

North Bristol NHS Trust

**NORTH BRISTOL AND SOUTH GLOUCESTERSHIRE
HOSPITAL SERVICE CONFIGURATION APPRAISAL**

TRANSPORT APPRAISAL

November 2004

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1.0 INTRODUCTION

1.1 Aim of Appraisal

- 1.1.1 The aim of this appraisal is to assess the options put forward by the North Bristol NHS Trust (NBT) for the potential reconfiguration of hospital services within the North Bristol and South Gloucestershire area.
- 1.1.2 Three options are assessed within this appraisal for their general impact in terms of transport. Each option is assessed against a range of criteria in order to identify the most beneficial option in terms of transport.
- 1.1.3 This transport appraisal forms part of a wider study managed by Finnamore, which considers other important social, economic and environmental factors.
- 1.1.4 Main acute and emergency hospital services within North Bristol and South Gloucestershire are currently provided at the Southmead and Frenchay hospitals. Both of these hospitals currently provide main acute and emergency hospital services to their combined catchment area, and three options are being considered for the reconfiguration of these services:
- OPTION 1 - Retention of both Southmead and Frenchay Hospitals as Acute/Emergency Hospitals, with community facilities provided at both sites;
 - OPTION 2 - Main Acute Hospital plus a Community Hospital at Southmead, with a second Community Hospital at Frenchay; and
 - OPTION 3 - Main Acute Hospital plus a Community Hospital at Frenchay, with a second Community Hospital at Southmead.
- 1.1.5 A study was undertaken in 2001/2002 for the NBT area which involved the selection of potential development sites for the amalgamation of the existing hospitals within the NBT area. This report therefore draws upon some of the information and assessment from this previous study, updated where necessary.

1.2 Scope of Appraisal

- 1.2.1 This appraisal considers both car and non-car means of transport. The traffic implications of each option are assessed by examining the potential change in travel patterns along key routes. The travel patterns of staff, patients and visitors at the two hospitals are considered. For each option an assessment is made based on the percentage change in traffic during the morning and evening peak hours for each of these three groups. The significance of this change is judged qualitatively rather than quantitatively.
- 1.2.2 The appraisal also considers each option in terms of accessibility by walking, cycling and public transport. The two sites are examined for their potential to attract non-car modes of transport and the percentage of population which would have access to these modes.
- 1.2.3 The implications of the two reconfiguration options for the ambulance service and also the socially deprived areas of Bristol are considered. The general implications of each option on the current on-street parking conditions are also considered.
- 1.2.4 The main hospitals concerned by this review share the populations of North Bristol and South Gloucestershire. However, the primary impact on road congestion and traffic in general will be in the northern part of Bristol, bounded by the M5 motorway to the northwest, the M4 motorway to the north east, the A4174 Bristol ring road to the east, the River Avon to the west, and the remainder of the Bristol urban area to the south. Whilst there are a number of population centres outside this area, such as Yate and Thornbury, which are served by the two main hospitals, the impact of the options chosen on the road network outside these bounds will be minimal.
- 1.2.5 The road network within Bristol is divided into five categories:
- Motorway / National Primary Route;
 - County Primary Route;
 - Other A-Class Roads;
 - B-Roads and Other Important Routes; and
 - Local Roads.
- 1.2.6 Our study is limited to the first four categories of the road hierarchy. The strategic road network within Bristol, including traffic flow information on key routes, is shown at Appendix 1.

1.3 Contents

- 1.3.1 The appraisal continues in Section 2 with a review of the existing hospital facilities within the NBT area. Details are provided of the Southmead and Frenchay Hospitals, and consideration is given to the nearby Bristol Royal Infirmary (BRI), although the BRI does not form part of this study. Details of the proposed hospital configurations are provided in Section 3, and the methodology of this Transport Appraisal is described in Section 4.
- 1.3.2 Section 5 contains a review of the existing traffic conditions, and assesses how each configuration option would affect these conditions. Section 6 contains an assessment of walking and cycling accessibility, and Section 7 contains an assessment of public transport accessibility.
- 1.3.3 Section 8 examines the existing on-street parking conditions at the two hospital sites, and considers how the proposed configuration options would affect these conditions. Section 9 considers the implications for the ambulance service, and Section 10 considers the implications for the socially deprived areas of Bristol. An assessment of accessibility by car and non-emergency ambulance is also provided in Section 11.
- 1.3.4 A summary of the appraisal for each configuration option is contained in Section 12, and this indicates how each option performs against the transport criteria.
- 1.3.5 Section 13 provides a review of the development issues that would be associated with the reconfiguration of services, including the planning process and the local impact of each option. Our conclusions are set out in Section 14.

2.0 EXISTING HOSPITAL CONFIGURATION

2.1 Overview

2.1.1 The study area covers the North Bristol NHS Trust area, which contains the existing Southmead and Frenchay Hospitals. These hospitals currently provide general and emergency hospital care to the population within the NBT catchment area.

