NESTRANS Regional Transport Strategy 2021

A Rapid Health Impact Assessment

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January 2008

Executive Summary

Background

Nestrans is the Regional Transport Partnership for Aberdeen City and Aberdeenshire. Its purpose is to develop and deliver a long-term regional transport strategy and take forward strategic transport improvements that support and improve the economy, environment and quality of life across Aberdeen City and Shire.

The regional transport strategy published in March 2007 sets out the transport related challenges for Aberdeen and Aberdeenshire and how these challenges can be responded to between now and 2021.

Whilst the primary function of transport is enabling access to people, goods and services it can also have direct or indirect impacts on health. These impacts may be classified as relating to:

- Economic impacts
- Accidents related to travel
- Pollution (including noise) / impacts on the physical environment affecting health
- Physical activity
- Access to goods and services
- Maintenance and development of community and social networks

Health Impact Assessment

Health impact assessment (HIA) is a combination of procedures or methods by which a policy, program or project may be judged as to the effects it may have on the health of the population. The aims of this HIA were as follows:

1. To identify the potential health impacts of elements of the NESTRANS Regional Transport Strategy (RTS) 2021.
2. To make recommendations as to how positive health impacts associated with the strategy may be promoted and negative impacts be avoided or ameliorated.
3. To identify elements of the strategy that will require a more detailed health impact assessment to be undertaken.

Methodology

Following screening by the Public Health Unit, NHS Grampian, a rapid HIA was undertaken, under the leadership of a joint health and transport Steering Group, concentrating on the following three sub-elements of the RTS:

1. Expansion and promotion of the use of public transport; e.g. IC1, IC5, IC3, IC7, EC1, EC3
2. Transport infrastructure proposals; e.g. IC2
3. Changes promoting walking and cycling e.g. IC6

Following a review of the published evidence linking transport and health, a stakeholder group was brought together including expertise from health, planning, transport and social care to assess the impacts of the RTS proposals on health and to undertake an equality assessment.

The following recommendations are derived from the stakeholder participatory workshops. It should be noted that this was a rapid HIA and as such did not include local community stakeholders. Members of the stakeholder groups were purposively chosen for their knowledge and experience rather than as representatives of organisations, groups or geographies.

This rapid HIA set out to assess the impact and inform the implementation of a number of key strategic proposal areas within the NESTRANS RTS. The following recommendations are made.

Expansion in public transport

1. In order to maximise the positive health benefits associated with an expansion in public transport, particularly reduced pollution and accidents, it will be necessary to ensure that modal shift away from private transportation occurs.

2. In the initial phases of expansion in public transport provision there will be a need to raise awareness of safety, particularly in urban areas, where an initial overall increase in traffic density may lead to increases in road traffic accidents.

3. If the potential negative effects of increased pollution, especially particulates, are to be avoided in urban areas, in particular the effects on those in more deprived communities, then expansion of public transport must be delivered with reductions in both individual and total vehicle emissions.

4. To create a sustainable change in behaviour action should be taken to promote the use of public transport amongst adolescents and young people before they take up private transport use and behaviours. This group was also felt to be amongst those groups less likely to receive benefits from public transport currently.

5. In expanding public transport consideration should be made of the balance between accessibility of public transport access points (e.g. bus stops) and the beneficial physical activity undertaken by people in travelling from their point of origin to the access point for public transport.

6. In expanding public transport there is a need to consider the needs of both people with physical disabilities, or impaired mobility, and of young families. Both these groups could benefit significantly from an expansion in public transport but only if their needs for low level access and space once on the bus for wheelchairs, frames and prams are provided.

7. Public transport expansion should take account of where individuals access services both now and in the future, particularly essential services such as healthcare.

Infrastructure proposals

1. Accident reductions associated with infrastructure improvements may only be delivered if such improvements do not lead to increases in traffic volume.

2. There is a need to continue the monitoring of air quality within Aberdeen and for the NHS to monitor the health of residents within areas of recognised poorer air quality.

3. Infrastructure proposals leading to potential increases in physical activity in the form of functional commuting may only occur if traffic volume decreases and or safety, and perceived safety, improves.

4. Infrastructure improvements should be assessed and developed to minimise community severance both in new developments e.g. the Aberdeen Western Peripheral Route (AWPR) and existing roads where volume of traffic is presenting a barrier to community and social networking.

Proposals to increase walking and cycling

1. Walking and cycling should be promoted as low cost, zero emissions forms of transport that benefit the individual and the environment.

2. Such proposals should be linked to infrastructure changes to improve real and perceived safety.

3. Education should be undertaken to underpin any increase in cycling and walking if a rise in the crude number of accidents is to be avoided, particularly until a critical mass effect is attained.

4. Functional physical activity, e.g. commuting to work by bike, should be encouraged but not simply as a trade off for other physical activity undertaken in spare time.

Recommendations for further work

1. It is recommended that work should be undertaken through public health, NHS Grampian with partners in the local authority and NESTRANS to monitor the health of the local population, particularly in areas where air quality is poorest or at risk of being poor.

2. It was noted that detailed environmental impact assessments, including air quality and noise, had been or would be carried out for major projects such as the AWPR and development at Aberdeen Airport. It is recommended that consideration be given to undertaking prospective health impact assessments of major projects in the future.

Acknowledgements

The Steering Group would like to acknowledge the input of the following people to the stakeholder workshops undertaken as part of this assessment.

Rab Dickson	Transport Strategy Manager, NESTRANS
Ben Kerfoot	Transport Executive, NESTRANS
Ewan Wallace	Head of Transportation, Aberdeenshire
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1: Introduction

1.1 Background

Nestrans is the Regional Transport Partnership for Aberdeen City and Aberdeenshire. Its purpose is to develop and deliver a long-term regional transport strategy and take forward strategic transport improvements that support and improve the economy, environment and quality of life across Aberdeen City and Shire.

The regional transport strategy published in March 2007 sets out the transport related challenges for Aberdeen and Aberdeenshire and how these challenges can be responded to between now and 2021[1].

The strategic vision outlined in the strategy is one of a 'transport system for the north east of Scotland which enables a more economically competitive, sustainable inclusive society'.

Whilst the primary function of transport is enabling access to people, goods and services it can also have direct or indirect impacts on health. These impacts may be classified as relating to:

- Economic impacts
- Accidents related to travel
- Pollution (including noise) / impacts on the physical environment affecting health
- Physical activity
- Access to goods and services
- Maintenance and development of community and social networks

A summary of key health impacts is provided in Table 1.

Table 1: Summary of the key transport related effects on health

Health Promoting	Health Damaging
Enables access to: Employment Shops Recreation Social support networks Health services Countryside	Pollution: Particulates Carbon monoxide Nitrogen oxides Hydrocarbons Ozones Carbon dioxide Lead
Recreation	Transport related injuries
Exercise	Noise
Economic development	Stress and anxiety
	Loss of land and planning blight
	Severance of communities
	Constraints on mobility access and independence
	Reduced social use of outdoor space due to traffic and roads / streets

Source: Faculty of Public Health Medicine [2]

1.2 Commitment to HIA

Health and transport have a close interdependence, both in terms of the particular accessibility requirements to health care facilities, and the generic impacts that transport can have upon community health. The Regional Transport Strategy recognises the need to address the issues of access to hospitals and health services, encouraging active travel to improve health, and addressing the impact of emissions on public health.

The regional strategy makes a commitment to the development of a health and transport action plan and the undertaking of a health impact assessment.

This document describes the process, results and recommendations of the health impact assessment undertaken for the Regional Transport Strategy.

1.3 Health Impact Assessment

Health impact assessment (HIA) is a combination of procedures or methods by which a policy, program or project may be judged as to the effects it may have on the health of the population[3]. Its purpose is two-fold:

1. To assess the potential health impacts - positive and negative - of policies, programmes and projects.
2. To improve the quality of public policy decision making through recommendations to enhance predicted positive health impacts and minimise negative ones[3].

The results of HIA may be used to change a proposal or guide the implementation of a strategy to protect and promote the health of the community or population.

1.4 Steps in HIA

Figure 2 provides a schematic overview of the stages undertaken in health impact assessments[3].
HIA involves five key stages[4]:

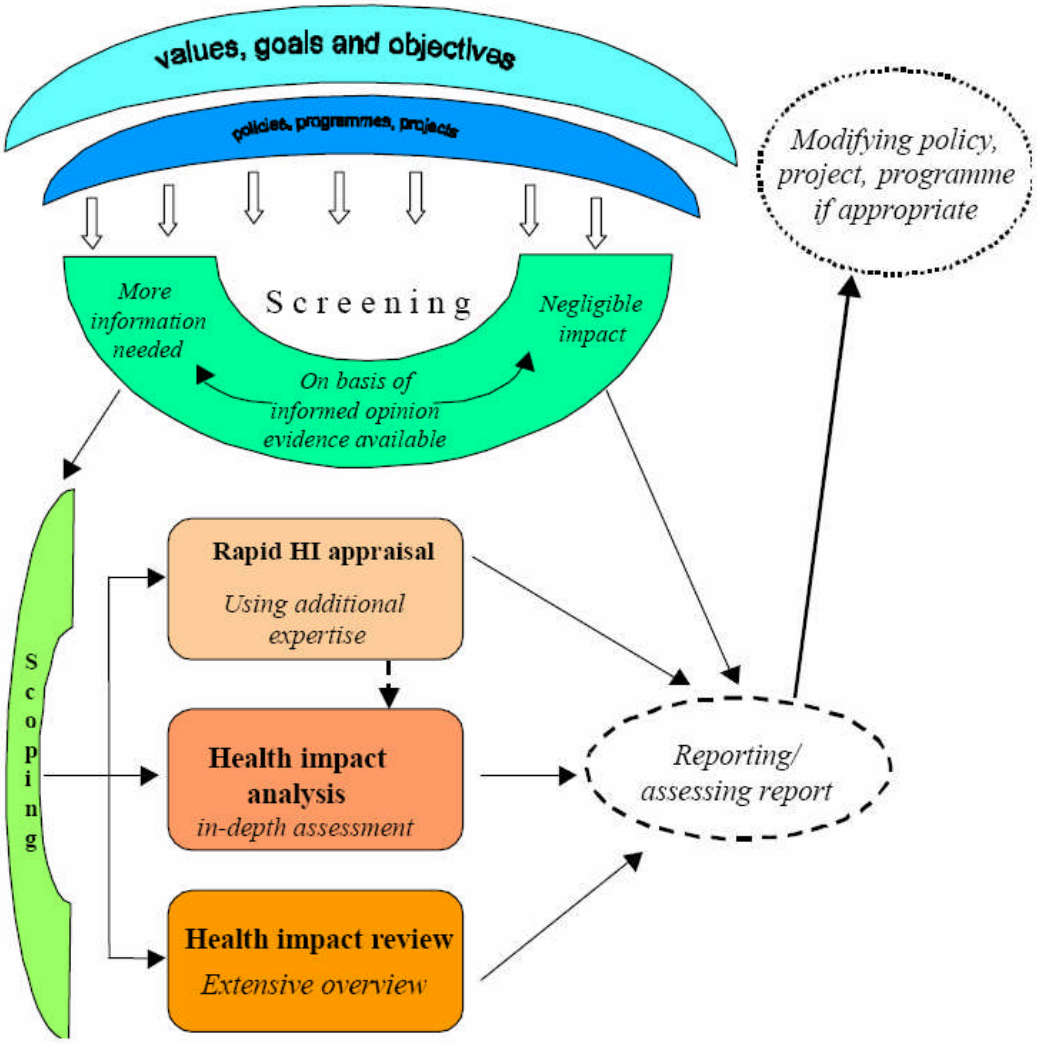
1. Screening – To make a decision as to which proposals should be subject to HIA.
2. Scoping – Agreeing the boundaries of the HIA.
3. Appraisal – Assessing the health impacts of this proposal, and what changes could be suggested to minimise / ameliorate the negative and maximise the positive.
4. Decision-making – Making recommendations to change the proposal in order to minimise / ameliorate the negative and maximise the positive health effects.
5. Monitoring and evaluation – Agreement of the outcomes to be assessed associated with the changes to implementation recommended as part of the HIA.

