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by

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Abstract

Like their counterparts elsewhere, local governments in Australia have been forced to operate under increasing stringent financial constraints. One response to these straightened circumstances has been to rely ever more heavily on "user pays" methods of raising revenue, including funds to cover infrastructure development. Under Section 94 Contribution Plans, local governments in the Australian state of New South Wales can levy developers for services and amenities which require provision as a consequence of development. Virtually all extant analyses of the application of Section 94 have focussed on infrastructural services attendant upon new development. By contrast, almost no work has been done on Section 94 developer charges which are levied to mitigate the adverse consequences of development. This paper examines the mitigatory use of Section 94 levies using the specific example of drainage services and evaluates existing practice in the cases of the Wagga Wagga City Council and the Liverpool City Council. We offer various suggestions for improving current practice.

Key Words: developer charges, drainage, Section 94 contributions plans

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INTRODUCTION

In many industrialised countries the past few decades have seen governments at all levels, including local government, experience ongoing fiscal strain, and Australian local government is no exception. One consequence of these straightened financial circumstances has been a decline in infrastructure spending in many nations, measured as a percentage of total government expenditure. In Australia this has meant that most of the burden of diminishing infrastructure funding has fallen disproportionately on local government since it allocates about 40 per cent of its total outlays on infrastructure, compared to some 20 per cent for State and 5 per cent for Commonwealth governments respectively (Lang, 1991, p. 15). With increasing population pressure, urban expansion, and a limited ability to raise funds, Australian local governments are placed in a dilemma. Under constitutional arrangements in Australia, relative to State and Commonwealth governments, local government has few means of raising revenue despite having concommitantly wideranging responsibilities for infrastructure provision. Urban infrastructure in Australia, such as community facilities, drainage, public open spaces and some roads, has traditionally been financed out of general tax revenue at the state and local government levels. However, with rate pegging, Loan Council controls on borrowing and a reduction in grants from higher levels of government severely restricting the revenue base of local government, municipal councils are steadily moving towards more "user pays" forms of financing. A significant example of a user pays funding mechanism in the Australian state of New South Wales is Section 94 of the NSW Environmental Planning and Assessment Act of 1979 which empowers local councils in NSW to extract contributions from developers for services and amenities which require provision as a consequence of particular developments (Department of Planning, 1992, p. 1).

The deployment of user pays funding mechanisms in general, and Section 94 in particular, has been controversial and generated considerable debate in urban policy circles (see, for example, Barnes and Dollery (1996*a*; 1996*b*) and Neutze (1997)). To date virtually all analyses of the application of Section 94 has focussed on the funding of infrastructural services provided (or extended) as a consequence of new urban developments. By contrast, almost no effort has been devoted to an examination of Section 94 developer charges which are levied to restore service standards to pre-development levels: that is, to mitigate the impact of development. This issue forms the subject matter of the present paper and we specifically evaluate drainage as an example of this genre of urban infrastructure.

The paper itself is divided into six main parts. The first section provides a brief synopsis of Section 94 of the 1979 NSW Environmental Planning and Assessment Act and its application. Discussion then moves on the problems posed by drainage services in NSW and their treatment under Section 94. The third section of the paper examines the chief economic attributes of drainage as a form of urban infrastructure. The determination of Section 94 developer charges in NSW is considered in section four and emphasis falls on two actual case studies - the Wagga Wagga City Council and the Liverpool City Council. Section five seeks to provide a more general evaluation of Section 94 Contributions Plans in the light of the Wagga Wagga and Liverpool case studies. The paper ends with some brief concluding remarks.

