

Evaluation of the

Report of the Statewide Neonatal Intensive Care Services Project (2006)

Summary Report to the Minister

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Executive summary

As Australia's fastest growing state, Queensland faces a number of challenges in the immediate future in order to meet the health needs of its increasing population. One of the most pressing obligations we have is to ensure the safety and wellbeing of some of the most vulnerable members of our community—newborn infants and their mothers.

As the birthrate in Queensland has increased in recent years, so too has the demand for special care and neonatal intensive care nurseries. This is partly because of an increase in multiple births as a result of greater access to assisted reproductive technologies, and partly because of an improved survival rate among preterm babies.

Special care nurseries and neonatal intensive care units provide a highly technical, expensive service using medical equipment that can function as a life support system for very sick newborns. These units provide critical care including ventilation, temperature and humidity control, nutritional support and continuous monitoring. Critically ill newborns need immediate access to these units if they are to have the best possible chance of survival.

Queensland hospitals with these units need sufficient cots and the appropriately skilled staff to ensure the wellbeing of those critically ill newborn babies. When a cot is not available, a baby will be transferred to another hospital often geographically far from home. This can mean mothers and babies are separated at a time of high stress and anxiety.

The *Report of the Statewide Neonatal Intensive Care Services Project (2006)*—the Report—highlighted the immediate need for more neonatal intensive care cots in Queensland and a review of special care nursery cot usage be undertaken. The Report highlighted factors related to the increasing birth rate and improvements in clinical care.

Moreover, the Report found that Aboriginal and Torres Strait Islander families are more likely to have need of special care or neonatal intensive care nursery facilities, and their situation is often compounded by the remoteness of their communities.

On the release of the Report in 2006, the Queensland Government acted promptly to increase the number of neonatal intensive care cots from 48 to 67. At the same time, the Minister requested an evaluation of the Report's findings. This document provides that evaluation and recommends that the number of available cots across the state be increased to meet the current demand, ensuring that mothers and babies in Queensland continue to receive the best and safest possible care.

The recommendations include that:

1. the statewide Maternity and Neonatal Clinical Network be supported in assuming a clinical leadership role related to maternity and neonatal clinical reforms
2. health services planning be enhanced through the development of an effective Perinatal Services Clinical Information System, formalised neonatal service networks, regular revision of the neonatal and maternity *Clinical Services Capability Framework* modules and development of specific criteria for the admission and management of neonates requiring complex care
3. a workforce taskforce be urgently convened to develop recruitment, retention and training and development strategies for a multidisciplinary neonatal workforce. This Taskforce membership should include representation by medical, nursing, and allied health clinicians and workforce unit officers.
4. Queensland's neonatal cot capacity be steadily increased to a benchmark of 1.2 NICU cots / 1000 births. SCN cot numbers be urgently increased to meet both

current and future demand and to improve demand management of NICU capacity and throughput. Lack of SCN cots is currently limiting the demand management of both NICU and SCN services in Queensland.

Abbreviations

AHS	Area Health Service
ALOS	Average Length of Stay
ART	Assisted Reproductive Technology
HSD	Health Service District
CAHS	Central Area Health Service
NAHS	Northern Area Health Service
SAHS	Southern Area Health Service
CPAP	Continuous Positive Airways Pressure
CSCF	Clinical Services Capability Framework
DON	Director of Nursing
NICU	Neonatal Intensive Care Unit
NICS	Neonatal Intensive Care Services
NHMRC	National Health and Medical Research Council
NNP	Neonatal Nurse Practitioner
NUM	Nurse Unit Manager
PCB	Planning and Coordination Branch
PSCIS	Perinatal Services Clinical Information System
SCN	Special care Nursery
RBWH	Royal Brisbane and Women's Hospital
TTH	The Townsville Hospital
MMH	Mater Mothers' Hospital
GCH	Gold Coast Hospital
GCUH	Gold Coast University Hospital
SSCH	Sunshine Coast Hospital
QCH	Queensland Children's Hospital
QNETS	Queensland Neonatal and Paediatric Transport Service
QCC	Queensland Emergency Medical System Coordination Centre

Introduction

As a result of increasing pressure on the availability of both neonatal intensive care unit (NICU) and special care nursery (SCN) cots, the Neonatal Services Steering Committee released a report titled, *Report of the Statewide Neonatal Intensive Care Services Project 2006*¹ (the Report). In response, Queensland's Minister for Health requested an independent detailed evaluation of the Report to test the veracity of the planning assumptions, data and costings it contains.

To meet the Minister's request, Kim Carter Consulting, an independent consultant, was commissioned to evaluate the Report in collaboration with Planning and Coordination Branch (PCB).

This document was prepared by PCB and incorporates a summary of the independent evaluation and the Report.

Background

In 2006, neonatal intensive care clinicians expressed concern that the number of NICU cots needed to meet the growing demand would exceed the number for which there was funding. Increasingly, staff and babies' families were worried about how the shortfall in the number of cots may affect the safety and care of babies and their mothers. As a result, the Neonatal Intensive Care Service Steering Committee convened, and developed the Report. Recommendations from both the Report and the *Report of the Taskforce on Paediatric Cardiac Services, 6 August 2006*,² indicated that funding was required to increase the number of cots from 48 to 67 in 2006. Consequently, the government provided \$19 million for NICU cots, recurrently funded (\$17.1 million for 19 cots plus additional equipment costs at \$100,000 per cot). No extra SCN cots were funded at this time.

Scope of this summary report to the Minister

The Report outlines:

- current and projected activity for neonatal nursery services
- current and future requirements for neonatal nursery services
- strategies to build the capacity of neonatal services
- recommendations for the review of the neonatal and maternity *Clinical Services Capability Framework 2005* (CSCF) modules
- strategies to improve access to neonatal service delivery and better meet growing demand in the short, medium and long term.

¹ Queensland Health 2006, *Report of the Statewide Neonatal Intensive Care Services (NICS) Project*, Queensland Government.

² Queensland Health 2006, *Report of the Taskforce on Paediatric Cardiac Services*.

Queensland Government's policy commitments and initiatives

Planning for health services takes place in the context of the Queensland Government's commitment to reform health service delivery across the state, as articulated by the:

- *Action Plan—Building a better health service for Queensland*
- Queensland Health strategic and statewide health services plans.

The *Action Plan—Building a better health service for Queensland*³ (Health Action Plan) was released in October 2005 and announced the government's intention to reform the public health system. It identified an agenda highlighting the:

- improvement of health services to all Queenslanders, regardless of where they live
- creation of new models for service delivery
- strengthening of partnerships and arrangements with non-government and not-for-profit organisations.

Training, recruitment and retention of health professionals were also highlighted as critical components in health service planning.