1.5 Types of HIA

There are three types of HIA[5]:

1. Rapid – Completed in a limited timeframe using existing, readily available information and data.
2. Comprehensive / in-depth: Completed in an extended timeframe, including the collection and analysis of new information and data.
3. Intermediate: A combination of rapid and comprehensive approaches where timeframes are limited but new data collection and analysis is involved.

Figure 1: Approach to Health Impact Assessment



Source: WHO, 1999[3]

2: Process and Methods

2.1 Screening

Screening was undertaken by members of the public health unit, NHS Grampian. Following the screening process it was concluded that the proposals laid out in the strategy may have potentially significant impacts on health to a large proportion of the Grampian population and that a number of the proposals within the strategy will be irreversible when implemented. The evidence base for transport impacts on health has been recently reviewed[5] but there still remained significant gaps in knowledge. Therefore it was agreed there was a need to consider the local health impact of the transport strategy in more depth through a rapid health impact assessment.

2.2 Scope of the Health Impact Assessment

Rapid Health Impact Appraisal is a systematic assessment of the health impact of a policy, programme or project by a number of experts, decision-makers and representatives of those potentially affected by the proposed policy. It is based on an exchange of the existing knowledge of the participants involved, including knowledge gained from previous similar exercises and research. The rapid HIA of the NESTRANS strategy was delivered through a combination of desktop analysis and participatory workshops (Appendix 2).

2.3 Steering Group

A steering group was set up including representation from NESTRANS, NHS Planning and Public Health. This group undertook the role of overseeing the health impact assessment process and specifically to advise / agree the scope and aims of the HIA, the elements of the NESTRANS strategy to be focussed on in the HIA, the planning and development of the participatory workshops and delivery of the final report.

2.4 Aims of this HIA

1. To identify the potential health impacts of ***elements*** of the NESTRANS Regional Transport Strategy 2021.
2. To make recommendations as to how positive health impacts associated with the strategy may be promoted and negative impacts be avoided or ameliorated.
3. To identify elements of the strategy that will require a more detailed health impact assessment to be undertaken.

2.5 Sub-elements of the strategy to be covered by this HIA

In deciding which elements of the strategy were to be included in the rapid HIA the steering group considered which elements were the greatest:

- priority in the context of local, regional and/or national targets, goals and priorities
- concern in terms of potential health impact based on an analysis of the available evidence for the health impacts of transport and transport policy
- in terms of local needs and circumstances

In considering the above the steering group also considered whether impacts would be

- potentially severe or irreversible negative impacts

- effecting a large number of people
- differentially experienced by those who are socially excluded or currently experience poor health
- positive impacts with potential for greater health gain.

The steering group considered the following elements to be a high priority for inclusion in the rapid HIA:

1. Expansion and promotion of the use of public transport; e.g. IC1, IC5, IC3, IC7, EC1, EC3
2. Transport infrastructure proposals; e.g. IC2
3. Changes promoting walking and cycling e.g. IC6

N.B. More detailed descriptions of these proposals are provided in Appendix 1.

The Steering Group agreed that whilst the general health impacts of the expansion of Aberdeen airport and the Aberdeen western peripheral route would be included in the assessment of the transport infrastructure proposals, there may be a need to undertake further specific work relating to these two developments.

2.6 Review of the published evidence

At the time of undertaking this HIA work was being completed nationally, led by Health Scotland, to publish a guide to health impact assessment for transport initiatives. This guide includes an up-to-date systematic review of published evidence of transport, access and health, transport and links to health and health determinants and health and health related impacts of transport interventions. Therefore it was with the agreement of the Steering Group that this review be used as the mainstay of the evidence in the NESTRANS RTS HIA and that this should be supplemented by retrieval of HIA reports from other areas or which demonstrated best practice in HIA methodology.

2.7 Population profile

Population profiles for Aberdeen city and Aberdeenshire were collated using routine local data and key local strategy documents, particularly the local Joint Health Improvement Plans.

2.8 Selection of the Transport Rapid HIA Stakeholder Group

The Stakeholder Group was selected to provide a range of expertise across health and transport across the NESTRANS geography. Invitees were selected on the basis of their individual expertise in either health, transport or both with the aim of putting together a group whose combined experience and expertise could be used to assess the health impacts of the NESTRANS RTS.

Stakeholder group membership is provided in Appendix 2.

2.9 Appraisal of health impacts

2.9.1 Stakeholder workshops

Two participatory stakeholder workshops were undertaken in late 2007, details provided in Appendix 3. The first concentrated on the expansion and promotion of the use of public transport; e.g. IC1, IC5, IC3, IC7, EC1, EC3 whilst the second covered NESTRANS transport infrastructure proposals; e.g. IC2 and changes promoting walking and cycling e.g. IC6.

The aims of the workshops were to:

- Identify the potential health impacts of selected elements of the NESTRANS RTS 2021.
- Make recommendations as to how positive health impacts associated with the strategy may be promoted and negative impacts be avoided or ameliorated.

2.9.2 Assessment and grading of health impacts

A HIA matrix was developed for the assessment of health impacts based on the results of the literature review.

The matrix used was developed based on a combination of approaches used in the HIA of Edinburgh Council's urban transport strategy [6], the Integrated impact assessment checklist developed by NHS Grampian [7] and the health outcomes and related health determinants identified in the guide to 'health Impact Assessment of Transport Initiatives' published by health Scotland in 2007 [5]. Groups and impacts included in the assessment are provided in Table 2.

Table 2: Groups and impacts assessed during the participatory stakeholder workshops

Population sub-group	Impact assessed
Young Families • Affluent • Deprived	General
Adolescents • Affluent • Deprived	Economic
Elderly • Affluent • Deprived	Accidents
Working people • Affluent • Deprived	Pollution / physical environment
Unemployed Deprived	Physical activity
Specific groups effected?[1]	Access to goods and services
	Community and social networks

[1] Any particular community groups effected by the assessed element of the strategy including: Black and ethnic minority (inc. gypsy / travellers, refugees and asylum seekers); people with disabilities, religious groups / faiths, lesbian, gay, bisexual and transgender; communities in areas of disadvantage; people with mental health problems; homeless people; people involved in the criminal justice system; rural groups.

Workshop participants used the matrix to quantify impacts for each population sub-groups on a scale of -3, -2, -1, 0, +1, +2, +3 (negative through neutral to positive impacts).

In addition an assessment of Equality impact was undertaken based on the assessment criteria used in the equality domain of the Integrated impact assessment checklist developed by, and used in, NHS Grampian. This assessment included the impact on: relations between groups; discrimination; social and family support; inclusion and access to information.

3: Profile of Aberdeen and Aberdeenshire

3.1 Geography

In the north east of Scotland Aberdeen city sits around the mouths of the rivers Don and Dee covering an area of almost 73 square miles. Aberdeenshire extends around the city of Aberdeen, representing 8% of Scotland's overall territory, making it the 4th geographically largest of the 32 local authority areas. Aberdeenshire is predominantly rural, with a mixture of rural villages and small towns.

The way land use and the economy have developed has led to housing and employment locations in the area being dispersed. More than half of the region's population (56%) lives outside the City and employment density averaged across the north east is very low. High income levels, rural living, employment sites away from transport nodes and other factors combine to generate high levels of car ownership and car use. Scottish Household Statistics show that 60% of Aberdeen residents and 71% of Aberdeenshire residents drove to work in 2002/03.

3.2 Economy

The region makes a strong contribution to the Scottish economy with the wider Grampian area (that is Aberdeen City, Aberdeenshire and the neighbouring area of Moray) outperforming Scotland as a whole in terms of economic performance over a number of years. In recent years, the region has ranked third in the UK with 2004 Gross Value Added (GVA - a measure of economic performance) per head 25% above the national average, reflecting the economic structure and the level of wealth generated by the oil and gas sector.

3.3 Population

The General Register Office (GRO) for Scotland estimates for the mid-year populations of Aberdeen City and Aberdeenshire for 2006 were 206880 and 236260 respectively.

Projections indicate an overall increase in the population between 2006 and 2031 although this will be made up by a fall in population in Aberdeen city of around 9% and an increase in the Aberdeenshire population of 19% (Figure 2). As can be seen in Figures 3 and 4 these changes are also significant because of the changing structure in the population. In Aberdeen city there is a predicted marked fall in children and working population (over 20% for each) and in Aberdeenshire whilst child and working population numbers remain relatively stable population growth is driven by retirees. GRO estimates indicate an expected 120% increase in the number of retired people living in Aberdeenshire.

Figure 2: Estimated population projections for Aberdeen City and Aberdeenshire 2006-2031;GRO

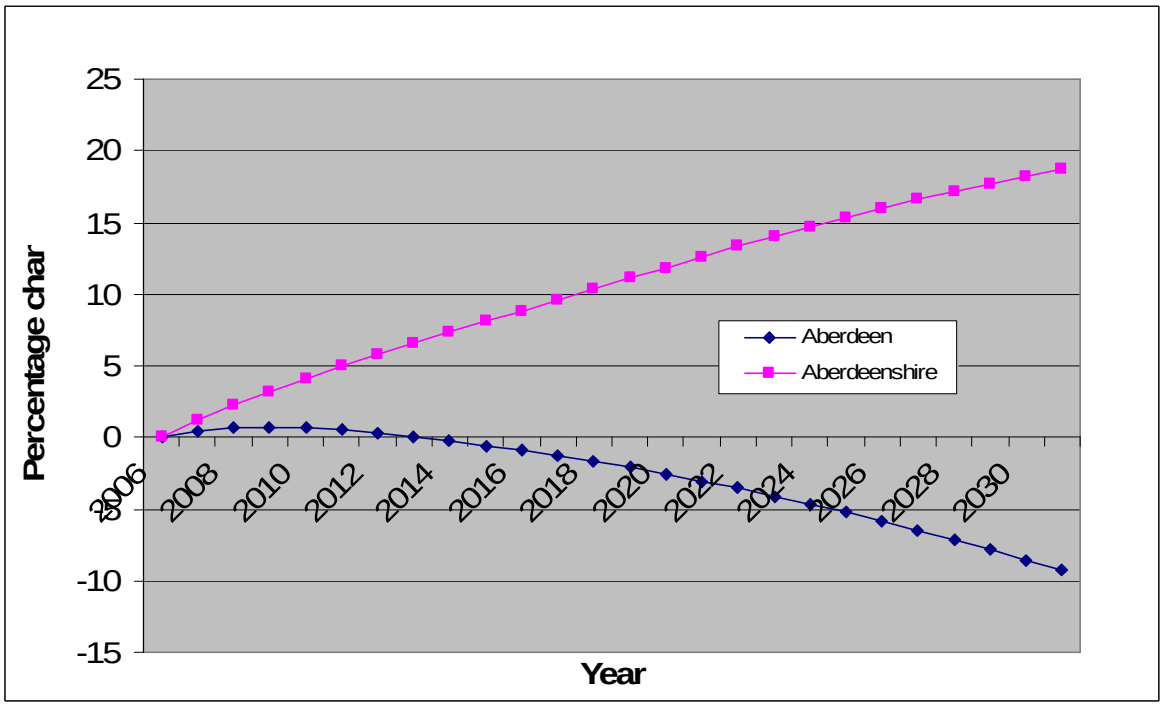


Figure 3: Percentage change in population of Aberdeen city by age group and projection year

