Health Services Investment Analysis of New Hospitals, Medical School and Related Developments in North Staffordshire

1. The NHS as Employer

"The NHS has huge potential through its own workforce, development and procurement practices to make a difference to local communities." Sir Nigel Crisp[1]

The NHS is a very large employer and one of the largest employers in North Staffordshire. The University Hospital of North Staffordshire employs 7200 and the four PCTs employ 3600. Its employment practice will therefore directly affect the health of a large number of people and indirectly affect even more by setting an example that other employers will be challenged to follow.

In addition to those directly employed, the NHS also generates other employment (indirect) through its demand for services and also (induced) through the demand created by NHS employees spending their income. This is further discussed under construction (section 3 of this report). When the new hospitals and medical school are operational there will be a modest expansion in the number of staff employed.

Employment Impacts of hospitals and medical school operation
Additional jobs (FTE) created

	New hospitals scheme	**Medical school**
Direct	333	27
Indirect and induced	67	5
Total	400	32

1.1 Best employment practice

Earlier sections have identified that the Trust will have to work hard to attract the workforce it needs and will therefore have the added incentive to follow best employment practice. It is important to be fully recruited since agency staff are far more expensive than those directly employed and to retain staff since the costs of new recruitment are high. The revision of skill mix and flexible working methods will not only aid recruitment but also be good for the health of the workforce. This will help to address the problem of work – life balance, an area in which the NHS has not excelled in the past but is now taking seriously with the "Improving Working Lives" initiative[2].

1.2 Childcare facilities

Women form a high proportion of the Trust workforce and many employees are parents who care for children. The Trust should therefore have to ensure that child care facilities are available. Not only does this fit with being a good employer but it is also financially prudent since it can reduce recruitment and retention costs and supports the policy drive, which recognises the importance of children and a good start in life. The demand for child care applies to all workers not only NHS workers and it is common for NHS child care facilities to be made available (for a cost) to children of other worker parents or for provision of facilities to be shared with other employers and agencies. There is scope to link with other government funded child care schemes. The NHS can support child care providers in various ways including training and perhaps in finding premises. Child care for workers is already subsidised but there may be a case for further reducing the proportion of cost born by worker parents. Through the arrangements it makes to improve child care facilities for its own staff the NHS can raise the standard of care throughout the community[3] [4].

The Outline Business case has asked that the following be provided:-

- Provide a range of high quality facilities that will assist in meeting the varied needs of the Day Nursery users so that they can successfully combine work with family commitments
- Meet the National Standards for Under Eight's day care and childminding.
- Follow the guidelines of the NHS Childcare Strategy
- Provide imaginative, creative, and educational activities for children using the Day Nursery reflecting the cultural diversity of the children.
- Provide a homely environment to encourage a child's intellectual, physical, emotional and social well being and development.
- Provide a play scheme that offers a range of indoor activities, outdoor activities in an appropriate play space in accordance with the age range of the children, and trips off site.
- Provide accommodation for the play scheme either on site or in a place easily accessible by public transport from the site.

1.3 Workplace health

The NHS should be a leader in workplace health. Care is taken to ensure that the workplace is safe. Hazardous chemicals have largely been eliminated from laboratories and where they are still used proper safety precautions are in place. The hazards of manual lifting and back injury (where the record of the NHS used to be poor) have now been recognised and procedures to avoid manual heavy lifting instituted. Stress at work remains a problem but is being addressed. The problem of bullying at work has been recognised and procedures to prevent it instituted. Violence and threats of violence from patients to staff is an increasing problem but again measures to protect staff are in place.

However, a healthy workplace not only ensures the absence of conditions that damage health but also the active promotion of health. The NHS should encourage behaviours that support good health in its staff. NHS premises are

with rare exceptions non-smoking and cigarettes are not sold on hospital premises. However smoking is still fairly prevalent in some sectors of the workforce. Working in a non-smoking environment is helpful for those contemplating quitting and the NHS should be advising all its staff of the benefits to them of not smoking and offering help to those who want to quit. Obesity is a problem in this country and the NHS should be helping its staff to maintain higher levels of physical activity. Encouraging walking and cycling is one way to do this. Provision of free or subsidised access to leisure exercise and sport facilities is another. Healthy eating is another aspect of healthy living. Catering and food provision in the trust should make it easy for staff to do this. Trust policies on drug and alcohol use should promote safe drinking in those who choose to drink and discourage illicit drug use as well as defining firm procedures for helping those with problems and laying down clear disciplinary steps where these are necessary. The occupational health service should not only be helping to cure or manage health problems but also play a part in health promotion. All these are characteristics of good employers but the NHS should be among the best. There is a further argument for the NHS to promotehealthy behaviours among its staff. Not only will staff be healthier and therefore have less sickness absence, but they will also be able to promote the health of their patients more effectively.