SECTION 94 DEVELOPER CHARGES

In terms of Section 94 of the NSW Environmental Planning and Assessment Act of 1979 local governments acquired the legal rights to levy developers for the provision of infrastructure, services and amenities attendant upon some new development. However, due to various legislative complications associated with Section 94 of the Act, these levies, known colloquially as "developer contributions", have only been fully utilised since 1989. Moreover, in accordance with a recommendation of the 1989 Simpson Inquiry, as of 17 December 1992, local governments were required to have a complete Section 94 Contributions Plan in place before they could impose developer contributions. A Contributions Plan should "... contain an implementation program for contributions and a fiscal strategy to enable efficient, economic and equitable administration of Section 94" (Department of Planning, 1992, p.1).

A great deal of time and effort has been invested in improving the procedures involved in the implementation of Section 94. The NSW Department of Urban Affairs and Planning produced a *Section 94 Contributions Manual* over 1992/1993 which has been widely used by all the parties involved. Moreover, some research has also been directed at the efficacy of contributions levied under Section 94 (Barnes and Dollery, 1996*a*) and various proposals put forward for improving on existing methodologies, including the adoption of an *ad valorem* tax by small councils (Barnes and Dollery, 1996*b*). [See also, for instance, the Industry Commission (1992) and Kirwan (1991)]. Recently a new *Section 94 Contributions Plans Revised Manual* was prepared for the NSW Department of Urban Affairs and Planning by Scott Carver Pty Ltd (1996). This has now been transformed into a new *Section 94 Contributions Manual* by the NSW Department of Urban Affairs and Planning in 1997, which provides guidelines as to how municipal councils should administer Section 94 policy.

The *Manual* itself places particular emphasis on four basic principles of policy: the demonstration of the '*nexus*' (between the type of development and the demand for additional public facilities); the requirement for '*reasonableness*' in determination of the contribution (comprising, according to the Manual, 'fairness, equity, sound judgement and moderation' (New South Wales Department of Urban Affairs and Planning, 1997, p. 12)); '*apportionment*' of costs of a public

facility (such that 'the contributing population only pays for its share of the total demand' (New South Wales Department of Urban Affairs and Planning, 1997, p. 13)); and the necessity for '*accountability*' of public funds (requiring, for example, clear and informative documents, maintenance of appropriate financial records, and public participation in decision making).

DRAINAGE SERVICES IN NEW SOUTH WALES

Techniques for the provision of drainage services are currently under review in NSW and some other Australian states (Industry Commission 1992:130-132). Environmental impacts and institutional problems apparently lie behind this reassessment of drainage infrastructure. As the Industry Commission (1992:131) has noted, problems appear to be especially acute in Sydney:

> In Sydney, perhaps more than in any other Australian city, local council provision of drainage services has created significant environmental problems. Local Council boundaries often do not align with natural catchment areas, so it is difficult to sheet home responsibility for adverse environmental effects to the Local Council concerned. Local Councils are responsible for the provision of drainage services, but it is the SWB [now Sydney Water Corporation SWC] which is judged on the condition of the waterways. The SWB contends that its efforts to improve the condition of the waterways through improved sewage treatment are impaired by the effects of drainage.

Among the options being considered to address some of these problems is the physical integration of sewerage and drainage systems. For example, at Rouse Hill in Sydney, the ownership of the drainage infrastructure has been vested with the Sydney Water Corporation (which is also responsible for sewerage), so that the requisite infrastructure can be built in the most effective place in the catchment (Industry Commission 1992:132). Other possibilities explored by academic researchers involve a fundamental reappraisal of the nature of sewerage and drainage infrastructure itself (see, for example, Civil Engineers Australia 1996:28; Troy 1996:82-93; Neutze 1997:88-90; 158-60; 249-50). In the United Kingdom it has been estimated that meeting European Community wastewater pollution targets using 'traditional' sewerage and drainage systems would be extremely costly. Suggestions for lower cost systems include making greater use of natural drainage channels and introducing drainage controls closer to water sources (Civil Engineers Australia 1996). Single pipe systems which follow natural drainage systems are envisaged, together with retention measures at source, whenever flows will exceed downstream sewer capacities. Neutze (1997:249) gives some examples of such retention measures. They include installation of storage basins which retard stormwater run-off and permit stormwater to be used for watering local public space. Designing wetlands or ponds to allow nutrients, sediments and pollutants to settle out so that downstream discharge is cleaner is another option as is directing stormwater discharge on to local sports fields and parks. All three measures reduce the requirements for downstream drainage capacity.