The *Queensland Health Strategic Plan 2007–2012*⁴ identifies the strategic directions for health services in Queensland over the next five years. It reflects recent service delivery reforms contained in the *Queensland Statewide Health Services Plan 2007–2012*⁵ and the critical role of the enabling functions: information, funding, workforce, and infrastructure and assets.

The *Statewide Health Services Plan 2007–2012* lays out a vision for the reform of health services in Queensland over the next five years. It identifies two clear objectives, which are two of the strategic directions stated in the *Queensland Health Strategic Plan 2007–2012*. These are:

- **improving access to safe and sustainable health services**

Queenslanders will be able to access high-quality, safe services organised to ensure the service is sustainable. Given the vast geographic area of the state, this will mean developing new and different ways of delivering services in the future.

- **better meeting people's needs across the health continuum.**

Queensland Health, in collaboration with its partners, will provide a comprehensive suite of health services to Queenslanders. The spectrum of services provided includes supporting those who are well, those who are at risk of developing a health condition, those who need treatment when they are injured or ill, and those who have long-term conditions. Services will be planned, organised and delivered on the bases of which services are needed most, by whom, and which services will give the greatest benefit.

The other two strategic directions are:

³ Queensland Health 2005, *Action Plan- Building a better health service for Queensland*, Queensland Government.

⁴ Queensland Health 2007, *Queensland Health Strategic Plan 2007-2012*, Queensland Government.

⁵ Queensland Health 2007, *Queensland Statewide Health Services Plan 2007-2012*, Queensland Government.

- **enhancing organisational work processes and systems to support service delivery and business effectiveness**

Queensland Health's work processes and systems will focus on providing services that are user centred and efficient to support and enable the provision of service delivery and business value. Performance monitoring, evidence-based practice and continuous improvement will be targeted to ensure Queensland Health operates at the highest standard within available resources.

- **developing our people in a way that recognises and supports their role in the delivery of health services.**

The people who work in Queensland Health are the foundation of our services. Developing the Queensland Health workforce will require creating an environment where staff can adapt and develop to meet the changing demands of health services. This will mean developing the capacity of staff, building consistency in managing people, engaging staff in new and innovative work models and processes, and valuing the workforce through improved and standardised recognition and reward practices.

Sources of data

The evaluation of the Report required the analysis of four data sources:

- Perinatal Data Collection
- Queensland Hospital Admitted Patient Data
- Casemix Data—both local and corporate
- Hardes Data.

All four data sources proved unreliable, with significant variability. It took considerable effort to confirm centrally accessed data with local data collections. Consequently, the evaluation recommends the development of an effective perinatal services clinical information system (PSCIS). This system should incorporate a standardised electronic information system for maternity and neonatal services across Queensland as currently, none exists. (Refer to Attachment 1.)

Consultation

Consultation meetings were arranged among the directors of neonatology and nurse unit managers (NUM) of the three NICUs, to discuss staff and training requirements and data related to each unit's activity. Meetings were also held with the Area planners to ascertain current planning related to either NICU or SCNs in each Area Health Service (AHS). Various other staff of Queensland Health were consulted via telephone including capital works staff, planning staff, directors of nursing (DONs) and NUMs at facilities and/or Health Service Districts (HSD) with neonatal nurseries, to determine current plans for master planning and capital works including SCN activity.

The Private Health Unit, Queensland Health, was consulted around current capacity and planning for SCN cots in private hospitals.

Clinical Services Capability Framework 2005

The *Clinical Services Capability Framework 2005* (CSCF)⁶ including the neonatal services module, serves several purposes, including:

- providing a standard set of capability requirements for public and private hospitals
- providing consistent service-planning descriptors
- encouraging explicit clinical risk management procedures where services do not meet minimum patient-safety requirements.

In Queensland, neonatal services are provided across a regionally coordinated system of care with a range of levels of care. Neonates (infants in the first 28 days of life) less than 32 weeks gestation or less than 1500 grams in weight are most likely to require a NICU and should, where possible, be transferred *in utero*. Therefore, when a neonate is transferred *in utero*, a maternal bed is needed as well as a neonatal cot.

The CSCF supports the National Health and Medical Research Council (NHMRC) guidelines⁷ that stipulate, wherever possible, preterm birth at less than 33 weeks gestation should occur in a perinatal centre with the expertise to care for women and their infants. This will usually affect the demand for metropolitan tertiary-level beds and cots. When those transferred neonates no longer require the services of an intensive care facility, they should be transferred back to an appropriate facility close to where they live.

The recognised deficiencies with the current version of the CSCF neonatal module will be addressed in the next review. The module should include a review of admission criteria to NICU and SCNs, including criteria to manage continuous positive airways pressure (CPAP) at SCNs not attached to a NICU. Furthermore, consistent service planning descriptors need to be clearly articulated for NICU and SCNs in line with the Australian and New Zealand Neonatal Network guidelines.

Current and projected births

Queensland—especially the South East—is currently experiencing a ‘baby boom’ and significant population growth due to migration. There are currently around 57,000 births in Queensland per year (see Table 1). Projections suggest that this number will rise to 69,000 by 2016, although these projections range from a low series projection of 65,000 to a high series projection of 70,000. It is also estimated that demand from cross-border flows will add another 2750 births per year to the catchment population for neonatal services by 2016, taking the total catchment population to approximately 73,000 births in 2016. (Refer to Attachment 2 for details of birth numbers.)

Of the total number of births in Queensland, Southern Area Health Service (SAHS) provides services for 46 per cent, Central Area Health Service (CAHS) provides for 35 per cent and the Northern Area Health Service (NAHS) provides for the least number of births at 19 per cent. However, while NAHS has the lowest percentage of births, it also has the highest birthrates in some of its HSDs, especially among the Aboriginal and Torres Strait Islander population.

Overall, Aboriginal and Torres Strait Islander births represented 5.6 per cent of all births in 2006, with almost double the rate of preterm births when compared to other

⁶ Queensland Health 2005, *Clinical Services Capability Framework*, Queensland Government.

⁷ *Ibid.*

Australians. (See Tables E and F in Attachment 2.) In all three Area Health Services, there are districts with Aboriginal and Torres Strait Islander birth rates over 100 births per 1000 women, with a Queensland rate of 98.3 births per 1000 Aboriginal and Torres Strait Islander women in 2005.

According to the Perinatal Data Collection, in 2005 the average Queensland birthrate was 64.3 births per 1000 women, with Gold Coast HSD having the lowest birthrate at 50.1 births per 1000 women, and the lowest Aboriginal and Torres Strait Islander birthrate at 39.5 births per 1000 women. West Moreton – South Burnett HSD had the highest birthrate for SAHS at 81.6 births per 1000 women and the highest Aboriginal and Torres Strait Islander birthrate for the area at 139.7 births per 1000 women.

