter' was published by the Department of Trade and Industry, informing companies of construction orders. However, the placing of construction orders was purely based on commercial decisions by Eurotunnel and TML. Nonetheless, by the end of 1989, nearly 80 percent of TML subcontracts by value were retained by British firms throughout the UK (Vickerman 1990).

'Thus, a dispersal strategy has accorded well with the preferred operations of British policy makers, which are to operate at arm's length from the commercial decisions of companies such as Eurotunnel and TML wherever possible.'

(Holliday et. al. 1991, P.120)

Other than the CTJCC, the Select Committees in both the House of Commons and the House of Lords provided the only other official platform for "consultation". The first public session of the Common's Select Committee commenced on 24 June 1986 and by the publication of the Official Report on the 22 November, 4,852 petitions had been lodged. The Select Committee agreed with the Government's definition of their remit and thus, since the principle of building the Tunnel had been approved, the Committee would only hear petitions concerning the affects of the Tunnel on private interests. Consultation on the principle of the Tunnel and related works was not allowed to proceed. The Select Committee approved 70 amendments to the Channel Tunnel Bill but most were of minor significance. However, ferry operators were successful in gaining an undertaking that no Government subsidy could be paid to Eurotunnel (Section 2 of the 1987 Channel Tunnel Act).

After an unopposed Second Reading in the House of Lords, the Lords' Select Committee began their sitting on 2 March 1987:

'The practice of the House with regard to a Hybrid Bill is for a Select Committee to accept the general policy of the Bill and to inquire into the interests of Petitioners who are directly and injuriously affected by its provisions. Both elements of the practice gave rise to argument before the Committee.'

(House of Lords 1987, P.3)

The Committee did not endorse the Minister of Transport's definition of the principles of the Bill and widened their remit to hear evidence on the siting of the international passenger station at Waterloo and the improvement of the A20 trunk road between Folkestone and Dover. More significantly, the Committee also decided to hear petitions lodged by local authorities and associations from Greater Manchester, Bradford, Yorkshire and Humberside and Glasgow concerning the wider implications of the Bill. The Committee heard the case presented by these regions despite the Government's legitimate

right to challenge the *locus standi* (their right to be heard) of these petitioners. Lord Amptill, the Committee's Chairman, had made it evidently clear from the opening that the Government would not have it all its own way. The above regions were therefore successful in starting consultation, albeit limited, on the regional implications of the Tunnel. The Committee concluded that:

'The key to spreading the benefits which could flow from the project mostly lie in the hands of British Rail, at present totally dependent on Government for its resources. The restraints....could possibly inhibit the capacity of British Rail to invest in the infrastructure to exploit the potential.'

(House of Lords 1987, P.4)

The Committee accepted that these issues were not within its remit but hoped that they would receive further consideration. The Government agreed to a 'modest' amendment ensuring that BR would adequately serve regions to the north and west of London with international passenger and freight trains. The Section 40 consultation process was the means by which BR could attempt to address the needs of all UK regions (BR 1989c, Knowles et. al. 1989). However, as will be shown later on, the usefulness of the Section 40 regional consultations was limited.

The Channel Tunnel Bill received royal assent shortly after the 11 June 1987 General Election. During the Parliamentary stage, the Government was effective in limiting consultation and thus, serious opposition to the Bill. The Government's overriding aim to avoid delays and to allow construction to start as soon as possible has left much uncertainty over the wider regional economic implications of the Tunnel. The KIS (1987) represents the only official consultative report on the potential impact of the Tunnel. The initial recommendations of the CTJCC, however, proved to be not much more than hopeful aspirations. Trusting the market to determine the wider impact of the Tunnel could be seen as an excuse by the Government for inaction or an overriding commitment to a political ideology. The political will shown by the Government to bring the fixed link to reality has not incorporated national impact studies.

4.2.3. The 1987 Channel Tunnel Act: implications for the UK

The 1987 Channel Tunnel Act gives Eurotunnel the authority to build and operate the Tunnel. It also ratifies the Anglo-French Treaty and outlines certain particulars of the project, including the necessary road and rail improvements, as well as giving authority for compulsory purchase and setting-out the regulatory regime under which the Tunnel will operate. The implications of Section 42 (i.e. 'No Government grants to Railways Board in respect of international railway services') will be examined first (Department of Transport 1987). The financial restrictions imposed on BR under Section 42 and the Government's wider policies toward the railways, require BR to base investment decisions purely on commercial grounds. Attention will then focus on Section 40 of the Act (the 'Railways Board's plan for international through services'). Under Section 40, BR is required to prepare a plan for international passenger and freight services to and from all parts of the UK.

Section 42(3) of the 1987 Act prohibits any element of public subsidy to Tunnel-related operations even though the House of Lords stress that the spreading of benefits from the Tunnel will mostly depend on the level of international services to the regions:

'No grants shall be made by the Secretary of State....towards expenditure incurred or to be incurred by the Railways Board for the purpose, improvement and development of international railway services.'

(Department of Transport 1987, P.34)

The Government did not want to commit public funds to expensive projects such as the high-speed rail link since it would conflict with their wider economic policy of reducing public spending. The Government was also trying to appease the real concerns of ferry operators and the British Ports Association that the Tunnel could be indirectly subsidised by BR's international services. In contrast, the French Government adopted the 'Plan Transmanche', a series of measures designed to ensure the maximum regional and national benefit (Conseil Regional Nord-Pas de Calais 1986). Regional development planning was apparent in France at an early stage but:

'Strategic vision of this kind has conspicuously not been developed by British institutions.'

(Holliday et. al. 1991, P.156)

National and regional interests did not coincide in the UK, at least to an acceptable level, and so there was no focus on regional development issues. The Section 40 report (Knowles et. al. 1989) identifies regional aspirations and commercially 'viable' services:

'Many county councils argued that the Final Reports of the working parties (set-up under Section 40) reflect the constraints imposed on BR in terms of future strategy and investment, rather than opportunities presented by the Channel Tunnel for economic development.'

(Farrington et. al. 1990, P.142)

It was beyond the remit of the Section 40 regional consultations to resolve the 'mismatch' between aspirations and commercial opportunities. Regional consultations were undertaken between May 1988 and June 1989. The 13 regional forums met three times and a total of 96 meetings were held by the 28 passenger and freight working parties. The independent report was submitted to BR in September 1989, and an input to BR's Business Plan, 'International Rail Services for the UK' (BR 1989b). Unlike the French national railways, SNCF, BR can only base investment decisions on identified demand levels and not on the generative effect of new services. The Government's policy on the financing of railways will be examined in more detail in section 4.4.1., as will a comparative study of SNCF (section 4.5.2.). Even though Section 40 is regarded as a success in terms of identifying regional aspirations and heightening the awareness of opportunities for the regions, Farrington et. al. (1990, P.143) conclude that:

'The financial conditions under which the Government requires BR to operate, together with the restrictions on investments imposed by Section 42 of the Channel Tunnel Act, are constraints which will need to be eased in some way if the economic development potential of the Tunnel perceived by the regions is to be fully and quickly realised after Tunnel opening.'

Therefore, in terms of the limited scope of Section 40, the regional consultation process can only be regarded as a success. But the overall usefulness of Section 40 is in question. No strategic forward planning emerged from the regional consultations, only an awareness of the strict guidelines imposed on BR.

4.2.4. British Tunnel Philosophy: a summary

The Government has stated that their policy on international transport is 'to increase consumer choice and promote efficiency by encouraging competition and innovation' (Department of Transport 1986). The oligopolistic structure of the cross-Channel ferry industry has meant that through tacit collusion tariff rates have been kept relatively high. The Government's support for a fixed link can therefore be seen, at least in part, as an attempt to promote competition in the cross-Channel transport market. The strong trade union contingent in the port and ferry industry could also have been the target of the Government's anti-union policies. The Government's support for a fixed link was crucial to the success of the Tunnel project. A key role was played by the Prime Minister in advocating the need for a fixed link. It is widely considered that the 'tragedy' of the 1970s project and 'perhaps the real reason for its failure', was that it did not enjoy the committed support from such a prominent figure (Holliday et. al. 1991, after Morris and Hough 1986).

However, the Government's determination to avoid unnecessary delays and restrict opposition limited the usual platform for consultation. The use of the Hybrid Bill instead of a public enquiry prevented consultation on the wider regional economic issues raised by the Tunnel. As with the 1985 Bus Deregulation Act, the Government avoided consultation and ignored calls from the opposition parties for a more open debate (Bell and Cloke 1990). The outcome has been that economic issues concerning the Tunnel have rarely been given a hearing. The Government's belief that the Tunnel would be good for the whole of the UK is not based on conclusions drawn from national/regional economic impact studies.

The commercial operating environment of BR needs to be relaxed if, as the House of Lords (1987) recognise, the benefits from the Tunnel are to be spread throughout the UK. Section 42 of the 1987 Channel Tunnel Act not only undermined the effectiveness of the Section 40 regional consultations but has limited BR's options to invest in international through services, including the high-speed rail link. Why advocate a Tunnel when, as independent consultants' (KCC 1989) predict, there is likely to a bottleneck on the railway lines approaching the Tunnel portal as soon as or shortly after it becomes operational?

The next section will examine the Government's attitude towards the supporting transport infrastructure, utilising the example of the high-speed rail link. Attention will then focus on the proposed 'denationalization' of BR. Considerable uncertainty is likely to be generated at a time when the Tunnel offers the rail network unbound opportunities. The interventionist policies of the French Government, which are aimed at maximising the opportunities created by the Tunnel, will also be outlined. In addition, the European Commission's support for a pan-European high-speed rail network will be briefly discussed. The British Government's view on high-speed rail travel conflicts sharply with the Commission's 'master plan' for a European high-speed rail network.

4.3. The High-Speed Rail Link

The rail link is particularly important in examining the legislative and policy framework of the Tunnel since: firstly, it is seen as an essential component of the supporting transport network; and secondly, it highlights the 'market solutions' strategy of the Government. The policy "vacuum" on supporting transport infrastructure is argued as evidence of the "failure" of Government policy. The prolonged history of the present rail link is also advanced as an argument for co-ordinated and coherent transport planning (Harmen 1989, Simmons 1989, Gibb and Smith 1991). The KCC (1989) report on rail services in Kent, concludes that capacity constraints on Network South East will be experienced as soon as the Tunnel opens or shortly thereafter. BR considers that a rail link is needed by 1998 (BR 1989b). The Government, however, is of the opinion that the anticipated increase in domestic and international passenger and freight traffic can be accommodated on existing Kent main line tracks until the year 2005. The decision by the Government to postpone effectively the rail link until well into the next century will be shown to be based more on electoral factors than transport needs or the economic well-being of the UK as a whole.

The recent history of the rail link is summarised in Figure 4.1, with the 'key dates' since 1987 highlighted. It is first useful to discuss briefly the prolonged history of the rail link. It is then possible to analyze the Government's latest decision to abandon BR's New Kent

Main Line (NKML) in favour of Ove Arup's East London route. 'Wider considerations' led the Government to reject BR's proposed route for the rail link.

4.3.1. The Recent History of the Rail Link

As is evident from Figure 4.1, the Government originally prioritised investment by the private sector, with BR directed to find a construction partner for the rail link project. By November 1989, the Eurorail Consortium of Trafalgar House and BICC was chosen. Of the initial four route options proposed an amended 'Route 2' was submitted by the Consortium to the Department of Transport in April 1990. Figure 4.2 outlines the original four routes taken under consideration by BR. All four options were rejected as originally proposed and a new route aligned close to the Route 2 corridor chosen (Figure 4.3). The amended Route 2 was costed at £1.7 million of which 30 percent was accounted for by environmental safeguards. Other options considered by BR included the RACHEL (Rainham to the Channel Tunnel) proposal and the TALIS (Thames Alternative link International System) route. Both routes were rejected on financial and technical grounds.

Autumn 1987	BR chose Waterloo Station as the London terminal for Channel Tunnel trains. BR undertake feasibility studies on the rail link.
July 1988	BR publish four alternative routes, costed at £1.2 billion.
August 1988	Government tell BR to look for a private sector construction partner.
January 1989	King's Cross selected as second London terminal.
March 1989	BR decides on an amended Route 2 southerly approach, costed at £1.7 billion.
October 1989	RACHEL route (Rainham to Channel Tunnel) and TALIS route (Thames alternative link international system) announced.
November 1989	Eurorail consortium of Trafalgar House and BICC chosen by BR. Rail link plans delayed for a year.
March 1990	Consortium asks for Government backing.
April 1990	Amended Route submitted to Department of Transport.
June 1990	Amended Route rejected as unacceptable. Government funding ruled out.
November 1990/ April 1991	BR again studies four options: its own revised route, Ove Arup's easterly route, Rail Europe's eastern link, and Newham Council's proposed route.
May 1991	BR again submits its own revised Route, the 'New Kent Main Line', the cost estimated at £3.75 billion and confirms King's Cross as the second London terminal.
October 1991	Ove Arup's easterly route via Stratford to King's Cross is chosen by the Government, costed at £4.5 billion.

Figure 4.1: The Rail Link - Key Dates.

(Source: Gibb and Smith 1991, P.346; after The Guardian, 10 October 1991, P.24)

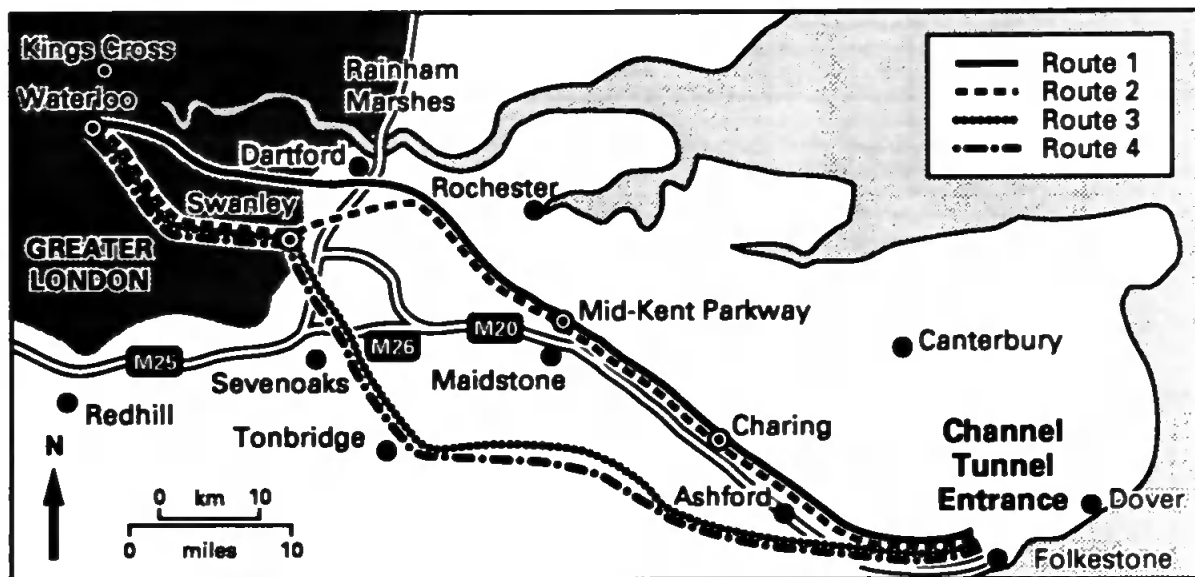


Figure 4.2 The Original Route Options

Source: BR 1989a

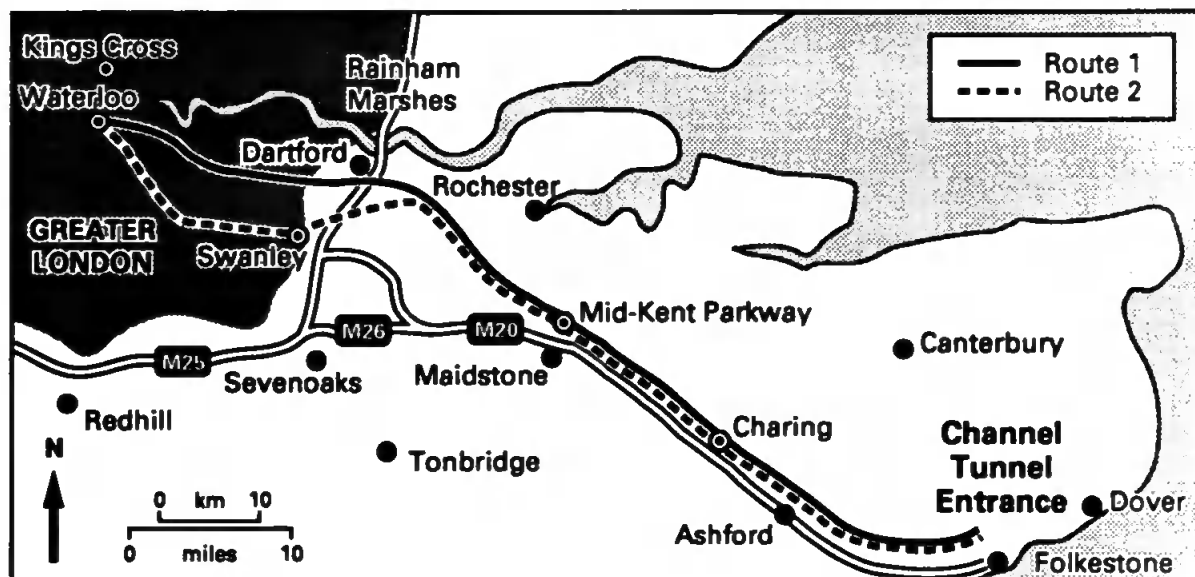


Figure 4.3 The Amended Route 2

Source: BR 1989a

In November 1989, the BR/Eurorail consortium delayed plans for the rail link by one year. The estimated cost of £1.7 million reduced the commercial attractiveness of the new route, particularly for the private sector companies. The incorporation of environmental safeguards was seen as an unfair burden. The Consortium asked for financial backing from the Government but any form of State assistance was immediately ruled-out. The commercial viability of the high-speed rail link has always been in doubt, with the Eurorail consortium requiring a much higher annual rate of return (greater than 20 percent is not uncommon in the private sector) than the statutory eight percent for BR:

'As Alastair Morton (1989) has argued, the Channel Tunnel's uniqueness is its value, which makes private finance viable in a way which could never be true of a rail link.'

(Holliday et. al. 1991, P.158)

Between November 1990 and April 1991, BR once more found itself reviewing four different options, including Ove Arup's easterly route. BR again concluded that its amended route was still the more attractive option, later renaming it the 'New Kent Main Line' (NKML). The Government disagreed and asked BR to co-operate with Ove Arup to prepare a more detailed feasibility study of the East London route.

4.3.2 'Wider Considerations' Lead to a Further Delay

The need for the rail link by no later than the late 1990s is recognised by all the interested parties except the British Government:

'Mr Rifkind (the former Secretary of State for Transport) believes that BR's traffic forecasts do not justify a rail link before the year 2005.'

(Gibb and Smith 1991, P.346)

The Government considers that the capacity of Network South East is sufficient to cope with the increase in passenger and freight traffic for at least 10 years after the Tunnel opens. Traffic forecasts and capacity assessments undertaken by BR, Eurotunnel and SNCF all point to the need for the rail link before the year 2005 (KCC 1989). Thus, the rail link is essential if an effective international passenger and freight service is to operate while maintaining domestic services in the South East.

The Government's decision to effectively postpone the rail link until 2005, or beyond, is based on 'wider considerations'. The Government is, however, confident that traffic forecasts do not justify the need for the rail link until this later date. The years of uncertainty prior to the Government's rejection of BR's NKML does not engender confidence for the future:

'In fact there is considerable concern that the recent announcement....is purely a delaying tactic to avoid this politically sensitive issue.'

(Gibb and Smith 1991, P.346)

BR is required to undertake feasibility studies, along with Ove Arup, on the newly favoured easterly route. Figure 4.4 contrasts BR's preferred southern approach route to London with Ove Arup's proposed route via Rainham Marches and Stratford. The two routes diverge just north of Maidstone with the Ove Arup route continuing north through Chatham, boring underneath the Thames, to emerge near Rainham in Essex. The construction costs are estimated to be approximately £4.5 billion, £750 million more than the route proposed by BR which carried straight on from Detling through Swanley and South London, primarily underground, to Waterloo and King's Cross. The incorporation of more elaborate tunnelling proposals under South London in order to reduce the impact on the environment and residential properties, increased the cost of BR's original route from £1.7 billion to £3.75 billion. The doubling of costs for the NKML, not surprisingly, meant that BR encountered severe difficulties in trying to attract commercial backers. The more costly option of the Ove Arup East London route was still preferred by the Government. Furthermore, it was suggested that State financial support could be forthcoming.

Malcolm Rifkind stressed that the Government had an obligation to take into account the impact of the rail link on the environment and residential properties, on the long-term requirements for rail freight and on the development opportunities for the East Thames Corridor. The Ove Arup route minimises the impact of the rail link on residential properties. Figure 4.5 summarises the environmental impact of both the NKML and the Ove Arup proposal.

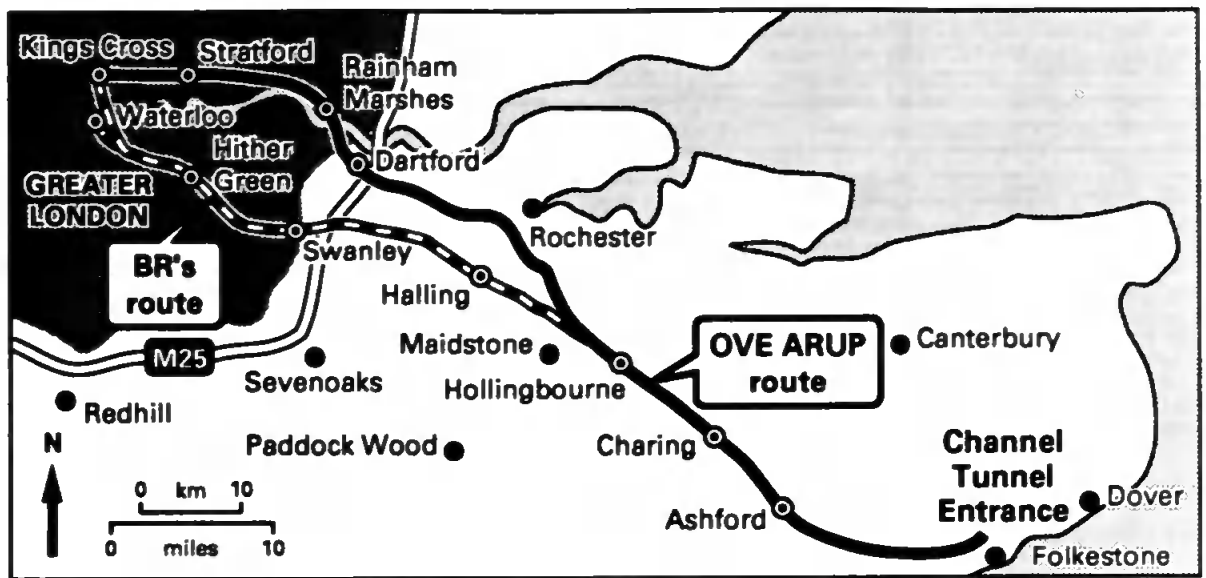


Figure 4.4 The BR and OVE ARUP routes Source: The Independent 1992

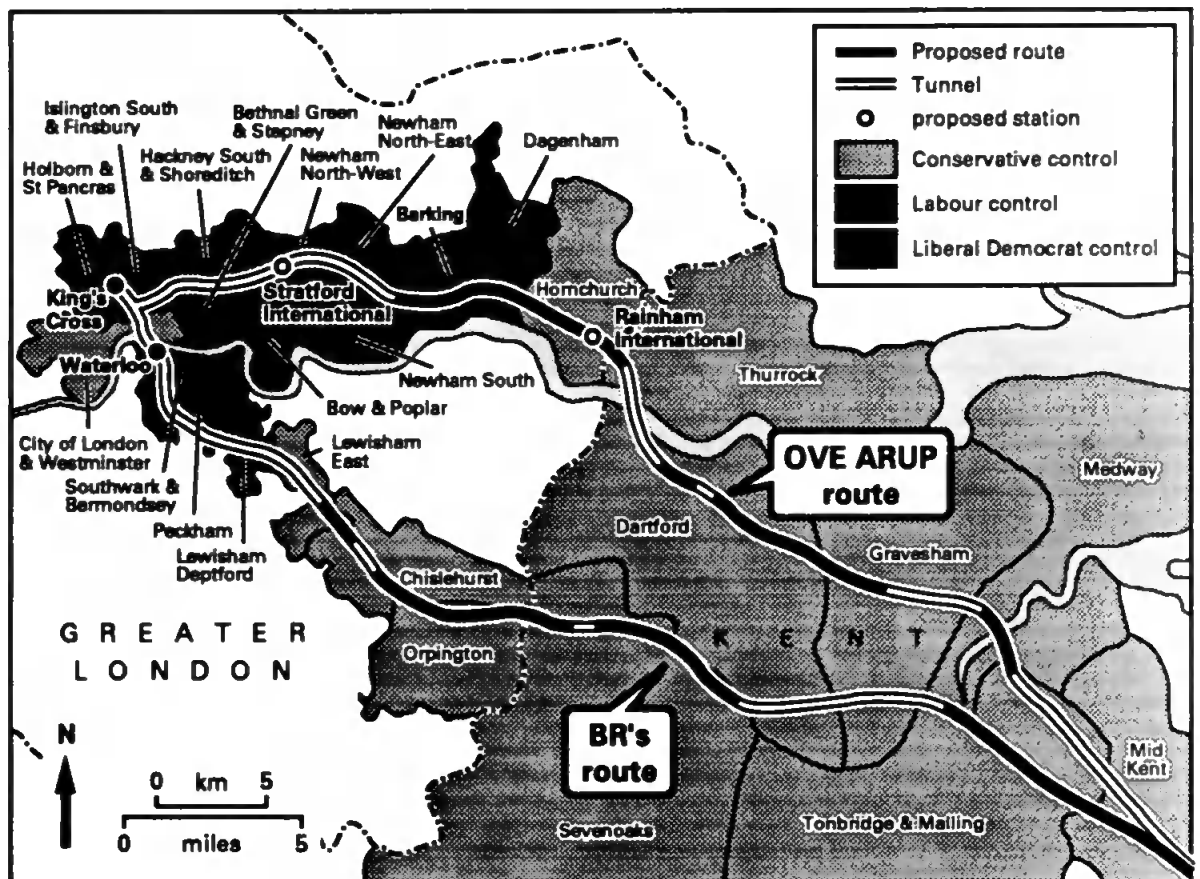


Figure 4.6 The Political Implications Source : The Independent 1992

	South	East
Projected cost	£3.75bn	£4.5bn
Length	69miles	69miles
Length in tunnel	15.6miles	23.7miles
Tunnel-London journey time	40mins	51mins
Residential property		
to be bought	127	2
to be demolished	24	none
within 100 metres	1,900	5
within 200 metres	5,900	115
Industrial property		
affected in some way	38	55
to be demolished	25	45
affected by settlement	4	27
Ancient monuments		
affected	1	none
within 100 metres	3	2
over tunnel	2	none
Listed buildings		
directly affected	1	none
within 100 metres	7	7
within 50 metres of a tunnel	249	234
Conservation areas		
directly affected	3	none
within 100 metres	3	none
within 50 metres of a tunnel	16	10

Figure 4.5: The Routes Compared: BR's NKML southern approach route versus Ove Arup's East London route.

(Source: The Daily Telegraph, P.4; after the Department of Transport 1991)

A report by the Consultants Environmental Resources highlights the difficulty in appraising the impact of the rival routes: 'How do you measure ancient woodland against an internationally important wetland?' (The Times 1991). The Government's assertion that the Ove Arup East London route involves only 'a fraction of the environmental impact' is really a reflection of the impact on residential properties.

The freight dimension of the Ove Arup route is also considered favourably by the Government. The BR route failed to encompass any real proposals for rail freight beyond the routing of freight around West London's already congested tracks. However, the "sketchy" nature of Ove Arup's freight plans do create some confusion. The scheme as initially proposed is only two-tracked with no dedicated freight lines, freight trains would have to be diverted on to loops so as not to interfere with passenger trains. There is an option to build a further two tracks for freight but cost would make this option unlikely.

The Government believes that the rail link via Stratford will act as a catalyst for economic development in the 'East Thames corridor', along with other improvements to the transport network, by attracting new investment away from the "over-heating" M4 corridor. Consultants employed by BR could only identify a development gain from the rail link of £100 million. The TCPA, however, regard the decision as making 'good planning sense' and the labour-controlled Borough of Newham considers that 'the imaginative development of East London will release sites and tap the large pool of unemployed and the skills of local people' (Grigsby 1991). Whether the Government will utilise these transport initiatives, including the rail link, in a wider regional development plan is really a matter of "wait and see" but the past record of the Conservative Government is not encouraging.

The Government's decision was greeted by the Conservative Party as the correct political decision in that far fewer homes in Conservative 'marginal' seats are affected by the new route (Brown 1991). Figure 4.6 (see P.120) highlights the political implications of the rail link. The routing of the rail link to the east of London would avoid several Conservative seats in South London, including the former Conservative marginal Lewisham East. The Chairman of BR, Sir Bob Reid, expressed his disappointment that political factors should

have outweighed the preferred transport solution (Hope 1991); in support the Times reported that:

'a transport minister admitted privately that if the decision had been taken purely on transport grounds the southern approach would have won.'

(Times 1991, P.5)

However, Malcolm Rifkind believed that the Ove Arup route satisfied the Government's transport objectives for serving the needs of both domestic and international passengers. BR had predicted that the NKML would carry 20 million passengers a year, as well as offering sufficient capacity for an extra 12 high-speed commuter trains an hour for Kent commuters this would have cut journey-to-work times between Ashford and London from 75 to 35 minutes. A comprehensive service for commuters was envisaged to Waterloo and King's Cross, and to other Central London stations¹ via a series of slip tracks connecting the rail link to existing Thameslink and South London track. In addition, the ability to move 12,000 people an hour direct to the main business centres would help to relieve congestion on the London Underground. BR estimated that the NKML would have generated £285 million per annum from domestic traffic. More importantly, Government subsidy could have been sanctioned, despite Section 42 of the 1987 Channel Tunnel Act, since benefits to domestic passengers were explicitly incorporated in the proposal. Sir Bob Reid insists that:

'...the route chosen will take commuters where they don't want to go and add up to 20 minutes to their overall journey to work.'

(Dynes and Webster 1991, P.1)

The possibility of indirect Government subsidy for the rail link, as hinted at by Malcolm Rifkind, through the improvement of domestic services could therefore be undermined by the limited capability of the Ove Arup route for domestic passengers. It is only possible to conclude that the Government's decision amounts to little more than indecision, purposely designed to postpone this politically sensitive issue.

'Any more dithering and Britain will enter the next century with a deserved reputation as the off-shore islands with a branch-line mentality.'

(Fyson, 1991, P.3)

If matters now proceed smoothly, a finalised route may just be set before Parliament by 1993, with a further two years needed for a Rail Link Bill to achieve royal assent. The rail link, however, was thrown into further confusion when the Department of Environment admitted that it was still considering the route advocated by the Rail Europe Consortium. Britain will have to wait at least 10 years for the rail link to be in place and thus, could be condemned to a branch line status while other European countries invest £50 billion in high-speed railways (Hope 1991).

Whether there will be a rail link and what route it will take is therefore still to be determined. Five years of planning have failed to produce any definite proposal. The Government's insistence that the new route should be privately financed has now been moderated by hints of State financial support. Thus, it is evident that the Government's handling of the rail link has generated little more than confusion and delay. The need for a more co-ordinated approach to transport planning is apparent. A national transport plan is generally regarded as essential to achieve a coherent policy on transport (Gossop 1987, AMA 1989, Harmen 1989, Simmons, 1989, TCPA 1990).

The Government's failure to ensure that the Tunnel will be served by an efficient supporting transport network is likely to restrict severely the ability of the regions to augment the opportunities created. The Government's proposed 'franchising' of rail services out to the private sector may also prevent Britain exploiting the anticipated benefits of the Tunnel. The following section will therefore briefly examine railway policy during the 1980s, and the proposals for the future financing and ownership of BR.

4.4. Post-1979 Railway Policy: implications for international rail services

As a result of the Government's proposed denationalization of the rail services, the immediate future of BR is extremely uncertain. Therefore, the renewed impetus that the Tunnel should bring to the rail network could be over-shadowed. Whether BR will be in a position to implement its plans for international through trains after the Tunnel opens in 1993 will depend on when the Government introduces the necessary legislation. The

freedom of private companies to include the generative effect of new services on forecast demand levels could result in a more comprehensive international service to the regions but the desired commercial rate of return will be higher than the eight percent required by BR. Nonetheless, it is necessary to ask why the Government is so keen to implement privatisation plans now, when a new "Victorian Age" for the railways could just be dawning.

Prior to the 9 April 1992 General Election, the Transport Secretary Malcolm Rifkind MP, emphasized the Government's commitment to increase competition on the railways:

'We want a very major private sector involvement in providing railway services.'

(Petre and Harlow 1992)

What form Government plans for the privatisation of BR would take, however, were still unclear. Having abandoned plans to produce a rail privatisation White Paper before the General Election, details concerning the future organisational structure of the railways were later released in the Conservative Party 1992 manifesto. The Government proposes the franchising of rail services out to the private sector. Before it is possible to examine the Government's plan for rail privatisation, it is first appropriate to discuss the Government's attitude towards the railways during the 1980s.

4.4.1. Financing of the Railways in the 1980s

Adley (1988) suggests that there has been a 'long tradition of misunderstanding, and indeed hostility to the railways that still characterises the views of British politicians'. This 'misunderstanding' and 'hostility' would seem to manifest itself in the separate method of account imposed on the Railways Board. In contrast to the railways, road investment assessment procedures do not encompass the full marginal cost of environmental damage.

'Unless the comparative costs are made on comparable criteria, no intellectually true cost comparisons, or judgements, can be made.'

(Adley 1988, P.8)

BR has to evaluate investment decisions based purely on commercial considerations, with a statutory minimum eight percent per annum required. The 'Economic Evaluation Comparability Study', commissioned by the Department of Transport in 1984², recommends that cost-benefit analysis employed to assess road investment should be applied to railway investment. This recommendation has been ignored.

Following the 1973 Joint Policy Review on the railways, which concluded that no unsubsidised rail network of an acceptable size could be achieved, the 1974 Railways Act reduced the Railways Board's debt liability and set-out the framework for the control of the railways. An External Finance Limit (EFL) was introduced to control the amount of borrowing by BR. The Secretary of State for Transport also became responsible for the level of passenger service beyond what is commercially viable, through the PSO Grant. The EFL for BR includes the PSO grant, borrowing to meet losses, capital investment and changes in working capital (ie. stocks, debtors and creditors). The EFL is based on BR's annual Corporate Plans. BR must plan to meet the EFL and may therefore have to revise its plans, including reduced expenditure on investment capital.

The level of funding secured by BR fell in real terms throughout the 1980s as the Government squeezed public spending, particularly on public transport. The Government attempted to hold the EFL at around £800 million during the 1980s. At the same time, expenditure on roads increased generally in line with inflation (expenditure for 1989-90 on roads exceeded £3 billion - Department of Transport 1987). Public subsidisation of the railways in 1991-1992 accounted for £892 million, with BR attracting extra financing to alleviate the difficulties caused by the recession. Recent Government policy has been based on the concept of the 'level playing field' which regards subsidies as a distortion of the revenue costs of competing modes of transport. However, some argue that the transport policy debate has been dominated by:

'....clear misunderstandings of what a level playing field for transport should look like.'

(Holliday and Vickerman 1989, P.168)

The Government's market based approach to transport does not take into account modes which use publicly provided infrastructure, such as the private car. BR is responsible for its own track, and thus the ability of the railways to compete is seriously undermined as other modes receive "indirect" public subsidy.

'Most other governments are fully aware of and prepared to pay for railways' social benefits (in all railways traffic revenue does not cover total costs).'

(Transport 2000 1984, P.9.)

The British Government disagrees, at least to some extent, with the 'social' argument for railway provision since rail carries only a small fraction (approximately seven percent) of total passenger-kms. The Government therefore believes that it would be unjustified to subsidise heavily new rail investment projects which would only benefit a selected minority.

Throughout the 1980s the Government also aimed to reduce the PSO grant. In 1983, the Transport Secretary, Paul Channon, set out the Government's objective to exclude InterCity from the PSO grant by 1988/89, which was to fall by 26 percent between 1983 and 1986, from £856 million £635 million. A further reduction in the level of PSO grants was announced in October 1986, the target set for 1989/90 was £555 million. BR was also asked to make a significant reduction in the grant requirement for Network South East by 1989/90. Network South East had to cope with a dramatic increase in passenger traffic in the 1980s as a result of the South East's 'Economic Miracle'. The extra burden on resources was passed on to passengers through higher than inflation price rises. However, the necessary investment to improve service quality could not be financed as station platforms became congested and trains packed. The Government's new Passenger Charter imposes minimum standards which BR has to meet but the necessary investment has still not been forthcoming. This situation can only get worse after the Tunnel becomes operational, especially with no high-speed rail link.

BR is one of the least subsidised of Europe's railway systems; in 1987, BR received £800 million of public support compared with £1,800 million for SNCF, and in 1988, the (West) German national railway company was subsidised by up to £4,500 million. The tight EFL's

imposed on BR have prevented long-term planning for investment decisions and has even led to investment projects being cancelled; prime examples are the Heathrow to Paddington link and cross-London link. The dogmatic approach of the Conservative Government has also prevented BR investing in the opportunities created by the Tunnel:

'The question of lack of investment in Channel Tunnel rail infrastructure is not a plea for private gain: it is part of the discussion about public transport facilities to serve the nation.'

(Adley 1988, P.6)

Drawing from an article in the Economist (1988) 'Public Works, Private Cash', Adley (1988) argues that any major infrastructure projects are ultimately public sector projects:

'In short, private finance does not in itself turn a public project into a private one. It's better to view all finance for public projects as public borrowing, regardless of the intermediaries.'

What then is a public sector project? The answer is 'any project where the public sector is the customer'.

(Adley 1988, P.10-11)

Adley therefore concludes that public money should be spent to enhance the opportunities created by the Tunnel and allow BR to support this 'great national asset'.

Nevertheless, while much of Europe moves closer to a high-speed rail network that will take them into the twenty-first century (for example, the proposed Paris-Brussels-Köln-Amsterdam (PBKA) network), Britain will still be dependent on a rail network of the nineteenth century. An urgent re-appraisal of the future of the railways is needed in the UK. Immediate action could take the form of the relaxation of criteria for Section 8 grants (1974 Railways Act) to encourage more freight on to the railways. The grants are paid to help with the costs of installing private rail freight facilities, usually up to 50 percent of the total cost. There has been a very low take-up of these grants due to the strict criteria. More importantly, Section 42 of the 1987 Channel Tunnel Act needs to be relaxed, or even repealed, and the whole question of railway finances re-examined. However, a debate on the 'ideological' issue of who should own the railways is certain to take precedence. Sir Bob Reid's calls for substantial investment guarantees in a newly franchised rail network

are believed to have received a 'sympathetic hearing' from the Government (Helm 1992). Even so, the proposed denationalization of the railways could not have come at a more inopportune time, with BR trying to persuade British companies to utilise the international through trains for both passenger and freight traffic.

4.4.2. Full-Scale Privatisation or 'Creeping Denationalization'

'Reports of proposals to re-establish 'competition' on the railways are full of 'analysis' based on political dogma than reality. We are offered the illusion of 'recreating the era of competition between the GWR and the LMS, or the LMS and LNER³'.'

(Adley 1988, P.11)

Whether based on 'political dogma' or 'reality', plans for the future privatisation of BR, in some form or other, will be likely to be presented to Parliament in the early 1990s. The Prime Minister was purported to favour, as Adley suggests, the recreation of regional railway companies (Petre and Harlow 1992). However, following the rationalisation of the rail network during the Beeching era, the revival of regional railway companies in an attempt to encourage competition is not seen as a realistic option (Adley 1988). Plans for the full-scale privatisation of the rail network through the selling off of BR's five business divisions (InterCity, Network South East, Regional Railways (formerly Provincial), Freight and Parcels) were also proposed. The selling off of InterCity was seen as the first stage in the programme of privatisation. However, prior to the 9 April General Election, the Transport Secretary, Malcolm Rifkind, committed the Government to the continued subsidisation of BR (Petre and Harlow 1992), effectively abandoning plans for wholesale privatisation.

Nonetheless, the 1992 Conservative Party manifesto proposed the 'franchising' of railway services as 'the best way to produce profound and lasting improvements on the railways'. In an attempt to reassure thousands of rail commuters, particularly in marginal seats in London and the South East, the Conservatives gave a commitment to maintaining and expanding the rail network. The Government now aims to end BR's state monopoly and encourage private sector companies to operate rail services. The Government also plans

to sell Railfreight Distribution, BR's profit-making freight division, to the private sector. In addition, BR's EFL for 1992/93 will be in excess of £2,000 million, enabling BR to meet performance targets set by the new Passenger Charter. The underlying political motive of this set of proposals can not be over looked.

The gradual privatisation of BR is doubtful before the opening of the Tunnel in 1993 but is likely to influence strongly the running of the railways shortly thereafter. The Government is confident that there is already much interest in the private sector and so is drafting legislation to allow the franchising of rail services as soon as possible. The Government anticipates improvements in performance and service quality which will enable services to be sold outright. For commercially unattractive services, subsidies will continue to be provided but not through lump sum payments to BR. Instead, under the franchise scheme, subsidies for individual services will be linked to the meeting of minimum standards of quality. The existing national network of services will be maintained and through-ticketing required under the franchise agreements. A Rail Regulator will be appointed to ensure free access to private companies and to hold franchisees to their terms of contract. A new Railways Board will be responsible for all track and infrastructure, and BR will operate passenger services until they are franchised out to private sector companies.

The proposed franchising of rail services and the outright sale of Railfreight Distribution is likely to create much confusion, at least in the initial stages when legislation is being drafted. The newly denationalized BR may not be able to capitalise on the opportunities generated by the Tunnel after it opens in 1993. The Government's commitment to expanding the rail network, signalling the end of the Beeching era of cuts, is an encouraging shift in rail policy. However, financial support for the railways will be determined even more by commercial criteria. The announcement, albeit prior to a General Election, to increase BR's EFL to £2 billion for 1992/93 is an improvement on past levels of financing but the increased investment in BR could be regarded as a short-term "sweetener" to encourage private sector interest in rail services. A railway franchise scheme has already been introduced in Switzerland but most private sector run services are

dependent on substantial State subsidies. This raises the question over whether the British Government will be prepared to properly subsidise private sector rail services?

Before it is possible to make any concluding remarks, it is first useful to compare and contrast the British Government's 'market solutions' approach with the more interventionist attitude apparent in France and supported by the European Commission. The French Government, in close collaboration with the Nord-Pas de Calais Regional Council, has used the opportunity presented by the Tunnel to promote economic development in the region, both in the short- and long-term. In addition, the Tunnel and TGV Nord represent only a part of the French high-speed rail network. Unlike BR, SNCF has benefitted from a massive investment programme to take their rail network into the next century. The French Government's attitude towards high-speed rail travel is also closer to Commission policy, with a 30,000 km high-speed rail network planned by 2015.

4.5. British Uncertainty Versus French Optimism

SNCF are building a high-speed Northern Line, TGV Nord, linking Paris and the Belgian border with the Tunnel, via Lille. TGV Nord will connect the whole of the existing French high-speed Sud Est and Atlantique systems by 1994, when the Paris Interconnexion is due for completion. The Belgian Government has also decided to include Belgium in the European high-speed rail network. The opening of a new line between the French border and the Belgian capital is planned for 1995. At a later stage, this link with Brussels will be extended towards Germany, via Liege, and the Netherlands, via Antwerp. To complete this new Northern European high-speed rail network, BR planned for the rail link between London and Cheriton to be in service by 1998. As we have seen, the British Government decided that such a link through Kent would be unnecessary until 2005. This 'missing link' highlights the conflicting strategies of the British and French (and Belgian) Governments' toward the Tunnel in general.

The political environment of the Tunnel within the UK and France is regarded, albeit simplistically, as British dogmatism versus French pragmatism (Harmen 1989, Simmons 1989, Holliday et. al. 1991). This would seem to be more representative of the British Government's approach after the 1987 Act received royal assent. During the pre-selection and Parliamentary stages, the British Government was quite pragmatic in seeking to ensure the success of the Tunnel project. Although public funding was ruled out early on, the necessary political support was forthcoming to prevent any momentum being lost. However, following the 1987 Act, the reactive policies of the British Government contrast strongly with the interventionist attitude of the French Government. The British Government also actively isolated local government from the policy-making process prior to the selection of the Eurotunnel project, whereas collaboration between the State and the regions is an integral part of the French system of Government (Holliday et. al. 1991).

4.5.1. French Policy-Making for the Tunnel

'Considering only the 1980s scheme (the Tunnel), it is evident that the French policy community was far more extensive than was the British, having a developed regional dimension in Nord-Pas de Calais which simply had no British equivalent.'

(Holliday et. al. 1991, P.91)

Unlike KCC, the Nord-Pas de Calais Regional Council has been actively involved in Tunnel policy-making since the early 1980s (Comfort 1987). Holliday et. al. (1991) argue that institutional differences have had a substantial impact on the policy responses within Britain and France. The British system of strong 'centralism' usually prevents coherent decision-making and implementation throughout the Government system. The French governmental system, however, promotes co-ordinated national and local policies through unbroken centre-periphery policy networks (Holliday et. al. 1991). An important element of the French system is that key Government officials are not excluded from holding positions at the regional/local level. This ensures that the regional aspirations cannot be ignored. Pierre Mauroy, the former Prime Minister (1981-84) and Mayor of Lille, played a critical role in securing the finance necessary to persuade SNCF to re-route TGV Nord via Lille. The current Minister for National and Regional Development and the Chief Vice

President of the Nord-Pas de Calais Regional Council, Michel Delebarre, (and the former Maritime and Transport Minister in 1988) has been influential in implementing plans for a modern transport network to support the Tunnel.

At the same time as the Anglo-French Study Group (set-up in September 1981) was compiling its report on a fixed link, political meetings were being conducted in Nord-Pas de Calais under the auspices of the Braibant Commission, through the Comité Economique et Social Régional, and via semi-public 'chambres' and 'syndicates' (Holliday et. al. 1991). In addition, the Regional Council established a Working Group, chaired by Daniel Percheron, Senator and Vice President of the Council, to prepare a political report listing the regional requirements of a fixed link. The Transport Ministry also set up a Working Group with a wider remit than the Braibant Commission, bringing together local, regional and national interests. By the time the two Governments had selected the Eurotunnel project, 20 January 1986, the Regional Council was already aware that at least 75 percent of its regional requirements, set-out in a dossier⁴ submitted to President Mitterrand, would receive Government backing (Heddebaut 1991). Similar collaborative activity would only be undertaken in Kent several years later in 1987, through the CTJCC (KIS 1987). However, it should be recognised that the British system of centralised policy-making, while isolating local government, prevented any serious delays which could have resulted in the collapse of the project.

French policies toward the Tunnel and supporting transport infrastructure have been primarily orientated to the promotion of economic development within the relatively depressed region of Nord-Pas de Calais. The region has suffered from structural economic decline, with the rationalisation of the staple industries of steel, coal and textiles. During the mid to late 1980s, unemployment rose to 13.3 percent with the worst-hit areas recording figures exceeding 20 percent (Holliday and Vickerman 1989). In contrast to Kent, the region of Nord-Pas de Calais welcomed the anticipated construction and long-term economic benefits that the Tunnel project could entail. French policies were designed to contain the economic benefits within the region, while a strategy of regional dispersal was favoured in Britain.

On 14 March 1986, a Protocole d'accord was signed by the regional prefect and the Nord-Pas de Calais Regional Council which set-out a joint programme (Plan Transmanche), financed by the State and the Regional Council, usually on a 2:1 basis. Even though the French Government does not legally have to honour such commitments, Plan Transmanche has been substantially realised. The work to be carried-out included: the construction of a coastal road from the Belgian border to Boulogne-Sur-Mer; key road links to the three main ports of the region; the upgrading of the existing rail network, including TGV Nord; and the modernisation of the region's ports. Local training initiatives for TML subcontracting were also established. No serious opposition to the Tunnel emerged in France. By a process of extensive negotiation, mutual benefits were agreed upon. For example: the Calais Chamber of Commerce feared the impact of the Tunnel on the port and ferry industry but was satisfied by plans to modernise and improve access to the ports; and local communities, such as Frethun and Sangatte, were 'rewarded' with investment in a business centre and tourist resort, respectively. The public enquiry therefore proved to be a formality. Compulsory purchases also engendered little opposition as protestors were 'bought-off' (Holliday and Vickerman 1989).

The French Government has a long tradition of regional economic development planning, thus the implementation of policies designed to enhance the opportunities created by the Tunnel are not uncommon. Strategic planning to promote economic development in Nord-Pas de Calais was developed at an early stage and is not restricted to the improvement of the supporting transport network. The EuroLille Metropole is an attempt by the City of Lille, the Regional Council and the French Government to redevelop Lille itself, and to act as a catalyst for the region as a whole. A tourism initiative is also being sponsored along the entire Nord-Pas de Calais coast, the Côte d'Opale. The Nord-Pas de Calais Regional Council has collaborated successfully with the French Government to have in place a package of policies that they hope will put the region at the 'crossroads' of Europe (Delebarre 1992). The creation of the 'EuroRegion' (the charter which was signed in Lille on 21 June 1991) encompassing both Kent and Nord-Pas de Calais, demonstrates the nature of cross-frontier relations initiated by the economic and political leaders of the region. Co-operation between the Regional Council, the City of Lille and SNCF was also crucial in the routing of TGV Nord through the centre of Lille. Lille will become the route

focus of a high-speed rail network between Paris and London, and Paris-Brussels-Amsterdam-Köln (PBKA).

4.5.2. The French (and Belgian) High-Speed Rail Network

Plans for TGV Nord did not emerge from proposals to support the Tunnel but were developed earlier as part of a wider strategy for the PBKA high-speed rail network (see Figure 4.7). The PBKA rail network was first discussed in 1983, independently of the proposed fixed link schemes, and originally only planned to link Paris, Brussels and Cologne. However, the PBKA rail network forms only a part of SNCF's existing five year contract with the State (1990-94) which incorporates a massive FFr100,000 million for investment, with nearly half (FFr45,500 million) allocated to TGV extensions (Freeman Allen 1990, Railway Gazette International 1990). This investment provision is 55 percent greater than under the previous plan which brought into service TGV Atlantique. Planned expenditure on TGV services has increased by over 250 percent, including the simultaneous construction of three TGV lines: Nord, Interconnexion and the extension to the Sud Est line from Lyon to Valence.

TGV Sud Est was first proposed in 1969, gaining Government support in 1973 and following a public enquiry in 1975, construction began in 1976. A full TGV service was in operation by September 1983, with 27 towns in the south east of France benefitting from high-speed travel. SNCF initially planned to extend TGV Sud Est from Lyon to Marseilles but this was postponed in 1986 to finance TGV Nord. After nine years in service, TGV Sud Est had covered all investment expenditure and current profits now help finance TGV Nord. Projects have to achieve a 12/13 percent annual rate of return over a 20 year period. SNCF finances projects meeting this criteria from its own resources and against Government guarantees. TGV Atlantique did not satisfy the above criteria but SNCF were able to attract specific Government grants, 30 percent of the total cost, based on environmental and regional development considerations (Modern Railways 1990).

By mid-1989, none of the civil engineering work had been carried-out but SNCF planned for TGV Nord to be in service by the time of the opening of the Tunnel, originally June

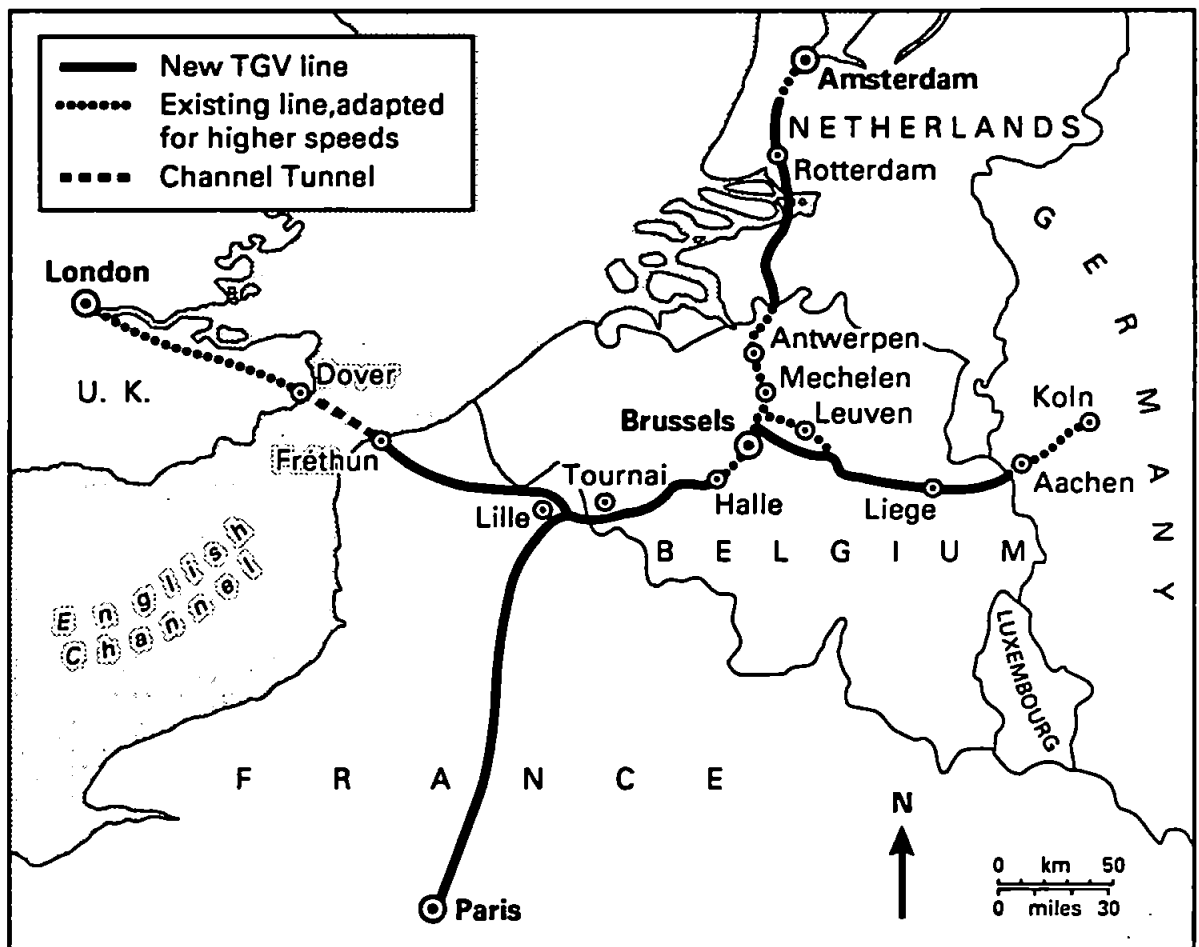


Figure 4.7 The Paris-Brussels-Koln-Amsterdam High Speed Rail Network (PBKA).

Source ; Innovation et Reconversion Industrielle 1986

1993 (See Figure 4.8). When the Paris-London route was finalised, the choice remained between passage via Lille and the construction of a station on a green-field site to the south of the city (Haydock 1989). The Mayor of Lille, Pierre Mauroy, found the latter proposal unacceptable. However, the cost of routing the line through the centre of Lille amounted to FFr1 billion, of which SNCF (and the French Government) agreed to cover half of the extra cost (Migneau 1991). The Nord-Pas de Calais Regional Council and the City of Lille covered 33 and 17 percent of the cost respectively.

The Regional Council also proposed further improvements to the regions rail network (costing FFr519 million), which would enable a more comprehensive TGV service to operate within the Nord. The cost evenly shared between SNCF, the Regional Council and the Government. Since 1984, regional councils have had the authority to negotiate with SNCF over regional services. The Nord-Pas de Calais Regional Council has used its increased powers to extend the TGV network to include most of the main cities in the region. SNCF agree with the Regional Council that this improved service will promote regional development and thus increase passenger traffic (Migneau 1991).

