

Community Relations
Council for Northern
Ireland

**The Implications of
Segregation for
Transport within
Northern Ireland**

Ove Arup & Partners
Arup Transport Planning

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Ireland**

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1. INTRODUCTION

The overall goals for the research were as follows:

- 1 Establish the nature and scale of the relationship between ethno-religious segregation and the transport geography of Northern Ireland.
- 2 Review the evolution of transport policy operational response and travel behaviour with particular reference to the role of ethnic conflict and division since 1969.
- 3 Assess the impact of ethno-religious tension on travel patterns and the transport system.
- 4 Evaluate the implications of changes in the transport system in response to ethno religious division, including:
 - promotion of segregation in residential location;
 - level of service afforded by the transport system;
 - propensity for contact;
 - access to opportunities - jobs, schools, shopping etc.
- 5 Assess the extent of inefficiencies posed by ethno religious division, to include:
 - car dependency;
 - level of public transport provision;
 - land use patterns environmental sustain ability;
 - access to opportunities.
- 6 Establish a benchmark for measuring the potential implications of a 'normal' society.
- 7 Identify and undertake a strategic review of policies designed to ameliorate these inefficiencies and limit further tendencies toward segregation.

This report deals with the first phase of this research.

2. PHASE 1 RESEARCH DESIGN

The research was to be largely based on “desk top” review of relevant research both relating to Northern Ireland and elsewhere where community tensions or concerns over personal safety distort travel and transport patterns. This was to include six main aspects.

- Trawl of key local planning and transportation plans, policy statements and related documents with a view to identifying explicit or implicit policy responses to community tensions and violence.
- Collection of census and other statistical data to inform an assessment of the extent of segregation and its progression over time.
- Review of ‘historical’ data/information relating to violence and community unrest in earlier periods of tension with a view to establishing potential effects of mass car ownership on segregation.
- Review and interpretation of specialist report on residential migration and choice and locational studies with a view to informing the role of spatial demographic change on propensity for contact between communities.
- Undertake focused discussions with key decision makers, commentators and specialists in relation to social and religious segregation, housing and planning, conflict resolution and transport operators.
- Review of literature on the relationship between perceived personal security and travel behaviour.

Phase 1 was expected to:

- identify the scale and impact of segregation on travel behaviour and inter-community contact and the (transport) policy response to the phenomenon.
- Assess the extent to which transport policy and operational practice contributes to/reinforces segregation (if at all), however unintentional.
- Postulate the likely long term effect of current transport policy on integration/segregation trends.
- Identify potential measures designed to promote integration and inter-community contact.

The principal deliverables from this phase were to be a comprehensive overview of the available evidence on the issues just referred to. Phase 1 seeks to establish the benchmarks for the implications which might be anticipated arising from a ‘normal’ society and the basis on which to measure in depth the extent of the problems identified and the likely behavioural response to policy initiatives intended to break down such barriers.

Phase 2 would encompass empirical research to include household based interviews in Belfast and outside the Belfast City Region designed to measure perceptions of access, current travel behaviour and activity patterns and likely response to potential policy initiatives. Interviews with key decision makers to inform this phase of the work and test their support for and perceived practicality and effectiveness of policy initiatives.

3. DEVELOPMENT OF SEGREGATED SPACE IN NORTHERN IRELAND

3.1 Introduction

3.1.1 Trends in City Structure and Activity Patterns

According to Lieberman (1961) there is an inverse relationship between the degree of assimilation of two ethnic groups and the degree of residential segregation that exists between them. Thus, increasing assimilation will be accompanied by decreasing segregation. Residential segregation between two ethnic groups is likely to reflect significant differences between them. Indeed, the physical separation of residence may contribute to and reinforce division. Equally, however, segregation between groups may act as an integrating force within each group. Boal (1982) argues that common residence permits the maintenance of ethnic cultural attributes and reduces the likelihood of dilution due to outside contact. He concludes that, in Northern Ireland, residential segregation indicates that the two groups are relatively unassimilated and that segregation may indicate and contribute to significant levels of integration within each group. However, it is important to relate observations on levels of segregation to geographical scale. This is very relevant in attempting to identify implications for transport.

3.1.2 The Development of Segregation in Northern Ireland: Overview

While a large proportion of the population of Northern Ireland live in what might be described as segregated areas the most visible manifestations of a local assimilation are to be found in urban areas around Belfast and Londonderry in particular. In 1991 the population of Northern Ireland was 1.578 million of whom almost 1 million lived in the Belfast City Region. Almost 300,000 live in the Belfast City Council area and more than 0.5 million within the Belfast Urban Area. Thus the Belfast area dominates the Province and it is not unexpected to find the greatest levels of segregation in the Region. It is therefore appropriate to focus attention on Belfast.

Jones (1960) suggested that residential segregation of Protestant and Catholics may have been a characteristic of the city from its inception. He notes that relationships between the two groups during the latter part of the eighteenth century appear to have been fairly amicable. However, as the nineteenth century proceeded these relationships deteriorated. This was related to the rapid growth in the number of in-migrant Catholics in the city at the time of the industrial revolution. The deteriorating relationship was accentuated by outbursts of inter-ethnic rioting and these sharpened the growing segregation. Where Protestants and Catholics perceived themselves to be vulnerable minorities they tended to move house in search of greater security provided by residing among the relevant ethnic group (Boal 1982). Throughout the latter part of the nineteenth century and into the twentieth there was a sequence of periods of relative peace punctuated by conflict, the latter triggered by the political agitation associated with the Home Rule campaign.

3.1.2.1 Segregation Trends in the Belfast Area (1780-1991)

Segregation in Belfast has been at a high level certainly since the city's major phase of expansion in the 19th century. As recently as 1780 the overall percentage of Protestants was 95% versus 5% Catholic although the total population was only around 10,000. By 1861 the population had risen to 121,000 with Catholics now making up 34% of the population.

The first recorded sectarian riot took place in 1813. From the mid-1800s to the end of the Century rioting took place regularly and on a large scale while the proportion of Catholics fell as the city grew rapidly, swelled by large numbers of Protestants from rural areas and higher levels of natural increase among the group coupled with out migration by Catholics. The segregation which had already been established with the emergence of a Catholic area on the

west side of the expanding city, increased as a result of the rioting concentrated at the interfaces.

Rioting and intimidation acted as the engine of segregation in the city, something which has continued up until today. The riots and other violence in the early years of this century were particularly vicious resulting in more than 450 deaths between 1920 and 1922 producing a yet further ratcheting of segregation. Primarily the trend towards segregation represented defensive reaction to the communal tension and violence.

A standard index of segregation for the period 1871 to 1891 showed a rise from 13.2 to 21.6. For the period 1901 to 1911, the same index, recalculated to a greater number of spatial units, rose by a further 10%, something which persisted up to World War 2. Over the period 1901 to 1937, while the overall percentage of Catholics varied little, certain areas exhibited marked changes notably in and around the harbour and north, west, south west and east of the Central Business District. Only south of the city centre in the Windsor ward was there no marked shift to greater levels of segregation. Moreover, segregation also reflects socio economic status. Further riots in the mid-1930s were, however, minor compared to 1920-22 and this did not produce significantly increased levels of segregation.

Against this backdrop the city's population continued to rise to 438,086 by 1937. By 1964 the Belfast Urban Area (BUA) had reached 582,273. The period from 1940s to the late 1960s saw little serious inter-communal violence. However, segregation remained at similar levels until the 1960s. Despite the outbreak of "the Troubles" two years earlier, segregation levels in 1971 were significantly lower than any period after 1911. However, the violence of the last three decades has produced a marked resumption in the long-term trend of increased segregation so that by 1991 the index at a ward level had risen almost 10% points since 1971.

The period 1969-71 saw unprecedented mass movements of population from formerly mixed areas to leave either destroyed property or houses taken by the stronger group. Between 7% and 12% of the population moved home as a direct result of the violence between August 1969 and February 1973. By 1972 70% of the city's population lived in highly segregated streets compared to 59% in 1911 and 67% in 1969.

Illustrative of a higher scale for the new 51 wards existing in 1991, 31 were highly segregated. Moreover, 18 wards were less than 10% Catholic and a further 8 were 90% Catholic. Almost half the population of the city lived in these wards.

At the BUA level, by 1991 40% of the area was segregated Protestant and 6% was segregated Catholic. 45% of the population of the BUA live in highly segregated environments i.e. more than 90% one religion or another.

At a BUA grid square level the index of segregation rose by more than 10% points between 1971 and 1991. This was occurring against a rapid decline in the city's population, and latterly that of the BUA as a whole, as Protestants in particular left the city for the dormitory towns and outer suburbs.

The percentage of Catholics in the city rose from 28% in 1971 to 39% by 1991 while for the BUA it rose from 27% to 31%. In fact the suburban part of the BUA has experienced an increase in the percentage of Protestant residents. Segregation has thus spread from being a city level phenomenon to one that increasingly characterises the more affluent suburbs. During the 1980s, while violence continued often at a more reduced level, the upward drift in levels of segregation reflected the emergence of independent housing markets not only between the two religions but also within each group at a spatially discrete level.

Within the BUA there are marked differences in the level of segregation experienced. Thus while, overall, Catholics represent 31.5 % of the BUA this varies between 6% for Belfast East and 74% for Belfast West. The index highlights high levels of segregation within sub areas. Segregation within Belfast West and contiguous areas to the older BUA boundary as well as to lesser extent in Belfast East, Newtownabbey, Lisburn and Castlereagh. Not only is the ring

of suburban areas more Protestant than the city itself but it is internally more segregated. This complex weaving of segregation patterns is reflected in the overall segregation index level for the BUA.

Segregation levels tend to be highest among the lower socio-economic groups, those in lower value property and those living in public sector housing. Moreover, mixed housing is not necessarily stable in terms of its religious composition. Streets that were only 10-29% Catholic showed marked changes towards Protestants, particularly in the public rented sector. The opposite pattern emerged when the population of Catholics rose to 50-90% across all housing categories but particularly in private housing occupied by lower socio-economic groups.

3.1.2.2 Segregation Outside Belfast

In a recent exhaustive account of segregation outside the Belfast urban system, Poole and Doherty (1996) describe the processes of change in towns over 5000 people in Northern Ireland. They classify the 39 towns they examined accordingly to the levels of *Dissimilarity and Dominance*. The Dissimilarity Index measures unevenness in the spatial distribution of the population while the Dominance Index measures the deviation of a social composition from a situation where each social group is found in equal numbers. Finally, *isolation* is analysed using an “exposure index ... which measures the extent to which minority members are exposed only to each other, together with an interaction index which measures the extent to which the minority is exposed to the majority population” (Poole and Doherty, 1996, p.26). Applying each indicator gives a different analysis of division at town level. For example, they found that high dissimilarity combined with high dominance happens in only 5 out of the 39 towns but that these contained 58% of Northern Ireland’s urban population. However, there are 17 towns classified as highly segregated in terms of dominance and they contain 78% of the province’s population.

4. DEMOGRAPHIC TRENDS IN THE BELFAST METROPOLITAN AREA

In assessing the implications of segmentation for travel and transport the extent of this phenomenon must be placed within a wider context of overall demographics, employment and activity patterns.

For the BUA, the trend was one of considerable population increase during the 1950s and 1960s with a peak of just over 0.6 million residents reached in 1971. Planned restraint of the population total in the BUA through an overspill strategy saw many people leave the area for the growth centres and dormitory towns. This trend, coupled with reduced natural increase and significant out-migration from Northern Ireland, reversed the pattern of an increasing population in the BUA.

The effect of “the Troubles” since 1969 has been very significant, acting as a push factor for those able to afford to move to more settled towns and areas outside the city, reinforcing the overspill strategy adopted in the 1960s. This was facilitated by increasing levels of car ownership. For instance, an enlarged Belfast City Council area saw its 1971 population total fall by more than a quarter between 1971 and 1981. Such a decline was two to three times the loss of population experienced by non-metropolitan cities in Britain during the same expansion period.

Within Belfast City Council Area there have been marked variations in the pattern of population decrease. For instance, the Belfast Household Survey 1978 (Northern Ireland Housing Executive, 1980) revealed percentage losses in the inner city ranging from 28% in ‘Inner Catholic West Belfast’ to 54% in the ‘Central Area’. This provides a striking contrast with a more stable picture evident in outer districts in the city. Much of the migration from the city was to contiguous areas within the BUA. Despite downward revisions of the expected population total, further increase in the population of ‘the Fringe’ were experienced in the 1980s. The remaining parts of the Belfast commuting region have also experienced substantial population growth, both in response to government policy and the push factor of “the Troubles”.

5. POPULATION CHANGE IN RURAL ULSTER

Rural population shifts have received considerable attention in academic literature. In a broad based analysis of population change between 1981 and 1991, Shuttleworth (1992) described the broad access process of loss in the BUA and net gain in rural areas. The District Council Areas (DCAs) with the highest rates of increase were Derry, Newry and Mourne, Limavady and Magherafelt. These DCAs experienced rates of natural increase between 11.5% and 16% over the 1981-1991 inter-censal period. Shuttleworth commented on the rate of increase:

“considering the patterns of birth, deaths and natural increase, it seems that population growth in the south and west of Northern Ireland can be attributed to a continued high rate of natural increase combined with a lessening of the rate of out-migration from the levels experienced in the 1970s” (Shuttleworth, 1992, p.87).