NAHS districts had the highest birthrate, with 122.2 births per 1000 women in Torres Strait HSD, and the highest Aboriginal and Torres Strait Islander birthrate, with 169.8 births per 1000 women in Torres Strait HSD. In CAHS, district birthrates ranged from 59.2 births per 1000 women in Northside HSD, to 68.8 births per 1000 women in Central Queensland HSD, which also had the highest Aboriginal and Torres Strait Islander birthrate in CAHS at 119.4 births per 1000 women. Attachment 8 outlines births by district of residence for 2006 and projections to 2016.

Table 1: Projected catchment population (infants) for NICU services in Queensland

Area	Births 2001	% Births 2001	Births 2006 [^]	% Births 2006	Projected Births 2011	% Births 2011	Projected Births 2016	% Births 2016
Southern	23019	46	26730	47	29962	48	32469	47
Central	17515	35	19906	35	21847	35	24870	36
Northern	9508	19	10237	18	10611	17	11744	17
Queensland	50042	100	56873	100	62420	100	69083	100
NSW births*	n/a	n/a	2499		2614		2750	
Total			59372		65034		71833	

Source: Population Projections from the Department of Local Government and Planning, Medium Series (October 2006 update of 2001 census, 2nd edition) and births recorded in Perinatal Data Collection for Queensland (births 2001–06). Richmond and Tweed Area Health Service.

Over recent years (2001–06), Queensland has been experiencing an increasing birthrate beyond the growth in the number of females of child-bearing age (refer to Attachment 2). In the next decade, births are expected to increase by about 21.5 per cent, if using the high series projection. The number of births will increase mainly in women over the age of 30 with a declining rate among women younger than 30 years old. In 2005, the mean age for mothers was 29.1 years, compared with 27.8 years in 1995. However, Aboriginal and Torres Strait Islander mothers have a higher birthrate in the under-30 age groups. In 2006, the birthrate for women in the 20–24 age group was 185.9 births per 1000 Aboriginal and Torres Strait Islander women against 69.4 births per 1000 Australian women generally, and in the 25–29 age group, the birthrate for Aboriginal and Torres Strait Islander women was 168.5 births per 1000 women, against 113.4 births per 1000 for other Australians.

In addition to the higher birthrate, the incidence of preterm birth (infants born before 37 weeks gestation) is higher among Aboriginal and Torres Strait Islander women, as is maternal and foetal morbidity. Consequently, Aboriginal and Torres Strait Islander babies make greater use of neonatal services, both NICU and SCN. (See Tables M, N, O, P and Q in Attachment 6.)

Preterm birth is also associated with the increasing number of multiple births (although the rate has been constant at around 1.7 per cent of all births), increasing number of older mothers and increasing use of assisted reproductive technology.

These factors, along with improved survival rates among lower gestational age groups, will continue to increase the demand for neonatal services.

Overview of current services

Neonatal intensive care services

NICUs provide medical, nursing and allied health services for neonates requiring specialised diagnosis and treatment including medium and long-term ventilation⁸. Queensland has three NICUs based at the Royal Brisbane and Women's Hospital (RBWH), the Mater Mothers' Hospital, Brisbane (MMH) and The Townsville Hospital (TTH). These currently provide each Area Health Service with one NICU. There are plans to increase the number of NICUs to five with one planned for the Gold Coast University Hospital (GCUH) and the new Queensland Children's Hospital (QCH).

Closely integrated with specialist neonatal services are maternal foetal medicine services. Maternity and neonatal services are inextricably linked, and highly specialised maternal foetal medicine services need to be available where NICU services are based. Currently, maternal foetal medicine services are provided at MMH and RBWH with services at TTH developing. Specialist neonatal services also provide:

- antenatal consultation, where neonatal illness is expected or where maternal illness affects the care required for a neonate
- assessment and treatment of neonates who do not require admission to neonatal units
- ongoing outpatient assessment units for neonates who have been admitted to a NICU
- Specialised transport services for neonates requiring special or intensive care.⁹

Currently, the MMH has 25 private/public NICU cots. While all 25 cots are publicly funded, the MMH periodically uses some of those cots (depending on demand) for private patients. However, during their stay, the status of NICU/SCN babies can change from private to public.

RBWH has 30 NICU cots and TTH has 12 NICU cots. Cot numbers across the state were increased from 48 to 67 in 2006. Despite this increase, a shortfall in NICU cot numbers remains, especially in NAHS and SAHS. Therefore, all three NICUs often provide neonatal intensive care services above their funded capacity, and at times, women and infants have been transferred interstate because there are no available cots. Also, the increasing demand for NICU cots and the growing numbers of births and preterm births have increased the demand for SCN cots and pressure on the level of care delivered in SCNs.

Special care nursery services

SCNs provide the level of care after NICUs. Generally, they care for neonates of more than 32-weeks gestation with minimal complications, including those transferred back after care in NICU¹⁰. However, some SCNs in Queensland are managing more complicated neonates, such as those requiring CPAP ventilation.

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

This is because of issues such as NICU capacity and the geographical distance of a baby's place of birth from a NICU.

SCN cots are provided in tertiary and regional facilities. In Queensland, there are 14 public and 14 private hospitals outside the tertiary facilities providing SCN services. There are currently 225 'funded' public and 77 private licensed level 2 SCN cots (302 cots in total). A further 55 cot spaces in public hospitals are either currently being used but are unfunded, or could potentially be used but require staff, funding and/or minor capital works to operate (see Table 2).

In addition, the new development at the MMH will open in April 2008 making a further 14 SCN cots available. Eight of these will be swing cots available for use as NICU cots.

The MMH will then be at capacity, bringing the total public SCN cot number to 371. Table 2 indicates that in 2009, the total number of cots should be 378 including 77 private and 294 public cots (55 of these are currently unfunded). This is still a shortfall of seven cots; however, further increases in SCN cots by 2016 are planned as capital works projects are progressed.