The continuation of TGV Nord into Belgium and on to the Netherlands and Germany, has not progressed as quickly. Belgian national railways, SNCB, commissioned a thematic study of the high-speed train project⁵ in 1989. It found that a high-speed rail line from the French border through Brussels and on to Amsterdam/Cologne would 'make a true contribution to the natural and human environment' (SNCB 1989). However, while the French-speaking half of Belgium, Wallonia, generally accept the TGV as a good thing, the route through Flanders, the Dutch-speaking half, has encountered much opposition (Murgatroyd 1989). Liege, like Lille, has been active in trying to ensure that the route passes through the city and not further to the North, via Vise or Beek (See Figure 4.9). Initially, the project was to be privately funded, but SNCB is now going to finance the investment, leading to fears that the existing rail network will suffer. Problems have also emerged over which stations the TGV service should stop at in Brussels, either Nord, Midi or Sud. The Belgian Government delayed announcing the preferred route until the late summer of 1991 and so it is unlikely that a dedicated high-speed rail network will be in place by 1995 as originally planned. In addition, the inclusion of Zaventem, Brussels

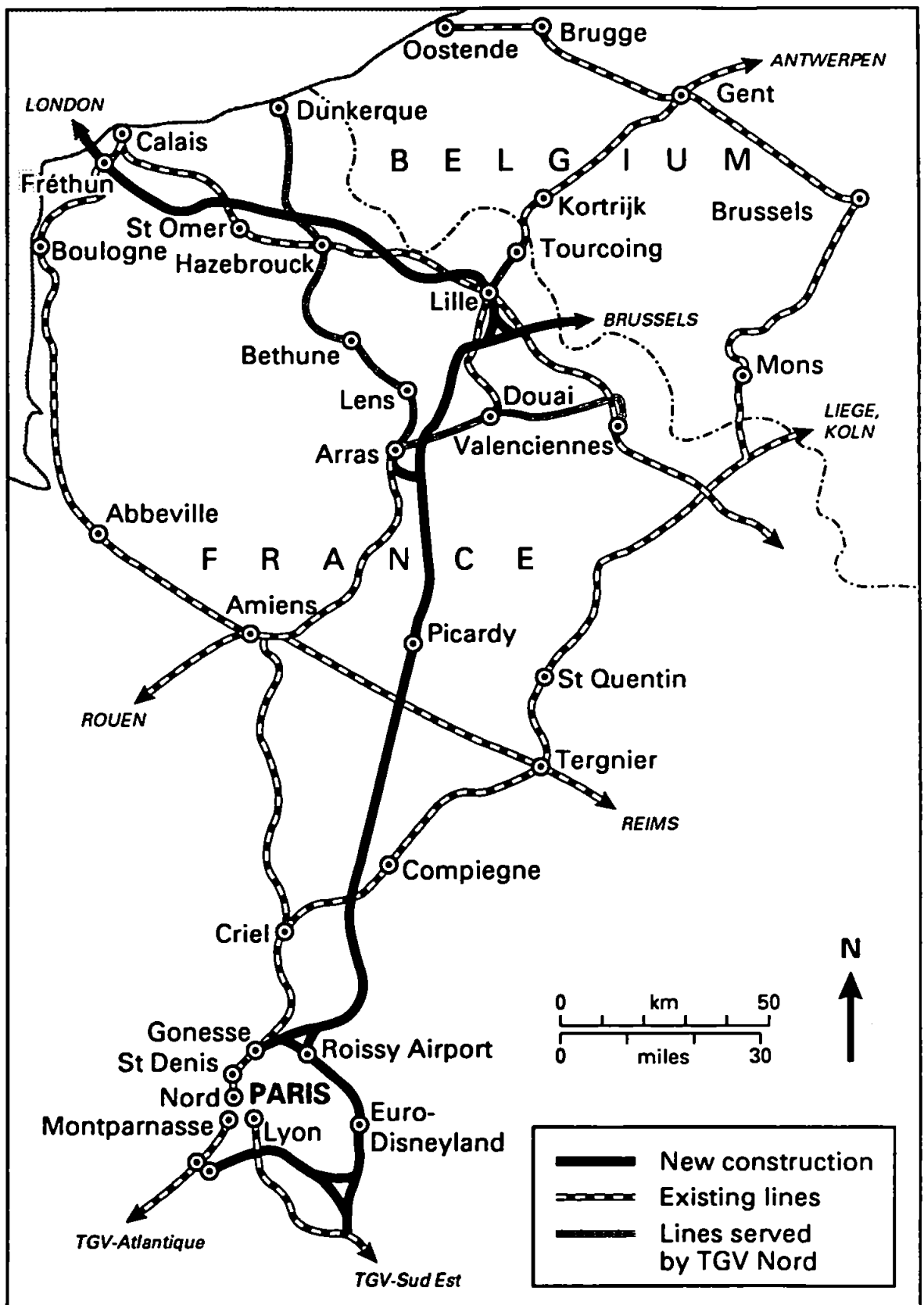


Figure 4.8 TGV Nord

Source ; Innovation et Reconversion Industrielle 1986

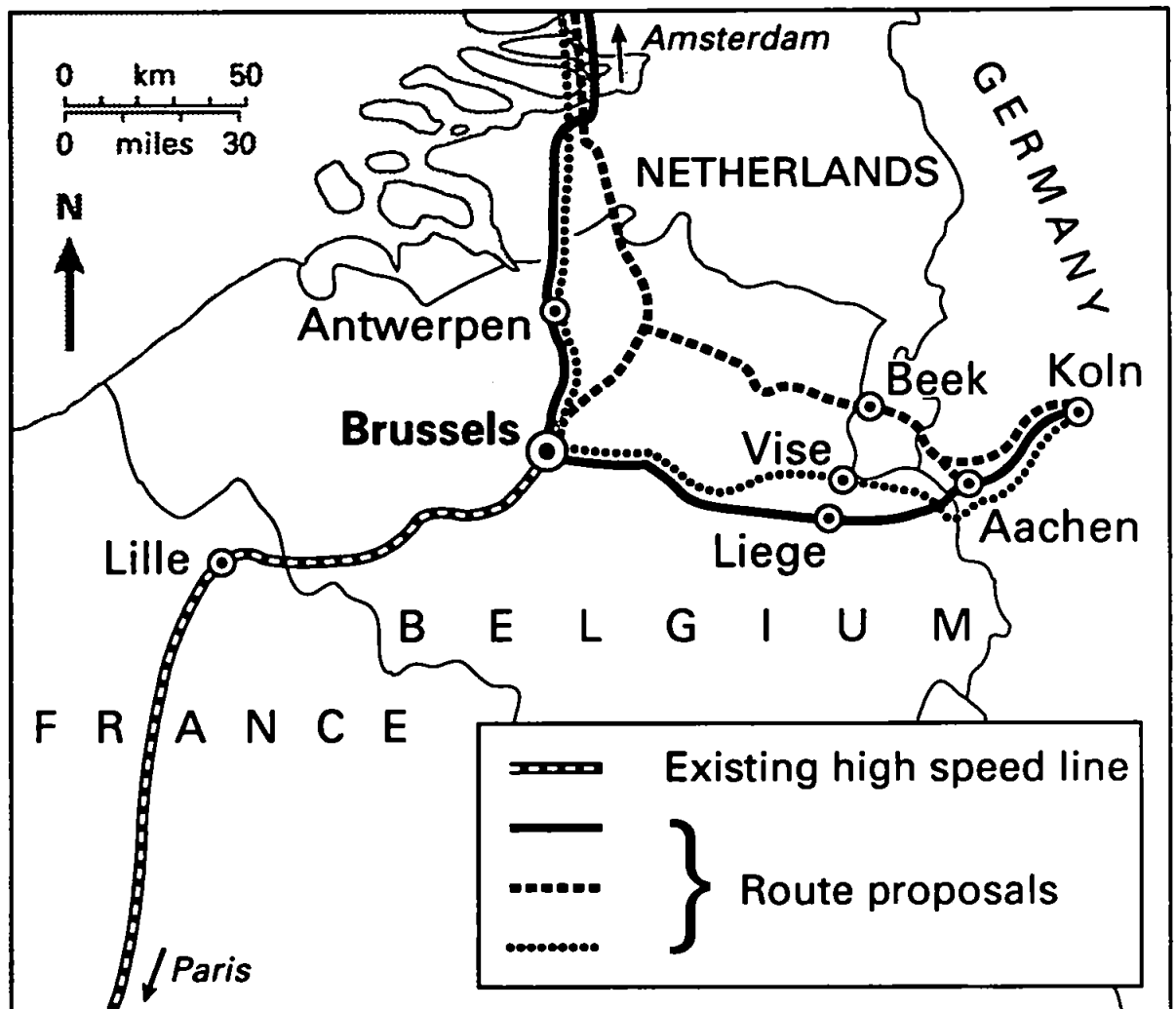


Figure 4.9 The Belgian high speed rail link : original route options
Source ; SNCB 1989

International Airport, in the proposed route aroused some concern over increased journey times and loss of revenue.

In a report by the national railways of Britain, France and Belgium, 'The joint development of a high speed train for Europe', the respective chairmen stress that:

'....British Rail, SNCF and SNCB/NMBS intend to take full advantage of this unique opportunity to connect their railway network....'

(BR et. al. 1990, P.1.)

It would, however, seem that 'this unique opportunity', namely the Tunnel, will be served by a differentiated TGV service as a result of the delays in Belgium and in the UK. The Belgian Government is, nonetheless, committed to having in place a high-speed rail network by the late 1990s, with Brussels becoming the route hub of a new European TGV service. High-speed trains emerging from the Tunnel on to Kent main line tracks will have to run along side Network South East trains at much reduced speeds. In contrast, TGV Nord will allow speeds in excess of 300 km/hr (187 mph).

4.5.3. European Commission Policy on High-Speed Rail Travel

It is only appropriate here to summarise briefly Commission policy on the future of European railways, which envisages 30,000 kms of new or upgraded lines for high-speed traffic (see Figure 4.10). The Tunnel will merge Britain's rail network with a European railway system that spans not only the twelve member states of the EC but also the countries of Scandinavia and Eastern Europe. The EC, through the European Investment Bank (EIB), has also been crucial to the success of the Tunnel project itself. The EIB made an initial loan of £1 billion to Eurotunnel and a further loan of £300 million. The Tunnel represents the EIB's largest liability, and thus 'reinforces the European dimension of the Channel Tunnel' (Holliday et. al. 1991).

The Community of European Railways (CER), which encompasses the twelve EC national railways and those of Austria and Switzerland, believes that:

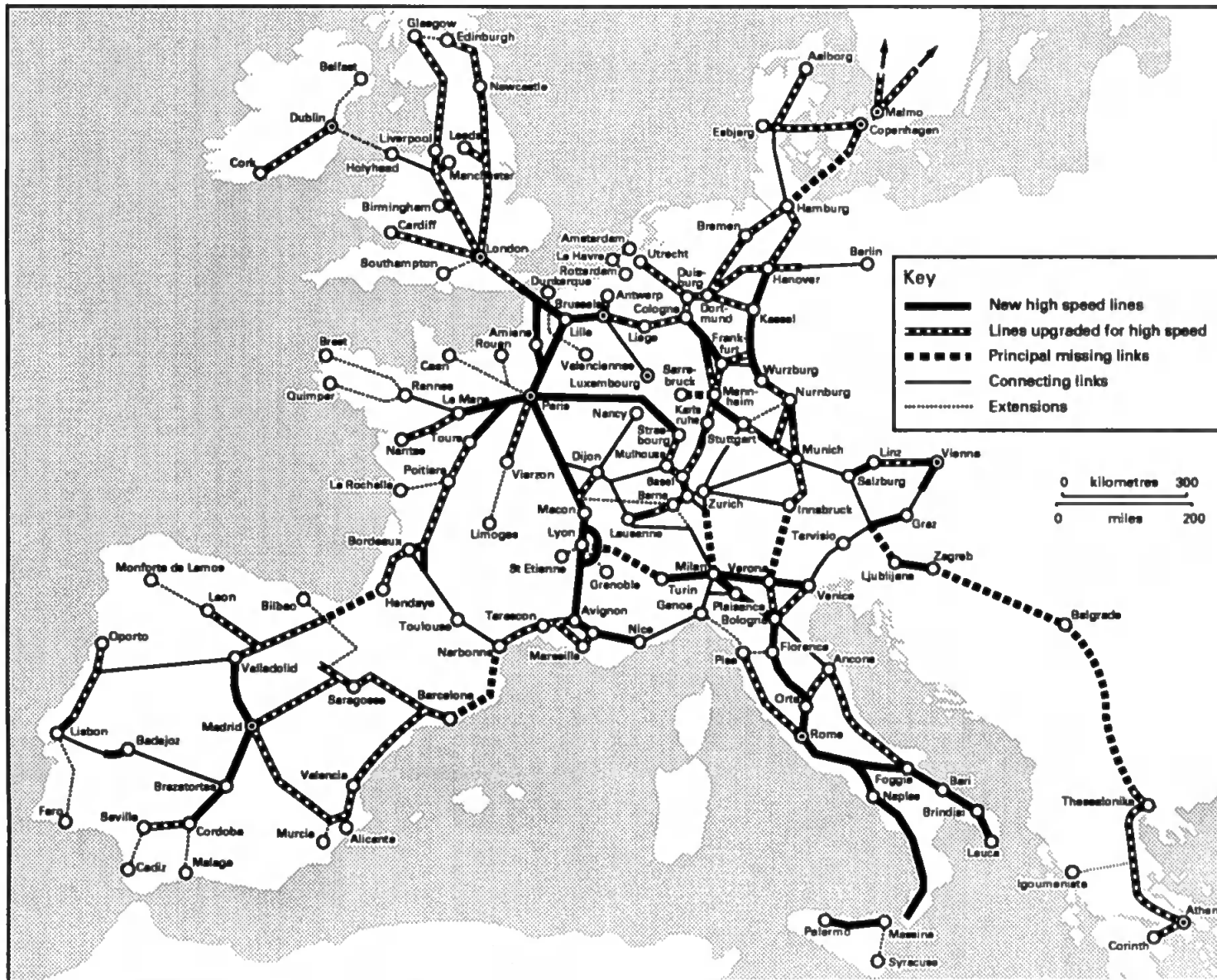


Figure 4.10

The European High-Speed Rail Network

Source ;
Conseil Régional Nord-Pas
de Calais 1991c

'....a (European high-speed rail) network would be a major factor in strengthening the links that bind the Community together.'

(Holliday et. al. 1991, P.163; after CER 1989, P.3)

In 1976, the European Commission proposed the co-ordination of major investment in rail infrastructure throughout the Community but the downturn in rail traffic following the 1973 'oil crisis' led to the indefinite shelving of this policy proposal (Whitelegg 1988, Harmen 1990). The Single Market will probably encourage increased passenger and freight movement within the Community and thus, the prospect of a new 'Railway Age'. The Transport Commissioner, Karel van Miert, at a conference on Community railway policy⁶ in November 1989, re-stated the Commission's determination to achieve a pan-European high-speed rail network by 2015. The new policy proposals set the framework for joint international action to ensure that the railways have an equal opportunity to gain success. High on the agenda was the need for railways to pay for their infrastructure on the same basis as roads (i.e. to create a 'level playing field').

The European Commission has been interested in proposals for a medium-term rail infrastructure programme, based on current national projects, between 1995 and 2005, and a longer-term policy, identifying 'missing links'. It is considered that high-speed lines will have to be developed 'to offset air and road travel growth' (Harmen 1990). A proposed transport infrastructure fund has never been established because 'one or two' countries, including Britain, have used their veto powers. Britain has been opposed to the fund despite the fact that high-speed rail links to the Tunnel would immediately benefit from EC financial support. The CER envisages a European high-speed rail network costing 90 billion ECUs. In December 1990, van Miert presented the Commission's 'master plan' for a 30,000 km network, costed at 150 billion ECUs (Commission of the European Community 1990). The plan focused on 15 'key links', including London to Cheriton. The Commission proposed that 40 percent of the total cost, 60 billion ECUs, should be met from the EC budget. Previous transport infrastructure programmes have been opposed and later scaled down. However, van Miert stressed the importance of a European high-speed rail network, warning that a qualified majority basis may be used, removing the power of veto, to implement the Commission's proposals. Harmen (1990) believes that European railway policy 'could be good news for Great Britain PLC' but will the British

Government concur? As is now evident, the British Government's policy towards the Tunnel and related infrastructure contrasts sharply with the strategies favoured on the Continent.

4.6. Conclusion

'The Government requires the Channel Tunnel to be treated as an ordinary commercial venture. However, it has far-reaching economic and environmental implications which cannot be resolved solely by the market. Local government believes that the Government must define a **national strategy** to deal with those implications. The aim must be to develop infrastructure and services to ensure that the benefits and opportunities for employment, growth, trade, tourism, and business travel are maximised and any adverse effects minimised for all regions of the UK.'

(Association of Metropolitan Authorities (AMA) 1989, P.2)

Concern over the lack of a national strategy for the Tunnel has been consistently highlighted throughout this chapter. The former Prime Minister, Margaret Thatcher, remarked on the Tunnel as 'a great national asset' but no strategy to maximise the economic benefits of the Tunnel has been implemented in the UK. Could the former Transport Secretary Nicholas Ridley be correct in suggesting that Margaret Thatcher saw the Tunnel only as a 'monument' to her personal glory?

The AMA's (1989) policy statement - 'Getting the Best from the Channel Tunnel: A local government initiative' - outlines the conflicting policy objectives of central and local government. Immediate action to set-up national and regional impact studies is seen as necessary in order to allow regions to maximise the economic benefits from the Tunnel and minimise any adverse effects. Government policy has thus far failed to ensure the adequate provision of supporting transport infrastructure and services. The ideological insistence that the private sector should provide the necessary investment is likely to have serious repercussions for the regions and the UK as a whole.

As a result of British Government policy, it would seem that the Tunnel can now only be considered as a "missed opportunity". Interventionist strategies adopted by the French Government are also likely to exaggerate the potential "cost" of Government inaction in the UK. The planned level of investment in Nord-Pas de Calais's transport and economic infrastructure may be considered as over optimistic but the Regional Council is determined to create the right commercial environment for success. Fears have even been expressed in the UK that British companies will migrate to northern France in order to locate at the 'crossroads' of Europe (SEEDS 1989).

If the gains in relative accessibility for UK regions, as shown in chapter 3, are to be realised, effort must be made to ensure that these regions are not disadvantaged by the supporting rail network. The Government should allow the necessary investment in the national transport network, particularly the railways, to maximise the opportunities created by the Tunnel. The revised pattern of beyond-London international passenger services and the location of regional freight terminals could prevent companies benefitting from the Tunnel. The Section 40 regional consultations, as well as regional consultancy reports, highlight strong criticisms of BR's (1989b) plans for international rail services. Economic Potential Analysis employed in chapter 3 showed that speed would be a critical in terms of international freight services. Therefore, inadequate rail services could prevent the potential of the Tunnel being realised, particularly in the more peripheral UK regions.

Notes

1. These central London stations include London Bridge, Charing Cross, Blackfriars, St.Paul's and Farringdon and Cannon Street.
2. Carried-out by C.Buchanan and Partners.
3. GWR = the Great Western Railway; LMS = the London, Midland and Scottish; LNER = the London and North Eastern Railway; and SR = the Southern Railway.
4. 'Elements pour un plan ed developpement de la region Nord-Pas de Calais (Conseil Regional Nord-Pas de Calais 1988), after the Bechtel Report '. Impacts et perspectives pour la region Nord-Pas de Calais.
5. Thematic Study: the high-speed train project: Paris/London-Brussels-Köln/Amsterdam Summary Report December 1989.
6. 'Topical issues of the common transport policy for railways', November 1989.

CHAPTER 5: THE QUESTIONNAIRE SURVEY

Prior to the present study, only two published surveys have been undertaken to identify the general perceptions held by the British business community of the Tunnel. Eurotunnel and BR (1988) commissioned a survey of large business interests in all UK regions outside the South East (except for Northern Ireland), while the London Chamber of Commerce and Industry (LCCI - 1989) carried out a survey of the London business community. Since the scope of both studies prevented an inter-regional comparison of companies in the South East and the more peripheral UK regions, their findings are of limited value to the present study. This chapter will examine the results of the questionnaire survey carried-out for the present thesis in terms of company perceptions of the Tunnel and their likely reactions to it.

5.1. Objectives of the Survey

The aims of the survey were twofold: firstly, to provide information on the general perceptions held by British companies of the Tunnel and its wider regional economic implications; and secondly, to determine the potential demand for Tunnel services (i.e. BR's international through trains and Eurotunnel's Shuttle service). The questionnaire survey constitutes an important part of the project, not only because of the original nature of the data produced but also in terms of whether this data will support the findings of the Economic Potential Model (see chapter 3) or, as argued in chapter 4, highlight inadequacies in the supporting transport infrastructure.

Economic Potential Analysis was employed in chapter 3 to model the impact of the Tunnel on the relative accessibility of UK regions to economic activity on the Continent. In contrast to earlier studies (Clark et. al. 1969, Keeble et. al. 1982a), it was shown that certain peripheral UK regions, such as Scotland, the North and East Anglia, could experience fairly uniform increases in relative accessibility compared with the South East.

Since regions outside the South East account for more than 75 percent of UK-continental trade (BR 1989b, Dourmashkin 1989, Pineda 1989a&b), it was argued that the more peripheral UK regions could gain proportionately more than the South East from improved rail access to the Continent. However, there is still much uncertainty concerning the regional economic implications of the Tunnel. Government policy has failed to ensure the adequate provision of supporting transport infrastructure to serve the Tunnel (see chapter 4). Regions to the north and west of London are likely to be further peripheralised from European economic activity, thus undermining the potential opportunities created by the Tunnel.

In reality, the regional economic impact of the Tunnel will be determined ultimately by the policies implemented by British companies. Therefore a clear understanding of how companies are likely to react to the Tunnel is required. The questionnaire survey explores company perceptions of the Tunnel and the anticipated usage of its services. Before examining the results generated, it is important to discuss the 'Methodology and Scope of the Survey'; as well as the structure of the questionnaire, stating the rationale behind individual questions. The response rate will then be analyzed to ensure that the respondents are a fair representative sample of all companies surveyed. The results will be examined and interpreted in the light of the theoretical, legislative and policy frameworks established in the preceding chapters.

5.2. The Methodology and Scope of the Survey

The questionnaire survey was undertaken during May and June of 1991, with companies throughout southern England randomly selected after satisfying certain basic criteria (which are discussed below). Over 1,500 companies, 1,002 from the South East and 517 from the South West, each received an identical questionnaire (see Appendix 3). Time and financial restrictions made it impractical to broaden the scope of the survey by including other regions. After a period of two weeks a secondary letter was sent out to either encourage companies to reply to the questionnaire or thank them for already having done so. The

survey targeted approximately 1,000 companies in the South East and 500 in the South West to achieve a fair representative sample of both regions and obtain sufficient data for analysis. The size of the survey was primarily based on an assumed response rate of 20 percent. The aim was to receive at least 300 completed questionnaires.

The initial criterion employed required participants to be large exporting companies or companies with an annual turnover in excess of £20 million. Only manufacturing and distribution companies in the South East and the South West were targeted, the intention being to incorporate those companies most likely to be affected by the Tunnel. The "invisible" nature of service companies' exports makes them unlikely to utilise fully the Tunnel and the more direct route for rail/road freight to the Continent. Companies which satisfied the above criterion were randomly selected from Dun and Bradstreet's (1990) compendium of 25,000 'Key British Enterprises'. However, the criterion had to be relaxed for companies in the South West, where the required annual turnover was reduced to £5 million in order to facilitate a selection of a sufficient number of companies. This did not detrimentally affect the analysis of the results since the purpose of establishing a criterion was to target companies most likely to be affected by the Tunnel in the two regions. Companies selected from the South West, therefore, satisfied the relaxed criterion but still represent the region's larger exporting companies or companies with a higher annual turnover.

No attempt was made to survey a representative sample of the industrial base of either the South East or South West, or to analyze respondents in terms of their overall representativeness. The overriding objective, enforced due to time and financial limitations, was to survey companies most likely to be affected by the Tunnel. The inclusion of small and/or non-exporting companies could have proved counterproductive, jeopardising the significance of the sample size. Furthermore, it will be shown that the type of companies themselves do not significantly affect company perceptions of and/or the anticipated future usage of its services. The number of companies targeted within the two regions (1,000 in the South East and 500 in the South West) was also dictated by the need not only to obtain sufficient respondents at the regional level but also at the intra-regional/county level.

The postal survey was carried out after a pilot survey was undertaken in March, 1991. The questionnaire was tested at a conference held by the Royal Town Planning Institute concerning 'The Economic Impact of the Channel Tunnel on the South West', which attracted over 50 large companies from the region. More than 30 companies completed and returned the questionnaires. After examining the responses, only minimal amendments were made to the design of the questionnaire. The structure of certain questions was altered to avoid misunderstandings that became apparent with the original questionnaire. The pilot survey was undertaken purely to determine the effectiveness of the questionnaire. The completed pilot questionnaires were not therefore incorporated into the analysis of the main questionnaire.

5.3. The Questionnaire

As with all questionnaires, conflict arises between the "need" for certain questions and the overall length of the questionnaire. So as not to deter potential respondents, effort was made to keep the number of questions to a minimum without detrimentally affecting the usefulness of the questionnaire. In addition, where possible, answers to questions were structured so as to reduce the time required to complete the questionnaire. Over 75 percent of the questions incorporated some form of a structured answer. To improve the accuracy of the data and reduce the chance of human error, it was necessary to code the responses for use in computer data bases after the questionnaires were returned.

The structure of the questionnaire was based on four main categories (see Appendix 3):

- (1) Details about the company;
- (2) The impact of the Tunnel and related transport infrastructure on the location and competitiveness of the company;
- (3) Potential demand for the Tunnel, in terms of both passenger and freight traffic, generated by the companies; and,
- (4) Wider considerations.

The first seven questions are included to ascertain important details about the companies themselves and to allow cross-sectional analysis of the results by; type of company (questions 2 and 3), industrial classification (question 4), length of time at present location (question 5), size of workforce (question 6), and importance of export markets (question 7). Information derived from this section was used to ensure that the respondents are a fair representative sample. This issue will be discussed in more detail in section 5.4.

The second category of questions attempted to determine the importance of location to the companies (questions 8 and 9) and how the Tunnel would alter their perceptions in terms of: the locational advantages/disadvantages of their present site (question 10); accessibility to domestic and European markets (question 11); vulnerability to increased competition from both domestic and European producers (question 12); and whether or not the Tunnel would encourage companies to relocate (question 13). An improved supporting transport infrastructure will improve accessibility to both domestic and European markets, particularly with regard to Kent. The questionnaire therefore recognised this potential.

The questionnaire then focused attention on company plans for future Tunnel usage in terms of both business trips and the transportation of exports. The first section (questions 14 to 16) concentrated on business trips. Companies were asked about the nature of their existing business trips to Europe, according to the frequency, destination and mode by which representatives were likely to travel. Question 15(a) then attempted to obtain company "estimates" of the percentage of future business trips likely to go via the Tunnel. The pilot survey revealed that this question created certain problems, particularly since companies are unlikely to be confident about any predicted future usage until nearer to the time of the opening of the Tunnel. However, even rough approximations were considered beneficial. Companies were then prompted to distinguish between BR's international through trains and Eurotunnel's Shuttle service. Question 16 concluded this section by asking the companies what factors would be important to the outcome of the previous question. A similar structure was employed for the second section on freight traffic (company exports). The anticipated level of company usage of international freight services will determine ultimately the long-term economic impact of the Tunnel (see chapter 3).

The final category of questions brings together important but somewhat unrelated questions. First, attention is focused on whether company attitudes about using the Tunnel are static or whether they could be influenced by certain Government, BR and/or Eurotunnel strategies (question 20). This question is particularly relevant considering that Government policy towards the Tunnel and related transport infrastructure has been strongly criticised (Gossop 1987, Simmons 1989, Holliday et. al. 1991). Companies were then asked about the general availability of information concerning the Tunnel and the

services that it will offer. One would generally expect companies with a high degree of knowledge concerning the Tunnel to form more accurate perceptions of the Tunnel's likely impact and estimates of anticipated future usage. Furthermore, it was also possible to gauge the success or failure of promotional campaigns implemented by Eurotunnel and BR. The penultimate question then attempted to quantify the degree to which the Tunnel and the Single European Market (SEM) are likely to generate new cross-Channel trade. Based on the knowledge held by companies of their own regional economies, the final question tried to establish their opinions concerning the likely overall impact of the Tunnel on the South East/South West.

5.4. The Response Rate

More than 370 questionnaires were completed and returned, representing a response rate of 24.5 percent. The survey was conducted in the hope that at least 300 questionnaires would be completed, thus providing sufficient data for analysis. Hence, the first aim of the survey was achieved. The response rate was affected by the number of companies that had either gone out of business or changed location, leaving no forwarding address. Dun and Bradstreet's (1990) 'Key British Enterprises' was the most up-to-date database at the time of study, compiled during 1989. Even so, a surprisingly large number of companies, approximately 86, ceased operating at the location given. Therefore, a return rate of 26.0 percent would be a more accurate reflection of the true response rate. To ensure that the respondents are a fair representative sample of the total number of companies surveyed, it is necessary to analyze the response rate, utilising descriptive statistical techniques and the chisquare X^2 test, by region/county, industrial classification and size of workforce.

REGION	PERCENTAGE OF COMPANIES SURVEYED	PERCENTAGE OF RESPONDENTS
LONDON	19.68 (299)	13.17 (49)
BEDFORDSHIRE	2.24 (34)	2.42 (9)
BERKSHIRE	5.46 (83)	5.65 (21)
BUCKINGHAMSHIRE	3.03 (46)	3.23 (12)
ESSEX	3.75 (57)	3.23 (12)
HAMPSHIRE	4.34 (66)	6.45 (24)
HERTFORDSHIRE	4.28 (65)	3.49 (13)
KENT	4.08 (62)	6.45 (24)
MIDDLESEX	7.77 (118)	7.53 (28)
OXFORDSHIRE	2.30 (35)	1.88 (7)
SURREY	6.12 (93)	5.11 (19)
SUSSEX	2.90 (44)	4.03 (15)
SOUTH EAST	65.96 (1002)	62.63 (233)
AVON	8.23 (125)	7.26 (27)
CORNWALL	1.51 (23)	1.88 (7)
DEVON	4.81 (73)	6.45 (24)
DORSET	4.87 (74)	4.84 (18)
GLOUCESTERSHIRE	5.92 (90)	7.53 (28)
SOMERSET	3.69 (56)	4.57 (17)
WILTSHIRE	5.00 (76)	4.84 (18)
SOUTH WEST	34.04 (517)	37.37 (139)

Table 5.1: Percentage (and number) of companies surveyed and respondents by county/region.

Companies in the South East accounted for 66.0 percent of the total number of companies surveyed and 62.6 percent of the total number of respondents. Thus, the regional location of companies did not influence the response rate (see Table 5.1). It can be seen that only London records any significant difference, with the respective percentages falling from 19.7 to 13.2 percent.

However, the X^2 test does provide a more detailed account of the response rate at the county level (see Table 5.2):

Region	Total	Percent	Observed freq.	Expected freq. (% of 372)
South East				
London	299	19.68	49	73.21
Bedfordshire	34	2.24	9	8.33
Berkshire	83	5.46	21	20.31
Bucks.	46	3.03	12	11.27
Essex	57	3.75	12	13.9
Hampshire	66	4.34	24	16.14
Hertfordshire	65	4.28	13	15.92
Kent	62	4.08	24	15.18
Middlesex	118	7.77	28	28.90
Oxfordshire	35	2.30	7	8.56
Surrey	93	6.12	19	22.77
Sussex	44	2.90	15	10.79
South West				
Avon	125	8.23	27	30.62
Cornwall	23	1.51	7	5.62
Devon	73	4.81	24	17.89
Dorset	74	4.87	18	18.12
Glouc.	90	5.92	28	22.02
Somerset	56	3.69	17	13.73
Wiltshire	76	5.00	18	18.60
	1019		372	

Table 5.2: The significance of the response rate by region/county.

It was assumed that the location of the companies would not influence the response rate. The null hypothesis, H_0 , therefore stated that the response rate is not related to the location of companies.

$$X^2 = \frac{\sum (O - E)^2}{\sum E}$$

where O = the frequencies
actually observed, and
E = the frequencies expected

$$\begin{aligned}
X^2 = & 8.01 + 0.05 + 0.02 + 0.05 + 0.27 + 3.83 + 0.54 \\
& + 5.12 + 0.03 + 0.28 + 0.62 + 1.64 + 0.43 + 0.34 \\
& + 2.65 + 0.00 + 1.62 + 0.78 + 0.02
\end{aligned}$$

$$X^2 = 26.30 \text{ degrees of freedom (df) } = n - 1 = 18$$

$$\text{critical value of chisquare } (\alpha = 0.05) = 28.87$$

It is not possible to reject H_0 at the 0.05 level (i.e. that there is more than one chance in 20 that these observations occurred at random). This would therefore suggest that the location of the companies did not affect the response rate. But at the rejection level of $\alpha = 0.10$, the critical value of chisquare is 25.99 and so it is possible to reject H_0 . This can be explained by the less than expected number of responses for London and the relatively larger numbers of responses for Hampshire, Kent and Devon. However, overall it has been shown that the location of the companies at the regional and county level did not significantly influence the response rate.

Question 4 asked companies to state what industrial activities they were predominantly involved in. The answers were then coded for use on computer data bases/statistical packages, with the first three choices included. For the purposes of analyzing the response rate only the first choice will be examined (see Table 5.3). The response rate was again unaffected by industrial classification. The X^2 test was used on the seven main industrial categories to determine whether certain industries were more likely to respond. It was shown that the response rate was not influenced by the industrial classification of companies. Table 5.4 contrasts industrial classification at the regional level of analysis. Only electrical engineering in the South West experienced any noticeable change, accounting for 13.9 percent of the total number of companies surveyed in the South West and 20.1 percent of the respondents.

INDUSTRIAL CLASSIFICATION	PERCENTAGE OF COMPANIES SURVEYED	PERCENTAGE OF RESPONDENTS
FOOD, DRINK & TOBACCO	15.40 (234)	14.78 (55)
COAL & PETROLEUM	1.38 (21)	0.54 (2)
CHEMICALS & ALLIED INDS	14.42 (219)	10.22 (38)
METAL MANUFACTURE	4.61 (70)	5.11 (19)
MECHANICAL ENG.	11.72 (178)	12.63 (47)
INSTRUMENT ENG.	2.57 (39)	4.30 (16)
ELECTRICAL ENG.	17.18 (261)	16.67 (62)
SHIPBUILDING & MARINE ENG.	0.53 (8)	1.34 (5)
VEHICLES	2.11 (32)	2.96 (11)
OTHER METAL GOODS	1.12 (17)	1.08 (4)
TEXTILES	0.92 (14)	0.27 (1)
LEATHER & FURS	0.26 (4)	0.27 (1)
CLOTHING & FOOTWEAR	2.30 (35)	1.61 (6)
BRICKS, POTTERY, GLASS, CEMENT...	4.21 (64)	5.65 (21)
TIMBER, FURNITURE	3.16 (48)	3.49 (13)
PAPER, PRINTING, PUBLISHING	9.61 (146)	9.68 (36)
OTHER MANU. INDS	3.42 (52)	3.76 (14)
DISTRIBUTION & WHOLESALING	5.07 (77)	5.65 (21)

Table 5.3: Percentage (and number) of companies surveyed and respondents by industrial classification.

INDUSTRIAL CLASSIFICATION	PERCENTAGE OF COMPANIES SURVEYED		PERCENTAGE OF RESPONDENTS	
	SE	SW	SE	SW
FOOD, DRINK & TOBACCO	14.87	16.44	17.17	11.51
COAL & PETROLEUM	1.50	1.16	0.0	1.44
CHEMICALS & ALLIED INDS	17.86	7.74	13.73	4.32
METAL MANUFACTURE	4.49	4.84	5.15	5.04
MECHANICAL ENG.	9.38	16.25	12.88	12.23
INSTRUMENT ENG.	1.90	3.87	4.29	4.32
ELECTRICAL ENG.	18.86	13.93	14.16	20.86
SHIPBUILDING & MARINE ENG.	0.20	1.16	0.43	2.88
VEHICLES	1.90	2.51	3.43	2.16
OTHER METAL GOODS	0.70	1.93	1.29	0.72
TEXTILES	0.60	1.55	0.0	0.72
LEATHER & FURS	0.10	0.58	0.0	0.72
CLOTHING & FOOTWEAR	2.69	1.55	0.86	2.88
BRICKS, POTTERY, GLASS, CEMENT...	3.79	5.03	4.29	7.91
TIMBER, FURNITURE	2.40	4.64	3.86	2.88
PAPER, PRINTING, PUBLISHING	10.28	8.32	10.30	8.63
OTHER MANU. INDS	3.00	4.26	1.72	6.47
DISTRIBUTION & WHOLESALE	5.49	4.26	6.44	4.32

Table 5.4: Percentage of companies surveyed and respondents by industrial classification for the South East and South West.

Finally, Tables 5.5 and 5.7 provide a breakdown of the proportion of companies surveyed and respondents by size of workforce.

SIZE OF WORKFORCE	PERCENTAGE OF COMPANIES SURVEYED	PERCENTAGE OF RESPONDENTS
0-50	6.42 (92)	10.22 (38)
50-100	6.98 (100)	8.33 (31)
100-500	39.32 (563)	43.28 (161)
500-1000	17.60 (252)	16.13 (60)
1000-5000	22.70 (325)	16.13 (60)
5000 +	6.98 (100)	5.91 (22)

Table 5.5: Percentage (and number) of companies surveyed and respondents by size of workforce.

The X^2 test does show that the size of companies, in terms of workforce, did to some degree influence the response rate (see Table 5.6):

Size of Workforce	Total	Percent	Observed freq.	Expected freq.
0-50	92	6.42	38	23.88
50-100	100	6.98	31	25.97
100-500	563	39.32	161	146.27
500-1000	252	17.60	60	65.47
1000-5000	325	22.70	60	84.44
5000+	100	6.98	22	25.97
	1432		372	

Table 5.6: The significance of the response rate by size of workforce.

$$X^2 = 8.35 + 0.97 + 1.48 + 0.46 + 7.07 + 0.61$$

$$X^2 = 18.94 \quad df = 6 - 1 = 5$$

the critical value of chisquare ($\alpha = 0.05$) = 11.07

It is therefore possible to reject H_0 and accept H_1 , and conclude that the response rate was influenced by the size of companies. It can be seen from Table 5.6 that companies employing less than 50 people are significantly over-represented in the response rate and companies employing between 1000-5000 people are under-represented. However, this could be explained by the time lag between the compilation of the Dun and Bradstreet's (1990) company database and the present questionnaire survey, a two year period of recession resulting in numerous company rationalisations. South East England is generally perceived as being the hardest hit by the downturn in the economic cycle; this is likely to have resulted in a greater number of company rationalisations in this region as compared to the South West. This would result in a larger number of companies in the South East employing fewer than 100 people, between the compilation of the data base and the time of the survey.

SIZE OF WORKFORCE	PERCENTAGE OF COMPANIES SURVEYED		PERCENTAGE OF RESPONDENTS	
	SE	SW	SE	SW
0-50	5.13	8.74	12.02	7.14
50-100	4.91	10.68	8.58	7.86
100-500	30.86	54.37	33.91	58.57
500-1000	19.96	13.40	17.17	15.00
1000-5000	29.55	10.49	20.17	9.29
5000 +	9.60	0.84	8.15	2.14

Table 5.7: Percentage of companies surveyed and respondents by size of workforce for the South East and South West.

In terms of respondents in the South East, Table 5.7 shows an over-representation of companies with a workforce of less than 100 employees and an under-representation for companies with a workforce greater than 1,000. The respective figures for the South West are fairly uniform. The X^2 test did show that the response rate for companies from only the South East were significantly affected by size of workforce.

On the whole, it is possible to conclude that the companies which responded to the questionnaire are a fair representative sample of the total population. Analysis of the response rate failed to identify any major differences between the respondents and the total number of companies surveyed. Only the size of company workforces in the South East seemed to influence the response rate but this can be explained, at least in part, by the present recession.

5.5. Analysis of the Results

Attention will focus on an analysis of the overall results. Descriptive statistical techniques, cross-tabulations and the chisquare X^2 test are utilised in order to interpret the findings in accordance with the theoretical and legislative framework established in the two preceding chapters. The X^2 test was employed to test the significance level of any associations found to be relevant. The following chapter will examine the results at the regional, sub-regional and county level, identifying any apparent similarity/dissimilarity.

Analysis of the results will highlight the general hopes and fears of the business community engendered by the Tunnel. The impact of the Tunnel on "location", and thus the ability of companies to compete, will have important repercussions on the overall performance of the UK economy. However, the success (and significance) of the Tunnel will depend on the level of demand for its services. The perceptions of companies at present anticipating to use the Tunnel will be contrasted with all respondents in general, in order to identify any differences of opinion.

However, it is first important to examine the "type" of companies which have responded to the survey, in terms of ownership status, industrial classification, size of workforce and percentage of exports. This data can then be used to ascertain whether certain categories of companies are more or less likely to perceive the impact of the Tunnel favourably, or plan to use the Tunnel to a greater extent. Company perceptions of the Tunnel and related infrastructure will then be analyzed. Forecast usage of the Tunnel, via international through

trains or the Shuttle service, will be examined according to passenger and freight traffic. The results of the final section, 'Wider Considerations', will be discussed before making any concluding remarks.

5.5.1. Company Details

Over half of the companies which responded to the questionnaire classified themselves as privately owned and a further 30 percent as public limited companies (PLCs). The ownership status of the companies is set out in Figure 5.1. More than three quarters of the companies were multinational corporations (MNCs) or subsidiaries of MNCs. Over half the companies have other companies/branches located in the UK but the majority are also represented abroad; 41.4 percent within the EC, 17.5 percent in other European countries, and 62.1 percent worldwide.

Categorising companies by industrial activity showed that over 60 percent are operating in just five industrial sectors (see Table 5.3): electrical engineering accounting for 16.7 percent of the companies; food, drink and tobacco, 14.8 percent; mechanical engineering, 12.6 percent; chemicals and allied industries, 10.2 percent; and paper, printing and publishing, 9.7 percent. It was decided that companies could list up to three industrial activities (Table 5.3 represents the first response only). A further 23.9 percent of companies listed two industrial activities and only 3.8 percent gave three. The dominance of the above five industrial sectors is further evident when looking at all industrial activities listed.

More than three quarters of the companies have been operating at their present location for longer than 10 years (see Table 5.8). Only 51 companies (13.7 percent) have been at their present site for less than five years. This would suggest fairly stable local/regional economies, in terms of the turnover of manufacturing companies. The majority of companies will therefore have strong links with their local/regional economy and thus, company perceptions of and reactions to the Tunnel could have profound implications for the local community and the region as a whole. Companies have also generally become larger in terms of the size of their workforce (see Figure 5.2). More than 50 percent of

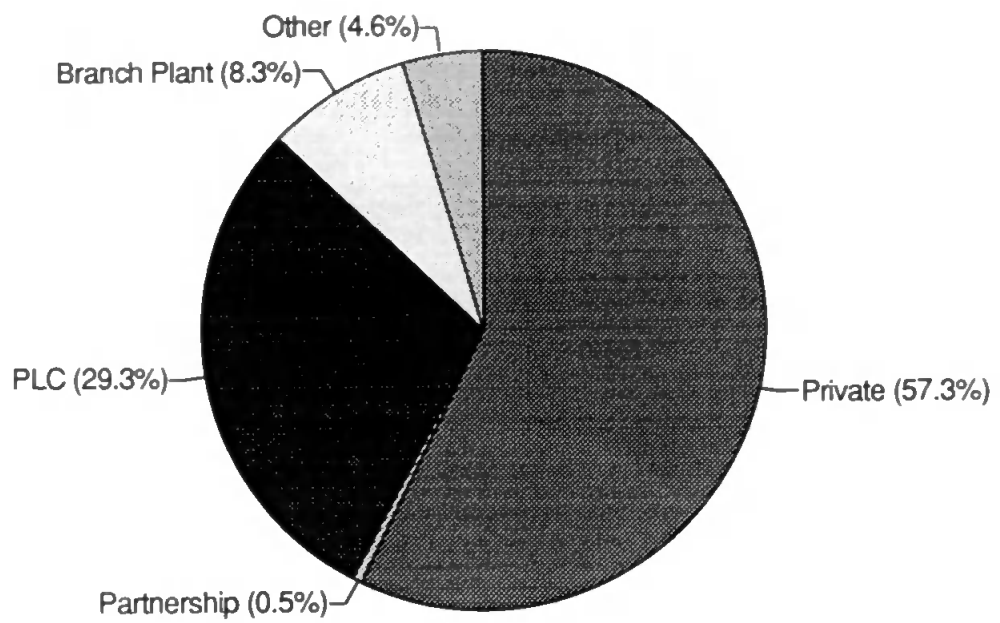
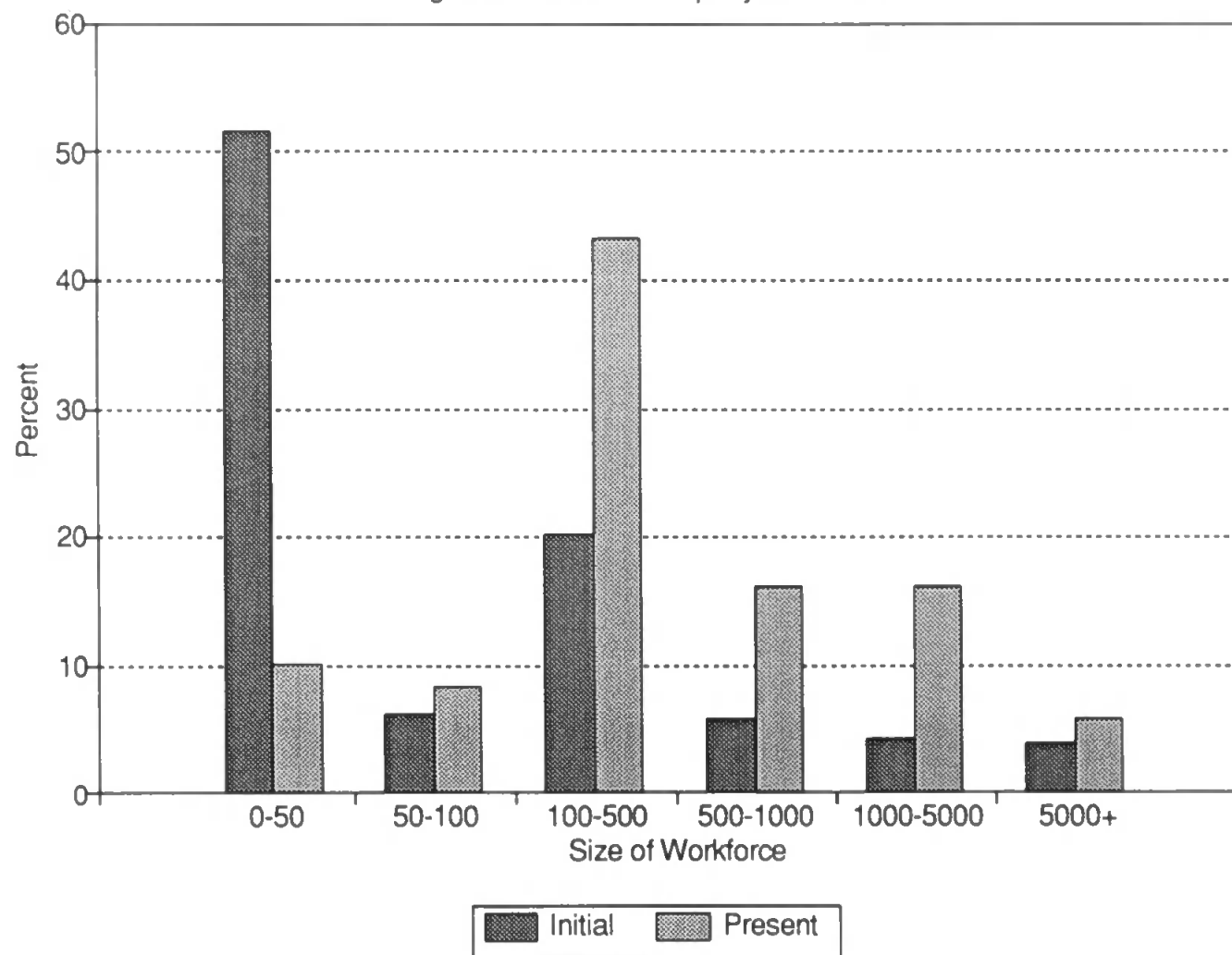


Figure 5.1: Ownership Status of Companies.

Figure 5.2: Size of Company Workforce.



companies had an initial workforce of less than 50 people, only 8.1 percent employed over 1,000. Workforces of less than 50 people now account for 10.2 percent of the companies and nearly one quarter employ more than 1,000 people. Over 40 percent of companies can be classed as "medium" sized companies, employing between 100-500 people, and 38.2 percent as "large" companies, employing more than 500 people.

NUMBER OF YEARS	PERCENTAGE OF COMPANIES
0 - 5	13.71 (51)
5 - 10	10.22 (38)
10 - 20	25.54 (95)
20 - 50	31.45 (117)
50+	18.82 (70)

Table 5.8: The number of years companies have been operating at their present location.

Finally, the percentage of company sales that are dependent on exports, as well as their designated market areas, will determine the likely attraction of the Tunnel. The majority of companies, 55.1 percent, export less than 20 percent of their goods (see Table 5.9).

PERCENTAGE OF EXPORTS	PERCENTAGE OF COMPANIES
0 - 20	55.11 (205)
20 - 40	11.29 (42)
40 - 60	16.40 (61)
60 - 80	7.53 (28)
80 - 100	8.60 (32)

Table 5.9: Percentage of company sales dependent on exports.

Of those companies, 35.6 percent are non-exporters and at least a further 23.7 percent export less than five percent of their goods. However, approximately one third of companies are dependent on exports for at least 40 percent of their sales. Ownership status did not significantly affect company attitudes towards export sales but fewer than half of MNCs or subsidiaries of MNCs export less than 20 percent of their goods compared to 77.4 percent of non-MNCs.

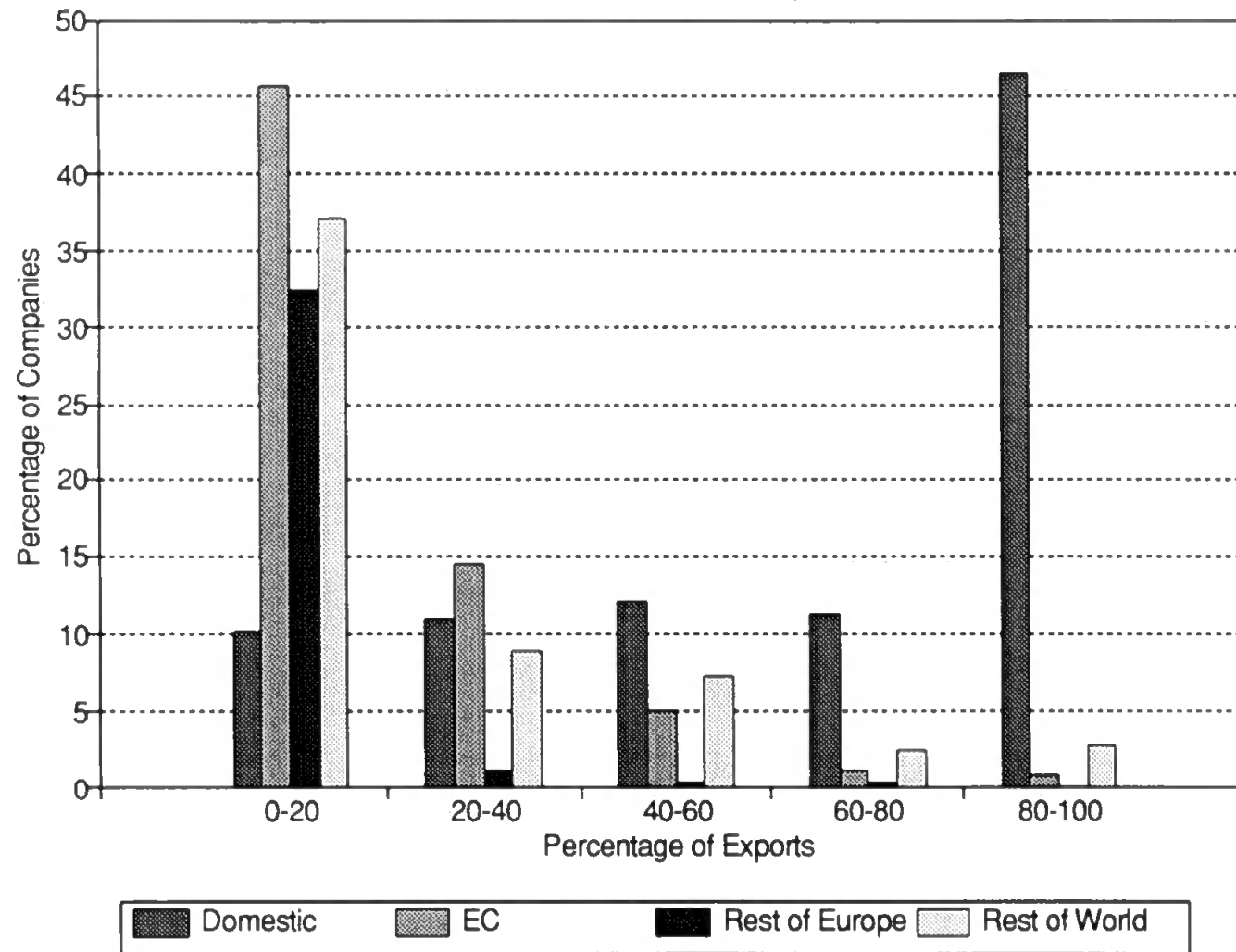
In terms of market orientation, over two thirds of companies export to some degree to other EC member state countries (see Figure 5.3). However, 68 percent of those companies export less than 20 percent of their goods. Nevertheless, BR and, to a lesser extent, Eurotunnel would consider most EC countries to be within their catchment area, and thus would expect some of these exports to go via the Tunnel. Exports to other European countries and to the rest of the world are much less likely to be attracted by direct rail/road haulage. At present company exports to Germany and eastern Europe are more likely to go via North Sea ferry routes, instead of short-sea cross-Channel routes. Approximately one third of companies also export to non-EC European countries, of which 95.0 percent export less than 20 percent of their goods; and a further 58.3 percent export to the 'rest of the world', of which, 63.6 percent export less than 20 percent of their goods. The Tunnel is much less likely to influence the existing distribution practices of companies exporting outside of the EC.

The following sections will utilise the above information to obtain a better understanding of how companies are likely to perceive the potential impact of the Tunnel, as well as their anticipated usage of BR's international through trains and Eurotunnel's Shuttle service.

5.5.2. The Perceived Impact of the Tunnel

The perceived impact of the Tunnel on company location will be examined first. Analysis of the results will then focus on the effect of the Tunnel on the competitiveness of British companies in both the home and continental marketplace. It is then possible to contrast the results of the current survey with the comparative findings of the London Chamber of Commerce and Industry (LCCI - 1989), Eurotunnel and BR (1988) reports. The possibility

Figure 5.3: Destination of Exports.



of company relocations will then be examined before summarising general perceptions of the Tunnel.

Impact on company location

Companies were asked to state why they located at their present site; more than one reply was allowed. The responses are listed below:

Rent/Rates	21.8% (81)
Proximity to markets	23.4% (87)
Proximity to supplies	12.1% (45)
Good transport links	37.4% (139)
Labour force	35.5% (132)
Room for expansion	28.0% (104)
Other	34.7% (129)

More than one third of the companies stated that good transport links and labour force requirements were factors in their decision. A large proportion of the companies which listed 'other' located at their site as a result of historical reasons or to 'suit the convenience of the managing directors'.

Over 55 percent of companies considered location to be an important component of their business strategy, 18.8 percent as very important and only 11.3 percent regarded the location of their company as unimportant. Of those companies which believed location to be significant, accessibility (55), contact with customers (50), workforce considerations (23), high transport costs (8), and quick delivery (7), were cited as being important considerations.

Focusing attention on how companies perceive the potential impact of the Tunnel and related transport developments on their location, 80 percent stated that the Tunnel would have no effect and only 11.6 percent could foresee some kind of impact. The Tunnel represents a significant addition to the UK's transport infrastructure but the vast majority

of companies do not regard it as important to their operations. Nearly 15 percent of PLCs considered that the Tunnel would have some influence on their location compared to 8.9 percent of privately owned companies. Whether companies are yet to understand fully the implications of the Tunnel has therefore to be questioned. The X^2 test showed that ownership status did not influence the perceptions of companies. The Economic Potential Model employed in chapter 3 quantified the impact of the Tunnel on regional accessibility, showing for all scenarios significant increases in relative accessibility for the South East and the more peripheral UK regions. Nonetheless, the vast majority of the companies in both the South East and South West do not expect the Tunnel to affect the locational advantages/disadvantages of their current operations.

Of those companies which consider the Tunnel to be important to their location, the main reasons cited are:

- Increased accessibility (34)
- A reduction in transport costs (27)
- A reliable year round cross-Channel service (11)
- Just an alternative mode of transport (4)

However, some companies did point out that the Tunnel would only improve their location, and thus increase their accessibility, if road and rail links to the Tunnel are improved. The main reasons given why the Tunnel would not affect the locational characteristics of companies are:

- Present transport links adequate (24)
- UK markets only (23)
- Specialised market (13)
- The Tunnel is irrelevant to our company (11)
- Only use air freight (9)
- Have European subsidiaries (9)
- Too distant - South West companies only (8).

Only 15 companies which regard 'good transport links' as a factor in their decision to locate at their present site believe the Tunnel would change the locational characteristics of the company. Thus, the linking of Britain to mainland Europe by the Tunnel is not seen by companies to be of any great locational significance. Furthermore, one would expect a larger percentage of companies which regard location as an important component of their business strategy to believe that the Tunnel will alter their locational advantages/disadvantages (see Table 5.10).

'LOCATION'	CHANGE LOCATIONAL ADVANTAGES/ DISADVANTAGES OF THE COMPANY		
	----- YES	NO	DON'T KNOW
VERY IMPORTANT	14.29	81.43	4.29
QUITE IMPORTANT	13.97	75.74	10.29
NOT TOO IMPORTANT	9.68	83.06	7.26
UNIMPORTANT	4.76	88.10	4.76

Table 5.10: Importance of location and the impact of the Tunnel.

As the importance of 'location' diminishes, progressively fewer companies believe the Tunnel will affect their location. However, on the whole, the importance of location in overall company business strategy does not influence the perception of companies.

Impact on company competitiveness: increased accessibility to markets

A significantly larger proportion of companies, 28.5 percent, do consider that the Tunnel and related transport developments will improve their accessibility to both UK and European markets, with a further 10 percent uncertain. The reasons given are set out below:

Will improve accessibility:

reduced time of transit (42)
reduced cost (7)
if road/rail links improved (10)

Will not improve accessibility:

existing transport adequate (19)
company already accessible (12)
specialised market (12)
only local markets (9)
have European subsidiaries (9)
no 'real' change (9)
too distant (5)

One third of all PLCs believe that the Tunnel will make them more accessible compared to just over one quarter of privately owned companies. However, the X^2 test showed that ownership status did not affect company perceptions of increased accessibility.