An option being considered at state level in NSW is that local councils be levied for their discharges into major trunk drainage systems (Industry Commission 1992:131). Making local councils accountable for the amount of run-off leaving council boundaries is viewed as implementing the principle that those responsible for downstream effects should be made to bear the responsibility for them. Troy (1996:85) argues that local councils and developers have been adopting 'bugger thy neighbour' approaches by making sure that land for which they are responsible is well drained, but with no concern for those lower down the drainage basin. With regard to developers, Troy (1996:176) suggests that all new developments should be required to ensure that no more run-off occurs after development than prior to development, including the amount of run-off at peak flow. This policy is termed 'zero impact' and has become a requirement for many newly developed urban sites in the United States (Neutze 1997:158, 249). If zero impact cannot be achieved on a site, then developers are required to pay the cost of offsite facilities needed to maintain pre-existing water quality and flow levels further downstream. Lee (1988:301), working in the North American milieu, is more specific about how developer charges should be designed in this regard, arguing that developers should be presented with a choice:

> Impact can be measured directly as the peak volume of run-off leaving the site, after development, with the impact fee based on the cost of absorbing that run-off elsewhere. If on-site devices can be fashioned to reduce run-off to zero, then there should be no impact fee. In contrast, paving over a hillside would result in the maximum fee.

In advocating a similar policy in Australia, Neutze (1997:159) argues that developers have an incentive to examine on-site absorption storage and re-use possibilities, and since drainage costs do vary significantly by location, it would also provide an incentive to subdivide land where stormwater can be dealt with relatively cheaply. Neutze (1997:159) does note that 'there may be difficulties in calculating the cost of off-site facilities', but adds that 'these would be no greater than making the cost estimates for implementing some other aspects of developer charges'. If alternatives can be accurately costed, then Lee (1988) and Neutze's (1997) suggestions might represent the economically optimum solution. Developers, in choosing the cheapest alternative, would also choose the most socially efficient outcome from the point of view of the community as a whole.

A Planning Research Centre (PRC)'s study of Section 94 Contribution Plans ranked drainage as the poorest performing of all the contribution items examined (PRC 1994:122-24). According to the PRC, purpose, nexus, and the costing of works schedules were inadequate and apparently many of the key requirements of document preparation were also not fulfilled. Moreover, Plans were apparently poorly set out and badly written. Toon (1995:7) reported that 'costings were often presented in a cavalier manner with little or no explanation of how they were formulated'; and works programs seldom presented a time frame. This led Toon (1995:7) to remark that 'this assessment suggests to me that drainage engineers have either found the requirements for CP's to be rather boring or not felt it necessary to justify their proposals'. Toon (1995:7) recommended that:

> Drainage CPs should be conceptually approached more like contribution plans and less like engineering plans. They must be more coherent, with better justification, better expression and closer links to a council's other contribution plans.

The PRC (1994:124) also reported that they found no drainage Contribution Plans that had mentioned a concern for efficient pricing or a user pays rationale.

ECONOMIC ATTRIBUTES OF DRAINAGE

In common with water and other urban infrastructure assets, drainage infrastructure can be capital intensive, location specific, durable and relatively indivisible. The calculation of developer charges therefore confronts many difficulties, not least of which is the excess capacity problem and the need to forecast 'final demand' for drainage assets, both of which are generally found with water infrastructure.