Stockdale has detailed the process of ‘counter-urbanisation’ and has identified the DCAs of Armagh and Newry and Mourne as experiencing the highest levels of rural population growth. This process of rural re-population dates back to the mid-1970s when “the distribution pattern of rapid population growth can be described as representing isolated pockets with three principal areas of concentrated growth: the border region of Newry and Mourne DCA; the Lakeland area of Fermanagh DCA and the south-west of Londonderry DCA” Stockdale, 1991, p.76). By the late 1980s, not only were these wards involved, but the previous ‘pockets’ had been consolidated to produce several major axes of growth of which Newry and Mourne was one.

In a positive departure from the rather descriptive nature of much of the research, Stockdale (1992) posits three explanations for rural re-population: voluntarist, non-voluntarist and intervention. Adopting a behavioural approach, Stockdale firstly emphasises the importance of human motivation and individual residential choice as a factor influencing this trend; secondly, the importance of structural forces operating in society as a whole is stressed; finally, and most importantly for Stockdale, intervention is seen as the factor most influencing the ‘turnaround’. In particular, she argues that the relaxation of planning controls associated with residential development in the open countryside since 1978 is the key causal factor:

“removing or reducing these (planning) barriers gave way to a greater freedom of residential choice and accordingly paved the way for re-population of the Northern Irish countryside” (Stockdale, 1992, p.419).

6. EMPLOYMENT TRENDS AND ACTIVITY PATTERNS IN THE BMA

Central to a consideration of accessibility and travel behaviour are the structure and distribution of employment and activity patterns. As with population, employment patterns in the Belfast Urban Area have undergone radical change during the post-war period, particularly since 1969. In the BUA employment in the tertiary sector increased by approximately 10% in the period 1971-78. This largely compensated for job losses in the manufacturing sector.

The first BUA Plan revealed a strong concentration of employment opportunities (31.1%) in the Central Area of the study area. There were also a number of large subsidiary employment nodes, most notably in shipbuilding, aircraft and engineering complex in East Belfast. The patterns of change evident in the 1960s had three main components: total employment in the central area was growing; there was considerable decline in employment opportunities in the inner industrial areas and employment opportunities were growing on 'the Fringe' of the BUA.

The preferred strategy drawn up on the 1960s for activity and land use distribution in the BUA had a number of important implications for employment. The intention was to produce a 20% decline in Central Area employment in the period 1966-86. For manufacturing, the pattern of decline was anticipated to continue. New jobs were to be created on government owned sites in the outer parts of the urban area. Growth was to be encouraged in twelve district centres in the BUA as well as in growth centres outside this area.

The first BUA Plan also made a number of recommendations concerning shopping. It encouraged the consolidation of the regional shopping function of the city centre. However, once again a large measure of dispersal was envisaged for shopping with the intention that the dominance of the Central Area should be reduced.

The effects of these land use strategies for employment and shopping were considerable. However, they were compounded by changing population trends, economic decline and, not least, the effects of the terrorist bombing campaign. Retail floor space declined by 400,000 square feet between 1969 and 1975. Some recovery took place between the mid-1970s and early 1980s bringing the total floor space back to its 1965 total. The percentage of retail turnover held by the Central Area decreased from 45.6% in 1965 to 36.4% in 1975. This was in contrast to trends for cities of similar size elsewhere in the United Kingdom. After 1975 there had been even greater decentralisation. During the 1980s and into the 1990s while new investment in shopping facilities has brought about something of a renaissance in the City Centre, overall market share has fallen in response to large scale edge, and out of town, shopping developments.

In general the rate of dispersal of offices and retailing up to the mid-1980s was greater than that envisaged in the BUA Plan. Employment in the Central Area had already declined to 74,430 by 1971, representing a fall of 11%. By 1985 it had fallen sharply to 56,000. Today new developments are also faced with competition from the promotion of Laganside as a centre for new office developments.

The extent of the decline in recreational activity in the city centre was even greater than that experienced for shopping or employment. The early/mid-1970s represented the nadir as the longer term effects of "the Troubles" made themselves felt on entertainment and leisure facilities. Regeneration at an increasing rate, aided by 'pump priming' from government and promotional campaigns, helped to re-establish the city centre in the late 1980s.

These changes in population and employment distribution, and patterns of shopping and engagement in recreational activities have had considerable impact on travel behaviour and the transport policies developed to meet the changed circumstances. The major feature of this period was the switch from public to private transport and an ever increasing dependence on the private motor car to meet the mobility needs of the people living and/or working in the

city. However, perhaps more fundamentally, they have widened the gap in terms of access to opportunities between those members of society with and those without access to private transport. This affects the less well off members of both communities, i.e. the carless, to varying extents dependant upon the location of employment, shopping and recreational opportunities.

7. TRENDS IN THE SUPPLY OF TRANSPORT FACILITIES AND DEMAND FOR MOBILITY IN THE BELFAST URBAN AREA

7.1 Commuting Trends in the Belfast Region

The effects of the changes in city structure outlined above for travel behaviour and transport supply have been very significant. The rate of decline in Belfast's population was, until 1980s, greater than the dispersal of employment. During the 1960s and early 1970s this produced an increase in the total amount of commuting into the former Belfast County Borough area from 41,000 in 1960 to 69,206 in 1971 (Matthew, 1964, H.M.S.O., 1975) by 1991 this had risen yet further to more than 75,000.

Within the Belfast City Council Area there continued to be a high degree of self-containment with respect to daily labour flows. Surveys in the 1980s highlighted the continued concentration of employment opportunities in East and Central Belfast. For resident heads of household, those two areas combined accounted for 54% of work trip destinations. However, the same surveys also give some indication of the reduced importance of central Belfast as a source of employment or residents of the city. Moreover, total commuting within the city fell by 11% between 1966 and 1991.

Most of the decline in central area employment was in manufacturing and warehousing, with a greater tendency during the 1970s for higher income groups to leave the city, this would suggest that a greater proportion of city centre jobs were being filled by long distance commuters (see Tables 7.1 and 7.2). More recent data suggests that this pattern is continuing.

7.2 Modal Split Trends

The increasing separation of workplace and home inevitably leads to an increased demand for mechanised travel. The percentage of work trips made by public and private transport in the Belfast City Council Area stood at 71% in 1981. However, for commuters travelling into the city from outside its boundaries the figure was 97%. Clearly, the effect of "the Troubles" cannot be dismissed. This is indicated by the fall in total peak hour mechanised trips in the BUA. from 127,160 in 1966 to an estimated 109,000 in 1976 (Travers Morgan and partners, 1976). This figure represents approximately two-thirds of that predicted in the original Belfast Transportation Plan (Travers Morgan and Partners, 1969). Data from the 1991 Census demonstrates a continuation of this trend.

The 1970s witnessed a dramatic change in the absolute as well as the relative use of buses and cars with rail and walk trips showing a much greater degree of stability in their relative importance. The decline in use of public transport in the peak hour (in 1966 over half of all peak hour trips were work trips) was unique in the United Kingdom and more closely accorded with the decline in use of public transport experienced in many North American cities some twenty to thirty years earlier.

The reasons for this significant change in the modal composition of trips are complex. At a macro level the available evidence points to increasing car ownership, employment and residential dispersal, and decline in the "level of service" offered by public transport as being some of the main reasons. On top of this, the civil unrest has had a pervasive effect on travel behaviour in the Belfast City Region. Nevertheless, the downward trend in bus use and the overall market share by public transport continues, albeit at a reduced rate.

Table 7.1 Changes in the Pattern of Modal Split for the Work Trip into and Within the former Belfast County Borough

	1960	1966	1971	1981	1991
All work trips by people resident within Belfast Co Borough by:-					
Bus	-	77,908 (48%)	58,194 (43%)	41,076 (28%)	27,577 (19%)
Car	-	32,019 (20%)	34,389 (26%)	77,114 (52%)	95,198 (66%)
All Private Vehicles	-	35,429 (22%)	37,376 (28%)	81,347 (54%)	98,791 (69%)
All work trips (including walking)	-	161,676	133,554	149,358	143,392
Motorised work trips to Belfast Co Borough by:-					
Bus	21,100 (48%)	-	25,103 (37%)	14,231 (22%)	10,848 (14%)
Train	4,800 (12%)	-	4,237 (6%)	3,117 (5%)	2,418 (31%)
Private Vehicle	16,200 (40%)	-	39,111 (57%)	46,957 (71%)	62,862 (81%)
Total motorised work trips	42,100	-	68,451	63,915 (97%)	75,737 (97%)

Table 7.2 Persons Travelling to/from Work in Northern Ireland by Train

Year	Persons travelling to work by train
1966	4,694
1971	6,644
1981	5,268
1991	4,244

7.3 Public Transport Demand and Supply (Bus)

For bus services operated by the then Belfast Corporation and latterly Citybus, the postwar period has seen an almost continuous decline in patronage. Up to the late 1960s the rate of decline was similar to other urban areas in the UK. However, during the period from 1969 the rate of decline far outstripped that experienced elsewhere in Britain. Total patronage declined by some 60% between 1966 and the mid-1970s. After slowing down in the late 1970s the pace increased again. However, the last few years have witnessed greater stability with a reduced level of decline in ridership. For every trip made today by bus in Belfast more than five were undertaken in 1966.

For Ulsterbus urban area services, the decline in bus patronage since the late 1960s has been much more gradual. While this might initially indicate a large variation between the patterns of bus use within the city and the remainder of the BUA, if the criterion is rides per capita, the decline for Citybus in the period 1966-75 was 51% while for Ulsterbus the equivalent figure was 42%. Per capita use of Citybus remains higher than for Ulsterbus services. Average trip length by bus has also increased significantly, largely reflecting the dispersal of population

and activity centres and the relatively greater reduction in the attractiveness of the services offered for short distance trips.

Some of this decline in bus use can be attributed to the population and employment decline and redistribution within the BUA. However, the divergence of the curves in Figure 7.1 highlights the impact of “the Troubles” on the demand for travel in Belfast. This particularly affected optional trips in the early years of unrest as highlighted by Smyth (1981). Some 5,200 trips were made by bus from the city centre between 10pm and 11pm on a typical work week night in 1966. The equivalent figure for a typical Friday night in 1981 was less than 1,100 trips.

Figure 7.1 Changes in Bus Frequency Belfast versus UK Cities 1965-1979

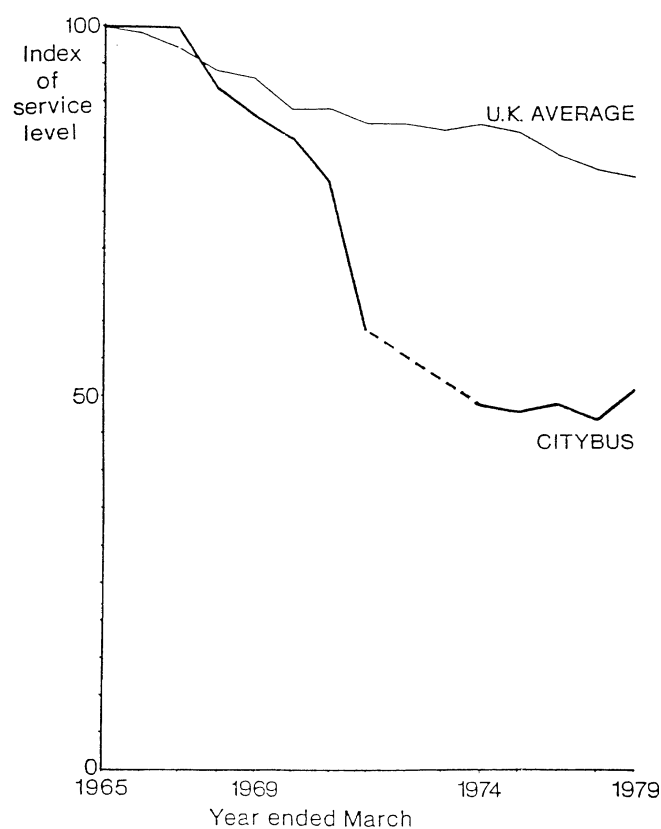


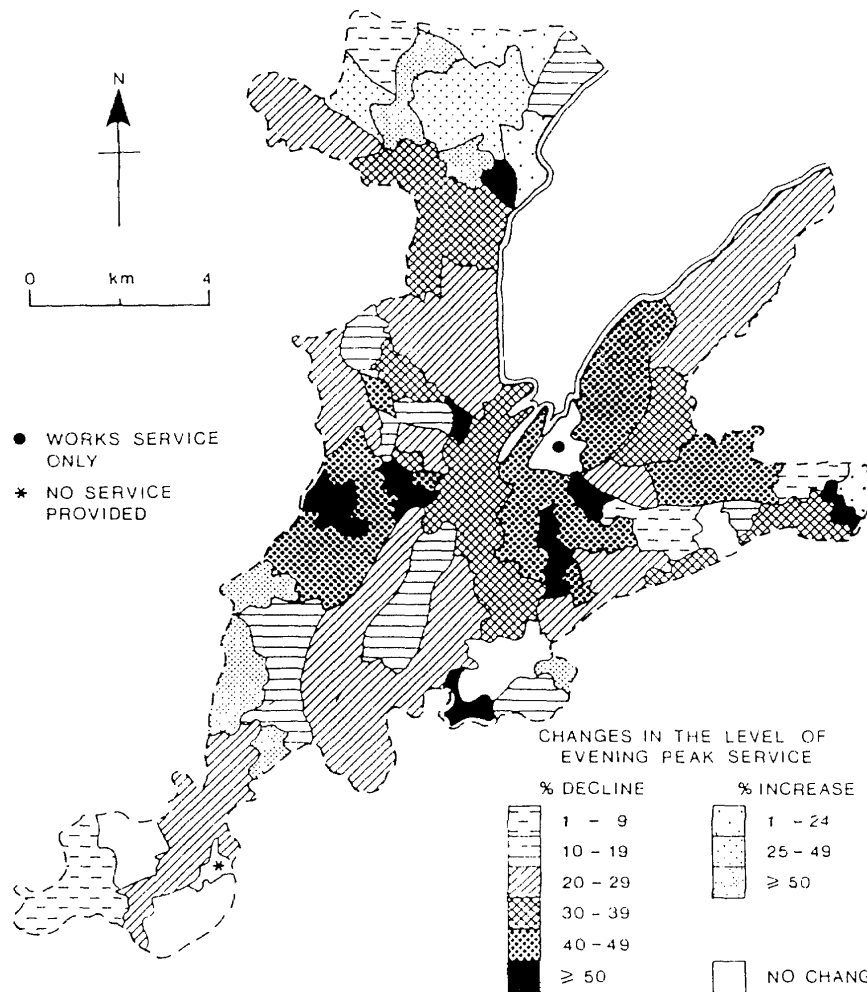
FIGURE 1 TRENDS IN THE LEVEL OF SERVICE (FREQUENCY); BELFAST AND THE UNITED KINGDOM AVERAGE (1963-1979)