A larger proportion of companies, 35.6 percent, which consider 'proximity to markets' an important factor in their original locational decision believe the Tunnel will improve their accessibility to both domestic and European markets. But this is not, as one may have expected, significantly higher than the respective overall figure of 28.5 percent. Furthermore, 26.4 percent of companies which consider 'proximity to markets' not to be an important determinant of location, stated that their accessibility to both domestic and European markets would be improved by the Tunnel and related transport developments. Thus, proximity to markets as a factor in locational decisions is only likely to refer to local and/or "Third Markets".

However, as can be seen from Table 5.11, a larger proportion of companies which regard location as an important component of their business strategy believe the Tunnel and related Tunnel developments will improve their accessibility to UK and continental markets. Furthermore, the percentage of companies that are uncertain as to the outcome generally increases as the significance of location decreases.

'LOCATION'	IMPROVED ACCESSIBILITY TO BOTH UK AND EUROPEAN MARKETS		
	YES	NO	DON'T KNOW
VERY IMPORTANT	30.00	61.43	7.14
QUITE IMPORTANT	35.29	54.41	8.82
NOT TOO IMPORTANT	27.42	60.48	12.10
UNIMPORTANT	7.14	81.00	11.90

Table 5.11: Importance of location and company accessibility to both UK and continental markets.

The X^2 test shows that the importance of location in company business strategy did affect the perceptions of companies as to the impact of the Tunnel on accessibility to continental markets (see Table 5.12):

'Location'	Increased accessibility						Σr
	Yes		No		Don't Know		
	Obs	Ex	Obs	Ex	Obs	Ex	
1	21	19.8	43	42.3	5	6.9	69
2	48	38.5	74	82.1	12	13.4	134
3	34	35.6	75	75.9	15	12.4	124
4	3	12.1	34	25.7	5	4.2	42
Σk	106		226		37		N=369

Table 5.12: The significance of company location on perceptions of improved competitiveness on the Continent.

(1 = Very Important, 2 = Quite Important, 3 = Not Too Important and 4 = Unimportant)

$$X^2 = 0.07 + 0.01 + 0.52 + \underline{2.34} + 0.80 + 0.15 + 0.07 + 0.01 + 0.55 + \underline{6.84} + \underline{2.68} + 0.15$$

$$X^2 = 14.19 \quad df = (4-1)(3-1) = 6$$

critical value of chisquare ($\alpha = 0.05$) = 12.59

The calculated X^2 value is higher than the critical value of chisquare, at a rejection level of $\alpha = 0.05$. Therefore, it is possible to reject H_0 , but companies which consider location to be unimportant in their overall business strategy account for most of the calculated X^2 value. Thus, companies which regard 'location' to be unimportant generally do not expect the Tunnel and related transport developments to increase their accessibility to domestic and European markets.

However, less than 30 percent of the companies anticipate improved accessibility as a result of the Tunnel. Significant increases in relative accessibility are recorded, in chapter 3, for all UK regions vis-a-vis the Continent. Nonetheless, the vast majority of companies, over 70 percent, do not foresee any such improvements. Company perceptions may have been influenced by the lack of transport infrastructure/services supporting the Tunnel, as advanced in chapter 4. But this study is primarily concerned with the regional economic implications of the Tunnel, thus the relative perceptions of companies in the South East and South West are of more importance. Chapter 6 will examine whether companies in the South East or South West are more or less likely to anticipate improved accessibility as a result of the Tunnel. If it is shown that companies in the South East are more likely to expect to benefit from increased accessibility to domestic and continental markets, this could conflict with the findings of the Economic Potential Model.

Impact on company competitiveness: vulnerability to increased competition

In terms of the home market, companies tend to be more optimistic. Nearly two thirds of companies believe that the Tunnel and related transport infrastructure will not encourage more intense competition from domestic and/or European producers. Only 22.9 percent expect the Tunnel to increase their exposure to increased competition, 11.3 percent are still undecided. The reasons given are set out below:

Will increase competition:

reduced time of transit (42)

reduced cost (9)

Will not increase competition:

already competitive market (40)

specialise market (18)

double-edged (7)

irrelevant (5)

no 'real' change (5)

The percentage of companies that regarded 'proximity to markets' to be important in their original locational decision and can foresee more competition as a result of the Tunnel is more than 50 percent higher than the overall figure (36.8 and 22.9 percent respectively). Of the companies which believed 'good transport links' to be important, nearly one third expect increased competition. Therefore, companies which prioritise contact with customers and overall accessibility are more likely to perceive increased competition resulting from the Tunnel. However, this does not directly imply that these companies are more aware of the potential consequences of the Tunnel and related transport developments.

'LOCATION'	INCREASED COMPETITION IN BOTH UK AND EUROPEAN MARKETS		
	YES	NO	DON'T KNOW
VERY IMPORTANT	22.86	60.00	15.71
QUITE IMPORTANT	27.21	58.09	13.24
NOT TOO IMPORTANT	21.77	69.35	8.87
UNIMPORTANT	11.90	83.33	4.76

Table 5.13: Importance of location and company vulnerability to increased competition.

Table 5.13 somewhat contradicts the above assumption since nearly as many companies which regard location as 'not too important' compared to those which consider it to be 'very important' also foresee increased competition resulting from the Tunnel. The importance of location as a component of company business strategy does not influence significantly their perceptions of increased vulnerability to more intense competition.

Nonetheless, feelings of vulnerability to increased competition reduce as the percentage of exports increase (see Table 5.14). Companies which export less than 40 percent of their goods feel more vulnerable than the overall figure. The X^2 test showed that while the null hypothesis (H_0 = exports are not related to company perceptions of vulnerability to increased competition) cannot be rejected at $\alpha = 0.05$, the alternative hypothesis, H_1 , can be accepted if the rejection level is relaxed to $\alpha = 0.10$.

EXPORTS AS PERCENTAGE OF COMPANY SALES	INCREASED COMPETITION IN BOTH UK AND EUROPEAN MARKETS		
	YES	NO	DON'T KNOW
0 - 20	28.29	55.61	15.61
20 - 40	26.19	64.43	4.76
40 - 60	18.03	77.05	4.92
60 - 80	7.14	85.71	7.14
80 - 100	9.38	81.12	9.38

Table 5.14: Exports as a percentage of total sales and company vulnerability to increased competition.

It is evident from Table 5.14, that a fairly positive relationship exists between company exports and feelings of vulnerability, i.e. more companies anticipate no increase in competition as exports rise in respect to total sales.

Tunnel usage and company perceptions

By isolating companies which currently expect to use the Tunnel for either business trips and/or freight exports, it is possible to contrast their feelings as regards to the effect of the Tunnel on their ability to compete at home and abroad, with all respondents in general (as discussed above). In terms of ownership status, industrial classification, size of workforce and percentage of exports, companies which at present plan to use the Tunnel do not significantly differ from all respondents in general. Therefore, any differences in perceptions of the Tunnel are not likely to be the result of the type of companies

themselves but more likely a result of their anticipated usage of the Tunnel. Table 5.15 summarises perceptions of companies currently planning to use the Tunnel.

Will the Tunnel affect:	(percentage)		
	Yes	No	Don't Know
Locational characteristics	15.38	76.15	8.46
Accessibility to markets	43.08	46.92	10.00
Vulnerability to increased competition	29.23	62.31	8.46

Table 5.15: Perceptions of companies currently anticipating using the Tunnel.

A significantly larger percentage of companies planning to use the Tunnel believe that the Tunnel and related transport developments will increase their accessibility to both UK and continental markets, 43.1 percent compared to 28.5 percent for all respondents. Only a slightly larger proportion of companies planning to use the Tunnel expect the Tunnel to either affect their location and/or their vulnerability to increased competition. In fact, fewer companies planning to use the Tunnel (62.3%) anticipate no increase in competition.

It is therefore quite apparent that companies are fairly optimistic about the potential impact of the Tunnel on their own level of competitiveness at home and abroad. However, surveys carried-out prior to the present research project (Eurotunnel and BR 1988, LCCI 1989), report a considerably higher degree of optimism among UK companies.

Comparison of results with the LCCI (1989), Eurotunnel and BR (1988) surveys

Reports commissioned by the LCCI (1989), Eurotunnel and BR (1988) both looked at the likely effect of the Tunnel on the ability of British producers to compete effectively in both the domestic and European markets. The LCCI survey targeted production and service

companies in London but attention will be primarily focused on the results for manufacturing companies. It was shown that 33.7 percent of companies in the production sector anticipated a positive effect on the level of exports/foreign business, with only 1.2 percent predicting a negative effect. In addition, 36.1 percent anticipated a positive effect on European competitiveness. The respective figures for the level of domestic business and UK competitiveness were 12.0 and 10.8 percent. Service companies were generally less confident about the likely effect of the Tunnel in both the UK and European marketplace. Furthermore, two thirds of manufacturing companies planning to use the Tunnel anticipated increased competitiveness in European markets, 20.6 percent could foresee a positive effect on UK competitiveness. All companies planning to use the Tunnel were more optimistic as to the outcome. Eurotunnel and BR (1988) asked companies to comment on what attributes of the Tunnel were likely to increase 'exporting efficiency to Western Mainland Europe', the results are listed below:

Delivery times reduced	67%
Increased tariff competition	39%
Greater transport choice	38%
Service frequency increased	30%
Service reliability	26%
Other	1%

The Eurotunnel and BR (1988) survey showed that 55 percent of companies considered that commercial performance would be improved as a result of cost savings and 45 percent due to faster response to market demands. Over two thirds of companies anticipated increased accessibility, i.e. reduced transit times, compared to only 28.5 percent of companies which responded to the present study. The generally higher levels of confidence/optimism reported in the above surveys can to a large degree be explained by the euphoria surrounding the Tunnel immediately after construction commenced. The problems associated with the Tunnel at the present time; particularly with regard to the increasing debt profile of Eurotunnel, the delays associated with the opening of the Tunnel and the introduction of the new international passenger trains; has affected the initial level of optimism. The influence of the Tunnel on potential company relocations is examined

in the next section. It will again become evident that fewer company relocations are now seen as necessary to optimise the improved level of accessibility offered by the Tunnel.

A migration of industry?

The final question designed to determine the perceptions of companies toward the Tunnel and related transport infrastructure attempted to quantify potential company relocations which might be brought about as a result of the Tunnel. The vast majority of companies, 98.1 percent cannot foresee any need to relocate. This apparent degree of certainty is reflected throughout all types of companies in both regions. As referred to in the Literature Review (chapter 2), there is great anxiety among regional interest groups concerning the likelihood of a southwards drift of industry in favour of the South East and northern France, i.e. the Tunnel's immediate hinterland. The results here should help to dispel such fears, providing more hope of a fairer distribution of benefits created by the Tunnel throughout all UK regions, as assumed in the hypothesis tested in chapter 3. The LCCI report concludes that:

'In neither the production nor services sector can the Channel Tunnel be said to be a major reason for relocation, it is cited by 20 and 14 percent of production and service firms respectively.'

(LCCI 1989, P.13)

These figures are relatively high compared to the present research project's results and those of Eurotunnel and BR, which showed that 'only one percent of companies considered that the Tunnel would encourage them to relocate production elsewhere'. However, the Eurotunnel and BR report went on to say that many companies believed increased investment in transport infrastructure in their regions would be necessary if they were to be able to benefit from the Tunnel:

Increased rail investment	43%
Need for localised customs facilities	42%
Increased road investment	42%

These findings substantiate the argument advanced in chapter 4, that Government policy was likely to peripheralise further regions to the north and west of London, and are in line with the Section 40 recommendations, which recognise regional concerns of inadequate transport infrastructure investment. Even so, nearly all of the companies which responded to the present survey do not consider relocation as a result of the Tunnel as a realistic option.

Company perceptions: a summary

Companies generally seem to be more optimistic about their prospects in the home market, with nearly two thirds anticipating no increase in competition as a result of the Tunnel. Approximately 30 percent of companies perceived that the Tunnel and related transport developments would improve their accessibility to both UK and European markets; 10 percent are uncertain. Company attitudes as regards the importance of location to their overall business strategy and/or the reasons for locating at their present site, do not generally influence company perceptions of the Tunnel and its implications. As expected, a larger proportion of companies planning to use the Tunnel can foresee the Tunnel affecting their company, in terms of their location, accessibility to UK and continental markets and vulnerability to increased competition. Thus, companies currently planning to use the Tunnel are much more optimistic about the effect of the Tunnel on accessibility to markets but more also fear increased competition.

The present study conflicts with the two earlier surveys. It was shown that companies, on the whole, have become less confident about how the Tunnel will affect their ability to compete at home and abroad. The initial level of euphoria surrounding the Tunnel has receded against the mounting problems now facing Eurotunnel and BR. The third postponement of the opening of the Tunnel (now expected to be December 1993) is just one of the latest problems facing Eurotunnel. The servicing of Eurotunnel's debt portfolio will be severely hampered by this delay, thus further reducing any hopes for cheaper cross-Channel transportation.

Nonetheless, 28.5 percent of the companies still believe that the Tunnel and related transport infrastructure will improve their accessibility to UK and continental markets. In addition, two thirds do not anticipate any increase in competition in the home market. Such optimism in the home market is based on the belief that domestic markets are already too highly competitive or too specialised to be affected. The Single European Market (SEM) and the Tunnel will significantly alter existing trading relationships, with all EC countries' markets becoming more open and accessible to increased competition. The Tunnel will considerably improve the accessibility of the near Continent to all UK regions but especially the South East and the Midlands. The South East and the Midlands represent the largest markets for the more peripheral UK manufacturers. Thus, the "Third market" impact of the Tunnel could severely hinder the growth of the more peripheral regional economies, such as the South West. The "Third Market" impact of the Tunnel, as discussed briefly in chapter 2, will be examined in more detail in chapter 8. Increased accessibility is a 'double-edged sword' (Pieda 1989b). If nearly 30 percent of UK companies expect their accessibility to the Continent to improve, it is only reasonable to assume that a similar proportion of companies on the Continent, particularly the near Continent and Nord-Pas de Calais, will also believe their accessibility to UK markets will improve.

Analysis of the results at the regional level (chapter 6) will highlight any differences in company perceptions toward the Tunnel between companies in the South East and South West, with regard to the impact of the Tunnel on the level of company competitiveness. However, a more detailed analysis of the results can only support the above finding that the Tunnel will not encourage company relocations in favour of the South East. Only two companies from London stated that they would relocate as a result of the Tunnel. With company perceptions toward the Tunnel examined, it is now possible to analyze current company plans to use the Tunnel. The long term impact of the Tunnel will depend on the level of demand for its services by companies in the UK and on the Continent.

5.5.3. Potential Usage of the Tunnel

The greatest potential benefit of the Tunnel, claimed by its proponents, is an increase in accessibility to the Continent. The Tunnel will improve cross-Channel road and rail links

for both passenger and freight traffic. But are companies likely to opt in favour of the Tunnel and switch from present modes of transport? To realise any increase in accessibility to EC markets, companies will have to use both BR's international passenger/freight trains and Eurotunnel's Shuttle service. Otherwise such benefits could be restricted to the mass of individual users and for leisure purposes only. Eurotunnel's traffic forecasts for 1993 and 2003 are set out in Table 5.16. Eurotunnel expect over 30 million passenger journeys in the Tunnel's first year of service, evenly divided between BR's international through trains and Eurotunnel's Shuttle service. In addition, Eurotunnel forecast that over 15 million tonnes of freight will travel to continental destinations via the Tunnel. However, Eurotunnel now regard its estimated rate of cross-Channel traffic growth as conservative, and thus anticipate an even larger market share for both passenger and freight traffic.

	1993*	2003
PASSENGERS: (millions)		
SHUTTLE	15.3	21.5
TRAIN	15.4	19.8
TOTAL	30.7	41.3
FREIGHT: (gross tonnes, millions)		
SHUTTLE	8.1	12.2
TRAIN	7.4	11.4
TOTAL	15.5	23.6

Table 5.16: Estimated Tunnel traffic.

(Source: Eurotunnel 1988) (*. Full year equivalent)

As recognised by Pida (1989a), the regional economic impact of the Tunnel will be determined ultimately by the reactions of companies to the challenges created by the Tunnel. Even though it would have been impracticable here to attempt to quantify the

likely demand for the Tunnel, the attraction of the Tunnel for company business trips and freight exports will be analyzed. By comparing the results of the current research project with the two earlier studies (Eurotunnel and BR 1988, LCCI 1989) and by examining the reasons behind company forecasts, it will be possible to identify the necessary policies that will have to be implemented in order to achieve the level of patronage set out in Table 5.16. The current and future business trip market will be examined first, with the following section concentrating on the freight market.

The business trip market

The current cross-Channel market and the estimated future usage of the Tunnel for business trips will be analyzed. However, it is useful to examine the earlier findings of the LCCI (1989), Eurotunnel and BR (1988) surveys. It will become evident that during the late 1980s considerable optimism affected the anticipated usage of the Tunnel.

Comparative findings

BR, and to a lesser extent Eurotunnel, recognise company business trips to the near Continent as important to the success of their respective services. To achieve this BR and Eurotunnel will have to encourage companies to switch from air travel in favour of direct rail/road links. BR believes that its proposed international passenger service to cities such as Paris, Brussels and Cologne, will be competitive on 'city-centre to city-centre' journey times and cost (BR 1989b).

Based on the LCCI (1989) survey, more than one quarter of manufacturing and service companies plan to use the Tunnel for business trips, the majority of which favour the Shuttle service (see Table 5.17A). BR would be concerned that a larger proportion of companies from London prefer Eurotunnel's Shuttle service for business trips. Of the companies that used cross-Channel services at the time of the study (see Table 5.17B), over half planned to use the Tunnel and a larger proportion of companies prefer the car/coach. More importantly, however, could be the degree of uncertainty. To ascertain the level of interest in the Tunnel for business trips, Eurotunnel and BR (1988) categorised

companies as 'very interested' or just 'interested' (see Table 5.17C). Caution must be used when interpreting these results since 'Interested' does not mean that companies will eventually use the Tunnel.

TYPE OF SERVICE THROUGH THE TUNNEL	% PLANNING TO USE THE TUNNEL			
	PRODUCTION		SERVICES	
	YES	DON'T KNOW	YES	DON'T KNOW
ANY SERVICE	41.0	9.6	32.2	9.3
ANY FREIGHT SERVICE	34.9	15.7	18.4	14.9
FREIGHT: RAIL	15.7	30.1	9.2	23.0
FREIGHT: LORRY	32.5	20.5	14.9	18.4
ANY PASSENGER SERVICE	26.5	20.5	25.3	14.9
PASSENGERS: RAIL	19.3	26.5	23.0	19.5
PASSENGERS: CAR/COACH	24.1	22.9	16.1	21.8

Table 5.17A: Planned usage of the Tunnel: percentage of all respondents.

(Source: LCCI 1989, P.8)

TYPE OF SERVICE THROUGH THE TUNNEL	% PLANNING TO USE THE TUNNEL			
	PRODUCTION		SERVICES	
	YES	DON'T KNOW	YES	DON'T KNOW
ANY FREIGHT SERVICE	63.4	22.0	57.7	38.5
FREIGHT: RAIL	29.3	48.8	26.9	65.4
FREIGHT: LORRY	58.5	29.3	50.0	42.3
ANY PASSENGER SERVICE	52.5	25.0	67.6	23.5
PASSENGERS: RAIL	37.5	35.0	55.9	32.4
PASSENGERS: CAR/COACH	47.5	30.0	38.2	38.2

Table 5.17B: Planned usage of the Tunnel: percentage of respondents currently using cross-Channel services.

(Source: LCCI 1989, P.8/9.)

	PERCENTAGE	
	VERY INTERESTED	INTERESTED
ESTABLISHMENT STAFF	19	42
MAINLAND EUROPEAN CUSTOMERS	11	39
MAINLAND EUROPEAN SUPPLIERS	6	25

Table 5.17C: The level of 'interest' expressed in the Tunnel for future business trips.

(Source: Eurotunnel and BR 1988)

The present survey was conducted during the Summer of 1991, more than two years before the Tunnel is due to open. Until service timetables and tariffs are published, companies

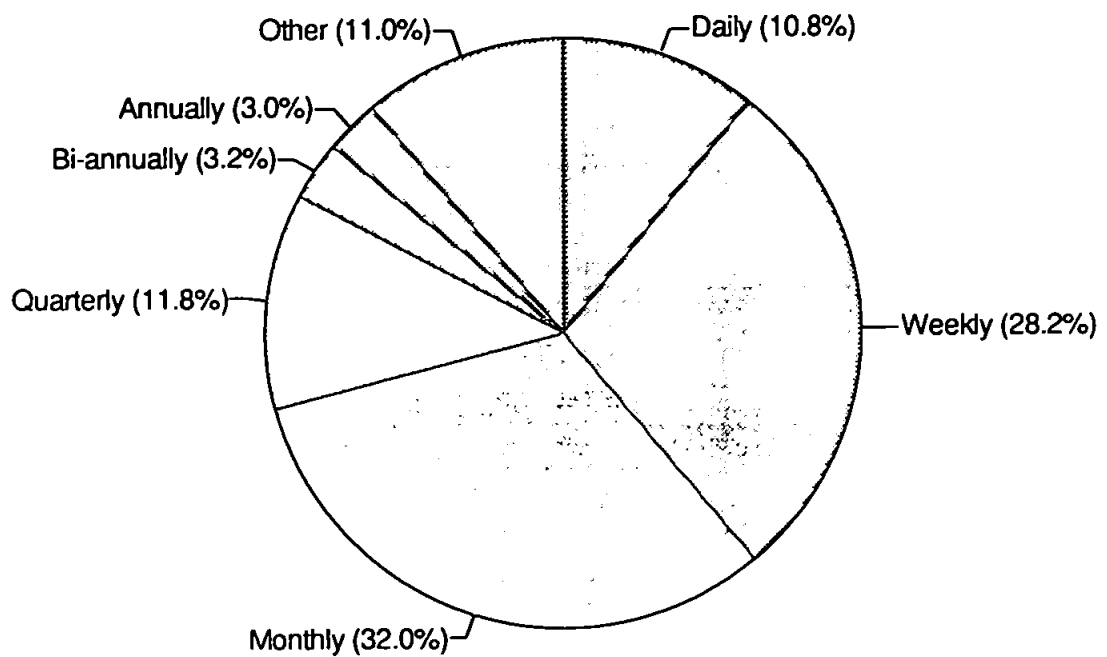


Figure 5.4: Frequency of Company Business Trips to the Continent.

will only be able to provide approximate estimates of their proposed future usage of the Tunnel. However, this argument is more relevant to the earlier reports, particularly since both surveys were undertaken shortly after construction commenced and the euphoria surrounding the Tunnel was at its peak. Forecasts will be revised as more information on quality of service, journey times and tariff rates is released.

The current cross-Channel market

Companies were asked to categorise the frequency of business trips (see Figure 5.4). Over one in ten companies currently undertake business trips on a daily basis, a further 28.2 percent every week and nearly one third once a month. Companies which stated 'other', 10.5 percent, undertake business trips less than once a year or not at all. In terms of companies which undertake business trips on a daily basis, 25 percent employ over 5,000 people and 30 percent had a workforce between 1,000 and 5,000 (see Table 5.18).

SIZE OF WORKFORCE	FREQUENCY OF BUSINESS TRIPS						
	1	2	3	4	5	6	7
0-50	2.50	7.62	8.40	20.05	8.33	18.18	15.38
50-100	7.50	5.71	5.88	11.36	25.00	9.09	15.38
100-500	22.50	34.29	53.78	52.27	66.66	54.55	38.46
500-1000	12.50	24.76	14.29	11.36	0.00	9.09	15.38
1000-5000	30.00	23.81	14.29	4.55	0.00	9.09	5.13
5000+	25.00	3.81	3.36	0.00	0.00	0.00	10.26

Table 5.18: Frequency of business trips with respect to size of workforce.

(1 = Daily, 2 = Weekly, 3 = Monthly, 4 = Quarterly, 5 = Bi-Annually,
6 = Annually and 7 = Other)

However, 22.5 percent was also accounted for by companies with between 100 and 500 employees. One would expect larger companies to undertake business trips on a more regular basis. There is a fairly positive relationship between the size of the workforce and frequency of business trips (see Table 5.19):

Size	Frequency of business trips								Σr
	>Weekly		Monthly		Quarterly		Other		
	Obs	Ex	Obs	Ex	Obs	Ex	Obs	Ex	
0-50	9	14.5	10	11.9	9	4.4	9	6.2	37
50-100	9	12.1	7	10.0	5	3.7	10	5.2	31
100-500	45	63.1	64	51.8	23	19.1	29	27.0	161
500-1000	31	23.5	17	19.3	5	7.1	7	10.0	60
1000-5000	37	23.1	17	19.0	2	7.0	3	9.9	59
5000+	14	8.6	4	7.1	0	2.6	4	3.7	22
Σk	145		119		44		62		N=370

Table 5.19: Significance of size of workforce on the frequency of business trips.

(obs = Observed Frequency and ex = Expected Frequency)

(Expected Frequency = $(\Sigma r)(\Sigma k)/N$)

$$X^2 = \Sigma r \Sigma k \{(O - E)^2 / E\}$$

$$\begin{aligned}
 X^2 = & 2.09 + 0.30 + \mathbf{4.81} + 1.26 + 0.79 + 0.90 + 0.46 \\
 & + \mathbf{4.43} + \mathbf{5.19} + 2.87 + 0.80 + 0.15 + 2.39 + 0.27 \\
 & + 0.62 + 0.90 + \mathbf{8.36} + 0.21 + \mathbf{3.57} + \mathbf{4.81} + \mathbf{3.39} \\
 & + 1.35 + 2.60 + 0.02
 \end{aligned}$$

$$X^2 = 52.54 \quad df = (6-1)(4-1) = 15$$

critical value of chisquare: $(\alpha = 0.05) = 25.00$
 $(\alpha = 0.001) = 37.70$

To utilise the X^2 test it was necessary to group the frequencies together, i.e. '>Weekly' refers to Daily and Weekly business trips and 'Other' incorporates business trips less frequent than Bi-annually. The calculated X^2 value proves to significant at $\alpha = 0.001$, or in other words there is less than one chance in 100 that the observations occurred randomly. As the size of company workforces decrease so does the regularity of business trips. When business trips become less frequent than quarterly, more than three quarters of the companies employed less than 500 people (see Table 5.18).

It can also be seen from Table 5.20 that companies which undertake regular business trips to the Continent export proportionately more of their goods: $X^2 = 46.22$; $df = 12$, thus the critical value of chisquare, $\alpha = 0.05$, = 21.03. Nearly three quarters of companies with representatives travelling daily to Europe export more than 20 percent of their goods. As the frequency of business trips decline so does the percentage of company sales dependent on exports. Companies exporting less than 20 percent of their goods undertake significantly fewer business trips.

% OF EXPORTS	FREQUENCY OF BUSINESS TRIPS						
	1	2	3	4	5	6	7
0 - 20	32.50	39.05	57.14	70.45	75.00	81.82	8.46
20 - 40	20.00	13.33	9.24	11.36	8.33	0.00	7.69
40 - 60	15.00	26.66	18.49	2.27	8.33	9.10	5.13
60 - 80	10.00	11.43	7.56	4.55	0.00	0.00	2.56
80 - 100	17.50	9.52	6.72	11.36	8.33	9.10	0.00
DON'T KNOW	5.00	0.00	0.01	0.00	0.00	0.00	0.00

Table 5.20: Frequency of business trips with respect to company exports.

(1=Daily, 2=Weekly, 3=Monthly, 4=Quarterly, 5=Bi-annually, 6=Annually, and 7=Other)

The frequency of business trips is important in determining potential demand but the destination of business trips will be paramount to the overall attraction of the Tunnel. Figure 5.5 shows the destination of current business trips between 'France, Germany and the Low countries', 'rest of EC' and the 'rest of continental Europe'. The Tunnel catchment area would encompass most of France, Germany and the Low countries, thus the 82.3 percent of companies which currently undertake business trips to this region are of particular interest to BR and Eurotunnel.

However, BR also plan to offer competitive over-night international train services to the more distant European cities from most British cities, departing 'UK' late evening and arriving 'European' early morning (BR 1989b). Therefore, business trips to other EC

countries (32.5%) and even other European countries (20.2%) can be considered part of the Tunnel's wider hinterland.

The frequency of business trips to the near Continent is not dissimilar to the overall frequency to all continental destinations, i.e. the frequency of business trips is not affected by destination. Hence, nearly three quarters of business trips to 'France, Germany and the Low countries' are more regular than monthly. In addition, of the 32.5 percent of business trips to the 'rest of the EC', over 82 percent are again more frequent than monthly. Therefore, a potentially huge market exists which BR and Eurotunnel will be determined to attract.

However, both BR and Eurotunnel will have to adopt aggressive advertising campaigns since over 90 percent of companies currently favour air travel for business trips. Only 11 companies said that they at present use rail/ferry for business trips to the Continent but more encouragingly for Eurotunnel, 27.4 percent also use road/ferry. It would seem that as the distance of business trips increase a progressively larger proportion of companies go by aeroplane and fewer go by road/ferry:

	Air	Road
France, Germany and the Low countries	95.8%	47.2%
rest of the EC	96.7%	29.8%
rest of Continental Europe	98.7%	29.3%

Quality of service will be important to the overall attraction of the Tunnel but reliability could be singularly paramount to the success of the Tunnel, particularly with regards to the frequent business trip market. Nearly one in ten companies undertake business trips on a daily basis to the near Continent. A further 25.3 percent of business trips to the near Continent are more regular than once a week. These companies will be strongly targeted by BR and Eurotunnel but frequent business trips in the Tunnel's catchment area will require a highly reliable service. However, the 'Open Skies' policy adopted by the EC

member states could seriously undermine the attraction of BR's international through trains and Eurotunnel's Shuttle service. Deregulation of air services within the EC after 1 January 1993, will lead to immediate price reductions and increased choice, with more carriers allowed to operate on previously restricted routes (Graham 1992). The late introduction of the new international passenger trains and the huge debt burden faced by Eurotunnel will further improve the competitive position of the airline industry. Company estimates of the future usage of the Tunnel for business trips to the Continent, discussed below, were made prior to the announcement of the 'Open Skies' policy. It is therefore reasonable to assume that companies are now less likely to be attracted by services operating through the Tunnel.

The estimated future usage of the Tunnel

The estimated future usage of the Tunnel is set out in Table 5.21. It is quite evident that the vast majority of companies (84.4%) only plan to use the Tunnel for less than 20 percent of business trips, of which 83.8 percent do not plan to use the Tunnel. Therefore, approximately 25 percent of companies plan to use the Tunnel for at least some of their business trips to continental Europe, 5.1 percent are undecided but only 2.2 percent plan for more than 60 percent of future business trips to go via the Tunnel.

% OF BUSINESS TRIPS	VIA THE TUNNEL	VIA THE TUNNEL	
		----- BY BR	BY SHUTTLE
0 - 20	84.41	78.23	75.54
20 - 40	5.38	0.54	1.88
40 - 60	2.96	8.33	8.06
60 - 80	1.08	1.88	0.54
80 - 100	1.08	3.76	6.72
DON'T KNOW	5.11	7.26	7.26

Table 5.21: Estimated usage of the Tunnel for future business trips: percentage of all respondents.

Planned usage of the Tunnel was divided between BR's international through trains and Eurotunnel's Shuttle service. One can ascertain from Table 5.21 that slightly more companies believe that they will use the Shuttle service in preference over international through trains. Table 5.22 outlines the percentage of future business trips which might go via the Tunnel for planned Tunnel users. It is therefore possible to obtain a better understanding of what proportion of business trips undertaken by planned Tunnel users are likely to go via the Tunnel, as well as the relative attractiveness of international through trains compared to the Shuttle service. Less than 9 percent of planned Tunnel users believe more than 60 percent of their future business trips will go by the Tunnel.

% OF BUSINESS TRIPS	VIA THE TUNNEL	VIA THE TUNNEL	
		----- BY BR	BY SHUTTLE
0 - 20	56.66 (51)	31.11 (28)	20.00 (18)
20 - 40	22.22 (20)	2.22 (2)	7.77 (7)
40 - 60	12.22 (11)	34.44 (31)	33.33 (30)
60 - 80	4.44 (4)	7.77 (7)	2.22 (2)
80 - 100	4.44 (4)	15.55 (14)	27.77 (25)
DON'T KNOW	- -	8.88 (8)	8.88 (8)

Table 5.22: Estimated usage of the Tunnel for future business trips: percentage (and number) of companies planning to use the Tunnel.

Companies plan to use Eurotunnel's Shuttle service for a larger proportion of their business trips, compared to the alternative international through trains. One would expect the Shuttle service to be more attractive since over 40 percent of companies planning to use the Tunnel currently prefer to use road/ferry for business trips.

Factors likely to influence planned Tunnel usage

However, current estimates of the future usage of the Tunnel will not remain static. Companies are likely to revise continually their plans closer to the time of the opening of the Tunnel and after experiencing the services offered. Therefore, it is necessary to

determine what factors are considered important by companies in evaluating what percentage of future business trips are likely to go via the Tunnel. The responses are listed below:

Cost	42.7%
Journey Time	82.5%
Reliability	35.8%
Comfort	14.5%
Other	10.8%

Over 80 percent of companies regarded journey time to be the main consideration in using the Tunnel and its services. In comparison, only 42.7 percent of companies believed cost to be important. Thus, BR will have to concentrate on offering competitive journey times to the main European cities. The importance of the above factors will vary according to how companies currently undertake business trips to the Continent:

	By Aeroplane	By Rail	By Road
Cost	43.5%	54.6%	61.8%
Journey Time	86.8%	54.6%	81.4%
Reliability	38.2%	27.3%	48.0%
Comfort	15.9%	9.1%	21.6%

It can be seen that a larger proportion of companies which currently undertake business trips by road/ferry, consider cost, reliability and comfort as important relative to the other modes of transport but still regard journey time as the principal factor. Fewer companies which travel by rail/ferry believe journey time, reliability and general comfort to be important compared to the respective overall figures. The proposed journey times for future international through trains are considered to be extremely competitive by BR but companies presently using cross-Channel rail/ferry services are less likely to regard journey times as important. Nonetheless, international through services will become more attractive to companies currently favouring air travel or road/ferry, at least in terms of journey time. Not surprisingly, companies which undertake business trips by aeroplane consider journey time to be paramount in their decision, nearly twice as important as their next

consideration, i.e. cost. However, the 'Open Skies' policy adopted by the European Commission will allow more direct air services, as well as an increased choice of operators, between UK and continental cities (Graham 1992). The ability of international through trains to compete on journey times could therefore be undermined. Furthermore, the mounting problems faced by Eurotunnel will affect their ability to offer competitive tariff rates. Thus, companies preferring road/ferry are likely to remain loyal to their existing ferry services.

However, the regional economic impact of the Tunnel is more likely to be influenced by the proportion of companies anticipating sending future freight exports via international through trains or the Shuttle service. The Economic Potential Model employed in chapter 3, incorporates rail freight journey times to quantify the impact of the Tunnel on regional accessibility. As a result of increased accessibility and reduced operating costs, the Tunnel is expected to lead to significant cost savings for British industry. British companies will have to send freight exports via the Tunnel if these benefits are to be realised. The next section will examine the current cross-channel freight market and the estimated future usage of the Tunnel.

The freight market

Analysis of current and future cross-Channel freight traffic will be structured according to the format adopted in the preceding section. Thus, to obtain a more comprehensive understanding of the results of the present research project, it is first useful to examine the findings of the two earlier surveys.

Comparative findings

The LCCI (1989) report showed that 34.9 percent of all respondents in the production sector planned to send at least some of their exports via the Tunnel, 32.5 percent favoured the Shuttle service and only 15.7 percent believed that they would utilise direct rail haulage to the Continent (see Tables 5.17A&B). More significantly, nearly two thirds of companies using cross-Channel services for freight at the time of the survey planned to use

the Tunnel. Again, a larger proportion of companies preferred the Shuttle service, 58.5 percent, over rail freight, 29.3 percent. Table 5.23 sets out Eurotunnel and BR's (1988) estimates of the 'level of interest' in the Tunnel for freight exports.

MODE OF TRANSPORT	PERCENT INTERESTED
THROUGH RAIL FREIGHT	5
BOTH RAIL & ROAD SERVICES	34
RORO SHUTTLE	57
DID NOT ANSWER	4

Table 5.23: The level of 'interest' expressed in the Tunnel for future freight exports.

(Source: Eurotunnel and BR 1988)

Both reports highlight the preference for the Shuttle service over rail freight but they diverge on the extent of this preference. According to Eurotunnel and BR, only five percent of companies are interested in rail freight for the transportation of exports to the Continent. This figure is less than the current percentage of exports to the Continent that go via rail/ferry. More than 40 percent of the respondents to the Eurotunnel and BR (1988) report did not export to Europe, thus one has to be careful when interpreting these results.

The current cross-Channel market

Question 7 ascertained what percentage of company sales are dependent on exports and the market orientation of these exports (see Table 5.9 and Figure 5.3). To summarise, only 73 companies are non-exporters or have no business interests abroad and approximately 56 companies export less than five percent of their goods. The remaining companies export to some extent, with one third exporting over 40 percent of their goods. In addition, more than two thirds of companies export to other EC member state countries. Exports were then categorised by mode of transport:

Aeroplane	21.5%
Rail/Sea	17.2%
RoRo	50.5%
LoLo	16.9%
Other	10.2%

Over half of the companies at present use RoRo facilities for at least some of their exports and more than 20 percent use air freight. The degree to which companies export, on the whole, will not determine the choice of transport mode; except possibly for air freight, where the X^2 test showed that the frequency of companies using air freight was higher than the 'expected' frequency (and vice versa when exports accounted for less than 20 percent of company sales).

Companies currently sending freight exports to the Continent via RoRo ferry services will be of particular interest to Eurotunnel, as will companies using existing rail/sea and/or LoLo services to BR. Rail freight services will become more competitive after the Tunnel opens in 1993, compared with the dominant road haulage sector. As discussed in chapter 3, Eurotunnel's Shuttle service is not expected to offer considerable time savings as initially envisaged. EC legislation on permitted daily driving hours negates any advantages the Shuttle offers, in terms of quicker cross-Channel transit times, compared with existing ferry services. Thus rail freight is likely to benefit from considerable time savings (as opposed to the road haulage sector). The proportion of companies currently planning to use the Tunnel for freight exports to the Continent, via international through trains and the Shuttle service, is examined in the next section. However, it is important to emphasize that the regional economic impact of the Tunnel will be strongly determined by the number of companies which anticipate using international rail freight services.

The estimated future usage of the Tunnel

Table 5.24 shows that 61.0 percent of companies plan to use the Tunnel for less than 20 percent of future exports, of which 89.9 percent do not plan to use the Tunnel. However, over 19 percent of companies do believe that they will send more than 20 percent of

exports via the Tunnel whilst 20 percent are undecided. But of those companies which currently export to the Continent, nearly one third anticipate using the Tunnel to some degree.

% OF EXPORTS	VIA THE TUNNEL	VIA THE TUNNEL	
		----- BY BR	BY SHUTTLE
0 - 20	61.02	61.29	60.22
20 - 40	8.33	1.88	1.08
40 - 60	7.80	9.14	9.14
60 - 80	1.61	1.34	1.61
80 - 100	1.34	4.03	5.65
DON'T KNOW	19.89	22.31	22.31

Table 5.24: Estimated usage of the Tunnel for future freight exports: percentage of all respondents.

Although slightly more companies favour the Shuttle, in preference over rail freight, the X^2 test showed this not to be statistically significant. A more detailed breakdown of the likely future usage of the Tunnel is provided in Table 5.25, which incorporates companies planning to use the Tunnel. Over one quarter of the companies plan to use the Tunnel to some degree, of which 63.8 percent anticipate sending between 20-60 percent of their exports via the Tunnel and 11.7 percent more than 60 percent of exports. Slightly more companies plan to send a larger proportion of their exports by Shuttle than rail freight. This would again be expected since nearly two thirds of companies planning to use the Tunnel currently send exports by RoRo ferry, however 22.3 percent also favour rail freight.

% OF EXPORTS	VIA THE TUNNEL	VIA THE TUNNEL	
		----- BY BR	BY SHUTTLE
0 - 20	24.46 (23)	25.53 (24)	21.28 (20)
20 - 40	32.98 (31)	7.45 (7)	4.26 (4)
40 - 60	30.85 (29)	36.17 (34)	36.17 (34)
60 - 80	6.38 (6)	5.32 (5)	6.38 (6)
80 - 100	5.32 (5)	15.96 (15)	22.34 (21)
DON'T KNOW	- -	9.57 (9)	9.57 (9)

Table 5.25: Estimated usage of the Tunnel for future freight exports: percentage (and number) of companies planning to use the Tunnel.

Therefore, three quarters of companies, or, more importantly, 70 percent of companies which currently export to the Continent, have no intention of sending freight exports via the Tunnel or are undecided. Furthermore, no real distinction is made between rail freight or the Shuttle service. Thus, considerably fewer companies will switch their distribution practices in favour of the rail network. Hence, the significance of the Tunnel to the UK and the regions has to be placed in context. The long-term benefits of the Tunnel, as highlighted in the Literature Review (chapter 2), are dependent on companies exploiting the advantages of improved journey time and cost via direct rail freight services to the Continent. Since most companies do not anticipate switching from their present preferred mode of transport, namely road/ferry, the long-term regional economic impact of the Tunnel is likely to be limited.

Factors likely to influence planned Tunnel usage

It is evident that current plans to use the Tunnel do vary according to the business and freight sectors. As compared to future business trips, significantly more companies are unsure how the Tunnel will be incorporated into their distribution plans. Thus, it is important to identify which factors are considered likely to increase the anticipated usage of the Tunnel for freight exports, particularly since company estimates will not remain static. The results are listed below:

Cost	64.0%
Journey Time	43.8%
Reliability	41.4%
Other	8.6%

Unlike with business trips, the relative cost of rail freight and/or the Shuttle is considered more important than the total transit time. This would seem to go against the general trend of manufacturing companies adopting 'just-in-time' systems of production and delivery. However, the cost of transporting goods to the Continent is of much greater concern to companies than individual business trips. BR and Eurotunnel will, therefore, have to offer favourable tariff rates to enable them to compete effectively. Companies will not make any final decisions until the actual tariffs are made public. Companies planning to use the Tunnel regard cost to be more important than all respondents in general; 50.8 percent for business trips and 78.5 percent for exports.

The above factors are generally regarded to be more important by companies currently exporting to the Continent and vary according to the mode of transport:

	Air Freight	Rail Freight	RoRo	Lo/Lo
Cost	72.5%	84.4%	79.8%	77.8%
Journey Time	67.5%	53.1%	54.8%	65.1%
Reliability	47.5%	45.3%	55.3%	58.7%

There is a definite consensus amongst companies that cost will be the most significant factor in deciding whether or not to use the Tunnel for freight exports and to what extent. Companies currently favouring RoRo or LoLo transport facilities consider reliability to be more important than companies using rail freight. The reliability of future rail freight services via the Tunnel will be vital to the success of their operations. Between a half and two thirds of companies currently transporting goods to the Continent regard time of transit to be important.

Anticipated Tunnel usage: a summary

More than one quarter of companies plan to use the Tunnel for business trips and/or the transportation of exports. These figures are more conservative than earlier findings but, as explained previously, the optimism generated by the Tunnel in the late 1980s has now given way to more realistic forecasts. Despite the Tunnel representing an important addition to the UK's transport infrastructure, more than 70 percent of companies have no plans to use the Tunnel or are undecided. However, as more finalised information becomes available, companies will revise their estimated future usage of the Tunnel. It is therefore dependent on BR and Eurotunnel to implement the necessary policies to increase demand.

One cannot place too much confidence in traffic forecasts or current company plans for the future use of the Tunnel since the post-Tunnel cross-Channel transport market will be extremely dynamic, and thus subject to volatile changes. Ferry operators have repeatedly stated that they will be in a position to compete effectively with the Tunnel as soon as it opens, now not until December 1993. P&O and Sealink are likely to re-apply to the Monopolies and Mergers Commission (MMC), shortly after the Tunnel opens, to allow the proposed merger of ferry services at Dover. The CTJCC considers that such a merger is vital to the long-term survival of the port and ferry in East Kent (see chapter 7). It is therefore expected that the MMC will finally permit the merger of the P&O and Sealink ferry fleets. The pooling of services and tariff collusion will result in more cost effective services and improved service quality. Thus, companies are likely to be constantly reviewing their distribution practices and, to a lesser extent, how they undertake business trips.

However, the recent difficulties encountered by both Eurotunnel and BR, in terms of the delayed opening of the Tunnel and the late introduction of international passenger trains, can only weaken their competitive positions. The postponement of the high-speed rail link, as discussed in chapter 4, casts a further shadow over the Tunnel project. KCC (1989), and most other commentators, predict capacity constraints as soon as the Tunnel opens. If Simmons (1989) is correct, capacity constraints on Kent main line tracks will lead to either a reduction in the level of domestic passenger services or slower international trains

operating alongside commuter services. The latter option will again reduce the attractiveness of international passengers trains for business trips to the Continent, especially in the light of the EC's 'Open Skies' policy for air services. The Government has also created further uncertainty through its planned denationalization of the railways and the complete sell-off of BR's freight sector (see chapter 4). It is therefore evident that companies will not be able to make any definite predictions of future usage of the Tunnel until service timetables and tariff rates are published. Nonetheless, certain strategies adopted by either the Government, BR and Eurotunnel could encourage companies to revise, positively or negatively, their planned usage of the Tunnel. The next section, 'Wider Considerations', will determine whether any strategies are considered necessary to increase the anticipated usage of the Tunnel. In addition, more general impressions of companies toward the Tunnel will be elaborated upon.

5.5.4. Wider considerations

To conclude the analysis of the results, attention will now focus on more general considerations. As referred to above, present plans to use the Tunnel are unlikely to remain static. Certain strategies/policies may also influence companies to increase their planned usage of the Tunnel. Thus, question 20 attempted to determine what Government and/or BR strategies would be needed to encourage companies to revise upwards their current estimated usage of the Tunnel, for both passenger and freight traffic.

The results show that BR will have to improve its overall image if more companies are going to be encouraged to rethink their planned usage of the Tunnel for passenger and freight traffic. More than one quarter of the companies believe that a better overall train service, including more and faster trains, would increase their planned usage of the Tunnel. The cost of train journeys via the Tunnel, for passenger and freight traffic, relative to other modes of transport, is regarded as important by 23.4 percent of companies. This could be to some extent premature but it does mean that BR will have to offer a competitive pricing policy. Only 15.3 percent considered that BR would have to increase its general level of reliability; somewhat contradicting the general perception of BR, particularly with regard to rail freight.

Earlier results showed that more than one third of companies would consider reliability important in their plans to use the Tunnel for business trips; the respective figure for freight exports is 41.4 percent. Of those companies which stated that either a better service, improved reliability or competitive prices would encourage them to increase their usage of the Tunnel: 85.6, 87.7 and 83.9 percent respectively, anticipate less than 20 percent of future business trips going via the Tunnel; the respective figures for exports are 64.4, 61.4 and 57.5 percent. Therefore, the vast majority of companies that at present plan not to use the Tunnel or use it for less than 20 percent of business trips and/or exports, are prepared to revise their plans if BR adopt certain strategies. Furthermore, nearly 30 percent of companies currently planning to use the Tunnel would increase their usage of the Tunnel if costs were competitive and 36.2 percent would require faster and more frequent trains.

Again rather surprisingly, only 9.1 percent of companies (16.9 percent for companies planning to use the Tunnel) stated that increased investment in Tunnel related transport infrastructure would be necessary to increase their usage of the Tunnel, of which approximately 70 percent did not plan to use the Tunnel for future business trips and over half had no plans to send exports via the Tunnel. The questionnaire survey was carried out prior to the Government's decision, 9 October 1991, to abandon BR's proposed route for the high-speed rail link in favour of the 'sketchy' Ove Arup East London route, effectively delaying the rail link until well into the next century (see chapter 4). This decision, after months of certainty that the Government would give the go ahead for BR's proposed route, and the increased publicity, could have altered the above finding. A further 13.2 percent of companies believe that accessibility to the Tunnel by road and rail needs to be improved. Again the majority of those companies had no plans to use the Tunnel, three quarters for business trips and nearly 60 percent for exports. One would expect to associate this response with companies more isolated from the Tunnel, namely companies from the "Far South West". Over one third of companies stated other reasons, of which the majority considered that no strategies would encourage them to revise their planned use of the Tunnel.

The accuracy of the responses to the questions would to a large degree depend on the general level of knowledge concerning the Tunnel and its services. Less than one third of

companies believe that information about the Tunnel has been easily accessible and 13.7 percent are uncertain as to whether any information has been forthcoming. The type or size of the company did not affect the amount of information available. It would therefore seem that BR and Eurotunnel will have to adopt a more aggressive advertising campaign, targeting potential users. Companies currently anticipating using the Tunnel do not seem to be more informed about the Tunnel and its services, over half do not believe that information was easily available and a further 13.9 percent are unsure.

The last two questions attempted to place the Tunnel in an overall context. In terms of companies becoming more 'Europeanised', 35.22 percent regard the Single European Act and the Tunnel as encouraging them to look more towards the Continent. However, the Tunnel is considered insignificant in comparison to the SEM. The theory of transport economics does not support the view that companies will relocate closer to the Tunnel, to optimise any improvement in accessibility to the Continent. The Port of Dover has been the main corridor for the majority of UK exports to the Continent but Kent has not benefitted from a migration of industry to the county or from a dynamic distribution industry (see chapter 7). If BR (1989b) are to be believed all regions will be well served by rail to and from the Tunnel. Nonetheless, the psychological importance of the SEM and the Tunnel could persuade some companies that the South East, and particularly the 'EuroRegion' of Kent, is where they should be located. However, nearly all of the companies which responded, as the present research highlights, do not foresee the need to relocate. In addition, the psychological importance of the Tunnel is negligible against the wider implications of the SEM.

Companies are generally optimistic that the overall regional economic impact of the Tunnel will be beneficial. Nearly half of the companies did believe the impact will be beneficial on the region in which they are located. In addition, 16.4 percent anticipated the impact to be neutral and only 15.1 percent could foresee a damaging impact. Increased trade, tourism and employment are the general reasons why companies are so optimistic. However, some companies are concerned about the impact of the Tunnel on the environment and its South East bias. Companies are generally more optimistic about their future outlook to Europe and the overall impact of the Tunnel if they at present plan to use

the Tunnel, 46.2 percent believe they will become more orientated towards Europe and 59.2 percent expect the overall impact on their region to be beneficial. Companies in the South East are much more likely to believe that the Tunnel will have a beneficial impact on their region; approximately one third of the companies in the South West expect the impact to be neutral. Analysis of the data at the inter- and intra-regional levels will be carried out in chapter 6, but it is first appropriate to conclude this chapter according to the theoretical, and the legislative and policy frameworks established in the preceding chapters.

5.6. Conclusion

The main findings of the present survey tend to be more conservative than those of the earlier reports by LCCI (1989), Eurotunnel and BR (1988). This can be explained by the mounting problems faced by Eurotunnel and BR. Construction of the Tunnel has continually been plagued by financial difficulties; contractual disputes between Eurotunnel and TML; problems meeting health and safety standards both in the Tunnel and in proposed future services; and the indecision associated with supporting transport infrastructure, particularly the high-speed rail link between London and the Tunnel portal. More important, however, is the decision to postpone the opening of the Tunnel, for a third time, until December 1993. This will effectively stop the revenue earning potential of the Tunnel for at least a further six months, representing a loss of revenue of more than £200 million (Daily Telegraph 1992), and thus increasing Eurotunnel's "real" debt burden. Pressure to meet a tightly enforced debt repayment schedule will restrict Eurotunnel's ability to introduce attractive tariff rates for both passenger and freight traffic. Until Eurotunnel and BR are in a position to publish service timetables and tariff rates, companies will be unable to plan confidently their future usage of the Tunnel. Both P&O and Sealink expect to be in a position of strength by the summer of 1993, after a substantial rationalisation of the cross-Channel ferry industry (Hall 1987). The significant time advantages of the Tunnel over short-sea ferry crossings, particularly for rail freight and passengers by road or rail, could be over-shadowed if the present difficulties hindering Eurotunnel and BR prevent them competing effectively with the more cost-efficient ferry

operators. Companies regard cost to be the paramount consideration in any future usage of the Tunnel for freight exports. The planned denationalization of BR also engenders considerable uncertainty, possibly adversely affecting the attractiveness of international rail services (see chapter 4).

At present, approximately one quarter of companies plan to use the Tunnel for future business trips, of which over half anticipate less than 20 percent of business trips going via the Tunnel. This is not surprising, since the present business trip market is dominated by air travel, with over 90 percent of companies currently using this mode of transport to some degree. BR and, to a lesser extent, Eurotunnel will have to adopt aggressive advertising campaigns, highlighting the unique advantages of direct rail (and/or road) travel to the Continent, namely fast city-centre to city-centre journey times without the need to check-in up to two hours before departure. Journey times are the prime concern of companies in their choice of transport mode for business trips; 82.5 percent regard journey time as important. In comparison, only 42.7 percent believe cost to be important. BR is confident that their international through train services will be able to compete on journey times, particularly to the near Continent and even to the more distant European cities via over-night sleeper services. Therefore as service timetables and tariff rates are made public and after the service becomes operational, companies are likely to revise their estimated usage of the Tunnel favourably. However, capacity constraints on Kent main line tracks (discussed in chapter 7) could entail international services running at much reduced speeds. Furthermore, the delayed introduction of the new international passenger trains will also limit the number of companies deciding to switch from air to rail travel, at least in the immediate years following the opening of the Tunnel.

In terms of freight exports, approximately 25 percent of companies again plan to use the Tunnel but companies generally anticipate sending a larger proportion of their exports, as compared to business trips, via the Tunnel. Over three quarters of the companies planning to use the Tunnel expect to send more than 20 percent of their exports via the Tunnel. In addition, nearly 20 percent of companies are still undecided. Rail freight will be a position to offer attractive time and cost savings after the Tunnel opens but EC legislation on permitted daily driving hours will reduce any time savings for road hauliers using the

Shuttle service. Nonetheless, companies are fairly evenly divided between their planned usage of rail freight or the Shuttle service. As stated in chapter 3, BR is introducing more powerful locomotives to increase both the load capacity and the average running speed of freight trains, initially 75mph. BR is actively trying to persuade companies that the general perceived image of an unreliable service is now out-dated. Regional freight villages are just one example of BR attempting to bring rail freight services to the regions and the companies, swap-body technology and inter-modal door-to-door services are others. The Tunnel represents a new era for the railway in the UK, but the complete sell-off of BR's rail freight sector is likely to create much uncertainty and prevent BR maximising the opportunities that the Tunnel offers. However, if these estimates remain fairly constant, 70 percent of companies currently exporting to the Continent do not plan to use the Tunnel and even fewer are likely to use international rail freight services. The regional economic impact of the Tunnel is therefore likely to be limited.

Surprisingly, fewer than 10 percent of companies believe that increased investment in transport infrastructure would increase their planned usage of the Tunnel. More companies are concerned about the general level of service quality, particularly for BR, and the need for competitive tariffs. Regional interest groups argue that the spreading of the benefits from the Tunnel will be hindered by the lack of necessary investment in the UK's transport infrastructure, citing the case of the high-speed rail link as a prime example (NOERC 1988, CLES 1989, Pieda 1989a&b). Nonetheless, companies seem to believe that it is up to BR and Eurotunnel to offer an attractive overall service, and thus persuade them to increase their planned usage of the Tunnel. This would also seem to conflict with the findings of the Section 40 Report (Knowles et. al. 1989), which highlights regional concerns of inadequate supporting transport infrastructure. However, the questionnaire survey was carried-out prior to the announcement (on 9 October 1991) that the Government was to reject BR's proposed NKML. The delay now associated with the high-speed rail link would have been likely to lead to more companies calling for increased investment in transport infrastructure.

Companies are generally optimistic about the impact of the Tunnel on their overall ability to compete in both UK and European markets. Nearly three out of every ten companies

believe that the Tunnel and related transport infrastructure will increase their accessibility to both UK and continental markets. Nonetheless, over 60 percent of companies do not anticipate any such improvements in accessibility, the majority considering existing cross-Channel transportation more than adequate for their purposes. Only 22.9 percent of companies anticipate increased competition resulting from the Tunnel, a sign that companies are more optimistic about the effect of the Tunnel on the home market. Such optimism could be misplaced considering continental attitudes toward the Tunnel. The threat posed by continental states, in terms of company relocations and increased exports, will be examined in the case studies of East Kent (chapter 7) and the "Far South West" (chapter 8). Concerns that the Tunnel will encourage a southward migration of industry were considered to be unfounded in the Literature Review (chapter 2), and are examined in more detail with respect to East Kent and Nord-Pas de Calais in chapter 7. Furthermore, the results show that companies have no plans to relocate. Chapter 8 will focus attention on the "double-edged" nature of improved accessibility and the "Third Market" impact of the Tunnel. Companies in the "Far South West", and other peripheral UK regions, are likely to suffer a loss of market share to increased competition from the Continent, particularly in the important markets of the South East and the Midlands.

The questionnaire survey also showed that companies anticipate a positive impact on their regional economies. However, this will depend ultimately on the reactions of British industry to the new challenge of a more accessible European mainland. The vast majority of companies which responded to the survey do not anticipate any increase in accessibility (>70%) and/or currently plan to use the Tunnel (approximately 75%). One has to be careful when interpreting these results, but it would seem that the real significance of the Tunnel, as seen by companies, is limited, especially in comparison with the SEM. But this could be indicative of the British Government's non-interventionist attitude towards the Tunnel. However, the real significance of the Tunnel will depend on how companies in the different regions of the UK and on the Continent actually react to the potential opportunities created by the Tunnel. It was argued in chapter 4, that British Government policy could disadvantage the more peripheral regions, and the UK as a whole, relative to the near Continent. The contrasting strategies implemented by the French Government, and the Nord-Pas de Calais Regional Council, could exacerbate the potentially damaging "Third

Market" impact of the Tunnel. It is therefore important to examine whether regional location affects how companies are likely to react to the new opportunities created and how they perceive the potential impact of the Tunnel.

