

# **Financing Public Infrastructure for Urban Development**

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## **Introduction**

This paper discusses the financing of infrastructure necessary for the development of new housing on the urban fringe. Infrastructure comprises economic, social and environmental infrastructure. Economic infrastructure includes networked services such as hydraulic facilities (water, sewerage and drainage), roads and other transport facilities, energy distribution networks and telecommunications. Social infrastructure includes facilities that provide services such as welfare and general community support, open space and recreational facilities, health and education. Environmental infrastructure includes the land, systems, installations and other measures aimed at protecting the natural environment and heritage, especially waterways, habitats, flora and fauna.

However, the issue of financing infrastructure cannot be isolated from several important related issues such as the efficient amount and delivery of infrastructure, who should actually pay for the infrastructure, and the process of infrastructure planning. Accordingly, we start by discussing contextual issues and objectives (or criteria) against which to determine appropriate infrastructure policies. We then discuss the key issues of efficient provision of infrastructure, funding and financing infrastructure, and the role of an efficient planning process. The final section contains the main findings. The Appendix contains a short note on issues relating to the proposed Marsden Park Urban Release Area, which was the subject of a field visit, and a selected bibliography.

## **Nature of the Issues**

Urban development and the related provision of infrastructure involve large commitments of resources. For example, preliminary plans exist for the release of land and consequent development of some 150,000 houses in south-west and north-west Sydney, that would house nearly half a million people. Such a population would be similar to the combined existing population of Newcastle and Wollongong cities!

Current indications are that the costs borne by state agencies to provide the necessary off-site hydraulic and transport facilities would be in the order of \$5 billion or about \$30,000-\$35,000 per dwelling. This does not include the Western Sydney orbital. In addition, local governments typically plan (in their Section 94 plans) for new or enhanced local services at a direct levy on the development of \$25,000 upwards per dwelling. Thus state and local governments may be expected to seek to fund infrastructure totalling about \$60,000 per dwelling.

This makes no allowance for schools and hospitals. Nor does the figure include infrastructure provided by power or telecommunications agencies, who usually finance their own infrastructure and recover the costs from user charges.

Nor does this figure include the on-site development costs incurred by developers, including infrastructure costs as well as site development. These costs typically total about \$35,000 per lot, including about \$14,000 for roads and drainage and \$8,000 for water and sewerage. There is, of course, much variation in actual costs depending not only on the site conditions but also on authority requirements, which vary considerably from one local or state authority to another.

Adding local council and direct developer costs for infrastructure indicates a total infrastructure cost of at least \$100,000 per lot. At 150,000 lots, this implies a funding need for \$15 billion, not even including power, telecommunications, schools and hospitals.

These figures should be placed in perspective. Some of these costs reflect the cost of housing the additional population of Sydney *that would occur in any case regardless of where the extra population is housed*. This raises the question as to how much of this cost should be borne by new housing development on the urban fringe (or by landowners, house purchasers or developers on the fringe)?

On the other hand, there is a high demand and a high implied willingness-to-pay for this infrastructure. A new detached house with land and services on the Sydney urban fringe typically sells for around \$400,000. Given average building costs including builder's profit, basic house construction of around \$170,000 per dwelling, there is a further \$230,000 available to pay for the purchase, planning, development and servicing of the land, and for appropriate contributions to associated economic and social infrastructure.

It is important to distinguish between financing and funding of a service. Financing and funding are separate issues. Financing is concerned with *the provision of financial capital*, by loans, equity or other form that will finance the capital works. Funding deals with servicing this financial capital and ultimately with the party that *actually bears the cost* of providing the infrastructure.

This issue is complicated when a developer pays for publicly provided infrastructure, and thus apparently finances and funds the infrastructure. However, when the developer passes the payment back to landowners or forward to the lot or house purchaser, the cost is borne ultimately by either the initial landowner or the house purchaser.