Source: Smyth(1985)

This dramatic decline in demand forced a substantial reduction in service frequencies and increases in fares to more closely tailor supply to demand. The vehicle kilometres operated by the bus undertaking declined by more than 40%. The degree to which “the Troubles”, by reducing demand, had an impact on service levels, can be gauged from evidence presented by Smyth (1985) which demonstrated service levels down by 55% between the late 1960s and mid-1970s compared to little more than 10% in the remainder of the UK. The consequences of such large reductions in the frequency of service and increases in fare levels included further reductions in demand in turn leading to a vicious circle of yet further reductions in service levels. The financial crisis facing the city bus undertaking was made worse by the

development of the so called ‘black taxi’ services in the early 1970s as a result of the dislocation caused to bus services, mostly in West Belfast, by rioting and hijacking. With the onset of “the Troubles” reliability was seriously affected on countless occasions. Black taxi operations subsequently spread to the north-west and north Belfast. By 1974-75 it was estimated that 11 million journeys were being made by these services. The effect of this competition can be seen in the relatively greater service reductions in areas where the taxis are strongest.

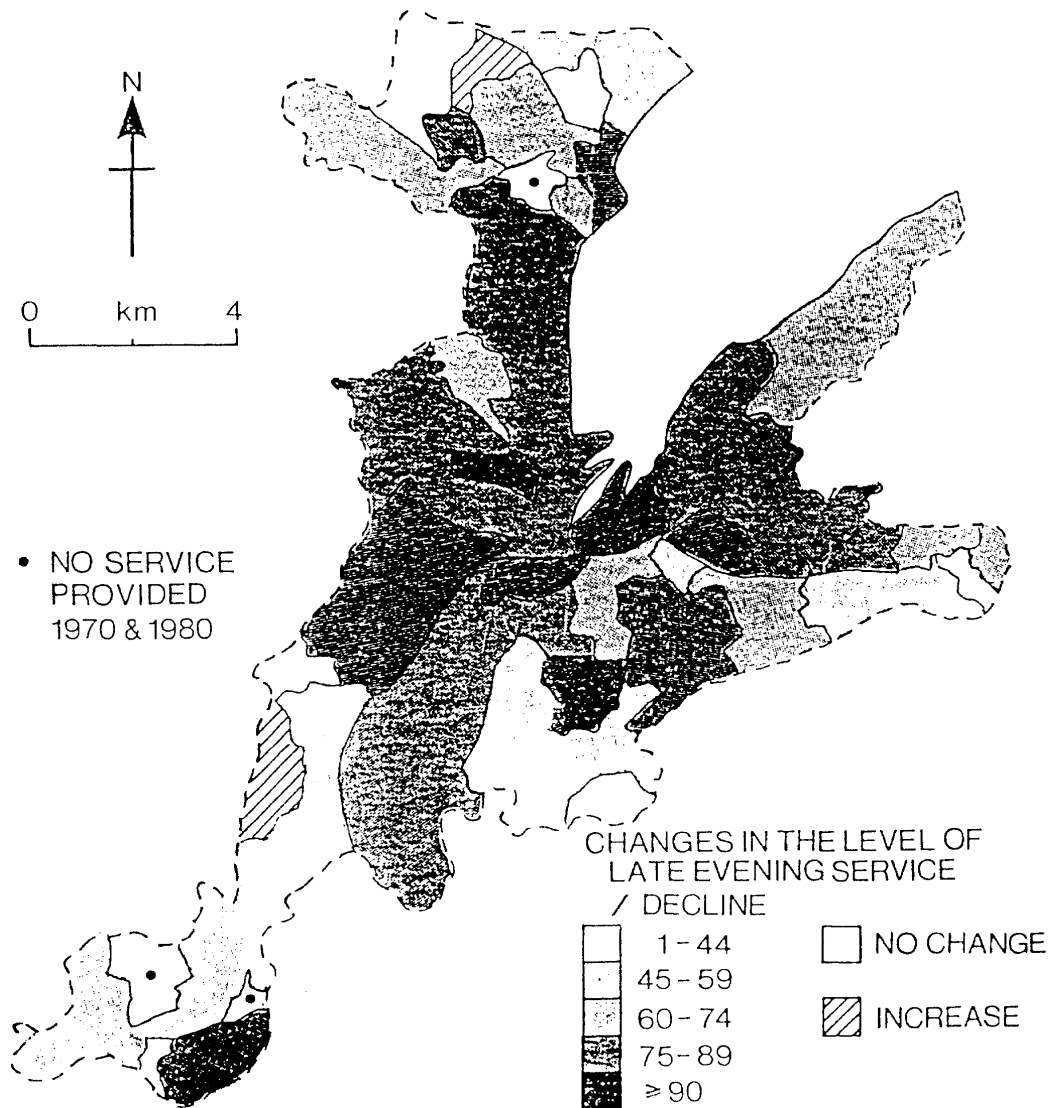
Figure 7.2 Changes in Level of Evening Peak Period Frequency 1970-1980



Source: Smyth (1985)

For Ulsterbus, greater stability in patronage reflected the significant population increases in the outer part of the urban area. This cushioned the bus company until the 1980s from the sharp decline in per capita use of its suburban services. The relative stability in patronage enabled service frequencies to be maintained to a far greater extent than those of Citybus at the time.

Figure 7.3 Changes in Level of Late Evening Peak Frequency 1970-1980



Source: Smyth (1985)

The abortive attempt to integrate Ulsterbus and Citybus within a single company highlights the failure of the public transport system to evolve in harmony with the changes in population distribution and can be attributed to the volatile conditions in the city region. Development of the route networks of both companies was largely piecemeal. The networks almost entirely focussed on a declining city centre.

Rail travel represents only a small, if growing, proportion of public transport trips in the BUA (2% of public transport trips in 1966 and 5% by 1974-75). This is indicative of the stability in patronage since the mid-1970s. However, the disruption and deaths caused by terrorist

incidents had a serious dampening impact on increases in patronage in the 1970s and 1980s. More recently patronage has grown with the opening of the Cross Harbour Rail Bridge and Great Victoria Street Stations. As with bus patronage, the factors influencing the demand for rail travel can be considered in two groups; direct and indirect. The direct effect of “the Troubles” has already been referred to. The dispersal of population to the suburban fringe and to dormitory towns, undoubtedly increased the potential demand for rail travel.

The 1981 census indicated a substantial shift toward use of the private car with a massive decline in the use of public transport among commuters working/and or living in the city. Until the end of the 1970s only a limited number of the road schemes designed to ease pressure on the Central Area and projected in the Belfast Transportation Plan had been completed. Most of the improvements made to roads in Northern Ireland had been on inter-urban routes and the outer-ring road for Belfast.

In addition to new roads or road reconstruction, a considerable number of traffic management schemes were implemented by the mid-1980s. Pedestrianisation received its main impetus from the security restrictions introduced on private vehicles in the city centre during the early 1970s.

Car parking represents the other element of supply. Total and off street car parking which had declined in the late 1960s (c.12,500 spaces 1967) as a result of the introduction of a parking meter and clearway scheme increased again towards the end of the 1970s. Brown (1981) estimated the 1981 total at 21,000 spaces. The Department of Environment (N.I.) estimates put the figure at between 16,000 and 17,000 spaces. A comparison with other medium-sized cities reveals the very much larger proportion of car parking in the private non-residential sector in Belfast and the relatively generous provision of car parking both for public and private use, given the relatively low level of car ownership. Overall parking supply increased significantly in the subsequent period to the 1990s.

Vehicle registrations in 1971 numbered 382,728, of which 299,288 were cars. By 1997 registrations had increased to 683,642 (of which 583,227 were cars), increases of 79% and 95% respectively. Driving licenses rose by 147% over a similar period. Traffic is increasing by an average 3% per annum and shows no sign of diminishing. This not only contributed to the increase in congestion and pollution, but the number and length of journeys also continue to increase. Over 95% of all journeys in Northern Ireland are now made by car.

With publication in 1995 of the Department of the Environment’s present transportation principles, Northern Ireland placed itself in the forefront of the move away from use of private car to promoting a greater service. ‘The Way Forward’ document is consistent with the recently published National Integrated Policy transport White Paper. It seeks to encourage home working, reductions in both the number and duration of individual trips and reductions in the need to travel through land use planning to locate workplaces, shops, schools etc, nearer to the population they serve and on public transport routes.

8. THE POLICY RESPONSE TO TRENDS IN THE BELFAST AREA

8.1 Introduction

Transport Strategies can be viewed on a continuum in terms of their intended effects on travel behaviour. At one end, the aim is to accommodate underlying trends, e.g. rapid expansion of car use and decline of public transport patronage. At the other end of this 'scale' are policies which attempt radically to alter the pattern of travel in an urban area; for the most part policies tend to fall somewhere in between these two 'extremes'.

8.2 The Evolution of a Transport Strategy in the Belfast Urban Area

It is possible to view the evolution of transport strategy in the Belfast region as being formed of seven phases: pre-1970, 1970-74, 1974-79, 1979-85, 1986-95, 1995-997 and 1988. This is not to be taken as a definitive breakdown of periods. Policy does not normally change so radically over short periods of time. However, these periods do reflect the emergence of either new or existing demands as important influences on the evolution of policy and/or the actual changes in urban transport strategy resulting from them.

8.2.1 Economic Growth: The need for more roads

During the period to 1965 little detailed planning was undertaken with reference to transport in the BUA. Indeed it was the early 1960s before official recognition was given to the close inter-relationship between the city and its commuter hinterland through the Belfast Regional Survey and Plan (Matthew, 1964) However, in 1945 outline plans had been drawn up for a ring road system in Belfast. In 1961 the City Surveyor presented a draft plan for a 'grade separated road system'.

The Belfast Regional Survey Plan (Matthew, 1964) also stressed the importance of the road developments. It noted "the urban motorway system inside Belfast is essential to link the main roads feeding traffic into the central area of the city and the port facilities" (Matthew, 1964, p.199).

In addition, the period up to the mid-1960s had seen major changes made to public transport in the Province. The railway network had contracted about 60% and the entire future of the railways was being questioned. Furthermore, as government policy required that public transport should be self-supporting financially, the effect was a declining "level of service" offered by all public modes.

In April 1965 Travers Morgan were given the task of developing a transportation system incorporating past planning decisions, notably the urban motorway system (Travers Morgan and Partners, 1969). This implied that the ring road scheme was to be regarded as committed. Given the terms of reference to the consultants, the policy output was inevitably a roads-based strategy with expenditure on roads requiring 95% of the total budget needed to implement the transportation plan. However, the one exception to this emphasis on roads was the recommended re-opening of the Belfast Central Railway. To sum up, the period to 1970 can be viewed as a phase when there was a general consensus on the need for new roads as an effective way of stimulating economic growth.

8.2.2 1970-1974: The emergence of opposition to the roads plans

By the early 1970s Belfast had already been suffering the effects of widespread civil disorder. The violence and the demands for political reforms in Northern Ireland were having a very significant impact on the social, economic and political fabric of society. Furthermore, the direct effects of the violence on road schemes were considerable.

Throughout Britain and Western Europe there was a growing realisation during this period that unrestrained use of the private car in urban areas was not perhaps the best goal in relation to alleviating the urban transport problem. During this time period a change in policy towards public transport in Northern Ireland as a whole became evident. In particular, much-needed new capital investment began to be made in the remaining rail services. Government gave the go ahead for implementation of the Belfast Central Railway scheme.

The energy crisis had arisen as a result of the war in the Middle East. Rapidly increasing oil prices had direct effects on the demand for travel as well as bringing about a downturn in the economy of the United Kingdom. The consequential need to cut public expenditure became a crucial factor in the decision by the government in the autumn of 1974 to review the whole transport strategy for Belfast.

The policy outcomes in this period were significant. In relation to roads a number of improvements had taken place. However, the whole planning environment had changed in terms of the potential attractiveness of the central area of the city as an activity centre. The bombing campaign had reached its height. The increase in the level of car ownership had been less than anticipated. Furthermore, public transport had suffered badly from the effects of the civil unrest.

