

Norwich Area Transportation Strategy (NATS) Review



Transport Related Problems and Issues



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Executive Summary

Introduction

This report summarises:

- the characteristics of the Norwich Area;
- existing and predicted future travel patterns; and
- transport problems and issues in the Norwich area.

The work was compiled by Norfolk County Council in partnership with Norwich City Council, Broadland District Council and South Norfolk District Council. Extensive use has been made of previous consultations carried out in the Norwich Area. The work was largely completed between August 2002 and December 2002.

In February 2003, a consultation on Problems and Issues was held in Norwich. For this, a report “Summary of Transport Related Problems and Issues – Consultation report” was produced. A report of the outcomes of the consultation has also been produced.

This report was finalised following the consultation event, with the addition of comments arising from it.

Main Problems and Issues

Work is being done to address many of the Problems and Issues in the Norwich Area. The new transportation strategy will need to continue to tackle the issues summarised in this report, including:

- addressing the aspects of transport provision that people have rated poorly – bus services, the bus station, quantity of car and cycle parking, cycle routes and safety in the city centre after dark;
- making it easier to travel in and around the area;
- allowing people – especially people who are poor, from deprived areas or don’t have the use of a car – to access places like work, shops and medical facilities;
- reducing traffic congestion;
- minimising people’s fears about travelling;
- reducing accidents and noise and air pollution;
- reducing traffic problems in areas where people live;
- catering for the economic growth aspirations of the area, and in particular expansion of Norwich International Airport and the Norwich Research Park;
- identifying transport solutions for the increasing population, and social trends such as a move towards smaller household sizes;
- addressing the impact of traffic on minor roads and residential streets around the north of Norwich;
- addressing air quality issues within the city centre; and
- increasing travel choice and providing options for ways in which people can travel.

Next Steps

This work will be used in the next stage of the NATS Review: identifying a range of possible strategies that will address the problems and issues and meet the agreed Aims and Objectives. Consultation on possible strategies will take place during autumn 2003. A final transportation strategy for the Norwich Area will then be adopted and implemented.

Chapter 1 Introduction

Introduction

1.1. Norwich is an important focus in the county for a range of services as well as the administrative and operational headquarters for a number of commercial and other organisations. It is a city of considerable historic importance and the city centre, in particular, retains many historic features. It has an extensive catchment area in Norfolk and north-east Suffolk.

1.2. Transport plays an important part in allowing the Norwich Area to fulfil its potential. But it can also cause problems – such as traffic congestion or environmental impacts. A transportation strategy is an important tool in making sure that transport can bring the maximum benefits to the area and ensuring that any problems are minimised.

1.3. The current Norwich Area Transportation Strategy (NATS3) was adopted in 1997. This strategy reviewed and amended the previous version in the light of the then current transport policy. A number of significant issues have been identified since the adoption of NATS3 that pointed to a need for a review of the strategy. The review was put underway in March 2002.

1.4. The study area includes the city of Norwich, its suburbs and the first ring of surrounding villages. This is shown on the plan on the inside of the back cover. It is an area approximately 22km by 18km and includes the Norwich City Council administration area and parts of the Districts of South Norfolk and Broadland.

1.5. This report summarises

- the characteristics of the Norwich Area;
- existing and predicted future travel patterns; and
- transport problems and issues in the Norwich area.

How this report has been compiled

1.6. This report has been put together by Norfolk County Council in partnership with Norwich City Council, Broadland District Council and South Norfolk District Council. Extensive use has been made of previous consultations carried out in the Norwich Area. In particular, these include:

- Consultation on the South West Sector Strategy (Norfolk County Council July 2001);
- Quantitative Research for Norfolk's Local Transport Plan (MAP Research for Norfolk County Council, June 2000);
- Norwich City Centre Transport Survey (MAP Research for Norfolk County Council, October 1999);
- Review of the Norfolk Structure Plan (Norfolk County Council, 1998);
- Consultation for Norfolk's Local Transport Plan and Annual Progress Reports (Norfolk County Council 200, 2001 and 2002).

1.7. Additionally, use has been made of the literature produced from previous reviews of the NATS Strategy (Norfolk County Council, 1974, 1990 and 1997).

Format of this report

1.8. This report contains the following Chapters and Sections:

- Chapter 2 Characteristics of the Norwich Area. This chapter sets out the area's character, including details of its people, landscape and townscape, its economy and the transport network.
- Chapter 3 Existing and Forecast Travel Patterns. This chapter summarises the progress made against targets in the existing NATS strategy and looks forward to how these trends may change in the future.
- Chapter 4 Problems and Issues. Problems and Issues have been grouped into four themes for the purposes of this report: Impacts from motorised Traffic, Issues for Other Modes, Social Inclusion and the Economy.

Chapter 2: Characteristics of the Norwich Area

Introduction

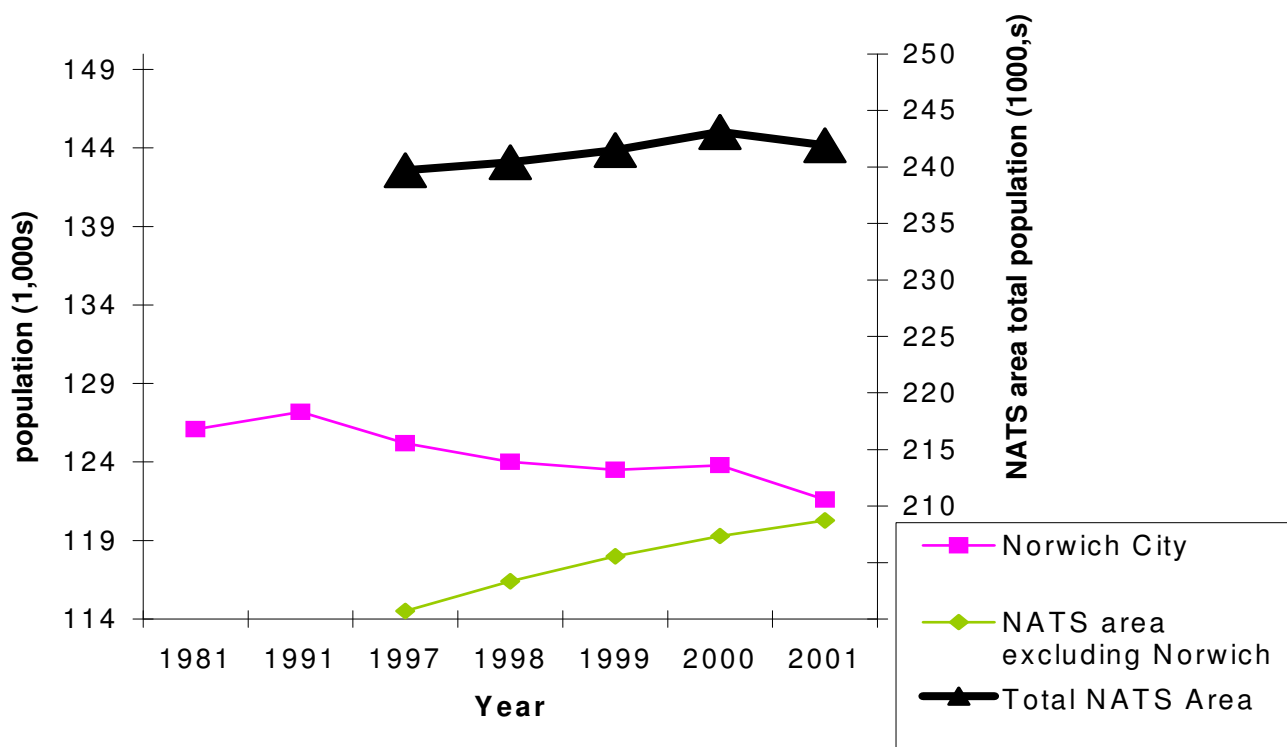
2.1. The NATS study area includes the city of Norwich, its suburbs and the first ring of surrounding villages. This is shown on Plan No 1. It is an area approximately 22km by 18km and includes the Norwich City Council administration area and parts of the Districts of South Norfolk and Broadland.

2.2. Norwich has an extensive catchment area in Norfolk and north-east Suffolk. As regional capital, the city fulfils an important function in the County providing for a range of services as well as being the administrative and operational headquarters for a number of commercial and other organisations. It is a city of considerable historic importance and the city centre, in particular, retains many historic features.

Social Characteristics of the Population

2.3. The population of the NATS Area was approximately 243,000 in 2000. Figure 2.1, below, shows that whilst the population within Norwich City has been falling in recent years, that of the NATS area as a whole is rising. The populations of Norwich City and that of the rest of the NATS area are now about the same.

Figure 2.1: Population in the study area



2.4. 55,000 people (almost one quarter of the total population) are aged over 60. A similar number are 19 years or younger (2001 Health Authority

ward population estimates). Results of the 2001 Census show that Norwich City has more than the average number of 20 to 30 year-olds. The other age groups have a similar profile to the national average.

2.5. The unemployment rate in Norwich is 7.8% (Source: Office for National Statistics).

2.6. Between 1993 and 2000, 33% of Norfolk's new houses were built in the Norwich Policy Area (NPA). (The NPA is the same as the NATS area, but also includes Wymondham and Long Stratton.) Housing completions have averaged 1,120 per year in recent years. In 1999 there were approximately 107,000 dwellings in the NATS area. The table below shows wards with increases between 1997 and 2000.

Table 2.1 Increases in Dwellings in NATS area 1997 to 2000

Ward	Increase in dwellings
Norwich City	500
Thorpe	644
Drayton	181
Horsford	254
Rackheath	148
Sprowston	164
Taverham	604

2.7. Within the NATS there are around 95,000 households in total. Table 2.2 illustrates the household characteristics.

Table 2.2: Household characteristics (Source: 1991 census)

Table 2121 Household characteristics (Source: 1991 Census)				
Household sizes				
1 person	2 person	3 persons	4 or more persons	
27%	37%	15%	20%	
Household types				
Households with children aged 0-15	Lone 'parent' with children aged 0-15	Households consisting of pensioners only	One pensioner living alone	Other
25%	3%	27%	15%	30%
Tenure (excludes non-permanent accommodation)				
Owner-occupied	Rented privately	Rented with a job or business	Rented from a housing association	Rented from a local authority
63%	8%	2%	4%	23%

Table 2.3: Car Ownership in NATS Area. Source: 1991 Census LBS, ONS Crown Copyright

	NATS Area (1991)	National (1998-2000)
No car	30%	28%
1 car	49%	45%
2 or more cars	22%	26%

Table 2.4: Journey to work (Source: Census 1991, total employees and self employed 10% sample)

Distance (km)	< 2	2-4	5-9	10-19	20-29	30-39	40+
Residents of NATS area	28%	38%	22%	6%	2%	1%	2%
Workplace in NATS area	23%	31%	19%	14%	7%	3%	2%

2.8. The above table shows that it is likely that at least 50% of commuting trips are from within the NATS area. Surveys of motorists were carried out during autumn 2001 to spring 2002. This will provide more information on the origins and destinations of motorists in the NATS area. Results from this will not be available until April 2003 at the earliest. Plan No 2 shows those residents living within 400 metres of a bus stop, with a 20-minute or better bus service.

Table 2.5: Journeys by mode by residents of NATS Area
(Source: Norfolk County Council mode share monitoring 2000/2001)

Mode	All journeys	To Work
Walking	18%	13%
Bike	5%	9%
Bus / Coach	7%	8%
Park & Ride*	0%	0%
Rail	1%	1%
Taxi	1%	1%
Car	49%	54%
Car passenger	16%	6%
Motorbike	1%	2%
Homeworking	1%	5%
	100%	100%

**NB Rounding results in this being shown as 0%.*

2.9. The mean household incomes vary considerably by ward. Throughout the study area, the mean household income is £18,900 (1998 data). The mean average income ranges from £12,500 in Mile Cross to over £30,000 in Cringleford and Colney.

2.10. The former Department of the Environment, Transport and the Regions (DETR) published The Indices of Multiple Deprivation 2000. This publication provides a comparison of relative levels of deprivation between different wards in the country. The Index of Multiple Deprivation is made up from six

indicators: income, employment, health deprivation and disability, education skills and training, housing and geographical access to services. Combining the six indicators derives an Index of Multiple Deprivation Score. This shows Mile Cross as in the top 5% most deprived wards nationally. By contrast, Cringleford and Colney and Taverham are two of the 5% least deprived wards nationally. Plan No. 3 illustrates the Index Score for the NATS wards.