Table 2: Proposed expansion to public level 2 SCN cots

Public hospital	Public cots 2007		Proposed expansion 2008–09			Potential expansion 2016		
	Funded	Built	Fund current	Expand built	Total public cots	Fund current	Expand built	Total public cots
Central Area Health Service								
Rockhampton	4	8	4	4	12	0	3	15
RBWH	36	40 [^]	4	0	40	0	0	40
Caboolture	12	12	0	0	12	0	0	12
Redcliffe	10	10	0	0	10	0	2	12
Nambour	10	10	0	7	17	0	8	25
Bundaberg	4	8	3	0	7	1	0	8
Hervey Bay	4	6	2	0	6	0	0	6
Subtotal	80	94	13	11	104	1	13	118
Northern Area Health Service								
Cairns	22	28	6	0	28	0	0	28
TTH	14	20	6	0	20	0	10	30
Mackay	4	6	2	0	6	0	2	8
Mount Isa	3	4	1	0	4	0	0	4
Subtotal	43	58	15	0	58	0	12	70
Southern Area Health Service								
Gold Coast	20	20	0	0	20	0	10–15 ^{**}	30–35 ^{**}
MMH	40	40	0	(54 ^{^^})	54 ^{^^}	0	11	65 ^{^^*}
Logan	16	16	0	0	16	0	0	16
Redlands	6	9	3	0	9	0	0	9
Toowoomba	10	17	7	0	17	0	8	25
Ipswich	10	16	6	0	16	0	9	25
Subtotal	102	118	16	0	132	0	38–43	170–175
Total	225	270	44	11	294	1	63–68	358–363

[^] Includes four cots spaces at RBWH as swing SCN/NICU services—unfunded/used at peak times.

^{^^} Includes eight swing SCN/NICU services at MMH new development, set to open in April 2008.

* Attachment 10 gives options for providing 11 extra cots. All hospitals in SAHS besides GCUH at built capacity.

** The range of demand reflects 'estimated demand' (lower number) and 'current use' (higher number).

Transport and accommodation

Distance and geographic isolation are important considerations in managing neonatal and maternity services in Queensland. The priority is to keep mothers and babies together at all times wherever possible. This not only affects the transport of mothers and babies, but also their accommodation needs when they are far from home and family support. Often, mothers require accommodation for lengthy periods of time, either awaiting the birth of a baby or while the baby is cared for in a NICU or SCN.

Transfers to NICU, SCNs and maternity units involving babies and mothers at or around the time of birth, occur either in utero or post-birth. These are generally emergency transfers requiring highly skilled transfer teams and specialised equipment, usually provided by the NICU or SCN accepting the baby. Due to the specialist nature of neonatal and maternity emergency transfers, and the time and distance travelled, they require dedicated teams. At present, there are no dedicated emergency retrieval teams—staff from the receiving NICU are used—providing care during transfer. In order to function properly, such teams require substantial investment in staff, equipment and transport.

Queensland Neonatal and Paediatric Emergency Transport Service (QNETS), as part of Queensland Emergency Medical System Coordination Centre, has over the last year been charged with organising speciality neonatal transport and the coordination of neonatal and high-risk obstetric patients. However as there are no dedicated emergency retrieval teams or routine neonatal transport teams within QNETS, many problems with neonatal transport have not been resolved creating 'bed block' in both NICUs and SCN.

A large percentage of all transfers are routine after complex care in a NICU, SCN and/or maternity facility has been completed, and babies are to be transferred *back* to a SCN near their home. Routine transfers or 'back transfers' often involve less specialised skills and equipment. However, back transferring is also regularly difficult if not impossible, because of a lack of SCN cots, skilled staff and available transport, resulting in NICU 'bed block', further complicating the ability to accept emergency admissions to NICU and or SCN.

In addition to the need for dedicated neonatal retrieval teams, there is a separate but complimentary role required with managing neonatal transfer and retrieval issues. A statewide neonatal transport coordination team, working in collaboration with QNETS, is required to manage not only statewide strategic transfer issues (including but not limited to emergency retrieval), but also the daily demand management for NICU and SCN cots to prevent 'bed block'. This team would require knowledge of several interrelated factors including:

- the complexity of care required,
- the immediacy of cot requirements,
- an extensive knowledge of cot availability and
- the ability to manage critical care situations often in a rural or remote areas.

The individual who leads this team and has transfer decision making responsibility, should be appointed by and accountable to the Chief Health Officer.

The Office of the Chief Health Officer is currently reviewing statewide transport and accommodation issues including those related to maternity and neonatal services.. However until that review is completed, a statewide neonatal transport coordination team is necessary to manage current neonatal transport issues.

The review will also aim to improve aspects of the transport system such as data management, communication processes and support for facilities transferring and/or

receiving mothers and babies. In the future, changes in the model of service and additional funds may be required to implement the necessary reforms for a safe and efficient transport and accommodation service.

Planning standards and benchmarks

Benchmarks

The Report proposes a ratio of 7.1 neonatal cots per 1000 births at 80 per cent occupancy for planning NICU and SCN services. This benchmark is split between NICU and SCN services as follows:

- 1.5 NICU cots per 1000 births at 80 per cent occupancy
- 5.6 SCN cots per 1000 births at 80 per cent occupancy.¹¹

On investigation, reference for validated or endorsed 'benchmarks' for planning NICU or SCN services in Australia was not found and the source (or basis) of the benchmarks proposed in the Report could not be identified (refer to Attachments 3 and 7). A number of national and international papers propose various benchmarks; however, many were written a significant time ago and most failed to provide objective evidence to support their recommendations.^{12 13 14}

Table 3 below shows the comparison between estimated demand for NICU cots based on 'current use', the benchmark of 1.2 NICU cots per 1000 births, identified from literature and the benchmark of 1.5 NICU cots per 1000 births, recommended in the Report. For further detail refer to Attachment 7.

Current statewide cot use indicates a supply of less than 1.2 NICU cots /1000 births. The number of funded NICU cots should be increased until this benchmark is achieved. As new NICUs are built or redeveloped at GCUH and TTH, additional cots at these facilities will contribute to meeting this benchmark. However to better manage the NICU cots currently available a number of issues need to be addressed including a substantial increase in SCN cots. Significant Increases in SCN cots will enhance the functioning of neonatal services. However, it will also be necessary to address concurrently the problems with transport and retrieval processes, multi-disciplinary workforce issues and clinical practice to efficiently manage neonatal services at a benchmark of 1.2 NICU cots / 1000 births and prevent 'bed block'.

¹¹ Queensland Health 2006, *Report of the Statewide Neonatal Intensive Care Services (NICS) Project*, Queensland Government.

¹² Burton, P, Draper, E, Fenton, A & Field, D 1995, 'Neonatal Intensive Care Cots: Estimating the Population Based Requirement in Trent, UK', *Journal of Epidemiology and Community Health*, vol. 48, pp. 617-28.

¹³ Northern Neonatal Network 1992, *Requirements for Neonatal Cots*, Northern Regional Health Authority.

¹⁴ NSW Health 2005, *Neonatal Intensive Care Plan to 2006*, NSW Government.