In so far as we are concerned with who actually pays for infrastructure, we need also to be concerned about the size of these charges. This depends in turn on the quantity of infrastructure provided and the unit cost of provision. New developments may reasonably be expected to pay for an appropriate amount of efficiently provided infrastructure, but not for excessive or inefficiently supplied infrastructure.

### **Criteria for Provision of Infrastructure**

Criteria are required to determine the appropriate quantity, timing and location of infrastructure provision and appropriate funding methods. In this paper we will draw on three criteria — efficiency, equity, and administrative effectiveness.

Efficiency means allocating an efficient amount of resources to infrastructure. This means providing at least cost the infrastructure services that households want and are willing to pay for. Incremental components of infrastructure should be made only when the prospective users' valuation of benefits, along with any benefits to third parties, exceeds the incremental cost.

Urban planners sometimes refer to other criteria, such as liveability, sustainability, integrated or balanced services. In our terminology, these objectives in so far as they are measurable are part of what we mean by efficiency — the provision at least cost of the services that households want.

Prices for infrastructure have a role in encouraging efficient provision or use of a facility. Efficient allocation of resources occurs when price signals help to show the amount of infrastructure required. Thus prices should reflect the costs of services.

Equity may mean either the beneficiary principle or the capacity to pay (affordability) principle. The beneficiary principle is that users should pay for the services that they receive and not expect others to pay for, or to cross-subsidise, these services. The affordability principle is that households should contribute according to their capacity to pay.

In this paper we focus on the beneficiary (user-pays) principle of equity because subsidising infrastructure generally does not reduce house prices. Indeed, if recurrent payments for infrastructure services are subsidised, house prices may increase. Broad-based subsidies for urban infrastructure do little to improve the welfare of low-income households. On the other hand, when a user charge exceeds the relevant cost, and the charge cannot be avoided, the excess is a form of tax.

Administrative effectiveness requires an expeditious, certain and transparent process for planning and delivery of urban infrastructure.

### **Efficient Provision of Infrastructure**

The efficient provision of infrastructure requires an efficient quantity, quality and timing of infrastructure. This means providing a level of infrastructure that reflects what local households want and are willing to pay for subject to their not imposing any costs on other households. It also means providing these services at least cost.

In our discussions with developers, consultants and public officers there were several indications that these efficiency requirements were not being met. Examples of excessive or premature provision of infrastructure include:

- The one-off provision of hydraulic facilities such as pumping stations, tunnels and pipelines at ultimate standards rather than staged in line with current and near future requirements. Sydney Water was said to be more concerned with technical efficiency (economies of scale) than with capital efficiency.
- An excessive planned supply and level of rail services, which may cost \$2-3 billion, in relation to likely use. Less than 8 per cent of households in Rouse Hill work in the CBD.
- An unrealistic level of environmental protection. Developers indicated that the planned preservation of Cumberland Plain native vegetation in north-west Sydney seems excessive in relation to what the preservation would achieve or what a community or market aware of the hidden costs would be willing to pay.

Examples of high cost or inefficient provision of infrastructure include:

- The high unit cost and inefficient delivery of water provided by the Rowse Hill Infrastructure Corporation that was said to be too dependent on Sydney Water's terms of supply.
- The proposed circuitous provision of water to the planned Marsden Park urban release area is not a least-cost solution.
- Untimely delivery of services.

From our limited meetings, there emerged concern that best practices are not being achieved in the delivery of utility services to urban developments. Moreover, the uniform servicing region charge per new housing lot levied by Sydney Water does not provide an efficient delivery incentive.

It was not possible to test these concerns while preparing this paper. However, there would appear to be a strong case for the principle that developers or other users of the infrastructure should be charged only for the technically efficient costs of service supply.

Moreover, in order to deliver infrastructure at least cost, competitive methods of supply and innovative structures for the supply of infrastructure should be actively examined and used where possible. This could include consideration of utility districts as in the United States or district development corporations or revenue-based districts as have been used on a smaller scale in NSW (for example the Honeysuckle Corporation in Newcastle or the South Sydney Development Corporation).