CHAPTER 6: A COMPARATIVE ANALYSIS OF THE **QUESTIONNAIRE RESULTS**

This chapter will highlight any similarities and dissimilarities in perceptions of and reactions to the Tunnel for companies in the South East and South West. As stated by Piedad (1989b), the reactions of companies to the challenges created will ultimately influence the regional economic impact of the Tunnel. It will be shown whether companies from the South East and South West are likely to react differently to the Tunnel and thus significantly affect the regional economic structure of the UK. The comparative findings of the survey between the two regions will have important implications for companies throughout the UK. The South West, but particularly the "Far South West" (Devon and Cornwall), is one of the regions most isolated from the Tunnel, in terms of geographical distance and supporting transport infrastructure. A comparative regional analysis of the results will therefore greatly contribute to existing research on the potential regional economic impact of the Tunnel.

6.1. Regional Analysis

Analysis of the results at the regional level will again be structured according to the design of the questionnaire (see Appendix 3). First the company base of the two regions must be examined before analyzing company perceptions of the Tunnel and any proposed future usage of BR's international through trains and/or Eurotunnel's Shuttle service. It will reveal whether businesses share the commonly perceived image that the Tunnel will further disadvantage the more peripheral UK regions. It was shown in chapter 3, that significant increases in relative accessibility could be experienced by all UK regions vis-a-vis the Continent. However, the realisation of these benefits will depend on company perceptions of and reactions to the Tunnel. Having established the more important parameters influencing the decisions of companies in using the Tunnel, the regional analysis will then

focus on more general considerations, particularly to ascertain if companies in either of the two regions are more optimistic or pessimistic as regards the likely impact of the Tunnel on the region in which they are located. Analysis of the results will also be undertaken at the sub-regional county level. However, caution must be used when interpreting the results because of the small number of respondents involved.

6.1.1. The Regional Company Base

Any similarity in attitudes toward the Tunnel found amongst companies in the South East and the South West cannot be accounted for by common factors in their economic base. The results outlining the company profiles of the two regions proved to be significantly different, at a rejection level of at least $\alpha = 0.05$. It will be shown that companies in the South East are less likely to be privately owned and are more likely to be a MNC or subsidiary of a MNC, employ larger workforces and export more of their goods as a proportion of their total sales. Analysis of the results in chapter 5 showed that the type of companies themselves did not generally influence perceptions and forecast usage of the Tunnel. The company profiles of the two regions will be discussed individually, with the results presented in Tables 6.1 to 6.3 and Figures 6.1 and 6.2.

Fewer than half of the companies in the South East, 46.4 percent, are privately owned and 37.3 percent are PLCs (see Figure 6.1). Companies considering themselves to be MNCs or subsidiaries of MNCs account for 85.8 percent; of which nearly half have branch/sister companies located in other EC countries, 21.9 percent in the 'rest of Europe' and 70.4 percent in the 'rest of the World'. More than two thirds of the companies can be categorised into five industrial categories (see Table 6.1); namely, 'food, drink and tobacco' (17.2%), electrical engineering (14.2%), chemicals and allied industries (13.7%), mechanical engineering (12.9%) and 'paper, printing and publishing' (10.3%). As is evident from Table 6.2, over one quarter have been located at their present site for less than 10 years but nearly 20 percent of companies have been at their present location for over 50 years. Companies employing more than 1,000 people account for 28.3 percent of all companies in the South East, 20.6 percent also employ fewer than 100 people.

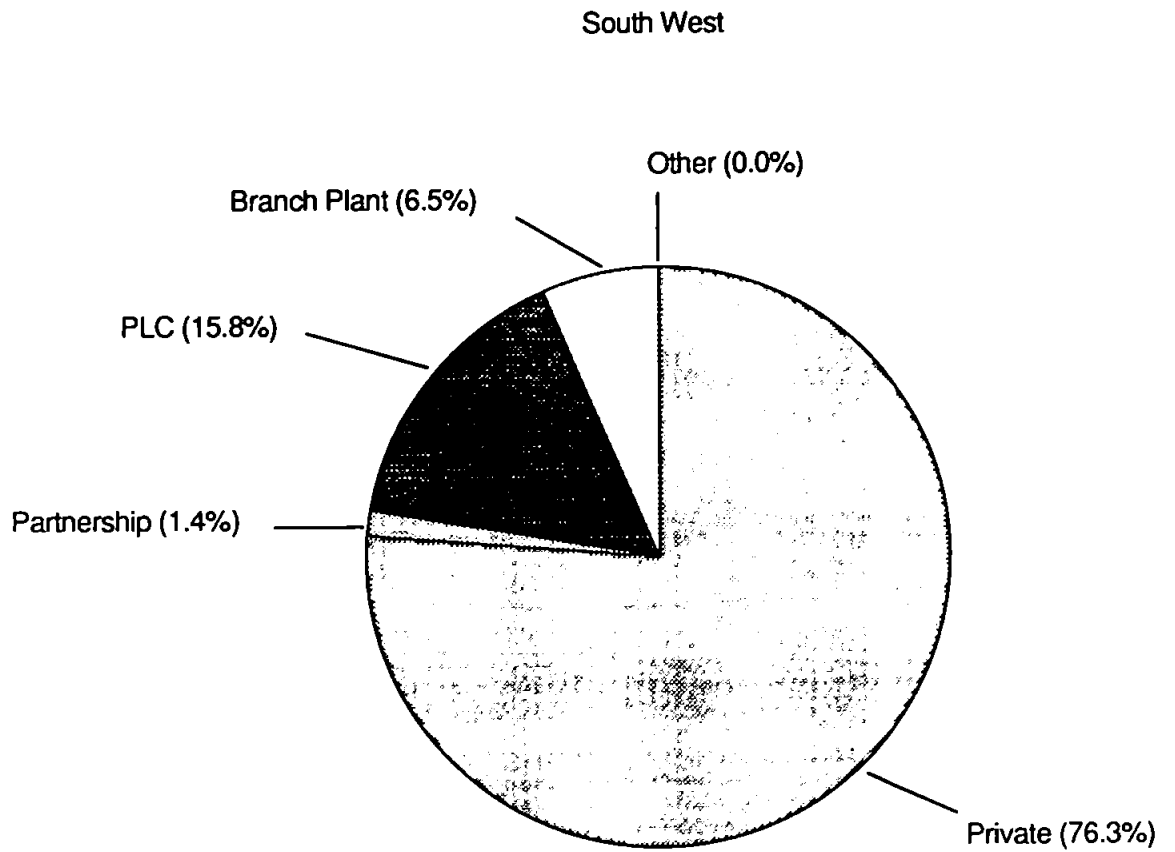
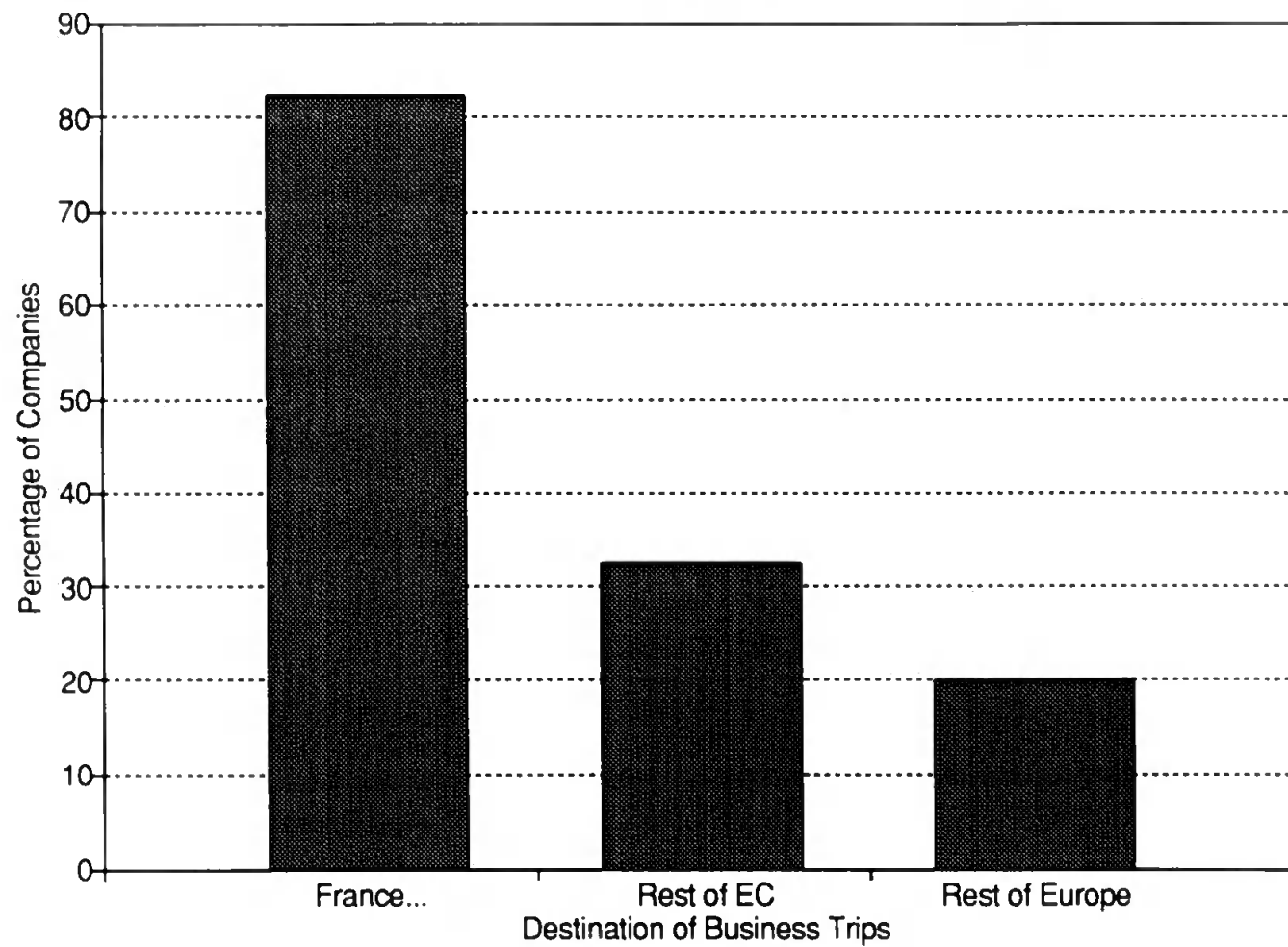


Figure 6.1 (cont'd): Ownership Status of Companies in the South East and South West.

Figure 5.5: Destination of Company Business Trips.



South East

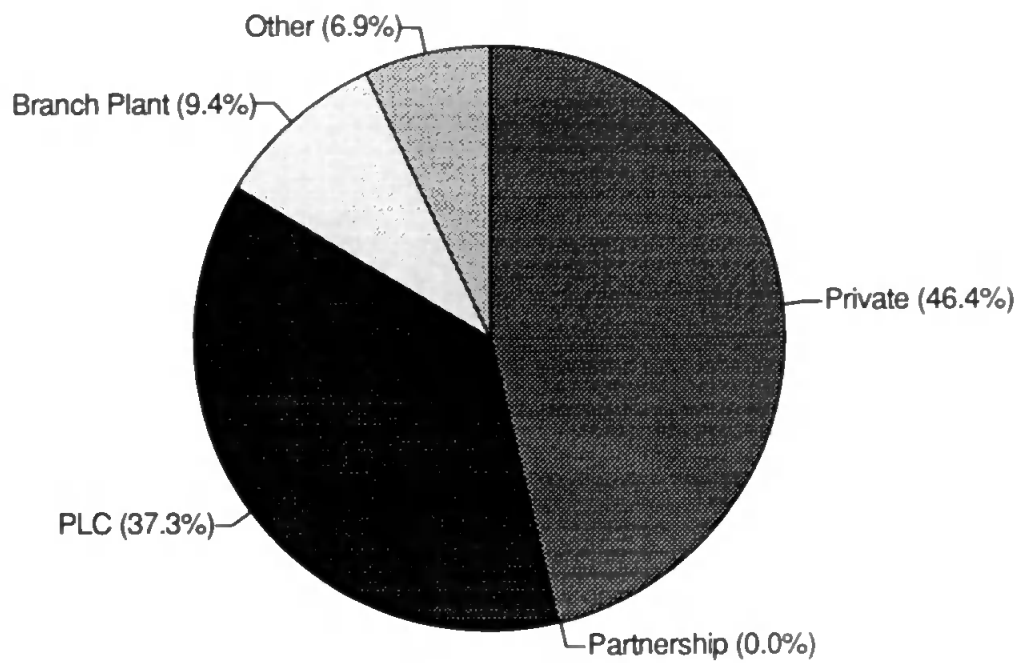


Figure 6.1: Ownership Status of Companies in the South East and South West.

Figure 6.2: Size of Company Workforce.
South East

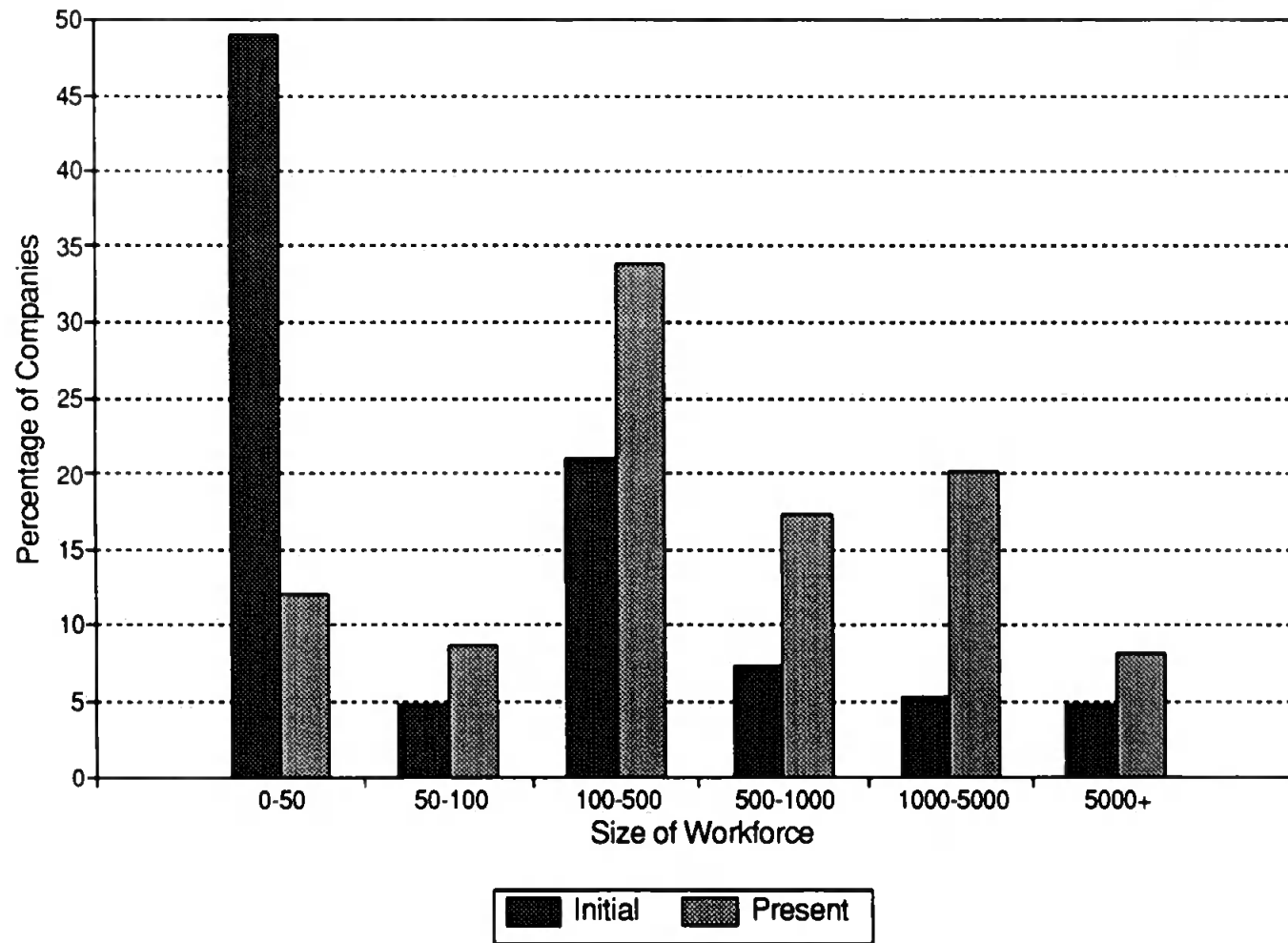
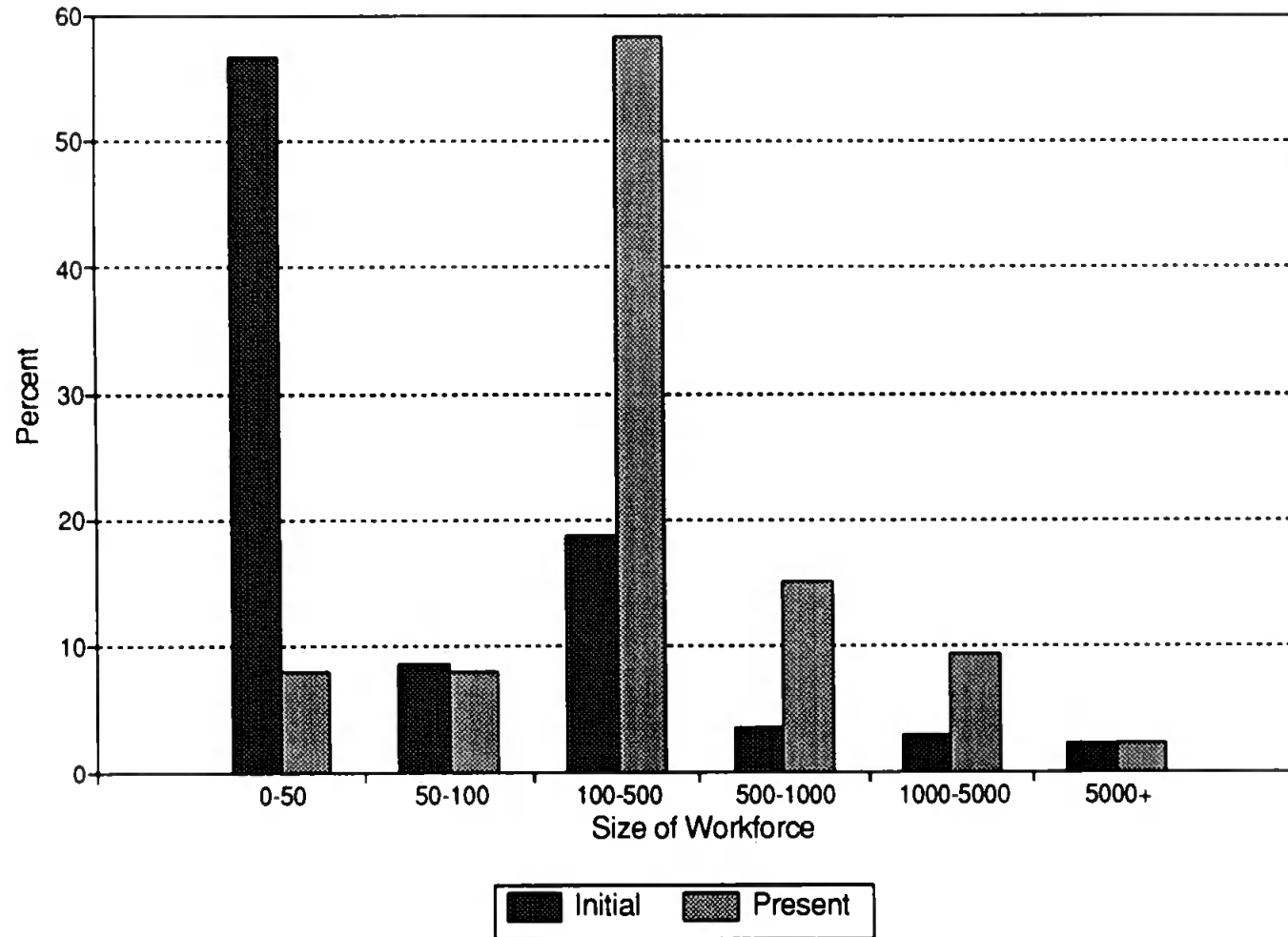


Figure 6.2 (cont'd):
South West



INDUSTRIAL CLASSIFICATION	SOUTH EAST	SOUTH WEST
FOOD, DRINK & TOBACCO	17.17 (40)	11.51 (16)
COAL & PETROLEUM PRODUCTS	0.0 (0)	1.44 (2)
CHEMICALS & ALLIED INDS	13.73 (32)	4.32 (6)
METAL MANUFACTURE	5.15 (12)	5.04 (7)
MECHANICAL ENG.	12.88 (30)	12.23 (17)
INSTRUMENT ENG.	4.29 (10)	4.32 (6)
ELECTRICAL ENG.	14.16 (33)	20.86 (29)
SHIPBUILDING & MARINE ENG.	0.43 (1)	2.88 (4)
VEHICLES	3.43 (8)	2.16 (3)
OTHER METAL GOODS	1.29 (3)	0.72 (1)
TEXTILES	0.0 (0)	0.72 (1)
LEATHER & FURS	0.0 (0)	0.72 (1)
CLOTHING & FOOTWEAR	0.86 (2)	2.88 (4)
BRICKS, POTTERY, GLASS, CEMENT...	4.29 (10)	7.91 (11)
TIMBER, FURNITURE	3.86 (9)	2.88 (4)
PAPER, PRINTING, PUBLISHING	10.30 (24)	8.63 (12)
OTHER MANU. INDS	1.72 (4)	6.47 (9)
DISTRIBUTION & WHOLESALING	6.44 (15)	4.32 (6)

Table 6.1: Industrial classification: percentage (and number) of companies in the South East and South West.

NUMBER OF YEARS	SOUTH EAST	SOUTH WEST
0 - 5	16.74 (39)	8.63 (12)
5 - 10	10.73 (25)	9.35 (13)
10 - 20	23.61 (55)	28.78 (40)
20 - 50	28.76 (67)	35.25 (49)
50+	19.74 (46)	17.99 (25)

Table 6.2: The number of years companies have been operating at their present location: percentage (and number) of companies in the South East and South West.

In terms of exports (see Table 6.3A), 11.2 percent export over 80 percent of their goods, the majority (53.3%) still, however, export less than 20 percent, of which 43.6 percent are non-exporters. Finally, it can be seen from Table 3.B, that nearly two thirds have export markets in other EC countries, 35.6 percent in other European countries and 60.5 percent outside Europe.

PERCENTAGE OF EXPORTS	SOUTH EAST	SOUTH WEST
0 - 20	53.22 (124)	58.99 (82)
20 - 40	12.88 (30)	8.63 (12)
40 - 60	15.02 (35)	18.71 (26)
60 - 80	6.44 (15)	9.35 (13)
80 - 100	11.16 (26)	4.32 (6)

Table 6.3A: Exports as a proportion of total sales: percentage (and number) of companies in the South East and South West.

% OF EXPORTS	EEC		EUROPE		WORLD	
	SE	SW	SE	SW	SE	SW
0 - 20	43.35	50.36	34.33	29.50	37.77	36.69
20 - 40	15.45	12.95	0.86	1.44	6.87	12.23
40 - 60	6.01	3.60	0.43	0.0	9.01	4.32
60 - 80	0.86	1.44	0.0	0.72	3.43	0.72
80 - 100	0.86	0.72	0.0	0.0	3.43	1.44

Table 6.3B: Destination of exports: percentage of companies in the South East and South West.

In comparison, more than three quarters of companies in the South West are privately owned, 15.8 percent are PLCs and 6.5 percent consider themselves branch plants. Nearly two thirds are MNCs or subsidiaries of MNCs; of which 52.5 percent have branch/sister companies located in the UK, 29.5 percent in other EC countries, 10.1 percent in other European countries and 48.9 percent around the World. Engineering industries accounted for over one third of all companies in the South West; electrical engineering (20.9%), mechanical engineering (12.2%), and instrument engineering (4.32%); chemicals and allied industries only accounted for 4.3 percent of companies, compared to 13.7 percent for the South East. As can be seen from Table 6.2 and Figure 6.2, more than 80 percent of companies have been operating at their present location for longer than 10 years and the vast majority employ between 100 and 500 people, only 2.2 percent employ over 5000 people. Companies in the South West also export a smaller proportion of their goods, 59.0 percent exporting less than 20 percent of their goods, of which 34.2 are non-exporters. The main markets for exports from the South West are the EC and the rest of the World, 69.1 and 55.4 percent respectively.

It is therefore quite evident that company profiles are significantly different in the two regions. Companies in the South West tend to be privately owned, employ fewer people and export a smaller proportion of their goods, as well as more likely to be active in engineering industries. Nonetheless, different company profiles did not generally influence perceptions and forecast usage of the Tunnel (see section 5.4). The next section will

compare and contrast company perceptions of the Tunnel between the two regions, in terms of the impact of the Tunnel on their own level of competitiveness.

6.1.2. Perceptions of "Peripherality" or "Insulation"

Fears that the Tunnel will lead to an increased polarisation of economic activity within the South East and the further peripheralisation of regions to the north and west of London are not substantiated by the results. Regional interest groups are concerned that the Tunnel will add to the existing disadvantages of the UK's more peripheral regions, thus reducing the competitiveness of their industries and widening the so-called "North-South" divide. Feelings of peripherality for companies in the South West are generally countered by the belief that they will be insulated from most of the adverse effects of the Tunnel. Consequently, perceptions of the Tunnel for companies in the South East and South West tend to converge, albeit for very different reasons.

The impact of the Tunnel on company locations in the South East and South West will be analyzed first. How companies in the two regions are likely to anticipate the effect of the Tunnel on their own level of competitiveness both at home and abroad will then be determined. Fears that companies will be forced to relocate have been shown to be misplaced at a national level, but how realistic is the perceived threat of large scale relocations at the regional and county level?

The Tunnel and company location

The reasons why companies locate at their present sites vary between the South East and South West, particularly with regard to 'proximity to markets' and 'good transport links' (see Table 6.4). Companies in the South East consider proximity to markets and good transport links as paramount in their decisions to locate at their present sites. More companies in the South West stated 'other' reasons, referring primarily to historical factors and/or the convenience of managing directors. Only 28.8 percent of companies in the South West consider good transport links as a reason for locating at their present site, thus explaining why companies in the South West are likely to regard themselves as relatively

more isolated from the Tunnel. Considerations such as rent/rates, proximity to supplies, the labour force and room for expansion, do not vary in importance for companies in either of the two regions.

DETERMINANTS OF LOCATION	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
RENT/RATES	22.75	20.14
PROXIMITY TO MARKETS	28.33	15.11
PROXIMITY TO SUPPLIES	11.59	12.95
GOOD TRANSPORT LINKS	42.49	28.78
LABOUR FORCE	34.76	36.69
ROOM FOR EXPANSION	27.47	28.78
OTHER	30.04	43.17

Table 6.4: Factors influencing company location: percentage of companies in the South East and South West.

The significance attached to the above reasons also vary within the two regions; for example, 71.4 percent of companies in Berkshire regarded good transport links to be important compared to 20.8 percent in Kent or only 5.6 percent in Dorset. In fact, no companies in either Cornwall or Devon believed good transport links to be a factor in their decision to locate at their present site. This cannot be regarded as surprising considering that the "Far South West" is relatively isolated from the rest of the UK in terms of both geographical distance and transport links. Companies in Bedfordshire were primarily concerned about the quality of the local labour force (77.8%) as well as good transport links (66.7%). Only 8.3 percent of companies in Buckinghamshire, Essex and Kent regarded proximity to markets as a determinant in their locational decision. Kent's rather unique position with respect to proximity to both London and the Continent does not seem to be an attraction for companies considering locating in the county. Companies in Devon were primarily influenced by historical factors or the convenience of their managing directors, 66.7 percent stated 'other'. The attraction of the labour force was only cited by

11.8 percent of companies in Somerset, compared to 44.4 percent in Wiltshire and 55.6 percent in Avon.

'LOCATION'	SOUTH EAST	SOUTH WEST
VERY IMPORTANT	19.74	17.27
QUITE IMPORTANT	38.63	32.37
NOT TOO IMPORTANT	31.76	36.69
UNIMPORTANT	9.87	13.67

Table 6.5: Importance of location as a component of overall business strategy: percentage of companies in the South East and South West.

The importance of location in the overall business strategy does not vary significantly between companies in the two regions (see Table 6.5). More than 58 percent of companies in the South East regard location to be an important component of their overall business strategy, compared to fewer than half of the companies in the South West. The chisquare X^2 test shows that this is not significant:

'Location'	South East		South West		Σ_r
	Observed Freq.	Expected Freq.	Observed Freq.	Expected Freq.	
V. imp.	46	43.84	24	26.16	70
Q. imp.	90	84.56	45	50.44	135
Not too imp.	74	78.29	51	46.71	125
Unimp.	23	26.31	19	15.69	42
Σ_k	233		139		372

Table 6.6: Significance of location for companies in the South East and South West.

$$X^2 = 0.11 + 0.18 + 0.35 + 0.59 + 0.24 + 0.39 + 0.42 + 0.70$$

$$X^2 = 2.98 \quad \text{degrees of freedom} = (4-1) (2-1) = 3$$

critical of value of chisquare, at $\alpha = 0.05$, = 7.82

The critical value of chisquare is higher than the calculated X^2 , at a rejection level of $\alpha = 0.05$. Thus, it is not possible to reject H_0 , which stated that there was no significant difference in the importance of location between companies in the South East and South West.

Companies in the South West are much less likely to anticipate the Tunnel having any impact on their location; only 5.8 percent believe that the Tunnel will affect their location and 6.5 percent are uncertain. In contrast, 15.0 percent of companies in the South East expect some degree of impact on their location and a further 7.7 percent are unsure. The X^2 test showed this difference to be significant at a rejection level of $\alpha = 0.05$: $X^2=7.93$; $df=2$, thus the critical value of chisquare = 5.99. Of the companies in the South East which believe that the Tunnel will affect their location, 20 stated that they anticipate improved accessibility, compared to only two of the respective companies in the South West. A further five companies in the South West consider that there would be an increase in accessibility if supporting transport links are improved.

Companies in the South East currently planning to use the Tunnel anticipate more of an impact than all respondents in the South East; 20.9 percent believe the Tunnel will affect the locational characteristics of their present site. This is not apparent for companies planning to use the Tunnel in the South West. Companies in Cornwall do not expect any effect on their location but a larger proportion of companies in Devon, 12.5 percent, compared to any other county in the South West, do expect some impact. One would expect companies in the "Far South West" to feel more "insulated" from the Tunnel but this is not evident for companies in Devon. BR does propose to run nighttime international through trains to-and-from Plymouth. Plans not to continue the service into Cornwall are now under review. Companies in Devon are thus more likely to feel "linked" to the Tunnel and so perceive more of an impact.

It is therefore apparent that companies in the South East are significantly more likely to anticipate some kind of impact on their present location as a result of the Tunnel. How this impact will affect company competitiveness in both the home and continental marketplace will be analyzed in the next section.

Regional competitiveness: increased accessibility to markets

Tables 6.7. and 6.8 outline company perceptions of the Tunnel, in terms of how the Tunnel and related transport developments are likely to affect accessibility to UK and continental markets, as well as vulnerability to increased competition. Slightly more companies in the South East generally believe their accessibility will improve as a result of the Tunnel, 30.5 percent compared to 25.2 percent for companies in the South West. One in ten companies in both regions are undecided. Companies in both the South East and South West currently planning to use the Tunnel are significantly more likely to anticipate increased accessibility to the Continent, 44.2 and 40.9 percent respectively.

Of the companies in the South East which stated that proximity to markets was a factor in their decision to locate at their present site, 43.5 percent anticipate increased accessibility to both UK and continental markets. The respective figure for South West companies is only 9.5 percent. Market orientated companies in the South East are therefore considerably more likely to believe that the Tunnel will improve their accessibility to both UK and continental markets. Companies in the South East tend to export a larger proportion of their total sales and so are much more likely to feel optimistic about their ability to compete on the Continent.

INCREASED ACCESSIBILITY	SOUTH EAST	SOUTH WEST
YES	30.47	25.18
NO	76.82	67.63
DON'T KNOW	7.73	10.07

Table 6.7: Improved accessibility to UK and continental markets: percentage of companies in the South East and South West.

Only 8.3 percent of companies in Essex anticipate increased accessibility resulting from the Tunnel compared to over 41 percent in Kent. Companies in Kent may not have considered proximity to markets as a reason for locating in the county but they do expect accessibility to markets in both the UK and the Continent to increase as a result of the Tunnel and related transport infrastructure. The proposed high-speed rail link will considerably improve their accessibility to UK markets, particularly London. However, the International Passenger Station at Ashford is vital if the county is to benefit from direct rail access to the Continent (see chapter 7). Furthermore, current plans for rail freight (BR 1989b), mean that company exports in Kent will have to be diverted by the Willesdon depot in North London. The Shuttle service is therefore likely to be of more importance to companies in Kent. One third of companies in Devon believe that the Tunnel and related transport developments will improve their accessibility to UK and continental markets; the respective figure for companies in Dorset is only 11.1 percent. Companies in Dorset regard present cross-Channel transport facilities as more than adequate but this probably reflects the market orientation of their exports.

Companies in the South West (10) commented that increased accessibility to the Continent could only be experienced if supporting road and rail links to the Tunnel are improved, one company stated that 'BR links are pathetic'. It was shown in chapter 3, that all UK regions would experience significant increases in relative accessibility to continental markets, and that certain regions, such as Scotland, the North and East Anglia, could record an increase of the same magnitude as the South East. The above results substantiate these earlier findings. Companies in the South East and South West do not anticipate a different type

of an impact on their level of competitiveness. However, a number of companies in the South West, and none in the South East, regard the transport network as inadequate. This supports the conclusion reached in chapter 4 that the Government may have biased the potential benefits created by the Tunnel in favour of the South East, and is in-line with the general consensus of opinion expressed in the Literature Review (chapter 2). The lack of a regional freight terminal within the South West, and BR's generally conservative freight estimates, could prevent the region maximising the advantages offered by the Tunnel. However, company plans to use the Tunnel will in the end determine whether regional gains in accessibility are realised or not. But if international rail freight services are perceived as inadequate, companies are less likely to send their exports via the Tunnel.

Regional competitiveness: vulnerability to increased competition

Companies in both the South East and South West are optimistic about the impact of the Tunnel on the home market; 58.8 and 67.6 percent respectively, anticipate no increase in competition (see Table 6.8). Companies in Berkshire (76.2%), Buckinghamshire (83.3%) and Hampshire (79.2%) tend to be more confident that they will not be exposed to an increase in competition. No companies in Somerset expect increased competition resulting from the Tunnel and only 5.9 percent are unsure. One in five companies in both regions, however, do believe that they will become more vulnerable to increased competition.

INCREASED VULNERABILITY	SOUTH EAST	SOUTH WEST
YES	23.61	21.58
NO	58.80	67.63
DON'T KNOW	11.59	10.79

**Table 6.8: Vulnerability to increased competition:
percentage of companies in the South East
and South west.**

Companies in the South East currently planning to use the Tunnel are also much more likely to believe that they will be vulnerable to increased competition (32.6%). This is not the case for similar companies in the South West (22.7%), again suggesting feelings of "insulation". Since companies in the South East generally anticipate more of an impact on

the home market, it would seem probable that the "Third Markets" of companies in the South West and other regional manufacturers are likely to experience increased competition from continental producers. Nonetheless, at least two thirds of all companies do not believe that they will be more vulnerable to increased competition from continental imports, as a result of the Tunnel.

Of the companies which considered proximity to markets to be an important locational determinant, 37.9 and 33.3 percent in the South East and South West, respectively, anticipate increased competition resulting from the Tunnel. Companies primarily orientated to market considerations, are therefore more likely to fear increased imports from the Continent. As exports increase as a proportion of total sales, one would expect feelings of vulnerability to increased competition to reduce but this is only apparent for companies in the South East (see Table 6.9).

PERCENTAGE OF EXPORTS	FEELINGS OF VULNERABILITY ----- SOUTH EAST SOUTH WEST	
0 - 20	30.89	24.39
20 - 40	26.67	25.00
40 - 60	17.14	19.23
60 - 80	6.60	7.69
80 - 100	7.69	16.67

Table 6.9: The influence of exports on feelings of vulnerability to increased competition: percentage of companies in the South East and South West.

The reasons cited for optimism over the impact of the Tunnel on the home market do not vary by region; 26 companies in the South East and 14 in the South West regard their markets as already highly competitive, a further 8 and 10 companies, respectively, believe their markets to be too specialised, and 5 and 4 companies, respectively, expect no 'real' change. Companies in the two regions which expect increased competition as a result of

the Tunnel again tend to agree on the reasons why, namely that increased accessibility experienced by continental producers will encourage further penetration of the UK market, i.e. the "double-edged sword" (Pieda 1989b).

The threat of company relocations

Fears of a massive relocation of companies in response to improved cross-Channel accessibility, culminating in a southwards drift of industry in favour of the South East, were not substantiated by the results in chapter 5. These fears cannot be justified at the regional level of analysis either. Less than one percent of companies in the South East and no companies in the South West foresee the need to relocate. Since the South West, but more particularly the "Far South West", is one of the most isolated regions in the UK from the Tunnel, it can therefore be surmised that fears of company relocations from other peripheral regions are also misplaced. Only two out of the 372 companies which responded to the questionnaire survey foresee the need to relocate; both are from London. This issue receives further attention in the case studies of East Kent and the "Far South West".

Regional perceptions: a summary

Although more companies in the South East expect the Tunnel, in some way, to affect the locational characteristics of their present site, companies in both regions are fairly evenly divided in their optimism over the impact of the Tunnel on their own level of competitiveness. But companies which attach importance to proximity of markets and/or export a larger proportion of total sales are considerably more likely in the South East to anticipate increased accessibility resulting from the Tunnel. Feelings of vulnerability to increased domestic and continental competition reduce, on the whole, as exports increase relative to total sales for companies in the South East but not for companies in the South West. Such companies in the South East are therefore significantly more likely to be optimistic about the impact of the Tunnel on their ability to compete in both the home and continental marketplace.

On the whole, companies in the South West are as inclined to be as positive about the effect of the Tunnel on their level of competitiveness as companies in the South East. Such optimism for companies in the South West has to be questioned, particularly in terms of the home market. The "Third Market" impact of the Tunnel, as recognised by Pida (1989a&b) and CLES (1989), is likely to be damaging to regional manufacturers. The Tunnel will relatively improve the accessibility of continental producers to markets in the South East and the Midlands to the detriment of the more peripheral UK regions. While local markets in regions such as the South West are less likely to be affected by the Tunnel, companies will have to compete harder in their "Third Markets", namely the South East and the Midlands. The South East and the Midlands represent the largest domestic markets for UK manufacturers, thus any loss of market share will have a significant impact on the viability of the more peripheral UK companies and the future growth of the regional economies as a whole. Table 6.9 shows that feelings of vulnerability to increased competition from both UK and continental producers, as a result of the Tunnel, do not significantly reduce for companies in the South West as exports increase as a proportion of total sales. Since local markets are less likely to be penetrated by increased imports from the Continent, "Third Markets", such as the South East and the Midlands, will therefore remain relatively important even for companies exporting a larger proportion of their total sales. Chapter 8 will focus attention on the "double-edged" nature of improved accessibility and the "Third Market" impact.

6.1.3. Planned Usage of the Tunnel and its Services

It will become evident that current plans to use the Tunnel are fairly uniform between companies in both the South East and South West. It is appropriate therefore to examine the planned level of usage of the Tunnel and its services, before studying the current cross-Channel transport market. The time advantages of the Tunnel for passenger traffic, particularly via the Shuttle, will be predominantly restricted to the South East. Companies in the South East, however, do not significantly plan to utilise the Tunnel for business trips to a much greater extent than companies in the South West. Furthermore, it was argued in chapter 3 how the Tunnel could benefit certain peripheral UK regions, in terms of rail freight, to the same extent as the South East. More than 75 percent of exports to the

Continents originate from or are destined for regions outside the South East, nearly 25 percent within a 40 mile radius of Manchester (Pieda 1989b). Hence, it is important that BR offers an attractive service for companies outside the South East to optimise the future attraction of rail freight. Even though BR have already decided on the location of regional freight villages, there is still much concern that the more peripheral regions are likely to be discriminated against with a second class service (Pieda 1989b). This is particularly true for the "Far South West" since the nearest freight terminal serving the region is likely to be Cardiff. The outcome of the Section 40 regional consultations, as discussed in chapter 4, did little to allay the concerns of the more peripheral UK regions. Nonetheless, current plans to use the Tunnel for the exportation of freight to the Continent do not vary significantly between the two regions.

These issues will be discussed in more detail below. Explanations will be advanced for the apparent similarity in company plans to use the Tunnel for the two regions. Examination of the potential future demand for the Tunnel and the current cross-Channel business trip market, will be followed by an analysis of the freight market.

The business trip market

First the similarity in company plans to use the Tunnel will be examined. The current cross-Channel business trip market and the factors influencing company decisions will then be analyzed to determine the basis for this similarity.

The attraction of the Tunnel

As one can see from Table 6.10, there is less than a two percent difference between companies in the South East and South West planning to use the Tunnel for more than 20 percent of future business trips (11.2 and 9.4 percent, respectively). Table 6.11 provides a more detailed account of company plans to use the Tunnel, encompassing only companies currently planning to use the Tunnel for either business trips and/or freight exports. There is no apparent difference in the planned level of usage of the Tunnel but slightly more companies in the South East do plan to use the Tunnel to a higher degree.

Eurotunnel's Shuttle service is also slightly preferred over BR's international through trains for companies in both regions.

% OF BUSINESS TRIPS	SOUTH EAST			SOUTH WEST		
	TUNNEL	BR	SHUTTLE	TUNNEL	BR	SHUTTLE
0 - 20	83.26	76.82	74.25	87.05	81.29	78.42
20 - 40	6.01	0.86	2.15	4.32	0.0	1.44
40 - 60	2.15	9.01	9.44	4.32	7.19	5.76
60 - 80	1.72	3.00	0.0	0.0	0.0	1.44
80 - 100	1.29	3.43	7.30	0.72	4.32	5.76
DON'T KNOW	5.58	6.87	6.87	3.60	7.19	7.19

Table 6.10: Estimated future usage of the Tunnel for company business trips: percentage of all respondents in the South East and South West.

% OF BUSINESS TRIPS	SOUTH EAST			SOUTH WEST		
	TUNNEL	BR	SHUTTLE	TUNNEL	BR	SHUTTLE
0 - 20	68.60	57.16	44.19	70.45	54.55	45.45
20 - 40	16.28	2.33	5.81	13.64	0.0	4.55
40 - 60	5.81	24.42	25.58	13.64	22.73	18.18
60 - 80	4.65	8.14	0.0	0.0	0.0	4.55
80 - 100	3.49	9.30	19.77	2.27	13.64	18.18
DON'T KNOW	1.16	4.65	4.65	0.0	9.09	9.09

Table 6.11: Estimated future usage of the Tunnel for company business trips: percentage of companies currently planning to use the Tunnel in the South East and South West.

The results, however, do vary to some extent at the county level but, as stated above, one has to be careful when interpreting these results, due to the relatively small number of companies involved. Companies in Bedfordshire, Hampshire and Oxfordshire currently have no plans to use the Tunnel whilst more than 20 percent of companies in Kent and

Sussex plan to use the Tunnel for more than 20 percent of future business trips. Thus, companies in closer proximity to the Tunnel portal plan to use the Tunnel to a greater extent, especially the Shuttle service. Nearly 30 percent of companies in Kent plan for more than 20 percent of business trips through the Tunnel to go via the Shuttle compared to 20.8 percent by BR's international through trains. As stated earlier, the International Passenger Station at Ashford will be paramount in any decision by companies in Kent in using BR's international passenger trains. Companies in Hampshire seem to regard existing cross-Channel ferry services from Southampton and Portsmouth to be more than adequate. Of the companies in London planning to use the Tunnel, 27.2 percent anticipate more than 20 percent of business trips to go by BR's international through trains and 20.4 percent by Shuttle. London companies will be more efficiently served by the Waterloo and King's Cross international passenger termini, and thus a larger proportion currently anticipate using this service.

In terms of the South West, only companies in Dorset have no plans to use the Tunnel but 28.6 percent of companies in Cornwall plan to use the Tunnel for more than 20 percent of future business trip; the vast majority plan to use BR's international through trains. This figure is rather surprising considering that there are at present no plans for international passenger trains to serve Cornwall, and with links to London Waterloo considered as poor.

The current cross-Channel market

Similarities in current company plans to use the Tunnel and its services for future business trips cannot be explained by the present cross-Channel business trip market. Although the destination of business trips from both regions is fairly similar, there are significant differences in the frequency and the mode in which they are undertaken. The generation of business trips from companies in the South East is much more likely to be more frequent than once monthly (see Figure 6.3). More than three quarters of companies in the South East undertake business trips to the Continent more regularly than once monthly compared to 58.3 percent for companies in the South West:

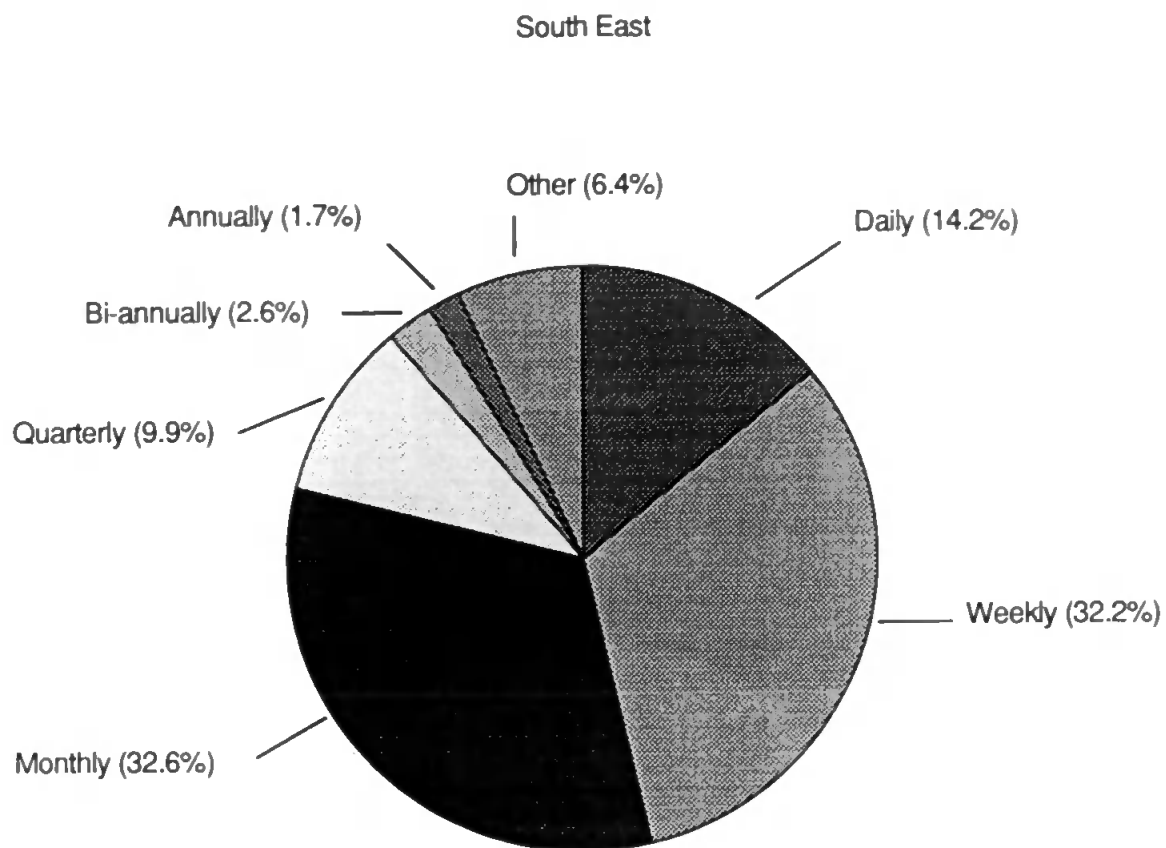


Figure 6.3: Frequency of Business Trips for Companies in the South East and South West.

South West

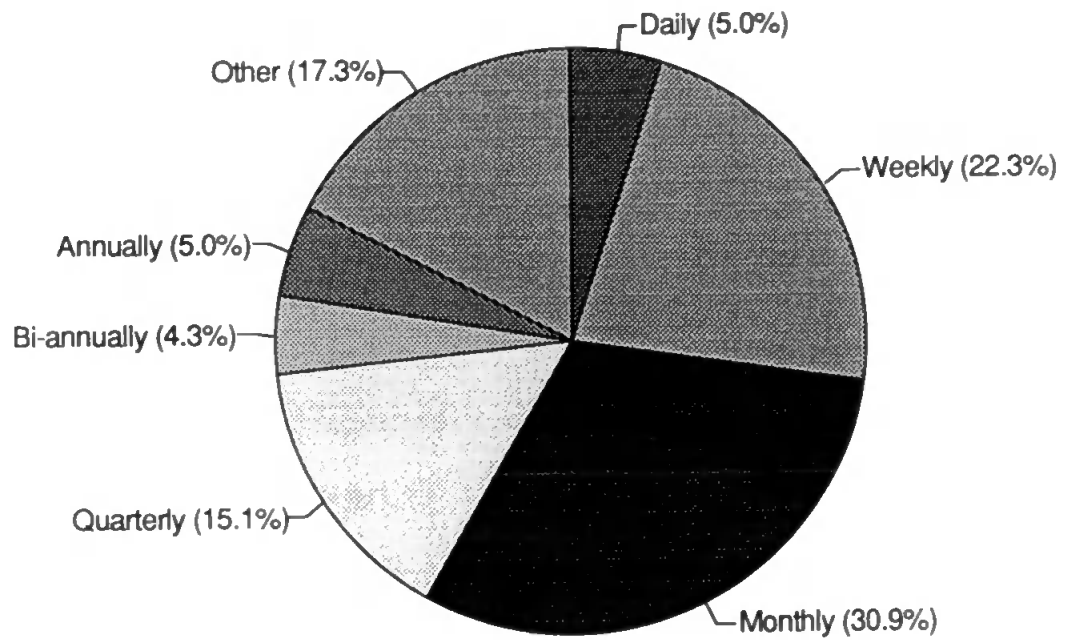


Figure 6.3 (cont'd): Frequency of Business Trips for Companies in the South East and South West.

Frequency	South East		South West		Σ_r
	Observed	Expected	Observed	Expected	
Daily	33	25.01	7	14.99	40
Weekly	75	66.29	31	39.71	106
Monthly	76	74.42	43	44.58	119
Quarterly	23	27.51	21	16.49	44
Bi-annually	6	7.50	6	4.50	12
Annually	4	6.88	7	4.12	11
Other	15	24.39	24	14.61	39
Σ_k	232		139		371

Table 6.12: Significance of regional location on frequency of business trips.

$$X^2 = 2.55 + 4.26 + 1.14 + 1.91 + 0.03 + 0.06 + 0.74 \\ + 1.23 + 0.30 + 0.50 + 1.21 + 2.01 + 3.62 + 6.04$$

$$X^2 = 25.60 \quad \text{degrees of freedom} = (7-1)(2-1) = 6$$

$$\begin{aligned} \text{critical value of chisquare:} \quad \alpha = 0.05, &= 12.59 \\ \alpha = 0.001, &= 22.46 \end{aligned}$$

The value of the calculated X^2 is higher than the critical value of chisquare, at a rejection level of $\alpha = 0.05$. Thus, it is possible to reject H_0 , or in other words, there is a significant difference in the frequency of business trips between companies in the South East and South West. The real differences in frequency can be seen in the individual cell values of X^2 , i.e. a larger proportion of companies in the South East undertake business trips more frequent than once weekly and companies in the South West less frequent than once per annum or not at all. The frequency of business trips does not vary significantly at the county level, except possibly for Cornwall where companies undertake business trips on a monthly or less frequent basis.

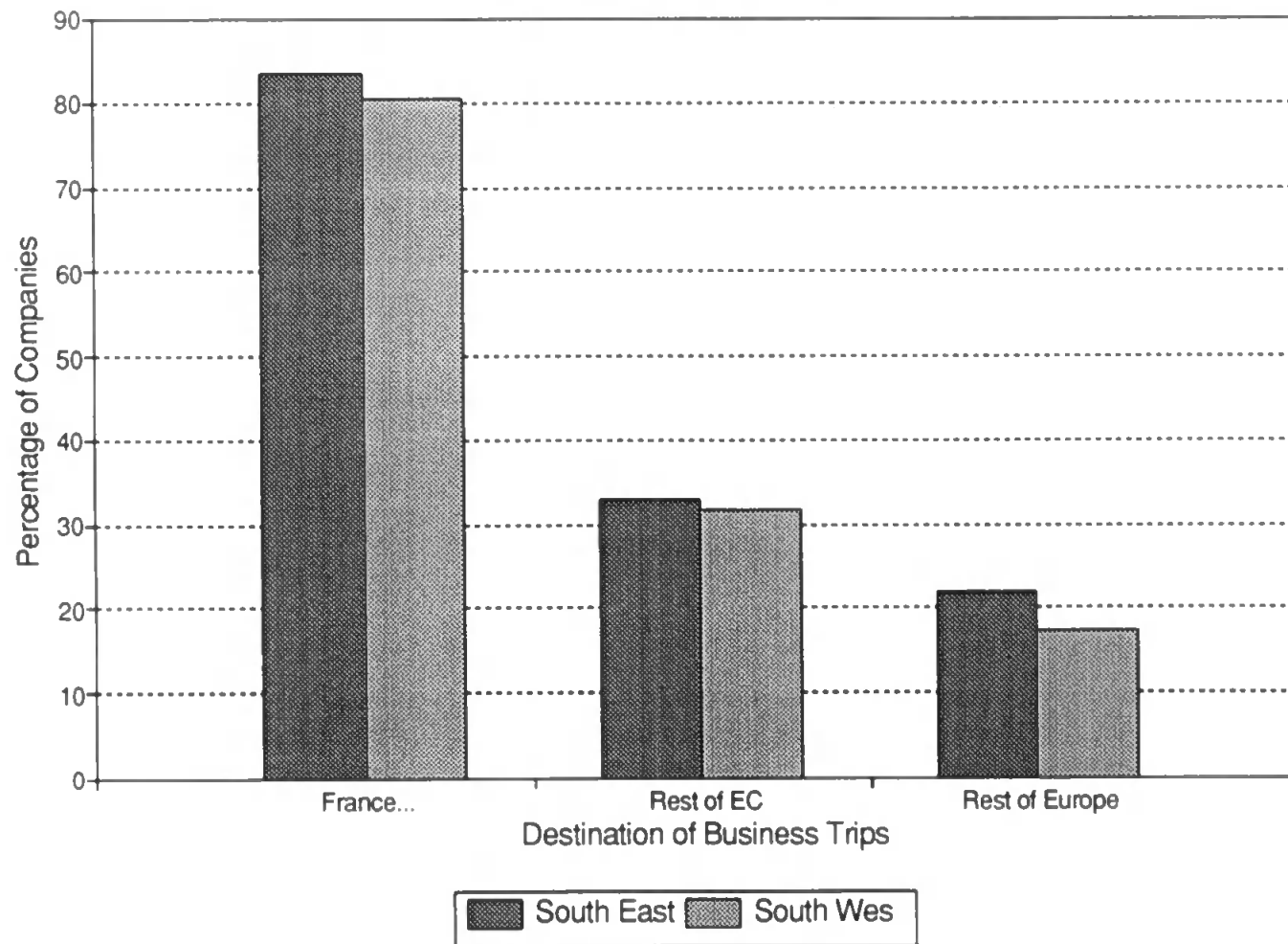
Figure 6.4 outlines the destination of current business trips for companies in the South East and South West. It is apparent that the destination of business trips are similar for companies in both regions, with over 80 percent going to 'France, Germany and the Low countries' and approximately one third going to the 'rest of the EC'.

MODE OF TRANSPORT	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
AEROPLANE	93.56	88.49
RAIL/FERRY	2.58	3.60
ROAD/FERRY	23.18	34.53
OTHER	0.43	1.44

Table 6.13A: Preferred mode of transport for current business trips to the Continent: percentage of companies in the South East and South West.

The preferred modes of transport for business trips are set out in Table 6.13A. Air travel is the preferred mode of transport for business trips in both regions but more companies in the South West currently go via road/ferry (34.5%), except for companies in Wiltshire where the respective figure is only 5.6 percent. The destination and mode of business trips at the county level also remains constant. Significantly more companies currently planning to use the Tunnel in both regions prefer road/ferry when undertaking business trips (see Table 6.13B). The attraction of road/ferry for companies currently planning to use the Tunnel explains the slight preference for Eurotunnel's Shuttle service. More than half of the companies planning to use the Tunnel in the South West at present use road/ferry.

Figure 6.4: Destination of Business
Trips - South East/South West.



MODE OF TRANSPORT	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
AEROPLANE	94.19	93.18
RAIL/FERRY	3.49	4.55
ROAD/FERRY	32.56	56.82

Table 6.13B: Preferred mode of transport for current business trips to the Continent: percentage of companies anticipating using the Tunnel in the South East and South West.

Factors influencing company plans

It can be seen from Table 6.14A. that companies in the South East are more likely to be influenced by journey time and reliability in their decision to use the Tunnel compared to companies in the South West. Companies in the South West are relatively more concerned with cost, even though journey time is still of paramount importance. Companies in Avon and Wiltshire, the more accessible counties of the South West, consider journey times to be the main factor in their decision to use the Tunnel for future business trips, 92.6 and 88.9 percent respectively, compared to only 57.1 percent for companies in Cornwall. Companies in both regions planning to use the Tunnel attach more importance to cost and 43.2 percent of such companies in the South West consider reliability to be important (see Table 6.14B).

FACTORS	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
COST	40.34	47.48
JOURNEY TIME	85.84	77.70
RELIABILITY	39.91	28.78
COMFORT	15.02	13.67
OTHER	10.30	11.51

Table 6.14A: Factors influencing the planned usage of the Tunnel for business trips: percentage of companies in the South East and South West.

