

A Health (Inequality) Impact Assessment of the St. Mellons Link Road Development



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Introduction

The social exclusion of children, elderly people and those without a car has been exacerbated by the frequent equation of transport policy with road traffic (Roberts 1998). General quality of life is better without the constant background of traffic noise and the smell of exhaust fumes, which are suffered disproportionately by people living in socio-economically disadvantaged areas.

Concerns over the health effects of the St. Mellons Link Road development were brought to the attention of the Health Authority by a letter from the Residents' Association in September 2001. Around this time, the Authority had arranged to train the Cardiff Local Health Alliance in the Bro Taf method of Health Inequality Impact Assessment (Lester 1999 & 2001) and it was decided that the St. Mellons development should be used as an example. Following this, it was decided to undertake a collaborative Health Impact Assessment involving local residents, community development workers, the Health Authority, council officers and elected members (see appendix 1). Most of those invited agreed to take part, with Council officers attending as "interested/participating observers".

At the first meeting, the HIA process was introduced, including the focus on reducing health inequalities, which is integral to Bro Taf Health Authority's approach. HIA should be based on the determinants of health and a multi-disciplinary understanding of the proposal and of the local situation. Both positive and negative impacts should be examined and the likelihood of each occurring should be supported by evidence.

Steering group members discussed the proposal in relation to the Unitary Development Plan, which contained several relevant statements on conservation and transport. The Council had commissioned a *Landscape Study for Cardiff (1999)* in collaboration with the WDA and Countryside Council for Wales. This recommended several Special Landscape Areas for individual protection and all were accepted by the Council, but with proposed boundary modifications in the case of Wentloog Levels (Cardiff Unitary Development Plan 2001). These modifications have not been formally accepted and remain the subject of consultation. In proposing boundary changes, the Council appears to have disregarded its stated responsibility to preserve and enhance the quality and character of the countryside and of historic landscapes. The Unitary Development Plan also recognises that pollution due to road traffic is harming air quality, which will be added to by another new road. It could be argued that the Council may have failed to consider its own Proposition 36, which states that "The Council will resist

development which, by its location, would have an unacceptable effect on the amenity of residential areas because of air or noise pollution”. Proposition 17, however, specifically protects land for the named road scheme, which is the subject of this health impact assessment.

The Link Road Project

Council officers explained the current proposed layout and what it sought to achieve. The preferred route differed slightly from the original plan and an environmental assessment of this route was currently taking place. The objective was to provide a direct freight route between the Eurofreight terminal, Wentloog Industrial Park and major road networks. The project also sought to promote walking and cycling in the area and plans included a new cycle way. A brief account was given of findings from assessing four highway route options at preliminary stage, but members were asked to note that a full environmental statement for the preferred route was in progress. If the currently preferred route were taken, this would mean that the road was located further away from houses than the initial option.

Officers explained that, though they wished to be helpful, they were not permitted to provide information that was contained in the environmental assessment of the currently preferred route, because this was at a draft stage and needed to be finalised and seen by the council cabinet before disseminating more widely. Officers anticipated that this information would be in the public domain by August 2002. Failure to grant permission for disclosure has hindered the health impact assessment process to some extent, as it has not been possible to estimate the positive or negative health effect of changing the route.

Scoping

There would be some impact on the whole of Cardiff and further afield, but it was agreed that it was not feasible to examine this in sufficient detail in the time available. (The timetable for the assessment appears as appendix 2.) It was therefore agreed to examine likely impacts within approximately 2km of Cypress Drive. The Steering Group would also examine the broader implications for health and wellbeing of increasing the volume of road traffic.

The Evidence

Vehicle emissions

Residents were worried about the effects on asthma, bronchitis and heart conditions of the additional vehicle emissions that would result from the new road. Several newspaper articles were quoted in support of these concerns. It was stated that in the opinion of local primary care practices, the prevalence of asthma was increasing, but it was not possible to quote exact figures on this.

A European study published in 2001 made a critical assessment of 15 reviews of published studies linking air pollution and adverse health affects and concluded that the associations were both valid and causal (Dab et al 2001). Although the individual health risks of air pollution are relatively small, the public health consequences are considerable (Kunzil et al 2000).