Monopoly providers may over-specify, over-supply and mis-supply services (time, location, type), especially in the absence of market signals and given their power to recover inefficient costs.

### **Paying for Infrastructure**

The user pay principle means that beneficiaries should pay for the services that they benefit from. Thus new residents of an area should pay for the incremental provision of infrastructure in specific locations. Payments may be either capital or periodic payments.

However, two caveats may be noted. First, new infrastructure is needed partly to meet the requirements of general population increase. Even if the population increase occurs in established urban areas, additional infrastructure is required, especially but not only social infrastructure. Much of this social infrastructure is usually funded from tax revenue. It is not clear that residents of new areas should pay for the costs associated with general population increase that arise in any case and are independent of urban location. This includes many community facilities. Non-location specific costs of population increase should be funded from tax revenues. Providing that the population increase contains a reasonable proportion of young persons and workers, taxpayers benefit in the long run from the increase in the tax base and in the economic growth and well-being of an area that is a consequence of population growth and development.

Second, some jurisdictions, utilities and other service providers charge rates or fees that more than cover their operating expenses, and so recover some or all of capital expenditures (depreciation charges) for existing and new assets. In such cases, suppliers double charge when they levy a special capital charge on new home owners plus a standard periodic rate or levy. Where there is both a capital cost levied on new development and a component of capital repayment built into the more widely applied recurrent charges, equity and transparency are difficult to ensure.

This leaves open two questions. What infrastructure charges may fairly be apportioned to new housing developments? And, how should these charges be levied?

It is beyond the scope of this paper to discuss and resolve all the issues involved in cost apportionment. However, a few points may be made and a few examples can be given.

It is generally accepted that developers should provide most of the infrastructure within the boundaries of a sub-division. Developments should also pay for the full costs of off-site costs that arise as a result of the development except for social expenditures that are generally borne by the community. The efficient allocation of resources requires that a development should bear the location-specific costs.

These principles are commonly exemplified by the provision of water and sewerage where there are three main categories of works: *reticulation* to individual dwellings within the boundaries of a subdivision; *distribution works* (for example water supply mains, collection sewers, and main drains); and *headworks* (dams, sewage treatments plants and outfalls). The main funding issue is the allocation of the costs of the authority's mains or distribution works to a development. Some headworks costs may also be allocated to servicing a new development. However, headworks are often independent of new development locations and added to the system over the life of a headworks item (which can be 50 years or more).

It is often difficult to determine the cost of meeting additional demands on the system, especially for networked services, and cost allocations have to be considered on a case-by case basis. A major general issue is the current state of the transport system (both rail and road) in Sydney, which is at full capacity in many places. There is concern that developments may be expected to pay for the renovation and extension of a major public transport facility for the benefit of the whole urban area.

Some specific concerns that arose in our field visit to Marsden Park are:

- The apportionment of costs to a development in one area when pumping stations are located in another catchment.
- The apportionment of costs to a development when a major road, such as Richmond Road, needs duplication in any case.

- The requirement for bank guarantees that are not related to service delivery.

Given that new housing developments should bear properly apportioned costs, how should these charges be levied? This raises several issues — notably issues of nominal and actual incidence, of capital versus recurrent payments, and of timing.

It is a fundamental finding of economics that the party that has the nominal responsibility for paying a tax does not necessarily bear the real burden of the tax. Taxes are borne by the party that has few (if any) options or substitute courses of action and who therefore cannot easily escape the tax. Parties that can undertake alternative actions or purchase alternative goods can escape a tax.

The assumption of the authors is that whether infrastructure charges are levied on developers or house buyers, most of the ultimate burden is borne by the initial landowners, at least where urban land values are significantly in excess of non- or pre-urban land values. Such landowners may have little alternative choice for use of their land whereas house buyers purchasing in new release areas can, in principle, purchase elsewhere in the metropolitan area. If these arguments are correct, in terms of incidence, it is immaterial whether the landowner, developer or house buyer is charged for the new infrastructure charges.

