



# Transport & Health Study Group

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## CARRYING OUT A HEALTH IMPACT ASSESSMENT OF A TRANSPORT POLICY - GUIDANCE FROM THE TRANSPORT & HEALTH STUDY GROUP

2000

**FACULTY OF PUBLIC HEALTH MEDICINE**

The Faculty of Public Health Medicine is a professional organisation whose members are public health professionals or academics in public health medicine. It is a faculty of the three Royal Colleges of Physicians of the United Kingdom and gives independent advice on the public's health.

## A Summary of the Health Impacts of Transport

The Transport & Health Study Group has listed the health effects of transport as follows:

### WAYS IN WHICH TRANSPORT INFLUENCES HEALTH

#### Health Promoting

Enables access to  
employment  
shops  
recreation  
social support networks  
health services  
countryside

Recreation

Exercise

Economic Development

#### Health Damaging

Road Traffic Injuries

Pollution

particulates  
carbon monoxide  
nitrogen oxides  
hydrocarbons  
ozones  
carbon dioxide  
lead

Noise

Stress and anxiety

Danger

Loss of land and planning blight

Severance of communities by road

Constraints on mobility access and independence

Reduced social use of outdoor space due to traffic  
and streets

## Health impact assessment (HIA) for transport – a framework suggested by Transport & Health Study Group

In 1991 we published 'Health on the Move', a report setting out the links between transport and health. 'Saving Lives – Our Healthier Nation', acknowledges that population health is affected by policies external to the NHS. Under the chapter 'Communities: tackling the wider causes of ill-health', the white paper encourages 'local agencies to make health impact assessments when planning investment in, for example, amenities, buildings or local communities and in the location of services.'

At the World Health Organisation conference on Environment and Health, held in London in June 1999, the UK Minister for Public Health (Tessa Jowell) and the Minister for Transport (Lord Whitty) signed a Declaration on Transport, Environment and Health on behalf of the ministers of all 51 countries of the WHO European region. The Declaration (see [www.who.dk/london99/welcomeE.htm](http://www.who.dk/london99/welcomeE.htm)) commits governments to promote health in transport policies.

The methods for HIA are still being developed. HIAs should include both quantitative and qualitative data, and should impact on decision-making. There have been some HIAs already on transport and health.

Initiator	Investigation	Impact
Stockport public health department (1994)	Contributed an HIA to the planning inquiry on a second runway for Manchester Airport.	Greater use of public transport to access the airport. Improved recruitment approaches to give fair access to local people and disabled people.
Health of Londoners Project (1996) (pp. 41)	Described health impact of transport in London; calculated potential health benefits of a 10% 'modal shift' to walking and cycling.	NHS and Ministers not interested.
HIA of the City of Edinburgh's Urban Transport Strategy	Tested three scenarios for transport strategy and documented health effects.	Encouraged more integrated thinking on transport within land use planning and the production of Local Transport Strategies.
Liverpool Public Health Observatory (1999) (pp. 110)	Defines health effects of policies within 'Merseyside Integrated Transport Strategy'.	Gave support to local strategy.

### Tips and reflections.

- As health professionals seek to promote health and know little about transport, transport professionals seek to promote transport and know little about health. (Environmentalists concerned for environmental conservation may or may not impact on health). Transport planners seek to provide more transport and economic growth, so speed and convenience may be prioritised over health. The purpose of a transport HIA will be to bring the health effects into wider discussion: to balance transport and economic objectives for health.
- There are many varieties of transport policy, which can each have different health impacts. Increasing public transport without restraining of private cars could increase air pollution without providing exercise benefits. Cycling injuries fall per mile travelled with a larger 'critical mass' of cyclists. Road 'safety' engineering in towns (kerb barriers, traffic lights) may increase traffic flow and reduce pedestrian access. Rather than accept the transport plan proposed, the HIA might investigate how equivalent journeys by other modes could maximise health.
- Existing government policies encourage public and private agencies to produce 'green' travel plans but the response has been limited. Local authorities are charged with improving air quality, but environment departments and transport departments are only beginning to collaborate on this. No one knows yet how far public bodies or public officers are prepared to change their thinking on health grounds.

## The effects of transport on health

Transport includes walking and cycling, as well as the use of private vehicles, public transport and goods vehicles. Transport can have a wide range of beneficial and deleterious effects on health. Positive effects include recreation; exercise; and access to employment, education, shops, recreation, social support networks, health services and the countryside. Negative effects include: pollution; traffic injuries; noise; stress and anxiety; danger; land loss and planning blight; and community severance.<sup>1-3</sup> Each potential effect of transport on health is categorised below as calculable, estimable, definite but unquantifiable, or speculative (C/E/D/S).