Table 3: Comparison of estimated demand with 'benchmarks' for NICU cots (public and private)

Year	Cots required		
	Current use*	1.2/1000 births [^]	1.5/1000 births ^{^^}
2006	76	76	89
2016	93	92	108

* 70 per cent occupancy

[^] Increased birth numbers to allow for higher use by Aboriginal and Torres Strait Islander residents

^{^^} Assumed to include an allowance for higher use by Aboriginal and Torres Strait Islander residents

Cot occupancy

Neonatal services tend to consist of relatively small numbers of cots, and infants who require them need to be accommodated on an emergency/urgent basis. The system needs enough capacity and flexibility to enable the effective management of surges in demand, without too many babies transferred due to insufficient cots.¹⁵

The current occupancy rate in Queensland NICUs is on average 86 per cent. However, this often creates 'bed block' situations where there are no available NICU cots or SCN cots, making it difficult to move babies on in order to accommodate new NICU/SCN admissions. As admissions to NICU/SCN are usually urgent, it is necessary to have a lower occupancy rate to manage ongoing demand for neonatal services.

Also, as national and international groups have identified an optimal occupancy level of 70 per cent for paediatric and intensive care services, including NICU and SCN, it is recommended Queensland Health adopt this occupancy level as a benchmark and basis for health services planning. (Refer to Attachments 3 and 7.)

Size of NICUs

Individual Queensland NICUs currently serve birth numbers of between 10,000 and 27,000 births per year. Recent studies suggest a trend towards larger units serving populations where the number of births is up to 20,000 to 25,000 (or more)¹⁶. Larger units are preferable in areas where people have reasonable access to NICU, as both the facilities and the workforce may be more effectively used and better outcomes provided for infants. However, smaller units may be required in more geographically isolated areas, with a minimum of 5000 births.¹⁷ In Queensland, the minimum catchment areas for the NAHS and Gold Coast HSD are around 10,000 births or more.

No national or international information could be found on the preferred maximum catchment population for a NICU. However, Queensland neonatologists believe that one medical team can safely manage a maximum of 25 to 30 cots, suggesting a catchment of 20,000 to 25,000 births. They believe that units of greater than 30 cots become unsafe and difficult to manage, unless numbers of medical, nursing and allied health staff are doubled.

¹⁵ British Association of Perinatal Medicine 2001, *Standards for Hospitals Providing Neonatal Intensive and High Dependency Care*, British Association of Perinatal Medicine.

¹⁶ Ibid.

¹⁷ Burton, P, Draper, E, Fenton, A & Field, D 1995, 'Neonatal Intensive Care Cots: Estimating the Population Based Requirement in Trent, UK', *Journal of Epidemiology and Community Health*, vol. 48, pp. 617-28.

Current use of NICU and SCN services

Overall use

During the period 2001–05, the following trends were observed:

- Use of neonatal cots increased by 4.9 per cent per year, which is 2.2 per cent per year more than the birthrate. Most of this increase was for SCN cots.
- Demand for SCN cots increased by three per cent per year more than the birthrate, whereas demand for NICU cots increased by one per cent per year less than the birthrate.
- The 'average length of stay' for both NICU and SCN services appears to have remained stable around 11.6 to 16.8 days combined. (NICU:11.6 days, SCN: 6.9 days, private MMH NICU/SCN combined: 23.6 days)
- An increasing proportion of SCN admissions are being managed in tertiary facilities because of decreased capacity in regional SCNs and increasing transfers of mothers with high-risk pregnancies for complex management.
- The public sector provided 89 per cent of NICU activity and 74 per cent of SCN activity.
- The private sector has 30 per cent of the state's SCN cots, but uses only 23 per cent of cots.
- The private sector is operating at around 66 per cent occupancy, whereas the public sector is operating at an average occupancy of 86 per cent.

Potential activity for Queensland Children's Hospital

It has been proposed that Queensland Children's Hospital (QCH) will manage superspecialty surgery for neonates as well as all complex medical cases. It is proposed that neonates will be transferred to QCH for care and will continue on to the 'Babies Ward' after their superspecialty NICU care needs are met. However, decisions around the governance of a QCH NICU and an interlinked NICU service network across the state have yet to be made, and a review of data, including current surgical and medical activity in the existing and planned NICUs, is necessary before demand can be defined and QCH cot numbers and role decided.

Use by Aboriginal and Torres Strait Islander residents

Infants born to Aboriginal and Torres Strait Islander mothers use neonatal services at a higher rate than those born to other mothers. They represent 5.6 per cent of births in Queensland, but use 12 per cent of NICU cots and 10 per cent of SCN cots (*Perinatal Data Collection 2001-05*)¹⁸. (Refer to Table M in Attachment.) Increased demand for NICU and SCN cots by Aboriginal and Torres Strait Islander babies has been used in calculating the projected cot numbers for each AHS. (Refer to Attachment 6.)

Demand from residents of New South Wales and other states

The *Perinatal Data Collection (2001–05)* indicated that New South Wales and other interstate residents currently use an average of 4.1 per cent of Queensland NICU cots and 1.6 per cent of Queensland SCN cots. As a result, projected cot requirements for the SAHS have been increased to cover this use. (Refer to Attachments 2 and 5)

¹⁸ Queensland Health 2007, *Perinatal Data Collection (2001-05)*, Queensland Government.

Public–private arrangements

Currently, the MMH has the only private NICU cots in Queensland and Australia. However, most private hospitals with birthing facilities have a number of SCN cots. This may enable the private sector to provide cots to the public sector when there is a demand for extra cots, given that the private sector occupancy rates are around 66 per cent. There are currently 77 private licences for SCN cots in Queensland, excluding the private cots at the MMH.

Additional information around private hospital current capacity and future planning is difficult to obtain. At times Queensland Health purchases SCN cot capacity from private hospitals, which is generally managed at the Area Health Service or public hospital to private hospital level.

Trends in use of NICU and SCN services

Trends in demand

The proportion of infants born to older women (aged over 30 years) is increasing. As infants born to older mothers have a higher risk of requiring NICU and SCN services, (predominantly due to prematurity), demand for these services is increasing beyond the birthrate. Some factors increasing demand are listed here:

- Assisted reproductive technology often involves an increased risk of multiple and preterm births, and is therefore likely to place higher demand on NICU and SCN services.
- Over the past five years, multiple births in Queensland comprised 1.7 per cent of all births (approximately 3.4 per cent of infants)—a steady trend.
- 8.4 per cent of all births are premature.
- Older women carry a higher risk of having babies with congenital abnormalities, although improvements in screening in more recent years may have reduced the potential impact of this demand on services.
- Infants born to Aboriginal and Torres Strait Islander mothers have a higher risk of admission to NICU and SCN services generally because of increased rates of prematurity, infant morbidity and mortality. (Refer to Attachment 6.)

