



THE POTENTIAL ENVIRONMENTAL IMPACTS OF A SUBSTANTIAL POPULATION GROWTH IN THE NORTHERN REGION OF SYDNEY

Executive Summary

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This report discusses in detail the key environmental impacts expected to be associated with an intensification of the population in the NSROC region. Initially, it outlines the concepts underpinning the generic relationship between human settlement and the natural environment, and then establishes the tests for applying the findings to the NSROC region.

A feature of the NSROC region that dominates the analysis is that many parts are already heavily urbanised. Growth will come largely from re-engineering existing settlement areas, rather than from the strategic urbanisation of green-field sites. This creates many impediments to the implementation of good planning intentions. Unlike the green-field areas identified for new growth centres, fewer opportunities will be available to match the needs of the built environment with demands to protect nearby vulnerable natural environmental assets.

Within this constraint, there are various matters that the authors identify for consideration by NSROC as its plans to accommodate a population increase. These are:

1. Intensification of the population of the NSROC region will unavoidably impact on the key environmental assets that are highly valued by its residents. Some changes will be manageable, but others will be irreversible.
2. The environmental outcomes will be superior if the expected population growth in the region occurs through a structured and comprehensive land-use planning strategy such as the *Metro Strategy*. The current fragmented and case-by-case approvals regime for development projects that is now administered by the NSROC Councils in concert with the NSW Minister for Infrastructure, Planning and Natural Resources, will be inadequate to respond to the stresses that the anticipated growth will place on the local environment of the region.
3. Some environmental impacts will become obvious far earlier than the 30 year planning horizon considered by the *Metro Strategy*. The timing and magnitude of some will be greater if key parts of the economic infrastructure servicing the region continue to deteriorate. The sewerage, stormwater and transport management functions are ready examples where further investment in infrastructure will be necessary if the region is to accommodate the predicted population growth.
4. But this investment will need to be made judiciously. It will fail to mitigate the adverse population effects on the local environment if it does not focus on providing specific improvements that address recognised threats. For example, a new road may service a particular user group, but may also increase the private use of vehicles and lead to further congestion at other locations.
5. Notwithstanding the best planning intentions and even the hypothetical availability of substantial infrastructure funding, there is a distinct possibility that the population density of the region could still reach a point where it is no longer sustainable against a wide range of commonly accepted environmental sustainability indicators. There may be, for example, absolute limits to the capacity of the local fresh and marine waters to tolerate further pollution, or to the ability of the extensive native bushland and ecosystem habitats throughout the region to withstand further anthropocentric intrusion.

6. If this point is reached, some blame must lie at the feet of past developers who have left a legacy of an inadequately conceived building stock which will continue to dominate the region for decades. Most residential and commercial buildings are not only poorly designed to cope with potential energy and water constraints, but many are also located at sites that present ongoing threats to sensitive ecosystems.
7. It is acknowledged that this criticism could be levelled at all historical settlement patterns across Australia, but there are factors that amplify the problem here. The NSROC region is characterised by steep inclines, hills and gorges, many of which rise above environmentally sensitive land or aquatic features. The higher sites have been preferred for residential development for a variety of reasons, but disturbance of the land at the top of the sensitive areas has caused soil mobilisation and accelerated stormwater flows. Both have resulted in significant environmental problems for the vulnerable ecology below, which will continue to be at risk from future building activity.

The following comments are discussed in the issue-specific sections in Section 3 of the report. Their order below focuses on the most significant issues first.

Transport Issues

1. The arterial roads of the region appear to be on an unavoidable trajectory towards extreme traffic congestion during peak hours. The major roads in the region are prominent thoroughfares for the vehicle-bound commuters of the outer suburbs, and for an accelerating intra-regional commercial traffic flow. Eight of the major roads were already taking more than 70,000 vehicles daily as far back as 2002, and they will continue to be traffic conduits for the growth areas in the north-west sector and the Central Coast.
2. It is imperative that initiatives be taken urgently to implement a fully integrated public transport system for the region that will maximise the effectiveness of its existing bus, rail and ferry systems in moving the greatest volume of people as quickly as possible, using the lowest number of conveyances. A failure to develop a comprehensive and sustainable transport strategy could seriously impede the goal of increasing the population within NSROC while preserving the natural environment.
3. The report's projection takes into account the \$5 billion worth of transport-related infrastructure currently being built within the region or on its outskirts, which should delay some aspects of the problem. It does not consider the influence of a dramatic increase in the price of petrol which appears a possibility within the next decade. Nevertheless, the evidence implies that the eventual strain will be overwhelming.
4. The *Metro Strategy* needs to develop the competitiveness of buses as a major form of public transport, but to do so in a manner that is sustainable against the strictest of the environmental criteria that are likely to apply in foreseeable future. Their operations are already well established in the region, and especially for conveying passengers into and across the city. But their services often appear poorly coordinated, and there are circumstances where the fleet becomes an environmental problem on its own. There is an urgent need to optimise effectiveness of the bus-fleet as a mass transit system, and to run it as a 'clean and green' operation.
5. Similarly, the *Metro Strategy* should provide funding for a study to identify the circumstances in which light rail could be used to augment the movement of people within NSROC, or across the Harbour Bridge to the city. If shown to be commercially viable, this could prove to be a valuable component of an integrated transport system, and could augment the effectiveness of the new north-south rail line proposed for 2017.