### Air pollution

In the UK, motor vehicles are responsible for 46-61% of nitrogen dioxide in outside air and up to 25% of PM<sub>10</sub> emissions.<sup>4</sup> Although emission regulations are becoming more stringent<sup>5</sup>, the amounts of nitrogen dioxide will increase after 2005 if traffic growth follows current forecasts.<sup>5</sup> Congestion will also increase<sup>2</sup> and this will exacerbate emissions per vehicle.<sup>6</sup> Air pollution episodes are associated with rises in deaths and hospital admissions.<sup>7</sup> Contemporary ambient levels of air pollution are also associated with raised morbidity and mortality.<sup>8</sup> In addition, transport accounts for over 25% of the UK's emissions of carbon dioxide<sup>9</sup>, contributing to future global climate change with its implications for health.<sup>10</sup>

Pollutant	Main sources	% in UK from road transport	Effect on health	Inequalities in exposure or susceptibility	C/E/D/S
Benzene	Combustion and distribution of petrol	67%	Genotoxic carcinogen, causes leukaemia	Those near petrol filling stations,	C
1,3-Butadiene	Combustion of petrol	80%	Genotoxic carcinogen, causes lymphomas and leukaemia	Occupational exposure	E
Carbon monoxide	Incomplete combustion	91%	Increased deaths and CVD hospital admissions	<i>Harmful to those with pre-existing cardiovascular disease</i>	E
Nitrogen dioxide	Combustion in air: road transport, electrical supply industry, industry & commerce	46-61%	Long-term: Affects lung function, enhanced responses to allergens. Acute: as particulates	Unvented gas heaters, Gas cookers, Living near main roads <i>As particulates</i>	D E/S
Ozone	Sunlight acting on NO <sub>x</sub> and VOCs, etc	(Long distance pollutant)	Deaths & Respiratory hospital admission Respiratory symptoms & Lung function	Rural >Urban	E S
Particles	1 <sup>0</sup> : combustion (road traffic) 2 <sup>0</sup> : chemical reactions in air Coarse: e.g. dust, soil, salt, pollen, tyres construction	25% ↑ in cities and in peak episodes	Acute: Shortens lives, increases hospital admissions from respiratory and CVD causes Increased asthma symptoms & bronchodilator use	<i>Harmful to those with pre-existing cardiovascular or respiratory disease</i>	E D
Sulphur dioxide	Combustion of sulphur-containing fuel	2%	Respiratory & CVD deaths and respiratory hospital admissions brought forward Constriction of airways	<i>Pre-existing asthma or chronic lung disease</i>	E D

CVD: cardiovascular

## Road traffic injuries

Transport accounted for 39% of accidental deaths in 1992<sup>11</sup>, accounting in 1993 for almost 6% of years of life lost before the age of 70.<sup>12</sup> Even more people are injured, causing both short- and long-term morbidity. Injuries to pedestrians and cyclists are higher in the UK than in most Western countries.<sup>11</sup> The greater the speed of the vehicle, the greater the risk of severe or fatal injury. These effects are estimable (if one assumes that injury rates by speed of vehicle and by road-user type do not change) or definite but unquantifiable (if, for example, a major shift in modality or infrastructure reduces the risk to cyclists).

Perceived danger from traffic leads to restrictions on children's independent mobility<sup>13</sup>, with consequent increases in motor vehicle traffic to transport children and concomitant decreases in the fitness and psychological well-being of children who no longer walk and cycle at will. These health effects are speculative.

## Physical activity

Both adults<sup>14</sup> and children<sup>15,16</sup> in Britain are less active and less fit than previously. Obesity is increasing and is related to inactive lifestyles.<sup>17</sup> Physical activity reduces the risk of heart disease<sup>18</sup>, stroke<sup>42</sup>, diabetes<sup>42</sup>, hypertension<sup>42</sup>, depression<sup>19</sup>, cancer<sup>43</sup>, especially of the colon<sup>43</sup>, and osteoporosis<sup>20</sup>, and improves well-being.<sup>21</sup> Both cycling<sup>22</sup> and walking<sup>23</sup> are good exercise: walking or cycling to school or work is as effective as a training programme<sup>24</sup> and can fulfil the recommendations for exercise.<sup>25</sup> The effect on all-cause mortality, heart disease<sup>26</sup>, stroke<sup>42</sup>, and colon cancer is estimable<sup>26</sup>; other effects are definite but unquantifiable. Physical activity may also reduce prostatic hypertrophy<sup>27</sup> (speculative).

## Community severance

Community severance is caused by major roads being built through a community, with a proportion of local residents being cut off not only from safe and easy access to shops, schools and other facilities but also from their social network. Studies in the USA have shown that number and frequency of social contact falls as traffic volume increase.<sup>28</sup> People without such social support have higher mortality rates<sup>29</sup> but there is no direct evidence for the effects of transport policies on social support. Traffic also reduces the use of residential streets as play areas for children.<sup>30</sup> The health effects of community severance from transport are speculative.