2. NHS as purchaser

" The NHS as a major employer and as a major business in virtually every locality has a role to play in tackling inequalities and addressing regeneration through its investment, its staff and capital, the purchase of services and the development of local economies".[5]

Requirements for purchasing

The NHS Purchasing and Services Agency PASA was established in 2000 replacing the NHS Supplies Agency. Its purpose is to advise and assist trusts in their purchasing and to take advantage of the bulk buying power of the NHS. Trusts can both negotiate contracts independently with local or national suppliers and take advantage of national contracts negotiated by PASA. PASA is seeking to expand the proportion of NHS purchases made through its contracts and this might militate against small suppliers and local sourcing.

As a public authority the NHS is required to follow treasury guidance and also European Commission directives.

Fair and open competition

The NHS cannot discriminate directly or indirectly on the grounds of nationality or restrict the free movement of goods or services. Open competition must be demonstrated for all contracts. Requirements specifying a type of product only produced in one place or limiting the distance it could be transported (eg food miles) could be considered indirectly discriminatory.

Best value

The NHS must demonstrate that it has chosen the supplier that gives best value for money. This should take quality into account and need not be the cheapest. Quality could include consideration such as running cost, disposal cost and whole life cost.

Probity and legal standing

Firms contracting with the NHS are required to show that they are legal entities with proper financial standing and can indemnify the NHS against loss in the event of failure to deliver the contract. This is an expensive process and may effectively debar small and medium enterprises from competing for many NHS contracts.

Single aim

Treasury guidance states that purchasing should not be used to pursue aims other than value for money. This might be interpreted to mean that purchasing cannot be used to pursue environmental and social objectives such as promoting “green” practices, stimulating the local economy or reducing inequalities.

Recent guidance however suggests that while being required to pursue best value and ensure fair and open competition other considerations are permissible. Thus the European Commission has stated that it is permissible to include clauses in contracts requiring that a proportion of unemployed people should be hired or training given. The treasury has indicated that a contract could specify environmental criteria such as the use of recycled or recyclable materials. The situation is complex but public bodies are increasingly able to use environmental and social considerations to inform their purchasing policy. In its explanation of how tenders are evaluated PASA states “Although the environment can form only one aspect of the evaluation, credit will be given where the bidder shows that they have taken any detrimental impact on the environment into account and minimised it as far as possible”.[6]

Sustainability and Environmental criteria

The NHS has recognised the importance of sustainability and the impact that its operations have on the environment. There are many ways in which the NHS can modify its operations so as to have less environmental cost. Its

purchasing policy needs to reflect this concern avoiding purchasing products whose production or use is damaging to the environment.

Local purchasing

Local purchasing has the attraction that more of the benefit goes into the local economy and that transport costs are less. The desirability of using health service developments as an engine for regeneration is widely recognised.

On the other hand some communities would be damaged if all purchasing were local. North Staffordshire businesses would be harmed if other localities favoured good produced near them over higher quality less expensive goods produced in North Staffordshire. There are also equity arguments against local purchasing where poorer communities are deprived of the opportunity to compete. Local purchasing is a helpful principle but it has to be considered together with other principles such as equity, fair trade and best value.

3. The NHS as developer / constructor

The government is making a major investment in construction of hospitals through PFI schemes having committed £16 billion nationally since 1997. Investment of this size has major impacts on the communities in which they are located. The economic impact of these been reviewed by Ecotec in "North Staffordshire Health Impact Assessment: Economic Impact Study" (Appendix 15). In addition to creating improved facilities for health care investment in healthcare infrastructure can benefit health by creating jobs and stimulating the economy.