Trends in treatment and practice

Improvements in care have led to increasing survival rates for infants born at less than 25 weeks gestation, thus increasing demand for NICU and SCN services. However, despite lower gestational infants having a longer average length of stay, concurrent changes in practice for older gestational infants have shortened lengths of stay. Therefore:

- average length of stay has stabilised over recent years
- the use of CPAP ventilation has been increasing in recent years
- improvements in clinical care have resulted in neonates who once required NICU care being managed in SCNs. This shift has resulted in more complex care being provided in both NICUs and SCNs
- as a result of rising activity in NICUs and SCNs and an insufficient number of SCN cots, the number of infants managed on either the postnatal maternity wards—or as part of a home care service where this model of care exists—has grown, and the level and complexity of care they require has also increased

- advances in maternal foetal medicine are resulting in more high-risk maternity patients being transferred to tertiary units prior to birth, and consequently initial neonatal care is provided at tertiary centres
- some neonatal nurse practitioners (NNP) are now undertaking tasks that would previously have been routinely undertaken by medical registrars. Where recruitment of medical staff has been difficult (particularly in the NAHS) this workforce model has helped meet demand. This model is supported by NAHS neonatologists and it is envisaged that it will continue and increase, at least in the NAHS.

Future demand for NICU and SCN cots

Estimated future demand

Projected statewide demand for neonatal services has been distributed between Area Health Services, based on the current location of resident births, with adjustments for cross-border flows and higher demand from Aboriginal and Torres Strait Islander infants. The estimated demand for cots indicates an increasing need for both NICU and SCN cots across Queensland.

Based on current use and a 70 per cent occupancy rate, 93 NICU cots and 418 SCN cots are needed across public and private sector services by 2016. Statewide, there is currently a shortage of nine NICU cots. However, if the high series projections for births are used, 108 NICU cots and 445 SCN cots will be needed in 2016.

The NICU at TTH is at built capacity for 12 cots, but it needs 14 to meet demand.

At MMH, there are only 25 NICU cots available, but SAHS requires 37 cots to manage SAHS and Northern New South Wales activity. This demand is currently accommodated to some extent by the RBWH, where there are 30 NICU cots as opposed to the 25 cots required for CAHS.

Table 4: Estimated distribution of demand for NICU and SCN cots between areas based on 'current use' 2006–16

Area	NICU cots [^]			SCN cots [^]		
	2006	2011	2016	2006	2011	2016
Northern	14 ^{^^}	16	18	63	70	78
Central	25	28	30	117	129	143
Southern	34	37	41	157	173	191
NSW*	3	3	4	5	6	6
Total	76	84	93	342	378	418
1.5/1000	89	98	108			

Includes all non-Queensland residents

[^] 70 per cent occupancy

^{^^}The Townsville Hospital (TTH) has built capacity for only 12 NICU cots.

Estimated demand for SCN cots is indicated in Table 4. Current use indicates a need for 378 cots by 2011, and 418 by 2016. However, this may underestimate demand, as indicated. Currently, there are 77 private SCN cot licences and it is unknown how much expansion is planned for the private sector. In the absence of that information, this review has assumed little expansion in the private sector and projected public cot numbers accordingly. If, as indicated in Table 2, there are 363 public SCN cots by 2016 and 77 private cots, there will be a total of 440 SCN cots—a shortage of five. However, as part of future planning reviews, consultation with the private sector must

occur—particularly given potential private sector expansion within the Wesley and new QCH. Public data should also be reviewed regularly to confirm that cot numbers are maintained against demand.

Proposed location and size of NICU services

The SAHS has sufficient demand to justify two NICUs. However, most of the demand flows to the Southside District, with Gold Coast HSD having a significantly smaller catchment population despite cross-border flows. The Gold Coast HSD and Northern New South Wales are projected to have around 9000 births by 2012: close to the minimum number of births for a NICU. Meanwhile, to meet interim demand for a NICU, the Gold Coast Hospital has proposed two NICU cots for 2010, with a NICU to open in the new Gold Coast University Hospital (GCUH) in 2012. Although cot numbers are yet to be finalised, the Report proposed 15 NICU and 40 SCN cots for the GCUH. In addition, the new MMH development will be at built capacity when it opens in April 2008 as is RBWH, so any additional cots required for SAHS and CAHS will need to be provided at GCUH.

RBWH is at built capacity, but there are four unfunded cots available to manage excess demand. These are swing cots, able to be used as both NICU and SCN cots.

The number of cots for QCH is yet to be determined.

TTH is at built capacity and requires an immediate increase in the number of cots to manage demand. Currently, the option of building a new unit with capacity beyond current demand is being discussed. When this unit is developed, cot numbers will initially need to increase to a total of 20 cots (an increase of eight). However, because of projected increasing births, built capacity will need to be at least 25 cots.

Table 5: Planned NICU cots for Queensland

	Current funded cots 2007	Funded cots 2008	Proposed expansion 2010–11	Proposed expansion 2012	Proposed expansion 2016
Central Area Health Service—35 per cent of births					
RBWH	30	4 [^] cots usable as both NICU/SCN			
Northern Area Health Service—19 per cent of births					
TTH	12		8		5**
Southern Area Health Service—46 per cent of births					
MMH	25	0			
Mater new development		25 + 8 [^] cots usable as both NICU/SCN			
GCH			2		
GCUH				8–13	
QCH					12**
Actual NICU cots	67	67+12 swing [^]	77+ 12 swing [^]	90 + swing cots	107 + swing cots
shortfall	11			3 or 15	
Total projected requirements 1.2/1000	76*	76*	84*	93*	
Total projected requirements 1.5/1000	89	89	98	108	

*70 per cent occupancy

** unconfirmed

[^] swing cots meant to be used when capacity issues or excess demand – not funded as NICU

Proposed location of SCNs

Table 2 shows 'funded' cots and 'built capacity' at public SCNs. It indicates funded cot numbers and current available built capacity. The Table is grouped by facility and Area Health Service. Statewide, it is proposed that an additional 44 SCN cots are funded over the next two financial years with planning for further increases in cot numbers to meet projected demand at 70 per cent occupancy rates. Increasing SCN cots across Queensland will also assist in preventing 'bed block' in the NICUs by enabling improved capacity to transfer babies out of NICU.

Facility allocations have been based on estimated district catchment demand (see Attachment 10) with some consideration for variation. However, this does not take account of the fact that tertiary facilities provide a larger proportion of services to pregnant women requiring superspeciality maternal foetal medicine services prior to delivery. In addition, apart from factoring in Aboriginal and Torres Strait Islander residents, it does not include variations in demand due to socioeconomic factors. Further small adjustments need to be made to these preliminary allocations based on local knowledge of these factors.