2.1.2 The location of the existing hospitals, the trust area and population levels within this area are shown at Appendix 2.

2.1.3 The services currently provided at the two hospitals can be broken down into four categories of patient. These are:

- Inpatient Episodes, which are the admission of patients to the hospital for the use of a hospital bed for a variable period of time;
- Outpatient Attendances, which are the admission of patients for treatment without the need for a hospital bed or overnight treatment;
- Daycase Episodes, which are the admission of patients to the hospital for the use of a hospital bed but treated within the period of one day; and
- A+E Attendances, which are the admission of patients to the accident and emergency department.

2.2 Southmead Hospital

2.2.1 Southmead Hospital currently provides core acute services to residents within the NBT catchment area, and also provides a number of specialist services to the wider Avon area. There are currently around 699 inpatient beds provided at the hospital, with an additional 71 beds provided for daycase patients.

2.2.2 Southmead is around 5.5 kilometres to the north of Bristol City Centre. The hospital is bordered by the B4056 Southmead Road to the northwest, by Monk's Park Avenue to the northeast and by Kingholm Road to the southwest. The site is also bordered by an area of residential development to the southeast, which is served by Dorian Road. The roads and the areas surrounding the hospital are predominantly residential in character.

2.2.3 Access to the hospital is currently provided from junctions on Southmead Road and Monks Park Avenue, and access is also provided from an extension of Dorian Road.

2.2.4 Monks Park Avenue meets Southmead Road at a double mini-roundabout adjacent to the northern corner of the site. Southmead Road continues northeast from this junction to meet the A4174 Avon Ring Road, around 1.5 kilometres from the hospital. All roads within the vicinity of the hospital are of single carriageway standard and are lit.

2.3 Frenchay Hospital

2.3.1 Frenchay Hospital also provides core acute services to residents within the NBT catchment area and a number of specialist services to the wider Avon area. There are currently around 620 inpatient beds provided at the hospital, with an additional 57 beds provided for daycase patients.

2.3.2 Frenchay Hospital is around seven kilometres to the northeast of Bristol City Centre in the Frenchay area of Bristol. The hospital is bordered by the B4058 Bristol Road to the west, by Begbrook Park to the south, and by Beckspool Road to the east. An existing area of residential development forms the northern boundary of the hospital. The roads and the areas surrounding the hospital are predominantly residential in character.

2.3.3 Three vehicular accesses are currently provided into Frenchay Hospital. These are provided from a priority junction on Bristol Road, from the mini-roundabout junction of Bristol Road / Begbrook Park, and also from a priority junction on Begbrook Park.

2.3.4 The B4058 Bristol Road connects with the A4174 ring road at the Hambrook signal junction, around 500 metres to the east of Junction 1 of the M32 Motorway. The Hambrook signal junction is linked to the traffic signals of the M32 junction and gives priority to traffic leaving the motorway. A high occupancy vehicle lane is provided on this section of the ring road, eastbound towards the M32 junction.

2.4 Bristol Royal Infirmary

- 2.4.1 The BRI is located in the centre of Bristol and is not within the NBT catchment area. However, the accident and emergency services of the BRI are available to residents of the NBT catchment area, and an element of 'drift' therefore occurs as patients within the NBT area use the facilities available at the BRI. The BRI also provides a number of specialist services to the wider Avon area.
- 2.4.2 At present, there are some 906 inpatient beds provided at the BRI, with an additional 99 beds available for daycase patients.

3.0 PROPOSED CONFIGURATION OPTIONS

3.1 Overview

3.1.1 The North Bristol NHS Trust has been working together with other health organisations in Avon to consider the way that hospital services in the area will be developed over the next ten years. As well as re-configuring the services at Southmead and Frenchay Hospitals, the options under consideration involve a transfer of some services to community based facilities. The options put forward by the North Bristol NHS Trust are shown at Appendix 3, and are described below.

3.2 Option 1

3.2.1 Option 1 represents a 'do minimum' scenario and would involve only a minor level of development at both Southmead and Frenchay Hospitals. Both hospitals would be retained as acute and emergency service hospitals with community facilities also provided.

3.2.2 As part of Option 1, additional community based facilities would also be provided at local centres in Thornbury and Yate.

3.3 Option 2

3.3.1 Option 2 involves the provision of a Main Acute Hospital and a Community Hospital on the existing Southmead site. A second Community Hospital would then be provided on the existing Frenchay site. As part of Option 2, some community based facilities would also be provided at local facilities in Thornbury and Yate.

3.4 Option 3

3.4.1 Option 3 involves the provision of a Main Acute Hospital and a Community Hospital on the existing Frenchay site. A second Community Hospital would then be provided on the Southmead site. Option 3 would also involve some community based facilities being provided at local facilities in Thornbury and Yate.