8.2.3 1974-1979: A re-appraisal of Belfast's Transportation Strategy

In 1974 the government gave six reasons for a review of the city's transport strategy:

1. Very little of the present strategy had been implemented, in part due to "the Troubles".
2. Attitudes to urban motorways, public transport and the environment had changed over the past few years.
3. The money available for transport would be much less than previously expected due to the general cutback in government spending.
4. Belfast's population was likely to decline rather than increase in the future.
5. The number of cars owned in Belfast in the future was expected to be considerably lower than previously forecast - due to the economic situation and the increase in motoring costs.
6. The number of bus passengers in the future was expected to be much lower than previously forecast - mainly due to the cut-back in services of the last few years and due to reduced leisure travel. (Travers Morgan and Partners, 1976).

Budget constraints limited the finance available to 63%, in real terms, of that envisaged for the original proposals. Phase 1 of the elevated urban motorway was now precluded. The main report of the consultants was published in September 1976. Following a Public Inquiry into its recommendations, the inspector's report was submitted to the Department of the Environment 1978. In general, the resulting plan provided for an M1-M2 dual carriageway link with allowance for grade separations at specific junctions, the cross-harbour tangent, completion of the Central Distributor Box, acceptance of the need to improve bus services to an unspecified level, and the acceptance in principle of the plan to build a rail link between York Road and Central Stations. A rapid start was also made on the M1-M2 link road, while there was optimism that the cross-river rail link between York Road and Central Station would be completed by the early or mid-1980s. However, after April 1978 a number of events took place with important implications for the planning environment.

8.2.4 1979-1985: Cuts in public expenditure; priority for roads

The June election of 1979 saw a return of a Conservative Government at Westminster, committed to reducing public expenditure. The construction of "Westlink" was completed in

1983. Other new road developments completed since 1978 included another section of the outer ring road, a further section of the Central Distributor Box and the M5 in North Belfast. However, with regard to public transport, developments were extremely limited. No work had yet been undertaken on constructing the rail link. The oil shortage of early 1979 broke the momentum of all the improvements being made to bus services in the urban area. The period between 1979 and the mid-1980s was characterised by an even lower investment in urban transport facilities than the reduced levels envisaged in the mid-1970s. Of the money actually committed, only a very small proportion has been used to improve public transport. A de facto roads strategy has been the result, in spite of government commitments to a balanced private: public transport strategy.

8.2.5 1986-1995: A period of rethink and future uncertainty

In the late 1980s a further review of transport policy in Belfast was initiated as part of preparation of a new BUA Plan - 2001. This broadly reaffirmed the 1978 strategy's philosophy and resulted in the construction of the Cross Harbour Road Bridge and other more modest schemes. However, in addition, and somewhat against expectations and government thinking when the review started, when new railway projects were also initiated including both the Belfast Cross Harbour Rail Bridge and the Great Victoria Street Rail Station and spur line. The Europa Bus Centre was also a product of this period. However, most bus measures had to be self financing and, in the prevailing political climate, were thus limited. This was followed by other reports notably the Vision for the City Centre document, the Belfast City Centre Local Plan and the Belfast Southern Approaches Strategy.

Nevertheless, the emphasis on transport both in Belfast and elsewhere in Northern Ireland was changing largely under the influence of European Community/Union policy and financing mechanisms.

8.2.6 The role of the European Union after 1989

EU funding in Northern Ireland for the period 1989-93, has been both substantial in financial terms and influential in informing policy development. Among the priorities identified was reducing the effects of peripherality, a priority which reflected Northern Ireland's remoteness by land and sea from markets in the continental heart of the Community. The Transportation Programme incorporated a series of measures reflecting the main transport sectors, i.e. ports, airports, roads, rail and bus. The main focus of assistance was on strengthening Northern Ireland's "gateways" but public transport projects and roads also benefited. A budget of £125m for grant was allocated. Ports and airports attracted 75% of total grant on offer, public transport projects 18% and roads 7%.

Under the Rail Measure 75% funding was provided for the cross-harbour rail link which was officially opened in March 1995. During the Programme work also commenced on a joint project with Iarnrod Eireann to upgrade the infrastructure and rolling stock on the main Belfast-Dublin, cross-border railway line.

In 1993 new Structural Funds Regulations came into force. The current Transportation Sub-Programme focuses on improvement of access to the gateways. The Sub-Programme embraces roads, rail, bus, ports, airports and, new technology and technical assistance. The Commission allocated approximately £108m to assist projects under the Transportation Sub-Programme. Five projects, including the cross-harbour rail link and the Belfast-Dublin rail project embraced the two Transportation (Sub) Programmes.

Under the present Sub-Programme the majority of the funding (59%) has been directed to rail projects, particularly the cross-harbour bridge and the Belfast-Dublin line. Other rail projects receiving support include the planned re-opening of the Antrim-Bleach Green line. Other public transport projects receive support via the Bus Measure. Roads projects supported under the 1994-99 Sub-Programme include the completion of the Newry bypass on the A8 and Omagh throughpass on the A5.

In a number of areas, notably road and rail, EU support for transport infrastructure in Northern Ireland has helped strengthen cross-border linkages and co-operation with the Republic of Ireland. The most visible sign of cross-border co-operation on rail transport is the recently upgraded "Enterprise" service between Belfast and Dublin.

8.2.7 1995-1997: Rethinking priorities and acknowledging segregation

In January 1995 the then Minister for the Environment called for a rethink of transportation policies for Northern Ireland. The objective was to achieve a better balance between the economy, the environment, and individual freedom of choice. Seven principles were to underpin future transportation planning:

- the need to minimise the effects of transport on the environment;
- a recognition that it is no longer acceptable to seek to meet the full demands of traffic growth simply by building roads;
- an improved public transport system including better co-ordination of bus and rail;
- fuller integration of land use and transport planning;
- a more integrated approach to transport planning and funding;
- the maintenance of good strategic transport connections within Northern Ireland and with the rest of Europe;
- a realistic assessment of what is achievable having regard to the availability of resources and changing public attitudes.

The aim was to set a new direction for transportation planning designed to:

- reduce, where possible the need for travel;
- encourage the use of alternatives to the private car; and
- provide an efficient, safe and accessible transportation system which offers better choice and mobility for all its users.

Publication of a policy/consultation document later in the year - *Transportation in Northern Ireland - The Way Forward* - sought to highlight the issues, identify the choices and explain what the Government proposed to do in the short term. Following the publication of the document, the Department embarked on a programme of action to implement the new direction. This includes:

- the bringing together of the bus and rail companies under a single management;
- an investment of over £100m in the upgrading of the permanent way and rolling stock of the Belfast to Dublin rail service;
- the introduction of bus lanes in Belfast on a phased basis;
- the construction of several new bus stations in Belfast and other towns;
- the proposed reopening of the more direct rail route between Belfast and Londonderry;
- the development of private/public partnership proposals for the replacement of buses and railway rolling stock;
- the introduction of new accessible services aimed at bridging the mobility gap suffered by those who find it difficult to use public transport;
- the development of new car parking policies;
- acknowledgement and development of the role of community transport;

- new provision for pedestrians and cyclists.

Published in January 1996, *The Belfast City Region: Towards and Beyond the Millennium- A paper for Discussion* sought to widen the debate on the future of Belfast and its surrounding region. It sought to enlarge on key development issues and identify future choices for the city region. The ultimate goal was seen to be promotion of competitive, socially inclusive and sustainable city. The document takes as its cue the emerging concern nationally about the need for sustainable development, while noting the importance of earlier local planning, notably the Belfast Regional Survey and Plan, the so called Matthew Plan.

The discussion paper was one of the first to outwardly acknowledge the sectarian geography of the city. Of particular relevance to this research is the assertion that land designated for employment can be attractive to job seekers from both communities by ensuring that location and access are perceived as no threat. It goes on to point to the role which the city centre plays in that regard as neutral territory, acceptable to and accessible to both sides of the community. The position of women and access to job opportunities through differentials in access to cars is also highlighted.

In relation to housing the paper freely refers to the importance of sectarian influences in the residential patterns of the inner-city in particular. In considering transport issues the document notes the new principles set out in the Department of the Environment's own *Transportation in Northern Ireland: The Way Forward* document. However, the latter, while recognising links between land use and transport planning in influencing accessibility, does not explicitly consider such issues and those of segregation and equality of opportunity. Indeed, the Belfast City Region Discussion paper does not make this connection either in setting out the fundamental questions to be asked for the future of the city region.

Belfast City Region: Public Voices is a report commissioned by Government as part of its contribution to the *Belfast City Region: Towards and beyond the Millennium Discussion Paper*. It reported on an extensive programme of consultation among many statutory and non-statutory bodies, interest groups and professionals as well as the public at large. It focuses on a series of themes:

- Sustainable Communities;
- Housing Choices;
- Strengthening the Economy;
- Targeting Social Need;
- Transportation and Land Use;
- Environment and Quality of Life;
- The Implications of a Divided Society.

In relation to housing choice, overall it is recognised that low income households with limited mobility require housing accessible to job opportunities. There is also recognition of increasing social divisions prompted by income and age differentials manifesting itself in spatial segregation. In relation to targeting social need, residential patterns are also seen to affect accessibility to health, social and education services. The importance of public transport in providing accessibility is explicitly identified.

In relation to the implications of a divided society, Belfast City Council was of the view that the sectarian geography of the city had contributed to suburban sprawl while Craigavon referred to the effect of segregation on housing mobility. Another council saw these issues in terms of equality in opportunities. Some of the community groups attributed the decline in inner and middle city areas with high levels of segregation to declining services, poor environment and limited housing choice. They suggested that improved public transport could

play a role in stabilising these areas or encouraging their re-population. Community groups also stressed the importance of ensuring that the location of jobs should be accessible to both sides of the community. With reference to the role of the city centre as neutral space, several groups highlighted safe access to transport as a problem in access to jobs in a neutral area. This referred to bus routes passing through both Protestant and Catholic areas. Groups also stressed the importance they attached to the so called black taxis with some advocating their extension to the whole city

The concerns raised in the Belfast City Region Discussion Paper were subsequently taken up in yet another discussion document: *Shaping Our Future: Towards A Strategy for the development of the Region*, published in November 1997 and intended to provide a launch for developing A Regional Strategic Framework for the entire Province by the end of 1998. Unlike the previously mentioned discussion paper and Public Voices document, this discussion paper initiated by the then new Labour administration is concerned with Northern Ireland as a whole rather than limited to the Belfast City Region. Amongst the themes being addressed are housing choice, implications of a divided society and transportation and land use. It notes the trend towards suburban and semi-rural lifestyles made possible by growth in car ownership which, in turn, has promoted longer commuting distances and a greater dispersal of places of work, retailing and entertainment.

Under the theme of a divided society it also notes that half Northern Ireland's population lives in areas that are more than 90% Protestant or Catholic. It openly acknowledges that this has obvious and fundamental implications for planning, especially when rational planning choice is often frustrated by a strong sense of communal ownership of territory. There are no simple solutions, and in the past there has been an understandable reluctance to engage, openly in public debate on these matters.

Shaping Our Future, however, recognises that divisions are affected by Government policies and that, in turn, these policies are affected by the divisions. Land designation, the location of employment, infrastructure decisions on social, economic and physical infrastructure must respect the sensitivities of the divided and polarised nature of the community in Northern Ireland, while seeking to contribute to healing community divisions. In relation to equality of opportunity and equity of treatment the paper poses the question what is the scope for improving accessibility for all people in the Region to a full range of services and to employment opportunities?

The discussion paper is influenced by a myriad of government policies, both local and national, including Targeting Social Need, Policy Appraisal and Fair Treatment and the UK White Paper on Integrated Transport. It also identifies the possible tension between long standing strategies and more recent updates which seek to regenerate both Belfast and Londonderry and allow a wide choice of development opportunities elsewhere, and the emerging consensus elsewhere in Britain of the requirement for Sustainable Development. At an urban level, the paper refers to the importance of the proximity, accessibility and vitality principles in producing more sustainable urban development. These refer to mixed land uses, multi-modal urban transport systems enhancing accessibility for the whole community, reduced dependence on the car and maximum use of 'brown field' sites for development. In relation to the Belfast conurbation and Londonderry, it calls for an improvement in the level of accessibility for all groups within the community. It explicitly recognises the social benefits which a good and accessible transport system can deliver, including equality of access to opportunities for the whole community. However, it acknowledges the high levels of car dependency within Northern Ireland. At the time of writing, the Report of the Panel Conducting public hearings on the draft RSF had just appeared. It is important to emphasise that the panel had adopted the recommendations of the CRC in relation to awarding due recognition to the implications of segregation for planning generally.

8.2.8 1998: An integrated transport policy for the UK and Northern Ireland – The new rhetoric and current realities

The much heralded and long delayed Integrated Transport Policy for the United Kingdom was published on 21 July 1998. Northern Ireland signed up to the principles of the new policy as set out in the Green Paper last year. 'The Way Forward', had already committed the Province to many of these principles, notably integrated public transport and integration of land use and transport planning, both intended to underpin the goals of sustainable development through reduced dependency on the private car.

Progress on realising these goals locally has, by common consent, been slow. More recently, fundamental questions have emerged about the coherence of policy with the announcements of major new road developments totalling some £100 million coming in the wake of decisions to permit additional large scale retail development on the edge of Belfast.