In the UK, motor vehicles are responsible for 46-61% of nitrogen dioxide in outside air and 25% of PM₁₀ emissions (Department of the Environment 1999). However, emission regulations are becoming more stringent (Department of the Environment 1997). Congestion exacerbates emissions per vehicle (Barratt 1996) and, though this should not be a problem on the proposed road, there will be increased emissions resulting from stopping and starting at the proposed three sets of traffic lights in Cyprus Drive. Air pollution is associated with a rise in hospital admissions and deaths (Anderson 1991), morbidity and mortality (Department of Health 1998). Transport causes 25% of UK carbon dioxide emissions, contributing to climate change and subsequent affects on health. A recent study has shown that long term exposure to fine particle air pollution is an important risk factor for lung cancer (Pope 2002). The conclusion must be that the total effect is probably greater than sum of the parts. Table 1 summarises pollutants from road transport and their health affects.

Table 1 – Pollutants and their health effects

Pollutant	Health Effect	Comment
Benzene	Carcinogen (petro-chemical workers, e.g. pump attendants)	No evidence of general traffic affect, but any amount may be hazardous to health
Carbon monoxide	Cardiovascular disease (CVD)	Some effect, but greater exposure from passive smoking
Nitrogen dioxide	Lung function, response to allergens, CVD	Definite association but difficult to quantify - may be a marker for others, e.g. fine particles
Ozone	Respiratory symptoms, lung function	Ozone affect appears at some distance from the traffic source
Fine particles	Respiratory, asthma, CVD, myocardial infarction, carcinogen	Definite effect of fine particles from motor fuel, especially diesel
Sulphur dioxide	Respiratory, CVD	Definite association, but difficult to quantify

High-risk groups for adverse affects of particulates include the elderly, infants and those with existing acute respiratory infection or cardiovascular problems (Pope 2000). There is increasing evidence that elevated levels of particulate matter can exacerbate existing asthma, but only limited evidence for its induction (Gavett 2001). The evidence of a causal affect for asthmatic symptoms is not conclusive, as a study of road traffic and wheeze in children found that traffic activity was not a major determinant (Venn 2000).

In evidence to the Alconbury Health Impact Assessment (Cambridgeshire Health Authority 2000) based on 8500 traffic movements per day linked to industrial development, the developer stated that the main affects of emissions occur within five metres of the source, decreasing to almost undetectable levels at 2000 metres. To calculate the maximum possible health effect using

WHO figures on death/illness rates, it was assumed that the total local population of 4270 was within five metres of the pollution source for 24 hours a day for one year. Using these assumptions, the estimates of adverse health effects were low (table 2) and the acute effects of the link road project would be approximately one eighth of these.

Table 2 – Estimates of acute adverse health effects based on 8500 traffic movements per day and maximum exposure to emissions

Event	Maximum occurrence per year
Long term mortality (age 25 years or more)	0.3 deaths per year
Respiratory hospital admissions (all ages)	0.3 admissions per year
Cardiovascular hospital admissions (all ages)	0.4 admissions per year
Chronic bronchitis incidents (age 25 years or more)	0.5 attacks per year
Bronchitis (age under 15 years)	1.3 cases per year
Exacerbation of asthma (age under 15 years)	0.6 attacks per year
Exacerbation of asthma (age 15 years and over)	6.5 attacks per year

Source: Adapted from Alconbury Health Impact Assessment

In conclusion, the overall effects on the local population of pollutants caused by emissions from vehicles using this road are likely to be small.

Accidents and injuries

In 1992 39% of accidental deaths were associated with road traffic, with cyclist and pedestrian injuries higher in the UK than in most other Western countries (Royal Commission 1994). There is high correlation between deprivation and pedestrian injury (Kendrick 1993, Abdalla 1997) and childhood pedestrian mortality, though declining, shows a steep social class gradient (Roberts 1996). It would be fair to say that accidents are likely to increase if the volume of traffic using roads that are also routes to school increases.

Mitigation Area-wide traffic management schemes, for example 20 mph speed limits, are effective in reducing child road traffic injuries (Health Evidence Bulletins 1998), but road safety training alone is relatively ineffective (Effective Health Care Bulletin 1996).

The Alconbury Health Impact Assessment used data from a variety of sources to calculate the likely impact of the development on traffic accidents. Based on information from the Highways Agency, Automobile Association and the Transport Research Laboratory, it calculated that the number of injury only accidents would be between one and 19 based on the predicted 8500 movements per day. Using the same data, it was predicted that one fatal accident was likely to occur in between three and 57 years. Bearing in mind that the predicted number of movements for the link road is 1000, the accident estimate would be approximately one eighth of those in the Alconbury HIA. Even if this is a gross underestimate of the eventual traffic movements, there are likely to be very few accidents actually on the new road. This assumes that the risks posed by the two roads are equivalent and it is possible that we may not be comparing like with like.