FACTORS	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
COST	47.67	56.82
JOURNEY TIME	88.37	75.00
RELIABILITY	41.86	43.18
COMFORT	19.77	20.45

Table 6.14B: Factors influencing the planned usage of the Tunnel for business trips: percentage of companies anticipating using the Tunnel in the South East and South West.

Therefore, as shown in chapter 5, if companies are to use the Tunnel both BR's international passenger trains and Eurotunnel's Shuttle service will have to be competitive in terms of journey time. Relatively more companies in the South West are concerned with cost. Plans not to run an international daytime service to and from the South West (BR 1989b) will reduce the attractiveness of such a service for companies in that region. In addition, medium- and long-sea ferry services are likely to remain popular with companies in the South West (Gibb 1990).

Regional differences in the weight of importance attached to the above factors do not explain the similarity in present company plans to use the Tunnel for the South East and South West. The forecast usage of the Tunnel does not appear to be related to the present cross-Channel business trip market or strongly influenced by the above factors. The destination of business trips is however of paramount importance. The near Continent represents the main destination of business trips for companies from both the South East and South West. The destination of business trips will, on the whole, determine the attraction of the Tunnel and its services. The marginal preference for Eurotunnel's Shuttle service over BR's international through trains is a reflection of the main destination of business trips, namely 'France, Germany and the Low countries', and the current dominance of road haulage. The wider catchment area of BR's international through trains cannot be exploited by the majority of companies which undertake business trips to the near Continent, even though BR's principal services will be to Paris, Brussels and Cologne. However company plans to send freight by the Tunnel, particularly via rail freight, will determine the regional economic impact of the Tunnel. The next section will therefore focus attention on the freight market, with more general considerations discussed before making concluding remarks.

The freight market

Analysis of company plans to use the Tunnel for freight exports is undertaken according to the structure adopted in the preceding section. Thus, the level of anticipated Tunnel usage for freight exports is examined first. The current cross-Channel freight market and the factors which are likely to influence company plans will then be analyzed.

The attraction of the Tunnel

The anticipated level of demand for the Tunnel and its services for the exportation of freight is outlined in Tables 6.15 (all respondents) and 6.16 (companies currently planning to use the Tunnel). Table 6.16 provides a more detailed account of the likely demand for rail freight and the Shuttle service. It can be seen that current plans to use the Tunnel do not differ significantly by region. However, nearly one quarter of companies in the South

East remain undecided (see Table 6.15). Of the companies planning to use the Tunnel for the transportation of over 20 percent of their exports, 19.3 and 18.7 percent are from the South East and South West, respectively. Companies currently planning to use the Tunnel in the two regions do vary in their expected usage of the Tunnel. Companies in the South West planning to use the Tunnel do not differentiate between rail freight or the Shuttle service (see Table 6.16), while their counterparts in the South East generally prefer the Shuttle service. This would tend to support the earlier assumption that the benefits of the Shuttle service are predominately restricted to the South East. Nonetheless, there is, at present, no significant difference in the planned usage of the Tunnel for companies in either the South East or South West. The planned level of usage of the Tunnel also does not vary considerably within the two regions but companies in Kent are again more likely to use the Shuttle service.

% OF EXPORTS	SOUTH EAST			SOUTH WEST		
	TUNNEL	BR	SHUTTLE	TUNNEL	BR	SHUTTLE
0 - 20	58.37	58.80	57.08	66.19	66.19	66.19
20 - 40	8.58	2.58	1.72	7.91	0.72	0.0
40 - 60	7.30	8.15	8.15	8.63	10.79	10.79
60 - 80	1.72	2.15	2.15	1.44	0.0	0.72
80 - 100	1.72	3.43	6.01	0.72	5.04	5.04
DON'T KNOW	22.32	24.89	24.89	15.11	17.27	17.27

**Table 6.15: Estimated future usage of the Tunnel for company exports:
percentage of companies in the South East and South West.**

% OF EXPORTS	SOUTH EAST			SOUTH WEST		
	TUNNEL	BR	SHUTTLE	TUNNEL	BR	SHUTTLE
0 - 20	36.05	37.21	32.56	29.55	29.55	29.55
20 - 40	23.26	6.98	4.65	25.00	2.27	0.0
40 - 60	19.77	22.09	22.09	27.27	34.09	34.09
60 - 80	4.65	5.81	5.81	4.55	0.0	2.27
80 - 100	4.65	9.30	16.28	2.27	15.91	15.91
DON'T KNOW	11.62	18.61	18.61	11.36	18.18	18.18

Table 6.16: Estimated future usage of the Tunnel and its services: percentage of companies anticipating using the Tunnel in the South East and South West.

As highlighted in chapter 5, the regional economic impact of the Tunnel is likely to be limited. The long-term impact of the Tunnel depends ultimately on companies exploiting the advantages of improved journey times and cost, leading to significant savings for British industry. As explained in chapter 3, these advantages are predominately restricted to the rail network. Only 19 percent of companies in the South East and South West anticipate sending more than 20 percent of their exports via the Tunnel. Thus, the vast majority of companies do not plan to use the Tunnel, and only 3.4 and 2.2 percent of companies in the South East and South West, respectively, plan to send more than 60 percent of their goods through the Tunnel. Considerably fewer companies expect to use BR's international rail freight services. Hence, the results show that the impact of the Tunnel will be limited but, more importantly, since company plans are similar in the two regions, it is unlikely that the Tunnel will adversely affect the regional economic structure of the UK. Company plans to use the Tunnel for freight exports suggest the Tunnel will not detrimentally affect the more peripheral regions, such as the "Far South West". However, it is now necessary to determine why the anticipated usage of the Tunnel is similar for companies in the South East and South West. The current cross-Channel freight market will be examined next, before identifying the factors likely to influence company decisions.

The current cross-Channel market

The preferred modes of transport for existing exports to the Continent are set out in Table 6.17A. 'Other' refers to postal service, couriers and Hoverspeed, etc. It can be seen that relatively more companies in the South East at present send exports to the Continent via rail freight but that, on the whole, company preferences between the two regions for current modes of cross-Channel transport do not diverge significantly. Companies planning to use the Tunnel are more likely to send exports to the Continent by RoRo and LoLo ferry services, especially companies in the South West (see Table 6.17B). The existing preference of companies planning to use the Tunnel for RoRo ferry services explains the current attraction of the Shuttle service. The Shuttle service will offer road hauliers more flexibility, with Shuttle trains running up to every 15 minutes and total transit times less than half an hour.

MODE OF TRANSPORT	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
AEROPLANE	20.60	23.02
RAIL FREIGHT	19.31	13.67
RoRo FERRY	51.93	48.92
LoLo FERRY	17.60	16.55
OTHER	7.73	14.39

Table 6.17A: Preferred mode of transport for current freight exports to the Continent: percentage of companies in the South East and South West.

MODE OF TRANSPORT	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
AEROPLANE	20.93	22.73
RAIL FREIGHT	25.58	15.91
RoRo FERRY	63.95	70.45
LoLo FERRY	15.12	25.00

Table 6.17B: Preferred mode of transport for current freight exports to the Continent: percentage of companies anticipating using the Tunnel in the South East and South West.

Therefore, the existing pattern of cross-Channel transportation accounts to some extent for the anticipated preference, albeit slight, for the Shuttle service over rail freight. However, the current use of certain modes of transport for the exportation of freight cannot completely explain the similarity in the anticipated overall use of the Tunnel for companies in the South East and South West.

Factors influencing company plans

Companies in both regions seem to attach the same weight of importance to potential factors influencing the future usage of the Tunnel for freight exports, except for cost (see Table 6.18A). Companies stating 'other' primarily leave all distribution and transportation considerations to their couriers. Over two thirds of companies in the South East generally regard cost to be an important determinate of any future usage of the Tunnel, compared to 58.3 percent of companies in the South West.

FACTORS	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
COST	67.81	58.27
JOURNEY TIME	42.92	46.04
RELIABILITY	45.06	35.97
OTHER	7.30	10.79

Table 6.18A: Factors influencing the planned usage of the Tunnel for freight exports: percentage of companies in the South East and South West.

As is evident from Table 6.18B, the importance attached to cost rises significantly for companies planning to use the Tunnel in both regions. Companies planning to use the Tunnel in the South West also attach much more importance on reliability. The degree of importance attached to cost may differ but the vast majority of companies in both regions believe it to be the paramount consideration. The overall attraction of the Tunnel will therefore be dependent on the level of tariffs introduced by both RailFreight Distribution and Eurotunnel. Thus, the 'cost' factor could explain to a certain extent the similarity in the planned usage of the Tunnel by companies in both regions. Until the tariff rates for both services through the Tunnel are made public, companies in the two regions will only then be in a position to provide accurate forecasts of the future usage of the Tunnel.

FACTORS	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
COST	81.40	72.73
JOURNEY TIME	45.35	50.00
RELIABILITY	55.81	54.55
OTHER	11.36	6.98

Table 6.18B: Factors influencing the planned usage of the Tunnel for freight exports: percentage of companies anticipating using the Tunnel in the South East and South West.

As shown earlier, a larger proportion of companies in the South East export (see Table 6.3A). Over 11 percent of companies in the South East export more than 80 percent of their goods compared to only 4.3 percent of companies in the South West. Approximately two thirds of all companies export to other EC countries. The extent and the market orientation of company exports was shown not to affect anticipated Tunnel usage. It would seem that existing company preferences for RoRo ferry services, and the level of importance attached to cost, will ultimately influence the planned usage of the Tunnel and its services. The regional location of companies therefore does not affect the anticipated level of Tunnel usage for freight exports.

Plans to use the Tunnel for future business trips for both regions are likely to be influenced more by destination and journey time. However, the future demand for the Tunnel for freight exports will be more responsive to the cost of either BR's international through trains and/or Eurotunnel's Shuttle service. Company plans to use the Tunnel for both business trips and freight exports will not remain static; certain policies could persuade companies in either region to revise their estimated usage of the Tunnel. It is therefore important to determine what strategies, adopted by the Government, BR and/or Eurotunnel, are likely to influence current plans to use the Tunnel, as well as highlight any regional differences and/or similarities. The availability of information and the psychological importance of the SEM and the Tunnel, will also be examined to identify any regional bias. Finally, it is important to analyze the perceived overall impact of the Tunnel on the companies' respective regions.

6.1.4. A South East Bias?

Comparative analysis of the results between the South East and South West has so far shown no significant differences in company perceptions of the Tunnel or future plans to use its services. Companies in the South East, however, are more likely to believe that the Tunnel will have a beneficial impact on their region. It has been suggested in this chapter that feelings of peripherality for companies in the South West are generally countered by the belief that they will be insulated from most of the adverse effects of the Tunnel. This

assumption is supported by the percentage of companies anticipating an overall neutral impact on their respective region.

Current company plans to use the Tunnel will continually be revised as more information becomes available, particularly with regard to cost. Certain strategies adopted by either the Government, BR and/or Eurotunnel could encourage companies to revise their estimated usage of the Tunnel.

' STRATEGIES '	PERCENTAGE	
	SOUTH EAST	SOUTH WEST
INCREASED INVESTMENT	11.16	5.76
SERVICE QUALITY	26.61	30.94
INCREASED RELIABILITY	16.31	13.67
COMPETITIVE PRICES	21.46	27.34
INCREASED ACCESSIBILITY	13.30	12.95
OTHER	43.17	33.91

Table 6.19: Strategies perceived necessary to increase the anticipated usage of the Tunnel: percentage of companies in the South East and South West.

Except for the level of transport infrastructure investment, companies in both regions generally agree on the need for certain strategies (see Table 6.19). 'Other' incorporates a wide variety of responses but most refer to 'none', i.e. that no initiative by either the Government, BR or Eurotunnel would encourage companies to use the Tunnel to a higher degree.

Compared to the South West, twice as many companies in the South East regard increased investment in supporting transport infrastructure as necessary. The on-going public debate within the South East over the high-speed rail link could account for this difference. The results reveal no bias in the perceived need for increased accessibility, by road or rail, to Tunnel services. One would tend to expect a larger proportion of companies in the South West to demand improved access to Tunnel services but this proved not to be the case.

One quarter of companies in Devon do, however, believe that accessibility to Tunnel services should be improved. Only 4.8 percent of companies in Berkshire consider there to be a need for improved accessibility to Tunnel services; the respective percentages for companies in Hampshire, Essex and Surrey are 29.2, 25.0 and 21.1 percent. As a result of delays associated with the high-speed rail link and the International Passenger Station at Ashford, 12.5 percent of companies in Kent also believe there is a need for improved access to Tunnel services. BR's international rail freight proposals also fail to serve the needs of companies in Kent. Companies in Berkshire are much more positive about their ability to utilise Tunnel services than companies in the Tunnel's immediate hinterland, namely Kent and Surrey.

More than one quarter of companies from both regions would like to see BR improve overall service quality, with more and faster trains. Contradicting earlier findings, slightly more companies in the South West stated that competitive prices for BR and Eurotunnel services would encourage them to revise favourably their planned usage of the Tunnel. More companies in the South East stress the importance of reliability in any future usage of the Tunnel. Companies in Essex and Oxfordshire are much more likely to foresee the need for an overall improvement in BR's passenger and freight services.

The level of information available to companies did not vary by region; 33.1 and 30.2 percent of companies in the South East and the South West, respectively, believe that information concerning the Tunnel has been easily available. Approximately 45 percent of companies in both regions are not satisfied with the availability of information concerning services offered by BR and Eurotunnel. It can therefore be argued that any regional differences and/or similarities in the results are not the consequence of more companies in either region being more informed. Closer to the opening of the Tunnel, one would expect both BR and Eurotunnel to step-up their publicity campaigns, as well as finalise service timetables and tariff rates.

The impact of the SEM and the Tunnel on company attitudes toward Europe does not seem to change between regions. Over one third of companies are now re-assessing the potential of European markets but the Tunnel is regarded as insignificant within the wider

context of the SEM; 20.2 percent of companies specifically state that the SEM would make them more European in outlook. However, 22.3 and 21.6 percent of companies in the South East and South West, respectively, believe that they are already European in outlook. As one would expect, companies planning to use the Tunnel are more likely to become more European in their outlook, 47.7 and 43.2 percent for the South East and South West respectively.

Comparative analysis of the results between the South East and South West has constantly highlighted important similarities in company reactions toward the Tunnel. Company perceptions of the overall regional economic impact of the Tunnel, however, differ significantly between companies in the South East and South West. Nearly two thirds of companies in the South East anticipate a beneficial impact, 6.0 percent 'neutral' and only 12.0 percent 'damaging'. A larger proportion of companies in Kent, 29.2 percent, expect the impact to be damaging. The ferry and port-related industry represents one of the largest employers in Kent, thus the rationalisation of short-sea ferry services has had/will have important repercussions for the county, particularly the coastal towns of Dover, Folkestone and Ramsgate. Chapter 7, the case study of East Kent, will examine the impact of the Tunnel on the port and ferry industry, as well as the longer term implications of the Tunnel.

Only one quarter of companies in the South West believe the impact will be beneficial, 10.1 percent are unsure. Feelings of "insulation" are reflected in the 33.8 percent of companies in the South West anticipating a neutral impact but 20.1 percent also predict the impact of the Tunnel on the South West to be damaging. Over half of the companies in Cornwall (57.1%) and Wiltshire (50.0%) are optimistic as to the implications of the Tunnel for the South West. Only 12.5 percent of companies in Devon believe the impact will be beneficial. The respective percentages for companies in Devon and Cornwall would seem to contradict each other but one has to be careful when interpreting findings at the county level; the absolute number of companies in both regions is 24 and 7 respectively. As one would expect, companies planning to use the Tunnel are more optimistic; 70.9 and 36.4 percent in the South East and South West, respectively, anticipate a positive impact on their regions.

The apparent optimism of companies in the South East, as compared to the South West, contradicts the earlier findings. The regional analysis of the results has identified a considerable degree of similarity in company perceptions of and likely reactions to the Tunnel. Nonetheless, companies in the South East are much more likely to anticipate a positive impact on the regional economy in which they are located. The media's portrayal of the South East as the main beneficiary (see the Literature Review), probably accounts for the contrasting levels of optimism. A more detailed examination of the regional economic implications of the Tunnel will be carried out in the case studies of East Kent and the "Far South West". However, it is first appropriate to conclude the current chapter, outlining the likely impact of the Tunnel as perceived by the companies.

6.2. Conclusion

Regional differences in the perceived overall economic impact of the Tunnel cannot be attributed to conflicting perceptions of the Tunnel. Future plans to use the Tunnel also fail to show any significant differences between companies in the South East and South West. The most striking feature of this regional analysis is the degree of similarity between companies in the two regions. The widely believed South East bias of the Tunnel is not reflected in company perceptions, in terms of how their level of competitiveness is likely to be affected, or in current plans to use either BR's international through trains and/or Eurotunnel's Shuttle service. Nonetheless, companies in the South East generally anticipate a favourable overall regional impact from the Tunnel and related transport developments. This perception may have been influenced by the short-term construction multiplier of the Tunnel, which is predominately confined to the South East and the Midlands. Companies in Kent are more aware of the medium-term impact of the Tunnel on the cross-Channel ferry and port-related industry (see chapter 7); thus nearly 30 percent believe the Tunnel will adversely affect the region.

It was shown in chapter 5 that the vast majority of companies do not anticipate using the Tunnel for business trips and/or freight exports. But, more important, no regional bias is

evident. Approximately 19 percent of companies in both regions only plan to use the Tunnel for more than 20 percent of freight exports. However, 22.3 and 15.11 percent of companies in the South East and South West respectively are uncertain and so could be encouraged to use the Tunnel. If company plans do remain relatively static, the long-term impact of the Tunnel is likely to be limited and the more peripheral regions are unlikely to be adversely affected. The findings of the questionnaire survey for Devon and Cornwall, which are generally regarded as exhibiting characteristics commonly associated with the "North" (Green 1988), reflect the regional and overall averages.

Company perceptions of the Tunnel support the conclusion that no regional bias is apparent which could detrimentally affect the more peripheral UK regions. In terms of the impact of the Tunnel on the level of competitiveness, companies in the South West tend to be as optimistic as their counterparts in the South East. The overall results (analyzed in chapter 5) showed that nearly 30 percent of companies believe that their accessibility to both UK and continental markets will be improved as a result of the Tunnel. Approximately two thirds also cannot foresee any increase in competition in the home market. Since the Tunnel is not perceived to affect the South East or the South West differently, it is unlikely that the regional economic structure of the UK will be affected significantly.

CHAPTER 7: THE HOMOGENEOUS SOUTH EAST -

THE QUESTION OF EAST KENT

Attention has so far focused on the main factors affecting the national and regional economic impact of the Tunnel and related infrastructure. As outlined in chapter 1, the present thesis is structured according to three broad strands of analysis: the impact of the Tunnel on regional accessibility (chapter 3); the policy and legislative framework of the Tunnel and related infrastructure (chapter 4); and company perceptions of and likely reactions to the Tunnel (chapters 5 & 6). Case studies of East Kent and the "Far South West" will now highlight the specific hopes and fears within these areas as regards the Tunnel, as well as allow discussion of the findings of the preceding chapters at this local level of analysis. Utilising these two case studies should allow the wide spectrum of Tunnel-related pressures, both positive and negative, to be addressed and comparisons to be made.

The case studies of both East Kent and the "Far South West" will rely on published reports and academic articles, as well as original data generated for the current research project. In terms of East Kent, the analysis will be based primarily on the Kent Impact Study (KIS - 1987) and the follow-up reports from the Channel Tunnel Joint Consultative Committee (CTJCC), especially the 'Kent Impact Study: 1991 Review' (the Review). The present study critically examines these reports for the first time, contrasting the optimistic findings of the KIS with the more "realistic" predictions set out in the Review. In addition, the findings of the questionnaire survey undertaken for the present study will be drawn on but, as a result of the small number of respondents involved, caution must be used when interpreting the findings. Finally, interviews were carried-out with officials from local government within East Kent, including a representative of the 'East Kent Initiative' (EKI) set up by the CTJCC.

7.1. Introduction

The Tunnel portal and the proposed International Passenger Station (IPS) at Ashford, are both located within East Kent. Hence, it is widely believed that East Kent, and the county as a whole, will experience the greatest impact of the Tunnel; economically, socially and environmentally:

'By far the largest impact of the Tunnel - both positive and negative - will be felt in East Kent.'

(CTJCC, 1987, P.21)

However, a favourable outcome is far from guaranteed. Indeed, the impact of the Tunnel on the port and ferry industry could seriously damage the local economies of the port and coastal towns, especially Dover. Furthermore, Ashford, which was to act as a 'Growthpole' (CTJCC 1987), is no longer regarded as a suitable base for an economic recovery of East Kent (CTJCC 1991a&b). Since the KIS (1987), the negative effects of the Tunnel are now being experienced, with both the run-down of TML construction jobs and the rationalisation of the port and ferry industry. The anticipated long-term positive effects of the Tunnel are still at best estimates. It is therefore appropriate to examine the potential economic impact of the Tunnel on East Kent according to three broad categories:

- (1) The short-term impact - the construction and the associated Multiplier effects.
- (2) The medium-term impact - the immediate impact on the competitive structure of the cross-Channel ferry industry.
- (3) The long-term impact - it is hoped British industry will rethink its location and distribution policies in favour of East Kent.

It will become apparent that these three categories are determined by the type of impact, not their time-scale. For example, the closure of Folkestone harbour to traditional ferry services is related to the medium-term impact which looks at the effect of the Tunnel on the port and ferry industry. Before proceeding further with this analysis, it is useful to refer

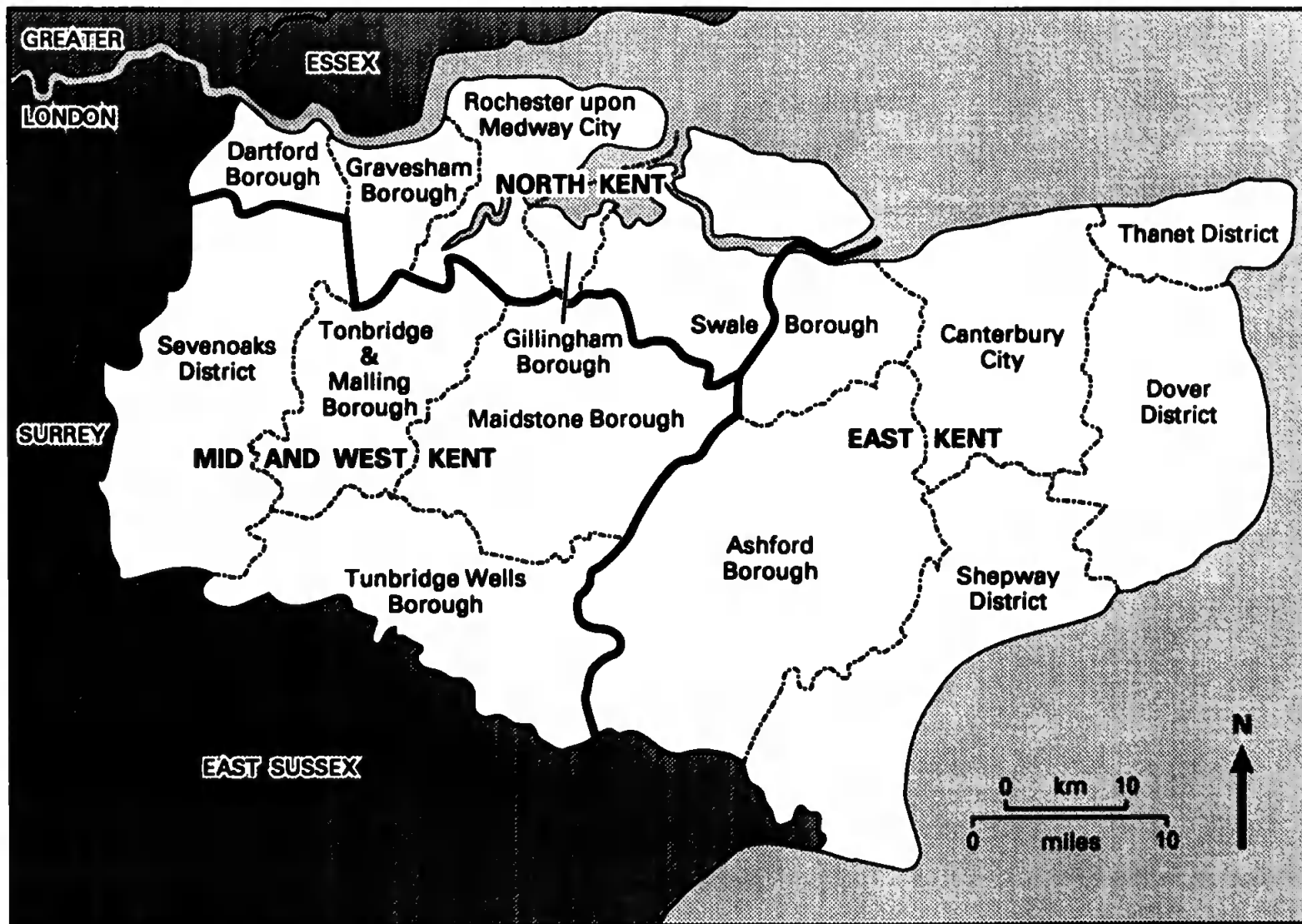


Figure 7.1 The sub-region of Kent

Source ; CT JCC 1987

to the map of East Kent (see Figure 7.1), which identifies the six districts within the area. Tunnel-related infrastructure is primarily located in Ashford, Shepway and Dover, thus the case study will concentrate on these three districts within East Kent.

7.2. The Short-Term Impact

East Kent does not share in the economic prosperity usually associated with the South East. Although the unemployment rate for East Kent nearly halved between 1986 and 1989, from 12.4 to 6.5 percent, it has consistently lagged behind the unemployment rate for the county as a whole (CTJCC 1989). Partly for this reason, the CTJCC (1986, 1987, 1989) points to the benefits that would accrue from the short-term construction impact of the Tunnel, and thus provide an immediate boost to East Kent's stagnating economy.

'Conventional economic analysis of major construction projects treat the cost of construction as a major injection into the regional economy which has an important multiplier effect.'

(Vickerman 1989a, P.5)

Inward investment into East Kent as a result of the Tunnel has taken the form of newly created construction jobs and the placement of contracts. The local orientation of the Tunnel during construction determines the magnitude of the multiplier effect for the East Kent economy. Analysis of the short-term impact will first concentrate on the number of construction jobs created, before focusing attention on the local placement of construction contracts. Since the CTJCC (1987, 1989, 1990, 1991a) has consistently been unable to breakdown the figures sufficiently for East Kent, the short-term analysis is based primarily on statistics for the county as a whole.

7.2.1. Local TML Recruitment

The KIS estimates that TML would employ approximately 3,400 workers at its peak during 1990. However, this estimate proved to be extremely conservative. Although few statistics are available, it is worth pointing out that the KIS believes that East Kent's large pool of

unemployed workers represented a good potential source of TML employment. The CTJCC (1989) reports that the total TML workforce (full-time staff, hourly paid workers and sub-contractors) reached nearly 5,200 by the end of 1988 (see Table 7.1). From the 'TML Database', the CTJCC shows that 36 percent of the TML full-time staff were resident in Kent at the end of 1988 (for those working in Kent the proportion is 42 percent) as well as 49 percent of the hourly paid employees. Of the hourly paid employees that are resident in Kent, over half are believed to be from East Kent.

	FULL-TIME STAFF	HOURLY PAID	SUB CON- TRACTED	TOTAL
SHAKESPEARE CLIFF	795	1,905	614	3,314
GRAIN	122	439	52	613
CHERITON	201	129	382	712
FOLKESTONE OFFICE	249	-	26 ¹	275
KENT	1,367	2,473	1,068	4,908
SUTTON OFFICE	208	-	73	281
TOTAL	1,575	2,473	1,141	5,189

Table 7.1: TML employment at the end of 1988.

(Source: CTJCC 1989, P.21)

The KIS is correct in anticipating that TML recruitment would peak during 1990. By October 1990, the TML construction workforce totalled 8,300 (CTJCC 1991a), more than double the level anticipated by the KIS. However, Kent's share of the recruits fell to 35 percent as compared to 50 percent of hourly paid workers (3,056) at the end of 1989 (CTJCC 1990). In addition, 1,827 people were employed as sub-contractors but the majority were from outside Kent. Thus, by October 1990, the total TML labour force exceeded 10,000 workers, with relatively fewer people drawn from within Kent. The latest

available figures show that by March 1991, 6,334 construction staff remained; 4,957 at Shakespeare Cliff, 1,199 at Cheriton and 178 at the Isle of Grain (CTJCC 1991a).

The CTJCC (1989) was only able to identify 811 of Kent residents employed by TML in 1988 as formerly unemployed, therefore the construction of the Tunnel is likely to be of limited benefit to East Kent and the county as a whole. Furthermore, longer term problems are likely to be encountered as a result of the "run-down" of the larger than expected TML workforce (see Table 7.2A). Between May 1991 and the completion of the Tunnel, redundancies will total 8,370. The percentage and number of these redundancies accounted for by Kent residents is set out in Table 7.2B, with over 4,400 redundancies expected in the county. Of the Kent residents, more than half of the TML job losses, not including subcontractors, are skilled or semi-skilled operatives. The re-employment prospects for these skilled and semi-skilled workers will certainly compare favourably with the unskilled redundant TML workers.

	STAFF	OPERATIVES A B		SUB CON- TRACTED	TOTAL
MAY 91 - DEC 91	300	1550	450	500	2800
JAN 92 - DEC 92	915	2000	350	1000	4265
DEC 92 - (1993)	235	680	40	350	1305
TOTAL	1450	4230	840	1850	8370

Table 7.2A: Expected 'run-down' of the TML construction workforce.

(Source: CTJCC 1991a, P.23)

(A = Skilled and Semi-Skilled, and B = Unskilled)

	REDUNDANCIES	%age KENT RESIDENTS	No. of KENT RESIDENTS
STAFF			
Managerial, etc	730	40	292
Clerical	720	80	576
OPERATIVES			
Skilled/	4230	40	1692
Semi-skilled			
Unskilled	840	90	756
SUBCONTRACT	1850	60	1110
TOTAL:			
incl. subcontract	8370		4426
excl. subcontract	6520		3316

Table 7.2B: Proportion and number of TML redundancies which are Kent residents.

(Source: CTJCC 1991c, P.8)

Nonetheless, the magnitude of the these redundancies within such a short period of time - less than two years - will place a considerable strain on the resources of local authorities, especially in East Kent where unemployment levels are already high. The Review has placed considerable stress on the need for an effective retraining initiative, backed by the Department of Employment. The short-term beneficial impact of the Tunnel has always been recognised as transitory but the large-scale redundancies up to the opening of the Tunnel are likely to have longer term adverse effects on the local economy of East Kent and the county as a whole. Of the 4,400 redundancies for Kent residents, it is reasonable to assume that more than half will be from East Kent (CTJCC 1991a). Based on previous large construction projects, the KIS (1987) calculates the value of the regional multiplier to be 1.3. Again this has short-term beneficial effects but the run-down of the TML workforce will also place a further 1,320 jobs at risk in local industries (30 percent of 4,400).

7.2.2. The Local Orientation of Construction Contracts

'It was always recognised that this (construction orders) would not have a very major impact on the Kent economy, or even on the south east region as a whole.'

(Vickerman and Flowerdew, 1990, P.71)

The CTG (1985a) estimated that the South East as a whole would only attract 7.25 percent of construction orders. However, the CTJCC (1989) shows that the South East attracted 27 percent of TML (UK) construction contracts by March 1989, of which one third were located in Kent (see Table 7.3). Of the £492 million of TML (UK) contracts awarded by March 1989, £44 million were placed within Kent due to its advantage of proximity to the Tunnel. But as pointed out by the CTJCC (1989), this represented only one percent of Kent turnover in manufacturing in a single year. In addition, by March 1989, the major orders, such as new locomotives and rolling stock, had still to be awarded.

	PERCENTAGES
KENT	9
REST OF THE SOUTH EAST	18
REST OF UK	42
EEC - REST OF WORLD	8
MULTI-NATIONAL	23

Table 7.3: Distribution of TML (UK) contracts: up to March 1989.

(Source: CTJCC 1989, P.25)

Thus, the relatively high figure for Kent reflects the initial set-up costs for the Tunnel project, with local companies awarded contracts to build site offices and supply materials, as well as providing certain consultancy services. Tunnel-related construction orders also encompass the £600 million committed by BR to the upgrading of existing track and the introduction of new locomotives, and the £330 million designated by the Department of Transport to improve the county's road network. However, the contracts for new

locomotives and rolling stock have been predominately awarded to companies in the Midlands. The siting of the IPS at Ashford and the routing of the high-speed rail link through Kent have both encountered serious delays, significantly reducing the short-term construction impact of the Tunnel and related infrastructure. The later report by the CTJCC, the 1991 Review, is seriously flawed in that it fails to up-date the regional placement of TML contracts.

The combined effects of TML employment and the placement of contracts within Kent, and the related positive multiplier effects, can only be considered as having a beneficial but modest impact. The beneficial construction effects of the Tunnel have always been regarded as short-term but little consideration has been given to the long-term problems created by the run-down of the TML workforce. Few statistics are available for East Kent but it is reasonable to assume that the above conclusion for the county is also applicable to East Kent. However, East Kent will have to absorb a large proportion of the 4,400 redundant TML construction workers, relative to the other areas in Kent.

The situation in Kent contrasts with that found in Nord-Pas de Calais. Chapter 4 has already highlighted the conflicting policies of the British and French Governments toward the short-term impact of the Tunnel. While the British Government encouraged the regional distribution of construction benefits throughout the UK, their French counterparts favoured a policy of consolidation within the relatively depressed region of Nord-Pas de Calais. By January 1989, the Nord accounted for 47.4 percent of the FF2801 million worth of construction orders, as well as 74.9 percent of the 2145 employees.

British Government policy has meant that the short-term construction benefits stemming from the Tunnel have been spread too thinly to be of any real importance to any UK region (Vickerman 1987), even in East Kent where most of the infrastructure is located. East Kent therefore has to look towards the longer term impact of the Tunnel but the immediate effect of the Tunnel on the port and ferry industry will have serious adverse repercussions for the local economy. The rationalisation of the port and ferry industry will come on top of the TML redundancies and before any positive secondary development.

7.3. The Medium-Term Impact

'The medium-term effects are those to be felt immediately on the Tunnel's opening in 1993 but prior to any longer run adjustments of industrial location or trade flows.'

(Vickerman 1989a, P.6)

The medium-term impact incorporates the effect of increased competition from the Tunnel on the short-sea port and ferry industry. It is important to determine how increased capacity for cross-Channel traffic will ultimately affect existing ferry services. The ferry and port related industry has been one of East Kent's few growth industries, accounting for approximately 13,000 jobs in the late 1980s. The KIS considers that between 4,300 and 6,600 jobs in the ferry and port-related industry could be lost as a result of the Tunnel. But the KIS has again significantly underestimated the extent of the job losses (CTJCC 1991a&c). The jobs created by Eurotunnel will fall far below the level of job losses in the port and ferry industry, resulting in a net reduction in the level of employment in East Kent.

Analysis of the medium-term impact of the Tunnel on East Kent will focus initially on the estimated net job losses in the cross-Channel surface transport industry. The rationalisation of the port and ferry industry will have serious repercussions for the port towns of Dover, Folkestone and Ramsgate. Based on work carried-out by Chisholm (1986) and Szymanski and Manning (1989), the likelihood of a complete collapse of the short-sea ferry industry will also be examined. Finally, attention will focus on the plans of the two dominant ferry companies, namely P&O and Sealink. Provisions have been made to ensure the long-term survival of the short-sea ferry industry. A much rationalised version of the current ferry industry is regarded as vital to the long-term survival of this industry.

7.3.1. The Net Employment Implications

The CTG's (1985b) forecasts for the level of employment in the ferry and port-related industry for 1993 and 2003 are set-out in Table 7.4.

	1985	1993		2003	
		WITHOUT	WITH	WITHOUT	WITH
DOVER/FOLKESTONE/ HYTHE: TUNNEL PORTS	- 10910	- 12560	2460 8810	- 13910	3750 8285
ASHFORD: TUNNEL PORTS	- -	- -	1330 -	- -	1810 -
TOTAL	10910	12560	12600	13910	13845

Table 7.4: Employment in the East Kent port and ferry industry: with and without the Tunnel.

(Source: CTG 1985b)

Following an initial job loss, the CTG predict:

....a slight net increase in job levels over that which might occur at the ports in the absence of a link by 1993.'

(Gibb 1986b, P.340)

The CTG does foresee the Tunnel eventually leading to a net reduction in employment levels by 2003 but independent commentators consider it unlikely that the Tunnel will at any time lead to a net gain in employment levels:

'It is not possible to have it both ways. Either a fixed link saves labour and is cheaper or it provides employment and is dearer.'

(Gibb 1986b, P.340; after Cairncross 1982)

The CTG's forecasts for minimal job losses by 2003 have therefore been discredited and are now out-dated.

The Review (CTJCC 1991a) anticipates that only between 1,500 and 2,000 jobs will be created directly by Eurotunnel and associated rail operations, compared to the KIS's forecast of 3,200 job gains. This reduction in the level of expected job gains has far-reaching implications for East Kent since the extent of job losses in the port and ferry industry is likely to be more severe than as originally envisaged by the KIS. The Review's

'most favourable likely outcome' for the level of employment in the East Kent port and ferry industry is outlined in Table 7.5. Based on the combined impact of the Tunnel and the SEM, more than 7,300 job losses are expected between 1991 and 1994, with 5,400 at the Port of Dover.

	1987	1991	FORECAST JOB LOSSES 1991-1994
DOVER	10400	10400	-5400
FOLKESTONE	820	800	-800
RAMSGATE	640	1050	-780
ELSEWHERE (inc ASHFORD)	320	740	-330
TOTAL	12180	12990	-7310

Table 7.5: Estimated job losses in the East Kent port and ferry industry.

(Source: CTJCC 1991 a, P.29)

Folkestone has already ceased operating as a traditional ferry port but the new SeaCat service is running between Folkestone and Boulogne, as well as a new freight service. Thus, some of the 800 jobs initially lost have been recovered. However, Sea Containers Ltd, the owners of Folkestone Harbour, are not prepared to give a long-term commitment to Folkestone and the SeaCat service (personal interview: Jarret 1992). In addition, the Port of Dover will be privatised in 1995, gaining 'Trust Port' status. The CTJCC (1991c) does not rule out the possibility that Eurotunnel may attempt to become the new owner. However, this would obviously restrict competition and would be referred to the Monopolies and Mergers Commission.

The Tunnel is therefore likely to result in the direct loss of between 5,480 to 5,980 jobs in the East Kent cross-Channel surface transport industry. However, the CTJCC (1991c) has based its estimates of job losses on the proposed merger of P&O and Sealink. The

Tunnel will create excess capacity in the cross-Channel transport market, leading to a damaging price war between Eurotunnel and ferry operators. The merger is therefore considered necessary to ensure the long-term survival of the ferry fleet. The Review accepts that the merger would have to be assessed under the Fair Trading legislation but a viable ferry service is regarded as sustainable after the Tunnel opens only if the main ferry companies are allowed to pool resources. In the event that the proposed merger is not permitted, the Review fears that:

'....there is greater risk of both companies eventually leaving the Dover-Calais route and deploying their ships elsewhere.'

(CTJCC 1991a, P.26)

This scenario would therefore leave Eurotunnel with considerable monopoly powers, and thus sharply reduce competition and consumer choice. The CTJCC (1991c) hypothesize two potential scenarios: the 'five ships' or 'high' scenario and the 'low' scenario. The above estimates of job losses are based on the more favourable 'five ships' scenario. Both of these scenarios will be discussed in more detail in section 7.3.2. The Review fears that the SEM will lead to an additional loss of 1,300 jobs in freight forwarding companies, as well as 520 jobs in HM Customs and Excise and immigration. The net employment implications of the Tunnel and the SEM on the East Kent port and ferry industry are therefore expected to involve between 7,300 and 7,800 job losses.

7.3.2. A Complete Collapse of the Short-Sea Ferry Industry?

The likelihood of a complete collapse in the existing port and ferry industry is now examined. Using Chisholm's (1986) study, the expected level of demand for Tunnel services in terms of both passenger and freight traffic will be analyzed. The post-1993 cross-Channel transport market and the patronage levels between the competing modes will determine ultimately the degree to which the port and ferry industry will have to rationalise. Attention then focuses on the likely structure of the post-Tunnel cross-Channel transport industry, as postulated by Szymanski and Manning (1988).

Market size and patronage levels

The CTG expects almost 30 million passengers and more than 13 million tonnes of freight to pass through the Tunnel in its first year of operation (see Table 7.6). In terms of passenger traffic, it is believed that the Tunnel will attract 10.7 million car and coach passengers in 1993, leaving 7.2 million, or 56 percent, of the 1983 level for the ferry operators. But the CTG believes that the Tunnel will dominate completely the excursionist market. However, the CTG did expect the ferry companies to retain the largest share of the freight market, at levels greater than those occurring in 1983. Therefore, this study concentrates on passenger traffic forecasts.

	1983	1993		2003
	MARKET SIZE	MARKET SIZE	TUNNEL TRAFFIC	TUNNEL TRAFFIC
PASSENGERS (M.)				
CAR PASSENGERS	6.7	9.5	6.3	7.3
COACH PASSENGERS	6.1	8.4	4.4	5.5
EXCURSIONISTS	2.6	3.2	3.1	3.4
OTHER FOOT PASSS	30.6	46.1	10.9	12.9
ADDITIONAL RAIL PASSs: with IRL	-	-	5.0	7.9
TOTAL	46.0	67.2	29.7	37.0
FREIGHT (M. TONNES)				
RORO	17.7	24.2	6.0	7.5
CONTAINER & RAIL WAGONS	5.7	7.9	4.0	6.8
BULK ¹	30.0	41.8	3.2	4.6
TOTAL	53.4	73.9	13.2	18.9

Table 7.6: The potential composition of the Tunnel's cross-Channel market.

(Source: CTG 1985a)

(1. Bulk also includes new vehicles)

Chisholm criticises the CTG's (1985a) passenger and freight traffic forecasts as overly optimistic. Even though Chisholm's analysis is now somewhat dated, Eurotunnel's current projections for cross-Channel traffic do not diverge significantly from the CTG's initial forecasts (CTJCC 1989). Hence, conclusions reached by Chisholm are still relevant.

According to Chisholm, the total passenger market in 1993 will be 46.8 million, more than 20 million below the CTG's forecast of 67.2 million. Thus, Chisholm argues that the CTG:

'....overestimated the 1983 traffic potential and, as a consequence, have similarly overestimated the 1993 potential. Two implications seem to follow. First, that there will be considerably greater traffic on routes which are not strongly competitive with the Tunnel than the CTG envisage - air and ferry services to the east and south coast ports. Second, that if the Tunnel is to carry 30 million passengers in 1993 (the CTG's prediction), competition on the short ferry routes will indeed be fierce.'

(Chisholm 1986, P.325)

If Chisholm's analysis proves to be correct, the impact of the Tunnel on medium- and long-sea ferry routes will be minimal. This would seem to support the findings of Gibb (1989, 1990) which show that the port and ferry industry in the "Far South West" will not be significantly affected by the Tunnel. However, Chisholm also suggests that the Tunnel will lead to considerable over-capacity in the short-sea sector which could result in the complete collapse of the ferry industry in the long-term.

Chisholm's analysis then goes on to question whether the Tunnel is in fact likely to attract the volume of passenger traffic in 1993 forecast by the CTG. The CTG's (1985a) assertion that the tariffs charged for Tunnel services would be competitive is challenged, since the CTG only assumes that the ferry operators would reduce their lowest fares by 10 percent. Ferry companies, particularly P&O and Sealink, have made it clear that they expect to reduce tariffs by up to 40 percent by the end of the century (Hall 1987); as Chisholm reports:

'The Transport Committee of the House of Commons (1985, P.XXi) state that the 10 percent reduction in ferry prices appears 'to be a considerable, perhaps crucial, underestimation of the possible degree of reduction'.'

(Chisholm 1986, P.327)

Deregulation of air services within the EC, as part of the 'Open Skies' policy adopted by the European Commission, is also likely to affect assumptions made with regard to airline fares (Graham 1992). The liberalisation of the airline industry within the EC after the 1 January 1993, will lead to immediate reductions in fares. Thus, the ability of Eurotunnel's Shuttle service and BR's international passenger trains to compete with air services to the near-Continent will be detrimentally affected. In addition, P&O and Sealink are confident that they can successfully meet the competition from the Tunnel, especially on the Dover-Calais route.

Hence, in terms of the potential passenger market, Chisholm concludes that the CTG overestimated the Tunnel's importance and underestimated the continuing role of the ferries. Although Chisholm considers the CTG's passenger traffic forecasts to be somewhat optimistic, with a smaller market anticipated for 1993, the continued survival of the short-sea ferry industry is expected. The delayed opening of the Tunnel and the late introduction of international passenger trains, now expected during 1994, will considerably reduce the number of people using the Tunnel in the first year. In terms of the freight market, Chisholm found that the CTG's estimate of the potential volume of container and RoRo freight that could have used the Tunnel in 1983 is reasonable (see Table 7.6). However, Chisholm considers that the CTG again underestimated the annual growth rate, and thus the potential market for 1993. Even so, BR only forecasts 6.1 million tonnes of freight will be attracted to international rail freight services, considerably less than Eurotunnel's predictions. Thus, the ferries are expected to retain the dominant share of the cross-Channel freight market. Therefore, the complete collapse of the port and ferry industry in East Kent is not regarded as likely. However, if Eurotunnel is correct in assuming that at least 30 million passengers will travel through the Tunnel in its first year of service and Chisholm's traffic forecasts prove more accurate, intense competition is likely to be experienced in the short-sea sector, more so than originally envisaged.

Market structure

The impact of Railfreight Distribution's proposed through-trains and Eurotunnel's Shuttle service should only postpone the continued growth in cross-Channel freight traffic

transported by the ferries. The complexities involved in transporting freight cargo (namely cost structure, delivery time-tables, EC regulations on permitted daily driving hours for road hauliers, the different types of freight cargo (bulk, RoRo and LoLo), and incompatible European rail gauges) will prevent the Tunnel dominating the market. Furthermore, P&O and Sealink also introduced during the late 1980s freight-only ferries to offer an improved service to road hauliers.

Real "head-on" competition will be encountered in the short-sea passenger market. A new class of "Super-Ferries" now operate between Dover and Calais, and Dover and Boulogne, while other innovations such as improved "turn-around" times have reduced the operating costs of the ferries in readiness for the Tunnel. Modernisation of the ferry fleet, including port practices, is expected to allow tariffs to be reduced by up to 40 percent (Tolley and Turton 1987). Flexilink, the ferry consortium opposed to the Tunnel, is also optimistic because of the massive cost overruns experienced by the Tunnel project and the strict financial targets imposed on Eurotunnel by the lending banks (Hall 1987). However, Eurotunnel (1987) still argues that it will be able to offer a more competitive journey time and price, due to the Tunnel's much lower operating costs. This has also to be combined with the possible loss of duty-free sales as a result of SEM legislation. At present this is an important source of revenue for ferry companies, representing up to 25 percent of total revenue.

Szymanski and Manning (1988) have examined the post-1993 competitive structure of the port and ferry industry. Their paper outlines the two extreme scenarios: the 'Eurotunnel scenario', where the Tunnel will eventually force the ferries out-of-business by implementing predatory pricing policies; and the 'Flexilink scenario', where as a result of price reductions by the ferries and Eurotunnel's heavy debt burden, the Tunnel will become a loss-making enterprise. They, along with Kay et. al. (1989), also point out that the cross-Channel ferry industry already operates under an oligopolistic market structure, with P&O and Sealink as the two dominant companies having 45 and 50 percent of the market respectively. Implicit collusion has in the past been forbidden by the Office of Fair Trading. Szymanski and Manning believe that this policy should be re-considered, since after 1993:

'....collusion between ferries is unlikely to influence prices adversely, but may well increase social welfare by reducing total fixed costs. Under the Eurotunnel scenario a strengthened ferry consortium might be able to resist being driven from the market and thus prevent monopoly pricing by Eurotunnel. Under the Flexilink scenario, prices will be high anyway, and so collusion between the ferry companies will merely allow them to take advantage of economies of scale.'

(Szymanski and Manning 1988, P.2)

The merger of the P&O and Sealink ferry services would therefore allow the ferries to compete effectively with the Tunnel, ensuring a competitive market as originally desired by the Government (Department of Transport 1986). However, prices would still remain high in the 'Flexilink' scenario since it would not be in the long-term interest of the ferry companies to force Eurotunnel into bankruptcy. As a result of the stringent loan arrangements imposed on Eurotunnel by the lending bank consortium, which enables the banks to take control of the Tunnel in the event that Eurotunnel defaults on any debt repayments and refuses Eurotunnel the opportunity to borrow from elsewhere, the ferry companies would never drive prices down too much to cause Eurotunnel any difficulties:

'This is because any successor to Eurotunnel, particularly if that successor is the lending bank consortium, will have deep enough pockets (i.e. financial reserves - Note also that the banks would have to write off the debt for any successor company to be forthcoming; but the banks would retain the franchise) to engage in credible predatory pricing.'

(Szymanski and Manning 1988, P.25)

Hence, it is in the interest of the ferry companies to "surrender" a sufficient market share to Eurotunnel. The ferries' chances of survival have also been increased by the success of P&O and Sealink in preventing public money being used to finance international rail services, which would have further advantaged the Tunnel. Inadequate rail links to the Tunnel portal are likely to strengthen the position of the ferry companies relative to the Tunnel. The improved motorway network within Kent is likely to increase the proportion of passenger journeys to the Continent by car/coach, benefitting both the Tunnel and the ferries but poor access to the ports is a cause of much concern to the ferry operators. The ferry companies have also tried to gain assurances from the Government that no public money will be used to bail-out an unsuccessful Tunnel project but, as Szymanski and

Manning (1988) argue, it will be the lending bank consortium which refinances a bankrupt Eurotunnel.

Both extreme scenarios are unlikely, but the paper is in accordance with the opinions expressed by Gibb (1986b) and Chisholm (1986), namely that the worst-case scenario, the complete collapse of the ferry industry, is a very remote possibility. Nonetheless, the post-1993 ferry and port-related industry will incur considerable job losses.

7.3.3. The Proposed Merger of P&O and Sealink

As stated earlier, the CTJCC (1991c) supports the case for the proposed merger. In the event of the merger, it hypothesized in the so-called 'five ships' scenario that, except for the Dover-Calais service, all other short-sea ferry routes would all be lost. The CTJCC expects the viability of the Dover-Calais passenger service to be sustained, with three P&O and two Sealink (one with a French crew) multi-purpose vessels. In addition, freight-only ferries, four P&O and one Sealink, would still continue to operate on the Dover-Zeebrugge route. The SeaCat service is also expected to remain in service. The merged ferry fleet would have the capacity to take about 50 percent of the predicted cross-Channel traffic in 1993.

Table 7.7 sets out the implications of the 'five ships' scenario on the level of direct employment in the East Kent port and ferry industry. According to the CTJCC, more than 4,300 jobs would be lost, 49 percent of the 1991 level, with 67 percent at Dover. However, the current recession has led to a down-turn in the rate of growth in cross-Channel traffic. Such a fall in the rate of traffic growth could lead to an extreme over-capacity and the start of a damaging price war. In this event, the CTJCC (1991c) suggests that a further 1,961 jobs could be lost at Dover. At this level, a viable ferry service is not seen as likely. Thus, a complete collapse of the port and ferry industry is feared. To cater for the increased traffic, it is expected that Eurotunnel would create only 600 additional jobs. Nonetheless, based on the Review's most favourable forecast, East Kent will have to absorb nearly 7,500 redundancies in the port and ferry industry between 1991 and 1994, considerably more than envisaged by the KIS.

PORT/LOCATION	1991 EMPLOYMENT	POST-TUNNEL (1993-1995) EMPLOYMENT	NUMBER OF JOB LOSSES
DOVER: Sealink, P&O, Hoverspeed, BR, Harbour Board,	6541	3606	-2935
FOLKESTONE: Sealink, BR	554	0	-554
RAMSGATE: Sally Line, Sehia Hino, Port, Tug, Dock Co., Concessions	703	123	-580
ASHFORD: Sealink HQ	540	250	-290
TOTAL	8338	3979	-4359

Table 7.7: Ferry and port-related employment in the 'five ships' scenario.

(Source: CTJCC 1991c, P.10)

As pointed out by Vickerman (1989a), this problem is confined to the UK and East Kent, since about 80 percent of ferry traffic is on British ships. This case study has so far highlighted the considerable problems facing East Kent. The short-term construction impact of the Tunnel has proved to be more beneficial than anticipated, but East Kent will have to absorb 2,000-plus TML redundancies before the Tunnel opens. The medium-term impact threatens to damage irreversibly one of East Kent's few expanding industries. It is hoped that the benefits which the Tunnel brings to the area in the long-term will more than offset these job losses, thus revitalising East Kent's depressed economy. However, it will become apparent that the long-term benefits of the Tunnel are likely to be much less than originally forecast by the KIS. Even the more "realistic" forecast of secondary job gains as calculated by the CTJCC (1991a&b) appear to be flawed.

7.4. The Long-Term Impact

The CTJCC has attempted to calculate the potential secondary employment gains resulting from the Tunnel for the county as a whole. Thus, it was hoped that Kent would be in a better position to maximise the opportunities created and minimise any adverse effects. Hence, it is first appropriate to analyze the official reports produced by the CTJCC, particularly the KIS (1987) and the Review (1991a). It is important to examine critically the 1991 Review in comparison with the recommendations of the KIS, as well as the findings of the Review itself. The optimism expressed by the KIS is no longer apparent, with more job losses identified and fewer job gains predicted. No critical review of the CTJCC's official reports has been undertaken to-date. The present study therefore represents an important contribution in the examination of the economic implications of the Tunnel for Kent, especially East Kent.

Attention will then focus on the problems and opportunities that face East Kent from a theoretical perspective, including the findings of the questionnaire survey carried-out for the current research project. It was shown in the Literature Review (chapter 2) that a mass relocation of industry as a result of the Tunnel is not regarded as likely. The results of the questionnaire survey (chapters 5 & 6) also tend to support this view. However, the findings of a survey undertaken by the CTJCC would seem to contradict this belief, reporting a much higher degree of interest shown by Kent companies in Nord-Pas de Calais as a potential location. It will become evident that for East Kent to tackle successfully the problems created by the Tunnel, the revitalisation of the tourism industry, already important in the area, will be integral to any positive long-term strategy for the region.

7.4.1. The Kent Impact Study: 1991 Review

'Dover, Shepway and Thanet District Councils are totally against a cross-Channel fixed link. All these councils take the view that the existing cross-Channel facilities are of fundamental import to the local economy and a reduction of services would have serious economic consequences. None of the above councils are convinced that the link's long term economic

advantages are sufficient to outweigh the adverse impact upon employment and environment.'

(Gibb 1986b, P.342)

The fears expressed by the District Councils that the Tunnel would lead to a net reduction in employment levels in East Kent now seem justified. Even in Ashford, where the Borough Council has always been in favour of the Tunnel, the secondary development opportunities are expected to be much less than originally anticipated. Nonetheless, this early opposition - along with the inherently weak nature of the economy of East Kent - did persuade the Government to commission an economic impact study for the county as a whole under the auspices of the CTJCC. The Committee was originally chaired by the Minister of State for Transport, David Mitchell MP, and comprised of officials from other central Government departments and local government within Kent.

Whilst recognising the adverse effect the Tunnel would have on the East Kent port and ferry industry, the KIS highlights the potentially beneficial 'infrastructure effect'. Both the KIS and the Review are unable to isolate the impact of the Tunnel from other infrastructural effects. Thus the secondary employment opportunities referred to in these two reports incorporate the joint effect of the Tunnel, M25 and M20. The indirect employment gains identified by the CTJCC (1991a&b) are significantly lower than the respective estimates in the KIS and more in line with the theoretical arguments advanced by the Channel Tunnel Research Unit (Vickerman 1985, 1987 1988a, Henley et. al. 1989, Vickerman and Flowerdew 1990). The KIS expects the potential infrastructure effect to indirectly create between 13,000 and 14,000 jobs within the county by the mid-1990s (see Table 7.8). From a Kent workforce of 600,000, the additional development pressures resulting from the Tunnel in the long-term, even based on this optimistic forecast, are therefore likely to be small. Thus, it is pointed out that:

'Only if courageous and determined steps are taken - and taken well in advance of the opening - can East Kent as a whole expect to come out with the favourable employment balance....'

(CTJCC 1987, P.i)

	1987 KIS ESTIMATES	1991 REVIEW ESTIMATES
DIRECT EFFECTS:		
PORT & FERRY INDUSTRY	-4300/-6600	-7480
TUNNEL AND RAIL OPERATIONS	+3200	+1500/+2000
SUB-TOTAL	-1100/-3400	-5980/-5480
SECONDARY EFFECTS¹:		
PRODUCER SERVICES	+1800	+1500
MANUFACTURING	+5200	+2760
WHOLESALE DISTRIBUTION & ROAD HAULAGE	+2700	+1000
RETAIL DISTRIBUTION	+1300	(included in tourism)
TOURISM	+2000/+3000	+500
SUB-TOTAL	+14000/+13000	+5760
IMPACT OF THE SEM:		
CUSTOMS CLEARANCE IN FREIGHT FORWARDERS	not estimated	-1300
HM CUSTOMS & EXCISE & IMMIGRATION	not estimated	-520
INDIRECT IMPACT ON OTHER SECTORS (NET)	not estimated	+4150
SUB-TOTAL	not estimated	+2330
TOTAL	+12900/+9600	+2610

Table 7.8: Estimated employment changes in Kent resulting from the Tunnel, related infrastructure and the SEM, 1991-1996.