4.0 TRANSPORT APPRAISAL METHODOLOGY

4.1 Approach

4.1.1 The nature of our study means that the appraisal is based on experience and judgment, and a number of assumptions in relation to travel behaviour. The appraisal does not consider the traffic impact in detail and only gives an indication of the likely change in traffic movement for each option. For this reason, the appraisal should be considered as a qualitative review rather than a quantitative analysis.

4.1.2 We have considered the three configuration options using seven transport criteria, namely:

- traffic movements;
- potential for walking and cycling;
- potential for public transport usage;
- effects on on-street parking conditions;
- implications for the ambulance service;
- implications for the deprived areas of Bristol; and
- Accessibility by private car and non-emergency ambulance.

4.1.3 We have reviewed each of the three options against each of the above criteria. A greater weight has been placed on some criteria compared to others in order to reflect their greater importance and also the ability for any problems to be easily addressed.

4.1.4 This transport appraisal has been based on a review of the existing situation in terms of population levels, the location of housing, and the current provision of non-car travel facilities. It should be noted that any significant change in housing provision or public transport provision resulting from the policies and objectives of the Local Plan has not been considered and this could influence the findings of this appraisal in the future.

5.0 TRAFFIC ASSESSMENT

5.1 Existing Traffic Conditions

5.1.1 A review of morning and evening peak hour traffic conditions on the strategic road network within the identified study area has been undertaken. All of the key highway junctions that are located within the urban area of the NBT catchment area were visited during the morning and evening peak hour, and an assessment was made of how these junctions were operating. An element of local knowledge and experience has also been applied where appropriate.

5.1.2 The review of the highway network has enabled key areas of traffic congestion to be identified. These are areas where vehicle queues were noted during the morning or evening peak periods, and where an increase or decrease in vehicle movements as a result of the hospital service re-configuration is likely to have a significant impact upon traffic conditions.

5.1.3 There are other congested areas both within south Bristol to the south of the NBT catchment area, and also within areas of South Gloucestershire to the north of the two hospitals. However, these areas are unlikely to be affected by a change in the service configuration at the hospitals, as these areas of congestion are likely to cater for traffic associated with both hospital sites and a change of configuration would therefore not affect conditions.

5.1.4 The identified key traffic congestion areas are shown at Appendix 4.

5.2 Traffic Generation

5.2.1 We have used the details of the current hospital service configuration as a point of reference, as this corresponds with the existing scenario in terms of traffic movement through the congested areas. Traffic movements through the identified congested areas have been considered during the morning and evening peak hours, which typically occur between 08.00 and 09.00 in the morning, and between 17.00 and 18.00 in the evening. These time periods have been chosen because traffic in the morning and evening peak hours has the greatest influence on traffic congestion.

- 5.2.2 Some of the congested areas may be more sensitive to variations in traffic than others, and in terms of the general operation of the City, some areas may be more important than others. However, for the purposes of this assessment we have assumed equal importance and sensitivity for each of the congested areas.
- 5.2.3 In terms of the traffic impact of each option, we have considered the individual travel patterns for staff, patients and visitors. We have not considered any localised traffic implications for transferring hospital activity to the community based facilities at Thornbury and Yate, and have only considered within this appraisal the implications of traffic associated with the main hospital sites.
- 5.2.4 In order to forecast the traffic movements for each option, we have made a number of assumptions on the travel behaviour of staff, patients and visitors at the hospitals, based on the information provided by the NBT and the review of non-car facilities available. These assumptions are set out in a note provided at Appendix 5.

Staff Traffic

- 5.2.5 Information has been provided by the NBT relating to the home residences of staff at both Southmead and Frenchay Hospitals. Based on this information, the existing staff journeys to work have been distributed across the highway network.
- 5.2.6 We have assumed the following shift patterns for staff:
- Morning Shift 07.00 to 14.30
 - Afternoon Shift 13.00 to 21.30
 - Night Shift 21.00 to 07.30
- 5.2.7 We understand that hospital staff usually work within the three shifts shown above. Typically a similar number of staff work during the morning and afternoon shifts, with around half the number of morning or afternoon staff working on the night shift. Based on these shift times it is unlikely that during the morning or evening peak hours there would be a significant number of staff vehicle movements on the road network.

- 5.2.8 For the purpose of this appraisal, it has been assumed that 90% of all staff trips will be undertaken by car. In practice it is likely that car-borne trips would form a lower percentage, given the availability of non-car facilities.

Patient Traffic

- 5.2.9 For patient trips we have made assumptions on the number of trips that would be made, based on the facilities that would be provided at each hospital for each option.
- 5.2.10 Arrival patterns at the hospitals are different for each type of patient, and we understand that for inpatients, outpatients and daycase patients the majority would arrive during the morning peak hour, with only a small proportion arriving during the evening peak hour.

Visitor Traffic

- 5.2.11 For visitors to the hospitals we have made assumptions on the number of visitors that each type of patient is likely to attract. We have also assumed that the majority of visitors would arrive at the hospital at the general visiting time at 15.00, with the remaining visitors arriving at the hospital evenly throughout the rest of the day.