Regeneration

2.11. None of the NATS Area has been identified as eligible for European Structural Funds under Objective 1,2 or 3 areas, or proposed by Government as Assisted Areas.

2.12. In 1998, a successful bid for Single regeneration Budget funding was made. This was a 7-year bid to raise the education attainment levels and employability of young people with low educational achievement levels and the disadvantaged. The bid supplemented the existing schemes in Greater Mile Cross and East Norwich, improving employability by making learning opportunities more accessible; raising skill levels; raising aspirations; boosting confidence and adaptability; widening participation in learning and creating a culture of lifelong learning.

2.13. In September 1998 Government launched the “New Deal for Communities” initiative. This initiative was designed to target money on the most deprived neighbourhoods to:

- Improve job prospects
- Bring together investment in buildings and investment in people; and
- Improve neighbourhood management and the delivery of local services.

2.14. Seventeen local authorities that had areas with very low scores on the Index of Local Deprivation were chosen to submit bids to establish Pathfinder areas to try to pioneer new ways of working to cut across traditional barriers. North Earlham and Marlpit was selected to participate. The Department of the Environment, Transport and the Regions’ report ‘Social Exclusion and the Provision and Availability of Public Transport’ described the New Deal area as one where “there is little for young people to do. There is no doctor and no supermarket. The school...where most parents want to send their children...is three miles away. The community appears to be suffering from a great lack of morale and low self esteem.”

Characteristics of Built and Natural Environment

Introduction

2.15. Plans 4 to 10 show characteristics of the built and natural environment.

2.16. The city of Norwich stands on the confluence of three main rivers – the Yare, the Wensum and the Tas. This has contributed to the prosperity of the city from medieval times and has also resulted in the wealth of wildlife and high quality landscapes found within the study area boundaries.

Townscape

2.17. Norwich is the historical capital of East Anglia; the centre is of national and international importance, particularly in built environment terms. It is the largest medieval walled city in the country, with over 1,500 listed buildings, including 32 pre-Reformation churches, a Norman castle and two cathedrals.

2.18. The historic core of Norwich has a pattern of narrow streets within the city walls lined by many notable medieval and Georgian buildings and churches. Some streets are still cobbled. In the eighteenth and nineteenth centuries the city spread beyond the walls chiefly along the main approach roads, paralleled by growth in peripheral villages such as Sprowston, Lakenham and Hellesdon.

2.19. In the 1930s Norwich City Council began building large numbers of houses for rent around the northern fringes of the city. This expansion continued, firstly as ribbon development along the main arterial routes followed by infill until the present day when the villages of Sprowston, Hellesdon, Drayton, Taverham, Old Catton and Thorpe have grown together to form an urban fringe to the city.

2.20. To the south, the influence of the River Yare and the unwillingness of the large estates to sell land limited the outward expansion of the urban area with the exception of Cringleford and, to a lesser extent, Trowse. More recently, significant growth has occurred around Poringland and Mulbarton, some 5 miles south east of the city centre.

2.21. The study area also includes a number of villages outside the built up area: Brundall in the east, Horsford to the north, Marlingford to the west and Stoke Holy Cross to the south. It also includes the new settlement of Thorpe Marriott, built in the 1980s and 1990s on a green field site as well as the large extension of the built up area at Dussindale, Thorpe St Andrew. Three further villages, Hethersett, Poringland and Horsford have also undergone major expansion during the late twentieth century.

2.22. There are 12 Conservation Areas covering the built up area of Norwich. These include the historic medieval core, Georgian and Victorian settlements, former village centres of Sewell, Catton, Old Lakenham and Hellesdon and the 1930s Mile Cross Estate. (These are shown on Plan No. 10.)

2.23. A number of villages within the study area also have churches and buildings of historic interest and 8 have parts of the settlement designated as Conservation Areas. In addition, Venta Roman Town at Caistor and Arminghall Henge are important Scheduled Ancient Monuments. The village of Thorpe End was originally laid out as a garden village.

Landscape

2.24. The city contains, and is set within, a landscape of significant national and local value, which is also important for informal recreation. Nationally

designated areas include the Broads and historic parklands, whilst areas designated in Local Plans include woodland areas and river valleys.

2.25. Within the built up area, swathes of countryside run along the floors and wooded slopes of the river valleys. Open spaces such as Mousehold Heath, the Norwich parks, historic parkland at Catton Hall and the Rosary and Earlham cemeteries are also features of significant landscape quality. Smaller pockets of open space, together with the wealth of trees along the city streets form important landscape features within the urban area.

2.26. Outside the built up area, the landscape comprises two main topographical types: the river valleys and the plateau lands between. Within these areas the landscape types are:

- River valleys with their pastoral valley floors;
- Woodland and remnant heath;
- Historic Parkland such as Crown Point, Rackheath and Great Melton;
- Undulating farmland; and
- Flooded gravel workings, forming a chain of lakes in the Bawburgh / Costessey area and the new 'broad' at Whitlingham.

2.27. The Broads Authority area is of national importance and equivalent in status to a National Park. The area follows the broad flood plain of the River Yare, running through the NATS study area from Brundall in the east to Trowse on the fringe of the built up area. The Broads Area extends along the river as far as New Mills Yard, off King Street in the central part of Norwich.

2.28. Within the city area, five public parks, two cemeteries and the Plantation Garden, an Edwardian Garden within an old chalk quarry, are registered on English Heritage's list of nationally important historic landscapes. Another three parklands within the NATS study area are on the register, including Catton Hall, which is famous as landscape designer Humphrey Repton's first commission.

Habitats

2.29. The study area contains a fine range of habitats of local, national and international importance. Amongst these are five priority habitats: fen, floodplain, grazing marsh, reed bed and heathland, identified through the National and Norfolk Biodiversity Action plan process together with six priority species: otter, water vole, linnet, song thrush, great crested newt and sandy silt puffball.

2.30. The River Wensum and associated grazing marsh up stream of Hellesdon, Crostwick Marsh and the Yare and Broads Marsh south of Brundall are all Candidate Special Areas of Conservation and are internationally important for their wildlife. The Yare and Broads Marsh is also designated as a Ramsar site, an internationally important wetland site.

2.31. There are five nationally important Sites of Special Scientific Interest (SSSI) within the study area including two, Sweetbriar Marshes and St James Pit (geological SSSI) within the outer ring road of the city.

2.32. Many County Wildlife Sites of local importance are found within the study area. Many of these are along the river valleys of the Tas, Yare and Wensum although they include a number of other areas of woodland, heath and common land and former chalk workings.

Land use

2.33. The Norfolk Structure Plan was adopted in October 1999. It has a policy commitment to provide for sustainable development and states that the Norwich Policy Area provides the greatest potential for doing this. It identifies strategic locations for employment as the city centre, Longwater, Wymondham, Sweet Briar Road, Colney and Thorpe St Andrew. Colney is identified as a strategic location for research and development and Thorpe St Andrew as a strategic location for a business/office park.

2.34. The Structure Plan is currently being reviewed. Consultation on the Structure Plan Issues Report is underway.

2.35. Since adoption of NATS3 in 1997, the following significant land-use changes have occurred in the Norwich Area:

- Mixed-use development at Riverside including supermarket, housing, retail and leisure facilities including a multiplex cinema and swimming pool (under construction);
- Multiplex cinema in Castle Mall;
- Homebase on Hall Road, B&Q on Mile Cross Lane;
- St Andrews and Broadland Business Parks - Employment and associated development. A hotel and bar/restaurant is planned;
- Longwater Employment area - Limited employment plus hotel and associated development;
- Norwich International Business Park – Employment and associated development. Hotel and bar/restaurant planned;
- Norwich Research Park - Expansion at UEA including the Sportspark and opening of new hospital at Colney.

2.36. The following major developments are underway:

- Site of former chocolate factory on Chapelfield is being redeveloped for a mixed-use of retail and housing;
- Former hospital site on St Stephens Road to be redeveloped, predominantly for housing.

Characteristics of the Economy

Introduction

2.37. Norwich attracts large numbers of people from considerable distances to shop, work and enjoy the many leisure and entertainment attractions. It is over 60 miles to a comparable range of employment opportunity, and 100 miles to a rival retail centre (in terms of overall ranking).

Employment

2.38. The following are the major employers (over 500 staff)

- Aviva (CGNU)
- Norfolk County Council
- N&N University Hospital NHS Trust
- Norwich Primary Care NHS Trust
- Archant Ltd
- UEA
- Group Lotus (although this is just outside the NATS area)
- Anglian Group
- City College
- Norwich City Council
- Marsh
- Royal Mail
- John Innes Centre
- Virgin One
- Contract Personnel
- Astron Ltd
- John Lewis
- KLM UK Engineering Ltd
- Virgin Money

2.39. These organisations are currently the largest in the Norwich area, with most based within the city boundary. In addition, supermarkets such as Tesco and Sainsbury are large employers, although their workforce is split across a number of stores. These, together with the plethora of micro, small and medium businesses account for some 140,000 jobs in the Norwich area – of which 94,000 are located within the city itself.

2.40. Job growth in the city between 1995 and 1999 increased by 3.4% compared to a national figure of 8.9%. In Norfolk, over the 10 years between 2000 and 2010, Business Strategies Ltd predicts that employment will increase by 9%, and as far as the Norwich Area is concerned, much of its share of this growth will occur at the major new employment areas along the A47 Southern Bypass.

Economic Development

2.41. It is predicted that, of sectors well represented in the Norwich area, the following will grow the most in terms of numbers of employees in the next 8 years:

- Business Services;
- Financial and related services - 2 sectors that predominate in the Norwich Area;
- Health;
- Education;
- Hotels and catering;
- Retailing;
- Construction.

2.42. Decline is anticipated in relatively few sectors predominant in the Norwich area, with the possible exception of chemical and food processing.

2.43. The major out of town strategic employment sites are the Norwich Research Park, Broadland Business Park and the Longwater Employment Area. Norwich Research Park is situated to the south west of the city and includes research institutions, the University of East Anglia and the Norfolk

and Norwich University Hospital. Broadland Business Park and Longwater Employment Area are located at opposite ends of the A47 Southern Bypass, some 4 miles from the city centre. Both contain large allocations of employment land, but neither has yet been fully taken up.

Sport and Leisure

2.44. The city has a wide range of sport and leisure facilities, including:

- Norwich City Football Club – average home gates this season are about 20,000. Promotion to the premiership and redevelopment of the South Stand could further increase supporter numbers and influence their spending/travelling habits.
- Norwich Sports Park – its impact is only starting to have an effect. The recent corporate games illustrate that the complex could increasingly become the focus for more high profile events.
- Night Time Economy – on some evenings up to 30,000 people are estimated to come into the city. The new Riverside development expands and consolidates the night time leisure scene to the east of the centre.
- There are a number of more local sporting and leisure facilities including the Royal Norfolk Showground.