In practice, because of the long holding periods required for urban development, developers may carry some of these landowner costs where developers have limited choice of sites and raw land purchase price in the urban land release areas. Also, when markets are not completely informed, the charges may be borne partly by developers and house purchasers as well as by landowners. This applies especially when unexpected charges are introduced in the long (multi-year) gestation period between land purchase and house completion and sale. In this case the charges are borne by the existing landowner, who in some instances is also the future developer.

It might appear that these arguments apply only to capital charges, such as developer contributions. However in a well-informed market, they would also apply to recurrent charges. Expected high recurrent charges in a new development would depress house prices in the subdivision and in turn lower land prices.

Nevertheless, this paper considers that there are important grounds for levying infrastructure charges at the time of sale of houses or when the infrastructure is supplied, whichever time is later. The reasons are financial efficiency, delivery efficiency and accountability, and transparency.

As argued in the next section, the public sector can finance infrastructure at lower cost than can developers. Second, the service supplier should have incentives to provide the infrastructure in an efficient, timely and accountable manner. The present situation in which developers have to provide the capital without any guarantee of timely services provides neither efficient incentives to suppliers nor equity to developers. Third, there is a lack of transparency in the present process. In principle services should be paid for when they are provided.

The main conclusions to emerge from this discussion are:

- New housing developments should be expected to pay for incremental location specific infrastructure costs. However, the apportionment of costs needs to be done carefully on a case by case basis. The real cost of infrastructure provision should be apportioned equitably to end users and beneficiaries, allowing for benefits to existing residents.
- Other population based and social infrastructure expenditures should be paid for from tax revenues. This might include a tax on land for development purposes. However, such a charge should be shown transparently as a tax rather than as a hidden tax on developers.
- Capital costs may be recovered by a combination of capital and periodic charges. However, when this is done, care should be taken not to levy excess charges or to double-charge a development. This occurs when new house owners pay for capital investment and then pay user charges that exceed operating costs (particularly where these are inefficient) and include payment for depreciation.

- Capital charges for infrastructure provision should be levied at the time of sale of houses or paid for by appropriate charges when the infrastructure is supplied, whichever time is later.

### **Financing Infrastructure**

As we have observed, financing and funding are separate issues. Financing is concerned with the provision of financial capital. Funding is concerned with servicing the capital.

However, financing can influence the efficient delivery of infrastructure services when the two are effectively coupled. Given appropriate arrangements, efficient financing instruments can assist in provision of an efficient roll out of infrastructure, with appropriate priorities met, and with neither leads nor lags in the process.

The main options for financing infrastructure are as follows.

- i. Public sector general borrowing (loans) by state or local authorities.
- ii. Public infrastructure revenue bonds.
- iii. Current public revenues.
- iv. Private financing of infrastructure when private development is feasible and appropriate.
- v. Private financing – developer levies in cash or in kind – of public development.

In the view of this paper, the preferred options are (i), (iii) and (iv), depending on the circumstances. The least good financing options are (ii) and (v).

The important advantage of government loan finance is that government, especially state government, can borrow at much lower rates than can the private sector, especially developers. Currently the NSW Government can borrow at around 5 per cent, whereas developers may have to pay twice as much for capital. Thus for every \$100 million of infrastructure, the community pays an extra \$4-5 million a year for the Government's refusal to raise public money to finance the infrastructure. Even allowing for some economic costs associated with raising taxes to repay the loan, there are substantial community savings from public borrowing.

The NSW Government's policy to eliminate financial debt has no sound economic or financial basis. The golden rule of public finance is that, over the business cycle, government should have a zero operating deficit on current expenditures and that net borrowing should equal net capital spending. This rule ensures no decline in the net worth of government. There is no case for funding capital expenditure out of current revenues unless the state has previously overspent and is in financial difficulties. Paying for capital out of current revenues (option iii) is unnecessary and unfair to current taxpayers.

When government borrows, there is no immediate change in net worth because the cash income offsets the liability. Nor is there any longer term decline in net worth if the repayments of the loan are secured against an income stream as can easily be the case with infrastructure funding, with repayments either by developers or house owners.