However, there are some notable differences in the characteristics of demand for (as distinct from supply of) drainage compared to those for water. These have distinctive implications for the calculation of charges. Using terminology employed by Neutze (1997:88-90), water and drainage can be said to have a demand that is both collective and individual. For example, for water there is an individual demand for the commodity itself (water) to be supplied to individual properties, and there is a collective demand for water as a health, or at least disease prevention measure. Similarly, for drainage there is an individual demand for stormwater drainage to avoid flooding on individual properties, but there is also a collective demand to avoid general flooding from the run-off from properties, roads and public spaces in order to prevent environmental damage and damage to the property of others. For drainage, it is the collective component of demand which is the largest, whereas for water it is the individual component which is most significant. One of the key consequences of this difference is that those individuals who should bear the costs of a developer charge for drainage are also those people who give rise to the need for measures to avoid harm elsewhere. By contrast, with water, those who should pay the developer charge are those who derive a direct benefit from consumption of water. The essential point here is that for drainage, developer charges might be more correctly viewed as an application of polluter pays principles, while for water it is user pays principles which apply.

One implication of this is that the apportionment principle which, according to the Section 94 Manual, requires distribution of costs amongst beneficiaries, may have to be reconsidered. Strictly speaking, it can be argued that it is not the *beneficiaries* of drainage services who should be charged, but rather those who gave rise to the need for these services.

Another contrast between drainage and water services resides in the fact that it does not appear to be administratively feasible to recoup costs through recurrent charges based on on-going consumption of drainage services. Moreover, even if it were feasible, few efficiency gains would ensue. Typically, when usage prices can be charged, signals are sent to service providers as to the

optimum capacity of service to provide. However, drainage capacity is influenced mainly by peak stormwater run-off. Day to day usage between these peaks will usually have a zero marginal capacity cost. Whilst peak run-off may be reduced by one-off consumer actions (such as collection of roof run-off and planting trees), it is the initial long term decisions of developers and consumers (such as the choice of site, its slope characteristics and the amount of impermeable area) which will have the most significant influence on drainage capacity requirements. It seems likely that a more effective response to signals about drainage capacity costs will take the form of a locational decision at the time of purchase of a home or industrial site rather than in any form of usage charge. Drainage may be an example of an urban infrastructure asset for which upfront developer charges are particularly suitable, provided the price signal is relatively accurate, and includes the costs of mitigating any downstream impacts.

DETERMINATION OF DEVELOPER CHARGES IN PRACTICE

If the price signals provided by developer charges for drainage are to be effective, then charges must reflect the cost of all the drainage requirements caused by a development. However, unless all run-off is retained on site, drainage infrastructure will sometimes be required in areas separate from the sites causing the infrastructure. For the purposes of determining a catchment area for developer charges - that is, an area which identifies the land blocks to be charged - costs of drainage infrastructure located in one area would have to be assigned to the 'polluting' area. This requirement is straightforward in principle, but in real world situations it becomes clear that the link between cause and effect is complex: any particular drainage asset is often the result of many upstream causes. In order to evaluate how developer charges for drainage in NSW are actually determined, we examine two specific case studies - the Wagga Wagga City Council and the Liverpool City Council.

Wagga Wagga City Council

The Wagga Wagga City Council expects population growth in its urban area of around 17,000 between 1991 and 2004 (Wagga Wagga City Council, 1993:21). Population growth is anticipated in all suburbs, with the highest growth forecast in the southern suburbs and the least growth in the outer areas. To cater for this growth, some 23 drainage projects have been identified. These consist of trickle flow pipes in existing drains, stormwater pump stations, open drain lining and contour banking. They will be required in various parts of the city.

These 23 drainage projects are estimated to cost $2.57m. of which $0.59m. has been allocated to be paid for by existing sectors and $1.98m. costed to new growth, payable through Section 94 contributions. The Wagga Wagga City Council Contributions Plan does not discuss the

apportionment process at all, but lists, in an appendix, all 23 projects with an attendant percentage (most commonly 100-0, 80-20, or 50-50) designating the split for each project between Section 94 and other funding. In a second appendix, each project is then allocated to one of 15 designated urban zones. In most cases, the allocation is one project to one zone, but in three instances the costs of a project are spread over more than one geographic zone. In a third appendix, the cost of projects allocated to each zone is tallied for each zone.