The Government has committed itself to promoting a strong economy, a sustainable environment and an inclusive society. It fully recognises the role of transport and communications generally in facilitating these goals. It is seeking to further these goals through a transport policy which will promote:

- economic development;
- the environment;
- the needs of rural and urban dwellers;
- the potential offered by integrating land use and transport;
- social inclusion; access to opportunities for all sections of society;
- effective use of existing transport systems;
- safety;
- awareness of the consequences of transport-related actions and behaviour;
- the securing of additional revenue to meet transport objectives.

The development of an integrated transport policy for the United Kingdom reflects the Government's manifesto commitments and the belief that transport is central to a range of economic, social and environmental challenges. Despite the prospect which technological advance offers for a true information-based society there is as yet no proven mechanism by which society's aspirations for increased prosperity can be uncoupled from its desire for more frequent and more extensive movement.

8.3 Policy Actions

The White Paper is ambitious in attempting to cover a wide range of issues and proposed policy initiatives. This reflects the highly complex nature of the transport problem. It contains a wide variety of proposals encompassing regulation and control, investment, restraint of private car and securing the interests of the motorists in relation to levels of service provided by agencies and companies, technology, environmental and planning measures, as well as delegation of authority in relation to pricing and revenue collection for infrastructure use.

The extent to which the objectives and actions contained in the White Paper are mutually consistent raises issues of the relative priorities which society considers to be attributable, for instance, for economic development and environmental sustainability. Given that policy initiatives have so far failed to enable society to uncouple economic prosperity from rising demand for transport, trade-offs must inevitably be addressed in relation to economic prosperity and environmental objectives. Moreover, these priorities will differ not only between urban and rural areas but also for different parts of the UK. For instance, employment

creation concerns in Scotland and Northern Ireland may tend to give regional economic development priority over environmental concerns, while the capacity of the South East of England to absorb, more housing and economic activity will tend to weight arguments there in favour of the environmental benefits to be realised from car restraint and the potential impact on the viability of town centres.

Significantly, the population of Northern Ireland do not perceive transport-related environment problems as being as serious as their counterparts in Great Britain. Moreover, survey evidence indicates less support for improving public transport than the rest of the UK, much greater dependency on the car but perhaps somewhat surprisingly little difference in acceptability of traffic restraint measures.

At a national level the impacts of current trends have been significant in terms of land use, particularly coming in the wake of, or acting as a catalyst for, conversion of former rural land use. Air pollution is a growing problem and is perceived to contribute to the rising incidence of respiratory illnesses and other diseases. Transport emissions are closely identified with the challenge posed by climate change and are likely to be the least tractable in meeting emissions targets under the Kyoto agreement.

Transport and land use trends and developments have contributed to social exclusion through the rundown of major sections of the public transport on which many women, the elderly, the young and poorer sections of society are dependent.

Transport and the location of activities are mutually dependent. The structure of the city, for instance, tends to be governed by the geography of its location, the planning regime and dynamic factors, often unique to the city, but above all the relative accessibility afforded to locations within the city and outside.

The transport system is vital not only to the functioning of cities on a daily basis but also their long term development and prosperity, particularly where substantial competing centres of commercial activity are planned or new housing proposed. Businesses and people locate themselves in terms of work or business or where they choose to live with reference to relative accessibility of various locations to varying degrees. The effect of reductions in transport costs is to promote dispersal.

Against this backdrop it is not unexpected to find a continued decline in the overall markets held by public transport in Northern Ireland. Even in the Belfast city region, where the potential for achieving behavioural change is greatest, the portents are not optimistic. It should be noted that both at elections and in relation to voluntary organisations, the Northern Ireland consciousness of and support for campaigns to address environmental problems is much less well developed than elsewhere in the UK. Thus it could be argued that it is not unexpected to find limited progress is advancing the principles set out in *The Way Forward*, nor in contrast given the well organised business lobby with its concerns on immediate economic growth, the positive reaction by the authorities to calls from that quarter for extensive new road development.

8.4 Conclusions

To sum up, the transportation strategy pursued in Belfast has been, with one or two hiccoughs, one based on accommodating increased use of the private car. The original BUA Plan, of which the transportation strategy represents an important element, recognised that it was necessary to disperse at least some activities from the city's core to permit relatively unrestrained use of the private car. This limited policy of dispersal was greatly reinforced by the bombing campaign of the 1970s which was particularly concentrated on the city centre. The net result was a massive relocation of shops, offices and light industries to the suburbs and a significantly less important city centre in terms of employment, shopping and entertainment facilities. While the 1990s has witnessed some movement in the fortunes of the

city centre and population loss from the inner city has been stemmed and even reversed in a few locations the pressure for dispersal remains strong.

Throughout “the Troubles”, the transport companies have operated in a very difficult environment. Eleven staff have been killed on duty, and many more injured. Some 1200 buses were destroyed beyond economic repair and, in its worst year, the Belfast-Dublin railway line was out of operation for 180 days.

9. TRANSPORT PLANNING AND CONFLICT: LIVING WITH THE PROBLEM

In order to provide an overall assessment of the effect of the period of civil unrest on policy developments outcome and behaviour, it is important to place these developments in perspective. For the United Kingdom as a whole it is possible to discern a similar overall pattern in the evolution of Belfast's transportation strategy as elsewhere in the United Kingdom. However, it is important to qualify such a statement. Implementation of Belfast's transport strategy lagged significantly behind other cities in the United Kingdom from the beginning of the 1970s until the mid-1990s. In the main this can be attributed to the onset of "the Troubles". Delay or abandonment of agreed public transport measures produced a transport strategy in the late 1970s and early 1980s more oriented towards private transport than during the period prior to the 1975-77 review of transport strategy, and unparalleled elsewhere in the United Kingdom for its reliance on the motor car. This fuelled further decentralisation pressures further 'rounds' in the spiral of decline in public transport. A comparison with other medium size UK cities highlights in particular the generous provision of private car parking spaces.

In large part these demands for more road space and car parks have been fuelled by the dramatic decline in the fortunes of the public transport system. Belfast's public transport system is characterised by an extremely efficient (in financial terms) bus service, especially allowing for the extremely difficult problems faced by the operator. While the city's bus undertaking can boast extremely low operating costs and negligible revenue support, the potential user is faced with a low overall level and quality of service. Not unexpectedly, this, combined with the long term dampening effect of civil unrest on trip generation, results in Belfast having by far the lowest number of trips by bus per capita for any medium or large size city in the UK.

How much influence have "the Troubles" and the segregation they have reinforced had on transport developments in Belfast? In general terms they have:

- (a) significantly reduced the propensity to travel;
- (b) reduced the effectiveness with which public transport can serve the Belfast area as decentralisation of jobs, shops and homes proceeded a pace throughout the 1970s, the 1980s and until recently;
- (c) significantly increased the rate of decline in the use of public transport vis-à-vis private transport partly through the perceived higher level of safety which the private motor car is widely regarded as affording;
- (d) brought about severe financial and operating difficulties to the public transport operators forcing them into a policy of retrenchment.;
- (e) heightened the mobility 'gap' between households with and without access to cars.
- (f) provided conditions for the emergence of para-transit services on a large scale (widespread mobility deprivation).;
- (g) delayed the implementation of certain road schemes and the development of multi-storey car parks;
- (h) caused a switch from on-street to off-street car parking.

The response of government to the prevailing circumstances is evident in the development and implementation of various transport plans and policies. It can be seen that "the Troubles" have permeated all aspects of the urban transportation system - planning, analysis, supply, demand and operation. Up to the late 1970s the approach adopted was either been to assume an end to "the Troubles" in producing forecasts and evaluating options or to adopt a laissez-faire approach to the situation and simply react to events. More latterly little or no explicit

reference is made to this factor in transport plans even though discussion papers on wider planning issues in recent years do explicitly recognise the importance of segregation geography in influencing perceptions and activity patterns. “The Troubles” acted as a catalyst for the emergence of mobility deprivation and the widening of the mobility gap.

In Belfast important catalysts for change in the original transport strategy were the political and security problems involved in building roads through very volatile and unsettled inner city areas. The emergence of widespread mobility deprivation and an increasing mobility ‘gap’ following the onset of “the Troubles” exhibit a clear spatial pattern especially when related to access to private transport. The presence of competing ‘black taxi’ services on the most lucrative bus routes accounted for approximately 15% of the public transport is a response to these conditions. Conventional taxis also increased their importance in the total travel market. Taxis in general are more extensively used by disadvantaged groups in Belfast than equivalent cities elsewhere in the United Kingdom.

The research presented in this report provided for discussions with today’s senior government planners and transport operators with a view to establishing awareness of any potential impact strategic, policy or operational decisions might have on segregation and/or whether such decisions were taken in response to the tensions or violence linked to segregation. In relation to public transport operators it was the view of senior management that while having to respond to difficult conditions they had tried to maintain community-wide provision of services. The evidence available wholly endorses this claim. However, what is possibly of some significance is that there is little awareness of the potential non-neutral impacts that might arise from what would be seen quite reasonably as neutral decisions. On a more positive note, while some services had been sacrificed as a result of violence in Belfast in the early days of “the Troubles”, initiatives had been taken with a network of district centre-based Easibus accessible bus services to bridge sectarian divides, often in areas that have experienced the greatest levels of tension, violence and deprivation. These initiatives are to be commended from the perspective of promoting physical cross-community contact. A major problem, however, remains the perception of the so called black taxi services, which with their origins in highly segregated areas and their operations similarly so confined, and while providing good accessibility within strictly defined corridors and to/from the city centre, do little to promote wider levels of accessibility particularly across interfaces.

Among government planners recent years have seen an emerging awareness of the potential implications of planning decisions for segregation and cross-community contact. However, the apparently more indirect effect on segregation and contact attributable to transport policy, in particular, the strategy for roads is not something that transport planners have been aware of, at least a strategic level. This excludes more localised decisions where new roads have been used to create more defensible boundaries between communities at interfaces. One of the by-products of such schemes is to reduce the ability of public transport to integrate communities. In discussion, however, it was recognised that neutral decisions in this field of transport policy, and roads in particular, could have the potential undesirable consequences of facilitating segregation of communities, even if they did not set out to promote division. There is limited awareness, however, of the need to integrate transport policy measures with land use planning at both a strategic and development control level if the potentially beneficial synergies of both are to be harnessed in promoting greater community cohesion.

The response of land use and transport planners, and public transport operators to the challenges raised by segregation can be summarised under six headings:

The Planners Response - Strategic level

- Planners did not seek to promote segregation – however, dispersal policies, coupled with road development, have had the effect of reinforcing spatial separation and segregation.

- Planners were largely unaware of potential effect of their policies on the extent of segregation, in particular the reduced opportunities for the large numbers experiencing mobility deprivation in highly segregated areas.

Transport Policy – Strategic Response

- Executed policy, for most of the period, facilitated/encouraged population dispersal with associated implications for segregation and cross community contact.
- Community violence and segregation has reduced likelihood of market reform/privatisation.
- It has also promoted continued state owned monopoly.
- Government has presided over under-funding of public transport leading to reinforcement of classic spiral of decline.
- Underfunding of public transport has reduced the relative and absolute competitiveness of buses and trains.
- Ambivalent attitude to black taxis and failure to support public transport has encouraged part provision of public transport along sectarian lines and threatened continued city-wide network provision.

Planning - Land Use Planning

- Out of town retail developments which have been hitherto welcomed may tend to increase segregation for those without access to private transport and reduce access to employment opportunities.
- Greenfield site oriented housing development will tend to produce reinforcement of segregation by reducing potential for effective access by public transport. City centres and town centres are locations which either operate, or have the potential to operate, as shared space. The development of out of town facilities works against this producing a doughnut effect.

Transport/Planning - Operational Level

- Certain road scheme designs, by restricting access to residential areas in promoting principles of defensible space, have had effect of cutting off contact and reducing attractiveness of public transport due to lower ability of buses to penetrate such areas.
- Some high capacity roads play a role as barriers between communities.

The Transport Operators' Response

- Curtailment of services, while maintaining the network in response to long term market decline, significantly reinforced by long term violence, political uncertainty and underfunding by Government.
- Reduced propensity for innovation.

The Legacy

- Disruption of long established travel patterns making it difficult for public transport to respond to new conditions, created conditions for emergence of taxis as a vital mode for disadvantaged groups.
- Reduced propensity for travel in (non-car available) households .
- Unprecedented level of car dependency (by European Standards) of population and activities.
- Non-neutral impacts of neutral policy responses.

10. ADDRESSING THE LEGACY

10.1 Segregation, Contact and their Implications for Travel

10.1.1 Recognising the existence of the problem

Segregation is a product of and a response to inter-communal tension and violence. It does not of itself produce violence. However, once established, it exhibits a high degree of inertia reflected in the stability of the index between 1937 and 1961, a period of some twenty five years with little overt tension. Although this may have reflected the effect of the second world war on residential mobility and housing availability, it does suggest that even if the current period of little violence does extend to a genuine peace it will be many years before we can expect to see any significant fall in the current extremely high levels of segregation.