Currently the NSW Government has a net worth of nearly \$100 billion and a net debt (which is included in the net worth estimate) of less than \$4 billion. In these circumstances there is no reason for not borrowing to finance productive assets, including housing. Failure to do so represents a costly and inefficient failure to utilise a strong balance sheet.

We have heard the NSW Treasury give two reasons why Government should not increase net debt. One is that this could risk the Government's triple A rating and increase the interest rate on government borrowing. The second is that servicing high levels of net debt may not be sustainable if government revenues decline, for example with a fall in property prices. Neither the interest rate nor the sustainability argument has any empirical justification at current levels of net debt or even at double the current level.

Public infrastructure revenue bonds represent an alternative method of public borrowing. These bonds would provide debt repayment from project revenues. The bonds could be raised by State or local government or by public utilities. In whatever case, the borrower would have a state-guaranteed right to a revenue stream to repay the loans. Note that it is not proposed here that these loans be subsidised. This is neither necessary nor desirable.

An advantage of public infrastructure revenue bonds is that they would introduce more competition and more accountability into the provision of finance, including some public-private sector partnerships. This would most likely introduce innovation and efficiency into infrastructure provision. However, the details need to be worked through.

Option (iv), the private financing of infrastructure, is most appropriate when private development of infrastructure is feasible and appropriate and the private sector is responsible for the risk. Those structuring the deals can then introduce appropriate incentives into service delivery. Of course, the private financing would be voluntary not mandated.

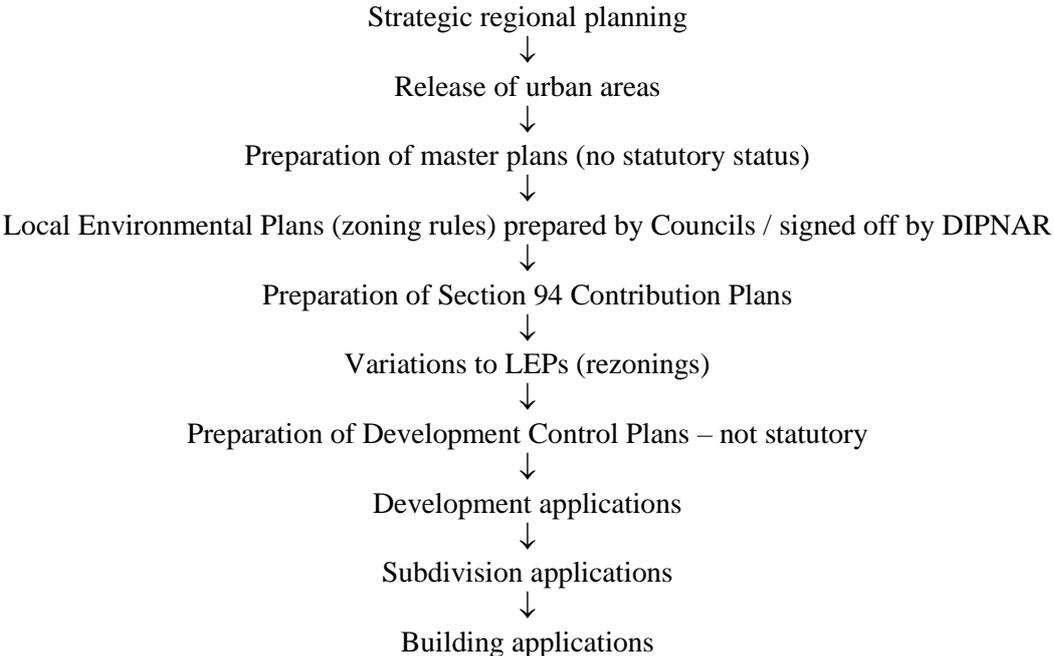
This paper does not favour option (v) — mandated private financing of public infrastructure — which is a large part of current financing arrangements. As already indicated, this is a costly financing process. It is also unfair and inefficient because the provision of finance is decoupled from provision of services. The government receives money to provide infrastructure but has no financial incentive to ensure that the infrastructure is provided, or provided in a timely way. Indeed because the funds are interest free, it has an incentive to let it earn a return rather than provide the necessary infrastructure.