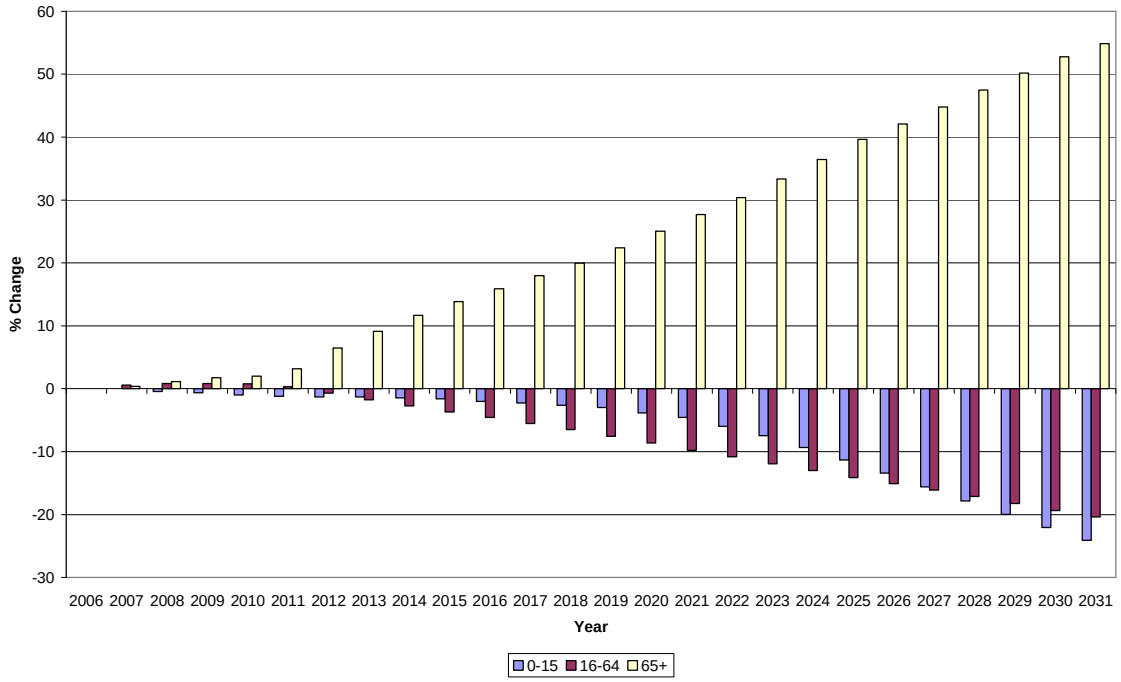
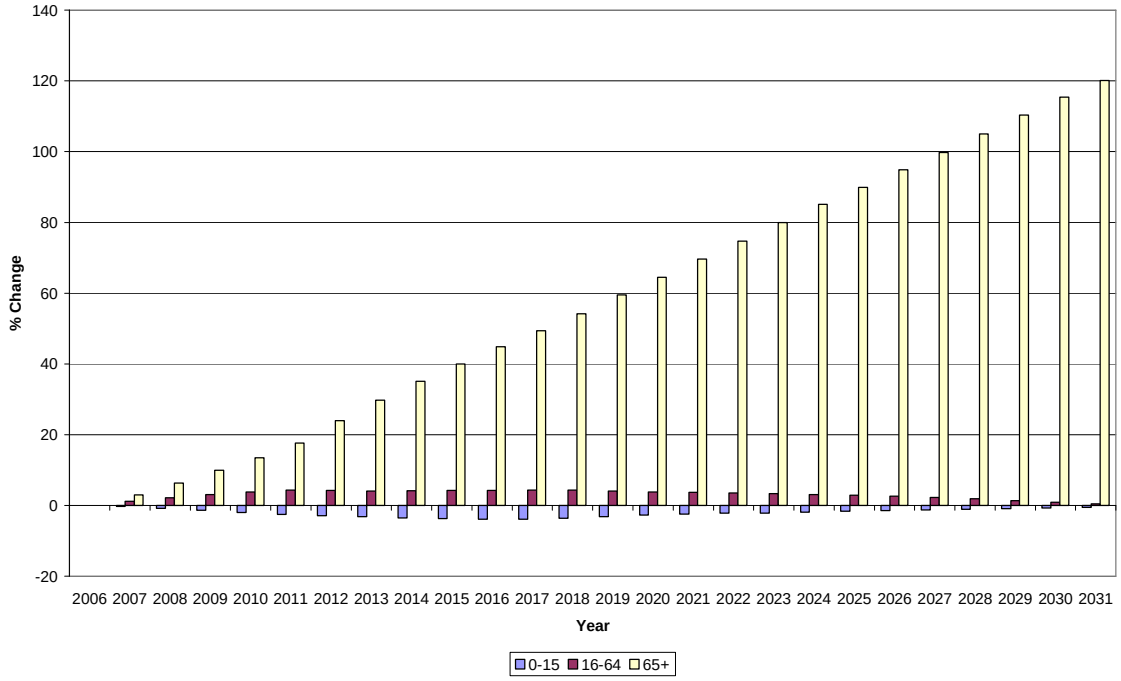


Figure 4: Percentage change in population of Aberdeenshire by age group and projection year



In addition to the crude population growth and decline envisaged there are changes in the household makeup within the area which is expected to fuel further growth in the number of households.

3.4 Economy and Employment

Evidence on earnings shows that the region enjoys higher male average earnings than for Scotland, and Great Britain as a whole. Scottish Executive Statistics show that average earnings in the north east were 3% higher than GB in 2004, despite Scotland, as a whole, being 10% below the GB average. This reflects earnings in the oil and gas related sector, which despite accounting for only some 15% of employment is a dominant player in the regional labour market. Unemployment rates within the region are relatively very low. Aberdeen City has an average rate of 1.7% (2006), whereas Aberdeenshire has a rate of just 1.1% (2006). These rates remain lower than both Scottish statistics (3.0%) and UK (2.7%).

3.5 Deprivation

The picture of a generally wealthy area often hides the fact that there are pockets of significant deprivation within Aberdeen city and Aberdeenshire which are ranked among the 5% most deprived areas in Scotland, according to the Scottish Index of Multiple Deprivation.

These include areas within the Woodside, Tillydrone, Middlefield, Cummings Park, Torry and Seaton neighbourhoods in Aberdeen, which are the focus of regeneration master plans whilst Northfield, Hanover, Hilton, Sunnybank, Mastrick and the city centre are considered as being ‘at risk’. In Aberdeenshire, two areas covering Fraserburgh North and Peterhead Central (Roanheads) fall within the 5% most deprived in Scotland, and a

further four areas fall within the worst 15% in Scotland. They cover Fraserburgh East and Blackhouse, Buchanhaven and Clerkhill.

3.6 Transport Behaviour

3.6.1 Car ownership and use

Car ownership in the north east is higher than the national average of 66% of households, and the rate of increase is slightly higher than the average for Scotland, however a significant number of people do not have access to a car. Aberdeen's level of car ownership with 85,600 cars is 24% greater than the average of Scotland's large urban areas. In Aberdeenshire, car ownership of 123,100 cars is 21% greater than in comparable rural areas (the average of accessible small towns, remote small towns and accessible rural areas).

The 2001 Census showed that in Aberdeen over 30% of households (and in some Aberdeenshire towns over 20% of households) do not have access to a car. Car use is high in the north east; half of motorists in the north east of Scotland use their car every day. Within the population aged 17 and over:

- 45% of residents in Aberdeen City use a car every day, compared to 34% in urban Scotland as a whole.

- 55% of Aberdeenshire residents use a car every day, compared to 47% in rural areas averaged across Scotland, although often this is a necessity which causes economic hardship requiring other sacrifices.

These proportions have remained relatively stable between 1999/2000 and 2003/2004. The proportion of journeys to work by car in the north east has risen steadily from 68% in 1999/2000 to 73% in 2003/2004, in contrast to the average for Scotland which remained static at around 68%. Distances travelled to and from work or study are higher for those people living in Aberdeenshire than in Aberdeen city [8].

3.6.2 Bus travel

While use of the car has grown, in contrast, numbers travelling to work by bus have dropped relative to the national average. In 2003/04 among employed adults:

- 12% of city residents travelled to work by bus compared to 19% in urban areas.

- 4% of Aberdeenshire residents travelled to work by bus compared to 7% in rural areas.

- 15% of city residents walked to work compared to 14% in urban areas.

- 11% of Aberdeenshire residents walked to work compared with 15% in rural areas.

Overall, bus use is relatively low in the north east, although investment in improved services and fleet has resulted in growth in recent years. In both the City and Shire, the proportion of residents using buses more than twice a week was below the corresponding urban and rural averages, and especially so in Aberdeenshire. Access to services and service frequencies are factors that affect how often people use buses:

• 72% of city residents live within 6 minutes walk of a bus stop and a service frequency of 26 minutes or better, compared to 65% for large urban areas in general.

• Only 9% of Aberdeenshire residents live within 6 minutes walk of a bus stop and a service frequency of one bus every 26 minutes or better, compared with 16% in rural areas on average.

Survey findings on views on bus services show more positive views in the north east than other areas with regard to running on time, frequency, meeting needs, personal safety/security and information. However, residents of both Aberdeen and Aberdeenshire were more negative than residents of Scotland's urban and rural areas with regard to interchange (integration) and value for money.

3.6.3 Cycling

Levels of cycling to work were similar in all areas at between 1% and 2%, despite cycle ownership being relatively high. In 2003/04 just 3% of people in Aberdeen and 4% in Aberdeenshire had cycled as a means of transport in the previous week; 3% in Aberdeen and 6% in Aberdeenshire cycled for pleasure or to keep fit.

3.6.4 Rail travel

The rail network in the north east is very limited in extent and less than 1% use rail for travel to work, although in towns with a good rail service this can rise to 4%, such as Stonehaven. Scottish Household Survey data show that

• 91% of Aberdeen residents had not used a train in the month prior to the survey, compared to 81% in large urban areas across Scotland.

• 93% of Aberdeenshire residents had not used a train in the month prior to the survey, compared to 87% in rural areas on average.

There are three direct rail services to London per day via the East Coast, plus an overnight sleeper service. There is one Cross-Country service per day, providing a direct link to the north of England.

3.6.5 Air travel

The north east depends to a greater degree than many regions on the ability of people to use air travel in and out of the region on business - not just the day and short stay business visitor but also for people working offshore. Research indicates that access to a range of frequent direct air services is important for inward investment and city development. Aberdeen currently has services to many UK and European destinations including direct services to 24 business destinations.

4: NESTRANS Regional Transport Strategy

4.1 Background

It is not the purpose of this document to convey the full description of the NESTRANS RTS. A brief summary is provided as context to the HIA. Further information is available in the full RTS report (available at http://www.nestrans.org.uk/strategy/strategy.asp)

The Regional Transport Strategy (RTS) sets out the challenges facing Aberdeen City and Aberdeenshire over the next fifteen years and how we will address them. It includes a comprehensive appraisal of the problems and issues affecting transport in the north east, sets clear objectives and proposes a detailed plan of action for improving transport in the region between now and 2021.

The accessibility of Aberdeen City and Shire to the rest of Scotland, the UK and the wider world is essential to achieving sustainable economic growth and a high quality of life. Transport connects people to jobs, healthcare, education and other public services. It also helps connect communities and enables people to access retail and leisure facilities, meet with friends and family, promoting social inclusion across the region. The RTS has a key role to play in shaping the future of Aberdeen City and Shire and contributing to the achievement of wider economic and social goals for the region.