- Ten construction years of employment is considered equivalent to one permanent FTE job.
- One construction year of employment is supported by £75,000 (£60-80,000) of construction expenditure.
- One construction year of employment creates a further 0.2 years of employment outside the construction. (ie multiplier is 1.2).

On the basis of these assumptions it may be estimated that as a result of construction of the hospitals and medical school 600 permanent jobs will be created..

Employment Impacts of hospitals and medical school construction
Number of jobs (FTE) created

	New Hospitals	Medical School
Direct	468	33
Indirect and induced	94	7
Total	562	40

The extent to which this benefits North Staffordshire depends first on the extent to which direct construction jobs can be taken by local residents. This in turn depends on the capacity of local partners to deliver against sector skills

and on the strength of contractor commitment to source labour locally. Ecotec suggest that local sourcing of 40% is a realistic and achievable target.

Estimation of the multiplier effect, the number of additional jobs created as a consequence of each direct job is difficult. Jobs are created indirectly in the supply chain producing the materials and services that the primary worker uses in their job. Jobs are also induced to meet the demand that the primary workers create by spending their earnings. The number of indirect jobs varies with type of work done by the primary worker and the number of induced jobs depends on their spending patterns. Saving produces no extra jobs while spending on services produces many extra jobs. The multiplier effect for work in different sectors varies considerably. The size of the multiplier is affected by things such as the propensity to save and the buoyancy of the economy. In general the multiplier effect is greater for lower paid jobs (since there is a lower propensity to save) than for higher paid jobs.

How can the NHS when commissioning construction maximise the benefit to the local economy flowing from it? Can it influence either the proportion of jobs taken by local residents or the economic multiplier?

There is limited scope to influence the proportion of jobs taken by local residents. It is possible to include terms in contracts specifying proportions of the workforce that should be locally hired, but care must be taken that these terms do not infringe fair competition legislation. Cooperation and planning with employment agencies and colleges can ensure that local residents are aware of the employment opportunities, which are likely to arise, and are offered courses to equip them with the skills that will enable them to take these opportunities. Plans must be made well in advance if this is to be done successfully. It appears that these steps have been taken In North Staffordshire.

4. Catering

The catering operations of the hospitals in North Staffordshire will affect the health of the population in many ways.

- Nutrition affects ability of patients to recover from illness.
- Healthy eating habits reduce the risk of becoming ill.
- Hospitals should act as an examplar of healthy living including healthy eating.
- Hospital purchasing affects the variety and quality of food available on the market.
- Hospital purchasing affects the viability of food production and distribution chains.

Patient Nutrition

Many of those admitted to hospital are malnourished. Many illness states increase the patients' need for energy and other nutrients. Recovery from some illnesses requires special types of diet. For all these reasons it is important that hospitals, following good dietetic advice, are able to supply those patients who have particular dietary needs with appropriate diets. However although special diets are important, the majority of patients, like the rest of the population, simply require ordinary good nutritious food.

Healthy eating

The nature of healthy eating is well understood .

- Enough energy to maintain body weight
- High intake of complex carbohydrates
- Percentage of energy as fat not excessive
- Percentage of fat as saturates not excessive
- Percentage of energy as refined carbohydrates not excessive.

- Adequate amounts of vitamins and minerals.
- Ample intake of fluids

Eating is far more than consumption of nutrients; it should be an experience which is hedonically appealing (taste, smell, temperature, visual appearance) and a social occasion. The caterer's art is to achieve all this at the same time as providing healthy eating.

Food must not only provide the necessary nutrient balance but it must also be microbiologically safe and free of toxins. Good food hygiene and sound catering practice will ensure that this is so.

Exemplar role of hospital catering

In addition to caring for patients the hospital is a workplace and many of its staff will eat there. The hospital therefore, like any other workplace, should offer a choice of healthy food in staff restaurants and make it easy for its staff to eat healthily. Similarly many visitors will wish to eat while they are visiting the hospital and they too should be able to make healthy eating choices if they wish.

For most patients the hospital stay is a very brief fraction of their lives and for visitors the hospital visit is even shorter. It could thus be argued that the food consumed in hospital makes a very small contribution to their overall nutrient intake. This however ignores the importance of the exemplar role of the hospital and the important opportunities for education about healthy eating. People rightly expect that hospitals are run by people, who know about health, and that hospital catering will be an example of healthy catering. Eating in hospital should be a practical demonstration that healthy eating is enjoyable.