5.3 Results of Traffic Assessment

- 5.3.1 A summary of the traffic assessment calculations is provided at Appendix 6. This indicates the percentage of increase/decrease of traffic through each of the congestion hot spots for each option.
- 5.3.2 Each option results in a slight increase in daily traffic through the congested junctions compared to the existing configuration. Option 1 would result in an overall daily increase in traffic through congested junctions of 6.5%. Option 2 would result in a daily increase in traffic of 5.5%, and Option 3 would result in an increase of 7.7%.

5.3.3 However, based on the travel assumptions set out at Appendix 5, there would be a decrease in traffic during the morning and evening peak hours associated with each of the proposed options. This is because each options results in a reduction in patient and visitor trips, but a significant increase in staff trips. These staff trips occur outside of the morning and evening peak hours, and there is therefore a decrease in trips during these periods.

5.3.4 Option 1 would result in an average decrease in traffic of 13.2% during the peak hours compared with the current configuration. Option 2 would result in an average decrease in traffic of 13.3%, and Option 3 would result in an average decrease in traffic of 13.1%.

6.0 WALKING AND CYCLING

6.1 Accessibility to Hospitals

6.1.1 The potential for staff, visitors and patients to travel to both the Southmead and Frenchay hospital sites by cycle and on foot has been considered. PPG13 suggests that it is reasonable for journeys under two kilometres in length to be made on foot, and journeys under five kilometres in length to be made by cycle. We have therefore considered a two kilometre radius walking zone and a five kilometre radius cycling zone for both hospital sites.

6.1.2 Although walking and cycling have been considered, these modes of transport are often not suitable for hospital staff or patients. This is because some staff at the hospitals work late shifts, which have safety implications for travel at night, and also because a high proportion of patients often do not have the necessary mobility for these modes.

6.1.3 There are currently a number of designated cycle routes within Bristol. The City Council are also proposing a number of extensions to these routes which would enhance the cycle network across the study area. As well as the designated cycle routes we have also considered the opportunity for cycling on existing roads.

6.1.4 The walking and cycling isochrones for each site, and the existing and proposed cycle routes within Bristol, are shown at Appendix 7. The approximate population within the walking and cycling isochrones for each site are as follows:

Hospital	Approximate population within a 2km walking distance	Approximate population within a 5km cycling distance
Southmead	25,000	75,000
Frenchay	10,000	90,000

6.2 Assessment of Walking and Cycling Opportunities

- 6.2.1 In summary, Southmead and Frenchay Hospitals have similar population levels within walking and cycling distances of the site. Both hospital sites are restricted in terms of walking and cycling by the physical barriers of the strategic road network.
- 6.2.2 It is considered that walking is likely to offer a greater opportunity as an alternative mode of transport to the car compared to cycling. This is because patients and visitors in particular are more likely to walk than to cycle given the nature of trips associated with health services. In this respect, the ability to promote walking trips should be considered as a slightly higher priority than the ability to promote cycling trips.
- 6.2.3 The population data confirms that Southmead Hospital has a greater level of population living within walking distance of the site, with around 25,000 residents, compared to around 10,000 residents within walking distance of Frenchay Hospital. It is therefore concluded that the Southmead site is accessible to more staff, patients and visitors on foot than the Frenchay Hospital Site.
- 6.2.4 Frenchay Hospital has a greater level of population living within cycling distance of the site with around 90,000 residents, compared with around 75,000 residents living within cycling distance of Southmead Hospital. Frenchay Hospital is therefore concluded to be accessible to more cyclists than Southmead, although cycling is considered to be a less viable alternative to car-borne traffic than walking.
- 6.2.5 Again, it should be noted that any significant development at either of the hospital sites may enable additional pedestrian and cycle facilities to be provided, especially in the immediate local area. Extensions to the existing cycle route network within Bristol are also proposed, which may increase the accessibility of either Southmead or Frenchay.

6.3 Options Assessment for Walking and Cycling

6.3.1 We have calculated the potential for walking and cycling by using the walking and cycling isochrones described above. The potential for non-car trips to each of the hospital sites has been identified by the level of population with access to these modes.

6.3.3 Based on the location of population levels within the vicinity of the two hospital sites, Option 2 offers the greatest potential for encouraging walking and cycling trips. Option 1 offers the second highest potential, with Option 3 the lowest.

7.0 PUBLIC TRANSPORT

7.1 Existing Bus Service Provision

7.1.1 Bus services within Bristol are predominantly radial services from the City Centre. There are a limited number of services which connect the outer lying settlements within the City. Frequent daily services currently operate between the City Centre and the two hospitals at Southmead and Frenchay. One regular service also operates on a route which connects the two hospital sites.

7.1.2 We have reviewed the bus routes which currently serve the two hospital sites. For staff and visitors travelling to a hospital it is considered reasonable to assume that a travel time of up to 45 minutes by bus would be acceptable. Beyond this length of time, other transport options are likely to become more attractive. We have therefore based our assessment of bus potential on a maximum journey time of 45 minutes.