(Source: CTJCC 1991a, P.19)

1. Incorporates the effect of the Tunnel and the related infrastructure.

The CTJCC is only a consultative platform with no executive powers to enforce any recommendations. However, it was hoped that, since the relevant central Government departments and local government bodies were represented on the CTJCC, most of the recommendations would be implemented. This hope has not been realised because the necessary resources were not forthcoming from central Government. Kent is still waiting for the planned high-speed rail link and the proposed IPS at Ashford. Therefore, the implementation of the recommendations, after an initial 'good start', has been disappointing, particularly for East Kent:

'....the net adverse effects of the Tunnel on East Kent in the medium term are larger than was then (the KIS) envisaged and it is in offsetting those adverse effects that implementation of the 1987 strategy has largely failed.'
(CTJCC 1991a, P.ii)

Employment implications for the county

Due to the contrasting nature of the CTJCC's employment estimates, as originally outlined by the KIS and later revised by the Review, it is important to look more closely at the predictions of indirect job employment gains for the county. The overall estimates for the county as a whole will be examined first before concentrating on the secondary employment prospects for East Kent. As can be seen from Table 7.8, the Review anticipates 5,760 additional jobs to be created as a result of the infrastructure effect, over 7,300-8,300 jobs less than that forecast by the KIS. The Review also states that the SEM will create a further 4,150 jobs in Kent; no comparative figure is given in the KIS. In terms of the total net employment effects, the Review forecasts a net increase of 2,610 jobs by 1996 but 2,330 will be as a result of the SEM. Therefore, the Tunnel and related infrastructure could result in a net loss of 220 jobs. The KIS estimates that the net impact of the Tunnel and related infrastructure will be a net gain of between 9,600 and 12,900 jobs within the county. Thus, within a period of four years, the CTJCC have revised downwards their estimates of employment opportunities by more than 100 percent. However, it is also recognised that there is a considerable amount of uncertainty surrounding the indirect employment estimates. Thus, the net increase of 2,610 jobs, including the SEM, only represents a mid-point figure between 0 and 4,000 jobs. Hence,

the overall impact of the Tunnel and related infrastructure could be the creation of few additional jobs, considerably lower than the 5,760 forecast, leading to a much higher reduction in employment levels.

The activities singled-out by the KIS as likely to be affected in the long-term by the Tunnel are:

1. Expanding Producer Services - business services, computing, banking, insurance and research and development
2. Faster Growing Manufactures - primarily Hi-Tec companies
3. Distribution - wholesaling, road haulage and retailing
4. Tourism

Manufacturing industry is now expected by the CTJCC (1991a) to create an additional 2,760 jobs, nearly half of the 5,200 gains predicted in 1987. Since North Kent has been successful in attracting a relatively large proportion of Hi-Tec industries; 32 percent of total manufacturing in 1989, compared to only 15 percent in East Kent (CTJCC 1991a), it is likely that North Kent will also benefit from a large proportion of this secondary development. Furthermore, the Kings Hill business park outside Tonbridge, in Mid Kent, is considered the main centre for Hi-Tec industrial growth in the county (personal interview: McKim 1992). The Eureka science park in Ashford will have to compete with the attractions of North and Mid Kent. In addition, the Review (CTJCC 1991a) estimates that 1,000 jobs will be created in 'wholesale distribution and road haulage' and 500 in 'retail distribution' (including tourism), compared to the KIS's more optimistic estimates of 2,700 and 3,300-4,300 respectively. As pointed out by Gibb (1986b, P.346):

'Neither Folkestone nor Dover are centres of large-scale warehousing. Despite cross-Channel traffic trebling since 1970, the demands for warehousing in the immediate hinterlands of these ports has always been poor. Most of the freight handled at Dover is containerised, usually roll-on/roll-off shipments...As a result, there is no need for transhipment or distribution depots to be located at the ports.'

The CTJCC's revised estimates would seem to support Gibb's earlier conclusions.

As a result of the direct job losses in the construction and port and ferry industries, the CTJCC (1991c) also states that more job losses will be incurred through backward linkages and the multiplier effect:

'The backward linkages, whereby the loss of economic activity which caused the job losses reduce economic activity in some local supplier business, will cause a further loss of jobs....The loss of jobs, both the direct effects and backward linkages, reduce the amount of employment incomes (the multiplier effect).'

(CTJCC 1991c, P.19)

For local districts, the backward linkage effect is calculated to be an additional 10 percent of the direct job losses, 20 percent for the county as a whole. The CTJCC (1991a&c) also calculate the multiplier effect to be 1.25. The total impact on Kent is therefore predicted to be a net loss of 5,100 jobs between 1991 and 1996. However, as will become clear, the net total impact on East Kent is a loss of 8,900 jobs, at least 2,000 jobs as a result backward linkages and the multiplier effect. The effect of backward linkages and the negative multiplier will be paramount in Dover, where the majority of the job losses are located. Dover could suffer from a "spiral of decline" without immediate Government financial assistance. Government intervention could take the form of designating East Kent an Assisted Area or Dover an Enterprise Zone.

The Review stresses that the anticipated job gains are based on best estimates. It is therefore useful to examine the basis upon which these estimates are made. The CTJCC (1991b) carried-out a questionnaire survey of over 1,500 companies in Kent during April and May 1991. Fewer than 200 companies completed and returned the questionnaires, a response rate of less than 13 percent. The sensitivity of the findings could be undermined by this poor response rate. The response rate for individual questions is usually lower than the overall figure but no indication is given in the report. A second survey conducted interviews with companies recently locating some activity to Kent, only 80 out of the 200 companies approached agreed to an interview. Again the results of some individual questions are based on a response rate of 40 companies or less. The significance of the findings is even more questionable when the results are analyzed for the three sub-regions

of Kent and the six districts within East Kent. It is therefore necessary to be cautious when interpreting these findings.

Employment implications for East Kent

Table 7.9 breaks down the total net employment implications of the Tunnel, related infrastructure and the SEM for the three sub-regions of Kent. Of the 17,000 total job losses, 85.3 percent are located in East Kent (-14,500), compared to only 47.1 percent of the job gains (+5,600). Based on the CTJCC's (1991a) estimates, East Kent is therefore expected to experience a net loss of 8,900 jobs between 1991 and 1996.

TUNNEL/RELATED INFRASTRUCTURE & SEM ¹	SW & MID KENT	NORTH KENT	EAST KENT	TOTAL
JOB LOSSES	-1500	-1000	-14500	-17000
JOB GAINS	+2900	+3400	+5600	+11900
NET EMPLOYMENT	+1400	+2400	-8900	-5100

Table 7.9: Anticipated net employment effects of the Tunnel and related infrastructure within Kent.

(Source: CTJCC 1991a) (1. Including backward linkages and the multiplier effect)

In terms of the long-term impact of the Tunnel within East Kent:

'....the port towns will suffer employment losses through the contraction of ferry traffic; and the coastal towns generally, with the possible exception of Folkestone, seem to be relatively poorly placed to gain from secondary development stimulated by the infrastructure changes.'

(CTJCC 1987, P.21)

As can be seen from Table 7.10, Dover will have to absorb a total loss of 10,500 jobs, including redundancies in both the construction and port and ferry industry. Job losses in Dover will affect 6,000 residents, with residents of Folkestone and Thanet also affected. The net employment implications for Shepway will therefore be a net loss; not 800 job gains as shown in Table 7.10. The real impact of the job gains/losses for the six sub-areas of East Kent are highlighted in terms of the forecast changes in the local labour markets. Between 1991 and 2001, the demand for labour in Dover will not keep pace with the supply, leading to a further surplus of 13,300 workers.

The KIS hopes that Ashford will:

'....become the manufacturing and commercial hub of the sub-regions radiating development outwards to the depressed north-eastern areas and coastal towns.'

(CTJCC 1987, P.24)

	ASHFORD	CANTERBURY	DOVER
TUNNEL/INFRAS./SEM IMPACT by 1996:¹			
JOB LOSSES	-500	-400	-11,100
JOB GAINS	+1100	+600	+600
NET CHANGE	+600	+200	-10,500
LABOUR SUPPLY²:			
1991 - 2001	-1500	-800	-13,300
2001 - 2011	0	+3000	+1700

(Table 7.10 continued overleaf)

	SHEPWAY	SWALE	THANET	TOTAL
TUNNEL/INFRAS./SEM IMPACT by 1996:				
JOB LOSSES	-900	-500	-1100	-14,500
JOB GAINS	+1700	+1000	+600	+5600
NET CHANGE	+800	+500	-500	-8900
LABOUR SUPPLY¹:				
1991 - 2001	-1900	+1300	-5600	-21,200
2001 - 2011	-900	+2300	0	+6100

Table 7.10: Estimated net employment effects of the Tunnel, related infrastructure and the SEM, 1991-1996, and the change in the supply of labour, within the six districts of East Kent.

(Source: CTJCC 1991a, P.57)

(1. Including backward linkages and the multiplier effect)

(2. A minus sign indicates the supply of labour will increase by more than the growth in employment opportunities, i.e. unemployment will tend to increase)

But the Review only anticipates a net increase of 600 jobs for Ashford. The uncertainty now associated with the IPS at Ashford has meant that the 1,100 additional railway jobs which would have been created can no longer be included in employment estimates, at least in the years immediately following the opening of the Tunnel (CTJCC 1989). Eurotunnel, in October 1991, put forward a temporary solution for an IPS at Ashford, priced at between £3 and £9 million (KCC 1992a). However, BR immediately rejected this 'portable hut' idea, based on safety considerations. The Government on 3 December 1991, also released £18 million for an interim solution but little progress has been made. An IPS at Ashford is not only important in terms of the direct employment opportunities but also as a result of improved accessibility offered to the Kent business traveller. In fact the IPS is regarded as 'very important' in securing the main strategic objectives for East Kent as

a whole (CTJCC 1991a&b). However, the Review considers that the KIS places too much emphasis on Ashford as a 'growthpole' for East Kent, concluding that:

'If there was ever any doubt in 1987 (the KIS) about the need for a Channel Tunnel strategy for Kent, and particularly East Kent, these revised estimates are such as to make it absolutely essential.'

(CTJCC 1991a, P.iii)

The CTJCC therefore calls on the Government to designate East Kent as an Assisted Area. The economic problems facing East Kent as a result of the Tunnel and the SEM are regarded as severe enough to require extra Government and EC funding which would be forthcoming if East Kent gained Assisted Area status. A formal bid for the designation of East Kent as an Assisted Area is expected by June 1993 (personal interview: McKim 1992). In fact the Review believes that the Government is responsible for the 'poor' and 'patchy' implementation of the CTJCC 'Strategy' for Kent, particularly in East Kent

'....Central Government Departments are largely opting out of the Strategy and looking to Local Authorities to implement it, whilst controlling their purse strings in such a way as to make it difficult if not impossible for them to do so.'

(CTJCC 1991a, P.99)

This goes against the spirit of the KIS and restricts the effectiveness of the CTJCC. From interviews with representatives of local government within East Kent (personal interviews: Jarret 1992, McKim 1992, Vickem 1992), it is clear that everything possible has been done at local level with the limited finances available. County and District Councils within Kent have been active in freeing potential development land but as recognised by the Review:

'There is a surplus of development sites in relation to the likely demand to be generated by the Tunnel....'

(CTJCC 1991a, P.74)

The supply of development land within Kent as a whole is estimated in the Review to be 880 hectares, whilst demand for 100 to 130 hectares only is anticipated. Thus, there will be considerable competition between the sub-regions of Kent to attract Tunnel-related development. However, except for Ashford, there is a shortage of appropriate land for development in East Kent. The two proposed 'Flagship' development sites in Dover (the

International Business Park at Honeywood) and Thanet (the Kent International Business Park at Alland Park) are both still subject to access and infrastructure constraints. Based on interviews with Shepway District Council (personal interview: Jarret 1992), the current level of demand in Shepway for new industrial and office sites is low. Nonetheless, it is expected that as the UK economy comes out of recession this demand will increase.

The long-term prospects for East Kent therefore look 'bleak' (CTJCC 1991a&b). The CTJCC Strategy for East Kent is based on the diversification of the industrial base, with certain sectors of industry specifically targeted. The lack of interest in available industrial and commercial sites in the area supports the above conclusion that the CTJCC's (1991a&b) forecasts for East Kent are also somewhat optimistic. If East Kent is to benefit from the Tunnel and related infrastructure in the long-term, and compensate for the considerable job losses in the port and ferry industry, the designation of Assisted Area status for the area is vital. The 'East Kent Initiative' (EKI) was set-up in 1991 by the CTJCC to lobby for additional Government and EC funds for East Kent. The estimated secondary employment opportunities stemming from the infrastructure effect have been substantially revised by the Review. Thus, in conclusion the successful diversification of the East Kent economy has not and is not expected to be achieved. Indeed the question arises as to whether there is any real justification for anticipating secondary development opportunities in East Kent.

7.4.2. The Theoretical Perspective

The CTJCC (1987, 1991a&b) makes the assumption that the Tunnel will alter the regional distribution of industry to the benefit of East Kent and the county as a whole. According to Vickerman, however, the question is still:

'....whether, and how, the Tunnel and its associated infrastructures, will change the existing regional pattern of the structure of activities and the associated flows of people, goods and services.'

(Vickerman 1989a, P.9)

Vickerman argues that any secondary economic development is unlikely to be experienced in East Kent as a result of the Tunnel because there is no need for any change of transport mode close to the Tunnel portal. Therefore, industry will gain no commercial advantage from locating within the immediate hinterland of the Tunnel. The Tunnel and the international through trains will make possible the direct haulage of freight from most regions in Britain to the Continent, with no transshipment necessary. In fact, all international rail freight, including freight originating in East Kent, will have to go via the Willesdon depot located just outside London. Hence, as Vickerman asserts, the Tunnel will not become the catalyst behind an East Kent industrial revival. The results of the Economic Potential Model employed in chapter 3 show that certain peripheral UK regions could experience fairly uniform increases in relative accessibility compared with the South East. Thus, the Tunnel is not likely to further peripheralise companies to the north and west of London, or encourage them to relocate closer to the Tunnel portal.

The opportunities created by the Tunnel primarily depend on companies using rail freight since EC legislation on permitted daily driving hours negates the time savings offered by the Shuttle service, as compared to the ferries, for road hauliers. Companies are therefore also not likely to change location as a result of Eurotunnel's Shuttle service. Dover has been the main port for UK-continental RoRo traffic during the 1980s and early 1990s, but East Kent has not benefitted from any large-scale relocation of industry. However, reduced transit times to centres of European business could prove to be important, with accessibility to Paris, Lille and Brussels increased significantly via the Tunnel. Some company directors may consider it important to be near the centre of European economic activity; thus the reduced journey times between East Kent and near-continental cities could be significant. But the IPS at Ashford is vital if companies in East Kent, and the county as a whole, are also to benefit from reduced journey times to the Continent.

Vickerman (1988a) considers that the implications of the Tunnel cannot only be analyzed in such static terms, believing that the 'dynamic' impact of the Tunnel could bring about changes in 'optimal production processes'. The Tunnel will influence the price of transport, as an input relative to the prices of other inputs, especially for companies with strong trading links with Europe, and so encourage moves towards more transport-intensive modes

of production, namely JIT systems which remove the cost of storing raw materials and finished goods in favour of buying and selling goods as required or when ordered. Improved reliability in cross-Channel transport via the Tunnel could prove to be the critical factor. But Vickerman (1988a, P.9) believes that:

'....the existing industrial structure of the regions closest to the Tunnel (Kent and Nord-Pas de Calais) would not appear to be particularly suitable for exploiting any reductions in transport costs....'

Vickerman concludes that none of these a priori reasons may prove to be dominating causes of economic change resulting from the Tunnel. On the contrary, he argues that subjective and psychological factors could prove to be more influential:

'If British producers believe that the Channel Tunnel will make a difference to their ability to penetrate other European markets, then they will invest and behave in a way which is likely to bring this about. If they believe that a location close to the Tunnel is more likely to be beneficial, then again their collective actions could have important consequences for the local economy of Kent.'

(Vickerman 1988a, P.11)

The results of the questionnaire survey carried out for this research project show that less than one percent of companies anticipate relocating as a result of the Tunnel (see chapters 5 & 6). Furthermore, nearly 30 percent of the companies which responded to the survey believe the Tunnel and related infrastructure will improve their existing accessibility levels to continental markets. The comparative percentages for companies in the South East and the South West do not diverge significantly. Hence, the results show that companies are unlikely to be influenced by the psychological attraction of areas close to the Tunnel.

Vickerman (1988b, 1989a), incorporating work carried out by Bröcker (1980), shows that the Community's internal borders reduced trade between neighbouring regions on opposite sides of national boundaries below the level one would expect for regions a similar distance apart within a single state. Vickerman (1988b) believes that such frontier or 'economic shadow' regions have been hampered by these "artificial" restrictions imposed on their "natural" economic hinterlands, and by transport networks which focus on national core areas. Kent, but more precisely East Kent, exhibits all the signs associated with the

classic frontier region, with London casting its economic shadow over the region. The creation of the SEM should help to remove these artificial barriers and stimulate cross-frontier trade. The European high-speed rail network, of which the Tunnel will become an integral part, could lay the foundations for a European Transport Policy and reduce the national bias of transport networks. However East Kent, and other depressed frontier regions of North West Europe, may not necessarily benefit from the Tunnel and/or the European high-speed rail network, since the 'Corridor Effect' could replace the economic shadow cast over these regions (Holliday and Vickerman 1989). Only major centres will be linked by the high-speed rail network, leaving the depressed border regions en-route between such core areas un-served. This theoretical proposition would seem to be supported by the experience of TGV Sud Est. Berlioz et. al. (1985) and Bonnafous (1987) argue that TGV Sud Est became a catalyst for economic development only where prior dynamism already existed, and so did not encourage growth outside the major metropolises served by the new line.

However, based on the findings of the questionnaire survey undertaken for the present thesis, companies in Kent do currently plan to use the Tunnel for freight exports to the Continent to the same extent as all respondents (approximately 25% plan to use the Tunnel to some degree). In addition, a proportionately greater number of companies in Kent anticipate using the Tunnel for future business trips; 20.8 percent plan for more than 20 percent of future business trips to go via the Tunnel, compared to 10.3 percent of all respondents. In both instances, companies in Kent are more likely to favour using Eurotunnel's Shuttle service, reflecting their proximity to this service. It would therefore appear that companies in Kent are as likely to realise the advantages offered by the Tunnel as all companies in general. Thus, the findings of the questionnaire survey suggest that Vickerman could be overly pessimistic.

Companies in Kent are also more likely to anticipate that the Tunnel will have an impact on their level of competitiveness. Over 40 percent expect their accessibility to continental markets to improve after the Tunnel opens, compared to 30.5 percent of companies in the South East as a whole and 28.5 percent for all respondents. However, 41.7 percent of companies in Kent also believe they will be vulnerable to increased competition from the

Continent. The respective figures for the South East and all respondents are 23.6 and 22.9 percent. Furthermore, the questionnaire survey showed that companies in Kent are as likely to be optimistic about the overall regional economic impact of the Tunnel and related infrastructure. Those anticipating a beneficial impact account for 62.5 and 63.5 percent of the companies in Kent and the South East as a whole, respectively. However, more companies in Kent (29.2%) fear a damaging impact on their regional economy compared to the South East as a whole (12.0%) and all respondents (15.1%). It is likely that the adverse medium-term implications of the Tunnel on the Kent port and ferry industry influenced this result. Nonetheless, it is apparent that company perceptions in Kent and their planned usage of the Tunnel, for both passenger and freight traffic, contradict to some extent the conclusions reached by Vickerman (1988b).

A survey carried-out by Henley et. al. (1989) shows that only 19 percent of companies in Kent had any European sales and none had sales greater than 50 percent. The comparative figure for non-Kent companies is 64 percent. Furthermore, only 12 percent of companies in Kent purchased supplies from Europe. This would appear to be a strong indictment of Kent as a frontier region. Therefore, the results imply that the advantage Kent establishments have regarding proximity to the Continent via existing transport links has not been an important locational factor. The CTJCC (1991a&b) also reports that the improvements to Kent's road and rail networks are considered more important by companies in Kent than the Tunnel, in that they would increase the area's accessibility to the major domestic markets of the South East and the Midlands.

7.4.3. Nord-Pas de Calais

The same argument advanced by Vickerman (1988a&b, 1989a&b), in terms of the 'Corridor Effect' preventing East Kent benefitting from the Tunnel, would also be relevant to Nord-Pas de Calais. However, as discussed in the Literature Review (chapter 2), northern France is perceived as an alternative location for British companies. Nonetheless, most commentators do not regard this threat as serious:

'The CTG-FM (now Eurotunnel) fixed link will not precipitate any substantial movement of British manufacturing firms to the Nord. Indeed it will probably reduce the likelihood of British firms locating in Nord-Pas de Calais for the same reasons as those advanced in assessing the impact of the link upon east Kent; through traffic will be enhanced by the removal of a transport bottleneck.'

(Gibb 1986b, P.347)

Gibb is therefore of the opinion, as is Vickerman, that the Tunnel will not encourage a southwards migration of British industry to the South East or northern France. In contradiction, however, the Review (CTJCC 1991a) states that the reduced secondary employment estimates for East Kent result in part from some companies seriously considering locating 'some activity in Nord-Pas de Calais'.

Given these varying fears and assessments it is important to examine the relative attractions or otherwise of Nord-Pas de Calais. Land values/rents are 75-80 percent lower in Nord-Pas de Calais but these costs only form a small proportion of total costs (CTJCC 1991a). Since labour costs in Kent are 25 percent lower than in Calais, Kent was considered to retain a significant 10 percent advantage in terms of set-up and operating costs. Even so, both the KIS and the Review recognise that Kent, particularly East Kent, cannot afford to be complacent. Since the publication of the KIS in 1987, the road and rail infrastructure in Nord-Pas de Calais has improved considerably. The motorway networks in both regions are believed to be of a similar standard, whilst TGV Nord has led to a relative advantage for Nord-Pas de Calais in terms of rail services. As a result of proximity to London's airports, Kent is seen to have 'the edge' in terms of access to international air services (CTJCC 1991a).

The availability of potential development land is not regarded as a problem in either region but:

'The principal difficulty facing Kent is that sites in districts where economic development is most needed in East Kent tend either to have poor road access, or poor site services or both.'

(CTJCC 1991a, P.94)

Environmental constraints are also more pronounced in Kent, including East Kent. Furthermore, Nord-Pas de Calais is in receipt of substantial French and EC financial assistance. The designation of East Kent as an Assisted Area would redress this imbalance. The KIS believes that, with the Tunnel, Kent and Nord-Pas de Calais will be perceived as one region within which locational decisions are made, especially by American and Japanese investors. KCC and the Nord-Pas de Calais Regional Council have agreed to cooperate actively to the benefit of both regions. More important to industrial location, however, could be the greater commitment shown within France towards the Tunnel:

'Many French organisations, particularly in Nord-Pas de Calais, see the Tunnel as an historic opportunity to transform their region....'

(CTJCC 1987, P.58)

A survey undertaken by the Review (CTJCC 1991a) shows that 30 percent of companies in Kent now regard Nord-Pas de Calais as a possible location, with 15 percent seriously considering relocating part of their activity to the region. These figures are much higher than the comparative findings of the questionnaire survey carried out for the current research project. The Review (CTJCC 1991a) places much emphasis on the tourism industry for the successful diversification of the Kent economy but, as shown in the Literature Review (chapter 2), considerable effort has been made by the Regional Council to upgrade the Cote d'Opale in northern France.

7.4.4. The Tourism Industry

Tourism is seen as a potential source of development on both sides of the Channel. For example:

'Overall the 1987 Strategy called for a "massive scaling up of the tourist industry in East Kent" and of the training measures needed to support this.'

(CTJCC 1991a, P.63)

The CTJCC now anticipates that less than 500 additional jobs will be created in the Kent tourism industry as a result of the Tunnel by 1994, compared to the KIS's earlier estimate of between 2,000-3,000. The CTJCC (1991a) regards the KIS's estimate as too optimistic since:

'It roughly requires £30,000 of tourism expenditure to create an additional tourism job....which means that tourism expenditure generated by the Tunnel would have to be £60-90 million per annum.'

(CTJCC 1991a, P.37)

In 1989, tourism expenditure in Kent was £473.95 million. This implies that the Tunnel would have to encourage an increase in tourism expenditure by 12.7 to 19 percent (or 24 to 36 percent on 1987 levels). It is estimated that in 1989, East Kent accounted for 14.3 million of the 22.82 million holiday/day trips in Kent and £293.65 million of the £473.95 million tourism expenditure in the county (CTJCC 1991b). Tourism expenditure directly supported 12,236 jobs in Kent in 1991, which is expected to increase to 15,580 jobs in 2001; 529 of which are as a result of the Tunnel. Including multiplier and linkage effects, it is anticipated that the Tunnel will create a total of 730 jobs in the tourism industry by 2001. It is reasonable to assume that a large proportion, nearly two-thirds based on 1991 tourism expenditure, of these job gains will be located in East Kent.

The Review cites the recent tourists developments within East Kent which have been designed to augment the opportunities created by the Tunnel; the visitor centres at Canterbury, the White Cliffs Experience at Dover, improvements to Dover Castle and the Eurotunnel Exhibition Centre at Cheriton. Nonetheless, a continued up-grading and improvement of the East Kent tourism industry is needed. As Gibb argues:

'Although there was a 29 per cent increase in leisure and tourism-related employment in the South East between 1971 and 1981, this sector actually declined by five per cent in east Kent as a result of outdated holiday accommodation and the lack of modern facilities.'

(Gibb 1986b, P.342)

The East Kent 'Tourism Development Action Programme' (TDAP) initiative was established in 1989, and originally planned to run for three years. The TDAP initiative is intended to improve the quality and image of the tourism sector in East Kent:

'There will be an on-going requirement to continue to stimulate the tourism industry to improve the product and standards of service if the East Kent area is to compete successfully with other destinations to maximise the benefits from the Tunnel....'

(CTJCC 1991b, P.131)

One of the 'other destinations' will be the Nord-Pas de Calais. As shown in the Literature Review (chapter 2), the Regional Council has made significant attempts to improve the tourism attractions and facilities in the region. As part of "Region Transmanche" (the frontier region agreement signed by KCC and the Regional Council), Kent and Nord-Pas de Calais will be marketed as one joint region. Based on a discussion with the KCC Tourism Officer (personal interview: Ormiston 1992), it is hoped that although northern France and Belgium will become more attractive to traditional British visitors to Kent after the Tunnel opens in 1993, this will be more than offset by the increased number of foreign visitors to Kent. KCC is eager to attract more transit tourists to stay within the county. The Council therefore plans to market Kent as being in easy reach of London. However, the effectiveness of the TDAP will be limited as a result of its relatively small budget, £0.5 million over three years (personal interview: McKim 1992).

7.5. Summary and Conclusion

'The Strategy (the KIS) was originally designed to provide Kent with an opportunity to share in the economic and other benefits generated by the Channel Tunnel and to minimise the substantial adverse impact of the Tunnel, particularly on East Kent, through the contraction of the ferry industry.'

(CTJCC 1991a, P.i)

The CTJCC (1991a) accepts that the implementation of the Strategy for East Kent has largely failed. The initial optimism associated with the Tunnel in East Kent expressed in the KIS is no longer apparent, with more job losses and fewer job gains anticipated. The direct impact of the Tunnel on the port and ferry industry is estimated to be a net loss of nearly 6,000 jobs. In addition, at least a further 2,000 jobs will be lost in East Kent through the 'run-down' of the TML workforce. The priority of the EKI is seen to be the retraining and re-employment of these redundant workers. However, significant employment opportunities will have to be created if East Kent is not to suffer a negative long-term impact. The early fears of several East Kent District Councils are now likely to be realised. The Strategy for East Kent, as outlined in the Review (CTJCC 1991a), seems

to be primarily dependent on the "massive scaling" up of the tourism industry. The Review states that the KIS places too much emphasis on tourism but very little seems to be able to take its place.

The net employment estimates for Kent as a whole, based on the effects of the Tunnel, related infrastructure and the SEM, forecast a gain of 2,610 jobs (CTJCC 1991a). In terms of just the Tunnel and related infrastructure, however, the net impact on the county is only a net gain 280 jobs or even a net loss of 220 jobs. This represents less than two to three percent of the 12,900-9,600 net job gains estimated by the KIS. The KIS has continually been regarded as over-confident in its estimations, the Review believing that:

'The boom of 1987 to 1989 generated an air of optimism about the Tunnel and the opportunities it presented....'

(CTJCC 1991a, P.i)

Nonetheless, the Review (CTJCC 1991a) avoids highlighting the extent of this 'optimism'. Analyzing the Review's findings in more detail, two implications become evident. Firstly, the statistical evidence on which the estimates of indirect job gains are based can at best be considered semi-accurate. The more modest estimates of job gains have to be treated with some degree of scepticism and a higher number of job losses are now more likely, in terms of TML redundancies and the rationalisation of the port and ferry industry. Secondly, since both North and Mid Kent are expected to experience a net positive impact, 2,400 and 1,400 job gains respectively, the burden of the job losses will fall almost entirely on East Kent. As Table 7.9 shows, the total net impact of the Tunnel, related infrastructure and the SEM, including backward linkages and the multiplier effect, on East Kent is a loss of nearly 9,000 jobs. Even this extremely pessimistic forecast for East Kent is conservative compared to the CTJCC's (1991a&c) more "dire" scenario, which encompasses a complete collapse of the East Kent ferry industry.

In terms of the impact within East Kent, Ashford is still regarded as the main beneficiary. But it is no longer seen as the basis for an East Kent economic recovery. Its role as a "growthpole" within East Kent has been undermined by the delays associated with both the IPS and the high-speed rail link. The 1991 Review considers the IPS at Ashford to be

critical for East Kent, allowing companies and residents in the area to benefit fully from improved accessibility to the Continent. Without the IPS, Holliday and Vickerman (1989) argue that any induced development from the Tunnel will by-pass East Kent in favour of the wider South East region.

The CTJCC calls on central Government to designate East Kent an Assisted Area, but such a designation is far from certain (personal interview: McKim 1992). Thus, financial assistance for East Kent will have to be sought elsewhere. To compound this problem, East Kent is likely to lose its status as an area benefitting from European Coal and Steel Community assistance. However, if East Kent is successful in gaining Assisted Area status, the attraction of the area to potential companies will be improved significantly. An East Kent Development Agency has again been proposed by the CTJCC (1991a) but moves toward such a body are still unlikely as a result of the unwillingness of certain District Councils to co-operate. Furthermore, central Government departments are criticized by the Review for the 'poor' and 'patchy' implementation of the Strategy. Concerted action is needed to help East Kent absorb the large-scale redundancies in the port and ferry industry following the opening of the Tunnel. Many therefore believe that without full Government support little will be achieved. Local government within East Kent believes that with the limited resources available, all that can be done has been done (personal interview: Jarret 1992). The EKI and the TDAP initiative for the area will allow the problems and opportunities to be identified but the necessary Government assistance has to be forthcoming. The designation of East Kent as an Assisted Area is of paramount importance to the area, thus it is only possible to conclude that the long-term prospects for East Kent look "bleak".

CHAPTER 8: THE "FAR SOUTH WEST" (DEVON & CORNWALL)

In terms of railway infrastructure and service provision, the South West, but more particularly the Far South West, is one of the most isolated regions from the Tunnel and any associated development benefits (see Figure 8.1). In addition, many commentators believe that the Far South West exhibits characteristics commonly associated with the "North" (see Champion and Green 1988, Green 1988, Martin 1988, TCPA 1987, 1989). Therefore, the case study of Devon and Cornwall can be seen, to some extent, as representative of the likely implications of the Tunnel on the "North" in general. Thus, it is a continuation of the "North-South" theme which is pursued throughout the present thesis. This chapter will examine whether Devon and Cornwall are likely to be disadvantaged by an inadequate transport infrastructure. The concepts of "isolation" (i.e. whether the region will be prevented from taking advantage of the opportunities created) and "insulation" (i.e. whether Devon and Cornwall will be protected from the adverse effects) will be juxtaposed to determine the economic impact of the Tunnel on the Far South West.

Local authorities within the Far South West, principally the Devon and Cornwall County Councils and Plymouth City Council, have commissioned several reports examining the economic implications of the Tunnel (Cornwall C.C. et. al. 1989a&b). These reports represent a useful starting point for the current analysis. More up-to-date information was generated during August 1992, through personal interviews with representatives of local government, commerce and industry. Reference will also be made to the results of the questionnaire survey undertaken for the current research project. However, due to the small number of companies responding in Devon and Cornwall, care must be taken when interpreting the results.

To determine the economic implications of the Tunnel on the Far South West, attention will focus first on the likely impact on the Devon and Cornwall port and ferry industry. The short-sea ferry industry will experience head-on competition with the Tunnel but the

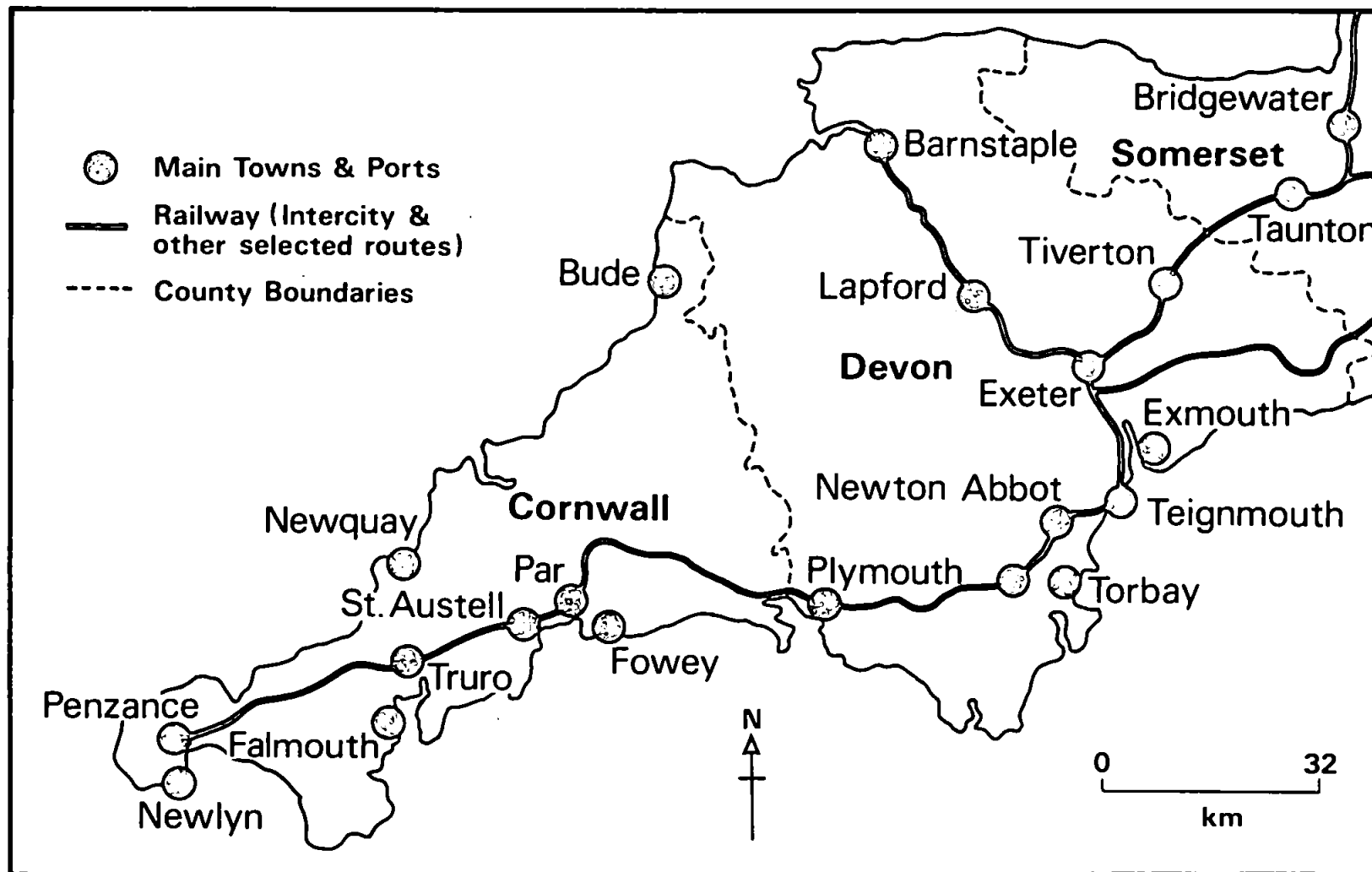


Figure 8.1 The 'Far South West' : Devon and Cornwall

Source ; Gibb et al 1990b

long-sea sector is also likely to be affected, albeit marginally. The adequacy of the Far South West transport network will then be examined, since the long-term impact will be strongly influenced by the quality of transport links serving the region. The effect of the Tunnel on the Devon and Cornwall tourism industry, already an important component of the regional economy, will also be examined. Finally, the "unforeseen" threat of improved accessibility between the UK and the Continent with respect to the Far South West will be analyzed. This "Third Market" effect has been largely ignored by earlier regional reports. Devon and Cornwall will not be "insulated" from potential adverse effects if "isolation" from the Tunnel proves to be costly in terms of lost market share in the South East and the Midlands as a result of increased import penetration by continental producers.

8.1. The Long-Sea Ferry Industry

The post-Tunnel long-sea ferry industry is likely to be marginally affected (Gibb 1989, 1990). Time and cost savings, if any, are considered to be negligible for both passenger and freight traffic going via the Tunnel. However, head-on competition in the short-sea sector could indirectly affect ferry services in the western Channel. Therefore a brief discussion of existing ferry services operating from Devon and Cornwall is required, before examining the likely impact of the Tunnel and the potential for a westward redeployment of excess ferry capacity from the short-sea sector.

8.1.1. Existing Ferry Services

The ferry services operating across the English Channel are shown in Figure 8.2, with the three Channel sectors identified. The western Channel or long-sea sector incorporates the ports of Cherbourg, St. Malo, Roscoff, Plymouth, Weymouth, Poole and Southampton. The current analysis is applicable to other ports in the western Channel outside Devon and Cornwall, albeit less so as distance from the Tunnel decreases. Although the short-sea sector accounts for approximately 75 percent of passenger, 70 percent of car-accompanied and 55 percent of RoRo traffic, Gibb (1990) emphasizes the substantial rate of growth

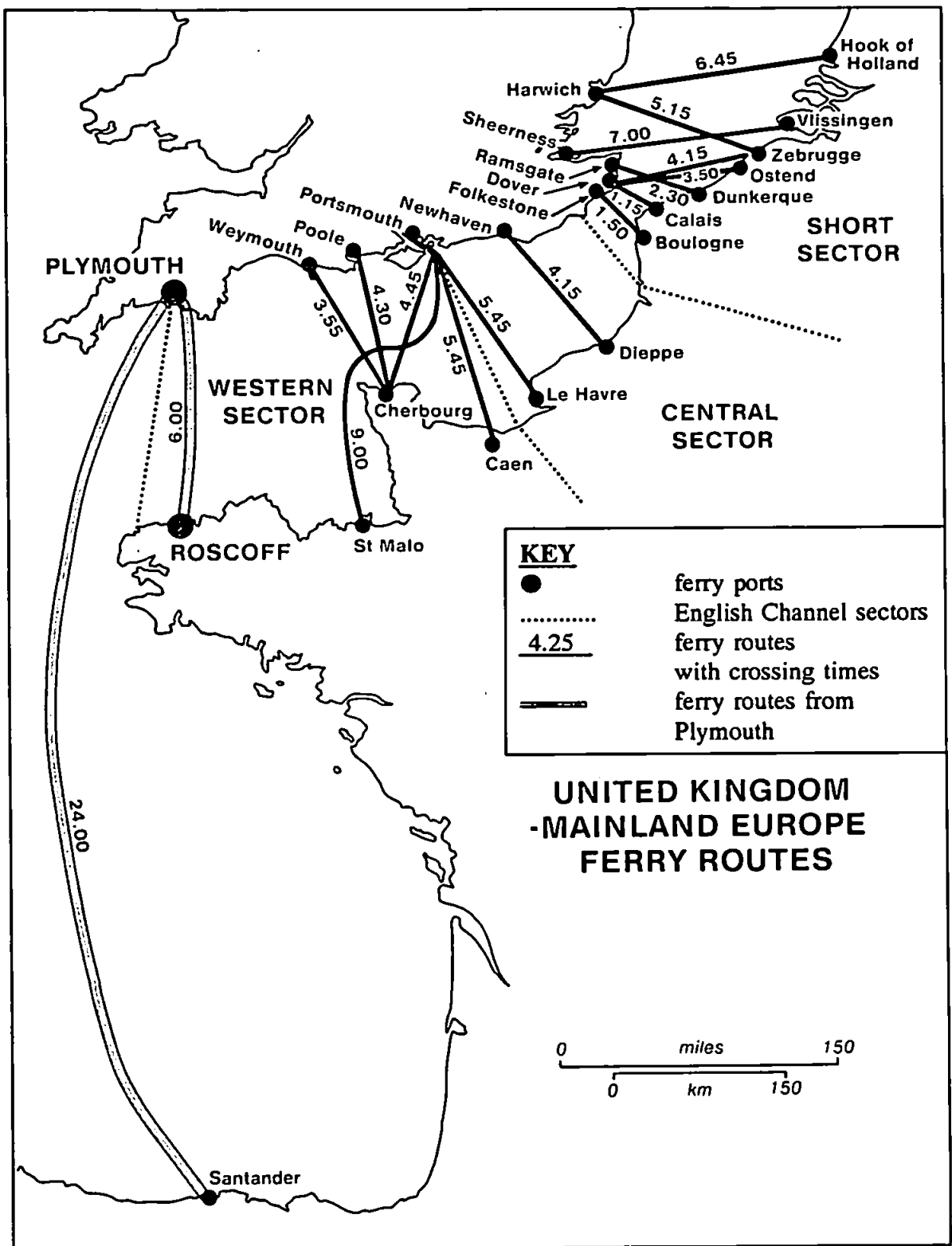


Figure 8.2 Cross Channel Ferry Services

Source ; Gibb 1990a

experienced in the western sector (see Table 8.1). Anglo-French cross-Channel passenger and car-accompanied traffic nearly doubled in the long-sea sector between 1971 and 1980 but RoRo traffic recorded an increased market share from 1.7 to 18.2 percent in the same period. This rapid increase in RoRo traffic was at the expense of the central Channel and is attributed by Gibb to the expansion of services operated from Plymouth by Brittany Ferries (Bretagne, Angleterre, Irlande (BAI)).

The only regular ferry services out of Devon and Cornwall are run by Brittany Ferries. By 1974, both freight and passenger/car-accompanied ferry services were operating on the Plymouth-Roscoff route and by 1978, a similar service was established on the Plymouth-Santander route. Figures 8.3 to 8.5 outline the rate of growth experienced on these routes between 1978 and 1988 for passenger, car-accompanied and freight traffic respectively.

SECTOR	YEAR (PERCENT)		
	1971	1975	1980
PASSENGERS			
Short-sea	77.8	76.4	75.4
Central	16.6	16.1	14.0
Western	5.6	7.5	10.6
CAR-ACCOMPANIED			
Short-sea	70.6	69.8	68.9
Central	20.8	19.6	15.0
Western	8.6	10.6	16.1
ROAD HAULAGE (RORO)			
Short-sea	53.3	56.6	57.7
Central	45.0	29.9	24.1
Western	1.7	13.5	18.2

Table 8.1: Cross-Channel traffic by sector.

(Source: Gibb 1990, P.7; after Conseil Supérieur de la Marine Marchande 1981)

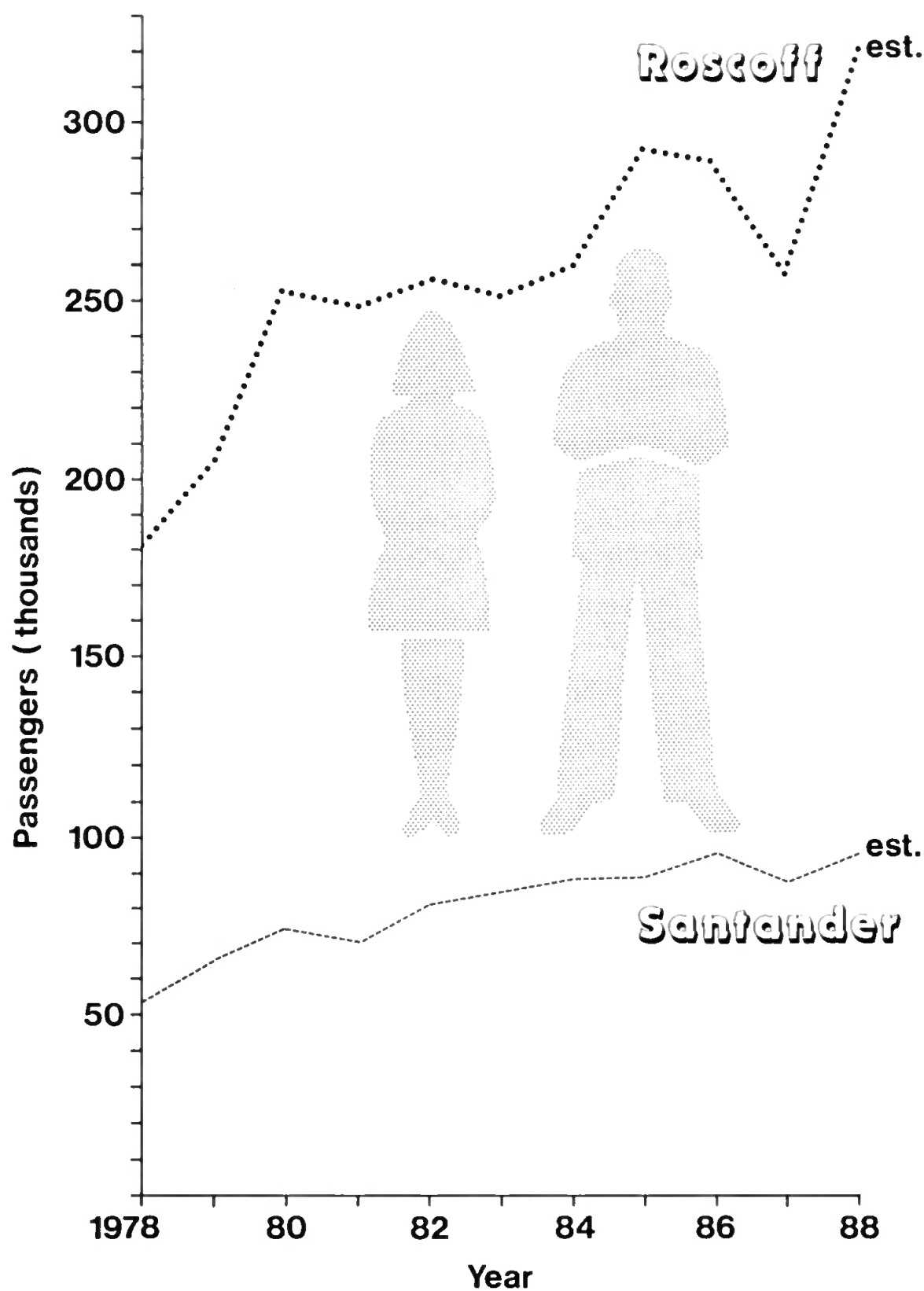


Figure 8.3 Rate of growth on the Roscoff and Santander routes ; passenger traffic.

Source ; Gibb 1990a

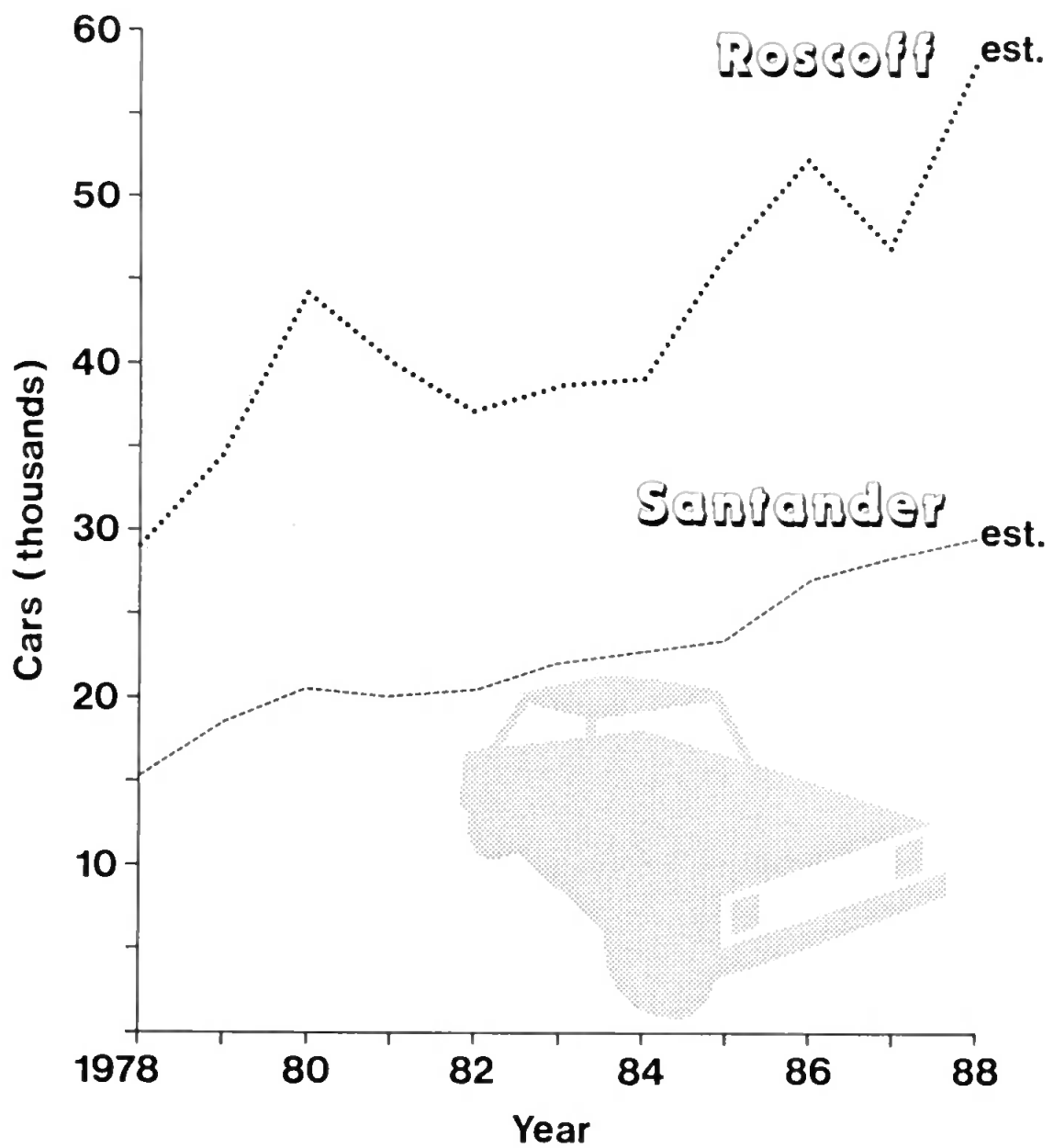


Figure 8.4 Rate of growth on the Roscoff and Santander routes ; car accompanied traffic.

Source ; Gibb 1990a

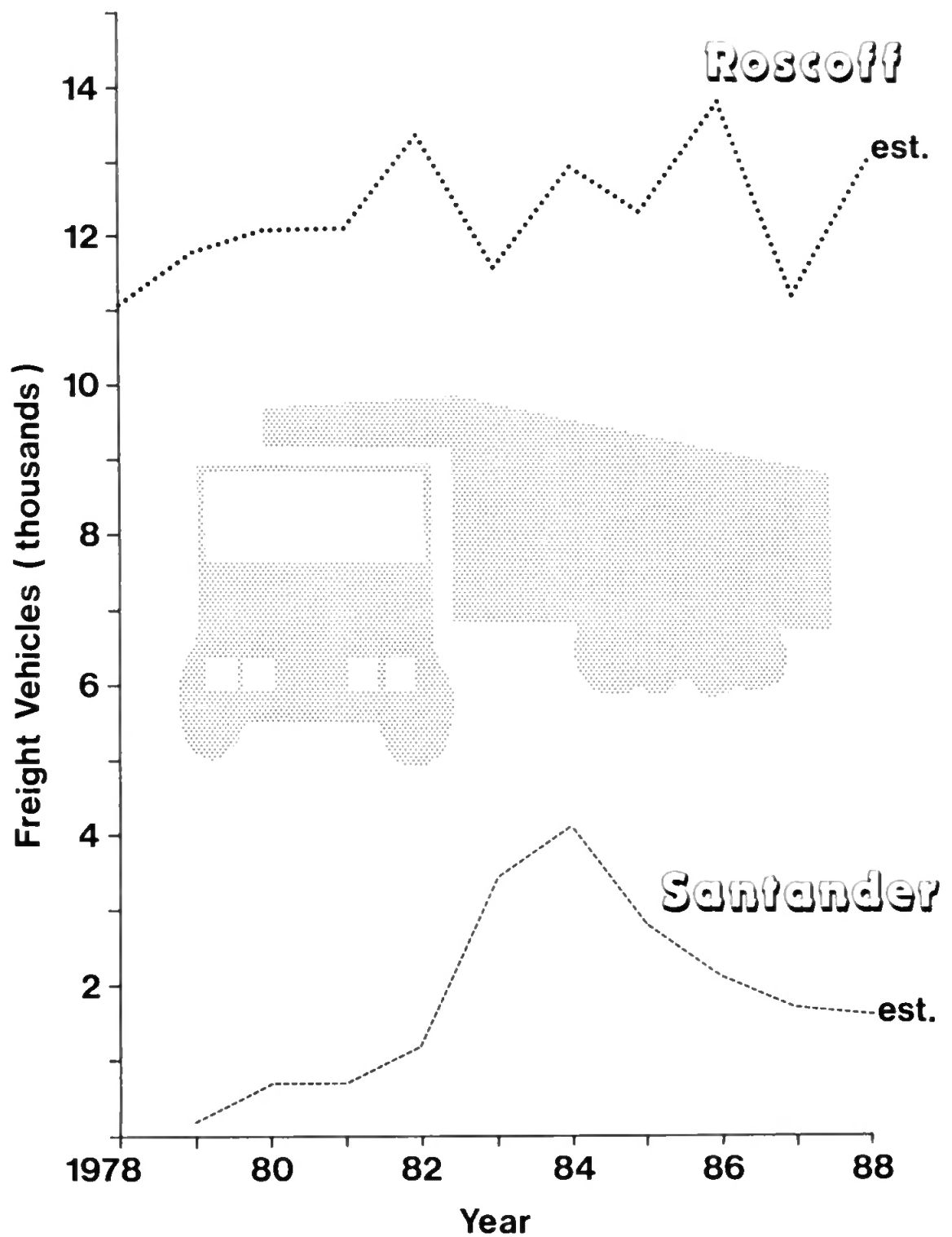


Figure 8.5 Rate of growth on the Roscoff and Santander routes ; freight traffic.

Source ; Gibb 1990a

During the early 1980s, Brittany Ferries suffered considerable operating losses, but the French Government, in collaboration with the local authorities from the Brittany region, invested £8.6 million in the company:

'BAI's operations cannot be considered outside the broader economic and political environment of the Breton region of Western France. BAI's aim, shared by the French state, is to create a new European axis of communication centred on Brittany.'

(Gibb 1990, P.8)

Gibb therefore assumes that if Brittany Ferries was to be adversely affected by the Tunnel, further support would be forthcoming from the French Government.

8.1.2. The Post-Tunnel Western Channel

Eurotunnel (1987) anticipates all of the EC (except Eire), plus Austria, Switzerland and the former Yugoslavia, to be within the catchment area of the Tunnel. It is therefore expected that 90 percent of the classic passenger market and 63 percent of the car-accompanied market would be captured respectively by BR's international through trains and Eurotunnel's Shuttle service. In addition, 25 percent of RoRo and 50 percent of container/wagon traffic is also expected to go via the Tunnel. As Gibb (1990) suggests, if these market shares are attracted evenly from the three cross-Channel ferry sectors the impact on Brittany Ferries will be 'disastrous'. However, utilising the earlier study by Chisholm (1986), it is argued in chapter 7 that Eurotunnel's traffic forecasts are overly optimistic, with the hypothesized catchment area regarded as too extensive.

Gibb (1990) also employs the analysis carried-out by Chisholm (1986) to determine the relevance and implications of Eurotunnel's forecasts for the Far South West port and ferry industry. Any immediate time savings enjoyed when using the Tunnel in comparison with the Plymouth ferry routes for both passenger and freight traffic are shown to be 'partially or fully offset' by the additional driving time incurred and the associated extra costs (Gibb 1990). Thus, the car-accompanied passenger market is considered to be relatively safe from Tunnel competition. In addition, since the Plymouth-Santander ferry service attracts very few classic foot passengers, it does not represent a 'competing service' with the Tunnel

(Gibb 1990). The Plymouth-Roscoff service does, however, carry a proportionately greater number of foot passengers which could be attracted by BR's international through trains. But with no day-time service planned by BR and existing links to London Waterloo/King's Cross considered inadequate, the attraction of international rail travel is likely to be much reduced in the Far South West. As reported by Gibb, the CTG, in the original submission to the Government, estimated that 31 percent of the passenger market in the central and western sectors would be captured by the Tunnel. This figure would seem very optimistic; especially for ferry services operating out of Plymouth, given that they are the most geographically protected. Therefore, the overall impact of the Tunnel on passenger traffic is likely to be minimal, with any immediate loss in market share expected to be made-up by the continued rate of growth in the western sector (Gibb 1990).

In terms of the freight market, Gibb (1989) again concludes that the Tunnel will only marginally affect the Devon and Cornwall port and ferry industry. Based on Department of Transport 1987 data, Gibb points out that 91 percent of freight exports from the Far South West are bulk or non-unitised goods. Only Plymouth and Exmouth handle unitised freight, with 95 percent going through Plymouth. Low value bulk goods can only be viably transported by sea, not by rail. Thus, most ports in Devon and Cornwall handling freight traffic will be unaffected by competition from the Tunnel. In terms of unitised freight, EC legislation on permitted daily driving hours (not more than nine hours in any 24 hour period) makes it unlikely that road hauliers from the Far South West will favour the Tunnel. Therefore, any loss of market share to BR is also likely to be more than compensated for by the continuing growth in the cross-Channel freight traffic.