Tourism

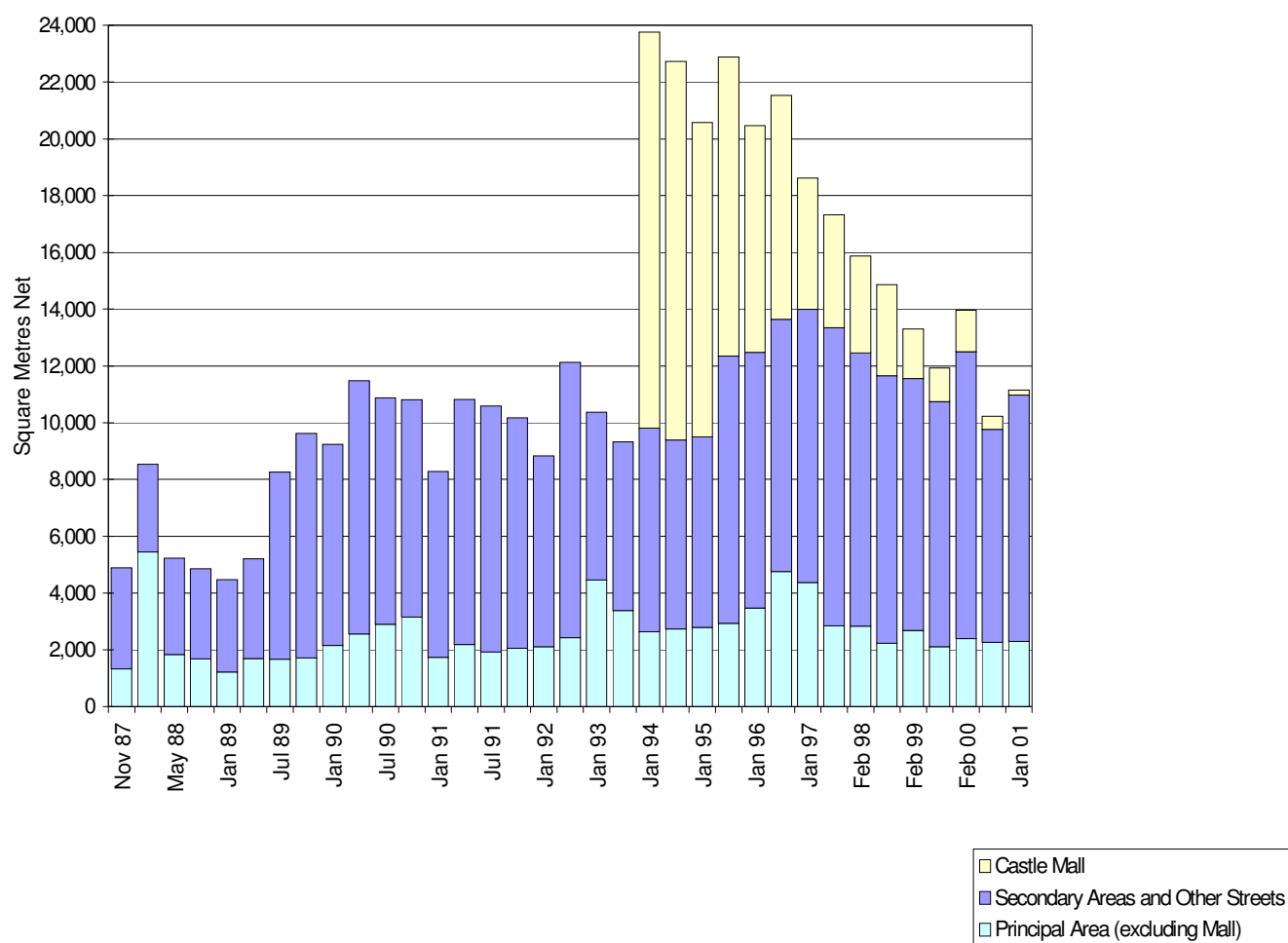
2.45. Tourism forms an important part of the city's economy. Norwich has one of England's finest Norman Cathedrals, the striking Catholic Cathedral and a Norman Castle. It can also boast the most complete medieval street pattern in England with 1,500 historic buildings within its walled centre and a large open-air market. There are many other attractions, including riverside walks, 1930's parks, Mousehold Heath, a thriving retail centre, a regional theatre, the Sainsbury Centre for the Visual Arts, a wide range of pubs, tea-rooms, cafes, restaurants and nightclubs, the Forum and League Football. Norwich also provides an ideal base to explore the Norfolk Broads, as well as the region's market towns and villages, coast and attractions.

2.46. During the 1990s, employment in tourism in Norwich increased at a faster rate than the average for Great Britain and during 1998, approximately £170m was derived from tourism in the Norwich area. The current and possible future growth of Norwich and Stansted airports brings Norwich even closer as a tourist destination, especially for those living near to other budget airline airports.

Retail

2.47. Norwich is the 8th highest ranking retail centre in the UK (source: Experian), based on the range and quality of its facilities. Despite impacts from the internet and home delivery, the retail sector shows every sign of remaining buoyant and even growing. The Riverside development is very successful and, with a 350,000sq. ft. development planned for Chapelfield, this could further consolidate the importance of Norwich. The market towns surrounding the Norwich area seem to be experiencing a modest revival, which could reverse some of the traffic flows, but this will not cause any major displacement of the position of Norwich as the retail capital.

Figure 2.2: Retail Vacancy Trends: Floorspace, Norwich city centre



2.48. The graph illustrates that the overall vacancy rate for retail floorspace is falling. The graph also illustrates the impact of Castle Mall, which opened in January 1994. This resulted in a large increase in retail floorspace, which since opening has increasingly been taken up. Castle Mall effectively resulted in a concentration of retail space within the core of the city centre. In terms of transport, this has resulted in a large demand for trips into the most central part of the city, including a large demand for car trips. The graph does not show the impact of the Riverside development.

Characteristics of the Transport Network

Introduction

2.49. The transport infrastructure serving the Norwich Area is illustrated on Plan No. 11a. The transport system is described in more detail in the following sections.

Road Network

2.50. The road network is characterised by a pattern of radial routes converging at the city centre. Two ring roads, both well within the built up area, cater for orbital movements and north south through traffic. The Inner Ring Road bounds the city centre office and retail area. The Outer Ring Road is some 2-3kms further from the centre with the built up area extending beyond. Neither the Inner nor Outer Ring Roads are complete; to the south east there is a common section comprising, in part, radial routes. The A47 Norwich Southern Bypass opened in September 1992 and carries east –west through traffic. The Southern Bypass acts as an orbital distributor road to the south of Norwich. There is no equivalent in the north of Norwich beyond the Outer Ring Road.

Parking

2.51. Norwich City Council and private companies operate car parks in Norwich. Policies in NATS3 aim to reduce the use of long stay car parking in the city centre and encourage longer stay visitors and commuters to use either Park and Ride or other means of travel into the centre. These policies were aimed to be implemented through charges at the car parks, with high tariffs for long-stay parking. Plan No 11b shows the major public car parks.

2.52. Norwich City Council is currently in the process of entering into partnership agreements with private companies to run its car parks. This is because of the large investment that is needed into the current stock of City Council owned multi-storey car parks. The City Council is unable to make this investment on its own and is looking for private-sector partners. To illustrate the scale of the maintenance difficulties, one multi-storey car park has recently been demolished as a consequence of structural problems.

2.53. Charges for on-street parking have recently been introduced within the city centre (generally within the Inner Ring Road). Residents' Only parking zones are in operation within much of the city. These extend from the city centre to a distance sufficient to deter commuters from parking and walking into the city centre, generally 1-2 miles. Norwich City Council has taken over the enforcement of parking within the city. Revenue raised from enforcement (through parking penalty fines) and parking charges can be used to finance transport schemes.

2.54. Table 2.6 below shows the parking stock in Norwich city centre (within the Inner Ring Road) as at October 2002. (Source Norwich City Council. The figures for Private Non-Residential spaces are from a Norwich City Council survey in 1993.)

2.55. A review of motorcycle parking in the county was carried out in 2002. In Norwich, the motorcycle parking provision is popular and well used, although there is a lack of signing to it. Within the city centre there are approximately 80 dedicated spaces. The review recommended that an additional 135 to 150 spaces be provided. This would raise motorcycle parking to approximately 2.5% of the parking stock, from its present level of 1.5%.

Table 2.6 Parking Stock in Norwich city centre

Parking Type	Short/Long	Spaces	Tariff up to 4 hrs	Tariff up to 8 hrs
Private Non Residential	Long	7,000	N/A	N/A
Public On-Street	Short	89	£2.40	N/A
Public Off-Street	Short	3,700	£3.27 (average cost)	£9.09 (average cost)
	Long	3,400	£2.40 (average cost)	£3.46 (average cost)

The table excludes semi-private shop car parks such as Morrisons, Big W, Sainsburys and Toys R Us.

2.56. Cycle parking in the city centre generally comprises open-air racks, although there is secure undercover storage at the library. Overall it is likely that cycle parking provision is adequate, in terms of overall level of provision. However, there is a general lack of secure, undercover facilities, particularly within the city centre and at the rail and bus stations.

2.57. There are 34 spaces for holders of blue badges within Norwich city centre and 22 for holders of green badges. The City Council's Green Badge scheme is to enable people with severe mobility difficulties to park in the city centre on specially allocated spaces. The green disabled badge system is not a national scheme. Anyone who has a green badge should also have a blue badge

2.58. Following a review of on-street waiting and loading restrictions earlier this year, the City Council intend to undertake some changes to the on-street restrictions to increase the number of disabled badge holders' spaces in the City centre. It is anticipated that this will be undertaken early in the New Year.

2.59. Parking is available for holders Disabled Badges on all Norwich City Council's Pay & Display car parks.

Park and Ride

2.60. Park and Ride is a feature of NATS3 and, to date, 4 sites are in operation. Three of these are purpose-built and sited at Costessey, Postwick and the Airport. A fourth service operates from a temporary site off Hall Road at Harford. Park and Ride services are provided at a frequency of approximately every 8-10 minutes between 0700 and 1900 Monday to Saturday. The services are enhanced in the period leading up to Christmas, operating a later service on Thursdays and a Sunday service.

2.61. The Airport and Postwick sites have purpose built central waiting areas. The latest site, at Costessey, operates on an airport parking type arrangement where the bus picks passengers up from various points within the car park. The site also has a central toilet and information facility. The service from Costessey currently operates on a largely commercial basis (although some journeys are paid for via the NHS Trust using money from a Section 106 agreement secured as a result of the planning consent for the hospital). It operates via the new Norfolk and Norwich University NHS Trust Hospital at Colney with other intermediate stops en-route. A privately operated Park and Ride, not forming part of the Council's strategy, recently started to operate from a car-park close to the rail station.

Table 2.7 Park and Ride Sites operated by Norfolk County Council

Site	Date of opening	Number of spaces	Tariff
Costessey	July 2001	1,100	£1.50 (Adult Return) £2.50 (Group Return)
Airport	June 1994	620	£2.00 (before 9am) £2.50 (after 9am)
Postwick	May 1998	525	
Harford	1991	555	
Total number of spaces		2,800	

Bus services

2.62. The majority of bus services in the NATS area are provided by First on a commercial basis with no public subsidy. First also operate the Costessey Park and Ride service on a commercial basis.

2.63. Services in the city area operate via the radial road network to and from the city centre. This is shown on Plan No. 12. For orbital trips it is necessary to change services in the city centre, although a few services do provide through-city links. This means for example that it is possible to make a trip from Costessey to Heartsease without changing buses. There are relatively few routes with extensive penetration beyond the suburbs.

2.64. There is 5½km of bus lane in the city. Cross-city buses stop in Castle Meadow. Frequencies vary, but it is the Council's aim to encourage the provision of a ten-minute daytime frequency, with a minimum half-hourly evening and Sunday frequency on principal urban bus routes. Service 25 operates 24 hours between the hospital / University and the railway station.

2.65. The bus station is situated in the city centre, although it does not offer the facilities expected by today's bus user. Many bus services do not utilise the bus station, and instead use on-street facilities. The County Council has been successful in securing funding from Government to rebuild the bus station. This scheme will provide 14 bays, improve links between the bus and rail stations and improve interchange facilities at the rail station.

2.66. Within the NATS Area there are two voluntary and community transport schemes – Norwich Door to Door and Carlink. Norwich Door to Door provides a minibus service for people who cannot use conventional transport due to physical mobility impairments. It can be used for any purpose. Carlink is a co-ordinated community car scheme based in Norwich but providing a service countywide. It provides journeys for people who cannot use or do not have access to bus services and who can travel in a volunteer's car (i.e. they are not permanently confined to a wheelchair). These schemes have the overall aim of reducing social exclusion and isolation and are managed via registered charities and a committed team of volunteers and paid personnel. They offer an important complementary service to that provided by conventional bus and trains services.

Rail

2.67. Rail travel provides an opportunity for commuting and visitor trips from some outlying villages and further afield. In the NATS area there are rail stations at Norwich, Rackheath and Brundall. Rail services operating from Norwich station can generally be classified as longer distance services (such as to Cambridge, London, the north or the Midlands) or local services. Local services provide commuter and visitor links to surrounding towns and villages including Wymondham, Great Yarmouth and Cromer. Anglia Railways operate the majority of services out of Norwich. Central Trains operate services to the north and Midlands, via Ely. The rail services are currently being re-franchised, to take effect from March 2004. The new "Greater Anglia" franchise will cover a wider area.

2.68. Norwich Thorpe rail station is situated some 800 metres east of the city centre and has recently been refurbished. Short-stay parking is provided on the station forecourt, with long-stay parking provision situated in a multi-storey car park recently constructed as part of the Riverside redevelopment.