7.1.3 Within deprived areas of the City, where car ownership is below average and more reliance is placed on non-car means of transport, a longer journey time is likely to be more acceptable.

7.1.4 The 45 minute bus journey zones for the two hospital sites are shown at Appendix 8 and the approximate population within a 45 minute journey time of the two hospital sites is shown in the table below.

Hospital	Approximate Population within 30 Minute Journey	Approximate Population within 45 Minute Journey
Southmead	100,000	155,000
Frenchay	90,000	140,000

- 7.1.5 Details are provided within the Bristol Local Transport Plan of the proposed 'showcase' bus routes proposed within the city. These are bus routes where a combination of measures is proposed to be introduced to greatly enhance the operation of existing bus services. These measures include bus priority measures, high quality bus shelters and lighting, better quality buses, real time information at bus stops and improved paper information. It is envisaged that the frequency of service will be improved as a result of these additional facilities.
- 7.1.6 The first 'showcase' bus route to be introduced is route 76/77 which operates on a route between the Hartcliffe area in the south of Bristol, through the city centre along the route of the A38. The route then passes Southmead Hospital and continues to Henbury.

7.2 Bus Services at Southmead Hospital

- 7.2.1 High frequent bus services are available from Southmead Hospital and the immediate vicinity. However, its non-central location in the north of Bristol restricts the size and coverage of the 45 minute travel time area. Bus services from the hospital site are also restricted by the physical barriers of the M4 and M5 motorways, and by the River Avon. Bus services are predominantly radial routes to the city centre and services to other locations are limited.
- 7.2.2 The nearest bus stops to Southmead Hospital are located adjacent to the site on Monk's Park Avenue. From Southmead hospital, both the BRI and Frenchay Hospital sites are accessible by bus.

7.3 Bus Services at Frenchay Hospital

- 7.3.1 The 45 minute travel radius by bus from Frenchay Hospital is similar to that of Southmead Hospital as the bus routes available are again radial routes to the City Centre. Again, the travel zone is mainly confined within the M4 and M5 motorway. The A4174 Avon Ring Road also acts as a physical barrier to bus services, although to a lesser degree.
- 7.3.2 The nearest bus stops to Frenchay hospital are provided on the B4058 Bristol Road adjacent to the hospital. From Frenchay hospital both the BRI and Southmead Hospital sites are accessible by bus.

7.4 Existing Rail Services

- 7.4.1 There is currently only a limited potential for hospital staff and patients in the NBT area to use rail services. The nearest station to Southmead Hospital is Filton Abbey Wood Station, which is approximately 2 km from the hospital. The nearest station to Frenchay Hospital is Bristol Parkway Station, which is around 2.5 km from the hospital site.
- 7.4.2 Guidance within RPG10 suggests that the desirable maximum distance between rail stations and a residential site should be 800 metres in order to encourage this mode of travel. Although a longer distance to the nearest rail station may be appropriate for a hospital site, both hospitals are not considered to be located within a convenient walking distance of a rail station, and we have therefore not considered rail services for the purpose of this appraisal.
- 7.4.2 Until early 2004, a light rapid transit (LRT) scheme was being promoted within Bristol and South Gloucestershire. The proposed route of the LRT was from the Broadmead shopping centre in the City Centre to Temple Meads station, and then north through Easton and Horfield to Bristol Parkway Station, following the line of the existing railway. However, promotion of the LRT scheme was recently suspended, although the route of the LRT scheme is still being safeguarded in order to preclude any development along the route which may prejudice the future revival of the scheme.

7.5 Options Assessment for Public Transport

- 7.5.1 In terms of public transport, Southmead and Frenchay have a very similar level of accessibility. However, the above table confirms that Southmead Hospital has a greater level of population living within a 45 minute journey time by bus. However, this assessment has been based on the existing service provision and it should be recognised that hospitals are a major generator of traffic, and a significant development at either Southmead or Frenchay Hospital could therefore warrant the provision of new bus services and facilities.
- 7.5.2 The review of existing public transport services has demonstrated that Southmead offers the greatest potential for encouraging the use of non-car modes of transport such as walking, cycling and the use of public transport services.

7.5.3 Based on the current provision of public transport services, Option 2 offers the greatest opportunity to encourage public transport use. Option 1 offers the second highest opportunity, with Option 3 the lowest.

8.0 PARKING

8.1 Existing Parking Conditions

8.1.1 On-site observations have noted that it is currently possible to park on-street with relative ease within the vicinity of both Southmead and Frenchay Hospitals. It is also noted that there is little difference between the on-street parking conditions and the availability of spaces at these sites.

8.2 Options Assessment for Effect on Parking Conditions

8.2.1 Significant development at either Southmead or Frenchay Hospital would have implications for local on-street parking conditions. On-street parking currently occurs within the vicinity of both sites, and further development is highly likely to be dependant upon implementation of a localised parking management scheme. However, imposing any stringent measures to control parking around the existing hospital sites is likely to have an adverse impact on local residents.