Shaping the food supply chain

The NHS is a very large caterer and food purchaser. The University Hospital of North Staffordshire provides about 1300 meals per day for patients and a similar number of meals for staff. It spends £1.5 million per year on food

items. The NHS whether purchasing through PASA or as individual trust can use its bulk purchasing power to place upward pressure on the quality of the food generally available (for example a requirement for lower salt content in some manufactured foods).

If a hospital purchases food from local suppliers it not only stimulates the local food market but also reduces the “food miles” the number of miles with consequent vehicle emissions and use of energy required to bring the food to the hospital. However purchasing policy and the strict rules applicable to the NHS (see section 2) may limit the ability of a trust to specify local suppliers.

Cook chill meals

In the new hospital catering will be provided using a cook chill operation with meals being prepared off site and then heated prior to being served to patients. There is a possibility that the central meal preparation facility could supply other users in addition to the new hospitals. This mode of catering offers advantages of quality control, portion control and economies of scale. The nutritional quality of meals prepared by cook chill is not different from that prepared by other methods and if it avoids the need to hold food at high temperatures for long periods it may provide meals with higher vitamin content.

While cook chill may have advantages in terms of cost, and food quality it could involve more need for transport (from production facility to the hospital) and increased use of disposable containers and wrapping.

5. Energy

5.1 Energy Use

Energy use of NHS facilities is important because most means of energy production rely on combustion of fossil fuels, which produce carbon dioxide and other gases. Carbon dioxide production causes global warming and so impacts negatively on health. Energy efficient hospitals directly or indirectly result in less production of carbon dioxide.

A further benefit of energy efficiency is financial saving thereby releasing funds to be spent on patient care.

Examples of how buildings can be made more energy efficient are

- Using less energy (eg lower temperatures, not using lifts etc)
- Not wasting energy (eg thermal insulation, more energy efficient lighting etc)

In addition less carbon dioxide will be produced if they use energy from renewable sources such as wind power, tide power, photovoltaic power, biomass etc.

5.2 Global Warming

Global warming is having numerous adverse health impacts. Rising sea levels threaten populations living on low level land (including most Pacific Island Countries and Bangladesh). Shifting climatic patterns and rainfall distribution is reducing the capacity of many countries to feed themselves (including Sub Saharan Africa, Australia, South America and the Indian Sub continent). Extreme weather conditions are becoming more frequent resulting in floods, hurricanes and gales. Other adverse effects include changing and widening distribution of various insect borne diseases including malaria. In

these ways global warming threatens the health and viability of millions of people [7] [8].

Global warming is caused by increasing levels of carbon dioxide in the atmosphere, which reduce heat loss through radiation and so raise global temperature. The rise in carbon dioxide levels are almost certainly due to increased production of carbon dioxide as a result of human activity chiefly through combustion of fossil fuels. The earth's atmosphere changes very slowly and even if carbon dioxide production were radically reduced today it would take many decades before atmospheric carbon dioxide levels stopped rising and started to fall. It is probably our grandchildren who will experience the consequences of our production of carbon dioxide.

Many countries have recognised the need to act quickly if trends are to be stabilised before they become catastrophic. The Kyoto treaty to which UK is a signatory agreed to take measures to reduce production of carbon dioxide and other green house gases.

5.3 Hospitals and Energy

The NHS in England has been set targets

- Reduce the level of primary energy consumption by 15% or 0.15 million tonnes carbon emissions from a base year of March 2000 to March 2010.
- Achieve a target of 35-55 GJ/100m^3 energy efficiency performance for the health care estate for all new capital developments and major redevelopments or refurbishments and that all existing facilities should achieve a target of 55-65 GJ/100m^3.