Mitigation The greatest danger is from traffic coming through the estate to join the new road and it should be possible to designate residential roads as for access only.

Impact on health services

Emergency services Evidence to the Alconbury enquiry from the ambulance service stated that, for similar developments, there had been no increased demand in either the constructional or operational phases. Accident and Emergency departments expressed similar views.

Primary Care There is evidence that demands on primary care services are greatest in disadvantaged areas (Carlisle 1998, Harrison 1998). Many illnesses are related to stress, which is suffered disproportionately by socio-economically disadvantaged people (Brunner 1997). Enquiries to a local practice suggest that there is currently a six day wait for non-urgent appointments, so extra demand could be problematic.

Stress

Whilst there is no direct evidence that demands on primary care will increase as a result of the development, it is possible that there could be an increase in stress related consultations, especially in those most adversely affected by the road. Residents reported that they were already suffering stress as a result of worries about how the development might affect their health and the value of

their property. Those nearest the road were afraid that the volume of heavy goods vehicles might damage the foundations.

Restrictions to children

If residential areas are used to access the new road, this may be detrimental to children in particular. Increased traffic leads to restrictions on children's independent mobility (Hillman 1990). This results in more traffic as parents transport their children and less physical activity for children, leading to associated health problems. Obesity rates in British children have trebled since 1982 and the first recognised UK cases of type II diabetes in white adolescents have recently been reported (Dyer 2002). The Safe Routes to School Initiative introduced in 1999/2000 aims to show children that there are alternatives to the car, encouraging them to take regular exercise and to develop healthy travel habits for the future. This work may be damaged if traffic on school routes increases as a result of 'cutting across' to reach the new road. Council officers were unable to submit current information on traffic flow to the Steering Group for discussion, but provided the following statement to be included in the report:

"Traffic turning north onto the new road could use the Willowbrook Drive/Willowdene Way route to avoid two new sets of lights on the new road. The effect of new traffic cutting through the new road past the school is likely to be nullified by a greater percentage of the road traffic avoiding Sandbrook Road. "

Encouraging walking and cycling

New roads usually increase car use and tend to reduce the proportion of journeys made by other means. But, having said this, the project includes proposals to encourage walking and cycling by enhancing existing routes. However, it was doubtful that anyone would wish to walk for pleasure in an area with constant traffic noise, though the route might be used for other purposes such as reaching the place of employment. Regarding cycling, cycle ways for commuting would need to take the quickest route to work in order to be a viable alternative to other forms of transport and this would mean close proximity to heavy traffic. Such routes would not be appealing for recreational purposes.

Walking and cycling can make an important contribution to improving public health. If moderate physical activity for 30 minutes on at least five days per week became the norm, about a third of coronary heart disease and strokes

could be avoided, 25% of type II diabetes and 50% of hip fractures (Scottish Forum for Public Health Medicine 1996).

Social capital

The concept of social capital is based on reciprocal support, informal social networks and a sense of attachment (Gatrell 2000). It has been recognised that the physical environment is important for community morale and social interaction. When people in communities affected by new developments feel that their opinions and needs are being disregarded by those in authority, this engenders feelings of powerlessness and lack of confidence (Rowntree 2002). This may be aggravated by the knowledge that the Council does not accept the recommendations of its commissioned consultants and formulates transport plans that are inconsistent with some of the principles stated in the Unitary Development Plan. However, Council officers asked the Steering Group to note that the Wentloog Levels SLA and Wentloog to St. Mellons Link Road Phase 2 are in the Cardiff Unitary Development Plan.

It is possible that opposition to the road may give residents a common interest, which may lead to greater social interaction. Involvement in issues around childcare and schooling (in this case relating to increased traffic on school routes) has been shown to unite communities. There is evidence that good social networks reduce the risk of coronary heart disease, depression and infections (Wilkinson et al 1998). Even if opposition to the development was not successful, social networks may persist and continue to be beneficial. On the other hand, there may be a risk of social exclusion for people who support the road.

Employment

It is claimed that the development will increase local employment opportunities. Unemployment and poverty are strongly associated with illness and premature death. This has been demonstrated notably by the Black Report (Townsend 1988) and more recently by the Acheson Report (1998). Encouraging local recruitment should contribute to environmental sustainability and health. Working close to home can confer both physical and mental health benefits (Halpern 1995), giving people more time for recreational activities. To achieve health benefits, jobs should be of good quality: minimum wage jobs may create pressure to work long hours, which could be health damaging.