Drinking Water Security

1. Even if the current dry spell in the catchment of Sydney's drinking water relents, there is still a long-term need for measures to ensure that the growing NSROC region is less vulnerable to future supply constraints. It is legitimate to expect the community of the region to position itself to support any city-wide demand management initiatives, and to also take large steps to reduce its local call on the reticulated system operated by Sydney Water.
2. This analysis identified initiatives that could enhance the water-conservation goals of the NSROC Councils, but which have languished in the past from a lack of interest. Two examples in particular are:
 - a) an investigation should be undertaken under the Metro Strategy umbrella into the viability of using the Northside Storage Tunnel as a conduit for high quality recycled water to be transported from the North Head sewerage treatment plant, to large volume users in the LGAs in the vicinity of the Tunnel. This water should be sold for application to parklands and sports grounds as a substitute for potable water, wherever this satisfies strict public health guidelines.
 - b) there should be a thorough investigation of the options available for recycling stormwater for similar types of applications. Models are available that specifically capitalise on the natural advantages of the NSROC region. The Ku-ring-gai Council has recently received funding to implement a program, and the North Sydney Council has a similar approach that appears admirably suited to its circumstances. These should be investigated early, and if viable, pursued quickly under the *Metro Strategy* umbrella for funding to extend them across the region.

In making these recommendations, the authors are aware of that the NSW Government is proposing to invest in a desalination plant to augment the city's drinking water supplies. The authors consider that this should not compete with local proposals to develop options for the non-potable recycling of wastewater, but instead argue that each should be seen as complementary approaches to a problem that provides room for all innovations to be evaluated on their merit.

3. Consideration should be given to further extending the need for any multi-unit dwelling development to include stormwater retention basins as a condition of their development approval, and to identify opportunities for recycling the water collected in its vicinity. The collection systems should be designed to suit their local circumstances, but if effective will reduce the peak volumes entering the drainage system and hence the speed of its total flow.

Sewerage Management

1. Sydney Water should publish its perspective on the capacity-constraints that are likely to be faced by all segments of its sewerage network in the NSROC region that will be required to cope with a population increase. This should be updated regularly for use by developers and the Councils who will need to assess their applications.
2. Should any land-use planning changes be proposed for Development Consent that are contrary to this advice, the proponents should describe how the published limitations will be addressed prior to approval being granted for their projects. The alternative is that future sewerage system augmentations will be exercises in crisis management if Sydney Water is merely left to retrofit upgrades to cope with the additional strain on the system.
3. Further development of the unsewered areas identified across the region should be prevented, preferably until they are properly reticulated, or at least until it is established that they satisfy an objective risk profiling against relevant environmental performance criteria.

Biodiversity Conservation

1. The NSROC region includes some of the most extensive and highly valued natural bushland in the Sydney basin, and also includes wildlife corridors that support the survival of sensitive fauna inhabitants. These areas are currently under threat, not only from commercial quarters, but also from the creeping impacts of soil erosion and chemical contamination from stormwater drainage; attacks on the natural inhabitants from domestic pets or an increase in the numbers of their feral cousins; and increasing pressure for recreational access to areas that are ill-adapted to cope with the human intrusion. These impacts will compound as the population density of the region increases.
2. NSROC should therefore enter into early negotiations with the Metro Strategy planners to identify approaches for arresting these threats. One suggestion is for the planning law reform program to include the statutory capacity to place highly valued native bushland areas beyond development pressures. This should declare the areas “out-of-bounds” with a force that resists legal challenge.
3. The stricter planning controls should also prescribe stringent risk-mitigation measures for proposed developments adjacent to sensitive natural settings. Their effects can be gradual, cumulative and less easily predicted, and are severe on steep slopes above bushland, for example in the Hornsby and Kuring-gai local government areas. Here there is a higher risk of soil erosion, weed invasion and pollution from increased volumes of stormwater flowing off the impervious surfaces that are standard features of residential developments.