4.2 Key issues addressed by the strategy

In developing its strategy NESTRANS identified twelve key issues that required to be addressed (Table 3).

Table 3: Key issues to be addressed by the NESTRANS RTS

Supporting sustainable economic growth	Improving connectivity	Developing a strong city centre
Reducing emissions of greenhouse gases and pollutants	Increasing public transport usage	Supporting vibrant Aberdeenshire towns
Ensuring social inclusion	Ensuring efficient movement of goods	Embracing new technologies
Improving safety and security	Maximising the benefits of the Aberdeen Western Peripheral Route (AWPR)	Changing travel behaviour

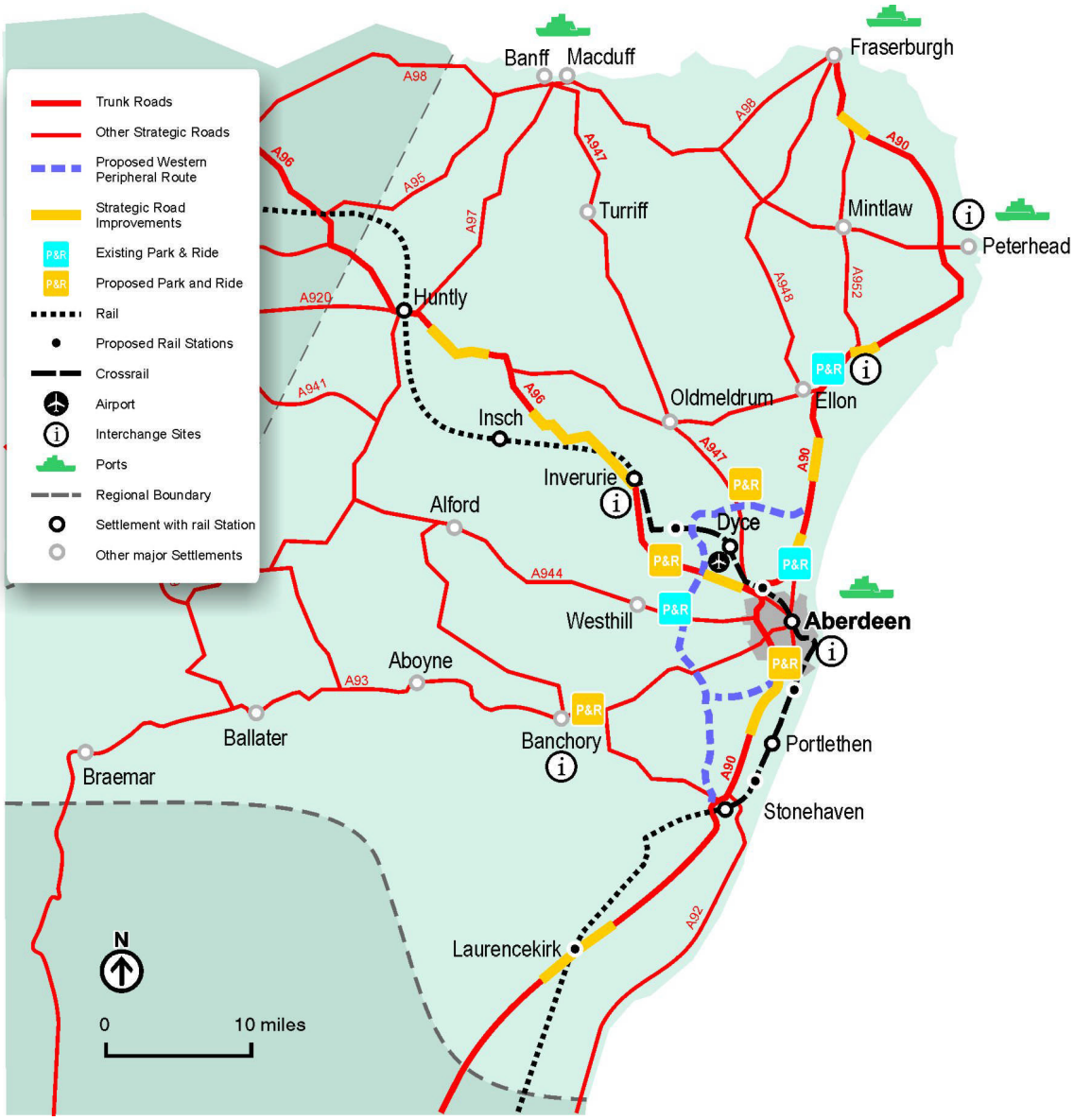
Table 4: NESTRANS Regional Transport Strategy Objectives

Economy	To enhance and exploit the north east's competitive economic advantages, and reduce the impacts of peripherality.	• To make the movement of goods and people within the north east and to/from the area more efficient and reliable. • To improve the range and quality of transport to/ from the north east to key business destinations. • To improve connectivity within the north east, particularly between residential and employment areas.
Accessibility, safety and social inclusion	To enhance choice, accessibility and safety of transport, particularly for disadvantaged and vulnerable members of society and those living in areas where transport options are limited.	• To enhance travel opportunities and achieve sustained cost and quality advantages for public transport relative to the car. • To reduce the number and severity of traffic related accidents and improve personal safety and security for all users of transport. • To achieve increased use of active travel and improve air quality as part of wider strategies to improve the health of north east residents.
Environment	To conserve and enhance the north east's natural and built environment and heritage and reduce the effects of transport on climate and air quality.	• To reduce the proportion of journeys made by cars and especially by single occupant cars. • To reduce the environmental impacts of transport, in line with national targets • To reduce growth in vehicle kilometres travelled.
Spatial planning	To support transport integration and a strong, vibrant and dynamic city centre and town centres across the north east.	• To improve connectivity to and within Aberdeen City and Aberdeenshire towns, especially by public transport, walking and cycling. • To encourage integration of transport and spatial planning and improve connections between transport modes and services. • To enhance public transport opportunities and reduce barriers to use across the north east, especially rural areas.

Source: NESTRANS RTS 2021[1]

Figure 5 provides an overview of the main actions proposed in the regional Transport Strategy

Figure 5: Overview of the main actions proposed in the Regional Transport Strategy



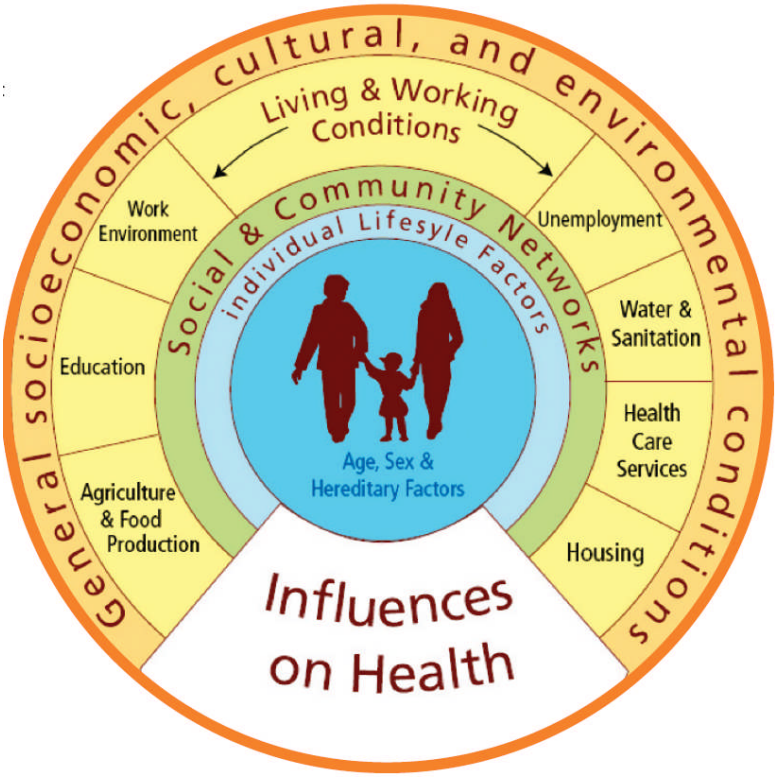
5: Evidence base for health impacts relating to transport

This section summarises the evidence for impacts related to transport on those determinants of health used in the assessment process.

5.1 Determinants of health

Health determination is complex and is perhaps best visualised in the model proposed by Dahlgren and Whitehead. In this model interaction can take place both within the layers and between them. For example an individuals cardiovascular risk could be linked to their genetic predisposition; their sex; their age; their socioeconomic status, which will impact on both their lifestyle behaviour and their responses to ill health and health promoting messages; their job; local environment and services, including transport and the legislative changes delivered through, for example, the ban on smoking in public places.

Fig. 6: Dahlgren and Whitehead "Wheel of Health" model



Source: Dahlgren, G. & Whitehead, M. 1991. Policies and strategies to promote social equity in health. Stockholm: Institute of Futures Studies [9].

5.2 Economic

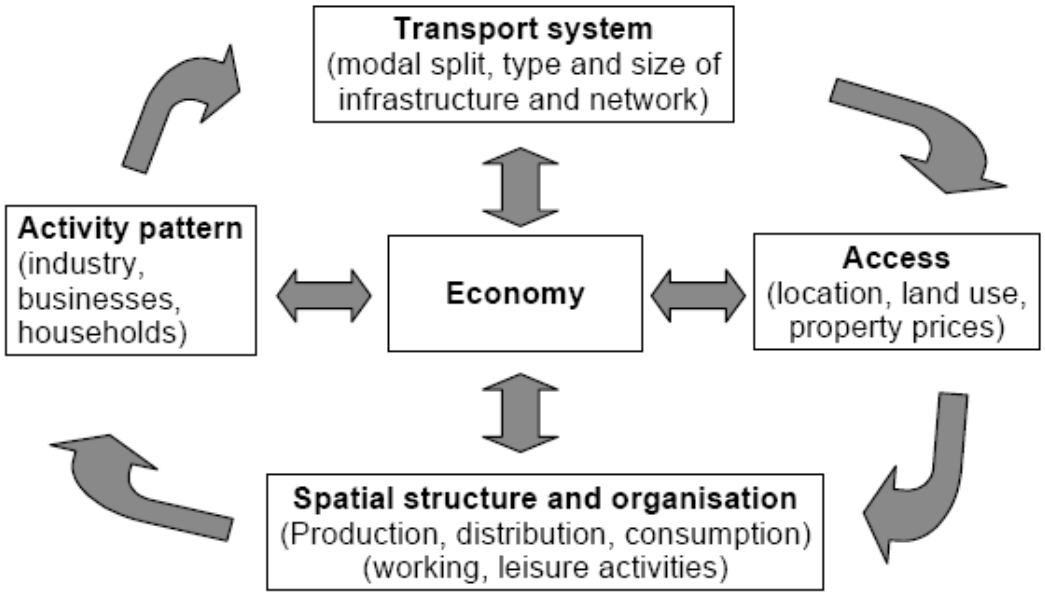
Transport policy and systems directly affect mobility of goods and people. An efficient transport system, and well equipped transport infrastructure, are key to a strong economy.

The Standing Advisory Committee on Trunk Road Assessment (SACTRA) put forward a number of important mechanisms by which transport can improve economic performance[10]:

- Reorganisation or rationalisation of production, distribution and land use.
- Effects on labour market catchment areas and hence on labour costs.
- Increases in output resulting from lower costs of production.
- Stimulation of inward investment.
- Unlocking inaccessible sites for development.
- Triggering growth which in turn stimulates further growth.
- A number of key points are brought out in the SACTRA report:
- The lack of any consensus as to transport's role in economic development.
- The importance of considering the extent of imperfect competition in the sectors using transport.
- The importance of distinguishing the re-distributive effects from net impacts.
- The incidence of the "two-way road" effect where transport improvements sought by a region may work against its best interests.
- The need to demonstrate clearly the relationship between the wider economic and environmental impacts of any proposal.