Hospitals use energy in many ways including lighting, ventilation, lifts, heating, water pumps, boilers, chiller plant, medical equipment, IT equipment, etc. In a typical hospital the biggest energy uses are lighting, ventilation and lifts, though in the case of the current North Staffordshire buildings lifts are not significant users of energy . A typical hospital consumes energy equivalent to

16 tonne of CO^2 per bed per year. Electricity accounts for 20% of energy use and 60% of hospital energy expenditure.[9]

Example of ways by which hospitals can reduce energy use are

- Improved thermal insulation (walls, roofs, windows)
- More efficient temperature controls systems
- Greater use of natural light
- Low energy lighting
- More efficient boilers *
- Combined heat and power schemes *
- Encouraging staff and visitors to use stairs rather than lift
- Power down devices on IT and intermittently used equipment

*More efficient boilers and CHP give same energy output for reduced energy input.

The old hospital buildings on the sites of the City General and Royal Infirmary are energy inefficient but they are low energy users since they operate at relatively low temperatures with low air change rates (typically half to one times per hour). In addition these buildings are cool in summer and do not need energy demanding cooling systems.

Areas such as theatres use energy much more intensively because they operate at a higher temperature, have high air change rates (up to 30 times per hour) and in summer have to be cooled with energy demanding refrigeration.

The new hospital will reduce energy demand both by replacing existing buildings with more energy efficient ones and more importantly taking measures to reduce energy use in the higher tech areas which account for much of the energy use. Developments in medical care tend to require more energy using equipment and continuing effort will therefore be required prevent energy use rising again.

Energy consumption at the City General Hospital in 2002/3 was 72.94 GJ/100m^3. The new buildings will be much more energy efficient. The level of energy consumption achieved will be critically dependent on the way in which the buildings are used.

6. Waste

The NHS produces large volumes of waste. Some of this is clinical waste requiring special disposal and some of it is domestic waste. In 2003-04 the Trust produced about 1040 tonne of clinical waste and 1200 tonne of domestic waste. All of it has to be disposed of[10].

Creation of waste is not environmentally friendly. It depletes the earth of resources many if which are not renewable. Disposal by landfill or incineration produces pollutants and contributes to global warming by production of carbon dioxide and methane. Waste production is also financially wasteful, disposal of ordinary waste is expensive and disposal of clinical waste very expensive. The costs will rise further as public policy places further disincentives on waste production.

The first response of the NHS to the problem of waste was better separation of ordinary and clinical waste streams. Constant education is required to reduce the amount of ordinary waste entering the (expensive) clinical waste stream.

The strategy for reduction of waste operates at several levels

- Minimise waste production
- Segregate waste streams
- Reuse where possible
- Recycle materials
- Minimise volume

There is a great deal of scope to reduce waste particularly with packaging. Negotiations with suppliers should ensure that goods have only the minimum amount of packaging necessary to ensure that they can be received and stored in proper condition. In many cases it is possible to agree with regular suppliers that they collect packaging and reuse it.

For reasons of safety and cleanliness the health service relies heavily on single use products which are disposed of after use. For many purposes this is unavoidable. However the NHS should be looking for opportunities to move from disposable to reusable wherever possible especially for non clinical uses. Toner cartridges are an example where reuse (after reprocessing by the manufacturer) is possible and financially advantageous. In other situation such as where disposable cutlery or plates and cups are used it is necessary to scrutinise carefully the environmental and financial case for each option. With disposable instruments the case for servicing and re-sterilising needs to be continually reviewed. Technological advance and changing costs may mean that an option, which is not viable today, may become viable in five years time.

A high fraction of waste can be recycled. Paper, cardboard, aluminium, glass and certain plastics are well known examples. The key to affordable recycling is separation of waste at source, sorting mixed waste is a very expensive procedure. A further problem with recycling is fluctuation in the market for recycled materials. The market price for recycled paper is notoriously volatile.

While recycling is environmentally advantageous it is not always immediately cost saving or even cost neutral. In 2003/04 the Trust sent for recycling 100 fridges (legally required) and 108,000 fluorescent tubes, which cost more than less environmentally friendly disposal. About 50 tonne of paper was recycled without gain or cost and 25 tonne of scrap metal was sold with a gain of about £10 per tonne. Printer toner cartridges were recycled and generate income. Processing materials prior to recycling, for example baling cardboard, has capital and recurrent costs. Government involvement to create more stable markets for recycled materials would make it easier for the NHS to recycle more.

Organic waste from NHS kitchens and estates can be composted though large scale composting is not entirely environmentally benign.

Where waste production is unavoidable the costs of disposal can be reduced by compacting it, so it occupies a smaller volume.