Cyclists and pedestrians

2.69. The cycle network in the NATS area comprises a mix of on-road and off-road facilities. A cycle network has been identified and work has been implemented, albeit often on an ad-hoc basis, to implement this.

2.70. Within the city centre, much of the network has been pedestrianised, and includes London Street, the first pedestrianised street in the country. Parts of the city centre appear pedestrianised but allow vehicular access for parts of the day or certain classes of vehicle or usage.

2.71. Pedestrian phases have been introduced at most traffic signals in the city centre and pedestrian crossings have been introduced at specific locations. In April 2002, 92% (127 of 138 crossings) had facilities for disabled people; i.e. audible warning, tactile surfacing and tactile cones. Of those not meeting the criteria, three are pelican crossings on Wroxham Road, the rest being signalised junctions.

2.72. The former M&GN (Midlands and Great Northern) and Lakenham Way railway corridors have been dedicated for cycle and pedestrian use. The

M&GN corridor runs from Barkers Street / Crispins Road roundabout alongside the River Wensum to Thorpe Marriott and beyond. The Lakenham Way runs adjacent to Hall Road, from the Inner Ring Road at Brazengate to the Outer Ring Road at Mansfield Road.

Norwich International Airport

2.73. Norwich International Airport lies to the north of the built up area of the city at Hellesdon and has about 1,000 full-time employees based on the site. It is designated a 'Regional Connecting and Accessibility Point' under the European Union's guidelines on Trans-European Networks.

2.74. Currently the airport serves Amsterdam, Aberdeen, Edinburgh and Manchester with scheduled flights. Holiday services serve 14 locations during the summer and Alicante, Malaga, Malta, Gran Canaria and Tenerife in the winter. The current split in passenger between leisure and business (based on charter / scheduled flights) is around 50/50.

2.75. It is one of the fastest growing airports in the country, seeing a 59% increase in passengers since 1993/4. Some 390,000 passengers used it in 2000/01 and this is expected to continue to rise. Forecasts produced by Norwich International Airport Limited range from 0.9 million passengers per annum (low growth) to 1.57 million passengers per annum (high growth) by 2020.

2.76. The Government consultation on the Future Development of Air Transport in the UK: South-East notes that the future role of airports like Norwich depends on the amount and timing of future capacity at the major south-east airports. It sets out two growth scenarios for Norwich Airport to 2030: 4.4 million passengers per annum (mppa) if growth is constrained at main south-east airports or 0.7mppa if growth is not constrained. Norwich International Airport themselves anticipate handling 1mppa by 2014 and 2mppa by 2030.

2.77. Work completed by Arup Economics and Planning for Norfolk County Council (2002) also acknowledges the relationship between growth of other airports, in particular at Stansted, and demand for Norwich Airport. The study finds that there is a potential for Norwich to take advantage of changes to the market and for example pick up a greater share of the low cost and charter market, with major expansion at Stansted.

Taxis

2.78. The District Councils – Norwich, South Norfolk and Broadland, license taxis within the NATS area. Only hackney cabs in Norwich are required to have facilities for people with disabilities. These generally comprise ramps and seatbelts. All other vehicles are usually family saloons. Hackney cabs licensed in one District cannot pick up passengers in other Districts, although private hire vehicles can, if pre-booked.

2.79. Generally, there are sufficient spaces on taxi ranks in the area.

Table 2.8 Numbers of licensed taxis in each District

		Norwich	Broadland	South Norfolk
Hackney	Number	190	0	90
	Style	Black cabs – fully accessible for people with disabilities	Generally family saloons. Unlikely to have facilities for people with disabilities	
Private hire	Number	320	140	30
	Style	Generally family saloons. Unlikely to have facilities for people with disabilities		

Note – numbers have been rounded to nearest ten

Freight

2.80. The only specific facilities for freight deliveries in the Norwich area are on-street loading bays. Vehicles are also allowed to load and unload in the pedestrianised areas outside of the working day. There are no facilities, for example, to transfer freight from large to small vehicles and no area wide voluntary agreements on routing or loading arrangements. There is a weight restriction within the Outer Ring Road, preventing heavy vehicles from using the central parts of Norwich as a through route.

Water transport

2.81. Although Norwich is on a navigable waterway, there is little in the way of water-borne commercial traffic. River traffic is almost wholly related to tourism. A river bus operates from Norwich to Surlingham Broad, but again this is largely tourist-related.

Chapter 3: Existing and Future Travel Patterns

Introduction

3.1. NATS3 contains 14 targets, designed to measure the success of the strategy and also as an aspiration of what the strategy is designed to achieve. The first section of this Chapter provides a summary of the results of monitoring against these. A full report “Review of NATS targets” is also available.

3.2. The second part of the Chapter looks ahead to the likely situation in the future.

Results of Monitoring

Target 1 - Traffic

3.3. Traffic levels are monitored on cordons at the Inner and Outer Ring Roads. Traffic crossing the Outer Ring Road has grown by an average of 0.6% per annum. There has been a slight reduction (–0.1% per annum) in traffic crossing the Inner Ring Road. Further analysis of available traffic counts shows that there has been a reduction of traffic on the Inner Ring Road itself. This reduction has been approximately 6% between 1989 and 2001. The monitoring thus indicates an overall reduction in traffic within the centre of Norwich.

3.4. Monitoring shows that traffic crossing the outer ring road is increasing. It also suggests that the increase in traffic is due to traffic:

- Having an origin or destination between the inner and outer ring roads. (The pattern of flow might be explained by the increase in trips to out-of-town centres by for example people living between the outer and inner ring roads.); and / or
- Avoiding the Inner Ring Road when making cross-city trips.

3.5. The results also suggest that introducing traffic management features (including traffic calming, traffic signals or roundabout junctions) results in traffic displacing onto other roads.

Table 3.1: Traffic crossing the Inner and Outer Ring Roads

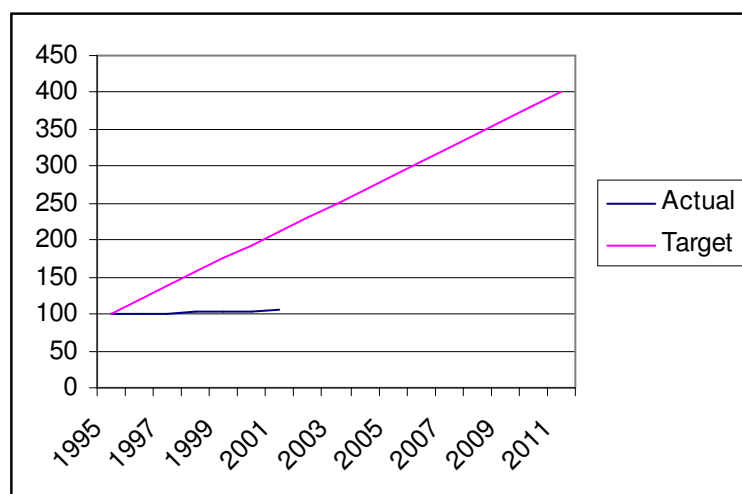
Year	1989	1995	1998	2000	2001
Outer Ring Road Cordon total	N/A	217,431	224,449	216,427	225,127
Inner Ring Road Cordon total (common sites only)	105,264	N/A	100,452	N/A	92,954

Target 2 - Cycling

3.6. The monitoring of cycle use that has been carried out to measure progress against the NATS target shows that the number of cycle trips has remained at a stable level. There is some evidence to show that the introduction of dedicated new cycle facilities has led to an increase in the numbers of cyclists recorded on that new facility, for example the Hall Road

cycle route. Balanced against this, however, there has been a recorded reduction in cycles on existing dedicated facilities such as at Bluebell Road.

Figure 3.1: Number of Cycles Crossing Inner Ring Road Cordon



Targets 3 and 7 - Public Transport

3.7. Bus passengers crossing the Outer Ring Road have been counted annually. Counts show an increase in the numbers of bus passengers. Numbers have increased on both registered scheduled services and Park and Ride Services. However, the rate of growth on Park and Ride is much greater than on registered services. This is probably due to it starting from a much lower base.

Table 3.2: Growth rates of passengers on Registered Service Buses and Park and Ride Services.

Year	Registered Services		Park and Ride	
	Passenger numbers	Index: 1997=100	Passenger numbers	Index: 1997=100
1997	26,353	100.0	3,114	100.0
1998	26,092	99.0	3,187	102.3
1999	28,182	106.9	4,670	150.0
2000	28,693	108.9	5,070	162.8
2001	29,875	113.4	5,200	167.0

3.8. Bus passenger numbers are rising slightly faster during the peak than the off-peak hours. The increase in passengers is similar between the am and pm peak hours.

3.9. First have provided provisional figures showing patronage on bus services from outside of the Norwich Area. This found approximately 12% of passengers arrived by County Services, compared to 88% on City Services.

3.10. There has also been an increase in the numbers of passengers arriving at Norwich Thorpe rail station, of nearly 20% between 1995 and 1999. This rate of increase is just below the target rate.

Targets 4 and 5 - Mode Share

3.11. Results from the County Council's modal share monitoring can be summarised as follows, in comparison to results from the 1991 census:

- The mode share of walking has remained fairly constant.
- The mode share of cycling has increased. It is interesting to note that the survey shows the mode share of cycling to have risen from 7% to 10%, whilst results from counts of cycles appears to show that the actual numbers of cyclists recorded have remained fairly static. This is probably due to the location of the counters resulting in them not picking up on all of the cycling trips made within the area.
- Similarly, the mode share of public transport has only risen by 1%, whilst the monitoring of passenger numbers shows a fairly substantial rise.
- For car journeys, the mode share has fallen. Monitoring of traffic levels crossing the ring roads shows increases crossing the outer ring road, and a reduction in traffic crossing the inner ring road.

Target 6 – School Trips

3.12. No survey was undertaken for the proportion of pupils travelling on foot, public transport or by bicycle and hence no information is known on progress against this target.

Target 8 – Traffic Delay

3.13. Journey time surveys were carried out in 1989 and repeated in 2002. These show that, overall, journey speeds in the city centre (inside the Outer Ring Road) in 2002 were 19.2mph.

3.14. It is difficult to draw conclusions from the journey time surveys, but it would appear that:

- Journey times for orbital or cross-city routes have increased, especially in the south-west area of the city.
- On routes out of the city to the south-east journey times appear to have shortened. This may be attributable to the introduction of the Southern Bypass.
- Routes to the south show increased journey times, especially during the peak hours, which could be a result of additional junctions on the A140.

Targets 9, 10 and 11 – Commuter Plans

3.15. Targets for the adoption of commuter plans by the local authorities and major employers in the NATS area have not been met.

Targets 13 and 14 – Air Quality and Emissions

3.16. The District Councils are responsible for reviewing and monitoring air quality. In the NATS area, only areas within the city centre have been found to have standards of air quality lower than the required standards. As a consequence, Norwich City Council is looking to declare Air Quality Management Areas around the Castle, in Grapes Hill and St Augustine's.

Target 14 - Road Traffic Accidents

3.17. Monitoring of road traffic accident data indicates that there has been a reduction in casualties, in line with Government target reductions. The tables below show casualty numbers in the past three years.

Table 3.3: Road Traffic Casualties in the Norwich Area 3 years from 1 Sept 1999 to 31 August 2002

Mode	driver	cyclist	passenger	pedestrian	Vehicle (driver and passenger)	Total No. of Casualties
Number of casualties	1,683	339	777	455	2,460	3,254

Severity	Slight	Serious	Fatal
Number of casualties	2,730	521	40

Age	Not Stated	1-16	17-24	25-44	45-65	66 & over
Number of casualties	243	458	710	1,083	525	234

Future Travel Patterns

Introduction

3.18. Modern society has seen an increase in the amount of travel that people have undertaken. The availability and affordability of travel has led to a dramatic rise in the extent of travel: businesses and individuals are travelling more often and further afield than before. Changes in where people live and where services are located affect people's travel behaviour. For example

- the declining population within Norwich City compared to the rise in population outside this area,
- the decline of local shops and
- the concentration of major investments in large facilities, such as the Norfolk and Norwich University hospital, which has replaced both the former hospital sites within Norwich.

3.19. This part of the report looks forward to the period for which the NATS strategy is being devised. This is to 2025, with a more detailed look to 2011. In doing this it is necessary to take into account the uncertainties that exist. For example, there may also be changes in social attitudes that cannot be predicted with any degree of certainty. Current trends could continue into the future, or these trends may be reversed.