It is also proposed that to improve access to services and better manage demand for NICU cots, a select number of SCNs are developed with the ability to manage

increasingly complex care (Level 2 SCN with CPAP) with formal support from NICUs. These should generally be provided for areas with a catchment of 3000 births or more (including private sector demand), but also take account of variations in demand and geographical location. (See Attachment 8.) Facilities such as Cairns, Rockhampton, Ipswich and Toowoomba could care for babies requiring CPAP if support services and staffing allow.

However, the decision about whether a facility will be developed as a Level 2 SCN with CPAP capability will be based on criteria within the CSCF (to be reviewed in 2007–08, clinician agreement, workforce capability and the availability of the required support services.

Capital projects

Currently, new Queensland hospitals are being planned, and master and service planning is in progress for other sites. These planning processes need to ensure the built capacity will meet not only current requirements for SCN activity, but projected increases in demand to meet the rising birthrate. Table 6 identifies the current planning for capital works related to NICUs and SCNs.

Table 6: Capital works planned related to SCN and NICU

Area Health Service	New hospital	Major building	Current master planning	Future master planning	Minor capital works required
SAHS	GCUH-2012 QCH-2012			Logan Ipswich Toowoomba	Ipswich Redlands GCH
CAHS	SSCH-2014	Nambour —six-storey building to meet interim demand before SSCH including new SCN Bundaberg —new maternity unit + new SCN Rockhampton—current tender process	Rockhampton —master plan complete for new maternity unit and 12-bed SCN—probably needs 15	Caboolture —master plan required for new maternity unit and SCN	Bundaberg Redcliffe may need work in the future
NAHS		New building planned for TTH with possible NICU/SCN	For new building at TTH	Cairns Mackay	Cairns Mackay

Sourced from capital works and planning departments in Queensland Health

In reviewing the costings related to NICU and SCN cots, Casemix funding prices have been used as the basis for recurrent NICU and SCN costs. A NICU cot has been costed at \$900,000 per year with an additional yearly adjustment for Consumer Price Index (CPI) rises required. A SCN cot has been costed at \$436,000 per year with an additional yearly adjustment for CPI increases also required.

Where capital costs are necessary for minor refurbishment, those costs will vary from facility to facility, depending upon the current infrastructure and required utilities, medical air suction, oxygen and other unit-specific requirements. Establishing new cots also requires new equipment, and estimated costs have been assigned to NICU cots at \$100,000 per cot, and \$50,000 per cot for a SCN cot unless otherwise

designated. Most staffing costs are incorporated into the Casemix price of a cot. However, it is unclear whether allied health positions are included in that price. There are also additional educational and training costs required for up-skilling of staff working in NICU and SCN not within the casemix price.

Workforce issues

Currently the lack of a skilled neonatal workforce across medical, nursing and allied health specialities is an inhibiting factor to managing neonatal services in Queensland. Due to the significant issues in each of the three speciality areas, a workforce taskforce should be formed urgently (including clinicians from each of the three clinical areas and workforce planning units) to address workforce challenges as discussed below.

Nursing staff

One of the major issues prohibiting the substantial increase of the number of SCN and NICU cots is the ongoing difficulty in recruiting, retaining and training adequate numbers of nurses skilled to the level required for NICU and SCN care. Such training takes about 18 months and involves the completion of the *Transition to Practice Nurse Education Program* in neonatal care. The operation of the program requires both educators and nurses trained as mentors to be employed in SCNs and NICUs. These educators and mentors provide the core training required for nurses to attain the necessary skill level. NICUs also provide placement time for staff from regional SCNs, therefore increasing the number of educators and mentors required.

There are no recommended workforce standards or benchmarks provided by national professional nursing organisations. However, according to nurse unit managers, nursing–baby ratios for NICUs range from 1:1 to 1:2 depending on the complexity of the care required. In SCNs, there is a ratio of approximately one nurse to four or five babies, depending on the level of the care required. Therefore, nursing workforce requirements are assessed on a shift-by-shift basis.

The provision of sufficient staff for future planned units requires the training of significant numbers of nurses, and needs to commence immediately because of the 18-month training lead time. Training requirements include:

- education and training of general nurses or midwives interested in specialising in NICU and SCN care
- recruitment of educators to support staff undertaking training
- development of new positions for neonatal nurse practitioners (NNPs). In addition to providing clinical support in hospitals, support services to smaller regional SCNs and home-based care, NNPs could lead the development of new models of care and provide clinical guidance and mentoring to less experienced staff. NNP positions would enhance career pathways for NICU and SCN nurses, aiding recruitment and retention. A number of NNP positions would be available in NICUs and, depending on the size of the unit, SCNs. To support staff undertaking training, candidate positions for NNP should only be available in the NICUs where permanent NNP positions are also available.

Medical staff

In addition to specialised nursing staff, the recruitment and retention of enough medical staff—both consultants and registrars—is also an issue. Not only will more doctors need to take up paediatrics as a speciality, they will also need to train in the subspecialty of neonatology (refer to Attachment 4). This may require the recruitment

of international medical graduates as currently, not enough Australian candidates are studying to be paediatricians and neonatologists.

Again, there are no recommended workforce standards or benchmarks for neonatologists provided by national organisations. However, the Report proposes a minimum of six neonatologists per unit to enable one-in-four, 'on-call' arrangements. The standard of one-in-four, 'on-call' is consistent with general recommendations for medical specialists with units comprising a maximum of 25–30 cots. Patient and staff safety and clinical governance issues develop if NICU cot numbers are greater than 30 without commensurate staff increases. (Refer to Attachment 4 for numbers of neonatologists.)

Allied health

There are also no recommended workforce standards or benchmarks provided by national bodies for allied health professionals working in NICU and or SCN. Anecdotally the current number of physiotherapy positions is inadequate—a national group of physiotherapists is currently progressing discussion around this topic—and this applies to various other allied health groups, such as psychologists and social workers, who are associated with NICUs, SCNs and relevant outpatient clinics. There has also been substantial growth in outpatient care and follow-up assessment clinics for babies who have been patients in either NICUs or SCNs. Further assessment of the number of allied health professional positions required in both the acute and ongoing care role is urgently needed.

Recommendations

In 2006, the Report recommended an immediate increase in the number of NICU cots in Queensland. While the government funded an increase in NICU cots from 48 to 67, the Minister also requested an independent review of the veracity of the planning data, costings and assumptions. This summary report has taken a statewide approach to the provision of neonatal services, considering current and future planning. As a result the following recommendations are made.