The links between transport and the economy are summarised schematically below:

Figure 7: Links between Transport and the Economy



Source: adapted from Ecoplan 2003 in 'Analysis of the links between transport and economic growth. Report of the working party on national environmental policy; Working Group on transport [11]

Many reports and studies have demonstrated the clear link between material deprivation and ill health. The concept of relative poverty and the effects of income inequality are also widely accepted. A strong local economy has the potential to affect health gain through improvements in economic status for members of the population. However, for those groups potentially left behind such growth e.g. those who remain unemployed or unemployable, income inequality may well increase.

5.3 Transport-related injury and death

The vast majority of transport related injury and deaths are caused by road traffic accidents (RTAs) with rail and air travel having the lowest rates of fatality and serious injury. Rates of RTA in Scotland are generally falling, despite increases in the volume of road traffic[5].

In the UK, approximately 60% of RTAs occur in built up areas, 30% outside built up areas and around 4-5% on motorways. Table 5 illustrates the rates of RTA on different road types in 2004.

Risk of RTA varies depending on the type of road, traffic mix, time, weather and speed and mass of vehicles involved[5].

Pedestrians and cyclists are at the highest risk of death or injury. Rates of cyclists killed or injured on UK roads have been falling and Scotland has lower rates of cyclists killed or injured than England. Evidence shows that in countries where cycling is common rates of RTA involving cyclists are lower, possibly due to a critical mass effect[5].

Table 5 Rates of crashes (all vehicles), users and pedestrians killed / seriously injured by road type (2004) per 100 million vehicle – kilometres travelled.

	Accident rates	Users killed or seriously injured	Pedestrians killed / seriously injured
Motorways	9	1.2	0.0
Urban A roads	70	6.3	3.2
Urban B, C and unclassified roads	64	5.3	3.2
Rural A roads	25	5.8	0.4
Rural B, C and unclassified roads	46	8.9	1.0

Source: Department of Transport 2005. Road casualties Great Britain: 2004 Annual Report National Statistics publication [12]

Table 6: Passengers killed or seriously injured (KSI) rates per billion passenger-kilometres travelled (2003)

Mode of transport	KSI rates
Rail (2002/3)	0.4* **
Air	0.01 **
Water	61** -
Road (Car)	27+
Road (Van)	10 +
Road (Bus / coach)	10
Road (Motorcycle)	1264 +
Road (Cycle)	534
Road (Pedestrian)	443

* Fatalities only
**1994-2003 average
-Passenger casualties on UK registered merchant vessels (includes public ferries and ships
+Includes drivers and passengers KSI

Table 7: Summary of reported injury accidents and reported casualties by police force area, council and severity; 2006

Area	Accidents				Casualties				Child casualties
	Killed	serious	Slight	Total	Killed	serious	Slight	Total	All severities
Grampian	56	165	880	1101	62	217	1180	1459	139
City	7	49	333	389	8	53	394	455	48
Shire	43	88	418	549	46	125	602	773	69

Source: Scottish Government, 2007 Road Accidents: Scotland 2006

Table 8: Accidents by road type and severity in Scotland; 1996-2006

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Built up roads											
Fatal	111	89	116	95	93	91	71	85	90	76	83
Serious	1,932	1,899	1,884	1,841	1,674	1,557	1,528	1,389	1,232	1,224	1,256
Fatal and Serious	2,043	1,988	2,000	1,936	1,767	1,648	1,599	1,474	1,322	1,300	1,339
Slight	8,667	8,932	8,743	8,053	8,003	7,788	7,587	7,269	7,384	7,087	6,859
All severities	10,710	10,920	10,743	9,989	9,770	9,436	9,186	8,743	8,706	8,387	8,198
Non-built up roads											
Fatal	205	251	223	190	204	218	203	216	193	188	210
Serious	1,383	1,413	1,434	1,368	1,333	1,283	1,156	1,107	1,099	1,026	991
Fatal and Serious	1,588	1,664	1,657	1,558	1,537	1,501	1,359	1,323	1,292	1,214	1,201
Slight	3,775	4,062	4,119	3,868	3,822	3,789	3,799	3,851	3,919	3,833	3,710
All severities	5,363	5,726	5,776	5,426	5,359	5,290	5,158	5,174	5,211	5,047	4,911
All roads											
Fatal	316	340	339	285	297	309	274	301	283	264	293
Serious	3,315	3,312	3,318	3,209	3,007	2,840	2,684	2,496	2,331	2,250	2,247
Fatal and Serious	3,631	3,652	3,657	3,494	3,304	3,149	2,958	2,797	2,614	2,514	2,540
Slight	12,442	12,994	12,862	11,921	11,825	11,577	11,386	11,120	11,303	10,920	10,569
All severities	16,073	16,646	16,519	15,415	15,129	14,726	14,344	13,917	13,917	13,434	13,109

Source: Scottish Transport Statistics No 26 – 2007 Edition

Table 9: Vehicles involved in RTAs by type of vehicle

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Pedal cycle	1,346	1,309	1,167	1,062	900	942	852	840	793	808	807
Motor cycle [1]	867	951	972	1,032	1,155	1,207	1,200	1,153	1,033	1,098	1,091
Car	20,343	21,785	21,328	19,622	19,284	18,611	18,193	17,724	17,717	16,765	16,391
Taxi	571	555	594	552	589	548	504	487	477	468	474
Minibus [2]	140	145	145|	125	134	101	115	111	109	84	87
Bus/coach	1,095	1,098	1,181	1,040	1,109	1,086	1,059	1,069	1,131	1,039	980
Light goods	1,137	1,143	1,189	1,073	984	934	858	795	975	911	925
Heavy goods	805	853	847	944	924	1,013	999	930	800	738	698
Other [2]	372	368	358|	384	474	434	374	348	365	558	509
Total	26,676	28,207	27,781	25,834	25,553	24,876	24,154	23,457	23,400	22,469	21,962

1. Includes all two wheeled motor vehicles.
2. The series is affected by a change in the way in which motor caravans are counted: for years up to 1998 they are included under "minibus": from 1999 they are counted as "other".

Source: Scottish Transport Statistics No 26 – 2007 Edition

Table 10: Casualties by mode of transport and age group, 2006

	Numbers						Rates per 1,000 population				
	age not known	**Children 0-15**	**Young Persons 16-24**	**Adults 25-59**	**Older Adults 60+**	**Total**	**Children 0-15**	**Young Persons 16-24**	**Adults 25-59**	**Older Adults 60+**	**Total**
Pedestrian	7	992	500	904	448	2,851	1.08	.83	.37	.40	.56
Pedal cycle	0	209	101	428	43	781	.23	.17	.17	.04	.15
Motorcycle	3	27	274	731	33	1,068	.03	.46	.30	.03	.21
Car	20	657	3,213	5,674	1,140	10,704	.71	5.34	2.29	1.02	2.09
Taxi	0	8	27	188	25	248	.01	.04	.08	.02	.05
Minibus	0	13	20	41	20	94	.01	.03	.02	.02	.02
Bus/Coach	1	102	49	287	324	763	.11	.08	.12	.29	.15
Light goods	1	7	63	299	23	393	.01	.10	.12	.02	.08
Heavy goods	0	0	10	167	14	191	.00	.02	.07	.01	.04
Other [1]	0	6	28	119	21	174	.01	.05	.05	.02	.03
Total	32	2,021	4,285	8,838	2,091	17,267	2.19	7.12	3.57	1.87	3.37

Source: Scottish Transport Statistics No 26 – 2007 Edition

5.4 Pollution and physical environment

5.4.1 Air pollution

Air pollution is a mix of gases and particulate matter (PM), the latter being a mixture of particles of various sizes. PM10 are particles less than 10 microns in diameter, at which size they can be inhaled into the lungs.

Air pollution is linked with adverse health outcomes and in particular:

- Increases in deaths from cardiovascular causes.
- Respiratory hospital admissions.
- Exacerbations of pre-existing asthma.
- Respiratory symptoms.
- Reductions in lung function.

Evidence has shown that rises of 10microgram/m $^{-3}$ may lead to an increase in daily deaths of 0.6%[13]. It is estimated that an increase in the annual average of $PM_{2.5}$ of 10microgram/m $^{-3}$ will lead to a 6% increase in mortality with the impact on life expectancy greater than that of passive smoking[5].

For many pollutants, concentrations in vehicles are higher than background and general roadside concentrations. These increases over background pollution for occupants of cars etc have been found to be 4-5 times higher for carbon monoxide, 1.5 times higher for nitrous dioxide, and in a London study $PM_{2.5}$ was found to be twice as high [5].

5.4.2 Transport noise and health

The Health Scotland review of the published evidence did not find conclusive links between transport noise and health and whilst aircraft noise may lead to sleep disturbance there is no clear link between aircraft noise and other health outcomes[5].

Table 11: Summary of noise outputs associated with various forms of transportation

Decibels (A-weighted dBA)	Form of transport
120	Aircraft at take off
110	
100	Pneumatic drill at 1m
90	Lorry, motorcycle, underground train
80	Busy crossroads
70	Near a motorway
60	Busy street through open windows
50	Busy street through closed windows
40	
30	Quiet room
20	Broadcasting studio
10	Desert
0	

Source: adapted from R. Tolley and B Turton (1995) Transport Systems Policy and Planning: A Geographical Approach, Burnt Mill, Harlow, Essex: Longman Scientific & Technical in Health Scotland (2007) Health Impact Assessment of Transport Initiatives: A Guide [5]

5.5 Physical activity

Current recommendations state that all adults should undertake thirty minutes of moderate intensity activity at least five days per week. Individuals who undertake such physical activity have been shown to have lower rates of all cause mortality and reduce their risks of developing cardiovascular disease, diabetes and cancer. In the elderly population such physical activity can also help to increase bone strength and reduce the risk of fracture.

Evidence suggests a link between levels of physical activity and the physical environment e.g. increases in walking or cycling have been directly linked with increased residential density, street connectivity, mixed land use and amenities within walking distance[14,15, 16.] However it is also suggested that changes to physical environment alone are not enough to change behaviour and increase physical activity. Socio-demographic factors are suggested as a more powerful influence on levels of physical activity and active travel choices[5].

5.6 Access to goods and services

Transport facilitates people's access to jobs, education, shops and services, including health services[5]. As transport is so central to accessing both jobs and services it is an important determinant of health. Research suggests that access to a car is associated with improved physical and mental health and that this association is independent of social class. Researchers have suggested that this might be explained by car users having improved access to essential services[1718].

5.7 Development and maintenance of community and social networks

Transport routes running near or through housing and communities can provide an artificial physical barrier to travel and development of community and social networks within that community[5]. In some cases an existing road, not historically seen as a barrier, may become one due to increased traffic flow. Evidence from the USA demonstrates a negative relationship between traffic density on a road and the number of friends and acquaintances that people living there have from the local community.

Whilst the health impacts of community severance are not known the role of community and social networks in health behaviours, experiences and outcomes is well recognised[9 19].

6: Health Impacts

6.1 Health impacts associated with an expansion of public transport

The completed matrix for the assessment of health impacts associated with an expansion of public transport is provided in Appendix 4.

6.1.1 Economic impacts

The group accepted that improved and expanded public transport may lead to business development resulting in increased employment but attention was focussed on the impacts to the specific population groups identified in the matrices.

In general it was agreed that those groups who were more likely to be able to access concessionary fares for travel i.e. people with disabilities and those aged over 60 and the discount scheme for 16-18 year olds in full-time education would benefit from the economic impacts of expanded public transport.