Having determined a cost of drainage projects per zone, the developer charge per dwelling in a zone is calculated by dividing the cost of projects by the expected number of new dwellings in that zone. For forms of development other than an 'average dwelling house', an 'average dwelling house equivalent' is calculated for that type of development. For example, an average dwelling house is considered to have a roof area of 200 square metres, and if the drainage contribution per dwelling in zone 1 is $863.79, then the developer charge for a 20 unit motel development in zone 1, where the roof area for each unit is 40 square metres and there is also one residence of average house size, would be calculated as follows:

$$\text{Number of equivalent houses} = \left(40 \text{ sq. m} \times \frac{20}{200}\right) + 1 = 5$$

$$\text{Developer charge for drainage for motel} = 5 \infty \$863.79 = \$4\,319$$

Industrial developments are also converted to dwelling equivalents in order to arrive at a developer charge (see Wagga Wagga City Council, 1993:17).

The Wagga Wagga City Council Contribution Plan for developer charges for drainage envisages a charge for the 23 new projects over the period 1993-2004. Per dwelling charges are calculated on the basis that the initial capital cost (in nominal terms) must be repaid over the period of the Plan. There appear to be no charges for planned excess capacity in existing headworks or major works (comparable, for example, to charges for water headworks, such as dam or reservoir capacity).

There appears to be insufficient explanation in the Wagga Wagga City Council drainage Plan to provide a detailed understanding of how each project was allocated to a charging zone. There could be a suspicion (because so few projects are charged to more than one zone) that those located in the zone in which the work is being done are being charged for the project, rather than those causing the works. However, it should also be noted that many of the projects listed appear to be relatively small scale developments so that it could not be safely assumed that the area requiring the works was not also the area in which the works are being undertaken. In his analysis, Kerwan (1995:8) does not provide an answer to this question but does lend some insight into the problems encountered by Section 94 policy makers in Wagga Wagga City Council when attempting to define catchments for drainage.[1]

In arguing that defining catchments is one of the principal problems in assessing developer contributions for drainage, Kerwan (1995:8) observed that:

> In many instances, there are catchments within catchments. If councils assess contributions on a sub-catchment basis, then inevitably there would be higher costs for a small number of dwellings and thus contribution rates would be unreasonably high. Conversely, the larger the catchment the "easier" it is to distribute costs across a larger number of dwellings. This would also mean there is more chance Council has to pay some of the costs to meet the "established" sector's proportion. The larger the catchment, the greater the possibility of "upstream" development paying for works carried out "downstream" ...

Various pertinent issues arise. Firstly, if Kerwan (1995) is conceding that the larger the defined catchment, the greater the chances of getting Section 94 charges to meet the established sector's proportion of costs, then this clearly contravenes the apportionment principle, but probably reflects his concern about the buildup of the existing sector's liability for drainage projects deriving from drainage requirements for new development (Kerwan 1995:12). This is a problem often encountered in the analysis of road funding where it can be argued that there may be a case for reconsidering the apportionment principle and charging new development for the full cost of roads required by them. The idea can be restated more formally as follows: if building a road of a standard required for new development also provides incidental benefits to the existing sector, there may nonetheless be an economic case for charging the full cost of the road to new developments. In the context of drainage, Kerwan (1995:8) provides a similar example:

> An example in Wagga Wagga has been the construction of a detention basin to hold water in a small part of a large catchment, before water enters a piped drainage system and thence into the Murrumbidgee river. This piped system is nearing capacity. Therefore, as well as benefitting immediately adjoining areas, the detention basin frees up capacity in the piped system and thus benefits the larger catchment as a whole.