Thus, it is reasonable to assume that the Devon and Cornwall port and ferry industry will only be marginally affected by increased competition from the Tunnel. However, the prospect of excess ferry capacity in the short-sea sector being redeployed westwards also needs to be examined.

8.1.3. A Westward Redeployment of Ferry Services?

It is hoped within Devon and Cornwall that the western Channel will benefit from over-capacity in the short-sea sector, with new ferry routes being established between the Far South West and the Iberian peninsular (personal interviews: Griffin 1992). As the former Chairman of Sea Containers, owners of Sealink, John Sherwood states:

'I can say with certainty that once the tunnel is open SEALINK UK and all other ferry operators will be out of business on the routes which connect South East England and the range of ports from Dieppe to Zeebrugge.... given notice we will have deployed our resources elsewhere.'

(Gibb 1990, P.38)

As outlined in chapter 7, both P&O and Sealink are now confident that they will be in a position to continue to operate ferry services on the Dover to Calais route after the Tunnel opens. Nonetheless, both P&O and Sealink still expect that a substantial redeployment of excess ferry capacity will be necessary. At the 'Moving into Europe' conference, Strover (1991) stated P&O's interest in operating a ferry service to the Iberian peninsular from either Devon or Cornwall. However, where these extra services would operate from poses real difficulties, since Brittany Ferries have leased the berths at Plymouth until the turn of the century. In 1986, the Olau Line showed interest in operating a Falmouth-Bilbao route but the 'appalling road network to the port' was regarded as a major drawback (Gibb 1989). A similar service from Falmouth is again under negotiation, with the County Council's full support. Based on discussions with the County Planning Officer for Cornwall, the County Council accepts that certain road improvements schemes to the port may be necessary to increase the attractiveness of Falmouth for a new ferry service (personal interview: Griffin 1992).

Nevertheless, by August 1992, no firm commitment has been made to operate a new ferry route from the Far South West. Port accessibility, by both road and rail, is likely to be critical to the potential redeployment of ferry services from the short-sea fleet to Devon and Cornwall, as well as of prime importance to the existing port and ferry industry. Transport links between the Far South West and the Tunnel portal will be crucial to the overall economic impact of the Tunnel. The next section therefore focuses attention on

the perceived inadequate nature of the region's transport network. It will then be possible to examine the long-term impact of the Tunnel on Devon and Cornwall, contrasting the benefits of "insulation" as against the costs of "isolation".

8.2. Transport Links to the Far South West

'With just three years to go before the Channel Tunnel opens to traffic it is becoming more and more likely that the potential that this project once offered to benefit all parts of the United Kingdom will not be fully realised.'

(TCPA 1990, P.1)

The TCPA is concerned that the opportunity for the regionalisation of benefits created by the Tunnel has already been missed as a result of inadequate transport infrastructure and services. In fact, without decisive action, the TCPA foresees the Tunnel exacerbating existing "Centre-Periphery" divisions in the UK. Devon and Cornwall County Councils and Plymouth City Council commissioned an 'Impact Study' (Cornwall C.C. et. al. 1989a), to identify potential opportunities for the Far South West. Their recommendations were also outlined in an 'Action Plan' (Cornwall C.C. et. al. 1989b). However, these opportunities have not been realised or the recommendations acted upon (personal interviews: Franceschini 1992, Griffin 1992). As argued in chapter 3 and recognised by the TCPA (1990), the benefits of the Tunnel for most UK regions will primarily depend on companies switching their distribution practices in favour of rail freight. Thus, the proposed level of international rail services to the Far South West is first examined, before focusing attention on the quality of the road network serving Devon and Cornwall (see Figure 8.6).

8.2.1. International Rail Services

'....the tunnel's benefits for the southwest may not materialise because of a failure to invest in convenient connecting services or new infrastructure to the peripheral regions.'

(Gibb, Essex and Charlton 1990, P.46)

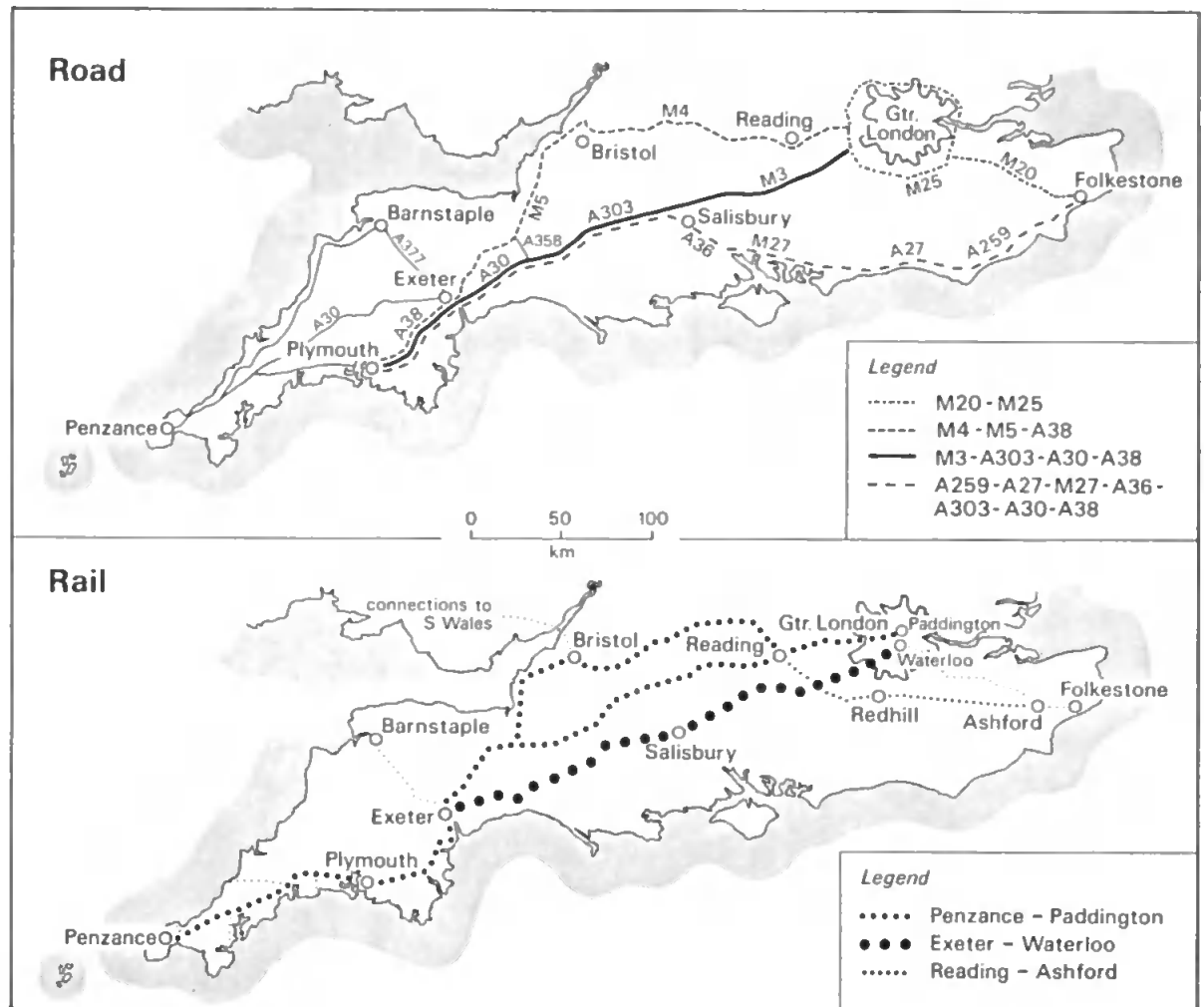


Figure 8.6 Road and rail links to the 'Far South West'

Source ; Gibb et al 1990b

Outside the South East, the highest regional passenger demand for international services is recorded by the South West/South Wales region (Gibb et. al. 1990). However, BR (1989b) does not plan to operate a direct daytime international passenger service to and from the South West/South Wales region. A nighttime service which splits at Bristol and continues on to Plymouth/Cardiff is planned to start operating in 1995. The South West and South Wales are treated as one region by BR because both are served by the former Great Western Railway (GWR) from Paddington, with Bristol in a strategic position to serve both areas.

The reasons behind BR's decision not to run a daytime through train to the West Country is partly as a result of the difficulty posed by the existence of three separate rail corridors (see Figure 8.6). In addition, passenger volumes are not considered sufficient to justify such a service. International passenger services to the South West/South Wales would only serve one region, unlike through trains to the North of England and beyond; which incorporate the West Midlands, the North West and Scotland (Glasgow) on the WCML and the East Midlands, the North East and Scotland (Edinburgh) on the ECML. More important, however, is that for a region to be served by a daytime international through train, the rail line has to be electrified to accommodate the new rolling stock for international services. The main Paddington to Penzance route is at present served by the 125 diesel locomotive fleet but Sir Bob Reid, Chairman of BR, has stated BR's intention to electrify this line by the turn of the century (Devon C.C. 1992). Despite this assurance, however, there is some concern that existing InterCity services to Cornwall will be terminated (personal interviews: Puzey 1992, Strandring 1992). The Paddington main line could therefore be electrified only as far as Plymouth.

The Far South West will only be served by a nighttime through train to Plymouth and connecting services during the day, from Penzance to Paddington or Exeter to Waterloo. There are no plans at present to continue the nighttime service into Cornwall, although BR are currently re-examining the potential to do so. Nighttime services from Plymouth, Swansea and Glasgow will be amalgamated at Olympia into two trains, one for Paris and one for Brussels. The reverse will also apply, with nighttime services from Paris and Brussels.

In terms of daytime international services, the Government's decision in favour of the Overland East London high-speed rail link via Stratford to King's Cross could further disadvantage the Far South West:

'As far as the West Country is concerned, King's Cross is not particularly relevant to the provision of direct through services to the Continent....'

(Devon C.C. 1992, P.17)

In contrast to other UK regions, King's Cross would not provide a useful interchange for international services to the Far South West. Devon County Council therefore recognise the importance of 'establishing an electrified link from Stratford across North London to Acton on the Paddington to Bristol route and electrification onwards to Bristol and Devon and Cornwall' (Devon C.C. 1992). However, with £200 million being currently invested in the Waterloo IPS, it is unlikely that international passenger services would cease to run into Waterloo after the high-speed rail link is built. With no direct daytime international passenger service on offer to the Far South West, an interchange facility at Exeter, with hourly services to the Waterloo IPS, was initially regarded as the optimal solution for Devon and Cornwall (Cornwall C.C. et. al. 1989a&b). Connecting services to Waterloo via Exeter may not significantly disadvantage the Far South West, at least in terms of journey times. But the psychological importance of not having direct through services could prove to be costly, particularly in terms of the tourism industry (personal interview: Strandrings 1992). The decision by BR not to extend the motorail service to the West Country is likely also to affect adversely the attraction of Devon and Cornwall to incoming tourists, since nearly 95 percent visit the Far South West by car (personal interview: Strandrings). The impact of the Tunnel on the Devon and Cornwall tourism industry will be discussed in section 8.3.2. Nonetheless, local government in Devon and Cornwall believe it necessary to lobby BR at every opportunity to ensure the electrification of the Paddington to Penzance main line and encourage the provision of direct daytime international passenger services to and from the Far South West (personal interviews: Franceschini 1992, Griffin 1992).

The Joint South Wales/South West Counties' 'Channel Tunnel Rail Strategy' (Welsh Counties Committee 1990) highlights the potential of an 'around London service' to the

proposed Ashford IPS, via Reading and Redhill. The Transport Users Consultative Committee for western England (TUCC - 1991) also argues for a 'direct route by-passing London for passenger and freight' traffic. The TUCC considers the upgrading of the North Downs route, the line between Reading and Ashford, as the best, and only practicable, solution:

'Reading....is a natural gateway to the West and Wales, the Midlands, the North and Scotland.'

(TUCC 1991, P.vi)

The North Downs route would avoid the need for across London links, by underground or taxi, and the capacity problems likely to arise at King's Cross. An around London route would be beneficial for the Far South West, and other peripheral UK regions, for both passenger and freight traffic but the indefinite postponement of the Ashford IPS undermines the whole proposal, at least in the short-term. Furthermore, BR (1989b) has indicated that it has no plans to develop a by-pass route via Reading.

The constraints imposed on BR, particularly through Section 42 of the 1987 Channel Tunnel Act, are widely appreciated (see chapter 4). However, BR has stated that with respect to the South West/South Wales region:

'EPS (European Passenger Services) will carefully monitor the initial traffic flows and respond if it can be demonstrated that an insufficient service is being offered, either in terms of through or connecting trains.'

(BR 1989c, P.5)

A continuation of the nighttime service on to Penzance would seem the first test of BR's commitment to offer an adequate international service to Cornwall. In the long-term, the electrification of the Paddington to Penzance main line will enable BR to improve considerably the level of international services proposed for the Far South West. In the meantime, a good connecting service via Exeter to Waterloo is likely to provide the best option for daytime passenger services to the Continent.

BR's (1989b) plans for freight services to the Continent for the Far South West are also widely regarded as inadequate (Cornwall C.C. et. al. 1989a, Gibb 1990). Devon and

Cornwall County Councils and Plymouth City Council consider an intermodal terminal at Plymouth as vital for both counties, but BR does not believe demand will justify such a facility. BR's (1989b) forecasts for rail freight are believed by most commentators to be very conservative (CLES 1989, Pidea 1989a&b, TCPA 1990). The TCPA (1990) argues that BR's policy of concentrating entirely on new intermodal technology is misguided. Continental UIC B+ gauge freight routes throughout the UK are considered to be important to allow the regions to maximise the opportunities created by the Tunnel. This conclusion is supported by the study carried out by the NUR (1987).

Since the high-speed rail link between London and the Tunnel portal may be built to the continental loading gauge, Devon C.C. (1991) believes that the proposed electrification of the main line to the Far South West should also encompass plans to change the loading gauge to the continental Berne UIC B+ gauge standard. This would facilitate direct international freight services between the Far South West and the Continent. The continental Berne gauge allows loads six inches wider and substantially higher than the UK loading gauge. The re-engineering of existing rail lines would be a massive undertaking, involving the rebuilding of bridges, tunnels and stations, as well as necessitate new rolling stock for all other rail services on those lines. For these reasons, BR currently favours the introduction of new vehicle technology to accommodate continental-sized containers and trailers within the UK.

8.2.2. Road links to the Tunnel

Since the benefits of the Tunnel for the more peripheral UK regions primarily depend on companies using rail freight (explained in detail in chapter 3), it is only necessary to examine briefly the implications of poor road links to the Far South West. Cornwall C.C. et. al. (1989a) considers improved road access to be critical if the benefits created by the Tunnel for the tourism industry are to be realised. Nearly 95 percent of tourists visiting the Far South West travel by car. In addition, an inadequate road network could adversely affect the attraction of Devon and Cornwall ports in terms of the redeployment of ferries from the short-sea sector.

As can be seen from Figure 8.6, road links between the Far South West and the Tunnel portal are 'tied' to the M25 (Cornwall C.C. et. al. 1989a). Improvements to the M4/M5 and M3/A303/A30 are therefore considered important but a route by-passing the M25 is favoured:

'Both routes are congested and circuitous and an upgraded through route from Kent to the southwest, bypassing the heavily trafficked M25, would be of considerable value.'

(Gibb et. al. 1990, P.46)

However, the necessary investment is unlikely to be forthcoming from central Government. The Department of Transport has argued that increased road traffic as a result of the Tunnel will be insufficient to justify increased investment in the road network outside Kent (Department of Transport 1986). Improvements to the trunk road network within Devon and Cornwall have been made, including the Okehampton and Blackwater by-passes and the North Devon link road. But Cornwall C.C. et. al. (1989a) also propose the extension of the M5 to Plymouth, a second Tamar Crossing and the completion of the improvements to the A30.

8.2.3. An Inadequate Transport Network: a summary

It is apparent that many regional actors think that considerable improvements to the transport network to the Far South West and within Devon and Cornwall are vital if the regional economic impact of the Tunnel is to be positive:

'Road and rail infrastructure to and from Devon and Cornwall needs to be improved to enable the counties to compete better with more accessible regions of Britain.'

(Cornwall C.C. et. al. 1989a, P.38)

The TCPA (1990) recognises that the benefits created by the Tunnel for the regions primarily depend on companies exporting goods to the Continent via the rail network, and thus calls for a 'TGV North'. However, like most other regional reports, the TCPA seems to have overlooked the interests of the Far South West. Devon and Cornwall are not only geographically peripheral but also isolated in terms of road and rail links to the Tunnel.

The local authorities in the Far South West have been active in stating the case for transport infrastructure investment in the region, lobbying both BR and the Department of Transport at every opportunity (personal interview: Franceschini 1992). Nonetheless, recommendations outlined in the Action Plan (Cornwall C.C. et. al. 1989b), including extending the nighttime passenger service to Penzance and the siting of an inter-modal freight terminal at Plymouth, have not been implemented. It will become evident that the initial optimism expressed in the Impact Study (Cornwall C.C. et. al. 1989a) has now largely diminished (personal interviews: Franceschini 1992, Griffin 1992).

8.3. Regional Implications

This section will also examine the implications of peripherality for the regional economy, juxtaposing the cost of "isolation" from the Tunnel against the benefits of "insulation" (from any adverse effects). The experience of the Far South West may have important implications for the "North" in general. It is first important to examine the significance of the Tunnel to local industry within Devon and Cornwall. The long-term impact of the Tunnel for the UK will be determined by companies realising improvements in journey times and costs to the Continent, and vice versa. Industrial relocations and/or a switch in distribution practices favouring rail freight are seen as the likely reactions of companies.

8.3.1. Local Industry

Before examining how the Tunnel will affect local industry in Devon and Cornwall, it is first useful to provide a brief outline of the Far South West regional economy. Gripaios (1990) in 'The South West Economy: Trends and Prospects', after employing 18 economic indicators to study intra-regional comparisons, concludes that:

'A clear picture emerges of reduced prosperity the further South West one travels.'

(Gripaios 1990, P.23)

	1987 % of EMPLOYEES: AGRIC. ENERGY MANU. SERVICES			
SOUTH WEST	2.9	1.6	22.6	68.5
AVON	1.2	1.9	21.8	70.8
CORNWALL	5.3	1.3	15.6	73.3
DEVON	3.4	1.4	19.7	71.3
DORSET	2.2	1.3	20.3	72.2
GLOUCS	2.7	2.1	28.2	62.7
SOMERSET	5.1	2.2	28.1	59.5
WILTSHIRE	2.8	1.2	25.6	65.5

Table 8.2: Employment by industry†.

(Note: † Excludes self-employed and unemployed.)

(Source: Gripaos 1990, P.28)

	OCT 1983	SEPT 1988	OCT 1989
SOUTH WEST	11.3	7.4	4.1
AVON	10.8	7.5	4.4
CORNWALL	15.7	11.8	6.7
DEVON	13.0	9.0	4.9
DORSET	10.8	5.8	3.8
GLOUCS	9.9	5.9	3.6
SOMERSET	9.3	6.5	4.3
WILTSHIRE	9.8	5.5	3.1

Table 8.3: Unemployment rate†.

(Note: † Figures for 1983 and 1988 express unemployment as a percentage of employees and unemployed. 1989 figures express it as a percentage of the total workforce.)

(Source: Gripaos 1990, P.29)

Devon and Cornwall are ranked sixth and seventh respectively of the seven counties in the South West region, with the eastern counties of Wiltshire, Avon and Dorset ranked the top three. In terms of employment by industry (see Table 8.2), more than 70 percent of employees in the Far South West are employed in the service sector. Manufacturing only accounts for 19.7 and 15.6 percent, respectively, of the Devon and Cornwall workforce, compared to a South West average of 22.6 percent. Devon and Cornwall also record the highest unemployment rates within the South West (see Table 8.3).

The unemployment rate for Cornwall in October 1989 was more than double that for Wiltshire and over 60 percent above the South West average. Although improvements in some economic indicators for Cornwall are recorded, Gripaios states:

'Unfortunately, the reason is that Devon and, in some cases, Somerset are now slipping down towards the Cornish level relative to the South West as a whole.'

(Gripaios 1990, P.23)

From this rather brief synopsis of the Far South West economy, it is possible to ascertain that Devon and Cornwall do not share in the prosperity commonly associated with the "South". In fact, the TCPA (1989) categorises the Far South West as part of the "North", whilst defining the "South" as:

'....embracing broadly the South East standard region, East Anglia, Dorset, Wiltshire, Avon and Gloucestershire, as well as parts of the East and West Midlands....'

(TCPA 1989, P.30)

The "North" is believed to comprise of 'everything else' to the north and west. Champion and Green (1988) define the "North-South" divide as a line traversing Britain between the Severn and the Wash but identify local 'North-South divides' throughout the UK, including the Far South West. Therefore, it is widely accepted that the Far South West exhibits characteristics commonly associated with the "North".

It is generally argued that most of the benefits created will be confined to the "South" (Keeble et. al. 1982a, Simmons 1985, 1989, Button 1989, Vickerman 1989a&b). Cornwall

C.C. et. al. (1989a) agree with this belief but also foresee the Tunnel leading to increased land values, rents and labour costs in the South East. Therefore, with reduced profitability, it is hoped that:

'In due course, the South West, could become a more attractive industrial location, as the economic advantages of the South East spread westwards in a ripple effect.'

(Cornwall C.C. et. al. 1989a, P.30)

The findings of the questionnaire survey carried-out for the present study show that no companies outside the South East anticipate relocating as a result of the Tunnel. Only two companies in London believe they will move closer to the Tunnel portal. As discussed in the Literature Review (chapter 2), South East regional reports also regard a southwards migration of industry as unlikely (SEEDS 1989, SERPLAN 1989). Hence, with no increased economic pressure within the South East, the South West, particularly the Far South West, will not derive benefit from a 'ripple effect'. Poor transport links further reduce the possibility of a westward movement of industry to Devon and Cornwall. Such a ripple effect for other peripheral UK regions would also seem unlikely.

Nonetheless, the long-term impact of the Tunnel will depend ultimately on companies switching their distribution practices in favour of rail freight, since:

'An important factor....is the cost of transport relative to time and with the opportunities that the Tunnel presents for a shift towards rail, the economics of transport should favour rail in the future.'

(Cornwall C.C. et. al. 1989a, P.30)

Inadequate rail freight facilities and services will disadvantage the Far South West relative to other UK regions. The findings of the questionnaire survey show that fewer companies in Devon and Cornwall anticipate using the Tunnel for freight exports (see Table 8.4). Over 70 percent of companies in the two counties plan to use the Tunnel for less than 20 percent of freight exports. The respective values for the South West and all respondents in general are 66.2 and 61.0 percent. In addition, only 12.9 percent of companies in the Far South West currently expect to send more than 20 percent of their freight exports via the Tunnel (none greater than 60 percent), compared to 18.6 percent for the South West

and 19.0 percent for all respondents in general. This apparent difference in company plans to use the Tunnel for freight exports cannot be explained by preferences for existing modes of cross-Channel transport (see Table 8.5). However, companies in Devon and Cornwall are less likely to be influenced by journey times (35.5, 46.0 and 43.8 percent respectively).

% OF FREIGHT EXPORTS VIA THE TUNNEL	DEVON & CORNWALL	SOUTH WEST	OVERALL (SOUTH EAST & SOUTH WEST)
0 - 20	71.0	66.2	61.0
20 - 40	3.2	7.9	8.3
40 - 60	9.7	8.6	7.8
60 - 80	0.0	1.4	1.6
80 - 100	0.0	0.7	1.3

Table 8.4: Percentage of companies anticipating using the Tunnel for freight exports.

MODE OF TRANSPORT	DEVON & CORNWALL	SOUTH WEST	OVERALL (SOUTH EAST & SOUTH WEST)
AEROPLANE	22.6	23.0	21.5
RAIL	19.4	13.7	17.2
RORO	41.9	48.9	50.5
LOLO	16.1	16.6	16.9
OTHER	19.4	14.4	10.2

Table 8.5: Percentage of companies using existing cross-Channel modes of transport for freight exports.

Thus, with relatively fewer companies in the Far South West planning to send freight exports via the Tunnel, the opportunities created, in terms of rail freight, are less likely to be realised. However, as a direct consequence of closer proximity to regional freight terminals, companies located in other peripheral UK regions are more likely to anticipate using the Tunnel for freight exports. Since, as argued above, a westward movement of industry to Devon and Cornwall is considered unrealistic, the long-term benefits of the

Tunnel for the region are likely to be minimal. The Far South West would appear therefore to be "isolated" from the potential opportunities created by the Tunnel. Whether the two counties are also "insulated" from the adverse effects of the Tunnel is not as evident. Continental companies are more 'geared up' to rail freight than their British competitors (Pieda 1989b), placing them in a stronger position to maximise the benefits created by the Tunnel. This is likely to lead to increased continental imports penetrating UK markets, and thus capturing the "Third Markets" of the more peripheral UK producers, including companies in the Far South West. The "Third Market" impact of the Tunnel on Devon and Cornwall is examined in section 8.3.3.

% OF BUSINESS TRIPS VIA THE TUNNEL	DEVON & CORNWALL	SOUTH WEST	OVERALL (SOUTH EAST & SOUTH WEST)
0 - 20	87.1	87.1	84.4
20 - 40	0.0	4.3	5.4
40 - 60	9.7	4.3	3.0
60 - 80	0.0	0.0	1.1
80 - 100	3.2	0.7	1.1

Table 8.6: Percentage of companies anticipating using the Tunnel for future business trips.

The Tunnel is also considered unlikely to affect significantly continental business trips to and from the Far South West. Air travel will still be too competitive in terms of journey times, especially in the absence of day-time international train services. However, as is evident from Table 8.6, companies in Devon and Cornwall are as likely to anticipate using the Tunnel for future business trips, even though more than 80 percent of companies do not plan to use the Tunnel. The 'Impact Study' (Cornwall C.C et. al. 1989a) regards information technology to be of more importance than the Tunnel, making offices more mobile and thus increasing the prospects for Devon and Cornwall. But, contradicting this premise, the TCPA (1987) states that information technology will lead to the increased

centralisation of high-level functions, leaving only manual and clerical jobs for the periphery.

In conclusion, Cornwall C.C. et. al. (1989a) consider the economic benefits of the Tunnel to be only marginal. The present study agrees to some extent with this conclusion, in that the benefits created by the Tunnel are not likely to be augmented within the Far South West. However, the potential adverse effect of the Tunnel is seen as a cause for much concern. The impact on the tourism industry is hoped to be beneficial but, as shown in chapter 7, the positive effects of the Tunnel on the East Kent tourist trade are now believed to be much less significant (CTJCC 1991a&b).

8.3.2. The Tourism Industry

'Tourism is a critical component in most aspects of Cornwall's economy. It should thus be promoted as the key trigger-mechanism for nearly all forms of development in moving towards a sound multi-strand economy.'
(Travis 1991, P.3)

Tourism is an important industry within both Devon and Cornwall. The effect on the Far South West tourist trade is therefore significant in the overall economic impact of the Tunnel. Cornwall attracts more than 3-3.5 million visitors to the county each year, spending nearly £600 million and accounting for more than 33,000 jobs within Cornwall or 21 percent of the workforce (Travis 1991, personal interview: Strandring 1992). From a report commissioned from the then Plymouth Polytechnic (Charlton and Essex 1989), the Impact Study (Cornwall C.C. et. al. 1989a) states that:

'In terms of tourism, the three Councils recognise that the Channel Tunnel is a potential opportunity.'
(Cornwall C.C. 1989a, P.30)

Charlton and Essex (1989) believe that since tourism is already an important growth industry in Devon and Cornwall, the Tunnel is likely to create more opportunities. In the 10 year period up to 1987, overseas tourist visits to the West Country increased by 53 percent, compared to the average for all the tourist board regions in England of 27 percent (Cornwall C.C. et. al. 1989a). However, transport infrastructure limitations are again

regarded as a major cause for concern (Charlton and Essex 1989). Primarily for the above reason, the Cornwall Tourist Board (personal interview: Strandring 1992) is no longer optimistic as to the impact of the Tunnel. With only limited improvement in transport infrastructure and services to the Far South West, it is now considered that improved accessibility between the UK and the Continent can only be detrimental to the Devon and Cornwall tourism industry.

The West Country is the most popular destination for domestic tourists and the largest, outside the South East, for overseas visitors. In terms of overnight stays in the West Country, Devon and Cornwall account for two thirds of the domestic market and over half of the overseas market (Cornwall C.C. et. al. 1989a). From European Tourist Board and West Country Board statistics, Charlton and Essex (1989) show that Devon and Cornwall, in 1987, attracted approximately 52 percent of the 1.2 million overseas tourists, 10.5 million 'nights' and £249 million tourist expenditure in the West Country. The principal source countries of overseas visitors to the West Country are North America (372,000 in 1987), Australia (120,000) and Europe; 168,000 from both France and (West) Germany, and 72,000 from the Netherlands (Cornwall C.C. et. al. 1989a). Thus, some feel that:

'The European market still has great potential and the opening of the Channel Tunnel presents an opportunity for that market to expand.'
(Cornwall C.C. et. al. 1989a, P.31)

The influence of the Tunnel will more than likely be restricted to visitors from the Continent, particularly the near Continent. Therefore, the respective Councils' tourist boards will make a strong effort to attract customers from this market.

The Far South West tourist trade is 'highly dependent on the traditional holiday market', with business/conference trips forming a very low proportion of the total (Charlton and Essex 1989). The West Country's main competitor in the traditional holiday market is the Mediterranean; thus the Tunnel is unlikely to affect significantly tourists plans to visit either region. Nonetheless, if the Tunnel does alter perceptions and attitudes, more domestic tourists may be encouraged to take their main annual holiday on the Continent. Considering that by the late 1990s, journey times between Penzance and London, and

London and Milan will both be approximately five hours, 30 minutes, it is not inconceivable that perceptions will change.

The growth in the Devon and Cornwall tourism industry over the last decade is accounted for by short-stay visits. But it is argued that:

'The Tunnel will bring the greatest advantage to destinations up to 3 hours drive from the exit. Regions closer to the Tunnel will be the main generators of outbound short stay tourism.'

(Cornwall C.C. et. al. 1989a, P.31)

In 1987, 43 percent of all visits to the West Country were from London and the South East. The West Midlands is another important source region for the short-stay market in the West Country. Both regions have good road and rail links to the Tunnel. If there is a net fall in the short-stay market in the Far South West, with more domestic tourists encouraged to have breaks on the Continent than vice versa, the Tunnel will adversely affect the Devon and Cornwall tourism industry. Hence, Charlton and Essex (1989) emphasize the need to improve the 'tourism product', with higher quality accommodation and more facilities. In addition, a more professional attitude among the people employed in the tourist industry is regarded as critical. This is particularly important considering the investment now being directed towards the tourism industry in the regions on either side of the Tunnel (see chapter 7). The Cornwall Tourist Board (personal interview: 1992) is now marketing the county as a year-round tourist destination, with more activity/theme holidays, in an attempt to retain existing tourist levels.

BR's reluctance to provide a daytime through train service from the Tunnel to the Far South West will be extremely detrimental to the Devon and Cornwall tourism industry. Charlton and Essex believe that inadequate transport links by both road and rail from the Tunnel to the Far South West will reduce the potentially large European market and, furthermore, it is feared that poor connectivity will:

'....reduce the attractiveness of Devon and Cornwall to foreign visitors and increase the relative popularity of other more accessible regions in the UK.'

Similarly, the domestic market, particularly for short breaks, could be diverted to the Continent.'

(Gibb et. al. 1990, P.59)

The "double-edged" nature of improved accessibility between the UK and the Continent is therefore regarded as potentially damaging. Devon and Cornwall's tourist industries could lose in terms of short-break holidays, with their traditional catchment area, the South East and the West Midlands, being exposed to the attractions of the near Continent. Furthermore, overseas visitors to the Far South West may in future be persuaded, by direct daytime international train services, to travel to other UK tourist destinations, such as the Lake District, the Pennines and the Scottish Highlands. The Deputy Tourism Officer for Cornwall (personal interview: Strandring 1992) cites the present lack of direct international train services to the county as being of critical importance to Cornwall as a destination for continental visitors. Developing existing air services between the Far South West and the Continent, including charter flights, is seen as one means to increase accessibility to the region (personal interview: Griffin 1992).

Therefore, as a consequence of an inadequate transport network, the opportunity presented by the Tunnel to expand the European tourist market has been lost. In fact, the Tunnel is now regarded as a real threat to the Devon and Cornwall tourism industry.

8.3.3. The "Third Market" Impact

The "Third Market" effect of the Tunnel poses a real threat to most peripheral UK regions, including the Far South West (see chapter 2). Significantly more companies on the Continent already use rail freight, placing them in a stronger position to realise the advantages offered by the Tunnel. Domestic UK markets will experience increased competition from the Continent, particularly from the near Continent. The South East and the Midlands represent the main domestic or "Third Markets" for most peripheral UK regions. Increased import penetration by continental producers could have serious repercussions for regions such as the Far South West.

However, no comprehensive study of the "Third Market" impact has yet been undertaken. It is therefore only possible to highlight this specific threat to companies in the Far South West. Based on the findings of the questionnaire survey, companies in Devon and Cornwall are more aware of the likelihood of greater import penetration by continental producers than all respondents in general. When asked whether the Tunnel and related transport infrastructure are likely to make companies vulnerable to increased competition, the results show that nearly one third of companies in Devon and Cornwall anticipate increased competition, compared to 21.6 and 22.9 percent respectively for the South West and all respondents in general (see chapter 5). More than two thirds of companies in Devon and Cornwall also do not expect their accessibility to continental markets to be improved. Thus, the Tunnel is likely to have serious implications for the Far South West economy.

REGIONAL ECONOMIC IMPACT	DEVON & CORNWALL	SOUTH WEST	OVERALL (SOUTH EAST & SOUTH WEST)
BENEFICIAL	22.6	25.2	48.9
NEUTRAL	38.7	33.8	16.4
DAMAGING	29.0	20.1	15.1
DON'T KNOW	6.5	10.1	10.8

Table 8.7: Company perceptions of the regional economic impact of the Tunnel.

However, despite this, no companies in Devon and Cornwall believe it necessary to relocate. But companies in the Far South West are in general less optimistic about the overall regional economic impact of the Tunnel (see Table 8.7). More companies are likely to anticipate an overall damaging impact than a beneficial one. Nevertheless, no substantive conclusions can be drawn from this limited data base, especially considering the small number of respondents in the Far South West (31). However, company perceptions in Devon and Cornwall do seem to diverge from the South West and overall averages. Companies in Devon and Cornwall are more likely to perceive the threat posed

by a "Third Market" effect than those in the South West as a whole and all respondents in general.

8.4. Conclusion

'The Tunnel and the Single European Market are forcing a level of competitiveness on local companies which many may well be ill-equipped to meet.'

(personal interview: Blacker 1992)

This conclusion by the head of the Devon and Cornwall Development Company is a further reflection of the concern that is now expressed about the regional economic implications of the Tunnel for the Far South West. The optimism apparent in the Impact Study (Cornwall C.C. et. al. 1989a) has receded. Inadequate transport infrastructure and services are now widely seen as limiting the potential benefits created by the Tunnel, whilst at the same time enhancing the likely adverse effects. International rail services for both passenger and freight traffic are considered critical to the Far South West. However, the role of local government is confined to one of only lobbying BR for improved services. BR have no plans to operate a daytime international passenger service to the West Country. Only a nighttime service as far as Plymouth is proposed. Potential rail freight volumes are also regarded as insufficient to justify an inter-modal terminal at Plymouth. The ability of companies within the Far South West to exploit the opportunities generated by the Tunnel is therefore likely to be restricted.

Devon and Cornwall's relative isolation from the Tunnel does, however, seem to protect the region's ferry and port related industry from increased competition, since time savings for both passenger and freight traffic, would be negligible. However, such isolation is likely to be detrimental to Devon and Cornwall's tourism industry, which is of particular importance to the local economy. The lack of daytime international passenger services and a nighttime service which terminates at Plymouth will place the Far South West at a relative disadvantage to other UK regions. If, as a consequence, more domestic tourists are

attracted to the Continent, particularly from the main markets of the South East and the Midlands, and fewer European visitors attracted to the South West, the net impact on the Devon and Cornwall tourism industry is likely to be extremely damaging.

A larger proportion of companies in the Far South West also anticipate increased competition from the Continent, compared to the South West and all respondents in general. This study has only been able to highlight the threat posed by the "Third Market" effect. However, without further academic study of the potential "Third Market" impact of the Tunnel, no substantive conclusions can be drawn. Nonetheless, the findings of the questionnaire survey carried out for the current research project do indicate cause for concern. Companies in Devon and Cornwall are less optimistic than all respondents in the South West about an overall positive impact on the regional economy. In fact, nearly 30 percent fear an overall damaging impact, twice as many as all respondents in general (South East and South West).

The conclusion of this chapter therefore reinforces the widespread belief that the opportunities created by the Tunnel for most peripheral UK regions will be restricted as a result of Government (and BR) policy. If a co-ordinated and cohesive national transport policy - as called for by Harmen (1987), Simmons (1989) and the TCPA (1990) - was in place, the situation for the Far South West and other peripheral regions could be much different. Only a change in policy at the national level, as indicated in chapter 4, will allow Devon and Cornwall to maximise the benefits created by the Tunnel and minimise the adverse effects.

CHAPTER 9: SUMMARY AND CONCLUSIONS

In this concluding chapter, the main aims and objectives of the project are reiterated. The results generated in the preceding chapters are then summarised before a discussion of the overall conclusions. Issues requiring further research are also outlined.

9.1 Aims and Objectives

The principle aim of this study was to investigate the potential regional economic impact of the Tunnel and identify some local consequences of such a major transport infrastructure project. It was hypothesized that the Tunnel represents an opportunity to redress the economic imbalance between "North" and "South". Following the Literature Review (chapter 2), which highlighted a widespread perception that South East England would benefit the most from the Tunnel, Economic Potential Analysis (chapter 3) was employed to determine the likely effect of the Tunnel on UK regional accessibility in relation to the Continent. The aim of the model was to identify potential gains or losses for the more peripheral UK regions as well as the South East.

However, British Government policy towards the Tunnel and related transport infrastructure will influence critically the potential regional economic impact; thus a review of the legislative and policy framework is fundamental to any study of the Tunnel. It was argued in chapter 4 that Government policy is likely to limit the opportunities created by the Tunnel for regions outside the South East. The contrast between the British Government's policy of inaction with the interventionist approach favoured on the Continent, especially in France, was emphasized. The confusion and delay associated with the proposed high-speed rail link between London and the Tunnel portal illustrates the "failure" of British Government policy to take advantage of the potential regional advantages offered by the Tunnel.

A questionnaire survey was undertaken to determine the reactions of British companies to the opportunities and problems that are likely to be created by the Tunnel. The results of all the respondents were first examined (chapter 5), before a regional analysis was carried-out (chapter 6). The information generated provided a strong empirical foundation for the present study. Finally, attention was focused on a local scale, with case studies of East Kent (chapter 7) and the "Far South West" (chapter 8). In both instances, the differing conclusions of previous studies were drawn together for the first time, but data was also generated via personal interviews. One of the original features of this study is that the information obtained by questionnaire and interview techniques was compared and contrasted with the results of the Potential Model. The originality of the present thesis is also complemented by its comprehensive analysis of published statistics and critical synthesis of Government and private sector consultancy reports (chapter 4).

9.2. Summary of the Results

Discussion of the results generated will be structured according to the lay-out of the thesis (see Figure 1.9). First, the main findings of the Economic Potential Model (chapter 3) will be outlined. A critique of the legislative and policy framework of the Tunnel, both within the UK and on the Continent, will then follow. The main results of the questionnaire survey are also highlighted, before attention focuses on the information derived from the case studies of East Kent and the "Far South West".

As was evident from the Literature Review (chapter 2), the South East is generally perceived as the region that will gain the most from the Tunnel, with the advantages derived from the region's proximity to the European mainland expected to be enhanced. However, it is also generally considered that even in the South East the benefits will be small. Regional commentators (Campaign for the North 1981, NOERC 1988, CLES 1989, Pieda 1989a&b, TCPA 1990) link the impact of the Tunnel on regions outside the South East to the quality of the supporting transport network. The British Government's policy of non-intervention is therefore criticised for preventing the regions from maximising the

benefits created by the Tunnel and minimising the adverse effects. The call for a 'National Impact Study' is echoed in most academic articles and consultancy reports (Gossop 1987, AMA 1989, Harmen 1989, Simmons 1989, TCPA 1990, Holliday et. al. 1991). From the outset this study has challenged the general assumption that the South East has the most to gain from the Tunnel.

9.2.1. Improved Accessibility to the Periphery?

The Economic Potential Model developed for this study showed that certain peripheral UK regions, such as Scotland, the North and East Anglia, could experience increases in relative accessibility of the same magnitude as the South East (see Table 3.9). The planned average running speed of post-Tunnel international freight trains, i.e. 75 mph (BR 1989b, personal interview: Jenkins 1990), was incorporated into the model (Simulation 3). Since the results for Simulation 3 are based on a realistic running speed for international freight services after the Tunnel opens, they are of critical importance, as compared to Simulations 1 and 2 (30 and 40 mph respectively), to the more peripheral UK regions.

It was also argued that because more than 75 percent of British-continental trade originates from, or is destined for, regions to the north and west of London, improved access to the Continent would represent as much as, or more of, an opportunity for these peripheral regions. Rail freight also becomes increasingly competitive, compared to road haulage, over distances in excess of 250/300 kms. Thus, the advantages of rail freight are just as likely to be enjoyed by companies in the more peripheral UK regions as their counterparts in the South East, particularly with respect to exports to the near Continent.

Therefore, based on the results for Simulation 3 and the above arguments, it was concluded that regions to the north and west of London could benefit to the same degree as, or relatively more than, the South East from direct rail freight services between the UK and the Continent. If, as suggested in chapter 3 (see section 3.7), a more narrow, and reliable, data set (regional exports or industrial output instead of GDP values) was available to measure regional economic activity, the advantages of improved accessibility to the Continent could have been shown to be even more significant to the more peripheral UK

regions. This conclusion contradicts most earlier studies, as well as the general assumption that the South East will be the main beneficiary. Furthermore, the results add further weight to criticisms of British Government inaction towards the Tunnel, in that it can be seen as failing to help the UK's more peripheral regions.

9.2.2. A Policy of Inaction

The Government's overriding objective was to avoid any delays before construction of the Tunnel commenced, which also meant that the scope for public consultations was limited. The Tunnel was at no time seen by the British Government as an opportunity to narrow the "North-South" divide, although the findings of the Economic Potential Model (chapter 3) highlight such a potential. Government policy was successful in avoiding the delays so harmful to the 1970s project. However, at what cost was this achieved?

The consequence of British Government policy has been inadequate investment in the national transport infrastructure, particularly in terms of the rail network. Britain's rail network will remain a product of "Victorian enterprise", whilst most other EC member states support the European Commission's initiative on high-speed rail travel. Section 42 of the 1987 Act prevents BR from using public money to finance international rail services. The delays associated with the high-speed rail link between London and the Tunnel portal are primarily a result of this provision. The House of Lords' Section 40 amendment to the 1987 Act (which established a series of regional consultations) only succeeded in identifying the great disparity between regional aspirations for improved rail services and commercially justified investment by BR. Thus, it is argued that the modification or complete repeal of Section 42, along with other measures to ease the strict financial remit imposed on BR by the Government, are essential if the regions are to be allowed to benefit from the Tunnel.

The series of delays associated with the high-speed rail link between London and the Tunnel portal is an example of the British Government's failure to ensure adequate investment in supporting transport infrastructure. Since the rail link was widely regarded in the Section 40 consultations as crucial to the regionalisation of potential benefits from

the Tunnel (Knowles et. al. 1989, Farrington et. al. 1990), it is therefore only possible to conclude that, as a result of the Government 'market solutions' policy, the opportunity created is almost certain to be missed. The planned franchising of rail services from 1994 is also a cause for concern in that deregulation of rail services is likely to engender considerable confusion and could undermine the ability of BR to attract freight from roads to the rail network.

The British Government's policy towards the Tunnel contrasts strongly with the interventionist strategies adopted in France. The French Government considers the Tunnel as an opportunity to revitalise the economic fortunes of the depressed region of Nord-Pas de Calais. Close consultation between national, regional and local government is the foundation of the French Tunnel policy. The Nord-Pas de Calais Regional Council was aware that 70 percent of its demands were already agreed to before officially presenting 'Plan Transmanche' to the Government. The effective marginalisation of Kent County Council in the British planning process has ensured that the county, especially East Kent, will have to absorb many of the adverse effects of the Tunnel. SNCF's 1990-1994 FFr20 billion investment programme is designed to establish France as the route focus of the European railway network. The UK, however, is likely to retain its European branch line status.

9.2.3. Company Reactions to the Tunnel

In terms of company plans to use the Tunnel and its services, the questionnaire survey carried-out for this research project showed that approximately 25 percent of all respondents anticipate using the Tunnel for future business trips and/or freight exports. This means that nearly 75 percent of the companies surveyed presently have no plans to use the Tunnel and its services. Compared to the earlier studies by the LCCI (1989), Eurotunnel and BR (1988), companies are also shown to be less optimistic about the impact of the Tunnel on their own level of competitiveness. Since, as argued in chapter 3, the impact of the Tunnel depends ultimately on the reactions of British companies, it would appear that the implications for the UK as a whole are likely to be limited.

However, nearly half of the companies surveyed believe the Tunnel will have a beneficial impact on the regional economies in which they are located, a further 16.4 percent anticipate a neutral impact and only 15.1 percent fear a damaging impact. This level of optimism can be accounted for by the proportionately greater number of companies expecting the Tunnel and related transport infrastructure to increase their accessibility to UK and continental markets (28.5%), than companies concerned that they will be vulnerable to increased competition (22.9%). In addition, only two companies out of the 372 respondents planned to relocate as a result of the Tunnel, both were from London. Therefore, a southwards drift of industry as feared by many regional interest groups would appear unfounded.

More central to the present thesis, however, is the analysis of the regional reactions in the questionnaire results. It was shown in chapter 6, that perceptions and anticipated usage of the Tunnel for companies in the South East and South West do not reveal significant regional differences. In fact, the most striking feature of the regional analysis is the degree of similarity between companies in the two regions. Nevertheless, companies in the South East are more than twice as likely to anticipate a beneficial impact on their regional economy (63.5 and 25.2 percent for the South East and South West respectively). One fifth of companies in the South West believe the Tunnel will have an overall damaging impact on their region, compared to only 12.0 percent of companies in the South East. The apparent optimism in the South East may be explained by the beneficial short-term construction impact of the Tunnel. However, the picture is not the same throughout the whole South East. For example, nearly 30 percent of companies in Kent, where most of the adverse medium-term effects of the Tunnel are located, expect the overall impact to be damaging.

No significant differences between the two regions were identified in terms of the perceived impact of the Tunnel and related transport infrastructure on company competitiveness in both the domestic and continental markets. Approximately 30 and 25 percent of companies in the South East and South West respectively expect the Tunnel to increase their accessibility to continental markets. Companies in the two regions are also as likely to fear that they will become vulnerable to increased competition (23.6 and 21.6

percent for the South East and South West respectively). Company plans to use the Tunnel for either future business trips and/or freight exports are also similar within the two regions, although demand is slightly lower in the South West. Since company perceptions of and their likely reactions to the Tunnel do not diverge significantly between the South East and South West, the Tunnel is only likely to affect marginally the regional economic structure of the UK. Therefore, to a large extent, the results of the questionnaire survey contradict the usual assumptions that the South East will be the main beneficiary from the Tunnel, and support the earlier findings of the Economic Potential Analysis.

9.2.4. Local Considerations

From the information collected in the case studies, it is evident that the general euphoria surrounding the construction of the Tunnel has now receded. The original hopes that the Tunnel engendered, not only in the South East but throughout the UK, have diminished as the necessary improvements to the supporting transport infrastructure have not materialised. Thus, the Government's policy of not commissioning national and/or regional impact studies, in conjunction with its strategy of non-intervention, can only be regarded as seriously limiting the ability of the regions to exploit the advantages created by the Tunnel.

Implications for East Kent

The case study of East Kent (chapter 7) highlighted the great anxiety that is now apparent within the area adjacent to the Tunnel portal. The optimistic forecasts of a beneficial impact as expressed by the CTJCC in the 1987 KIS, have been largely replaced by more sober predictions in the 1991 Review (CTJCC 1991a). Estimates of secondary job gains as a result of the Tunnel and other major transport infrastructure projects in Kent have been scaled down, whilst at the same time the actual number of job losses in the port and ferry industry have increased. A complete collapse of the ferry industry in East Kent is no longer regarded as a realistic possibility. Nonetheless, a substantial rationalisation is still necessary (CTJCC 1991a&b) to meet the challenge of competition from the Tunnel. The short-term construction impact of the Tunnel has been more beneficial than initially hoped,

but the run-down of the TML employment workforce will coincide with redundancies in the port and ferry industry.

The effect of the Tunnel in East Kent is likely to involve a net loss of at least 9,000 jobs (CTJCC 1991a), thus further exaggerating the relatively high rate of unemployment in the area. This figure is arrived at without even questioning the CTJCC's (1991a) "estimated" secondary job gains. Closer examination of the 1991 Review reveals the possibility of a net reduction in employment levels for the county as a whole, let alone East Kent. Although Kent had the benefit of a Government commissioned "Impact Study" (i.e. the KIS), the inability of the CTJCC to enforce its recommendations has meant that the county, especially East Kent, has been left to absorb many of the adverse effects of the Tunnel.

Implications for the Far South West

The implications of the Tunnel for the more peripheral UK regions are also less than promising. The case study of the Far South West (chapter 8) emphasized the perceived need to improve transport links from Devon and Cornwall to the Tunnel portal, particularly via the rail network. BR only plans to run a nighttime service to the South West which terminates at Plymouth (BR 1989b). In addition, an inter-modal freight terminal at Plymouth has been ruled out. BR's plans for international services have been criticised as inadequate for most regions (see chapter 2), not least in the Far South West. Unless the financial remit imposed on BR, including Section 42 of the 1987 Channel Tunnel Act, is relaxed, the Far South West could be further peripheralised from the centres of European economic activity.

Distance from the Tunnel has, however, ensured that the port and ferry industry in Devon and Cornwall is likely to be left untouched. Indeed, the redeployment of excess ferry capacity from the short-sea sector could encourage further growth in the western Channel. But isolation from the Tunnel does have its costs. Far South West tourism could be detrimentally affected if the Tunnel, as expressed by Strandring (personal interview: 1992), encourages fewer domestic and foreign visitors to travel to the region. The lack of a

daytime international passenger service to the Far South West is considered to be of critical importance (personal interviews: Franceschini 1992, Griffin 1992).

Based on the findings of the questionnaire survey, companies in Devon and Cornwall also appear to believe that the benefits of "insulation" (i.e. protected from the adverse effects) are more than outweighed by the costs of "isolation" (i.e. prevented from taking advantage of the opportunities created). Nearly twice as many companies in the Far South West (29.0% as opposed to 15.1% for all respondents) expect the Tunnel to have a damaging impact on the regional economy. Companies in Devon and Cornwall are more likely to anticipate a negative impact on their level of competitiveness; 29.0 percent believe that the Tunnel will increase their accessibility to continental markets whilst nearly one third expect to be vulnerable to greater competition. It is therefore argued in Chapter 8, that companies in the Far South West are more aware of the "Third Market" effect of the Tunnel and the "double-edged" nature of improved accessibility.

9.3. The Conclusion: A Case of Missed Opportunities?

The central hypothesis of this research project, that the Tunnel has the potential to reduce regional inequalities, is fully supported by the findings of the Economic Potential Model (see chapter 3). For the first time, evidence has been produced which specifically identifies potential gains for the more peripheral regions of the same magnitude as, or more than, the South East. This directly contradicts the widely held belief that the Tunnel will exaggerate existing "Core-Periphery" differences in the UK. However, if BR does not introduce, as planned, a new fleet of electric locomotives which would allow international freight trains to achieve running speeds of 75 mph, the results of the Potential Model indicate that the South East would indeed be the main beneficiary. The results for Simulations 1 and 2, which are based on the average running speeds of 30 and 40 mph for British and continental rail freight services respectively (personal interview: Jenkins 1990), both show the South East experiencing increases in relative potential significantly higher than the more peripheral regions. Absolute increases in potential values are also

consistently higher in all three simulations for the South East. But, as pointed out in chapter 3, one has to be careful when interpreting these results because regional GDP values used to measure economic activity emphasized the dominance of the South East. If a reliable data set was available for regional exports or industrial output, increases in absolute potential would have been more uniform throughout the UK. Overall, however, the Potential Model developed for this thesis has shown that the Tunnel does represent a potential to narrow the economic imbalance between "Core" and "Periphery".

The hypothesis of the present study is further supported by the results of the questionnaire survey which revealed no bias towards the South East in terms of the perceived opportunities offered by the Tunnel. Again, this finding contradicts the general assumption that the South East will be the main beneficiary. In fact, the most striking outcome of the analysis of regional reactions was the considerable degree of similarity in perceptions of the Tunnel and reactions to it for companies in the South East and South West. Geographical location is shown not to influence company perceptions of the Tunnel and/or the planned usage of its services. However, companies in the South East are significantly more likely than their counterparts in the South West to anticipate the Tunnel having a positive impact on the regional economy in which they are located. But, as explained in chapter 6, this contradicts their own belief on how the Tunnel will affect individual companies. The general consensus of opinion that the South East will benefit the most from the Tunnel is also likely to have affected this particular result. Therefore, it is possible to conclude that because the economic impact of the Tunnel will be determined ultimately by the reactions of the business community, the regional economic structure of the UK is likely to be only affected marginally.

However, based on a critical synthesis of the legislative and policy environment of the Tunnel and related infrastructure, it is argued that the British Government's policy of non-intervention is likely to be costly for the UK. The lack of foresight on the part of the Government to ensure adequate investment in supporting transport infrastructure is not likely to persuade British producers to send more of their goods by rail. Thus, British companies are less likely than their continental competitors to exploit the advantages offered by the Tunnel (more than 25 percent of continental freight is carried by rail

compared to only 7 percent in the UK). Hence, the opportunity created by the Tunnel to redress the economic imbalance between "North" and "South" is likely to be missed. The consequence of British Government inaction, in contrast to the interventionist policies adopted in France, could be an exaggeration of the "Third Market" effect for the more peripheral UK regions. This research project drew attention to the implications of increased continental imports for the more peripheral UK regions, but a more comprehensive study is needed (see section 9.4). The case studies of East Kent and the Far South West also reveal that the regions have become more pessimistic as regards to the potential effects of the Tunnel. The initial optimism associated with the Tunnel has receded because improvements to the supporting transport network have fallen far below regional expectations.

The potential impact of the Tunnel on the UK needs to be placed in context. The questionnaire survey carried-out for this study showed that nearly three quarters of companies had no plans to use the Tunnel for either future business trips and/or freight exports. Even fewer anticipate using rail freight services after the Tunnel opens. Thus, the implications for the UK as a whole are likely to be modest. Nonetheless, this thesis has achieved its main objective in that it has proved for the first time that the Tunnel does represent an opportunity to narrow regional inequalities in the UK.

9.4. Future Research

Two important issues have emerged during this research project which require further examination: firstly, the "Third Market" effect of the Tunnel on the more peripheral UK regions; and secondly, the implications of the legislative and policy environment of the Tunnel and related transport infrastructure both within the UK and on the Continent. In addition, the nature of the Tunnel project itself means that a study of the actual regional economic impact of the Tunnel following its opening would be important to determine whether company perceptions of Tunnel and their reactions to it have changed.

As argued in Chapter 8, the "Third Market" impact of the Tunnel could adversely affect the more peripheral UK regions. The "Third Markets" of these regions, especially the South East and the Midlands, are likely to experience increased import penetration from continental producers. As pointed out by Pida (1989b), continental companies are more 'geared up' to rail freight and thus, are more likely than their British counterparts to exploit the advantages offered by the Tunnel. The threat of increased continental imports is likely to be more pronounced from the near Continent, especially Nord-Pas de Calais. Thus, a UK-French survey of regional imports and exports after the Tunnel opens is needed.

The British Government's policy towards the Tunnel has been criticised in this study, particularly in relation to strategies favoured in France and by the European Commission. As argued in Chapter 4, British Government inaction is likely to be to the detriment of the UK, especially in the more peripheral regions. The "failure" to ensure adequate investment in the supporting transport network could seriously disadvantage regional companies in terms of their competitiveness in the home and continental marketplace. If progress is made by the European Commission on the proposed pan-European high-speed rail network, Britain's "branch line" status will become more apparent. An up-date of the interventionist policies adopted by the Nord-Pas de Calais Regional Council, and by the French Government in general, might also identify the relative success or failure of this proactive strategy as compared to the British Government's "market solutions" approach.