3.20. The report attempts to consider the changes that there may be in the future, and what impact these might have on transport in the Norwich Area.

Technology

3.21. There is vast potential to reduce vehicle emissions and increase energy efficiency through vehicle and fuel technology. The major fuel options include electricity, hydrogen, ethanol and methanol. Hydrogen may be seen as the most promising option for the future, but is unlikely to be introduced before 2020, due to complexities in its distribution and storage.

3.22. Even with improved technology, problems will remain. For example, increases in numbers and lengths of trips may outweigh any reduction in emission rates. Additionally, improvements to fuel or vehicle technologies will not overcome problems such as congestion, severance of communities or even noise.

Economy

3.23. The Shaping the Future Partnership (the economic development partnership for Norfolk) reports that detailed analysis of Norfolk's economy over the next 10 years has identified that economic output is likely to grow broadly in line with the UK as a whole, although somewhat less strongly than the east of England. The Partnership has drawn up an economic development strategy for Norfolk that has, as its overall aim, to improve the economic prosperity of the county. Targets have been developed, which will raise the growth in the economy above the projected level.

3.24. Traffic growth has, in the past, been intrinsically linked to growth in Gross Domestic Product (GDP – a measure of economic output). The challenge in the future is to decouple this growth and, whilst there are

opportunities to do this, it is not possible to make quantitative estimates. For the purposes of NATS, the strategy needs to consider the issues raised by the economic targets and the likely rates of traffic growth that are forecast in the area.

Traffic Forecasts

3.25. Government forecasts of traffic growth in Norwich are shown in Table 3.4.

Table 3.4 Government Forecasts of Traffic Growth

Year	1996-2006			1996-2011		
Economic Growth Forecast	Low	Central	High	Low	Central	High
Traffic Forecast (% increase)	9	18	26	13	25	36

Source: TEMPRO version 3.1, DETR

3.26. Targets for growth in traffic were adopted as part of NATS3. These are detailed in the first part of this Chapter. The actual growth rate in traffic will depend on many factors including the final strategy and policies resulting from this review. Other factors having a bearing on the amount of traffic increase include the amount of available roadspace and the increasing car ownership, as motoring becomes more affordable. (This latter point being related to the rising incomes and factors such as increases in the female labour force.)

3.27. Freight transport volumes in Europe rose by 71% between 1970 and 1995, primarily due to goods being moved further rather than an increase in the amount of goods transported (Whitelegg 1997). It is possible that there will be further increases in freight transport, with higher value goods being moved. There could for example be more home deliveries.

Social Changes leading to variance in the demand for travel

3.28. Changing social patterns have already resulted in many changes to how far, and the ways in which we travel. These changes are likely to continue.

3.29. Society is moving towards more flexible working patterns and a 24-hour economy. The effect of this on travel is likely to be that trips are spread more evenly throughout the day (and night). This might mean that public transport systems are not so competitive as they cannot carry the loadings of passengers that they do now (i.e. that passenger numbers are spread throughout a longer time period).

3.30. Increasing incomes and more diverse activities add to the growth in travel. Combined with the trend for people to live further from their workplace (and other facilities), this could mean that people are more inclined to use cars, rather than public transport. This could be further compounded by the relative costs of transport: in the UK, costs of bus travel rose by 48% between 1989 and 1996. The cost of motoring increased by 38%.

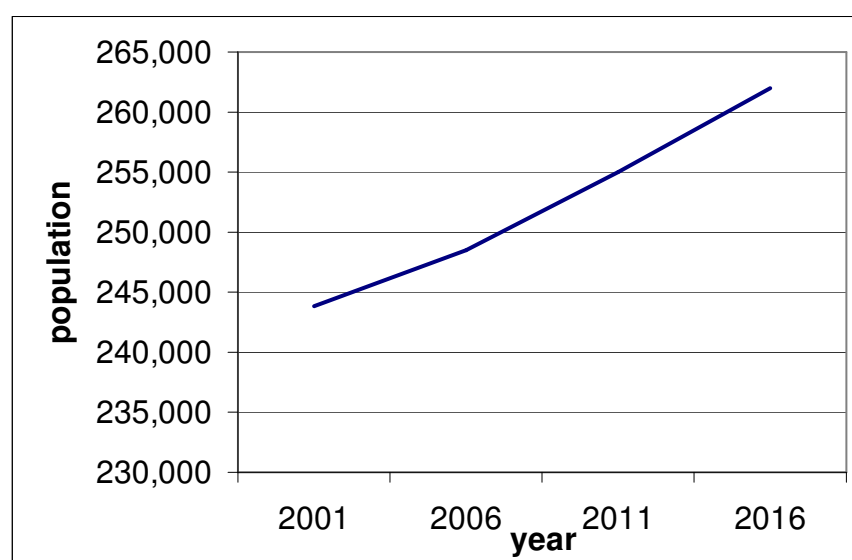
3.31. Another change could include more people working from home.

Population

3.32. There will be changes to both the overall population numbers as well as the make-up of the population in the area. The population forecast is predicted to rise by around 10% between 2001 and 2016. Previous trends have seen a decreasing birth rate and an increase in the numbers of elderly people. As well as having effects on the economy, such as a shortage of labour force, this could result in more elderly people who have grown up knowing how to drive.

3.33. Within the NATS area, there has been a decline in the population within Norwich City coupled with a rise in population outside this area. This will affect travel patterns, with a possible increase in commuting into the city centre from the suburbs. There is also a trend towards smaller households, which affects the need for housing space and also can result in higher car ownership (due to less opportunity to share travel).

Figure 3.2: Population Projection in NATS area



Housing

3.34. The Structure Plan Issues report identifies the potential requirement for housing and sets out the potential amount of new housing in the Norwich Policy Area between 2000 and 2025. This is illustrated in Table 3.5.

Table 3.5: Proportion of the county's dwellings in the Norwich Policy Area

	Proportion of the county's dwellings in the NPA (2000 – 2025) – Potential Options (annualised figure in brackets)		
	35%	40%	45%
Lowest Growth	20,000 (800)	22,800 (912)	25,700 (1,028)
Trend Growth	24,900 (996)	28,500 (1,140)	32,000 (1,280)
Highest Growth	29,700 (1,188)	34,000 (1,360)	38,200 (1,528)

3.35. The Issues Report notes that some 14,000 of these required dwellings are already permitted or allocated. It puts different options forward for where additional greenfield housing may be situated:

- Concentrate the majority of new housing growth as part of a mixed-use development on the north-east fringe of Norwich, somewhere between the B1150 North Walsham Road and the A47 (East);
- Significant expansion of Wymondham;
- A new village or significant expansion of an existing village;
- Divide it between north-east Norwich and Wymondham.

Other Land-Use changes

2.82. Other major changes to land-use or where significant expansion of existing uses may occur include Norwich International Airport, where forecasts produced by Norwich International Airport Limited range from 0.9 million passengers per annum (low growth) to 1.57 million passengers per annum (high growth) by 2020.

3.36. The Norwich Research Park (NRP) is of international significance and its expansion is promoted by the Shaping the Future strategy. It includes research institutions, the University of East Anglia and the Norfolk and Norwich University Hospital. It has the potential to be a key driver of the local and regional economy. A draft Vision for the NRP was produced early in 2002. This suggests that 80 hectares of land could be required to cater for demand over the next 20 years. The local area contains important landscapes and the quality of the environment is an important aspect of the Vision.

3.37. The UEA has an extensive programme of expansion in the pipeline for the next 10 years, including the School of Medicine that will have an additional 300 students in 5 years. The Norfolk and Norwich University NHS Hospital opened recently and already has plans for future growth.

Chapter 4: Problems and Issues

Introduction

4.1. This Chapter considers the problems and issues facing the Norwich area. It starts with consideration of people's perception of the transport system before considering problems and issues, in three themes:

- **Social.** This section includes public transport, difficulties of travel for lower income groups and security and safety issues, including crime. This section also deals with road traffic accidents
- **Economic.** This section includes freight, access into the NATS Area, issues for economic clusters, such as the UEA / hospital / Research Park at Colney and likely future growth of the area
- **Environmental.** This section considers the impacts of traffic on the natural and built environment and issues for public transport, cyclists and pedestrians.

4.2. Some of the problems and issues could readily apply to more than one of the themes (such as congestion, which has been included as an economic issue, but could apply to the environmental section). However, grouping them in this way allows for clarity of presentation.

Perception of Transport Provision

4.3. In 1999, MAP Research (now OPERA) carried out survey work within Norwich. As part of this work, respondents were asked to rate aspects of transport provision.

Aspects that received the highest number of good ratings

- pedestrian routes and provision (e.g. street environment and cleanliness)
- taxi provision,
- road safety,
- bus facilities and
- the quality of car parking facilities

Those with a high number of respondents rating aspects as poor include

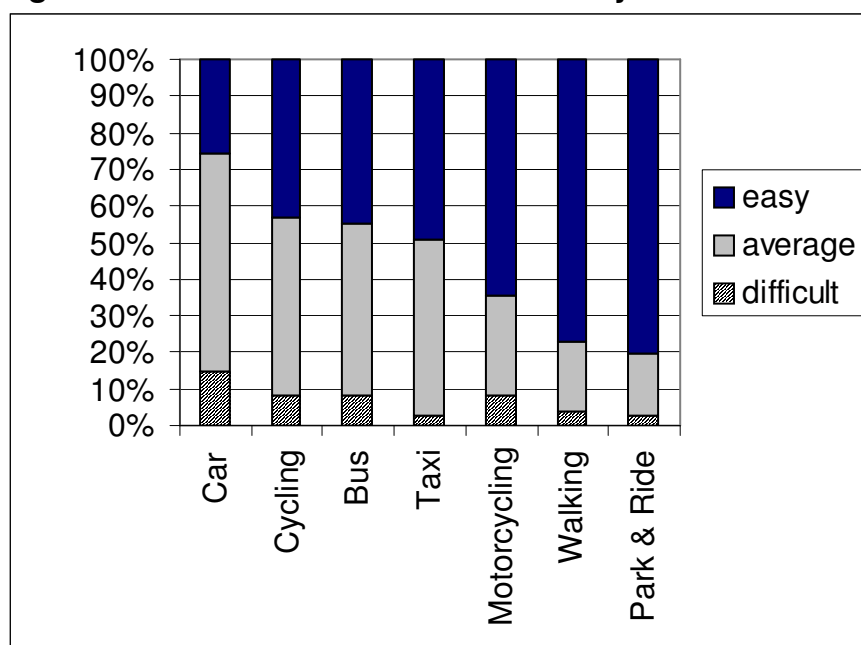
- the quantity of motor cycle parking,
- cycle parking,
- the bus station and
- cycle routes

4.4. The five top priorities for improvements to the transport system were (in order):

1. bus services,
2. the bus station,
3. quantity of car parking,
4. cycle routes and
5. safety in the city centre after dark.

4.5. The MAP Research also looked at perceptions of how easy it was to travel around the city by different modes. This is set out in the table below.

Figure 4.1: Ease of Travel around the City



*Correspondents were asked to rate ease of travel on a scale of 1 to 10, where 1 is extremely difficult and 10 is extremely easy. The above graph rates scores of 1-3 as 'difficult,' 4-7 as 'average' and 8-10 as 'easy.'

Source MAP Research 1999

4.6. The results suggest that pedestrians and those using motorbikes and Park and Ride find few difficulties travelling around the city. Cyclists and those using buses are more ambivalent. Car drivers, who made up the bulk of the sample, were not generally satisfied and had the lowest percentage response of any group rating ease of travel of 8 – 10. Although those using taxis were well rated, fewer scored the higher 8-10 rating, suggesting perhaps that taxi users also experienced some of the difficulties found by car drivers.

Social

Introduction

4.7. This section looks at issues that could be said to relate to 'people's lives,' including problems of crime and road accidents and issues relating to communities and neighbourhoods. It also considers social exclusion, which Government has defined as "a shorthand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low incomes, poor housing, high crime, bad health and family breakdown".

4.8. Inadequate transport contributes to social exclusion in two ways:

- It restricts access to activities such as work, learning, health care, food shopping, and other key activities.
- Deprived communities suffer disproportionately from pedestrian deaths, pollution and the isolation that can result from living near busy roads.