Also option (v) confuses financing with funding. As we have indicated, this paper considers that new urban developments should pay for appropriate infrastructure expenditures. However transparency requires that financing and funding be treated as separate activities.

**Efficient Process**

This paper has stressed the importance of efficient financial and administrative processes. But this is not the picture presented by an admittedly small number of interviews in the process of preparing this paper. We are cautious about drawing generalisations from limited evidence. However a few comments are in order because they bear on the financing of infrastructure. To provide a framework, Box 1 presents an overview of the planning process.

**The urban development process**



The following are some of the main concerns about the delivery of infrastructure.

- In recent years, until the last few months, there has been little strategic planning. There is consequently a planning vacuum. Current urban planning is urban splatter, reflecting individual initiatives, rather than a coherent urban plan or framework.
- Following the release of urban areas, master planning is often funded and done by private companies. There is little government funding for master planning. This master planning has no official status. However it tends to be site specific and encourages inefficient fragmented infrastructure solutions.
- Planners are reluctant to develop and finalise a local environmental plan and rezone land until infrastructure financing is in place. In the absence of public funding, developers have to contribute funding when provision of facilities is quite uncertain.
- Developers have to pay up front although they bear the regulatory risk of delays, or indeed not-approval, in the development process. The process is often drawn out and fraught.
- Section 94 contributions are justified by the principle of nexus. However, timely delivery of services is not guaranteed. There is less nexus and accountability for the new \$15,000 transport contribution per lot.
- There are many single issue agencies, stakeholders and rent seekers, including public agencies. These agencies are usually dealt with separately and each one may be able to hold up the process of development.

A classic and not entirely unrelated example of this drawn out and fraught planning process is the Sydney Harbour Climb. Agreed in principle by the NSW Government in 1989, it was 10 years before the Climb was opened to the public.

The inefficiencies in the planning and financing processes have a common element. The failure of the government to take responsibility and initiatives. To provide efficient timely regional planning and efficient low cost infrastructure, the government should take a more proactive role in both planning development and financing infrastructure. This can be combined with innovative public-private partnerships, new local service agencies, and with full user payments for services provided.

### **Conclusions**

A major theme of this paper is that efficient planning and delivery of infrastructure should be based on clear distinctions between financing infrastructure, funding (or paying for services), and taxation charges. Currently the distinctions are blurred and the delivery of infrastructure services has been inefficient.

New urban developments should pay for an appropriate amount of efficiently provided infrastructure, but not for excessive or inefficiently supplied infrastructure.

In order to provide infrastructure at least cost, competitive methods and innovative structures for the supply of infrastructure should be actively examined and used where possible.

New housing developments should pay for incremental location specific infrastructure costs. However, the apportionment of costs needs to be done carefully on a case by case basis. The real cost of infrastructure provision should be apportioned equitably to end users, allowing for benefits to existing residents and others, including general community benefits, to be acknowledged and taken into account.

Other population based and social infrastructure expenditures should be funded from tax revenues. This might include a tax on land for development purposes. However, such a charge should be shown transparently as a tax rather than as a hidden tax on developers.

Capital costs may be recovered by a combination of capital and periodic charges. However, double or excess cost recovery should be avoided.

Charges for infrastructure provision should be levied at the time of sale of houses or when the infrastructure is supplied, whichever time is later.

The most efficient methods of financing urban infrastructure are:

- Public sector general borrowing (loans) by state or local authorities.
- Public infrastructure revenue bonds.
- Private financing of infrastructure when private development is feasible and appropriate.

To provide efficient timely regional planning and efficient low cost infrastructure, the government should take a more proactive role in planning development and in financing infrastructure. This can be combined with innovative public-private partnerships, new local service agencies, and with full user payments for services provided.