APPENDIX 1:

BIBLIOGRAPHY - PRE 1986

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APPENDIX 2:

POTENTIAL ANALYSIS RESULTS

APPENDIX 2: POTENTIAL ANALYSIS RESULTS

SIMULATION 1 = 30MPH, NO DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
C3 - CHANGE IN ABSOLUTE VALUES
C4 - RELATIVE POTENTIAL VALUES FOR FERRY
C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	192714	230564	37850	11.653	12.826	10.0661
2	125186	153036	27850	7.570	8.513	12.4571
3	281167	339028	57861	17.002	18.860	10.9281
4	396569	483820	87251	23.980	26.914	12.2352
5	258753	311227	52474	15.647	17.313	10.6474
6	331531	405757	74226	20.047	22.572	12.5954
7	142330	173170	30840	8.607	9.633	11.9205
8	285327	352649	67322	17.254	19.617	13.6954
9	110168	130563	20395	6.662	7.263	9.0213
10	1381648	1862631	480983	83.547	103.615	24.0200
11	46250	63368	17118	2.797	3.525	26.0279
12	101278	154696	53418	6.124	8.605	40.5127
13	87467	92385	4918	5.289	5.139	-2.8361
14	172771	185565	12794	10.447	10.323	-1.1869
15	359334	422729	63395	21.729	23.516	8.2240
16	165045	183855	18810	9.980	10.228	2.4850
17	132164	146902	14738	7.992	8.172	2.2522
18	1653733	1797644	143911	100.000	100.000	0.0000
19	170624	176928	6304	10.318	9.842	-4.6133
20	192266	200937	8671	11.626	11.178	-3.8534
21	197346	208727	11381	11.933	11.611	-2.6984
22	103745	109314	5569	6.273	6.081	-3.0607
23	42180	44347	2167	2.551	2.467	-3.2928
24	158290	165530	7240	9.572	9.208	-3.8028
25	108508	112851	4343	6.561	6.278	-4.3134
26	98295	102372	4077	5.944	5.695	-4.1891
27	219826	229075	9249	13.293	12.743	-4.1375
28	80310	84401	4091	4.856	4.695	-3.3155
29	407927	429140	21213	24.667	23.872	-3.2229
30	84797	89326	4529	5.128	4.969	-3.1006
31	132326	140741	8415	8.002	7.829	-2.1620
32	209733	231701	21968	12.682	12.889	1.6322
33	174712	195016	20304	10.565	10.848	2.6787
34	122200	129954	7754	7.389	7.229	-2.1654
35	52547	56098	3551	3.177	3.121	-1.7627
36	51592	54879	3287	3.120	3.053	-2.1474

Node	C1	C2	C3	C4	C5	C6
37	94826	103331	8505	5.734	5.748	0.2442
38	200132	219207	19075	12.102	12.194	0.7602
39	140658	151466	10808	8.505	8.426	-0.9289
40	352178	379037	26859	21.296	21.085	-0.9908
41	441238	482427	41189	26.681	26.837	0.5847
42	35904	39872	3968	2.171	2.218	2.1649
43	258993	284303	25310	15.661	15.815	0.9833
44	118666	138244	19578	7.176	7.690	7.1628
45	133892	146916	13024	8.096	8.173	0.9511
46	175605	193003	17398	10.619	10.736	1.1018
47	123203	137361	14158	7.450	7.641	2.5638
48	44860	49180	4320	2.713	2.736	0.8478
49	135559	150878	15319	8.197	8.393	2.3911
50	373641	407990	34349	22.594	22.696	0.4515
51	271760	299287	27527	16.433	16.649	1.3144
52	89825	98686	8861	5.432	5.490	1.0678
53	19358	21098	1740	1.171	1.174	0.2562
54	58118	61413	3295	3.514	3.416	-2.7888
55	732660	745958	13298	44.303	41.496	-6.3359
56	1065057	1084237	19180	64.403	60.314	-6.3491
57	143383	153090	9707	8.670	8.516	-1.7762
58	57504	61208	3704	3.477	3.405	-2.0708
59	191277	202649	11372	11.566	11.273	-2.5333
60	715477	771924	56447	43.264	42.941	-0.7466
61	1005679	1081619	75940	60.813	60.169	-1.0590
62	341094	360438	19344	20.626	20.051	-2.7877
63	283399	297883	14484	17.137	16.571	-3.3028
64	118976	125173	6197	7.194	6.963	-3.2110
65	211062	218989	7927	12.763	12.182	-4.5522
66	303444	315223	11779	18.349	17.535	-4.4362
67	116848	121479	4631	7.066	6.758	-4.3589
68	207283	214982	7699	12.534	11.959	-4.5875
69	298675	309845	11170	18.061	17.236	-4.5679
70	254848	267056	12208	15.410	14.856	-3.5951
71	146466	152181	5715	8.857	8.466	-4.4146
72	591598	627567	35969	35.773	34.911	-2.4096
73	125791	131674	5883	7.606	7.325	-3.6945
74	749650	780649	30999	45.331	43.426	-4.2024
75	140510	145467	4957	8.497	8.092	-4.7664
76	98157	101260	3103	5.935	5.633	-5.0885
77	236875	243709	6834	14.324	13.557	-5.3547
78	103721	106585	2864	6.272	5.929	-5.4687
79	99027	101828	2801	5.988	5.665	-5.3941
80	497615	513388	15773	30.090	28.559	-5.0881
81	178551	184345	5794	10.797	10.255	-5.0199
82	604231	628859	24628	36.537	34.982	-4.2560
83	184681	192143	7462	11.168	10.689	-4.2890
84	198347	210521	12174	11.994	11.711	-2.3595
85	177623	179854	2231	10.741	10.005	-6.8523
86	545179	602126	56947	32.967	33.495	1.6016
87	40350	42544	2194	2.440	2.367	-2.9918
88	132777	141234	8457	8.029	7.857	-2.1422
89	4858	5184	326	0.294	0.288	-2.0408
90	28218	29927	1709	1.706	1.665	-2.4033

SIMULATION 1 = 30MPH, 6 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

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 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	174946	230564	55618	10.742	12.826	19.4005
2	113054	153036	39982	6.942	8.513	22.6304
3	257045	339028	81983	15.783	18.860	19.4956
4	362184	483820	121636	22.239	26.914	21.0216
5	233418	311227	77809	14.332	17.313	20.7996
6	299412	405757	106345	18.385	22.572	22.7740
7	127323	173170	45847	7.818	9.633	23.2156
8	255205	352649	97444	15.670	19.617	25.1882
9	93854	130563	36709	5.763	7.263	26.0281
10	1184065	1862631	678566	72.704	103.615	42.5162
11	42121	63368	21247	2.586	3.525	36.3109
12	91556	154696	63140	5.622	8.605	53.0594
13	85642	92385	6743	5.259	5.139	-2.2818
14	169014	185565	16551	10.378	10.323	-0.5300
15	352119	422729	70610	21.621	23.516	8.7646
16	161882	183855	21973	9.940	10.228	2.8974
17	130277	146902	16625	7.999	8.172	2.1628
18	1628604	1797644	169040	100.000	100.000	0.0000
19	167701	176928	9227	10.297	9.842	-4.4188
20	189492	200937	11445	11.635	11.178	-3.9278
21	194953	208727	13774	11.971	11.611	-3.0073
22	102506	109314	6808	6.294	6.081	-3.3842
23	41663	44347	2684	2.558	2.467	-3.5575
24	156498	165530	9032	9.609	9.208	-4.1732
25	107247	112851	5604	6.585	6.278	-4.6621
26	97289	102372	5083	5.974	5.695	-4.6702
27	217622	229075	11453	13.362	12.743	-4.6326
28	79365	84401	5036	4.873	4.695	-3.6528
29	403861	429140	25279	24.798	23.872	-3.7342
30	83953	89326	5373	5.155	4.969	-3.6081
31	130896	140741	9845	8.037	7.829	-2.5880
32	207415	231701	24286	12.736	12.889	1.2013
33	173065	195016	21951	10.627	10.848	2.0796
34	121118	129954	8836	7.437	7.229	-2.7968
35	52002	56098	4096	3.193	3.121	-2.2549
36	51111	54879	3768	3.138	3.053	-2.7087
37	93806	103331	9525	5.760	5.748	-0.2083
38	198122	219207	21085	12.165	12.194	0.2384
39	139257	151466	12209	8.551	8.426	-1.4618
40	348359	379037	30678	21.390	21.085	-1.4259

Node	C1	C2	C3	C4	C5	C6
41	435725	482427	46702	26.755	26.837	0.3065
42	35440	39872	4432	2.176	2.218	1.9302
43	256271	284303	28032	15.736	15.815	0.5020
44	117543	138244	20701	7.217	7.690	6.5540
45	131832	146916	15084	8.095	8.173	0.9635
46	173409	193003	19594	10.648	10.736	0.8264
47	121735	137361	15626	7.475	7.641	2.2207
48	44405	49180	4775	2.727	2.736	0.3300
49	134304	150878	16574	8.247	8.393	1.7703
50	369716	407990	38274	22.701	22.696	-0.0220
51	268696	299287	30591	16.499	16.649	0.9092
52	88909	98686	9777	5.459	5.490	0.5679
53	19148	21098	1950	1.176	1.174	-0.1701
54	57651	61413	3762	3.540	3.416	-3.5028
55	730943	745958	15015	44.882	41.496	-7.5442
56	1062565	1084237	21672	65.244	60.314	-7.5562
57	142458	153090	10632	8.747	8.516	-2.6409
58	57122	61208	4086	3.507	3.405	-2.9085
59	189939	202649	12710	11.663	11.273	-3.3439
60	710275	771924	61649	43.613	42.941	-1.5408
61	997954	1081619	83665	61.277	60.169	-1.8082
62	338502	360438	21936	20.785	20.051	-3.5314
63	281185	297883	16698	17.265	16.571	-4.0197
64	118289	125173	6884	7.263	6.963	-4.1305
65	209402	218989	9587	12.858	12.182	-5.2574
66	301264	315223	13959	18.498	17.535	-5.2060
67	116031	121479	5448	7.125	6.758	-5.1509
68	205712	214982	9270	12.631	11.959	-5.3202
69	296533	309845	13312	18.208	17.236	-5.3383
70	252884	267056	14172	15.528	14.856	-4.3277
71	145397	152181	6784	8.928	8.466	-5.1747
72	587085	627567	40482	36.048	34.911	-3.1541
73	124963	131674	6711	7.673	7.325	-4.5354
74	745132	780649	35517	45.753	43.426	-5.0860
75	139646	145467	5821	8.575	8.092	-5.6327
76	97534	101260	3726	5.989	5.633	-5.9442
77	235615	243709	8094	14.467	13.557	-6.2902
78	103163	106585	3422	6.334	5.929	-6.3941
79	98463	101828	3365	6.046	5.665	-6.3017
80	494719	513388	18669	30.377	28.559	-5.9848
81	177532	184345	6813	10.901	10.255	-5.9261
82	600772	628859	28087	36.889	34.982	-5.1696
83	183545	192143	8598	11.270	10.689	-5.1553
84	196984	210521	13537	12.095	11.711	-3.1749
85	175281	179854	4573	10.763	10.005	-7.0426
86	539904	602126	62222	33.151	33.495	1.0377
87	39890	42544	2654	2.449	2.367	-3.3483
88	130774	141234	10460	8.030	7.857	-2.1544
89	4823	5184	361	0.296	0.288	-2.7027
90	27925	29927	2002	1.715	1.665	-2.9154

SIMULATION 1 = 30MPH, 18 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	151497	230564	79067	9.463	12.826	35.5384
2	97729	153036	55307	6.104	8.513	39.4659
3	227609	339028	111419	14.217	18.860	32.6581
4	320943	483820	162877	20.046	26.914	34.2612
5	204215	311227	107012	12.755	17.313	35.7350
6	262454	405757	143303	16.393	22.572	37.6929
7	109730	173170	63440	6.854	9.633	40.5457
8	220531	352649	132118	13.775	19.617	42.4101
9	75949	130563	54614	4.744	7.263	53.0986
10	975305	1862631	887326	60.919	103.615	70.0865
11	36610	63368	26758	2.287	3.525	54.1320
12	79099	154696	75597	4.941	8.605	74.1550
13	83651	92385	8734	5.225	5.139	-1.6459
14	165168	185565	20397	10.317	10.323	0.0582
15	344934	422729	77795	21.545	23.516	9.1483
16	158626	183855	25229	9.908	10.228	3.2297
17	128161	146902	18741	8.005	8.172	2.0862
18	1600996	1797644	196648	100.000	100.000	0.0000
19	164308	176928	12620	10.263	9.842	-4.1021
20	186114	200937	14823	11.625	11.178	-3.8452
21	192068	208727	16659	11.997	11.611	-3.2175
22	100968	109314	8346	6.307	6.081	-3.5833
23	41012	44347	3335	2.562	2.467	-3.7081
24	154137	165530	11393	9.628	9.208	-4.3623
25	105559	112851	7292	6.593	6.278	-4.7778
26	95929	102372	6443	5.992	5.695	-4.9566
27	214611	229075	14464	13.405	12.743	-4.9385
28	78169	84401	6232	4.883	4.695	-3.8501
29	398592	429140	30548	24.896	23.872	-4.1131
30	82889	89326	6437	5.177	4.969	-4.0178
31	129138	140741	11603	8.066	7.829	-2.9383
32	204665	231701	27036	12.784	12.889	0.8214
33	171033	195016	23983	10.683	10.848	1.5445
34	119841	129954	10113	7.485	7.229	-3.4202
35	51363	56098	4735	3.208	3.121	-2.7120
36	50550	54879	4329	3.157	3.053	-3.2943
37	92622	103331	10709	5.785	5.748	-0.6396
38	195878	219207	23329	12.235	12.194	-0.3351
39	137731	151466	13735	8.603	8.426	-2.0574
40	344135	379037	34902	21.495	21.085	-1.9074

Node	C1	C2	C3	C4	C5	C6
41	429871	482427	52556	26.850	26.837	-0.0484
42	34916	39872	4956	2.181	2.218	1.6965
43	253231	284303	31072	15.817	15.815	-0.0126
44	116239	138244	22005	7.260	7.690	5.9229
45	129761	146916	17155	8.105	8.173	0.8390
46	171147	193003	21856	10.690	10.736	0.4303
47	120149	137361	17212	7.505	7.641	1.8121
48	43906	49180	5274	2.742	2.736	-0.2188
49	132905	150878	17973	8.301	8.393	1.1083
50	365549	407990	42441	22.833	22.696	-0.6000
51	265427	299287	33860	16.579	16.649	0.4222
52	87892	98686	10794	5.490	5.490	0.0000
53	18907	21098	2191	1.181	1.174	-0.5927
54	57102	61413	4311	3.567	3.416	-4.2333
55	728759	745958	17199	45.519	41.496	-8.8381
56	1059395	1084237	24842	66.171	60.314	-8.8513
57	141277	153090	11813	8.824	8.516	-3.4905
58	56646	61208	4562	3.538	3.405	-3.7592
59	188310	202649	14339	11.762	11.273	-4.1575
60	704132	771924	67792	43.981	42.941	-2.3647
61	988924	1081619	92695	61.769	60.169	-2.5903
62	335413	360438	25025	20.950	20.051	-4.2912
63	278539	297883	19344	17.398	16.571	-4.7534
64	117381	125173	7792	7.332	6.963	-5.0327
65	207185	218989	11804	12.941	12.182	-5.8651
66	298417	315223	16806	18.639	17.535	-5.9231
67	114952	121479	6527	7.180	6.758	-5.8774
68	203730	214982	11252	12.725	11.959	-6.0196
69	293870	309845	15975	18.355	17.236	-6.0965
70	250495	267056	16561	15.646	14.856	-5.0492
71	144055	152181	8126	8.998	8.466	-5.9124
72	581767	627567	45800	36.338	34.911	-3.9270
73	123931	131674	7743	7.741	7.325	-5.3740
74	739424	780649	41225	46.185	43.426	-5.9738
75	138520	145467	6947	8.652	8.092	-6.4725
76	96689	101260	4571	6.039	5.633	-6.7230
77	233935	243709	9774	14.612	13.557	-7.2201
78	102410	106585	4175	6.397	5.929	-7.3159
79	97696	101828	4132	6.102	5.665	-7.1616
80	490744	513388	22644	30.652	28.559	-6.8283
81	176147	184345	8198	11.002	10.255	-6.7897
82	596240	628859	32619	37.242	34.982	-6.0684
83	182037	192143	10106	11.370	10.689	-5.9894
84	195172	210521	15349	12.191	11.711	-3.9373
85	172418	179854	7436	10.769	10.005	-7.0944
86	532572	602126	69554	33.265	33.495	0.6914
87	39210	42544	3334	2.449	2.367	-3.3483
88	128335	141234	12899	8.016	7.857	-1.9835
89	4766	5184	418	0.298	0.288	-3.3557
90	27474	29927	2453	1.716	1.665	-2.9720

SIMULATION 2 = 40MPH, NO DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	231773	285378	53605	10.952	12.361	12.8652
2	150387	186623	36236	7.106	8.084	13.7630
3	340519	416751	76232	16.091	18.052	12.1869
4	489815	595656	105841	23.145	25.801	11.4755
5	318181	377220	59039	15.035	16.339	8.6731
6	407921	490480	82559	19.276	21.245	10.2148
7	173988	208448	34460	8.222	9.029	9.8151
8	349075	420285	71210	16.495	18.205	10.3668
9	129623	152950	23327	6.125	6.625	8.1633
10	1642799	2108610	465811	77.628	91.335	17.6573
11	54971	78007	23036	2.598	3.379	30.0616
12	118305	189614	71309	5.590	8.213	46.9231
13	112298	119381	7083	5.306	5.171	-2.5443
14	220748	238094	17346	10.431	10.313	-1.1312
15	446589	524509	77920	21.103	22.719	7.6577
16	210415	233272	22857	9.943	10.104	1.6192
17	168246	187134	18888	7.950	8.106	1.9623
18	2116245	2308666	192421	100.000	100.000	0.0000
19	220587	230539	9952	10.424	9.986	-4.2019
20	249120	261901	12781	11.772	11.344	-3.6357
21	255823	271578	15755	12.089	11.763	-2.6967
22	134630	142420	7790	6.362	6.169	-3.0336
23	54753	57787	3034	2.587	2.503	-3.2470
24	206045	216396	10351	9.736	9.373	-3.7284
25	141424	147708	6284	6.683	6.398	-4.2646
26	128075	134004	5929	6.052	5.804	-4.0978
27	286270	299853	13583	13.527	12.988	-3.9846
28	104282	110062	5780	4.928	4.767	-3.2671
29	528931	560064	31133	24.994	24.259	-2.9407
30	109330	116310	6980	5.166	5.038	-2.4777
31	170682	182851	12169	8.065	7.920	-1.7979
32	265619	296789	31170	12.551	12.855	2.4221
33	219691	248819	29128	10.381	10.778	3.8243
34	156393	168424	12031	7.390	7.295	-1.2855
35	67043	72575	5532	3.168	3.144	-0.7576
36	66005	71105	5100	3.119	3.080	-1.2504
37	119422	132564	13142	5.643	5.742	1.7544
38	253099	281296	28197	11.960	12.184	1.8729
39	178860	195158	16298	8.452	8.453	0.0118
40	447784	488702	40918	21.159	21.168	0.0425

Node	C1	C2	C3	C4	C5	C6
41	556665	617806	61141	26.304	26.760	1.7336
42	45051	50814	5763	2.129	2.201	3.3819
43	326484	364272	37788	15.428	15.778	2.2686
44	146269	173329	27060	6.912	7.508	8.6227
45	169978	187538	17560	8.032	8.123	1.1330
46	223430	246670	23240	10.558	10.685	1.2029
47	156219	174897	18678	7.382	7.576	2.6280
48	57059	63077	6018	2.696	2.732	1.3353
49	171236	192391	21155	8.091	8.333	2.9910
50	476651	523641	46990	22.523	22.682	0.7059
51	344780	382704	37924	16.292	16.577	1.7493
52	113958	126418	12460	5.385	5.476	1.6899
53	24642	27130	2488	1.164	1.175	0.9450
54	75349	79877	4528	3.561	3.460	-2.8363
55	968185	987754	19569	45.750	42.785	-6.4809
56	1407533	1435770	28237	66.511	62.190	-6.4967
57	185101	198748	13647	8.747	8.609	-1.5777
58	74325	79594	5269	3.512	3.448	-1.8223
59	247160	263814	16654	11.679	11.427	-2.1577
60	917233	997674	80441	43.342	43.214	-0.2953
61	1288425	1398344	109919	60.883	60.569	-0.5157
62	440105	468945	28840	20.797	20.312	-2.3321
63	366410	388351	21941	17.314	16.821	-2.8474
64	152982	162507	9525	7.229	7.039	-2.6283
65	273589	286950	13361	12.928	12.429	-3.8598
66	391243	410876	19633	18.488	17.797	-3.7376
67	151575	159184	7609	7.162	6.895	-3.7280
68	269794	281658	11864	12.749	12.200	-4.3062
69	388759	405984	17225	18.370	17.585	-4.2733
70	330138	348575	18437	15.600	15.099	-3.2115
71	190543	199324	8781	9.004	8.634	-4.1093
72	762360	815601	53241	36.024	35.328	-1.9320
73	163458	172139	8681	7.724	7.456	-3.4697
74	976989	1022976	45987	46.166	44.310	-4.0203
75	183612	191016	7404	8.676	8.274	-4.6335
76	128394	133072	4678	6.067	5.764	-4.9942
77	310510	320783	10273	14.673	13.895	-5.3023
78	136064	140375	4311	6.430	6.080	-5.4432
79	129837	134061	4224	6.135	5.807	-5.3464
80	652053	675550	23497	30.812	29.261	-5.0338
81	233806	242422	8616	11.048	10.501	-4.9511
82	788413	824723	36310	37.255	35.723	-4.1122
83	240898	251940	11042	11.383	10.913	-4.1290
84	256295	273969	17674	12.111	11.867	-2.0147
85	228683	233878	5195	10.806	10.130	-6.2558
86	684308	772288	87980	32.336	33.452	3.4513
87	51517	55433	3916	2.434	2.401	-1.3558
88	163841	178720	14879	7.742	7.741	-0.0129
89	6196	6720	524	0.293	0.291	-0.6826
90	35645	38747	3102	1.684	1.678	-0.3563

SIMULATION 12= 40MPH, 6 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	208871	285378	76507	10.018	12.361	23.3879
2	135205	186623	51418	6.485	8.084	24.6569
3	311508	416751	105243	14.941	18.052	20.8219
4	444924	595656	150732	21.340	25.801	20.9044
5	285943	377220	91277	13.715	16.339	19.1323
6	367018	490480	123462	17.603	21.245	20.6897
7	154772	208448	53676	7.423	9.029	21.6355
8	310949	420285	109336	14.914	18.205	22.0665
9	109827	152950	43123	5.268	6.625	25.7593
10	1404082	2108610	704528	67.344	91.335	35.6245
11	49511	78007	28496	2.375	3.379	42.2737
12	105829	189614	83785	5.076	8.213	61.8006
13	110080	119381	9301	5.280	5.171	-2.0644
14	216274	238094	21820	10.373	10.313	-0.5784
15	437341	524509	87168	20.976	22.719	8.3095
16	206291	233272	26981	9.894	10.104	2.1225
17	165677	187134	21457	7.946	8.106	2.0136
18	2084928	2308666	223738	100.000	100.000	0.0000
19	216905	230539	13634	10.403	9.986	-4.0085
20	245511	261901	16390	11.776	11.344	-3.6685
21	252715	271578	18863	12.121	11.763	-2.9536
22	132990	142420	9430	6.379	6.169	-3.2921
23	54051	57787	3736	2.592	2.503	-3.4336
24	203580	216396	12816	9.764	9.373	-4.0045
25	139647	147708	8061	6.698	6.398	-4.4790
26	126649	134004	7355	6.075	5.804	-4.4609
27	283126	299853	16727	13.580	12.988	-4.3594
28	102996	110062	7066	4.940	4.767	-3.5020
29	523315	560064	36749	25.100	24.259	-3.3506
30	108183	116310	8127	5.189	5.038	-2.9100
31	168770	182851	14081	8.095	7.920	-2.1618
32	262375	296789	34414	12.584	12.855	2.1535
33	217341	248819	31478	10.424	10.778	3.3960
34	155066	168424	13358	7.437	7.295	-1.9094
35	66378	72575	6197	3.184	3.144	-1.2563
36	65420	71105	5685	3.138	3.080	-1.8483
37	118186	132564	14378	5.669	5.742	1.2877
38	250730	281296	30566	12.026	12.184	1.3138
39	177238	195158	17920	8.501	8.453	-0.5646
40	443314	488702	45388	21.263	21.168	-0.4468

Node	C1	C2	C3	C4	C5	C6
41	550401	617806	67405	26.399	26.760	1.3675
42	44500	50814	6314	2.134	2.201	3.1396
43	323275	364272	40997	15.505	15.778	1.7507
44	144907	173329	28422	6.950	7.508	8.0288
45	167579	187538	19959	8.038	8.123	1.0575
46	220832	246670	25838	10.592	10.685	0.8780
47	154430	174897	20467	7.407	7.576	2.2816
48	56499	63077	6578	2.710	2.732	0.8118
49	169676	192391	22715	8.138	8.333	2.3962
50	471919	523641	51722	22.635	22.682	0.2076
51	341074	382704	41630	16.359	16.577	1.3326
52	112823	126418	13595	5.411	5.476	1.2013
53	24376	27130	2754	1.169	1.175	0.5133
54	74749	79877	5128	3.585	3.460	-3.4868
55	965963	987754	21791	46.331	42.785	-7.6536
56	1404307	1435770	31463	67.355	62.190	-7.6683
57	183900	198748	14848	8.820	8.609	-2.3923
58	73838	79594	5756	3.542	3.448	-2.6539
59	245482	263814	18332	11.774	11.427	-2.9472
60	910848	997674	86826	43.687	43.214	-1.0827
61	1279013	1398344	119331	61.346	60.569	-1.2666
62	436903	468945	32042	20.955	20.312	-3.0685
63	363669	388351	24682	17.443	16.821	-3.5659
64	152198	162507	10309	7.300	7.039	-3.5753
65	271724	286950	15226	13.033	12.429	-4.6344
66	388856	410876	22020	18.651	17.797	-4.5788
67	150669	159184	8515	7.227	6.895	-4.5939
68	267774	281658	13884	12.843	12.200	-5.0066
69	386031	405984	19953	18.515	17.585	-5.0230
70	327676	348575	20899	15.716	15.099	-3.9259
71	189172	199324	10152	9.073	8.634	-4.8385
72	756829	815601	58772	36.300	35.328	-2.6777
73	162401	172139	9738	7.789	7.456	-4.2753
74	971168	1022976	51808	46.580	44.310	-4.8733
75	182473	191016	8543	8.752	8.274	-5.4616
76	127550	133072	5522	6.118	5.764	-5.7862
77	308823	320783	11960	14.812	13.895	-6.1909
78	135311	140375	5064	6.490	6.080	-6.3174
79	129072	134061	4989	6.191	5.807	-6.2026
80	648095	675550	27455	31.085	29.261	-5.8678
81	232423	242422	9999	11.148	10.501	-5.8037
82	783839	824723	40884	37.595	35.723	-4.9794
83	239381	251940	12559	11.481	10.913	-4.9473
84	254473	273969	19496	12.205	11.867	-2.7694
85	225711	233878	8167	10.826	10.130	-6.4290
86	676668	772288	95620	32.455	33.452	3.0720
87	50933	55433	4500	2.443	2.401	-1.7192
88	161433	178720	17287	7.743	7.741	-0.0258
89	6141	6720	579	0.295	0.291	-1.3559
90	35269	38747	3478	1.692	1.678	-0.8274

SIMULATION 2 = 40MPH, 18 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	180073	285378	105305	8.774	12.361	40.8822
2	116879	186623	69744	5.695	8.084	41.9491
3	277452	416751	139299	13.519	18.052	33.5306
4	394183	595656	201473	19.206	25.801	34.3382
5	250805	377220	126415	12.220	16.339	33.7070
6	322516	490480	167964	15.714	21.245	35.1979
7	133477	208448	74971	6.504	9.029	38.8223
8	269391	420285	150894	13.126	18.205	38.6942
9	89032	152950	63918	4.338	6.625	52.7202
10	1163055	2108610	945555	56.669	91.335	61.1728
11	42591	78007	35416	2.075	3.379	62.8434
12	90609	189614	99005	4.415	8.213	86.0249
13	107774	119381	11607	5.251	5.171	-1.5235
14	211897	238094	26197	10.325	10.313	-0.1162
15	428752	524509	95757	20.891	22.719	8.7502
16	202341	233272	30931	9.859	10.104	2.4850
17	163012	187134	24122	7.943	8.106	2.0521
18	2052349	2308666	256317	100.000	100.000	0.0000
19	212854	230539	17685	10.371	9.986	-3.7123
20	241363	261901	20538	11.760	11.344	-3.5374
21	249177	271578	22401	12.141	11.763	-3.1134
22	131074	142420	11346	6.387	6.169	-3.4132
23	53223	57787	4564	2.593	2.503	-3.4709
24	200526	216396	15870	9.771	9.373	-4.0733
25	137417	147708	10291	6.696	6.398	-4.4504
26	124843	134004	9161	6.083	5.804	-4.5865
27	279096	299853	20757	13.599	12.988	-4.4930
28	101470	110062	8592	4.944	4.767	-3.5801
29	516494	560064	43570	25.166	24.259	-3.6041
30	106827	116310	9483	5.205	5.038	-3.2085
31	166562	182851	16289	8.116	7.920	-2.4150
32	258816	296789	37973	12.611	12.855	1.9348
33	214662	248819	34157	10.459	10.778	3.0500
34	153573	168424	14851	7.483	7.295	-2.5124
35	65631	72575	6944	3.198	3.144	-1.6886
36	64768	71105	6337	3.156	3.080	-2.4081
37	116814	132564	15750	5.692	5.742	0.8784
38	248187	281296	33109	12.093	12.184	0.7525
39	175535	195158	19623	8.553	8.453	-1.1692
40	438556	488702	50146	21.368	21.168	-0.9360

Node	C1	C2	C3	C4	C5	C6
41	543958	617806	73848	26.504	26.760	0.9659
42	43903	50814	6911	2.139	2.201	2.8985
43	319832	364272	44440	15.584	15.778	1.2449
44	143396	173329	29933	6.987	7.508	7.4567
45	165265	187538	22273	8.052	8.123	0.8818
46	218275	246670	28395	10.635	10.685	0.4702
47	152594	174897	22303	7.435	7.576	1.8964
48	55917	63077	7160	2.725	2.732	0.2569
49	168031	192391	24360	8.187	8.333	1.7833
50	467139	523641	56502	22.761	22.682	-0.3471
51	337315	382704	45389	16.436	16.577	0.8579
52	111630	126418	14788	5.439	5.476	0.6803
53	24087	27130	3043	1.174	1.175	0.0852
54	74086	79877	5791	3.610	3.460	-4.1551
55	963284	987754	24470	46.936	42.785	-8.8440
56	1400415	1435770	35355	68.235	62.190	-8.8591
57	182447	198748	16301	8.890	8.609	-3.1609
58	73261	79594	6333	3.570	3.448	-3.4174
59	243539	263814	20275	11.866	11.427	-3.6997
60	903654	997674	94020	44.030	43.214	-1.8533
61	1268504	1398344	129840	61.807	60.569	-2.0030
62	433267	468945	35678	21.111	20.312	-3.7848
63	360550	388351	27801	17.568	16.821	-4.2520
64	151187	162507	11320	7.367	7.039	-4.4523
65	269280	286950	17670	13.121	12.429	-5.2740
66	385786	410876	25090	18.797	17.797	-5.3200
67	149494	159184	9690	7.284	6.895	-5.3405
68	265354	281658	16304	12.929	12.200	-5.6385
69	382811	405984	23173	18.652	17.585	-5.7206
70	324827	348575	23748	15.827	15.099	-4.5997
71	187538	199324	11786	9.138	8.634	-5.5154
72	750609	815601	64992	36.573	35.328	-3.4042
73	161151	172139	10988	7.852	7.456	-5.0433
74	964194	1022976	58782	46.980	44.310	-5.6833
75	181067	191016	9949	8.822	8.274	-6.2117
76	126466	133072	6606	6.162	5.764	-6.4589
77	306696	320783	14087	14.944	13.895	-7.0195
78	134351	140375	6024	6.546	6.080	-7.1188
79	128089	134061	5972	6.241	5.807	-6.9540
80	642957	675550	32593	31.328	29.261	-6.5979
81	230647	242422	11775	11.238	10.501	-6.5581
82	778164	824723	46559	37.916	35.723	-5.7838
83	237478	251940	14462	11.571	10.913	-5.6866
84	252183	273969	21786	12.288	11.867	-3.4261
85	222259	233878	11619	10.829	10.130	-6.4549
86	666712	772288	105576	32.485	33.452	2.9768
87	50102	55433	5331	2.441	2.401	-1.6387
88	158628	178720	20092	7.729	7.741	0.1553
89	6055	6720	665	0.295	0.291	-1.3559
90	34709	38747	4038	1.691	1.678	-0.7688

SIMULATION 3 = 75MPH, NO DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	340368	505632	165264	9.552	12.481	30.6637
2	223167	327232	104065	6.263	8.077	28.9638
3	523275	737020	213745	14.685	18.192	23.8815
4	770631	1054445	283814	21.627	26.027	20.3449
5	496981	661787	164806	13.947	16.335	17.1220
6	638029	859228	221199	17.906	21.209	18.4463
7	266912	363483	96571	7.491	8.972	19.7704
8	538599	730213	191614	15.115	18.024	19.2458
9	183249	261370	78121	5.143	6.451	25.4326
10	2388646	3553835	1165189	67.036	87.720	30.8550
11	76219	137600	61381	2.139	3.396	58.7658
12	158049	334604	176555	4.436	8.259	86.1812
13	191359	212798	21439	5.370	5.253	-2.1788
14	371786	419607	47821	10.434	10.357	-0.7380
15	702321	862210	159889	19.710	21.282	7.9756
16	350422	404022	53600	9.834	9.973	1.4135
17	277754	322832	45078	7.795	7.969	2.2322
18	3563233	4051316	488083	100.000	100.000	0.0000
19	381977	415489	33512	10.720	10.256	-4.3284
20	432891	472210	39319	12.149	11.656	-4.0579
21	444789	488115	43326	12.483	12.048	-3.4848
22	234670	256575	21905	6.586	6.333	-3.8415
23	95445	104134	8689	2.679	2.570	-4.0687
24	361600	392095	30495	10.148	9.678	-4.6314
25	248884	268198	19314	6.985	6.620	-5.2255
26	225094	242958	17864	6.317	5.997	-5.0657
27	502057	543066	41009	14.090	13.405	-4.8616
28	181765	198369	16604	5.101	4.896	-4.0188
29	916182	1005631	89449	25.712	24.822	-3.4614
30	186611	206835	20224	5.237	5.105	-2.5205
31	291781	325179	33398	8.189	8.027	-1.9783
32	432233	507380	75147	12.130	12.524	3.2481
33	351542	419244	67702	9.866	10.348	4.8855
34	263646	295825	32179	7.399	7.302	-1.3110
35	111904	127002	15098	3.141	3.135	-0.1910
36	111160	124885	13725	3.120	3.083	-1.1859
37	192919	226227	33308	5.414	5.584	3.1400
38	414294	482603	68309	11.627	11.912	2.4512
39	297899	338748	40849	8.360	8.361	0.0120
40	743364	849306	105942	20.862	20.964	0.4889

Node	C1	C2	C3	C4	C5	C6
41	908622	1058489	149867	25.500	26.127	2.4588
42	72110	86245	14135	2.024	2.129	5.1877
43	529833	621780	91947	14.869	15.348	3.2215
44	224885	281891	57006	6.311	6.958	10.2519
45	281557	324575	43018	7.902	8.012	1.3920
46	372402	427155	54753	10.451	10.544	0.8899
47	257128	300558	43430	7.216	7.419	2.8132
48	94650	109058	14408	2.656	2.692	1.3554
49	280030	327360	47330	7.859	8.080	2.8121
50	798593	910293	111700	22.412	22.469	0.2543
51	569840	658791	88951	15.992	16.261	1.6821
52	187814	217616	29802	5.271	5.371	1.8972
53	40765	47096	6331	1.144	1.162	1.5734
54	131996	142988	10992	3.704	3.529	-4.7246
55	1774583	1825959	51376	49.803	45.071	-9.5014
56	2580244	2654518	74274	72.413	65.522	-9.5163
57	319854	353014	33160	8.977	8.714	-2.9297
58	128641	141738	13097	3.610	3.499	-3.0748
59	427730	469887	42157	12.004	11.598	-3.3822
60	1562385	1747664	185279	43.847	43.138	-1.6170
61	2192231	2448929	256698	61.524	60.448	-1.7489
62	761064	833387	72323	21.359	20.571	-3.6893
63	636452	693163	56711	17.862	17.110	-4.2101
64	264090	288779	24689	7.412	7.128	-3.8316
65	479728	519716	39988	13.463	12.828	-4.7166
66	680518	737161	56643	19.098	18.196	-4.7230
67	266198	288044	21846	7.471	7.110	-4.8320
68	475501	509671	34170	13.345	12.580	-5.7325
69	685617	734129	48512	19.241	18.121	-5.8209
70	575476	624858	49382	16.150	15.424	-4.4953
71	335255	360217	24962	9.409	8.891	-5.5054
72	1314097	1445677	131580	36.879	35.684	-3.2403
73	286881	309959	23078	8.051	7.651	-4.9683
74	1727037	1851161	124124	48.468	45.693	-5.7254
75	326646	347599	20953	9.167	8.580	-6.4034
76	229001	242802	13801	6.427	5.993	-6.7528
77	557121	586774	29653	15.635	14.484	-7.3617
78	244529	257148	12619	6.863	6.347	-7.5186
79	232982	245447	12465	6.538	6.058	-7.3417
80	1167367	1235285	67918	32.761	30.491	-6.9290
81	418064	442706	24642	11.733	10.927	-6.8695
82	1397387	1495138	97751	39.217	36.905	-5.8954
83	426436	456842	30406	11.968	11.276	-5.7821
84	443258	487842	44584	12.440	12.042	-3.1993
85	396473	419935	23462	11.127	10.365	-6.8482
86	1072186	1307197	235011	30.090	32.266	7.2316
87	85704	98644	12940	2.405	2.435	1.2474
88	248475	292517	44042	6.973	7.220	3.5422
89	10162	11723	1561	0.285	0.289	1.4035
90	57662	67844	10182	1.618	1.675	3.5229

SIMULATION 3 = 75MPH, 6 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	304484	505632	201148	8.655	12.481	44.206
2	200640	327232	126592	5.703	8.077	41.627
3	482901	737020	254119	13.726	18.192	32.537
4	699589	1054445	354856	19.885	26.027	30.888
5	448365	661787	213422	12.744	16.335	28.178
6	576301	859228	282927	16.381	21.209	29.473
7	237631	363483	125852	6.754	8.972	32.840
8	481739	730213	248474	13.693	18.024	31.629
9	155621	261370	105749	4.423	6.451	45.851
10	2060224	3553835	1493611	58.560	87.720	49.795
11	67388	137600	70212	1.915	3.396	77.337
12	139020	334604	195584	3.952	8.259	108.983
13	188310	212798	24488	5.353	5.253	-1.868
14	365837	419607	53770	10.399	10.357	-0.404
15	688248	862210	173962	19.563	21.282	8.787
16	343936	404022	60086	9.776	9.973	2.015
17	273351	322832	49481	7.770	7.969	2.561
18	3518149	4051316	533167	100.000	100.000	0.000
19	376575	415489	38914	10.704	10.256	-4.185
20	427264	472210	44946	12.145	11.656	-4.026
21	439958	488115	48157	12.505	12.048	-3.655
22	232026	256575	24549	6.595	6.333	-3.973
23	94253	104134	9881	2.679	2.570	-4.069
24	357291	392095	34804	10.156	9.678	-4.707
25	245609	268198	22589	6.981	6.620	-5.171
26	222431	242958	20527	6.322	5.997	-5.141
27	496096	543066	46970	14.101	13.405	-4.936
28	179565	198369	18804	5.104	4.896	-4.075
29	906273	1005631	99358	25.760	24.822	-3.641
30	184656	206835	22179	5.249	5.105	-2.743
31	288626	325179	36553	8.204	8.027	-2.157
32	426328	507380	81052	12.118	12.524	3.350
33	347082	419244	72162	9.865	10.348	4.896
34	261796	295825	34029	7.441	7.302	-1.868
35	110981	127002	16021	3.155	3.135	-0.634
36	110355	124885	14530	3.137	3.083	-1.721
37	191230	226227	34997	5.436	5.584	2.723
38	411210	482603	71393	11.688	11.912	1.916
39	295853	338748	42895	8.409	8.361	-0.571
40	737615	849306	111691	20.966	20.964	-0.010

Node	C1	C2	C3	C4	C5	C6
41	900951	1058489	157538	25.609	26.127	2.023
42	71383	86245	14862	2.029	2.129	4.929
43	525658	621780	96122	14.941	15.348	2.724
44	223024	281891	58867	6.339	6.958	9.765
45	278480	324575	46095	7.916	8.012	1.213
46	368983	427155	58172	10.488	10.544	0.534
47	254647	300558	45911	7.238	7.419	2.501
48	93861	109058	15197	2.668	2.692	0.900
49	277790	327360	49570	7.896	8.080	2.330
50	792160	910293	118133	22.516	22.469	-0.209
51	564774	658791	94017	16.053	16.261	1.296
52	186192	217616	31424	5.292	5.371	1.493
53	40368	47096	6728	1.147	1.162	1.308
54	131082	142988	11906	3.726	3.529	-5.287
55	1771154	1825959	54805	50.343	45.071	-10.472
56	2575260	2654518	79258	73.199	65.522	-10.488
57	317990	353014	35024	9.039	8.714	-3.596
58	127909	141738	13829	3.636	3.499	-3.768
59	425290	469887	44597	12.088	11.598	-4.054
60	1553467	1747664	194197	44.156	43.138	-2.305
61	2179256	2448929	269673	61.943	60.448	-2.414
62	756539	833387	76848	21.504	20.571	-4.339
63	632566	693163	60597	17.980	17.110	-4.839
64	263126	288779	25653	7.479	7.128	-4.693
65	477495	519716	42221	13.572	12.828	-5.482
66	677774	737161	59387	19.265	18.196	-5.549
67	265137	288044	22907	7.536	7.110	-5.653
68	472417	509671	37254	13.428	12.580	-6.315
69	681536	734129	52593	19.372	18.121	-6.458
70	571899	624858	52959	16.256	15.424	-5.118
71	333175	360217	27042	9.470	8.891	-6.114
72	1306392	1445677	139285	37.133	35.684	-3.902
73	285294	309959	24665	8.109	7.651	-5.648
74	1718133	1851161	133028	48.836	45.693	-6.436
75	324823	347599	22776	9.233	8.580	-7.072
76	227568	242802	15234	6.468	5.993	-7.344
77	554335	586774	32439	15.756	14.484	-8.073
78	243265	257148	13883	6.915	6.347	-8.214
79	231682	245447	13765	6.585	6.058	-8.003
80	1160537	1235285	74748	32.987	30.491	-7.567
81	415716	442706	26990	11.816	10.927	-7.524
82	1390015	1495138	105123	39.510	36.905	-6.593
83	423949	456842	32893	12.050	11.276	-6.423
84	440262	487842	47580	12.514	12.042	-3.772
85	392069	419935	27866	11.144	10.365	-6.990
86	1057189	1307197	250008	30.050	32.266	7.374
87	84817	98644	13827	2.411	2.435	0.995
88	245225	292517	47292	6.970	7.220	3.587
89	10027	11723	1696	0.285	0.289	1.404
90	57093	67844	10751	1.623	1.675	3.204

SIMULATION 3 = 75MPH, 18 HRS DELAY

DISTANT EXPONENT = 1.0

KEEBLE ET AL'S SELF POTENTIAL FORMULA WAS USED, i.e. $K = 0.333$

C1 - ABSOLUTE POTENTIAL VALUES FOR FERRY
 C2 - ABSOLUTE POTENTIAL VALUES FOR TUNNEL
 C3 - CHANGE IN ABSOLUTE VALUES
 C4 - RELATIVE POTENTIAL VALUES FOR FERRY
 C5 - RELATIVE POTENTIAL VALUES FOR TUNNEL
 C6 - % CHANGE

Node	C1	C2	C3	C4	C5	C6
1	263749	505632	241883	7.588	12.481	64.483
2	175910	327232	151322	5.061	8.077	59.593
3	439306	737020	297714	12.639	18.192	43.935
4	628150	1054445	426295	18.072	26.027	44.018
5	400792	661787	260995	11.531	16.335	41.662
6	515992	859228	343236	14.846	21.209	42.860
7	208528	363483	154955	6.000	8.972	49.533
8	425907	730213	304306	12.254	18.024	47.087
9	128979	261370	132391	3.711	6.451	73.835
10	1755611	3553835	1798224	50.510	87.720	73.669
11	57294	137600	80306	1.648	3.396	106.068
12	117902	334604	216702	3.392	8.259	143.485
13	185402	212798	27396	5.334	5.253	-1.519
14	360470	419607	59137	10.371	10.357	-0.135
15	676802	862210	185408	19.472	21.282	9.295
16	338539	404022	65483	9.740	9.973	2.392
17	269448	322832	53384	7.752	7.969	2.799
18	3475742	4051316	575574	100.000	100.000	0.000
19	371197	415489	44292	10.680	10.256	-3.970
20	421476	472210	50734	12.126	11.656	-3.876
21	435039	488115	53076	12.516	12.048	-3.739
22	229277	256575	27298	6.596	6.333	-3.987
23	93017	104134	11117	2.676	2.570	-3.961
24	352593	392095	39502	10.144	9.678	-4.594
25	242030	268198	26168	6.963	6.620	-4.926
26	219495	242958	23463	6.315	5.997	-5.036
27	489453	543066	53613	14.082	13.405	-4.808
28	177275	198369	21094	5.100	4.896	-4.000
29	895752	1005631	109879	25.772	24.822	-3.686
30	182626	206835	24209	5.254	5.105	-2.836
31	285416	325179	39763	8.212	8.027	-2.253
32	420840	507380	86540	12.108	12.524	3.436
33	342790	419244	76454	9.862	10.348	4.928
34	259884	295825	35941	7.477	7.302	-2.341
35	110029	127002	16973	3.166	3.135	-0.979
36	109528	124885	15357	3.151	3.083	-2.158
37	189502	226227	36725	5.452	5.584	2.421
38	408122	482603	74481	11.742	11.912	1.448
39	293834	338748	44914	8.454	8.361	-1.100
40	731893	849306	117413	21.057	20.964	-0.442

Node	C1	C2	C3	C4	C5	C6
41	893480	1058489	165009	25.706	26.127	1.638
42	70651	86245	15594	2.033	2.129	4.722
43	521480	621780	100300	15.003	15.348	2.300
44	221120	281891	60771	6.362	6.958	9.368
45	275729	324575	48846	7.933	8.012	0.996
46	365884	427155	61271	10.527	10.544	0.161
47	252336	300558	48222	7.260	7.419	2.190
48	93120	109058	15938	2.679	2.692	0.485
49	275661	327360	51699	7.931	8.080	1.879
50	786228	910293	124065	22.620	22.469	-0.668
51	560088	658791	98703	16.114	16.261	0.912
52	184654	217616	32962	5.313	5.371	1.092
53	39983	47096	7113	1.150	1.162	1.043
54	130182	142988	12806	3.745	3.529	-5.768
55	1767424	1825959	58535	50.850	45.071	-11.365
56	2569836	2654518	84682	73.936	65.522	-11.380
57	315957	353014	37057	9.090	8.714	-4.136
58	127123	141738	14615	3.657	3.499	-4.320
59	422715	469887	47172	12.162	11.598	-4.637
60	1544240	1747664	203424	44.429	43.138	-2.906
61	2165918	2448929	283011	62.315	60.448	-2.996
62	751832	833387	81555	21.631	20.571	-4.900
63	628517	693163	64646	18.083	17.110	-5.381
64	261932	288779	26847	7.536	7.128	-5.414
65	474665	519716	45051	13.657	12.828	-6.070
66	674334	737161	62827	19.401	18.196	-6.211
67	263801	288044	24243	7.590	7.110	-6.324
68	469079	509671	40592	13.496	12.580	-6.787
69	677167	734129	56962	19.483	18.121	-6.991
70	568127	624858	56731	16.345	15.424	-5.635
71	330932	360217	29285	9.521	8.891	-6.617
72	1298431	1445677	147246	37.357	35.684	-4.478
73	283592	309959	26367	8.159	7.651	-6.226
74	1708494	1851161	142667	49.155	45.693	-7.043
75	322801	347599	24798	9.287	8.580	-7.613
76	225929	242802	16873	6.500	5.993	-7.800
77	551193	586774	35581	15.858	14.484	-8.664
78	241827	257148	15321	6.958	6.347	-8.781
79	230193	245447	15254	6.623	6.058	-8.531
80	1152640	1235285	82645	33.162	30.491	-8.054
81	413026	442706	29680	11.883	10.927	-8.045
82	1381809	1495138	113329	39.756	36.905	-7.171
83	421155	456842	35687	12.117	11.276	-6.941
84	436890	487842	50952	12.570	12.042	-4.200
85	387412	419935	32523	11.146	10.365	-7.007
86	1040266	1307197	266931	29.929	32.266	7.808
87	83645	98644	14999	2.407	2.435	1.163
88	241738	292517	50779	6.955	7.220	3.810
89	9845	11723	1878	0.283	0.289	2.120
90	56295	67844	11549	1.620	1.675	3.395

APPENDIX 3:

THE QUESTIONNAIRE

APPENDIX 3: THE QUESTIONNAIRE

Details about your company:

1. Name and address: _____

2. Ownership status: (tick as appropriate)
☐ Private
☐ Partnership
☐ Public Limited Company
☐ Branch Plant
☐ Other (please state) _____
3. a) Is your company a multinational enterprise or subsidiary of a multinational enterprise?
☐ Yes
☐ No
☐ Don't Know

b) Where are the others located:
☐ The United Kingdom
☐ European Community
☐ Rest of Continental Europe
☐ Rest of the World
4. What industrial activities are your company involved in?

5. How many years has your company been operating from this present location?
☐ 0-5 ☐ 10-20 ☐ 50+
☐ 5-10 ☐ 20-50
6. a) Initial number of employees (approx):
☐ 0-50 ☐ 100-500 ☐ 1000-5000
☐ 50-100 ☐ 500-1000 ☐ 5000+

b) Current number of employees:

- | | | |
|---------------------------------|-----------------------------------|------------------------------------|
| <input type="checkbox"/> 0-50 | <input type="checkbox"/> 100-500 | <input type="checkbox"/> 1000-5000 |
| <input type="checkbox"/> 50-100 | <input type="checkbox"/> 500-1000 | <input type="checkbox"/> 5000+ |

7. a) Percentage of sales dependent on exports (approx)?

- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |

b) Market orientation (approx percentage of sales):

(%)

Domestic (British)	-
European Community	-
Rest of Continental Europe	-
Rest of the World	-

The Channel Tunnel and the Location of the Company

8. Why did your company establish operations at its present location? What were the main attractions?

- ☐ Rent/rates
- ☐ Proximity to market(s)
- ☐ Proximity to supplies
- ☐ Good transport links
- ☐ Labour force
- ☐ Room for expansion
- ☐ Other (please state) _____

9. a) How important is location to your company's overall business strategy?

- ☐ Very important
- ☐ Quite important
- ☐ Not too important
- ☐ Unimportant

b) Please explain why. _____

10. Will the Channel Tunnel and related transport developments alter the locational advantages/disadvantages of your company?

☐ Yes
☐ No
☐ Don't Know

Please explain why. _____

11. More specifically, will the Channel Tunnel and related transport developments make your company more accessible to domestic and European markets?

☐ Yes
☐ No
☐ Don't Know

Please explain why. _____

12. Is the Channel Tunnel and related transport developments likely to make your company vulnerable to increased domestic and European competition?

☐ Yes
☐ No
☐ Don't Know

Please explain why. _____

13. Does your company foresee the need to relocate to take full advantage of the Channel Tunnel?

☐ Yes
☐ No
☐ Don't know

If yes, where and for what reasons? _____

Potential usage of the Channel Tunnel

Passenger Traffic:

14. a) How frequently do representatives of your company undertake business trips to the Continent?
- | | | |
|----------------------------------|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Daily | <input type="checkbox"/> Quarterly | <input type="checkbox"/> Annually |
| <input type="checkbox"/> Weekly | <input type="checkbox"/> Bi-annually | <input type="checkbox"/> Other |
| <input type="checkbox"/> Monthly | | |
- b) What are the prime destinations?
- | |
|--|
| <input type="checkbox"/> France, Germany and the Low Countries |
| <input type="checkbox"/> Rest of the European Community |
| <input type="checkbox"/> Other Continental |
- c) By which mode of transport?
- | |
|---|
| <input type="checkbox"/> Aeroplane |
| <input type="checkbox"/> Rail/ferry |
| <input type="checkbox"/> Road/ferry |
| <input type="checkbox"/> Other (please state) _____ |
15. a) What percentage of future business trips are likely to go via the Channel Tunnel?
- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |
- b) What proportion (of 15a) by BR's international through trains?
- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |
- c) What proportion (of 15a) by Eurotunnel's Shuttle service?
- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |

16. What factors are likely to be considered important in the determination of Question 15?

- ☐ Cost/price
- ☐ Journey time
- ☐ Reliability
- ☐ Comfort
- ☐ Other (please state) _____

Freight Traffic

17. By which mode of transport does your company presently export its products to Continental markets?

- ☐ Aeroplane
- ☐ Rail/sea
- ☐ Roll-on/Roll-off ferry
- ☐ Load-on/Load-off ferry
- ☐ Other (please state) _____

18. a) What percentage of your company's exports are likely to go via the Channel Tunnel after June 1993

- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |

b) What proportion (of 18a) by BR's international railfreight services?

- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |

c) What proportion (of 18a) by Eurotunnel's Shuttle service?

- | | | |
|--------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> 0-20 | <input type="checkbox"/> 40-60 | <input type="checkbox"/> 80-100 |
| <input type="checkbox"/> 20-40 | <input type="checkbox"/> 60-80 | |

19. What factors are likely to be considered important in the determination of Question 18?

- ☐ Cost/price
- ☐ Journey time
- ☐ Reliability
- ☐ Other (please state) _____

Wider Considerations

20. What Government/BR strategies would be necessary to encourage the increased utilisation of the Channel Tunnel by your company, in terms of both passenger and freight services?

21. Has information about the Channel Tunnel and its services been easily available to your company?

22. Has the Single European Act ('1992') and the Channel Tunnel forced your company to look more towards Europe? If so, how?

23. Based on your company's knowledge of the local/regional economy, is the Channel Tunnel likely to have a beneficial or damaging effect on the South East/South West?

Thank you for your co-operation. As stated in the introductory letter, all information obtained will be treated with complete confidentiality and used only for the purposes of the research thesis. Please use the enclosed self-addressed envelope to return the completed questionnaire.

LIST OF ABBREVIATIONS

BAI	Brittany, Angleterre and Irlande
BR	British Rail
BTA	British Tourism Authority
CBI	Confederation of British Industry
CER	Community of European Railways
CTFI	Channel Tunnel Freight Interchange
CTG-FM	Channel Tunnel Group-Franch Manche
CTJCC	Channel Tunnel Joint Consultative Committee
EC	European Community
ECML	East Coast Main Line
ECU	European Currency Unit
EFL	External Finance Limit
EFTA	European Free Trade Association
EIB	European Investment Bank
EKI	East Kent Initiative
GDP	Gross Domestic Product
GWR	Great Western Railway
JIT	'Just-in-Time' systems
IPS	International Passenger Station
KCC	Kent County Council
LMS	London-Midlands Service
LNER	London-North Eastern Railways
LOLO	Load-on/Load-off Ferries
MMC	Monopolies and Mergers Commission
MNC	Multi-National Company
NKML	New Kent Main Line
PBKA	Paris-Brussels-Koln-Amsterdam high-speed rail network
PLC	Public Limited Company
PSO	Public Sector Grant

LIST OF ABBREVIATIONS (CONT'D)

RORO	Roll-on/Roll-off Ferries
SEM	Single European Market
SE	Southern Railways
SNCB	Société Nationale des Chemins de Fer Belges
SNCF	Société Nationale des Chemins de Fer Français
SOEC	European Commssion Statistical Office
TDAP	Tourism Development Action Programme
TGV	Trains Grande Vitesse
TML	Transmanche Link
TUCC	Transport Users Consultative Committee
UK	United Kingdom
WCML	West Coast Main Line

LIST OF ABBREVIATED REGIONAL CONSULTANCY REPORTS

AMA	Association of Metropolitan Authorities (1989) <i>Getting the Best from the Channel Tunnel. A Local Government Initiative</i> , AMA, London.
BR	British Rail (1989b) <i>International Rail Services for the United Kingdom</i> , BRB, London.
CLES	Centre for Local Economic Studies (1989) <i>Channel Tunnel: Vicious Circle. Pilot Study: The Impact of the Channel Tunnel on the North of England</i> , CLES, Manchester.
Eurotunnel/BR	Eurotunnel and British Rail (1988) <i>Making the Pieces Fit. Regional Studies of Business Opportunities</i> .
KCC	Kent County Council (1989) <i>Independent Assessment of Rail Services in Kent between London and the Channel Tunnel</i> , a report by Steer Davis and Gleave, and Maunsell, KCC, Maidstone.
KIS	Channel Tunnel Joint Consultative Committee (1987) <i>Kent Impact Study - A Strategy for Kent</i> , Department of Transport, London.
LCCI	London Chamber of Commerce and Industry (1989) <i>Impact of the Channel Tunnel on London's Business Community</i> , LCCI, London.
NOERC	North of England Regional Consortium (1988) <i>A Minimum Programme of Investment in the North</i> - a paper presented at 'The Channel Tunnel Conference - Making Most of the Link in the North'.
1991 Review	Channel Tunnel Joint Consultative Committee (1991a) <i>Kent Impact Study 1991 Review: The Channel Tunnel - A Strategy for Kent</i> , CTJCC, Maidstone.

LIST OF ABBREVIATED REGIONAL CONSULTANCY REPORTS

SEEDS	South East England Development Strategy (1989) <i>The French Connection. Impact of the Channel Tunnel on the South East</i> , a report by Transnet, SEEDS, Stevenage.
SERPLAN	South East Regional Planning Conference (1989) <i>The Channel Tunnel: Implications for the South East Regions</i> , Report of the Channel Tunnel Working Group, RPC.

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British Rail, Société Nationale des Chemins de Fer Français and Société Nationale des Chemins de Fer Belges (1990) 1993 - *The Joint Development of a High Speed Train for Europe*, SNCB, Brussels.

British Tourism Authority (1988) *The Channel Tunnel: an opportunity and a challenge for British tourism*, BTA, London.

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