Access to the Transport System

4.9. Inadequate transport restricts people's access to activities such as work, learning, health care, food shopping and cultural and sporting activities. There can be three types of barriers to access:

- Access and availability;
- Cost; and
- Travel horizons (People are unwilling to experience long journey times or distances, or may be unfamiliar with, or lack trust in transport services).

4.10. Within the NATS area, results from the County Council's modal share monitoring (2000 and 2001) show:

- C2DE's on average make fewer journeys than ABC1's. (The ABC1 group comprises those who are better off, compared to the C2De E group.) The trip length is generally shorter for C2DE's.
- Car availability declines as a function of socio-economic group. Car availability for females is lower than for males.
- Young children generally have relatively high access to a car for trips (albeit via adults). The 0-4 age group has highest levels of access out of all age groups, probably as parents choose cars as the easiest form of transport for 0-4 year olds. Car availability decreases gradually into early adulthood, with the 20-24 group showing the lowest car access rates of all, after which it generally increases with age, and assumed increasing affluence. Car availability decreases after 60.
- Females on average make more trips than males, but their journeys tend to be shorter

4.11. In the NATS Area, ownership of a car is shown in Table 2.3. Car Ownership varies considerably by ward, from only 6% of households in Plumstead having no car to 60% in Mancroft. Car ownership rates generally reflect the geography of the area, with wards within the more central parts of Norwich tending to have more households without a car. Conversely, there are fewer households without a car in wards at the edge of the built up area. Overall, 1/3rd of households in the NATS area do not have a car. This is shown on Plan No. 13.

4.12. In addition there will be certain people who do not have access to a car even if there is one available to the household. For example, children may have to rely on their parents to provide car transport or the car may be used by the wage earner during the day, leaving the remaining members of the household unable to access it. The cost of running a car can be an issue – particularly for those in low paid work who need a car to access work.

4.13. Practical transport difficulties typical of deprived areas, where a car may not be available for travel, include:

- Expense: for families, schoolchildren and leisure activities (where the total cost of the activity is the cost of travel plus the cost of the leisure activity). Often, cheap returns are not available at peak times;
- Timing of buses: they may not run when required, for example to provide transport for shift workers;

- The need for vehicles to be easy to load, including the ability to carry pushchairs or wheelchairs;
- Lack of easy access to facilities like the hospital, doctor surgery and supermarket;
- Reliability of public transport for school and work travel;
- Time taken to travel: there is often a need to take a bus into the city centre and out again due to the lack of orbital routes;
- Physical / learning disabilities can result in difficulties getting on / off buses and understanding timetables.

4.14. Some facilities can be difficult to reach by non-car modes. Examples may include edge of centre shopping or health facilities. The problem is particularly difficult if the journey involves an orbital movement. Public transport journeys in Norwich operate along radial routes. Orbital journeys will usually involve one trip into the city centre and another out. This can be time consuming and may be beyond the means of some people, particularly if the trip involves a family unit. Few public transport services operate late in the evening and only one (service 25 from the train station to the university / hospital) operates through the night.

4.15. Patronage on buses has been increasing in the Norwich Area, but some service levels have had to be reduced by the operator. This reduction in service has been caused by factors such as traffic congestion and difficulties of driver recruitment and retention. Some services can be overcrowded. For example, consultations for the south west sector study revealed concern that residents wishing to board the bus service between the station and hospital could not do so as vehicles were often full. Other services that can be crowded include Postwick and Harford Park and Ride services and on the Hethersett to city centre route.

4.16. The main bus operator, First, has restructured fares in the Norwich Area, recently introducing travel zones and return and season tickets. Single fares cost around £1 - £1.50. Day tickets are also available, priced at £2.80 for adults, allowing travel in a zone similar to the NATS area. Weekly tickets cost £8.50, whilst group tickets, for up to five adults cost £6.00 daily. (Prices correct as at January 2003.)

4.17. Journey times from residential areas around the outer ring road are typically around 15 minutes into the city centre. However, some journey times are much longer, such as over ½ hour from Bowthorpe or Thorpe Marriott. Journey times can be increased substantially if the route involves a change of bus, which would typically be needed for orbital trips. Bus service journey times often exceed those of car travel because buses do not take direct routes, as they need to penetrate residential areas, to pick up and set down passengers.

Crime and Perception of Crime in the NATS Area

4.18. There are many factors responsible for the transport decisions which people make. Department for Transport research (Pedestrian Security Issues in Pedestrian Journeys, 1999) concludes that people change the way they

travel because of fears for their personal security. Vulnerable groups such as women, the elderly and ethnic minorities are more likely to fear for their safety.

4.19. Examples of anti-social behaviour off-putting to (potential) public transport users include graffiti in shelters / stations, rowdy behaviour on buses or trains, people hanging around bus or train stations, those being rude or annoying to other passengers and vandalism of public transport. More generally, results from MORI Norwich Residents Survey, 2001 pinpoint harassment / intimidation, speeding cars, litter, 'rat running,' vandalism, noise nuisance in the street, abandoned vehicles and drug / solvent abuse as reasons why people may feel unsafe. There is also the increasing problem of mobile phone theft, which is an example of street crime, that is a threat in itself as well as being a realistic risk in a street environment.

4.20. The Department for Transport cites the fact that people consider walking to be the least safe way to travel. Walking constitutes 18% of journeys in the NATS area (Modal Share Monitoring Data, 2000/01), and almost certainly makes up part of the journey using any other mode of transport, such as walking to the bus stop. (Research shows that people take this into consideration negatively when looking at the overall safety of a journey.)

4.21. It is estimated that 10% more trips would be made if passengers felt more secure, indicating that safety fears limit journeys people wish to make, especially off-peak where fears are highest.

4.22. The 2001 Crime Audit data from the Norfolk Constabulary's Crime Recording and Intelligence System and the Computer Aided Despatch System has been reviewed. This was with specific reference to crimes committed in a street environment in order to establish how people's travel choices may be influenced by crime, or the fear of crime.

4.23. The data does have some limitations however and it can be difficult to draw any firm conclusions. In many cases it does not specify the exact location of a crime. There is a difference between crimes committed and reported (which are assessed in the Audit) and people's perception of crime and personal safety. Incidents of crime against the person seem less likely to be reported than other incidents.

4.24. The most thefts from motor vehicles were reported in Mancroft, which is also one of the most deprived wards. (It is not clear whether there is a link between deprivation and theft from motor vehicles in this case. Mancroft is almost wholly within the Inner Ring Road, and the high incidence of theft might be a result of this.) Other wards with higher than average incidence of theft from vehicles are Mile Cross, Thorpe Hamlet, Heigham and St Stephen. There appears to be a link between deprivation and theft from motor vehicles across Norwich as a whole.

4.25. By far, the two most common locations for theft from a motor vehicle in the city of Norwich area were a public car park (1,157) or road (1,117). Thefts from motor vehicles parked on a driveway were reported only 124 times.

4.26. Mancroft ward also experienced by far the most reports of incidents of disorder in a public place. There is a link between deprivation and incidents of disorder, with the more deprived wards seeing a higher incident of disorder, but there is not strong correlation. Of these incidents of disorder in the Norwich city area, the most common kind was other unlisted disorder / nuisance (3,274 instances). Disturbance in a public place was the fourth most common kind of disorder with 768 instances. Categorisation here has again made detailed analysis difficult.

4.27. Mancroft ward also showed the highest number of reported incidents of criminal damage in the city of Norwich area. Wards including Bowthorpe, Henderson, Mile Cross and Lakenham had higher than average incidences, but still had less than 50% of the number of incidents in Mancroft.

4.28. Of these incidents, criminal damage to vehicles was the most commonly occurring, with 1,015 instances. The most common location for criminal damage was in a dwelling. Criminal damage to vehicles was more likely in highways / open spaces and public car parks, which fall second and fourth most common respectively.

4.29. Roads in the Norwich area with a high number of crimes recorded include (in order of instances) Earlham Road, Cadge Road, Barrett Road, Springbank, Aylsham Road, Robin Hood Road and Clarkson Road. Roads in the inner area of Norwich such as Magdalen Street, Bethel Street and Prince of Wales Road did experience a high number of incidents, but not as many as the areas further out. The data did not specify whether the incidents occurred on or off-street.

4.30. Looking at the results of the 2001 Audit in comparison to studies on perception of crime, it would seem that there is more of a fear of being a victim of crime than the realistic likelihood of an actual incident. Results from MORI research (and the 2001 British Crime Survey) reflect that there is a general view that the crime rate has risen in Norwich in the past two years, which is in fact a misconception. In Norwich only 1.4% of the population reported experiencing violent crime, and only 0.5% of the population reported theft of a motor vehicle. In comparison, 36% of residents stated they chose not to venture into the city centre at night due to feeling unsafe.

People with Disabilities

4.31. The term 'disability' includes people with physical, sensory or mental impairment. Conservative estimates put around 12% of people as having a degree of impairment. Most people would benefit from good design of the street environment, but this applies especially to those with disability, with small children, carrying heavy or large items or who are elderly.

4.32. Particular issues may include road crossings, street furniture, access onto public transport (including taxis) and signs and information. 127 out of 138 (92%) crossings in the NATS area were reported to have facilities for people with disabilities in 2002. However, it is likely that fewer than half of the crossings would comply with the latest guidelines. No audit has been completed of the transport network to assess its suitability for the groups of people mentioned above.

4.33. From the MAP Research carried out in 1999 for the County Council, people holding Orange Badges (now Blue badges) were found to make fewer journeys into the city than other people. Nearly three quarters of trips were made by car and around one quarter by public transport. From the research, the main issue was the need to provide additional parking spaces close to the destination. Secondary issues included the need to improve bus services and widen the provision of Park and Ride.

4.34. There are numerous inter-related issues including:

- How to provide the street furniture (including bus stops and road signs) necessary for users of the transport network without compromising use of the network by certain groups
- How to provide the necessary facilities without harmful impact on the built environment
- How should the issue of allowing people with disabilities to access facilities by car be treated in relation to any policies regarding restricting car-use?

Road Safety

4.35. Research suggests that children from the lowest social class are five times more likely to die in road accidents than those from the highest social class (DfT 2002). This could be due to the exposure to risk. People in less affluent areas may be more likely to travel by foot because they do not have access to a car and children are also more likely to play on the street because of a lack of access to a play area or garden. Other factors may include less adult supervision; living in inner urban areas and living on busy through roads. Children from ethnic minority backgrounds are more at risk, even in one particular area, for reasons that are not fully understood.

4.36. Trends can be seen from the casualty data for the NATS area over the last three years. The most deprived wards generally have more casualties per head of population than the least deprived wards. For drivers and passengers this is less acute. However, for pedestrians and, in particular cyclists, the relative casualty rate per head is much higher in the most deprived wards than in the least deprived.

Road Traffic Casualties

4.37. During 2001 there were 1,311 casualties from road traffic accidents in the Norwich Area. (Casualties are shown on Plan No. 14.) Whilst the majority of injuries were classified as slight, ten people suffered fatal injuries. Monitoring suggests a downward trend in reported casualties. This may continue as speeds decrease (due to congestion), vehicle technology

improves and further traffic management / safety measures are implemented. However, the number of accidents may increase as traffic levels increase.

4.38. In the 3 years from 1 Sept 1999 to 31 August 2002 there were 3,254 casualties. Analysis shows peaks in the numbers of casualties per head of ward population in Crown Point, Mancroft, St Stephen, Horsford and Drayton (12, 5.5, 2.3, 2.4 and 2.3 casualties per 1,000 population respectively). The average across all wards is 1.3. Crown Point is south of the River Yare and includes only Trowse as a main centre of population. It does however include the busy Trowse and Norwich Southern Bypasses. This combination of low population and high traffic flows probably explains the high numbers of casualties per head of population. Mancroft includes almost the entire city centre inside the Inner Ring Road. The ward shows a comparatively higher number of casualties per head than other wards in total. It is particularly high in comparison to other wards for cyclists and for pedestrians. Mancroft is also one of the most deprived wards.

4.39. Road safety fears are likely to be related to fast moving traffic, high volumes of traffic and large vehicles, which can all cause fear and intimidation for other road users, such as pedestrians and cyclists. Lack of crossing facilities can add to this perception. These issues are likely to become worse as traffic levels increase.