While segregation is a function of violence its current very high levels are not solely attributable to the extended period which the current Troubles have lasted. Unlike previous periods of violence, the period since the 1969 has been characterised by prior plans for population and activity centre dispersal (e.g. the 'Matthew Plan') and facilitated by a massive expansion in road capacity and rapidly rising levels of car ownership. Thus, notwithstanding the limitations in the data and the arbitrariness of spatial definitions, it can be argued that planning and transport planning/policy from the 1960s until the late 1980s has facilitated greater levels of spatial separation of the two main religious groupings. In particular this is evident in the movement of a disproportionate number of Protestants to the suburbs and beyond. This was clearly not an intended goal of policy. After 1969 it was possible for an increasing proportion for each of the two communities to place themselves at some distance from the other religions for the first time. This reflected increased car ownership and large scale improvements to the highway network.

A number of American sociologists have suggested that there is an inverse relationship between the degree of assimilation of two ethnic groups and the degree of residential segregation that exists between them (Lieberson 1961). Thus, increasing assimilation will be accompanied by decreasing segregation. Residential segregation between two ethnic groups is likely to indicate some significant degree of difference between them. Indeed, the physical separation of residence may contribute to and reinforce division.

Research has shown that sectarian division plays a part in how people relate to each other and to the services that are provided or needed. The communal divisions are seen to affect decisions people make about where they travel to. Segregation and the labelling of areas can make people feel 'comfortable' or 'safe' in one area and 'uncomfortable' or 'unsafe' in another. These feelings or perceptions can be coloured by the prevailing political climate, what is happening in the neighbourhood, by the time of year, or even whether it is day or night. The perceptions can also be different for people of different economic or social backgrounds, gender or age. This is reflected in their willingness to use the facilities and services provided. One result may be that people travel long distances to reach services if those located nearby are in territory which is perceived as potentially unsafe. Another result may be equality of opportunity implications for public access to the services.

The effect of segregation is to reduce contact between the two religious groupings. In his seminal work on the West Belfast Peaceline, Boal explained what would otherwise be seen as irrational activity/ behaviour patterns in relation to use of local shops and access to the public transport system, even at times of little overt tension. Boal identified the impact on movement and community activity as a key consequence of territory. Segregation in the use of services and facilities has been the norm in highly segregated parts of Northern Ireland. This is true both for urban and rural areas. For instance, in a study of County Armagh, research demonstrated that residents of a typical village with a Protestant majority, Glennane look to largely Protestant urban towns such as Armagh, Markethill and Portadown for comparison

goods, convenience goods and services. The researchers noted that more people go to Markethill for these goods than Newry despite the latter's more dominant hierarchical settlement status offering a wider number, range and quality of services than Markethill which, while three miles closer, is smaller order settlement in the sub-region. Among the residents of Whitecross, a village with a Catholic majority, the population is drawn South to the mainly Catholic towns of Newry, Keady and even across the Border to Dundalk.

In a study of the Ardoyne /North Ardoyne areas of North Belfast around 70% of respondents in both study areas had previously worked in places peopled by the other religion (Table 10.1). However, only around 1 in 3 presently do so. This decline in the numbers working in either mixed or workplaces dominated by the opposite religion may signify how the impact of fear and intimidation and 'chill factors' presently operate. It could be postulated that people are tending to locate workplaces which are safe, more so than was the case previously. However, the supposition could also be made that the decline of traditional industries, such as textiles, and the rise in unemployment over the past three decades has also provided fewer opportunities to gain work and thus engage with mixed workplaces.

Table 10.1 Fear, Workplace Domination and Travel

	Ardoyne	Upper Ardoyne
Is Your Job Seeking Influenced by Fear?	68.0%	37.5%
Do You Work in a placed Dominated by the Other Religion?	36.7%	34.1%
Have You Worked in a Place Dominated by the Other Religion?	74.1%	72.1%
Would You Work in a Place Peopled by the Other Religion?	68.8%	75.6%
Would you Travel to Work Through Areas Peopled by the Opposite Religion?	59.2%	75.0%

Source: Mapping the Spaces of Fear Team (1999)

A particular problem in the search for work is the issue of travelling to work through areas of the opposite religion. 40.8% of respondents from Ardoyne compared to 25% in Upper Ardoyne would not undertake such a journey. This would suggest that for many individuals from Ardoyne the capacity to seek work is further impeded by a wider sense of fear based upon an extensive geographical notion of besiegment. Given the complex ethnic geography of North Belfast it is apparent that travelling out of Ardoyne into the wider urban area is complicated by the incapacity to travel through areas dominated by the 'communal self'. Of course, for both communities travel is in many instances centred upon a mental map of safe and unsafe journeys. In relation to shopping very few people in the study areas shared sites at which both communities shopped.

Those who stated that they '*would not travel through areas dominated by the other religion*' for work were asked if they would undertake such journeys if they did not rely upon public transport. In relation to this supposition 75% of respondents from Ardoyne compared to 42% from Upper Ardoyne stated that even if they did not have to rely on public transport to get to work that they would still not undertake such journeys. Overall for work and shopping the main mode of transport is the car. However, the use of public taxis is more common within Ardoyne (20.5%) in relation to work. 35.8% of respondents in Upper Ardoyne compared to 6% in Ardoyne use buses in order to access work. It is evident that the bus routes which operate between the study areas are less often used by those in Ardoyne due not only the availability of public taxis but also due to the fears attached to using this mode of travel. The routes taken by buses tend to mean moving through areas dominated by the other religion more so than is the case for respondents from upper Ardoyne. Attacks upon individuals from Ardoyne on the bus routes in and out of the city centre appears to be an important variable in the use of public transport. Private taxi use is high within each community and is similar in relation to work and shopping. The private taxi companies used are not the same. In relation to walking a similar pattern was observed in relation to work and shopping.

Other, more recent, studies of other areas both in Belfast and elsewhere in Northern Ireland highlight the extraordinary lengths people, particularly young people, will go to avoid what they perceive as unfriendly territory even where this is simply a matter of metres or the choice of bus stop. Examples of the latter are reported from areas such as Ballynafeigh (Belfast) and Portadown. For instance, in a study on student intakes to the Upper Bann Institute in Portadown both parents and, to a lesser extent, potential students indicated fear over personal security associated with travel to and attendance at the college as significant deterrent to choosing it over more distant education facilities as reflected in the tables below.

Table 10.2 If your child has chosen not to attend the Upper Bann Institute, are you aware of the reasons for this choice?

Issues	Yes		No	
	No.	%	No.	%
It did not offer the course/subjects he/she wanted			14	100
Another school/college offered a better course	1	7.1	13	92.9
It was too far from home			14	100
None of their friends were going there	2	14.3	12	85.7
None of their family have been there	1	7.1	12	85.7
The school did not recommend it			14	100
The school discouraged it			14	100
My son/daughter was not interested in going there	3	21.4	11	78.6
The physical appearance discouraged me			14	100
It does not have a good reputation for results			14	100
I do not feel that my child would be safe travelling to it	3	21.4	11	78.6
I do not feel that my child would be safe attending it	3	21.4	11	78.6
My child does not intend to enter FE			14	100
My child wanted to begin working/attending a jobskills training provider			14	100
My child wanted to continue FE in a sec/grammar school	5	35.7	9	64.3
My child wanted to continue FE in a university			14	100

Table 10.3 What factors, if any, would be likely to encourage you of the merits of the Upper Bann Institute?

Factors	Yes		No	
	No.	%	No.	%
More information about the Institute	7	50	7	50
Knowing that my child would be safe encourage me	4	28.6	10	71.4
The entire reputation of the college would need to change	1	7.1	13	92.9
A safe route to the college would help	3	21.4	11	78.6
A regular bus service to and from the college might help	2	14.3	12	85.7
My child would need to want to go there	6	42.9	8	57.1
Nothing would encourage me to allow my child to go there	3	21.4	11	78.6

Table 10.4 If you have chosen not to attend the Upper Bann Institute what are the reasons for this?

Reasons	Catholic		Protestant		All Pupils	
	No.	%	No.	%	No.	%
It did not offer the course/subjects I wanted	15	6.3	17	7.1	34	14.2
Another school/college offered a better course	11	4.2	10	4.2	22	9.2
It was too far from home	6	2.5	4	1.7	10	4.2
None of the friends were going there	17	7.1	9	3.8	27	11.3
None of my family have been there	6	2.5	4	1.7	10	4.2
My school did not recommend it	1	0.4	2	0.8	3	1.3
My school discouraged it	1	0.4	3	1.3	5	2.1
My parents discouraged me	8	3.3	7	2.9	15	6.3
The physical appearance of the college discouraged me	7	2.9	8	3.3	16	6.7
It does not have a good reputation for results	3	1.3	9	3.8	13	5.4
I would not feel safe travelling to the college	15	6.3	2	0.8	17	7.1
I would not feel safe attending the college	18	7.5	2	0.8	20	8.3
I do not intend to enter into further education	9	3.8	7	2.9	17	7.1
I intend to start working or attending a jobskills training provider	16	6.7	12	5	28	11.7
I wanted to continue my further education in a secondary/grammar school	11	4.6	22	9.2	36	15.0
I wanted to continue my higher education at a University	3	1.3	8	3.3	11	4.6

Table 10.5 What factors, if any, would be likely you encourage you to attend the Upper Bann Institute?

Reasons	Catholic		Protestant		All Pupils	
	No.	%	No.	%	No.	%
More information about the institute	33	13.8	41	17.1	75	31.3
More of my friends attending the institute	19	7.9	32	13.3	52	21.7
A safe route to the institute	17	7.1	7	2.9	26	10.8
A regular bus service to and from the Institute	18	7.5	27	11.3	47	19.6
If the course I wanted was available there I would go	29	12.1	44	18.3	75	31.3
Knowing that I would be safe there would encourage me	25	10.4	5	2.1	30	12.5
The entire reputation of the Institute would need to change	11	4.6	14	5.8	2	0.8
Nothing would encourage me to go there	16	6.7	13	5.4	29	12.1
I intend to go directly from School to University	3	1.3	4	1.7	9	3.8

Source: Mentor (1998)

Such perceptions of safety/comfort can also be influenced by the design and quality of maintenance of the built environment, including the presence/absence of graffiti marking out a particular group's turf which is likely to vary by time of day. The perceptions of one's turf can

also be different for people of different economic or social backgrounds, gender or age. Such perceptions are probably at their most acute at interfaces between hostile communities. In the public imagination the 'interface' is invariably represented by a physical structure. However, more often the interface has no such physical presence, yet it exists nevertheless. Demarcation lines which might be totally invisible to the passing stranger, can be very real in the minds of local young people. As the violence has had a greater impact on males rather than females – nine out of ten of the total victims of the conflict are male (Cost of "the Troubles" survey) – men, particularly young men, are more affected by segregation than women or older men. In-depth research in parts of Belfast, for instance, has demonstrated that such mental barriers place wide ranging physical and psychological restrictions on such population groups. Proof that these barriers, whether physical or psychological, are very real, was provided by the wide range of facilities and venues which young people listed as "off limits" to them. They include leisure centres, shops, amusement arcades, main roads, parks, public transport, and even parts of Belfast city centre.

10.1.2 The Contact Hypothesis

As territory becomes increasingly segregated and as communities become increasingly polarised, the need to address the issue of inter-community contact has added significance. The contact hypothesis offers some insight into how we might address such deep seated mistrust, fear and, often self-imposed, restrictions on access to opportunities. Originally the contact hypothesis offered the proposition that associations from a disliked group lead to growth of liking and respect for that group (Cook 1978). Developing this simplistic analysis Allport (1979) emphasised the **nature of contact** and concluded that the outcome of contact would be favourable when participants were of equal status, pursuing common goals and backed by social and institutional support (Allport, p.281).

Segregation and low levels of inter-community contact has important consequences in terms of travel and trip making. This is reflected in the flows of people between areas compared to what might be expected given the distance, cost and travel time involved. There can also be cost implications for the organisation in the delivery of services such as public transport. It may be that service is provided in a segregated fashion resulting in duplication and additional running costs, or that the service is not being used by a particular section of the community.

Despite the physical and psychological impact of the Peace Line, this does not mean that there is little or no contact or interaction. In total, 28.2% of respondents had friends or relatives on opposite side of the peace fence. Most had between 1 and 6 (18%) friends or relatives and of these 27% visited each other once a week or more. A total of 38% never visited their friends or relatives on the opposite side of the peace line.

Table 10.6 Impact on the Peace Line on movement to services and facilities

Problem	Suffolk		Ardoyne		S. Sd		Total
	P	C	P	C	P	C	
Daily Shop	3.5	6	7.7	5.1	0.4	12.5	5.7
Week Shop	3.5	3.7	1.7	5.1	1.1	13.3	4.6
Entertainment	5.8	0	0	4.3	0.7	5.0	1.9
Visit Friends	4.6	0.8	0.9	5.1	0.7	1.7	2.0
Health Facilities	3.5	0.8	0	2.9	0.7	5.8	1.9
Play areas	1.2	0.8	0	10.9	0	1.7	2.9
Public transport	2.3	0	0.9	2.2	0	3.3	1.0
Schools	2.3	0.8	0	0.7	0	1.7	1.7

Base: Population describing each element as a **major** problem

Table 10.7 Frequency of contact across the peace fence

Problem	Suffolk	Suffolk	Ardoyne	Ardoyne	S. Sd	S. Sd	Total
	P	C	P	C	P	C	
Day	2.4	3.7	2.8	2	0	2	2.3
Week	19.1	14.9	16.7	16	13.1	21.6	16.6
Fortnight	2.4	14.9	0	6	7.9	0	6.9
Monthly	4.9	17.8	13.9	16	7.9	5.9	12.6
Six Months	9.7	11.2	16.7	12	5.2	7.8	10.4
Less Frequent	7.3	3.7	8.3	16	13.1	21.6	11.8
Never	51.7	29.9	41.7	32	52.8	41.2	38.1
Refused	2.4	3.7	0	0	0	0	1.2
Total %:	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Number:	559	1840	544	1770	897	1117	6726

Base: Weighted base for all those in contact across the peace fence (N=6726)

Source: Murtagh, B. (1994)

10.1.3 Contact at a Strategic Level

At a strategic level the extent of any dampening of contact attributable to segregation, as well as other effects, can be traced through the investigation of trip distribution models. While a variety of techniques are available the most relevant in terms of a study of segregation effects is probably the gravity model based approach. Under this trips between two locations are projected to increase in proportion to size of the origin for trip makers and the attractiveness of the destination, and fall as distance, cost and or travel time rise. The same is true for trip makers emanating from the destination end.