Whilst Kerwan (1995) appears to accept that this might be an instance which supports the case for larger catchments generally, it will be helpful to clarify the application of the apportionment principle in instances such as this. The principle which might apply here would be the same as that for roads. If building drainage capacity to a minimum efficient scale also provides incidental benefits for existing development, then there is nonetheless a case for new development to pay the full cost of capital works. In other words, the catchment area (for Section 94 purposes) would include only new development. However, if at the same time as building sufficient capacity to handle new development, it is more efficient to also install now, rather than later, extra capacity for existing development, then that share of capacity should be charged to existing development. Having established this principle, the next question to be investigated in discussion of the issues raised by Kerwan (1995) can be stated as follows: how can the new development which caused the work to be undertaken in the first place be identified? Whilst it is true that for small scale local drainage works, both the cause and the works to deal with it may be in the same area, the problem clearly is that the further downstream the drainage basin is situated the greater the upstream contributors will

add to the need for this capacity. Downstream works become analogous to the headworks for water, except that they are needed at the end rather than the beginning of the service network. Accordingly, the larger the catchment area defined, the more the 'price' of drainage services will be averaged across the area so that potential locational signalling benefits will be lost. On the other hand, the smaller the area, the more potentially effective the signals, but the higher the risk of charging some areas for a portion of works necessitated by other developments outside the area. Kerwan (1995:8) concludes that in the Contributions Plan Wagga Wagga Council may have been 'simplistic' in its definition of catchments.

The solution to this dilemma may be that the problem is not so much an 'either/or' issue of larger catchments or smaller catchments in the terms in which Kerwan (1995) has presented it, but rather a question of defining catchments in a hierarchical series similar in concept to those described in the discussion on open space. The Liverpool City Council (1995) Contributions Plan No. 6 for new urban release areas provides an excellent example of how this might be done.

Liverpool City Council

The Liverpool City Council (1995) Section 94 Contributions Plan No. 6 relates to the new release areas of Cabramatta Creek, Carnes Hill and Prestons. Together these three precincts are estimated to have a development potential of 10,910 conventional residential lots between 1993/94 and 2006/7. Subsequent development of three other areas (Cecil Hills, Aerodrome and Edmondson Park) will complete what is described as the Hoxton Park Stage II release areas. The development potential of the entire Stage II is estimated to be 20,050 conventional lots, some industrial and commercial land and a total population of around 74,000. No time frame has been determined for the development of the final three areas.

The Contributions Plan for drainage for the new release areas outlines how the development of new areas can lead to significant change in the run-off characteristics of drainage catchments and how these factors may exacerbate flooding problems in areas remote from the development areas themselves. To offset these impacts, the Plan describes a drainage system known as Option A3. In essence, this system appears to comprise a series of wet and dry detention basins which will release water sequentially into the downstream drainage system. Technically, 'the scheme relies on the principle of controlling differential catchments response rates to optimise the required basis storage capacities' (Liverpool City Council 1995:55). The scheme offsets the impacts of development both on creek tributaries within the release areas and on those downstream of the release areas, so that it is judged to be a 'district' level catchment where the entire release areas are to contribute to the cost.

The cost of option A3 is estimated to be $21,752,000. To determine a developer charge the Council uses as the denominator, not the 10,910 potential lots estimated for the three areas which the Plan covers, but rather the 20,050 potential lots plus 6735 equivalent conventional lots to which the industrial and commercial land areas are converted. In other words, there is an attempt to estimate the final demand for the drainage facilities before calculating a per lot charge although (as

we have already noted to be common practice), the time period to final demand is not taken into account.

Having identified a district level charge, the Liverpool Plan then specifies 12 local catchment areas within Cabramatta Creek, Carnes Hill and Prestons. Each of these catchments contains projects ranging between $95,000 and $6.3 m, averaging around $1.6 m per catchment. Each catchment also forms a drainage system within the larger system. The charge for each local catchment is calculated by dividing the capital cost by the estimated conventional residential lot equivalents in that area. The local charges vary between $407 per lot and $1792 per lot, with a modal value around $1500 per lot. These local charges are then added to the constant district level charge (of $812 per lot) to arrive at a final developer charge for each area. There seems little doubt that the actual process of delineating catchment and sub-catchment areas in the three release areas involved judgements of less certainty than the precision implied in the final document. However, the Liverpool method appears to represent a rational approach to the problem of providing drainage services and it also generates a degree of local variation in charge according to different drainage costs.