There will always be the issue of clinical waste including sharps for which incineration is currently the best method of disposal. Clinical waste includes plastics such as PVC (blood bags, infusion bags, drip lines), which produce dioxins if burnt at low temperatures. They may also contain heavy metals and other toxic products. They therefore have to be incinerated at high temperatures under very carefully controlled conditions.

As well as minimising its own production of waste the NHS can play its part in encouraging waste minimisation and recycling by others. In its purchasing the NHS can explore the possibility of buying products made from recycled materials though it will always have to pay careful attention to best value. In negotiating contracts it can seek to negotiate elimination of unnecessary packaging and reuse of necessary packaging. In evaluating tenders it can look not simply at the purchase price of products but also at the life time cost including disposal after use. Within the constraints of fair competition and best value it can favour suppliers who minimise waste. In all these ways the NHS can reduce the problem posed to our society by waste.

The outline business case states that the provider will “use their best endeavours to ensure that waste is disposed of by the least environmentally harmful route” and that they will “segregate recyclable waste from non-clinical (household) waste which is not recyclable waste”.”

7. Transport

Health services are the cause of a very large number of journeys. Staff travel to and from their place of work; patients attend health service facilities in hospitals or primary care; visitors travel to see patients; staff travel to visit patients or other health service locations; service vehicles bring supplies to health service premises and take waste away. Altogether these add up to a very many vehicle miles.

Most hospitals have large car parks but continually receive complaints that the car parks are not large enough. Traffic around large hospitals can cause congestion and delays. The travel impacts of the new hospitals and medical school have been discussed in section 14 of the main report and the cause for concern about the effect of vehicle emissions and noise on health in appendix 8.

Both in its own interest and in the interests of sustainability the NHS must seek to reduce the amount of travel it generates and the environmental cost of that travel. The need for travel can be reduced in various ways such as making care more efficient so that it can be delivered with fewer visits and delivered closer to the patients home. This is a prominent part of the Fit for the Future plan.

Where the need for travel cannot be eliminated the NHS must seek to encourage more sustainable ways of travelling. Single car use is convenient for the driver but imposes a cost on the community. The NHS must seek to encourage more staff, patients and visitors to travel in shared cars, by public transport or even by cycle or foot.

Car sharing can be encouraged by initiating schemes that introduce staff members to other staff with whom they could conveniently share transport, an arrangement, which has the added benefit of reducing their travelcosts.

Public transport is often viewed as inconvenient and uncomfortable though this may not be the case. The NHS should negotiate with passenger transport providers to encourage them to operate frequent service to hospitals and health facilities using comfortable buses at times that meet the needs of staff, patients and visitors. Provision of information on bus timings and shelters with real time bus information will further encourage bus use. Passenger transport providers will be amenable to providing services if they can expect enough passengers to make the service commercially viable. The development of improved services will not only benefit health service users and staff but all other potential users. In planning new health care facilities considerable weight should be given to their accessibility by public transport, which means that green field sites outside towns would be chosen less often.

Cycling should be encouraged by provision of safe conveniently located bicycle storage where bicycles can be securely locked as well as showers and changing facilities. Trusts may also consider operating a trust bicycle pool or offering staff loans for bicycle purchase.

As well as encouraging car users to travel by other modes of transport it may be necessary to examine at the number of parking spaces provided and the tariff for parking and perhaps review policies on travel expenses to ensure that they are consistent with a sustainable approach.

The NHS should seek to operate its own vehicle fleet as sustainably as possible. Good management and maximum use of back loads will minimise the number of trips needed. Technical specification of vehicles for minimal emissions combined with regular maintenance will reduce their environmental impact.

Sourcing of supplies from local providers will also reduce the vehicle miles travelled by suppliers.

While it has been concluded that the transport impacts of this development will be slight, the NHS should be seeking not simply to refrain from increasing

its transport use but to reduce it. Fit for the Future is intending to do this through the development of Travel Plans. No single measure can be expected to do much by itself to reduce the problem of travel and congestion, but taken together as part of a determined strategy to reduce vehicle miles and combined with similar action from other generators of travel it could make a real difference. Once again the NHS should be playing its part in trying to produce less health damaging and more sustainable patterns.

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