A fundamental aspect of developing such a model is an attempt to reproduce existing travel patterns. The models employed assume a similar relationship between trip propensity, origin and destination characteristics and travel cost/time applies throughout the study area. In the process of validation such a model will therefore tend to over predict trip making where barriers, physical or perceived lower that propensity, even if the transport network suggests otherwise. In modelling, such deviations are addressed by the use of what are known as “K factors”. These are applied selectively in an attempt to reproduce, observed travel behaviour. Used in a different way these can act as an indicator of the effect of factors such as segregation on the level of contact.

It is important to emphasise, however, that the relationship underlying the gravity model will reflect overall trip movement propensity for the entire study area, including movements between areas exhibiting high levels of segregation of the other religions. In addition, the quality of transport infrastructure between two areas with highly segregated populations of the two religious groups may have been reduced or simply not developed to a level that might otherwise be expected. Thus the “K factors” will tend to under-predict the dampening effect generated by high levels of segregation, particularly where this is a common feature of the entire study area. Nevertheless, they do provide a useful pointer to the most extreme levels of low trip propensity between the two communities.

In the case of Northern Ireland only for Belfast is such information readily available. Models of this type were developed to inform the formulation of the BUA Plan 2001. Specifically this involved calibration of models of the two-person type gravity distribution model form:

$$T_{ij}^n = G_i^n A_j g_i^n a_j \exp(-\beta^n C_{ij}^n)$$

Where n = person type, i.e., whether a person is a member of a household with a ‘car available’ or ‘no car available’

$$\begin{aligned}
 T_{ij}^n &= \text{trips generated in zone } i \text{ and attracted to zone } j \text{ by person type } ^n \\
 G_i^n &= \text{trips generated in zone } i \text{ by person type } ^n \\
 A_j &= \text{trips attracted to zone } j \\
 C_{ij}^n &= \text{generalised cost of travel from zone } i \text{ to zone } j \text{ by person type } ^n, \\
 &= \text{expressed in equivalent minutes} \\
 g_i^n, a_j &= \text{the balancing factors to achieve the doubly constrained model:}
 \end{aligned}$$

$$\sum_j T_{ij}^n = G_i^n \sum_i \sum_n T_{ij}^n = A_j$$

and β^n = the model calibration coefficients to achieve the required trip cost distribution fit to surveyed results (also known as deterrence function coefficients)

This type of model was calibrated for Home Based Work (HBW), Home Based Other (HBO) and Non Home Based (NHB) trip purposes. For the Home Based Education (HBEd) trips education patterns are relatively constrained by school catchment area policy and it was concluded that the Furness matrix expansion technique was the more appropriate tool for forecast year distribution.

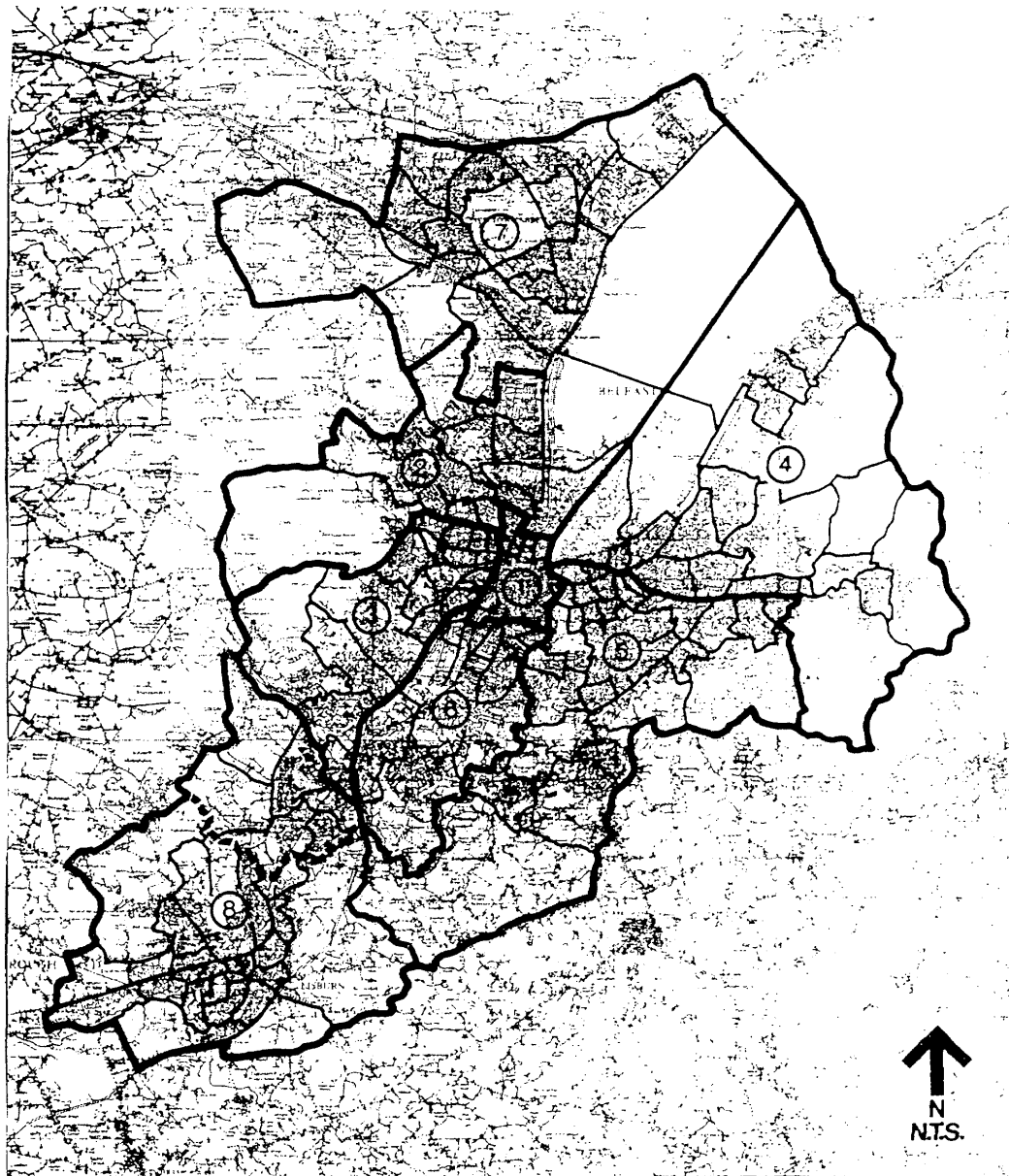
The use of the “K factors” in the calibration of the distribution models permits a degree of comparison between observed and synthetic sector-to-sector flows that would either not be possible with a model of this type, or would require the introduction of several different deterrence functions for each person type and for different areas of the matrix. Advancing the goal of a good validation against the sector-to-sector flows provided a further justification for the use of “K factors” in a Belfast context . It was appreciated that the economic and cultural situation had led to a pattern of movements in which some area-to-area movements are favoured and others of similar distance are minimal. “K factors” may be used to reflect such behaviour, where otherwise complex and time consuming modelling work would be required.

The “K factors” introduced to improve the sector-to-sector validation of the model are seldom greater than 2.0 or less than 0.5, and it is of note that the same cells of the sector matrix often require “K factors” for each of the three journey purposes, e.g., car available trips attracted to sector 8 (Lisburn) from other internal sectors. It is apparent from this analysis that segregation in addition to other factors, does affect the level of contact between communities. The case study evidence both confirms and enriches the strategic findings for the BUA as revealed from the trip distribution model.

The implications of constraints on physical contact as well as the psychological barriers on what would otherwise be accessible opportunities for transport supply could well be significant. The protracted period of “the Troubles” has resulted in an unparalleled decline in the level of service offered by public transport, particularly in Belfast, while the expansion of highway capacity has, at the very least, facilitated increased spatial segregation between the two main communities. It might be hypothesised that this response to the prevailing political, social and security considerations could have significant implications in terms of equality of opportunity in potential access a range of employment, commercial, shopping and social/recreational opportunities. The constraints on this phase of the research prevent execution of a purpose-designed primary data collection effort and supporting analysis. However, in addition to the localised case study evidence previously referred to, some insights into the spatial variation in accessibility can be drawn from the trip distribution model described above. Specifically, the denominator of the gravity model approximates to a useful measure of accessibility to opportunities. These reflect not only physical ease of access but also the spatial distribution of attractors, including employment in primary, secondary and tertiary sectors and various surrogates for facilities such as shopping and recreation. It was, therefore, decided to draw up an hypothesis suggesting that differentials exist between

separate areas and districts with a more mixed religious balance in their access to such opportunities, this to be tested by assessing relative levels of accessibility as revealed by the trip distribution denominator term. It was possible to execute analysis only in relation to one of the trip distribution model variants, that focusing on employment, and then only in relation to accessibility for the population as a whole including those with and without private transport.

Figure 4 Belfast Traffic Analysis Zones



Source: BTSR Calibration Report

The tests were performed by first categorising wards into three types: those with less than or equal to 10% Catholic, those with less than or equal to 10% Protestant and the remainder representing districts with more than 10% from each religious grouping. Then via spatial analysis in association with a GIS framework of the Belfast Metropolitan Area attributing accessibility values to each of these wards based on estimates calculated for each of the traffic analysis zones defined for the transport model. The pattern of accessibility for each ward type was then reviewed and a range of statistical tests performed between the types to establish the existence of any statistically significant levels of accessibility enjoyed by each. The overall

results based on the analysis to date point to little difference between the three groups of wards. However, there is evidence that two sets of most segregated wards, while not demonstrating significant differences between each other, do tend to exhibit lower levels of accessibility than that enjoyed by the more mixed wards.

It is important to offer words of caution in interpreting these results. First they relate to the 1991 Census although the transport accessibility indicator reflects late 1990s conditions. Secondly, however, the findings reflect physical or potential accessibility in the main to employment opportunities by all modes. For more deprived groups it would be essential to investigate the constraints on their mobility, for instance, imposed by limited or no access to private car. Research led by the author of this report in association with other colleagues at Queen's University demonstrated that, for 1990 Conditions, all other things being equal, residents of peripheral housing estates in West Belfast without access to private cars had approximately 25% of the potential job opportunities available to their car owning neighbours within a 45 minute door-to-door travel time isochrone. A similar differential emerged for housing areas on the periphery of East Belfast with broadly similar levels of overall accessibility. Finally, these findings do not provide for inclusion of any fear factor in the minds of individuals or groups

Nevertheless, setting aside the fear factor, the findings do lend credence to Saunders' (1986) contention that society in the UK is undergoing re-stratification such that, consumption sector relations are a more powerful explanatory variable in explaining individual life chances than social class relations. He argues that there is a fundamental distinction between those who rely on the state for education, health, housing and transport and those who can consume these services privately. He suggests that housing is the key discriminating criteria. Pahl argues that, "the division between the more affluent home owning households is coming to be more significant than conventional divisions based on the manual/non manual distinction".

Consumption sector relations are becoming an increasingly important and relevant explanation of deprivation and this research does point to those in peripheral located public housing estates, whether they are Protestant or Catholic, who share much in common collectively, in terms of access to opportunities.

11. INTERIM CONCLUSIONS AND RECOMMENDATIONS

The findings reported here can only represent an initial assessment of the complex and pervasive effects of ethnicity on transport in a deeply divided community. Nevertheless, it is possible to draw together some strands with a view to informing the debate on what will undoubtedly be a very challenging problem. It is on the basis of this review, therefore, that we present some interim conclusions and recommendations.

First and foremost it is patently obvious that, while the problems raised by segregation for mobility and access to opportunities that many may take for granted are a major handicap for the more deprived sections of the Community living in the most segregated areas, awareness of this problem has only recently emerged among policy makers and some transport planners as a key issue, and then only among strategic level land use planners. Thus there is a need to raise awareness among transport planners and other actors contributing to policy within the administration. At an operational level, the public transport operators are aware of the issue. However, while a number of initiatives have been taken which in part seek to reduce segregation and alter travel patterns, these have been limited by a combination of background conditions and finance.

Moreover, transport planners, unlike many urban planners and academic researchers, appear unaware of the inefficiencies posed by such segregation in the supply of infrastructure and operation of transport services. For instance, it is now widely appreciated that community hubs containing local services and facilities often operate inefficiently due to the constraints imposed by territoriality on community movements and interaction. Boal's (1969) research on the Shankill-Falls Divide in Belfast was amongst the first to show how communities operate within their own territorial boundaries for shopping, use of services and communal and kinship interaction. In 1994 the Centre for Policy Research published a report entitled *Ethnic Space and the Challenge to Land Use Planning: A study of Belfast's Peace Line*. This research showed that communities living in interface areas typically experienced restricted access to facilities and services which were perceived as being located within the 'other community'. Moreover, while the implications of community relations for land use planning were increasingly appreciated at a strategic level, this did not translate to specific location decision making (Poole and Doherty, 1996). If the relevance of division and conflict for planning discussed at the strategic level is not translated into the operational detail and content of area plans, then policy initiatives to address the adverse consequences of such conditions will remain ineffective.