Clinical leadership

It is recommended that:

- the statewide Maternity and Neonatal Clinical Network be supported in assuming a clinical leadership role related to maternity and neonatal clinical reforms including clinical governance and the role of the Queensland Children's Hospital NICU, leading the development and implementation of the recommendations related to health service planning, workforce and NICU and SCN capacity, admission and care management criteria as stated below.
- until the Office of the Chief Health Officer has completed its current review of statewide transport and accommodation issues related to maternity and neonatal services, a statewide neonatal transport coordination team is

appointed. The individual who leads this group will be appointed by, and accountable to, the Chief Health Officer and will have decision making responsibility for:

- statewide strategic neonatal transfer issues,
- emergency retrievals,
- daily demand management for NICU and SCN cots to prevent 'bed block'.

Health service planning

It is recommended that:

- an effective Perinatal Services Clinical Information System (PSCIS) be developed to provide accurate data for planning and clinical use. To advance this recommendation, a concept brief and business proposal for a PSCIS should be developed by a collaborative of Information Division and the statewide Maternity and Neonatal Clinical Network
- the issues around governance, formalised NICU/SCN service networks and staffing role of QCH NICU be urgently addressed, including the level of expected activity and number of cots required be determined by a working party made up of Area, QCH, PCB planners and the statewide Maternity and Neonatal Clinical Network and clinicians including MFM specialists and neonatologists
- a review and redevelopment of the CSCF Neonatal module occur in conjunction with a review of the CSCF Maternity module be lead by PCB in conjunction with the statewide Maternity and Neonatal Clinical Network admission criteria be developed for SCN and NICU
- criteria for the management of neonates requiring complex care and CPAP ventilation be developed the statewide Maternity and Neonatal Clinical Network
- that issues surrounding maternity and neonatal transport be addressed by the Office of the Chief Health Officer, including:
 - improving access to community-based transport for provision of necessary neonatal and maternity care
 - routine back transfers to regional SCNs
 - additional financial assistance for travel and accommodation for mothers and babies
 - funding for dedicated emergency retrieval teams—highly skilled staff, equipment, transport vehicles, education and training—for *in utero*, post birth and high risk maternal transfers
 - provision of transport for care regimes—medical and allied health developmental review, ophthalmology review—not available near place of residence.

Workforce

It is recommended that a workforce taskforce be urgently formed to address neonatal workforce issues including developing a sustainable neonatal workforce plan to meet current staffing needs and future requirements

The Taskforce should consider:

- developing new positions for NNPs to lead new models of care and provide training, clinical guidance and mentoring for less experienced staff in NICUs and SCNs. These positions would enhance career pathways for nurses aiding recruitment and retention. NNPs in TTH have been successful supporting the medical staff

- supporting all new NICU/SCN nursing staff to complete the Transition to Practice Nurse Education Program in neonatal care
- reviewing the number of medical, nursing and allied health positions for NICUs and SCNs
- reviewing the annual casemix cost of a cot to ensure adequate funding for medical, nursing and allied health positions.

NICU and SCN capacity

To address current and future neonatal capacity issues and to manage demand for NICU cots, it is necessary to substantially increase SCN cots across Queensland. An increase in NICU cots is also required as development of infrastructure allows.

It is therefore recommended that:

- the number of NICU and SCN cots are increased to meet current and future demand with the priority being SCN cots in the next four years.
- a target of 1.2 NICU cots per 1000 births at 70 per cent occupancy rates be realised over the next 10 years. This should be achieved as built capacity increases from the current ratio of less than 1.2 cots per 1000 births and an average of 86 per cent occupancy rate
- the new unit at TTH open with 20 NICU cots (with a built capacity for 25) and the GCUH open with a built capacity for at least 15 NICU cots (with the potential to expand further) regardless of how many cots are commissioned initially. This is because the MMH and RBWH are at built capacity, and TTH and GCUH will need to meet the increasing demand for NICU cots
- development of additional NICU and SCN cots at TTH be supported as part of the current master planning project. Projected activity suggests that provision of 20 NICU cots (with ability to expand to 25) and 30 SCN is likely to meet future needs
- unfunded SCN cots already in use at RBWH, Toowoomba, Cairns, Townsville, Mackay and Rockhampton be funded
- funding be provided for additional SCN cots including necessary minor capital works at Ipswich, Redlands, Bundaberg, Cairns and Hervey Bay
- where units are at built capacity (e.g. Caboolture), service and master planning be supported to expand SCNs
- where capital works are planned for new maternity units including SCNs such as those in Rockhampton and Bundaberg, the opening of cots be supported.

Queensland Children's Hospital Development

The Queensland Children's Hospital (QCH) planners have proposed a 20 cot surgical NICU for the new QCH. This NICU would care for neonates having complex surgery including those known antenatal neonatal surgical cases. However, further consultation with relevant stakeholders is required in respect of this planning, and before the clinical networks and governance, service plan and number of cots can be finalised. Further planning discussion will be undertaken between Planning and Coordination Branch, the Area Health Service planning units, neonatologists, key obstetricians, maternal foetal medicine clinicians, neonatal surgeons and the QCH planning team relating to the role of a QCH NICU. Issues to be considered include:

- the impact of additional QCH surgical NICU cots on the statewide neonatal service and network,
- the number and location of NICU cots needed to manage NICU surgical demand, and
- the ability to safely and sustainably staff a large new surgical NICU.

The number of NICU cots at QCH has not as yet received EMT endorsement and should be informed by these planning discussions.

Table 7: Proposed implementation schedule for SCN and NICU cots

Public hospital	Timing													
	2008–09		2009–10		2010–11		2011–12		2012–13		2013–2014		2015–16	
New cots	SCN	NICU	SCN	NICU	SCN	NICU	SCN	NICU	SCN	NICU	SCN	NICU	SCN	NICU
Southern Area Health Service														
Toowoomba Hospital	4**		3											8^
Ipswich Hospital	6													9^
Redlands Hospital	3													
Gold Coast Hospital				2^										
Gold Coast University Hospital							10–15^	8–13*^						5*^
Logan Hospital														
MMH	14#													11^
QCH										12*^				
Northern Area Health Service														
Cairns Hospital	4**		2											
The Townsville Hospital	6^**						10^	8^						5*^
Mackay Hospital	2**								2^					
Mount Isa Hospital			1											
Central Area Health Service														
RBWH	4**													
Redcliffe Hospital									2^					
Caboolture Hospital									10^					
Hervey Bay Hospital			2											
Rockhampton Hospital	4**				4^									3^
Bundaberg Hospital			3						1^					
Nambour Hospital					7^									
Sunshine Coast Hospital														8^
Total SCN	47		11		11		10		15					39
Aggregated new SCN cots	47		58		69	0	79		94					132
Total NICU		0		2		0		21		12		0		10
Aggregated new NICU cots		0		2		2		23		35		0		45

* not confirmed - QCH NICU proposal for 20 cots– but this not endorsed by EMT

** funding for unfunded cots currently in use

^ no built capacity

^^ new hospital or facility

funded through contractual agreement between Queensland Health and MMH

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