For all deprived groups it was felt that expanded public transport may result in greater access to goods and services which may result in greater value for individuals in their shopping choices, be they foods and staples or other goods and services. It was also felt that these groups may benefit from greater geographical and timely access to job opportunities, i.e. jobs further a field may become accessible due to the expansion.

For pensioners, both affluent and deprived, it was felt that greater access to public transport services would be a major benefit providing a better choice of journeys available.

There was felt to be particular benefit to individuals who worked but remained deprived as the expanded public transport would potentially allow a greater diversity of destinations to support both leisure and working and greater flexibility in reaching those destinations. In rural areas, many currently feel the need for a car even though they may struggle financially to provide one.

6.1.2 Accidents

It was generally felt that expansion of public transport would lead to a reduction in accidents, largely through reductions in general traffic volume and modal changes from those with a higher risk of injury e.g. car or motorbike to those with lower rates of injury e.g. bus or train. It was noted that any reductions in traffic volume would be dependent on behaviour change resulting in a modal shift from private to public transport.

Concern was raised that there may be an increase in accidents in urban areas as public transport expands. Whilst this may be mitigated by reductions in e.g. car use over the medium term, overall traffic levels and associated accidents may increase in the short term. The type of accident may well change as well with public transport/pedestrian conflict being a particular concern. Such a potential increase in accidents is likely to affect the deprived and working groups more than other groups as these will have a differentially higher exposure to the urban environment than other groups.

Whilst it was agreed that all pensioners should benefit from reduced accidents it was felt that affluent pensioners may benefit to a greater extent from changes than those who were deprived. This was based on the premise that affluent pensioners, who benefit from

concessionary fares, may well choose to use their cars less, or give them up totally, resulting in reduced rates of accidents in this group whereas deprived groups may already be using public transport.

6.1.3 Pollution / physical environment

On the basis that expansion of public transport led to a modal shift in transport usage away from private cars and motorbikes, it was felt that all groups would benefit from improvements in air quality. It was recognised that for road transport particulate pollution and Nitrous Oxides, as are commonly emitted from diesel heavy goods or passenger vehicles may remain high or increase. However, over time these vehicles would improve in pollution output in adherence to European legislation and lead to further reductions in pollution and improvement in the physical environment.

It was felt that the impact on the more deprived would be mixed. Deprived groups are often found / concentrated in urban areas which have the highest population and transport densities. Therefore these groups may benefit from reductions in pollution if the net pollution from public transport expansion is matched by a greater reduction in that from private transport, largely through modal shift. However if this reduction did not occur it is likely that air pollution would increase, particularly in the urban environment, with detrimental effects on those people living and working in thee areas. Whilst some of these effects would be mitigated by improving engine emissions it is noteworthy that these negative effects are likely to be experienced more in deprived groups, particularly those with existing cardiovascular and respiratory conditions.
It was proposed that if expanded public transport resulted in increased usage by young families and children and that this could be sustained through adolescent years into adulthood that attitudes to public transport, and potentially the environmental benefits of using such transport rather than private transport, may be beneficial.

6.1.4 Physical activity

It was felt that all groups could potentially benefit from improvements in physical activity and the health benefits associated with such improvements. The basis of this was the potential for increased activity, mainly walking, from the home / place of work to public transport access points e.g. bus stops. There was an assumption that this activity would not replace existing physical activities e.g. going to the gym / lunchtime walking and that the level of benefit would reach a level at which health benefits were accrued.

The group felt that the elderly may well experience a greater positive impact on their physical activity and related health due to the greater use of public transport. This being associated with walking to access such transport and also in terms of increased activity at destinations such as parks, sea promenades, civic centres, street markets and shopping centres. This usage would be encouraged in this group, who receive concessionary travel.

There was also a concern that the availability of high frequency / wide coverage public transport may lead to reduced walking in urban areas i.e. people may be encouraged to use the bus to travel a few stops where in the current situation they would walk.

6.1.5 Access to goods and services

It was generally felt that expansion of public transport would improve access to goods and services but that deprived groups would benefit to a greater extent than their affluent counterparts. This was driven by the assumption that expanded public transport would allow a greater choice of destinations as well as improved timing of access / convenience in these groups, who are more likely to rely on public transport. It was felt that this impact would be smaller on those in the affluent groups who, it was felt, already benefited from good access through their use of private transport such as the car.

6.1.6 Development and maintenance of community and social networks

Expansion of public transport was deemed to improve the development and maintenance of community and social networks for all groups. However, it was felt that those in the more deprived groups would benefit the most, largely though improved choices of destination and improved timings / availability. However the potential impact to more affluent groups, if a modal shift to public transport occurred, was recognised, largely through increased social mixing through these groups whilst accessing travel points e.g. bus stops.

6.1.7 Specific Groups

Adolescents - were a group where, except for transport related accidents, benefit was generally assessed to be towards the lower end of the groups discussed. In part it was felt that this group, who currently don't receive concessionary travel, were less likely to utilise an expanded public transport system without the incentive of free or reduced price travel. There was also a recognition that identifying and providing the transport services required by this group, particularly in the evenings, was a challenge.

Rural communities – There was discussion as to whether this group would benefit from expanded public transport. In general the economic, physical activity and social benefits of an expanded system would greatly benefit rural communities but only if the system provides them with a robust and timely transport system i.e. that expansion isn't focused only in urban areas. This reflects the increased car ownership seen in rural populations of Aberdeenshire across all levels of deprivation in response to the necessity to travel but with limited public transport alternatives.

Disabled groups – whilst it was felt that people with physical disabilities could potentially benefit from increased access to travel with its associated economic and social networking benefits this could only happen if the capacity to cater for wheelchairs and people with limited mobility was expanded and made available on all services.

6.1.8 Assumptions

In maximising the health benefits associated with an expansion in public transport there is a need to ensure that:

- Fare levels, including the use of concessionary fares, are set at affordable levels that promote public transport use and modal shift to reduce, for example, car use.
- Where more frequent services are provided, that these result in a significant increase in transport usage rather than volumes staying static spread over more services.

- Actual and perceived safety is addressed to make public transport an attractive and safe option.

6.2 Health impacts associated with transport infrastructure proposals identified in the Regional Transport Strategy

The completed matrix for the assessment of health impacts associated with transport infrastructure proposals identified in the Regional Transport Strategy is provided in Appendix 5.

6.2.1 Economic impacts

The group agreed that improvements in transport infrastructure, including road improvements to increase road capacity, e.g. additional road lanes, improving road junctions and road safety e.g. making junctions safer and improving road alignment and improvements to port, airport and rail infrastructure would all promote a positive impact on the macro level economic situation in the area. It was felt that the infrastructure proposals would benefit businesses and tourism.

The group identified those who were in work as generally receiving greater economic benefit from the proposals than those not working. Improved transport infrastructure should support expanded work opportunities. However it was recognised that unemployment in Aberdeen and Aberdeenshire are currently at very low levels and the group agreed that whilst there was potential for new job opportunities these may well be filled by individuals from outside the area, be they migrating to or within the UK, and that those currently unemployed may not take up the opportunities available. This would potentially lead to a widening of income inequality in the area with wages rising, standards of living rising and costs of living in the area increasing in line with this improved economic picture. Therefore whilst the economic benefits of transport infrastructure improvements were recognised there was concern that the unemployed section of the population may be ‘left behind’.

For the elderly it was felt that those who were more affluent would benefit to a slightly greater degree than the less well off, in the main due to their higher use of private car transport and air travel. It was suggested that road infrastructure improvements would lead to reduced journey times and therefore associated travel costs by private car. Improvements to public transport and airport links should make these forms of travel more efficient and travel cheaper and / or more accessible. For the less affluent the benefits were associated more with public transport changes e.g. better travel links and improved cross rail travel.

For young affluent families, who generally display high private car ownership and use, and are generally employed, the benefits of the infrastructure proposals were seen as similar to those for the affluent elderly. In addition it was felt that where infrastructure proposals reduced travel time significantly this might increase migration from the city to the Aberdeenshire as commutable distances within the usual 30 minute commuting time increased. Whilst it was accepted that in theory if public transport improved this group may switch it was also recognised that car ownership in Aberdeenshire tended to be high. Improved commuting times would also benefit employment flexibility, and this was likely to be a benefit to young adolescents as well.

6.2.2 Accidents

Transport infrastructure improvements should generally lead to improved road safety and reductions in the rate of transport related accidents, particularly where modal shift to rail travel is facilitated. The group recognised that there was a conflict between increasing capacity in road transport and the safety of more vulnerable road users, i.e. pedestrians be they elderly, adolescents and young families.

It was agreed that where heavy goods vehicles (HGVs) were concentrated on larger roads, e.g. the western peripheral route, removing them from smaller local roads, there should be an overall positive benefit to all population groups.

6.2.3 Pollution / physical environment

The group felt that there would be a small negative overall impact on pollution and the physical environment associated with the transport infrastructure proposals. In general this negative impact was felt to be strongly geographically associated rather than experienced by specific social groups within the population.

The main effects were agreed to be pollution, and its effect on air quality, and noise.

For example, plans to improve transport infrastructure around the port area should lead to increases in HGVs moving through this area leading to increased vehicle emissions and negative impacts on the physical environment

The development of the western peripheral route was an example where a clear geographical shift in pollution and physical environment effects could be envisaged. The group agreed that the shift in vehicles, particularly HGVs, from the traffic and population dense city centre to the less dense Shire would result in an overall benefit for the more deprived groups in the area, who tend to live in city areas.

Infrastructure improvements resulting in improved flow of commuter traffic were complex. On the one hand it was accepted that improved flow and reduced commuting times may increase the number of individuals commuting, leading to increases in traffic density, unless there was significant modal shift to shared and public transport mitigated these changes. The group agreed that improved traffic flow would lead to a reduction in vehicle emissions driven by reductions in congestion but these benefits may be lost through overall increases in traffic volume.

6.2.4 Physical activity

NESTRANS infrastructure proposals have the potential to increase physical activity in the local population. The group agreed that if the infrastructure proposals, such as the western peripheral route, led to a shift in vehicles away from local roads, improving separation of vehicles, cycles and pedestrians that this would facilitate the promotion and uptake of cycling and walking. However, this would only happen if the improved separation is achieved and therefore there remains a risk that physical activity, achieved through walking and cycling may not change or actually reduce.

In general the group agreed that these benefits would be greatest amongst young families and possibly students with little difference between deprived and more affluent groups.

6.2.5 Access to goods and services

In general the infrastructure proposals should improve access to goods and services for all groups in the population e.g. access to shopping facilities, access to and use of the rail network and links to and from Aberdeen airport.

The group concluded that those in deprived groups would benefit least, particularly those in the city, as they are least likely to be car users or use Aberdeen airport.

6.2.6 Development and maintenance of community and social networks

The group concluded that all groups in the population should see a small positive impact on development and maintenance of community and social networks resulting from increased accessibility.

Positive impacts were driven by a belief that movement of vehicles away from local roads would increase local travel, particularly pedestrian helping to support community networking. Development of cross city rail services and the opening of new stations in Aberdeenshire also had the potential to support people's social networks. The improved infrastructure and reduced travel times should also make visiting friends and relatives easier although it was recognised that where young families, in particular, moved from the city to the Shire there were potential negative impacts.

The group did express concern that the western peripheral route had the potential to lead to increased community severance and that this needed to be looked at in more detail, perhaps as a separate piece of work.

6.2.7 Specific Groups

For many aspects relating to transport infrastructure, benefits were shared across all groups of the population. More deprived groups were identified as potentially not benefiting from the macro-economic benefits to the local economy associated with improved infrastructure. In contrast the more deprived groups tended to have better outcomes, than their more affluent counterparts, when it came to improvements in pollution and physical environment, although there remained concern that in the city there would likely remain issues of poor air quality, particularly around the port.