8.2.2 Although there is little difference in the on-street parking conditions at the site, Southmead has a higher level of population surrounding the site compared to Frenchay. Therefore any displaced parking at the Southmead site would have a more significant impact upon local residents.

8.2.2 Option 1 would have little impact upon the on-street parking conditions as this would be similar to the existing situation. Option 2 and Option 3 are likely to have a similar level of impact. For both of these options there would be a reduction in on-street parking at one location and an increase in on-street parking at the other location. In both cases, the negative impact of increased on-street parking is likely to outweigh any perceived benefit of a reduction in on-street parking elsewhere.

9.0 IMPLICATIONS FOR AMBULANCE SERVICE

9.1 Ambulance Accessibility

9.1.1 We have commented on the implications of each scheme for the ambulance service. For each option this is based on the catchment area of the ambulance service and the implications for serving patients within the NBT catchment area.

9.1.2 The previous discussions with the ambulance service have identified their main concern to be related to traffic congestion that will result in delay to ambulances on emergency trips. The ambulance service previously considered that problems in terms of traffic and admitting patients into the hospitals would be exacerbated by amalgamating the existing hospital sites.

9.1.3 In terms of speeding up the process of admitting patients into the hospitals, this can be achieved through priority measures and increased capacity at the hospital entrance. The ambulance service are therefore keen for such measures to be introduced.

9.2 Options Assessment for Ambulance Accessibility

9.2.1 In terms of accessibility for the ambulance service, having two hospitals at the existing Southmead and Frenchay sites would be preferred. This is because the catchment area of the ambulance service would be divided between the two sites, reducing the journey times for emergency calls. With the emergency facilities concentrated at one site, it is likely that there would be an increase in emergency journey times. In this respect, Option 1 is preferable to either Option 2 or Option 3.

9.2.2 It is important to note that the above assessment does not consider the ability for any of the options to address the access arrangements at the existing hospital sites. With any significant development at either Southmead or Frenchay it may be possible to improve the access arrangements for ambulances. Improving the access arrangements may counter-balance any increase in journey times resulting from these options.

10.0 DEPRIVED AREAS

10.1 Implications for Deprived Areas

10.1.1 We have commented on the implications of each option for the deprived areas of Bristol. For simplicity, we have defined these areas as where car ownership is below average. Reliance on non-car means of transport for these areas is higher than average. Access by bus, cycling and walking is considered for each option.

10.1.2 We have been advised to classify the socially deprived areas of Bristol as those areas where car ownership is below a certain level. In this case, areas where the percentage of households without access to a car is above 22% have been classified as deprived. Residents of deprived areas have more reliance on non-car modes of transport, and the ambulance service have confirmed that deprived areas within Bristol typically represent a higher than average number of emergency calls.

10.1.3 The deprived areas are spread throughout the City, and include areas within north Bristol such as Lockleaze and Kingsweston.

10.2 Options Assessment for Deprived Areas

10.2.1 In terms of the deprived areas within the NBT catchment area, Southmead Hospital is better placed in order to avoid disadvantaging these deprived areas. For some areas such as Kingsweston, the BRI is the most accessible hospital after Southmead, and if a significant level of services were transferred to the Frenchay site it is likely that there would be an element of 'drift' to the BRI, as discussed in Section 2. In this respect, Option 2 would offer the greatest benefit to deprived areas, followed by Option 1. Option 3 would offer the least benefit to the deprived areas of Bristol.

11.0 ACCESSIBILITY BY CAR AND NON-EMERGENCY AMBULANCE

11.1 Accessibility to Car and Non-Emergency Ambulances

11.1.1 The travel times by private car and non-emergency ambulance to the existing hospital sites at Southmead and Frenchay have been considered. Bristol City Council has provided the following average peak hour journey speeds for traffic inside and outside of the central area:

Central Area - 11.4 mph

Non-central Areas - 16.3 mph

11.2 Corresponding information is not available from South Gloucestershire Council, and we have therefore used the above vehicle speeds to calculate a 30 minute drive time area from each of the hospital sites. These are shown at Appendix 9.

11.2 Options Assessment for Car and Non-Emergency Ambulance Accessibility

11.2.1 The total population and the population within the socially deprived wards, within a 30 minute drive time of the Southmead Hospital site, is shown in the table below.

	Total Population	Population Within Socially Deprived Wards
Within 10 Minutes	73,700	52,200
Within 20 Minutes	223,900	171,100
Within 30 Minutes	420,400	323,900

11.2.2 The total population and the population within the socially deprived wards, within a 30 minute drive time of the Frenchay Hospital site, is shown in the table below.