Air Quality

1. The air quality sampling data routinely collected by the NSW Department of Environment and Conservation shows very few exceedances of the national standards for health and environment protection throughout this region.

Unfortunately, the limited data available does not allow the authors to make projections about the future impacts of a more intensive urbanisation of this region, and especially on a sub-region basis. Only one site at Lindfield describes the air quality of the NSROC region, and this is unable to identify micrometeorological changes or localised pollution that may be impacting on the residents of vulnerable residential pockets elsewhere in the region.

If the Lindfield site under-reports local pollution levels, then any future deterioration in air quality would be from a lower base than is currently described by the published data. This may be particularly so for photochemical smog or contamination by air-borne particles of 10 microns or less, since these are expected to increase with the growth of vehicle usage in the region. Anecdotal comments in the Sydney press refer to local pockets of “haze” or “smog” from time to time, so there may be other factors at play that need to be investigated further. The BTRE report of July 2005 reinforces this for Lane Cove at least.

Greenhouse Gas Management

1. The NSROC members have collectively identified the need to reduce the growth of greenhouse gas production as a major policy target, and are examining ways in which they can influence their communities to move in this direction. Notwithstanding this commitment, it appears unavoidable that the impacts of a substantial increase in urban density will make this goal very difficult to meet.

The key contributors to the increased greenhouse gas emissions will include local heating effects from the loss of the extensive vegetation cover that characterises the region now, as the land allocation per capita decreases; increased non-renewable energy consumption, notably from the expected growth in air conditioning that will accompany the proliferation of multi-dwelling structures lacking adequate natural shading; and the expectation of significant increases in localised traffic congestion by cars that will be significant greenhouse gas emitters for many years into the future.

General Comments

1. The issues above are explored further in the body of the report, which was written during a period when there was more public debate over the future of human settlement in Sydney than perhaps at any other period in the past 10-15 years. The media systematically attacked the deteriorating transport systems across the city at the same time as the NSW Government announced various initiatives to address the most threatening water supply concerns for the city in a life-time. This public positioning could feed into the further designs of the *Metro Strategy* that are to be announced before the end of 2005, which in turn could alter some of our conclusions about the future environmental risks facing the region.
2. In addition, the NSW Government introduced changes to the *Environmental Planning and Assessment Act 1979* that may turn out to represent its most significant overhaul since its introduction. In particular, the new Part 3A that came into effect on 1 August 2005 is likely to support the policy initiatives at the core of the *Metro Strategy*.
3. Because the NSW planning system is in a state of 'dynamic flux', the authors consider that there is considerable scope for NSROC as a corporate entity to position itself as a lead negotiator with the State Government over the implementation of key features of the *Metro Strategy* in this region. Whilst some issues will be negotiated more effectively on a bilateral basis with each Council, most of those relating to environment protection affect more than one NSROC member, so would be better addressed on a regional basis.
There could also be value in framing planning strategies within the context of sub-regions that comprise two or three LGAs within NSROC facing similar issues. One such split could, for example, be Hornsby-Ku-ring-gai which have large areas of bushland, and another North Sydney-Lane Cove-Ryde-Hunters Hill that face intensive residential and commercial development. Willoughby could fit comfortably into either group.
4. This report complements others by NSROC on the social impacts of the changes mooted and the economic fundamentals underpinning the structure of the region at present. One link in the analysis is the assumption that the region offers an excellent tertiary infrastructure for the growth of the "knowledge" industries which tend to seek environmentally acceptable *milieu*. A similar link occurs with the value that would accrue by preserving the rural lands in the Hornsby Shire, and this is discussed in more detail in Section 3.7
5. The final point emphasizes the limitations that automatically attach to any predictive analyses, and especially relating to the environmental performance of natural systems. In this report, the integrity of the projections varies considerably across the issues discussed.
6. Some predictions, such as those relating to the concerns about future drinking water security in the region, or the potential for traffic gridlock to occur throughout the region at peak hours, are made with a reasonable level of certainty if suitable policy interventions to prevent them are not forthcoming. Others, such as the possible association between an increased local population and decreasing air quality, are more tenuous because of the limited availability of high quality local data. These qualifications need to be remembered if the findings of the analysis are to be called up in further work.