EVALUATION OF SECTION 94 DRAINAGE PLANS

At least three general observations concerning the treatment of drainage in Section 94 Contributions Plans are pertinent. Firstly, both the Liverpool and Wagga Wagga Contribution Plans are commendable insofar as capital charges within a catchment area are allocated according to the relative (drainage cost) impacts of different types of land development. For example, conventional residential lots, schools (with sealed surfaces) and shopping centres are all allotted varying run-off coefficients according to their potential impact (see Liverpool 1995:82). Drainage Contribution Plans of other councils (see, for example, Wyong Shire Council 1995, Penrith City Council 1993 and Blacktown City Council 1993) appear to simply use a denominator which measures 'developable' area (e.g. in hectares). This measure would not account for the differential impacts of varying land use.

Secondly, there appears to be a view among commentators that greater use could be made of the opportunities to combine drainage and open space requirements (see, for example, Toon 1995:10; Kerwan 1995:14). For instance, in Sydney some councils are creating wetlands both for scenic amenity as well as for drainage and water purifying purposes (McNeill 1998:293). Toon (1995:10) notes that in the past it has been commonplace for councils to delineate drainage reserves and then determine open space requirements according to formulae related to population.

A final issue on which comment should be made here concerns the trend for councils to remove drainage from Section 94 Plans and to levy for it under Section 64 of the New South Wales *Local Government Act 1993*, from which authority water and sewerage charges are now levied. Toon (1995) is unhappy with this trend and argues that councils perceive the benefits to be that drainage plans and costs are not therefore subject to the same degree of transparency and accountability

normally required with Contribution Plans. Toon (1995:10) adds that 'costs of works can be inflated at beneficial rates by avoiding the impact of the Allsands decision'. However, because of the new views on how drainage should be provided, and in particular the preferences for integrating the water-sewerage-drainage cycle, it may make sense to bring drainage arrangements into line with those of water and sewerage. As we have already observed, drainage assets can have long lives and contain excess capacity for lengthy periods in common with water and sewerage assets, and accordingly there is a broad similarity in the issues affecting calculation methodology. In this regard it may be better to bring drainage within the purview of the New South Wales Independent Pricing and Regulatory Authority (IPART) which is a consequence of transferring authority to Section 64. This may ensure that Development Servicing Plans are prepared and that a greater uniformity of contribution assessment procedures ensues. Moreover, the IPART proposed procedures appear for the most part consistent with standard economic efficiency principles. In addition, the IPART proposals contain avenues for redress if issue is taken with the amount of charges assessed (although they may not be as powerful as the appeals process under Section 94).

This paper has examined the calculation of developer charges for drainage which may be regarded as a service which mitigates the impacts of development. The theoretical basis for calculating charges for this type of service is relatively straightforward; developers should be charged for the cost to council of mitigating the impacts to pre-development standards. However, we have sought to demonstrate that the practical difficulties involved in calculating charges to achieve this principle should not be underestimated. Broad judgement is necessary. Moreover, even estimating the number and nature of incoming population to an area, and the take-up rates of development, particularly for infill development (as opposed to new release areas) is fraught with uncertainty (see, for example, Briggs 1995:1-3). With regard to population forecasts, it must be said that they are an essential planning skill and are required for a range of important purposes in addition to their use in calculating drainage charges.