The same lesson can be applied to transport as the strategic implications of widespread and deeply entrenched patterns of segregation influence and shape the transport system and have particularly adverse consequences for public transport. As the research into the Ardoyne shows the result is duplication of services and inefficient routeings and lower levels of accessibility mainly for those without access to private cars. The financial effects on public transport have been felt not only in that area but across the city's bus system which depends for its effectiveness on widespread use of cross subsidy to ensure city-wide mobility. Moreover, the duplication of mobility requirements by reinforcing segregation also reinforces fear of the other community traversing unfriendly territory by increasing the self perception of visibility to potential protagonists.

In attempting to draw up strategies to address the undesirable consequences created by segregation as they relate to transport, mobility and access to opportunities it is vital that the consequences of policy or operational initiatives are fully understood before being implemented. A useful starting point draws on the concept of the audit borrowed from many commercial organisations and endorsed by organisations involved in promoting more harmonious community relations. Through this a profile of the organisation can be obtained. The organisation can gain a better appreciation of how it is seen by its customers/clients and by those potential customer/clients who do not make use of the service. In any such audit or

research there is a strong case for the inclusion of how the sectarian divisions in Northern Ireland affect perceptions of the organisations and the services it provides. In addition to looking at the organisation, an important part of any analysis is a profile of the area served, its needs, current services, desire of local people and the degree of segregation.

More specifically, a community relations audit of the area served could address all or some of the following:

- the religious composition of the area served and change in the population make-up over the past ten to twenty years;
- identification of areas seen as one Community's turf or those perceived as neutral;
- identification of any physical infrastructure barriers increasing the sense of division, particularly for young people and vulnerable sections of the population;
- assessment of the equality of access to services and facilities e.g. schools, employment/training, statutory services, advice and support, retail outlets, social/cultural activities;
- the actual and 'normalised' level of contact by activity type between people of differing backgrounds in specific areas and by demographic/socio economic category;
- the extent to which absence of infrastructure and services inhibits cross-community joint activities.

Fear and Travel

Surveys in a number of UK cities establish that around two thirds of women are afraid to go out at night alone. Significant numbers will not use public transport and are worried about city centre car parks (Atkins, 1989). In Bradford, a survey found that as many as 59 per cent of women avoided using any form of public transport at night (Local Transport Today, 1990). In Nottingham as many as 54 per cent of women interviewed on two low income housing estates said they never used buses after dark, and a further 30 per cent only used them rarely. Seventy-eight per cent reported feeling 'not at all safe' or 'not very safe' waiting at bus stops, and almost as many felt as insecure walking to the bus stop (Hiley, 1995).

Women take a variety of measures to avoid situations seen as dangerous: they avoid walking alone at night, or only go out if a safe return has been arranged in advance; they avoid unsafe areas like subways and back streets and waiting at bus stops. Fear of crime increases the use of cars and the demand for close-by parking (Citizens Crime Commission, 1985).

Surveys of young people reveal that most feel safe on public transport during the day but, in common with adults, their perceptions of personal security change after dark. In particular, girls and young women were much more likely to express their fears for personal security, especially after dark, including the walk to and from bus stops and rail stations. Waiting for buses was seen as a problem for many young women and girls, especially when they are waiting in unfamiliar areas or at stops which were dark and isolated. Information and reliability of services was seen as important for keeping waiting times to a minimum.

Public transport is not perceived by many young people as a friendly environment where they are welcomed and their custom valued. An important aspect of young people's experience on public transport which affects their perceptions of personal security is the attitude of adults, both other passengers and staff, towards them. However, young people identified that the presence of staff was an important issue for personal security, despite negative comments on their relationship with bus drivers. Young people also identified that the greater numbers of people travelling could make a positive contribution towards their perception of personal security. However, the presence of undesirable or threatening people had a strong impact on perceptions of personal security.

Passengers need to feel safe on each part of the journey: on vehicle, waiting, changing between modes of transport, and walking to and from the stop or station. Transport operators need to consider improvement of each of these stages – to focus on one at the expense of the other is unlikely to meet the passenger’s need for personal security along the ‘ whole journey’.

The work of Jane Jacobs in *‘The Death and Life of Great American Cities’* and Oscar Newman’s – *‘Defensible Space: People and Design in the Violent City’* are still relevant in gaining an understanding of the fear factor and travel behaviour and as basis for developing strategies to address this huge challenge to policy makers and transport operators. Jacobs made important and plausible observations about crime in urban areas and about public space. The urban dimension is important as Jacobs recognised the inevitability of strangers. She saw anonymity as one of the attractions of cities. A feeling of safety was, however, one of the fundamental requirements of successful urban areas: ‘The bedrock of a successful city district is that a person must feel personally safe and secure on the street among all these strangers. (Jacobs, 1961, p 40).

Jacobs identified three particular themes: territoriality; surveillance and social controls; and the presence of people. She argues that a city street equipped to handle strangers and which makes the presence of these strangers a safety asset.

Oscar Newman (1973) provides a more formal framework for Jacobs’ ideas in his construct of “defensible space”. Newman conducted an empirical survey of the locations of crimes in housing projects in new York to try to identify the relationship between physical design and crime. The resulting book, *Defensible Space; People and Design in the Violent City* (1973), puts forward an alternative for restructuring urban environments, based on his interpretation of Robert Ardrey’s territoriality: “so that they can again become liveable and controlled, not by police but by a community of people, sharing a common terrain.”

Safety Audits

An audit of present conditions across a number of indicators could inform development of a strategy to improve individual perception of personal safety. An audit can also help you see the unforeseen consequences of some design features that looked good at the planning stage but present problems in reality. For example, in relation to bus and rail stations the positioning of the telephones may force users to have their backs to other people, and the toilets may be discreetly tucked away so that those using them feel isolated and vulnerable.

Toronto set up a special action committee on safety of the public transport system following its adoption of Municipal Strategies for Preventing Public Violence Against Women in 1988 (City of Toronto, 1988) which pioneered the use of safety audits and the participation of women’s groups in identifying unsafe places (Table 4.2). The idea has been taken up by groups in other countries – for example, in Nottingham STRIDE, a pressure group for safer travel for women, has produced a manual for local organisations and a guide to safety audits on transport in Nottingham (STRIDE, 1995).

A package of measures

No single measure stands out as meeting all those needs. It is a package of measures, tailored to local circumstances, that will help people to feel that the operator is taking all practicable steps to ensure their personal security. It is possible to draw on best practice in addressing issues of personal security in tackling the challenges posed by highly segregated communities.

Creating a busy environment

Feelings of isolation contribute to feelings of insecurity. It is especially important to create a busy environment during off-peak hours, when it is most difficult to achieve. It is worthwhile for operators to consider the possible benefits in having visible staff present at such times in

terms of providing reassurance to passengers and deterring those who might otherwise misuse the facility (eg those engaged in graffiti and vandalism).

Passenger perceptions that an environment is busy in off-peak hours can be created through reducing the space, for example by reducing the number of carriages on a train, limiting the number of bays in use at a bus station, or closing certain exits at a rail or bus station.

Ticketing schemes which make it cheaper to travel in pairs (such as 'two for the price of one') may encourage some people – especially women – to use public transport rather than go by car or taxi.

Creating a controlled environment

Revenue control is one means of excluding from the system those people who are using it other than for travel. Some revenue control initiatives may also affect crime levels, such as vandalism.

Control of the environment is signalled by clear boundaries, maintenance and cleanliness. Control of people is signalled by the capacity of staff to manage difficult situations. Personal control for the passenger is facilitated if there is information which allows them to plan their journey in advance, find their way along the route, including interchanges and helps them to orientate themselves in relation to the wider environment.

The Secure Stations Scheme

The Secure Stations Scheme in Great Britain recognises that crime and fear of crime can be addressed through physical design measures such as surveillance, lighting and landscaping, but that management practices which give priority to preventing crime and providing a reassuring environment will be crucial to ensuring that a station is – and remains – secure.

Measures to Address Concerns about Young People and Public Transport

Most transport operators recognise the impact that young people have on their business, both as an important market and as the cause of some of their problems. Transport and related organisations have identified many initiatives addressing issues relating to young people and public transport, including raising awareness of public transport issues and personal security.

The most popular means of *raising awareness* is through making visits to schools and youth clubs and arranging visits by young people to transport depots and infrastructure. Awareness can be raised by involving young people themselves in local action related to use of public transport. Campaigns which *promote public transport* amongst young people do not tend to refer specifically to issues of personal security, but there are some that do. The most common means of *encouraging responsible behaviour* is through Junior Citizen or Crucial Crew, which involves primary school children in participative learning. Some PTEs and operators have started to use detached youth workers to engage with the young people who are presenting most problems for them, in order to establish a relationship with them and offer *diversionary activity* which will draw them away from the transport network and provide alternative, more positive, activities.

Notwithstanding this review it is also clear that there is dearth of quantifiable spatially disaggregate data and other information on which any fully costed policy initiatives must rely to ensure cost effectiveness. Recent research in the United States on the issue of race and transportation, based on nation-wide household/individual surveys, is revealing very considerable variations in mobility and access to jobs among the various ethnic groups in that country. Some rather surprising insights are emerging given the typical stereotype view of life in the United States. The key finding, however, is the reliance on the private car to ensure equitable access to opportunities and the requirement for innovative thinking to overcome inequities where those exist. Our recommendations for research and data collection, therefore, envisage regularly collected data on travel behaviour and related attitudes by community for

areas exhibiting varying levels of segregation and socio-economic mix, along the lines of US current practice. A useful starting point would be the 2001 Census. The Northern Ireland Travel survey to be based on National Travel Survey (GB) could be usefully enhanced to include similar questions thereby giving a more frequent and reliable insight into changes over time in segregation, transport and travel.

Complementary research could build on the outline proposals set out above to gauge more accurate and comprehensive insight into the effect of policy initiatives designed to boost cross community contact and, in particular, greater equity in access to opportunities particularly among the young and other vulnerable and disadvantaged members of society. Accurate assessments in accessibility on a spatial basis could be facilitated by latest advances in Geographical Information Systems and spatial analysis techniques.

Our proposals also recommend informing local decision makers by reference to similar research conducted elsewhere, particularly in the US, in relation to the effect of racial segregation and ethnicity on mobility and accessibility.

The research set out to establish benchmarks for transport provision and travel behaviour which might reasonably be anticipated under normalised conditions. A review of conditions elsewhere in the UK and further afield indicates that we could expect at least a doubling in the level of public transport service and more than twice the use of public transport in the Greater Belfast Area compared to current conditions. Differentials in that figure are to be expected across the city region while details for specific areas of particular interest to this research must await further research. Nevertheless, the benefits to be gained in terms of access to opportunities can be readily illustrated by research led by the author and commissioned by Government in 1990 and reported in the findings of the *Alternative Urban Transport Technologies for the Belfast Metropolitan Area* study, 1992. This argued for the city to be tied together by a four line high quality public transport system explicitly linking East (2 lines) and West Belfast via the city centre as well as a link to South Belfast feeding the already well served Northern corridor. A critical argument in support of these proposal was to reduce inequities in access to jobs revealed by the research suggesting that a non-car owning household/person in a peripheral housing estate in outer west or indeed parts of East Belfast would have 25% of the job opportunities available to a neighbour with access to private transport.

The essence of that work remains valid today even if the failure to address the issues raised by its findings represent an even greater challenge today, given the further decline in the level of service offered and market share held by public transport in the Belfast Metropolitan Area in the intervening period. A citywide network of CityExpress type bus services to a higher standard than currently offered by two routes currently operated could yield some of the benefits offered by the AUTT proposals.

The Easibus schemes which now exist throughout much of Northern Ireland were conceived with mobility disadvantaged people in mind. Nevertheless, in some cases, these offer potential across well known interfaces, particularly in West Belfast. There is merit in monitoring existing schemes with a view to establishing the extent to which, if any, these have promoted physical contact across such boundaries with a view to expanding such operations. Similarly, research should be undertaken into the fear factor associated with other routes traversing interface areas as well as eliciting likely response to a range of initiatives of the type tabled in this report.

We would, however, counsel against a big breakthrough in the short term, certainly in the absence of major pump-priming given the legacy of more than quarter of a century of violence and mistrust. At an operational level, mobility deprivation experienced among many young people from deprived backgrounds and areas can only serve to reinforce the self imposed constraints on mobility referred to above. An opportunity exists for public transport through imaginative design, fare and ticketing systems, not only to boost revenue but contribute to addressing this challenge allied to an effective and comprehensive upgrading of passenger

information. Consideration should be given to drawing the funding required, not only from public funds, but also from employers benefiting from relocation to “green field” sites and other less accessible locations.

Finally, we suggest that, in assessing planning proposals for new developments, government and the appeals bodies should explicitly consider the implications arising from proposals for segregation linked to accessibility and mobility. If these are found to produce non-neutral impacts they should require the developer to finance offsetting measures to redress any inequities created.

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