It is possible that the predicted jobs will not materialise or that workers will be drawn in from a wider area, with no appreciable benefit to local people.

This may be due to local people not having the requisite skills. If future developments do create jobs, it should be possible to negotiate planning agreements to provide training to prepare local people for employment. It is not possible to verify or refute job creation forecasts, as they are necessarily speculative, but experience at other locations suggests that the number of jobs for local people is usually over-estimated.

Mitigation: It should be possible to negotiate local labour agreements and employment pacts with future developers.

Noise

There was likely to be a high level of disturbance to residents during the construction phase and subsequently from heavy goods traffic. In addition to general construction noise, there will be disturbance from pile driving when constructing the elevated section of the road. To reach home, cars would have to turn into Willowdene Way, round Willowbrook Drive and into Sandbrook Drive, thus creating congestion and traffic noise outside the school, with possible damage to children's concentration. Residents are also concerned about noise at night and consequent sleep disturbance. It was pointed out that night flights over residential areas could be stopped between 12 a.m. and 6 a.m., but that heavy goods vehicles are not subject to restrictions. The plans that are currently available show three sets of traffic lights along Cyprus Drive and this will inevitably contribute to higher noise levels from breaking, starting and acceleration. Noise is likely to cause direct disturbance to those near the road and the background noise level will increase over a wider area.

A recent Spanish study that monitored noise levels from heavy goods vehicles in three locations found that noise was the origin of disturbance and disposition (Uris 2001). It has been suggested that the poorer health experienced by people of lower socio-economic status may be related to chronic stress, including that caused by noise pollution (Baum 1999). It has also been shown that road traffic noise is a stressor in children with elevated resting systolic blood pressure in those exposed (Evans 2001).

Mitigation: Possible measures to reduce noise include:

During construction:

- avoidance of heaviest work during unsocial hours
- consultation with residents on strategies to reduce disturbance

During operation:

- noise attenuating glazing
- noise reducing road surfacing
- noise barriers where appropriate
- traffic reduction/exclusion measures on residential roads.

Loss of countryside

The rurality of the area would be damaged by the road development. This is considered to be a health inequalities issue, as those without a car will be disproportionately affected. This is the only rural area that is located within a short distance of the St. Mellons estate. Residents may continue to use the area for recreation due to lack of choice, but may not derive the same health benefits if the character of the area changes, whereas those with cars have the option of driving to other locations in order to enjoy the countryside. The loss of amenity in this area will be particularly disappointing to residents in view of the recommendation by the Council's own consultants that this historic landscape should be preserved.

Council officers asked the Steering Group to note that the only public footpath directly affected by the road is cut by the Faendre Reen and appears to be unused, though no evidence of its disuse was submitted. Part of the rural aspect would also be lost due to planned development of the St. Mellons Business Park, if these proposals are adopted. Land to the South of St. Mellons is being developed as a country park and it was stated that this would preserve the land in perpetuity, both visually and as a recreational area. However, enjoyment of the country park is likely to be diminished by a view of the proposed elevated section of road and by resultant traffic noise.

Residents pointed out that the Welsh Assembly Government (WAG) was reported to be urging local authorities to respond to public concerns by identifying areas for preservation. The countryside that will be adversely affected by the road has been designated as a Site of Special Scientific Interest (SSSI). As the WAG Minister for the Environment was unable to attend the Health Impact Assessment, it was not possible to pursue points regarding the SSSI with her.

Mitigation: Tree planting may go some way to improve the appearance of the area and to screen the road at ground level. It is understood that land between the new road and existing housing will be preserved as green space by the development.

Visual Impact

The elevated section of the road will cause visual disturbance to nearby residents and to those using the Country Park. The nature of the development is certain to have a negative aesthetic impact on pleasure in the scenery, but it has not been possible to find specific evidence of damage to the health of those whose view has been spoiled. People have claimed psychological damage following unsightly developments and it is thought that this could be due to exacerbation of an existing psychological condition (Cambridgeshire Health Authority 2000). On the other hand, there may be a benefit to some residents who may have the 'greenness' of their view improved. There will also be greater certainty that some areas will not be built on, due to their use as surface water drainage retention ponds.

An American study has shown that surgical patients whose recovery took place in a room with a view of trees had a shorter post-operative hospital stay and took less pain relieving drugs than matched patients with a view of a brick wall (Ulrich 1984). Nurses made more negative comments on the state of mind of patients with the wall view, indicating that this might have a depressing effect. Natural views elicit positive feelings, reduce fear in stressed subjects and may block or reduce stressful thoughts (Altman 1983).