The need for judgement, the necessity of compromise and workable solutions must be recognised in attempting to apply efficiency principles to developer charges. The general observation which can be drawn from the empirical investigations of the Wagga Wagga and Liverpool case studies is that Contribution Plans do not always reveal a consistent understanding of the underlying theory or purpose of a developer charge, or of the mathematics of a charge. Moreover, official Section 94 advice is not particularly helpful in this regard and certainly takes insufficient account of the distinctive attributes of particular types of infrastructure and the range of complex issues which can arise in determining charges for different infrastructure items. Indeed, the impression arises that a greater exchange of information, ideas and advice could see a marked improvement in consistency and uniformity of approaches. In addition to these general conclusions, two further concerns must be registered about actual calculation procedures. The first is the possible lack of understanding of the methodological consequences of excess capacity in infrastructure and the second is the need to review the wording of the principle of apportionment as defined in the Section 94 Manual.

Firstly, in order to address the treatment of excess capacity in Contribution Plans, it is certainly the case that some Plans have given careful consideration to the time period over which incoming development should be charged for an asset. For example, the case was noted in the Liverpool new release areas where the population to be charged for a drainage scheme specifically included areas which would be developed later and were currently outside the three areas with which the Plan was concerned (see Liverpool City Council 1995:56). However, in general plans appear to project requirements and population estimates five years ahead - this being the period used in the example in the Section 94 Manual. This would be a suitable procedure to use under either of two circumstances: firstly, where, after the five years, there will be no further incoming development to use the facility; or secondly, where, after five years, the facilities will need to be extended or replaced. It is possible that in some, if not most, instances either of these circumstances will apply; but the problem is that the matter is almost never explicitly mentioned in Plans. A five year planning period may be a convenient and reasonably predictable planning period, but will the excess capacity of all items of infrastructure really run out simultaneously in the five years (or the final demand always be reached)? It would be reassuring if Plans did bring out implicit assumptions and explain clearly the relationship between the five year planning period in Plans and the time until final demand or full capacity for items is reached. The period to full capacity can vary markedly with the type of asset, and charges should be designed to recoup asset values accordingly. It must be stressed that since the issue of excess capacity or period to final demand is not discussed at all in the Section 94 Manual, it is not surprising that Plans are deficient in this respect.

The second area where comment should be made concerns the potential for confusion which we have observed in the application of the principle of apportionment. The wording on the apportionment principle in the Section 94 Manual is as follows: 'Apportionment is a process which seeks to define the demands of *all those who may benefit from* the provision of a public facility to ensure that the contributing population only pays for its share of the final demand (emphasis added)'. However, as we have seen, when we come to examine the attributes of particular types of infrastructure it is not always the case that those who benefit from a facility should be charged for it. For example, for drainage the beneficiaries of a downstream drainage system may live in a different suburb from the development which gives rise to the run-off causing the need for the service. A similar principle was suggested where the provision of drainage for one development provides unintended benefits to existing development. In the light of these considerations, we make the suggestion that the wording on the principle of apportionment be changed to replace 'all those who may benefit from the provision of a public facility' with 'all those who give rise to the need for the public facility'. Put simply, apportionment should be based on need rather than on benefit. Further explanation and examples would be needed in the Section 94 Manual to emphasise that if there are incidental benefits to others whilst meeting the minimum efficient needs of development, then no charge should be made. But if at the time the service is being provided to development, it is also efficient to add to capacity for existing users at that same time, then the cost of the added capacity must be apportioned out of the developer charge. However, as it stands, the wording of the

apportionment principle in the Section 94 Manual is too simplistic: it tends to create confusion in the attempts to define catchment areas to charge, it leads to a buildup of debt to service on the part of the existing residents of an area, and it may lead to the provision of facilities before they are subjected to adequate economic scrutiny.

Endnotes

[1] The problem of defining 'catchments' for Section 94 purposes - that is, areas to be charged for the cost of drainage works - is not made easier by the fact that in the context of drainage, a 'catchment' is also the area or drainage basin into which flows are directed. Because drainage works may be in an area remote from those contributing to the flows the two areas will not always be identical.