Other groups less likely to benefit were those without / less likelihood of access to private transport e.g. homeless, people with disabilities, although it was felt that these groups may derive benefit if reductions in traffic density can be realised.

6.2.8 Assumptions

In considering the health impacts of the transport infrastructure proposals laid out in the strategy the group assumed that improvements in infrastructure and the reductions in traffic density, air quality and physical environment associated with such development would not be lost due to increases in overall traffic volume. This assumption may not be valid and therefore to realise the generally positive benefits from such development there is a need to ensure that infrastructure improvements don't simply result in more vehicle journeys.

6.3 Health impacts associated with proposals to increase walking and cycling identified in the Regional Transport Strategy

The completed matrix for the assessment of health impacts associated with proposals to increase walking and cycling identified in the Regional Transport Strategy is provided in Appendix 6.

6.3.1 Economic impacts

Promotion of increased levels of walking and cycling should reduce personal transport costs and, if increases in activity levels reach the point of providing health benefits, reduce health costs. In terms of employment and productivity such health benefits should lead to reduction in staff absences and improvements in efficiency and in the longer term, productivity.

On a wider scale the promotion of walking and cycling, if successful, may lead to improvements in external perceptions of the area in terms of physical environment and culture. This in turn may make the area more attractive to both inward migration of permanent residents and to tourism, both of which would be beneficial to the local economy.

The group agreed that in personal economic terms most benefits would be accrued by the more affluent as these groups would have more opportunity to change their behaviour, as those in more deprived groups tend to have higher levels of existing functional physical activity, i.e. through work rather than leisure. The group recognised that in more affluent groups there would be competition between functional and recreational physical activity but that there would not be a trade off between the two. The group concluded that the elderly deprived were likely to benefit the least from proposals.

6.3.2 Accidents

The group concluded that proposals to increase walking and cycling should reduce the rate of accidents. There was some discussion around the possibility of an increase in crude numbers of accidents related to cycling, in particular, simply due to the increased number of individuals using this form of transport. The group also recognised that increasing use of cycling should raise overall awareness of cyclists amongst all road users which in turn should help reduce accidents. The group did identify a potential issue in relation to shared cycle / pedestrian routes where increases in overall traffic may lead to an increase in accident rates and the overall crude number of accidents.

6.3.3 Pollution / physical environment

Promotion of walking and cycling should reduce pollution, particularly where it is functional e.g. replacing personal car use in getting to work. It was agreed that the benefits from such modal shift would be experienced by all and could be potentially highly significant. It was noted that air quality breathed by cyclists and pedestrians was no worse, and sometimes better, than that experienced within vehicles, particularly in congested traffic.

6.3.4 Physical activity

The group concluded that in a similar way to economic benefits those gaining most would be the more affluent as they are likely to have a greater capacity for change in

modes of functional transport than those in more deprived groups who already display higher levels of walking and cycling to work.

6.3.5 Access to goods and services

In general the group concluded that there were likely to be only small effects on access to goods and services. The benefit would be more likely accrued by those in more deprived groups as access in city areas becomes easier for cyclists and pedestrians, for those services a short distance from people's homes and work.

6.3.6 Development and maintenance of community and social networks

The group agreed that all groups should benefit from increased local travel by cycle or walking although this benefit would be greater for those not currently using these forms of transport i.e. the more affluent.

6.3.7 Specific Groups

The group recognized that there may be benefits for people with disabilities and mobility problems as infrastructure to support increased walking and cycling should benefit this group as well. The group recognised that those from ethnic minority groups were less likely to walk and cycle and that work needed to be done to promote change in these groups.

6.3.8 Assumptions

In considering the health impacts of the proposals to increase walking and cycling identified in the Regional Transport Strategy the group assumed that functional physical activity e.g. commuting by bike would not replace other physical activity already undertaken and that a critical mass effect on pedestrian and cycling accidents would be achieved to leading to a reduction in overall rates of travel accidents in these groups.

7: Recommendations

The following recommendations are derived from the stakeholder participatory workshops. It should be noted that this was a rapid HIA and as such did not include local community stakeholders. Members of the stakeholder groups were purposively chosen for their knowledge and experience rather than as representatives of organisations, groups or geographies.

This rapid HIA set out to assess the impact, and inform the implementation, of a number of key strategic proposal areas within the NESTRANS RTS. The following recommendations are made.

7.1 Expansion in public transport

1. In order to maximise the positive health benefits associated with an expansion in public transport, particularly reduced pollution and accidents, it will be necessary to ensure that modal shift away from private transportation occurs.

2. In the initial phases of expansion in public transport provision there will be a need to raise awareness of safety, particularly in urban areas, where an initial overall increase in traffic density may lead to increases in road traffic accidents.

3. If the potential negative effects of increased pollution, especially particulates, are to be avoided in urban areas, in particular the effects on those in more deprived communities, then expansion of public transport must be delivered with reductions in both individual and total vehicle emissions.

4. To create a sustainable change in behaviour action should be taken to promote the use of public transport amongst adolescents and young people before they take up private transport use and behaviours. This group was also felt to be amongst those groups less likely to receive benefits from public transport currently.

5. In expanding public transport consideration should be made of the balance between accessibility of public transport access points (e.g. bus stops) and the beneficial physical activity undertaken by people in travelling from their point of origin to the access point for public transport.

6. In expanding public transport there is a need to consider the needs of both people with physical disabilities, or impaired mobility, and of young families. Both these groups could benefit significantly from an expansion in public transport but only if their needs for low level access and space once on the bus for wheelchairs, frames and prams are provided.

7. Public transport expansion should take account of where individuals access services both now and in the future, particularly essential services such as healthcare.

7.2 Infrastructure proposals

1. Accident reductions associated with infrastructure improvements may only be delivered if such improvements do not lead to increases in traffic volume.

2. There is a need to continue the monitoring of air quality within Aberdeen and for the NHS to monitor the health of residents within areas of recognised poorer air quality.

3. Infrastructure proposals leading to potential increases in physical activity in the form of functional commuting may only occur if traffic volume decreases and or safety, and perceived safety, improves.

4. Infrastructure improvements should be assessed and developed to minimise community severance both in new developments e.g. the Aberdeen Western Peripheral Route (AWPR) and existing roads where volume of traffic is presenting a barrier to community and social networking.

7.3 Proposals to increase walking and cycling

1. Walking and cycling should be promoted as low cost, zero emissions forms of transport that benefit the individual and the environment.

2. Such proposals should be linked to infrastructure changes to improve real and perceived safety.

3. Education should be undertaken to underpin any increase in cycling and walking if a rise in the crude number of accidents is to be avoided, particularly until a critical mass effect is attained.

4. Functional physical activity, e.g. commuting to work by bike, should be encouraged but not simply as a trade off for other physical activity undertaken in spare time.

7.4 Recommendations for further work

1. It is recommended that work should be undertaken through public health, NHS Grampian with partners in the local authority and NESTRANS to monitor the health of the local population, particularly in areas where air quality is poorest or at risk of being poor.

2. It was noted that detailed environmental impact assessments, including air quality and noise, had been or would be carried out for major projects such as the AWPR and development at Aberdeen Airport. It is recommended that consideration be given to undertaking prospective health impact assessments of major projects in the future.

Appendix 1 NESTRANS Proposals for Action

The following table summarises the proposals for action identified in the Regional Transport Strategy

Sub Strategy 1: The external connections strategy	
EC1	Rail links and services • Reducing journey times to Edinburgh and Glasgow, and further south. • Improved train capacity, comfort and reliability. • Support for High Speed Rail connections to London, which benefit the north east.
EC2	Strategic roads • Overcoming constraints on the network that have a direct impact on travel to/from the north east, such as the A90 through Dundee.
EC3	Inter-regional Bus and Coach travel • Support further development of inter-regional bus and coach travel between the north east and other Scottish towns and cities and further a field. Explore possible links to Park and Ride sites.
EC4	Connections by sea • Closer joint working through North East Ports Forum. • Improved access to ports and interchange with passenger ferries. • Development of new freight and passenger services.
EC5	Connections by air • Support expansion of direct destinations from Aberdeen and frequency of popular services. • Support runway extension to facilitate wider range of destinations and more efficient, modern aircraft. • Ensure protection of slots for Aberdeen services at key hubs such as London Heathrow.

Sub Strategy 2: The internal connections strategy	
IC1	Rail • Increased frequency of services between Inverurie-Aberdeen-Stonehaven through Aberdeen Crossrail and improved services to Inverness. • New station openings in the City and Aberdeenshire as part of Aberdeen Crossrail.
IC2	Road Improvements • Strategic Roads Capacity improvements – tackling constraints at A90 Ellon - Peterhead, A96 west of Inverurie, Haudagain junction, Access to Aberdeen from the south, and at other junctions serving Aberdeenshire towns. • Strategic Roads Safety improvements – alignment and junction improvements on A90 south. Overtaking, junction and alignment improvements on A90 north and A96. Route Action on A92, A93, A944, A947. • Car share lanes – trialling priority lanes for cars with multiple occupancy. • Prioritised maintenance for strategic routes, with particular benefits for public transport and sustainable modes. These build on the AWPR and dualling of A90 Balmedie-Tipperty which are being taken forward by Transport Scotland and are due to be completed in 2011.
IC3	Bus Improvements • Quality bus corridor improvements to services and facilities. • Extend bus priority measures on key routes to enable buses to beat congestion. • Explore Rapid Transit options such as guided busways and the Super Bus concept. • Expand Park and Ride provision linked to the development of the AWPR. • Further develop real-time information systems to expand coverage across Aberdeen City and Shire.
IC4	Demand Responsive Transport • Support extension of 'Dial-a-Bus' and similar services to serve those unable to access conventional buses and to link with scheduled bus services. • Support community transport providers and encourage development of services. • Seek to ensure that taxis are provided in an efficient and effective way, which meets the needs of customers.
IC5	Transport Interchange • Maximising interchange potential of Guild Street development and link with Union Street and support enhancement of other interchange points in Aberdeen. • Implement city centre shuttle bus and explore potential for future 'Micro-Light' tram. • Support further improvements to interchange facilities in Aberdeenshire towns, in particular

	building on developments at Inverurie, Peterhead and Banchory. • Work with operators to develop integrated ticketing across services and operators in the north east.
IC6	Walking and Cycling • Support investment in measures to increase safety and security of walking and in particular to facilitate interchange between different modes of transport. Urban realm improvements to improve the pedestrian environment. • Support the extension of low speed zones, particularly where it improves the environment for pedestrians and cyclists and increases safety for children. • Continued development of cycle routes on key routes within Aberdeenshire, into Aberdeen and on routes through the City.
IC7	Airport Surface Connections • Facilitate an Express Bus Service to provide a dedicated, high-frequency service between Aberdeen City Centre and other key locations and the airport and enhanced regional connections. • Support a shuttle bus between Dyce station and the airport terminal. • In the longer term, explore a fixed link from Aberdeen City Centre to the airport, providing fast, reliable journey times, either as an addition to Crossrail or as a guided bus route.