4.40. Analysis of the accident data raises issues including:

- How the access needs of traffic and other road users can be met in the city centre whilst addressing the high numbers of road traffic casualties
- Reducing the high numbers of casualties per head of population in wards with high traffic flows

Residential Areas

4.41. The south west sector study consultation revealed, amongst others, the following problems in residential areas (residential areas include not only side streets, but also some of the main radial and orbital routes):

- Rat running on lower standard roads between main roads
- Streets comprising Victorian terraces characterised by on-street parking. Problems with cars constricting the available running width of roads and causing potential safety difficulties at junctions, for cyclists or crossing pedestrians.
- Volume and weight of traffic on some residential radial routes (e.g. Earlham Road).

4.42. These problems are likely to be common to most of the built-up area. The problems listed above are likely to become worse as traffic increases.

4.43. Heavy volumes of traffic, particularly if there is a high proportion of heavy goods vehicles leads to problems of pedestrian and neighbourhood severance.

The Economy

Introduction

4.44. Norwich is the largest English city without a continuous dual carriageway road link to the national motorway network. This can make it be perceived that the Norwich Area is peripheral and remote from the rest of the country, decreasing its attractiveness for inward investment. The lack of dual carriageway connections can make journey times long and unreliable for people and goods. This also affects longer distance bus and coach journeys, and currently the bus station is in a run down state and is unwelcoming for visitors. Some journeys can be difficult or inconvenient to make by rail, for example east west trips where the route is indirect (via Ely) and journey times are long due to the line speed. In addition, Norwich rail station is sited some distance from the bus station and city centre. Surface links to the airport are poor.

Strategic links into the area

4.45. According to the “Shaping the Future” Strategy, 20% of Norfolk businesses considered the “lack of communication links / transport infrastructure” to be the principal barrier to growth. The East of England Development Agency’s Regional Economic Strategy (East of England 2010) and Shaping the Future view high quality transport infrastructure as being essential to ensure the future prosperity of Norfolk. They both have specific transport related objectives in order to deliver their economic targets, some of which impact specifically upon the Norwich area. Shaping the Future includes the following as strategic priorities:

- Improved east west rail links – a direct rail link to Cambridge available in 2004 and 2010
- A growing regional airport in Norwich – passenger numbers of 466,00 by 2004 and 736,000 by 2010
- Preferred route for Northern Distributor Road determined by 2004 and built by 2010.

4.46. The east of England Development Agency (EEDA) specifically identifies 10 road transport priorities, 2 of which impact upon the Norwich area:

- A47 Norwich to Gt. Yarmouth improvements;
- A47 Norwich to Peterborough improvements.

4.47. Priorities outside the NATS area that could have an impact on transport movements in and around the Norwich Area include:

- A dual carriageway road link to the motorway network. This will make Norwich more accessible
- An outer harbour for Gt. Yarmouth (Eastport). This could accelerate demand for warehousing and other port related activity in and around the Norwich area. Passenger traffic will also increase, with 55,000 tourist vehicles per annum predicted by 2004.

4.48. Whilst the above improvements, if achieved, could well make a significant impact on the growth potential of existing businesses, there may well be a number of local issues which need to be addressed as well. Some

areas of the city centre are currently relatively unattractive for visitors and shoppers (e.g. St Stephens Street, Anglia Square). Also, the accessibility and attractiveness of Norwich may be compromised as traffic problems such as noise, visual intrusion, congestion and delays increase.

Land-use policy

4.49. During the 1990s major changes to the pattern of shopping occurred, including the development of the following out-of-town supermarkets: Sainsbury's at Longwater, Pound Lane, Tesco at Harford, Blue Boar Lane, Asda at Hellesdon, Waitrose at Eaton and Wymondham.

4.50. Much of the existing transport infrastructure, especially public transport, has found it difficult to respond to changes in the patterns of flows that have arisen from these changes in where facilities are concentrated. New growth, including edge of city development and more complex commuting patterns, are likely to have replaced, at least in part, traditional in/out flows. In addition to the challenges to city centres that these new patterns of retail and leisure (including out-of-town) complexes, have brought, there are also challenges to the transport system. These include:

- How to provide for the new patterns of movement for all modes, particularly public transport which presently doesn't easily offer anything but radial movements
- Conflicts between in/out movements and orbital movements – should one have priority over the other?
- These patterns of development are likely to have led to increase in trip lengths and resulted in some trips being taken by car, which were previously taken by other modes
- How to cater for changes to land-use in the future – see Chapter 3.

Housing Need

4.51. The Structure Plan Issues Report (Norfolk County Council 2002) puts different options forward for where additional greenfield housing may be situated. This is set out in the left-hand column of the table below. The right-hand column indicates the likely transport implications for each option.

Table 4.3: options put forward in Structure Plan Issues Report for new housing and issues for NATS

Options put forward in the Issues Report for new housing	Issues for NATS
Concentrate the majority of new housing growth as part of a mixed-use development on the north-east fringe of Norwich, somewhere between the B1150 North Walsham Road and the A47 (East).	Much of this area benefits from reasonable proximity to the city centre and could be well served by public transport. However, there are poor existing road links between the area and the city centre. New housing here would be reasonably close to existing superstores and employment opportunities around the airport and St. Andrews and Broadland Business Parks. A large new development could also enable the comprehensive provision of infrastructure and services. A Northern Distributor Road (NDR) could

	serve the area and development could contribute to its funding. The potential for mass transit links would need to be investigated.
The significant expansion of Wymondham.	Wymondham would be relatively convenient for employment in the town and at the Norwich Research Park and the new hospital. Wymondham also provides a range of existing local services. Housing would be much further from jobs and services in Norwich and would tend to encourage car use.
A new village or significant expansion of an existing village could be considered.	This would be poorly related to existing jobs and services and unlikely to attract businesses on a scale to be truly "mixed use".
Divide it between north-east Norwich and Wymondham.	Issues as above.

Norwich International Airport

4.52. Access to the airport is via the Outer Ring Road; the signed route from the south being around the outer ring road to the west of the city and the A140 Cromer Road. This route is severely congested at times. Currently there is no public transport service to the airport and, although the Airport Park and Ride site is adjacent, the service does not call at, or pass by the terminal building.

4.53. Travel surveys carried out during 1999 showed that 73% of passengers and visitors to the airport arrived by car – with a further 20% arriving by taxi. Work done by Arup Economics and Planning (2002) shows that surface access is one of the potential constraints on growth. To achieve a high rate of growth without major investment in road infrastructure would require a significant modal shift. Up to 2.4mppa in 2030 could be accommodated on the road network without major road improvements, provided that the car driver modal share was reduced to about 40% from the current 80%. This seems unrealistic, even with improvements to access arrangements for non-car modes and demand management through parking constraints. Failure to achieve such mode targets could restrict the growth of the airport unless major road schemes such as the Norwich Northern Distributor Road were built. Norwich International Airport has completed a draft Surface Access Strategy which includes targets for mode share to the airport.

Norwich Research Park

4.54. Access to the Norwich Research Park area must be improved to allow it to reach its potential. The County Council's preferred strategy is to dual the B1108 from the Norwich Southern Bypass to the hospital and for construction of a link road from the A11 to Colney Lane. This latter road is needed for proposed housing development in Cringleford. These proposals have been the subject of public consultation.

Freight Issues

4.55. Freight issues include:

- access restrictions making it difficult for operators to access premises on certain streets;
- lack of loading bays causing congestion for other road users;
- use of pedestrianised areas by vehicles causing conflict with pedestrians;
- use of large vehicles in central historical core;
- congestion of road network;
- access to Norwich from rest of country.

Congestion and Vehicle Speeds

4.56. Overall, average speeds in the Norwich built up area are similar to those found in 1989. However, observation would suggest that congestion and delay has worsened since NATS3 was adopted, particularly on the ring roads to the north of the city. It is difficult to verify this from the journey time surveys, although it does appear that journey times on orbital or cross-city routes have increased, especially in the south-west area of the city. On routes out of the city to the south-east, journey times have reduced. This could be attributed to the opening of the Southern Bypass. Routes to the south show increased journey times, especially during the peak hours. Again, this may be attributable to changes in road layout, such as additional junctions on the A140 near Harford.

Table 4.2: Average Speeds (mph) within Outer Ring Road

	1989	2001
am peak	15.9	16.3
daytime	21.6	20.4
pm peak	17.0	16.4

Source: Journey time runs commissioned by Norfolk County Council.

4.57. The Department for Transport undertakes traffic speed surveys in the main urban areas of England. The average speed in Norwich found from surveys in 1999 was 16.9mph; this is very similar to that recorded in 2001 from the Council's surveys. The DfT undertook similar surveys in 1996, when the average speed in Norwich was found to be 19.2mph. These surveys therefore show a reduction in vehicle speeds in recent years, although this is not mirrored in the Council's surveys. Of the areas surveyed by the DfT in 1999, only Sheffield and Southampton had lower average speeds than Norwich (15.7 and 15.1mph respectively). The average of all the areas surveyed in 1999 was 21.0mph.

4.58. Journey times in the Norwich Area therefore remain an issue. However, improving journey times raises issues including:

- if vehicle speeds are increased there will be safety implications, particularly in the centre of Norwich;
- Increased vehicle speeds could discourage pedestrians and cyclists;
- There is an issue regarding the relative priority of motorised traffic compared to pedestrians, cyclists and public transport. For example journey times could potentially be improved by removing pedestrian

crossing facilities, or giving longer 'wait' times for pedestrians so where should the balance be struck?

- Adding additional capacity to the road network will impact on the built environment;
- Additional capacity could encourage more journeys to be made by car and not have long term benefits.

The Ring Roads and their Junctions

4.59. The work carried out for the County Council by MAP Research in 1999 indicated that 49% of the people surveyed had travelled across the city centre without stopping in the last 12 months:

- 25% of these people stated that it was because it was quicker than using the Inner Ring Road,
- 10% because it was easier to do so and
- 5% because the Inner Ring Road was too congested.

4.60. The ring roads are generally single carriageway roads with 'at-grade' junctions. Developments, particularly in recent years to the north of the city have increased the number of junctions and access points onto the ring roads, compromising their ability to cater for traffic movements. There is limited scope for capacity improvement to the ring roads without significant cost, although this is being looked at as part of the review of NATS. The County Council had previously put forward a scheme to complete the Inner Ring Road between Queens Road and Carrow Road. This scheme was rejected at a public inquiry.

4.61. The work for the 1990 review of NATS found 30 junctions in the city having delays of more than 60 seconds. The majority of these were on the Inner and Outer Ring Roads. There was a higher incidence of delay on the radials crossing the ring roads than on the ring roads themselves. As part of this review, work has been done to look at junctions on the inner and outer ring roads. This work identified junctions and other sites that are, or will be, causing delays. The worst sites are indicated on Plan No. 15.

4.62. The study identified work that could be undertaken to address the problems at the 41 junctions found to be causing, or that will cause, delays.

4.63. The problems here raise issues including:

- The relative priority given to traffic on the ring roads compared to traffic on radial routes
- Should the objective be to encourage traffic to use the ring roads rather than travel through the city centre? And if so, how should this be achieved?

Car Parking

4.64. In 1990, demand for parking at public and private car parks in the morning peak hour was found rarely to exceed 85% of supply. In the off-peak, demand was found to exceed, or be close to exceeding, supply, at about half of the car parks in the city centre. Further out, demand could be comfortably satisfied. For the NATS3 review, work done indicated that there was not

enough parking to keep in line with projected demand in the city centre. The work concluded that all city centre car parks could be required for non-commuter use by 2006.

Environmental

Introduction

4.65. Norwich is an attractive city, particularly in terms of the historic built environment. Transport infrastructure can present a direct threat to this. Additionally transport can present a threat to people's enjoyment of the built environment; for example traffic noise impacts on city centre outdoor cafes. The natural environment can similarly be affected by transport impacts.

4.66. This section also considers cycling, walking and public transport. Improvements to these modes could reduce the numbers of vehicles and improve air quality and impact on people's health. Cycling and walking could in themselves improve the health and fitness.