## Noise

A 24-hour survey in England and Wales in 1990 recorded noise from roads outside 92% of the dwellings sampled.<sup>11</sup> Noise from traffic is unlikely to lead to hearing loss but contributes to stress-related health problems such as hypertension<sup>31</sup> (estimable) and minor psychiatric illness<sup>32</sup> (definite but unquantifiable). Traffic noise can also impair health by causing loss of sleep (definite but unquantifiable).<sup>33,34</sup> The effect on health of interference with concentration is speculative, while the importance of communication difficulties is definite but unquantifiable.

## Access/mobility

Access to education, work, shops, healthcare and social networks often requires transport. Those without a car have reduced access to facilities designed assuming car use, such as hospitals at the top of a steep hill or out-of-town supermarkets. Even in car-owning households, the elderly, children and women are less likely to have access to car use. Those with disabilities are particularly disadvantaged by financial or physical barriers to mobility. The health effects are definite but unquantifiable.

## Inequalities

Injuries are more likely for pedestrians and cyclists than drivers. There is a high correlation between deprivation and pedestrian injuries<sup>35</sup> and fatalities in childhood.<sup>36</sup> Those who can afford to do so usually live in accommodation that is not by a busy main road. Air and noise pollution and community severance from traffic are experienced more by those who cannot afford to live elsewhere.<sup>8</sup> Many of the diseases to which lack of physical activity predisposes are associated with deprivation. Physical activity in leisure time has a marked social class gradient, as many people have little access to sports facilities because of financial or travel barriers. These are definite but unquantifiable.

## Carrying out a health impact assessment

The first step in a health impact assessment is to identify the health impacts that are to be assessed. This may seem an obvious statement but it is at this stage that the success or failure of the HIA will be determined.

Time must be spent on deciding the impacts. Most successful health impact assessments devote a substantial brainstorm – half a day at least to this task. The Liverpool Health Observatory has suggested a checklist that will help in determining this. This is shown opposite 

The next step is to decide how far these impacts will be quantifiable. The Manchester Airport 2<sup>nd</sup> Runway HIA suggested four levels of quantifiability – calculable, estimable, definite but unquantifiable, speculative. The Liverpool Public Health Observatory has suggested a modification, which separates calculability from degree of certainty as two dimensions. Calculable, estimable, and unquantifiable are the three points on the one dimension, whereas definite and speculative are the extremes of the other dimension. The Liverpool approach is more sophisticated but the other end of the Mersey may have the more practical approach. Manchester suggests a 16-cell grid in which the quantifiability of the environmental or social impact forms one dimension and the other quantifiability of the associated attributable risk forms the other.

This grid is shown opposite 

It can be argued that if one dimension is unquantifiable it really doesn't matter that the other dimension can be the subject of precise calculations. The quantifiability of any factor will therefore be determined by the least quantifiable of these two dimensions and only four categories matter. After the quantifiable categories have been quantified a judgement must be made about how sensitive the conclusion is to assumptions about the unquantifiable.

Quantification is not the end point of a health impact assessment. Indeed some HIAs neglect quantification completely. One of the most important end points of an HIA is the recommendation of measures to minimise the adverse effects and maximise the beneficial effects 

## THE LIVERPOOL CHECKLIST

- Biological Factors
- Lifestyle
- Social and Environmental Factors
- Physical Environment
- Access to Services
- Public Policy

## THE MANCHESTER AIRPORT GRID

The Health effect of a particular social or environmental impact	Social or environmental impact			
	Can be calculated	Can be estimated	Is definite but unquantifiable	Is speculative
Can be calculated				
Can be estimated				
Is definite but unquantifiable				
Is speculative				

## ACHIEVING CHANGE

As an example of embodying the results of an HIA in an agreed programme to maximise benefits and minimise harm the agreement between Stockport Health Authority and Manchester Airport can be obtained from either party or found on the THSG web site: [www.nhs.uk/transportandhealth](http://www.nhs.uk/transportandhealth)

Key references include:

- Health on the Move available from the Public Health Association or THSG – 0161-419-5467
- Road transport and health available from the British Medical Association – 020-7387-4499
- Transport and Health available from the Health Development Agency –020-7222-5300
- The Healthy Transport Toolkit available from Transport 2000 – 020-7613-0743

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Published jointly by the Transport & Health Study Group c/o Dept. of Public Health Medicine, Stockport Health Authority, Springwood House, Poplar Grove, Hazel Grove, Stockport, Cheshire SK7 5BY. 0161 419 5467. [www.nhs.uk/transportandhealth](http://www.nhs.uk/transportandhealth), and by the Faculty of Public Health Medicine 4 St Andrews Place, London NW1 4LB. 020 7935 0243. [www.fphm.org.uk](http://www.fphm.org.uk)

Printed by SF Taylor & Co Ltd, Haigh Avenue, Whitehill Industrial Estate, Reddish, Stockport, Cheshire SK4 1QR.