Sub Strategy 3: The strategic policy framework	
Travel Behaviour	
TB1	Promoting Travel Planning and Travel Awareness • Implementation and future development of Nestrans' Travel Planning Strategy. • Continue to provide support through the Sustainable Travel Grants Scheme • Encourage increased up-take of car-sharing
TB2	Promoting Active Travel • Encourage more people to walk and cycle more often. • Work with NHS Grampian and Community Planning Partnerships to promote the benefits of active travel and achieve objectives for a healthier population.
TB3	Improving Safety • Work with the Councils, Emergency Services and others to promote road safety as part of a comprehensive approach covering Education, Engineering, Enforcement and Encouragement measures. • Improve security for users of public transport services and interchanges.
Incentives and Enforcement	
IE1	Changing Choices through Incentives & Partnerships • Work with operators to identify possible fare incentives to encourage increased bus use, particularly where this enables access to employment or training. • Through the Local Authorities/Bus Operators Forum (LABOF) continue to develop the Quality Partnership for Public Transport and consider introducing Punctuality Improvement Partnerships. • Support measures which encourage uptake of alternative fuels, particularly by public transport providers, to build on the north east's role as an energy hub.
IE2	Using Enforcement • Support enforcement of vehicle emission standards to improve air quality, in Aberdeen City Centre and towns across the north east. • Support measures to enforce speed limits to improve road safety and reduce carbon emissions. Promote the establishment of a Casualty Reduction Partnership to support NESCAMP's activities and support the trial of average speed cameras.
IE3	Parking • Develop a Regional Parking Strategy to ensure a coherent approach to parking controls and standards across the north east. • Support enforcement of parking restrictions, particularly where these exist to support strategic traffic movements, bus / pedestrian priority and road safety.

	• Investigate the potential for parking incentives to encourage use of small or multi-occupancy vehicles.

Appendix 2: NESTRANS Rapid HIA Stakeholder Group

Rab Dickson	Transport Strategy Manager, NESTRANS
Ben Kerfoot	Transport Executive, NESTRANS
Ewan Wallace	Head of Transportation, Aberdeenshire
Rachel Sharp	Infrastructure Strategy Dept, Aberdeen City
Freiderike Deebus	Social Services, Aberdeen City
Val Tweedie	Public Health Lead, Aberdeen City CHP
David Pfleger	Consultant in Pharmaceutical Public Health, NHS Grampian
John Gallagher	Planning Officer, NHS Grampian
Linda Leighton-Beck	Social Inclusion Manager, Public Health, NHS Grampian
Fred Nimmo	Statistician Epidemiologist, Public Health, NHS Grampian
Neil Buchanan	Physical Activity Co-ordinator, Public Health, NHS Grampian

Appendix 3: Participatory stakeholder workshops - Rapid Health Impact Assessment of the NESTRANS Regional Transport Strategy 2021

Aims of the workshops

To:

- identify the potential health impacts of selected elements of the NESTRANS Regional Transport Strategy 2021.
- make recommendations as to how positive health impacts associated with the strategy may be promoted and negative impacts be avoided or ameliorated.
- identify elements of the strategy that will require more a detailed health impact assessment to be undertaken.

Participants – draft list 20th Sept 07

Rab Dickson	Transport Strategy Manager, NESTRANS
Ben Kerfoot	Transport Executive, NESTRANS
Ewan Wallace	Head of Transportation, Aberdeenshire
Rachel Sharp	Infrastructure Strategy Dept, Aberdeen City
Friederike Debus	Policy and Planning Children Services to Children & Young People Aberdeen City Council
Val Tweedie	Public Health Lead, Aberdeen City CHP
David Pfleger	Consultant in Pharmaceutical Public Health, NHS Grampian
John Gallagher	Planning Officer, NHS Grampian
Linda Leighton-Beck	Social Inclusion Manager, Public Health, NHS Grampian
Fred Nimmo	Statistician Epidemiologist, Public Health, NHS Grampian
Neil Buchanan	Physical Activity Co-ordinator, Public Health, NHS Grampian

Program Workshop 1 (October 5th 9 – 1.30)

Introduction to workshop 5 (David Pfleger)
Warm up – What does health mean to you and what determines health (using a graffiti wall approach) 15 (DP)
Presentation about the proposal 10 (Rab D)
Presentation Aberdeen city and Aberdeenshire populations 10 (Fred Nimmo)
Coffee / Questions / Discussion 5 (DP /FN / BK)

Following repeated for each element (3 in total) (working in two small groups working in parallel):

Introduction to task 5 (DP / RD)
Task*:* Identifying impacts 15
Task*:* Identifying potential changes / recommendations regarding implementation of the strategy 10
Task*:* Prioritisation of changes / recommendations to the proposal / implementation 10
Feedback and discussion 10

Summing up – What next? (to include reporting and dissemination of the results, and the process for decision-making about the proposal)

Program Workshop 2 **(November 1st 1 - 4pm)**
Presentation of results from workshop 1 20 (DP)
Discussion of the draft report 20 (DP)
Task*: Identification of barriers and conflicts in implementing recommendations 20 (DP)*
Task*: Proposals for monitoring 20 (DP)*
Summing up

NB BK may be replaced in some instances by RD

Information requirements for the workshops

- an introduction to HIA/a resume of the NESTRANS HIA process
- NESTRANS Regional Transport Strategy 2021Data and a summary of the key elements chosen for the stakeholder workshop.
- Data comprising a baseline population profile, including any relevant information about the vulnerable, disadvantaged or marginalized groups.
- A summary of the available evidence base relating to the potential impacts of the proposal, and to the effectiveness of interventions that could be undertaken to minimise the negative and maximise the positive impacts on health.

DP to lead collation of above and circulation to those invited to the workshops / arrange suitable presentations on the day

Appendix 4: HIA matrix for participatory stakeholder workshop to assess health impacts of expansion and promotion of the use of public transport

HIA matrix for participatory stakeholder workshop to assess health impacts of agreed elements of the NESTRANS RTS

Strategic element assessed: Expansion and promotion of the use of public transport

Ratings: Quantify the health impact on a scale of -3, -2, -1, 0, +1, +2, +3 (negative through neutral to positive impacts) designating the impact as C = calculable, E = estimable; D = definite S = speculative

	General	Economic	Accidents	Pollution / physical environment	Physical Activity	Access to goods and services	Community and social networks
Specific groups effected?[2]	Rural Disadvantaged Disabilities						
Young Families Affluent Deprived	 +2 +2	 0 +1	 +2 +2	 +2 +2	 +1 +1	 0 +2	 +1 +3
Adolescents Affluent Deprived	 +1 +2	 0 0	 +2 +2	 +2 +2	 +1 +1	 +1 +2	 +2 +3
Elderly Affluent Deprived	 +3 +3	 +2 +2	 +2 +1	 +2 +2	 +2 +2	 +1 +2	 +3 +3
Working people Affluent Deprived	 +3 +3	 +1 +3	 +2 +2	 +2 +2	 +1 +1	 +1 +2	 +1 +3
Unemployed Deprived	 +3	 +2	 +2	 +2	 +1	 +3	 +3

[1] Are there any particular community groups that will be effected by this element of the strategy including: Black and ethnic minority (inc. gypsy / travellers, refugees and asylum seekers); people with disabilities, religious groups / faiths, lesbian, gay, bisexual and transgender; communities in areas of disadvantage; people with mental health problems; homeless people; people involved in the criminal justice system; rural groups.

What impact will the proposal have on Equality?	Impact -3 to +3	Comments
Relations between groups	+2	Expansion of public transport should promote social mixing and raising exposure to, and possibly awareness of, other social groups. If this occurs there is potential for reducing social segregation
Discrimination	+2	Expansion of public transport should promote access, reducing discrimination of access (largely geographical and those with physical disabilities / restricted mobility) but only if access, and capacity, is increased / provided for those who don't have access currently.
Social / Family support	+2	Expansion of public transport should support the development and maintenance of social networking
Inclusion	+2	BUT only if transport is accessible and inclusive e.g. access to community transport, access for people with pushchairs or wheelchairs where space is currently limited on public transport which restricts the number of people who may travel on a particular bus or train at any one time
Access to information	+1	BUT only if information is provided. Groups felt this should include access to travel information.

Appendix 5: HIA matrix for participatory stakeholder workshop to assess health impacts of Transport infrastructure proposals

HIA matrix for participatory stakeholder workshop to assess health impacts of agreed elements of the NESTRANS RTS
Strategic element assessed: Transport infrastructure proposals
Ratings: Quantify the health impact on a scale of -3, -2, -1, 0, +1, +2, +3 (negative through neutral to positive impacts) designating the impact as C = calculable, E = estimable; D = definite S = speculative

	General	Economic	Accidents	Pollution / physical environment	Physical Activity	Access to goods and services	Community and social networks
Specific groups effected?[3]							
Young Families Affluent Deprived		 +2 0	 +2 +2	 -1 0	 +3 +3	 +3 +1	 +1 +1
Adolescents Affluent Deprived		 +1 +1	 +2 +2	 -1 0	 +3 +3	 +3 +2	 +1 +1
Elderly Affluent Deprived		 +2 +1	 +2 +2	 -1 0	 +1 +1	 +3 +2	 +1 +1
Working people Affluent Deprived		 +3 +2	 +1 +1	 -1 0	 +1 +1	 +3 +3	 +1 +1
Unemployed Deprived		0	+1	0	+1	+1	+1

[1] Are there any particular community groups that will be effected by this element of the strategy including: Black and ethnic minority (inc. gypsy / travellers, refugees and asylum seekers); people with disabilities, religious groups / faiths, lesbian, gay, bisexual and transgender; communities in areas of disadvantage; people with mental health problems; homeless people; people involved in the criminal justice system; rural groups.

What impact will the proposal have on Equality?	Impact -3 to +3	Comments
Relations between groups	+1	Overall positive impact due to ease of access in terms of time and geography
Discrimination	0	No overall effect
Social / Family support	+1	Overall positive impact due to ease of access in terms of time and geography
Inclusion	0	Potential for polarisation of groups as macro economic benefits to the economy lead to a greater gap between employed and unemployable.
Access to information	+1	BUT only if information is provided.

Appendix 6: HIA matrix for participatory stakeholder workshop to assess health impacts of Promotion of cycling and walking

HIA matrix for participatory stakeholder workshop to assess health impacts of agreed elements of the NESTRANS RTS
Strategic element assessed: Promotion of cycling and walking
Ratings: Quantify the health impact on a scale of -3, -2, -1, 0, +1, +2, +3 (negative through neutral to positive impacts) designating the impact as C = calculable, E = estimable; D = definite S = speculative

	General	Economic	Accidents	Pollution / physical environment	Physical Activity	Access to goods and services	Community and social networks
Specific groups effected?[4]							
Young Families Affluent Deprived		 +3 +2	 +2 +2	 +3 +3	 +3 +2	 0 +1	 +2 +2
Adolescents Affluent Deprived		 +3 +2	 +2 +2	 +3 +3	 +3 +2	 0 +1	 +2 +2
Elderly Affluent Deprived		 +1 0	 +1 0	 +3 +3	 +1 0	 0 0	 +2 +2
Working people Affluent Deprived		 +3 +1	 +2 +2	 +3 +3	 +3 +1	 0 +1	 +2 +1
Unemployed Deprived		0	+1	+3	0	+1	+1

[1] Are there any particular community groups that will be effected by this element of the strategy including: Black and ethnic minority (inc. gypsy / travellers, refugees and asylum seekers); people with disabilities, religious groups / faiths, lesbian, gay, bisexual and transgender; communities in areas of disadvantage; people with mental health problems; homeless people; people involved in the criminal justice system; rural groups.

What impact will the proposal have on Equality?	Impact -3 to +3	Comments
Relations between groups	+2	Promotion of cycling and walking should promote social mixing and raising exposure to, and possibly awareness of, other social groups. If this occurs there is potential for reducing social segregation
Discrimination	+2	Promotion of cycling and walking should promote equality
Social / Family support	+2	Promotion of cycling and walking should support the development and maintenance of social networking
Inclusion	+2/3	Promotion of cycling and walking should promote social mixing and raising exposure to, and possibly awareness of, other social groups. If this occurs there is potential for reducing social segregation
Access to information	0	

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