Noise and Visual Intrusion from traffic

4.67. Impacts, ranging from noise and visual intrusion to the impacts of the transport infrastructure, are widespread across the Norwich Area. Particular locations include:

1. The public spaces of the area (which range from parks and gardens, tranquil areas such as river valleys or open country at the edge of the built up area to places in the city, such as city centre outdoor cafes). There could be potential visual intrusion and noise annoyance problems. Examples include:
 - The attractive historical square of Tombland
 - Gurney Road, which runs through Mousehold Heath, a County Wildlife Site.
 - The Wensum Valley Area, including the village of Ringland, which is badly affected by traffic on several minor roads running through. This area is a candidate Special Area of Conservation.
 - Chapelfield Gardens / Roman Catholic Cathedral, where the road infrastructure dominates
2. Residential areas. Noise is a problem principally in residential areas where there is a high traffic density, especially on routes where there is a high proportion of heavy goods traffic. Previous work, completed in 1990, showed that noise exceeded:
 - 75dB(A) threshold on Boundary Road and
 - 70dB(A) threshold on most sections of the outer ring road, several of the radial roads, part of the Inner Ring Road and several roads within the city centre itself.

(These thresholds were considered appropriate by the consultants who undertook the work on behalf of the Council. The World Health Organisation guidelines, 1995, to avoid sleep disturbance are 30LaEq measured in the bedroom and for reported moderate annoyance as 50LaEq. Other guidelines are given in, for example, Planning Policy Guidance note 24 – Planning and Noise.)

Other noise issues include emergency vehicle sirens, as identified by residents on Earlham Road.

Intrusion from traffic, including lorries remains an issue in Costessey.

3. The built environment

- The Commission for Architecture and the Built Environment (CABE) and Radio 4's Today programme carried out a survey looking for the best and worst streets in Britain in September 2002. They found that, in East Anglia, the worst street was St Stephen's Street, Norwich. The following is a quote from the work:

"'This street in historic Norwich is hideous' sums up one voter. 'Dust, metal and concrete are the main impressions that I am left with after being on this street' says another. The main problem, apart from being 'always clogged up with traffic' seems to be the '1980s style barrier in the middle of the road'. Yet again, pedestrians hate the feeling of being penned in."

- Anglia Square / Magdalen Street, where the historic shopping street has been bisected by a flyover following completion of the Inner Ring Road in the 1970s.
4. Other locations where the transport infrastructure dominates the townscape include Boundary Junction, Pound Lane / St Williams Way junction and Rose Lane.

4.68. The main issue probably relates to where the balance should be struck between the need to cater for traffic against its impacts on the landscape and townscape. This balance could be struck anywhere between accepting the impacts of traffic and its associated infrastructure through to opening up areas for people's enjoyment (as for example could be achieved by closing Tombland to traffic and opening it up as a public open space).

Traffic in the Periphery of the Built up Area

4.69. Most orbital trips around the south of Norwich are made using the Norwich Southern Bypass. Orbital movements around the north, however, cause particular problems on the edge of the built up area. There are a number of particular routes or individual roads on which traffic is a problem including roads through residential areas as well as minor rural roads. The north west sector study (Norfolk County Council 1996, but using traffic count data from 1993) drew its own conclusion. This was that, between the A47 and A1067 at least, the outer ring road carried 65% of the longer distance through traffic. Longer distance through traffic was defined as traffic not having an origin or destination inside the north west sector.

4.70. This NATS review will consider whether a northern distributor road could overcome the problems. Potential issues include:

- Would a northern distributor road take traffic out of the current problem areas and would this be maintained over the longer term?
- The impact of a new road on the environment
- Severance, for example the need to maintain links between communities on either side of any new road.

Local Air Quality and Greenhouse Gases

4.71. Within the NATS area, only Norwich City Council has identified that air quality falls below Government standards. Air Quality Management Areas are likely to be declared around the Castle, Grapes Hill and St Augustines.

4.72. In the future, Air Quality is likely to deteriorate unless action is taken. A prediction to 2005 in the City of Norwich Local Air Quality Management Plan indicates a number of potential areas of exceedance. These include large areas of the city centre and most of the major radial and orbital routes.

4.73. Emissions of greenhouse gases have been identified as a worldwide problem. It is commonly recognised that greenhouse gases can lead to global warming. Emissions from transport sources have a rate of increase more than from any other source. This review has not been able to quantitatively assess levels of emissions from transport sources, but increases in motorised traffic are likely to lead to additional CO₂ emissions.

4.74. There is growing evidence regarding the effects of pollutants from road transport. Air pollution is a potential hazard to the population as a whole, but in particular to vulnerable groups including pregnant women, the elderly, those suffering from respiratory and coronary illnesses, children and workers with high occupational pollution exposure levels.

4.75. Exhausts from petrol engines are the largest contributors of non-natural benzene which, as a carcinogen, has been implicated in contributing to deaths from leukaemia. Other lesser sources of benzene include diesel exhausts and evaporation of petrol during its distribution and refuelling. Diesel particulates can aggravate respiratory diseases such as bronchitis and asthma. Technological advances such as catalytic converters have already reduced emissions and further progress is likely. However, the health effects of vehicle emissions are likely to remain a serious issue.

Other health impacts

4.76. Other health impacts from traffic include stress and anxiety, noise and lack of physical exercise. The public health recommendation for adults is to build up to take at least 30 minutes of moderate physical activity (like brisk walking) on five or more days of the week. Activities like walking or cycling provide protection against coronary heart disease, stroke, non-insulin dependent diabetes and osteoporosis and, through improved strength and co-ordination protect against falls, fractures and injuries. The activities can also play a part in weight control and the prevention of obesity. This may be a particular issue for children and young people, where there is growing evidence of obesity.

Walking

4.77. Delays to cyclists and pedestrians were identified as a problem for NATS 3. However, no work has been done since 1990 to look at the lengths of delays experienced by pedestrians. However, delays for pedestrians may be a particular issue in the city centre where a number of busy traffic routes cross the retail area. Within the city centre pedestrians may expect to be

afforded some priority as they go about their shopping or business activity. On some pedestrian routes there are signalised crossings (for example Bank Plain and Tombland) but on others crossing is uncontrolled (for example Rampant Horse Street and Red Lion Street). The work identified several sites where conflict between cyclists / pedestrians and vehicles was an issue.

4.78. Issues include:

- The length of time that pedestrians consider it acceptable to wait before attempting to cross a road.
- Safety implications (if for example pedestrians attempt to cross roads before traffic is stopped or if crossings are not provided)
- The impacts on traffic, journey speeds and congestion if pedestrians are given priority
- Whether there should be a standard across the whole of the road network, or whether different priorities (between vehicles and pedestrians) should be adopted on different types of road or in different areas. For example, there may be economic benefits if more pedestrians were attracted to the city centre
- The types of crossings that might be provided (zebra crossing, pelican crossing, underpass or overbridge) and their likely levels of use, which could be related to convenience and perceptions of their safety and security.

Cycling

4.79. Monitoring of the strategy to date shows the number of cyclists crossing the inner ring road to be fairly stable. This is consistent with work undertaken for the County Council in 1999 by MAP Research. This found that cyclists are committed to this mode and that very few are reducing use of their bikes. However, the work also found that “cyclists as a whole are less satisfied than other minority groups because of the fragmentation, inconsistency and danger from traffic in the current network provision... The issues appear to be the fragmentation of the cycle routes, the small number of cycle paths and the ‘stop-start’ aspect of existing provision that forces them back into the main flow of traffic suddenly and unexpectedly.” In addition, the one way system in the centre of Norwich results in a circuitous route for cyclists, although there is some provision of cycle routes to reduce travel distances.

4.80. Many of the issues are similar to those for pedestrians. A noteworthy one is the fragmentation of the network. In particular, provision often ceases in situations where it would be difficult or costly to provide, for example across the Dereham Road at its roundabout with the Outer Ring Road. One issue might be the value for money of providing such links.

Norwich Bus Station

4.81. Norwich Bus Station, built in 1934, is presently in a run-down state and does not meet the demands of the modern bus user. In a survey of transport in Norwich city centre (Map Research, 1999) respondents were very negative about the bus station with as many as 25% rating it as very poor. The problems with the station appeared to centre on cleanliness and the need to

update the station generally. When asked to rate what the priorities for transport improvements in the city centre should be, the bus station came second after improving bus services.

4.82. An opportunity to improve the bus station now exists. The County Council has bought the bus station site and has made a bid to Government for funding to redevelop the site. The bid also includes measures to provide bus priority through the city centre linking the bus and rail stations and a revitalised public transport interchange at the railway station.

4.83. The present bus station has a poor waiting environment, with little cover and poor seating. There are few facilities and few staff.

Reliability of Buses

4.84. Increasing levels of congestion are undermining the operation and attractiveness of bus services in the City. Bus journey times are becoming longer and journey times are increasingly unreliable. As a result some bus operators have reduced the frequency of bus services in order to restore the reliability of the service. This problem is likely to get worse as traffic levels increase in the future.

4.85. Issues relating to bus service provision and the bus station include

- The number of bus services that use the bus station, as opposed to services where passengers to the city centre disembark on-street
- Infrastructure provision for bus services and its impact on the built environment and the possibility that its provision may obstruct others, for example pedestrians
- The perception that buses are often seen as polluting and never full. Should bus facilities only be available for clean fuel vehicles?
- The impacts on road capacity for other vehicles if bus priority measures are introduced, such as bus lanes.

Powered Two Wheelers

4.86. Whilst powered two wheelers may offer a convenient travel choice for shorter journeys, being able largely to overcome congestion, this mode is not without its problems. The death rate per kilometre travelled is the highest of all modes - nearly 50 times that of cars, and 4 times that of cycling. Parking can be a problem due to a lack of dedicated facilities – see section 2.54. A major concern of motorcycle groups is that they are currently prohibited from using the bus lanes. Allowing such vehicles to use bus lanes could make them more attractive but raises issues such as potential conflict with other users (buses and cyclists).

Chapter 5: Summary and Conclusions

Summary

5.1. Work has been done to identify

- Identify characteristics of the Norwich area, including its transport network, landscape and economy
- Examine progress in implementing the current NATS strategy in terms of what progress has been made in achieving its targets
- Identify transport-related problems and issues.

5.2. A project team led by Norfolk County Council has completed this work. The Team's work was supplemented by a stakeholder event on problems and Issues held in February 2003. The outcomes of this conference are detailed in a separate report.

Conclusions

5.3. In summary, this report sets out that:

- The population in the area has been on a rising trend in the last 10 years, although this increase has been outside of the Norwich City area, which has seen a steady reduction. In the future the NATS area is likely to see further population increases and large numbers of new houses. This, together with changes in social trends, which are likely to see smaller house sizes, is likely to lead to transport pressures;
- The Norwich area has a wealth of wildlife and high quality landscapes and, particularly in the centre, a fine built environment. In addition to the impact that the present transport system and its infrastructure has on the built and natural environment, it presents constraints on what is possible as part of a future transportation strategy. For example the river valley presents a constraint to transport infrastructure;
- Traffic levels are increasing around Norwich, but the numbers of vehicles crossing cordon-counting points on the ring roads is reducing. The rate of reduction is greater across the inner ring road. Journey times appear to be similar to those of ten years ago. Despite this, congestion is cited as one of the worst problems in the area. Congestion can affect the attractiveness of the area to businesses and visitors as well as causing delays for public transport services. There are particular problems from traffic travelling around the north of the city. These problems include congestion on the outer ring road and traffic using unsuitable minor roads and residential streets at the edge of the built-up area;
- Norwich's retail centre is rated as one of the top-ten in the country, but there are concerns that the viability of the centre could be compromised by difficulties of access to it. Of particular concern is the perceived lack of car parking in the centre (which at present has been heightened by structural problems at multi-storey car parks, leading to demolition). An alternative to driving into the city centre and parking is public transport. Park and Ride is well liked by users and has seen increases in its use. Scheduled bus services, however, are given as many people's worst problem. They are not seen as offering a reliable, frequent and convenient service;

- The lack of adequate transport links is cited by businesses as a threat to new or continuing investment in the area. In particular, problems of not having a continuous dual-carriageway link to the motorway network and difficulties for business in North Norfolk in accessing the main transport links south and west of the city are cited;
- Parts of the area suffer from deprivation, high crime or road-traffic accident rates and a relative lack of accessibility for residents. The future transportation strategy needs to tackle these linked problems (termed 'social exclusion'). This will be a major challenge.

5.4. The stakeholder conference showed that there was a good level of support for the existing strategy but that

- There were concerns that some aspects of the strategy had not been given due focus when it came to implementation;
- There should be better enforcement and education and that this should be part of a future strategy.