Mitigation: As previous section

Effect on local property

Elderly people have moved to what they believed would remain a semi-rural area, in the hope that this would be their final home in retirement. Residents close to the road fear that vibration during construction and from heavy vehicles may damage their property. There is already evidence that houses have become difficult to sell and the Residents' Association reported three recent cases where potential buyers had withdrawn when they were told about the proposed road. If council tenants find that they are living in a less healthy environment, it may be difficult for them to re-locate.

Mitigation: Purchase or compensation schemes should be put in place for those most severely affected.

Strategic Planning

The final link in the ring road (the Eastern Bay Link) will not be built in the foreseeable future due to the high cost. Though the road that is the subject of this HIA is not part of the ring road, residents questioned whether the St. Mellons link was necessary or economically viable. No precise costing was

available to the Steering Group for the St. Mellons development, but it would be considerably less than the Eastern Bay Link. Nevertheless, opportunity costs should be considered and it might be a better use of resources to devote this money to improving and/or subsidising public transport. (For example, the issue of transport costs to school has been an ongoing concern for St. Mellons residents.) Public transport subsidies could result in people choosing not to use their cars, thus relieving congestion and avoiding the need for yet more road building.

Cardiff needs a truly integrated transport strategy, emphasising the value of walking, cycling and low-cost, efficient public transport for the health of its citizens.

Reputation of the St. Mellons Estate

People living in areas that have a poor reputation feel stigmatised and discriminated against, which is bad for their psychological wellbeing. This feeling increases when they believe that their concerns are disregarded.

Conclusion

Evidence suggests that health-damaging effects resulting from the link road development can be reliably estimated. However, in estimating these effects, the work of the Steering Group has been hindered by the embargo placed on the Draft Environmental Statement being prepared for the preferred route. The Steering Group considers that, in the interests of efficiency and open government, those involved in health impact and environmental assessments should be free to make full mutual disclosure.

The health benefits that may result from this project have been impossible to quantify and no reliable estimates have been produced. This does not mean that some benefits might not occur, but the Council did not allow its officers to produce the current estimates of the effects (such as employment) that might create a positive impact.

On the evidence produced so far, the balance is that the Link Road project will have a negative impact on the health of St. Mellons residents. Elected members who wish to support this project need to demonstrate that they have considered data that offsets harms to the local population.

This Health Inequality Impact Assessment forms only one component of the evidence necessary to come to a decision on whether this project should go forward. It should now be considered alongside the Environmental Statement and the likely economic impact on St. Mellons residents. The Steering Group believes, on the basis of the evidence provided to it, that the development will harm the health of St. Mellons residents and, if the benefit to Cardiff as a whole is considered important, then suitable recompense should be made to those who are adversely affected.

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Appendix 1

Participants

Ralph Cook	Local Councillor and St. Mellons resident
Sandra Goosey	Health Promotion, Cardiff Local Health Group
Jamie Grundy	St. Mellons Healthy Living Project
Carolyn Lester	Health Inequalities, Bro Taf Health Authority
Joy Mason	St. Mellons Healthy Living Project
Liz McDonnell	Local Resident
Brian Russell	Highways and Parks Department, Cardiff County Council*
Dr. Mark Temple (Chair)	Environmental Public Health Medicine, Bro Taf Health Authority
Joan Trigg	Local Resident and St. Mellons Action Committee
John Vesey	Regulatory Services, Cardiff County Council*
Simon White	Highways and Parks Department, Cardiff County Council*

* Council officers attended as interested/participating observers.

The following were also invited

Sue Essex Government	Minister for the Environment, Welsh Assembly
Christine Jenkins	Co-ordinator, Cardiff Local Health Alliance
Christine Friday	Deputy Mayor, Cardiff County Council

Appendix 2

Timetable

First meeting January 2002

Presentations:	The Link Road development plan (Council Officers)
	Residents' concerns (Community representatives)
	Health Inequality Impact Assessment Process (Health Authority)
Discussion	Scope of assessment
	Timetable and target completion date
	Positive and negative health impacts
	Evidence needed and responsibility for evidence collection

Second meeting – March 2002

- Presentation of evidence
- Agreeing arrangements for production of draft report, circulation to members and response dates

April 2002

- Circulating draft report to Steering Group
- Receiving responses
- Amending draft

Third meeting – May 2002

Presentation of final draft

Discussion of amendments

Agreeing final report and its format

Agreeing arrangements for presentation to the Council,
publication and distribution