	Total Population	Population Within Socially Deprived Wards
Within 10 Minutes	37,300	21,400
Within 20 Minutes	177,700	122,500
Within 30 Minutes	381,200	250,600

11.2.3 Based on the above population figures, there is a higher level of population within a 30 minute drive time of Southmead. Option 2 therefore offers the greatest level of accessibility by car and non-emergency ambulances, followed by Option 1. Option 3 would offer the lowest level of accessibility.

12.0 TRANSPORT REVIEW OF OPTIONS

12.1 Option 1

- 12.1.1 Option 1 represents a 'do minimum' scenario and would involve only a minor level of development at both Southmead and Frenchay Hospitals. Both hospitals would be retained as acute and emergency service hospitals with community facilities also provided.
- 12.1.2 In terms of traffic, Option 1 would result in an overall daily increase in traffic through congested junctions of 6.5%, although there would be an average decrease in traffic of 13.2% during the morning and evening peak hours.
- 12.1.3 Option 1 represents a shared facility between the two hospital sites. This option therefore offers good potential for non-car trips, including walking, cycling and public transport trips.
- 12.1.4 Option 1 is unlikely to have a significant impact upon on-street parking conditions at either of the hospital sites, as this option would be similar to the existing configuration. Option 1 would also have little impact upon the socially deprived areas of Bristol, given the similarity to the existing configuration.
- 12.1.5 In terms of accessibility for the ambulance service, having two hospitals at the existing Southmead and Frenchay sites would be preferred, as the catchment area of the ambulance service would be divided between the two sites, reducing the journey times for emergency calls.

12.2 Option 2

- 12.2.1 Option 2 involves the provision of a Main Acute Hospital and a Community Hospital on the existing Southmead site. A second Community Hospital would then be provided on the existing Frenchay site.
- 12.2.2 Based on the population levels within the vicinity of the hospital sites, Option 2 offers the greatest potential for encouraging non-car modes of transport such as walking, cycling and public transport trips.

- 12.2.3 In terms of the impact upon on-street parking, Option 2 would result in a reduction in the on-street parking demand at the Frenchay site, but a potentially significant increase in the on-street parking demand at the Southmead site.
- 12.2.4 In terms of accessibility for the ambulance service, Option 2 could result in a slight increase in journey times for transporting patients to the hospital. However, the ambulance service has indicated that the journey time for an ambulance to reach a patient is more important than the time taken to reach a hospital, and an increase in journey time to a hospital may not have a significant impact upon the ambulance service.
- 12.2.5 In terms of the deprived areas within the NBT catchment area, Southmead Hospital is better placed in order to avoid disadvantaging these deprived areas. Option 2 would therefore offer the greatest benefit to these deprived areas.

12.3 Option 3

- 12.3.1 Option 3 involves the provision of a Main Acute Hospital and a Community Hospital on the existing Frenchay site. A second Community Hospital would then be provided on the Southmead site.
- 12.3.2 Based on the population levels within the vicinity of the two hospital sites, Option 3 offers the lowest opportunity for promoting non-car modes of transport. This is based on the lower population levels within walking and cycling distance of the Frenchay site, and the limited public transport services available.
- 12.3.3 In terms of the impact upon on-street parking, Option 3 would result in a reduction in the on-street parking demand at the Frenchay site, but a potentially significant increase in the on-street parking demand at the Southmead site.
- 12.3.4 In terms of accessibility for the ambulance service, Option 3 could result in a slight increase in journey times for transporting patients to the hospital. However, the ambulance service has indicated that the journey time for an ambulance to reach a patient is more important than the time taken to reach a hospital, and an increase in journey time to a hospital may not have a significant impact upon the ambulance service.

12.3.5 In terms of the deprived areas within the NBT catchment area, Frenchay Hospital is further situated from the deprived areas compared to Southmead. For some areas such as Kingsweston, the BRI is the most accessible hospital after Southmead, and if a significant level of services were transferred to the Frenchay site it is likely that there would be an element of patient 'drift' to the BRI. In this respect, Option 3 would offer the least benefit to the deprived areas of Bristol.

13.0 DEVELOPMENT ISSUES

13.1 Overview

13.1.1 Our studies are of a strategic nature and have therefore not involved any detailed discussions with Bristol City Council, South Gloucestershire Council or the Highways Agency. These are the main parties that would be involved in making a decision on any application for new facilities and developments at either of the hospital sites.

13.1.2 Detailed traffic studies normally form the basis of discussions with highway officers which in turn leads to an officer recommendation to the members who would take the decision on any planning application. Transport would be only one factor in the decision making process and views on transport would be balanced with other factors.

13.1.3 It should also be noted that should land become unoccupied at either of the sites as a result of the proposed configurations, this is likely to attract proposed for further development. Any new development for a non-hospital use would generate traffic at the site, although the level of this traffic would be dependant on the uses proposed.

13.2 Potential for Gaining Planning Permission

13.2.1 The potential for gaining planning permission from a transport viewpoint is best considered in relation to basic transport planning principles. The consistent theme underlying national and local policy guidance, including on transport, is that of sustainability. This is expressed in transport policy requirements to reduce the need to travel and maximise accessibility by means of transport other than the private car. In addition, government planning policy aims to concentrate major developments in urban areas, in or near to town and city centres and on previously developed land.

13.2.2 Hospitals are major generators of travel demand. The general transport and planning policies are therefore important considerations in determining suitable locations, although detailed traffic impact is not typically an over-riding consideration.

13.2.3 The Frenchay Hospital site is disadvantaged by its proximity to the Motorway and trunk road network, particularly at Junction1 of the M32. The Highways Agency are therefore likely to be more concerned with development at Frenchay than Southmead. The Highways Agency has power to direct refusal of any planning application and to delay a decision until any concerns are resolved, and there is therefore a higher element of planning risk involved with significant development at the Frenchay site.

13.2.4 The Highways Agency may also have specific concerns regarding development at the Southmead site, if detailed traffic analysis demonstrates any adverse impact upon the trunk road network.

13.3 Effect of Development on Local Junctions

13.3.1 The impact upon local junctions within the immediate vicinity of the site has been considered for each of the proposed options.

Southmead Hospital

13.3.2 The existing vehicular accesses to the hospital are provided from Southmead Road, Monks Park Avenue and Dorian Way. The access junctions are observed to operate satisfactorily at present for the existing hospital development. However, capacity testing would be required at each of the site access points in order to assess capacity with an intensified use of the site.

13.3.3 It is likely that improvements could be made within available highway land on Southmead Road or Monks Park Avenue, should improvements be necessary to the existing access junctions to cater for additional traffic.

13.3.4 It is anticipated that during the morning and evening peak hours, Option 2 would increase traffic flows on both Southmead Road and Gloucester Road, although the actual level of increase during the peak hours would need to be assessed in more detail.

13.3.5 The assessment of congestion hot spots described in Section 3 has identified the junction of Southmead Road / Monks Park Avenue / Penn Park Avenue as being congested. The increase in traffic flows on Southmead Road may raise a further capacity problem at the junction that would need to be addressed. Significant improvements at the junction are not likely to be available within highway land.

Frenchay Hospital

13.3.6 The existing vehicular accesses to the hospital are provided from Bristol Road, the Bristol Road / Begbrook Park junction, and also from Begbrook Park. These access points are observed to operate satisfactorily at present with the existing hospital development. However, capacity testing would be required at each of the site access points in order to assess capacity with an intensified use of the site, and it is likely that the access arrangements would need to be improved in order to accommodate a significant increase in traffic at the site.

13.3.7 It may be possible to provide an additional point of access from Beckspool Road opposite Frenchay Common, although this would require the removal of part of the existing boundary wall. All roads surrounding the site are public highway and it is anticipated that improvements to the existing junctions or the provision of a new junction would be achieved within the limits of available highway land. However, this would be a detailed consideration at the planning application stage.

13.3.8 It is anticipated that during the morning and evening peak hours, Option B would result in an increase in traffic flows on the A4174 Ring Road both to the east and west of the M32 Motorway junction, and on the B4058 Bristol Road. The increases in traffic on the Ring Road are likely to be in the opposite tidal direction of traffic during the peak periods. However, any increase in traffic in the vicinity of the M32 Motorway junction is likely to be of concern to the Highways Agency.

13.3.9 A more detailed assessment would be required in order to identify the actual level of traffic increase associated with an intensification of uses at Frenchay, and the effect of this increase on the operation of local junctions.

14.0 CONCLUSIONS

- 14.1 The preferred option in terms of the transport issues considered in this report is Option 2, which would provide a Main Acute Hospital and a Community Hospital at the Southmead site, and a second Community Hospital at the Frenchay Site. On balance, this option provides the most benefits when considered against the transport criteria.
- 14.2 It is concluded that Southmead is the more accessible site of the two existing hospitals, as it is accessible to a greater number of the local population when considering each mode of transport.
- 14.3 Southmead is less constrained in terms of local traffic conditions with a good level of public transport accessibility. An Acute and Community Hospital facility at Southmead would provide greater potential for non-car accessibility compared to the site at Frenchay.
- 14.4 Frenchay Hospital currently has relatively poor public transport accessibility and is in close proximity to congested junctions, particularly at the M32 Junction 1 and at Hambrook on the A4174 ring road. The scope for financially viable enhancement for public transport accessibility appears limited.
- 14.5 Because of the restrictions at Frenchay in terms of traffic congestion and public transport accessibility, it is concluded that a combination of both sites, as explored in Option 1, would be preferable to providing an intensified use at Frenchay, as explored in Option 3.
- 14.6 The nature of this study means that the appraisal is based on judgment, and a number of assumptions in relation to travel behaviour. The appraisal does not consider the traffic impact in detail and only gives an indication of the likely change in traffic movement for each option. For this reason, the appraisal should be considered as a qualitative review rather than a quantitative analysis, and a detailed traffic analysis would be required to assess the actual traffic impact at existing junctions on the highway network.