article

Sustainability: *the triple bottom line*

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Caveat

Without wishing to diminish the view that it is in regional Australia that we are experiencing the most acute problems of sustainability this paper is confined to dealing with our cities.

This is because Australia's urban areas are the locations where the greater proportion of the nation's wealth is created and held and where the culture of the nation finds expression. In this most urbanised of nations, the cities and urban areas are also the locations where the great proportion of the population engage in a wide variety of economic, social and political pursuits.

Our cities are our most intensively shaped landscapes. They are the most heavily overlaid and inscribed by the pipes, wires, roads, tracks and cultures that reflect and represent our aspirations for the present and our images of the future. They are the locations of much pollution, are the generators of much of the greenhouse gas emission, the greater part of the waste stream and the demands for water which have such a devastating effect on many of our catchments.

Introduction

Over the past century we have witnessed increasing concern over a range of environmental issues. We have expressed that concern in a variety of ways and taken a series of initiatives to minimise what we used to called 'externalities'.

The development of water supply sewerage and drainage systems, the regulations to control water pollution, the introduction of clean air regulations, the separation of residential development from industrial activities, the introduction of town planning all had a concern over environmental issues at their heart.

In the case of town planning we can see that this was based on a holistic approach to the development of cities and the stage on which the social, cultural, political, environmental and economic lives of citizens was to be played out.

We now see that concern over the viability of the biosphere itself is rising and that rather than be seen as 'externalities' environmental issues are of central importance.

We have begun to recognise that the natural ecological systems cannot continue to function as they have done if we continue our present practices in the exploitation of natural resources. Although our understanding of the natural processes which occur, and how they might be affected, is incomplete we see enough evidence to accept that we have exploited or driven various species of flora and fauna to extinction and have compromised the lives of others, in the process reducing the diversity of the biosphere.

Our farming practices have led to desertification, and our activity in clearing forests has increased flooding, erosion and salination. The consumption of fossil fuels has led to a great increase in CO2 in the atmosphere. Our activities have created major holes in the ozone layer. We suspect that forest clearance, the increase in CO2 and the holes in the ozone layer lead to climate change. We are struggling to cope with mountains of waste which themselves become major threats to ecosystems.

That is, we have enough scientific evidence about the effect of human agency on local and world ecosystems to cause us to begin to accept that the way we live is ecologically unsustainable.

We know that a city, which imports its energy, raw materials and food and exports its waste, cannot, by definition, be sustainable. Yet we hold out false hope.

The word 'sustainability' has become what Hugh Emy describes as a 'cheat word' of politics. It is a word that means what speaker and listener want it to mean. According to one of my colleagues it is differently defined in approaching 150 pieces of legislation in Australia.

Some argue that this is a strength, that there is value in the lack of precision. The lack of precision is a not a strength in our legal system which inevitably seeks to establish clarity and to reduce ambiguity. If the planning system does not provide definition or give meaning to the notion of ecologically sustainable development the courts will.

One of our tasks, then, is to progressively invest the word and concept with some precision. This might be done by setting targets which give meaning to the requirement to 'have due regard for ecologically sustainable development'.

Another is to convince our fellows that we have an ethical obligation to reduce the stresses we place on the environment. No amount of fudging by developing 'tradable' pollution or green-house gas production 'rights' or by providing mechanisms to 'export' waste will get us away from that obligation.

We cannot assume that less developed nations will be happy to remain less developed while we continue to behave as though we are at some global mad hatter's tea party. Alice eventually had to return to reality. So do we.

We have now generated strong pressures to change our behaviour and, ultimately, to reform our decision making.

Sustainability

While ecological sustainability is seen by some as problematic and by others as unattainable the reality is that Australia must adopt the strategy of a transition to sustainability by attempting to systematically reduce environmental stress. Nowhere is this strategy more important than in the city given their central role as sources and locations of environmental stress.

In pursuing the transition to sustainability, economic settings and mechanisms, including the suite of pricing strategies and taxes, are important. However, we must develop planning tools and aids to decision making which will complement them and allow the introduction of location and space issues into the consideration of policy options and development proposals.

In this process the first assumption is that there is no 'end point', that what we are engaged in is a process by which we set goals and targets which we strive to meet over a specified period knowing that the goals and targets will be continuously revised.

To provide discipline or focus in this kind of dynamic planning we typically set a period which is 'realistic' - not too short to have no effect yet not so long as to be fanciful or regarded as so far in the future it will not affect our behaviour or expectations. For the purpose of much of our planning we have tended to set horizons of twenty years.

While this period is arbitrary it is long enough to enable us to make significant changes to the infrastructure of our cities such as water supply, sewerage and drainage systems, road and rail networks, together with the rail rolling stock, and ferry and vehicle fleets, etc. It is long enough to make significant changes to other elements of the built environment, assuming current levels of building and construction activity. It is also long enough to make progress in achieving sustainability goals in the production and consumption of a range of services and in commercial and manufacturing processes.

The major disadvantage of such a horizon is that it is beyond the political cycle. This becomes important because we have witnessed a departure from many goals for which, regardless of which political party initially adopted them, bipartisan support was ultimately developed in Australia over the last fifty years in many areas of social policy, especially in pensions, health and education.

A similar evolution occurred in the approach to many urban development issues including infrastructure funding. For example, during and immediately after World War two we developed an approach to housing policy and programs, which ultimately drew bipartisan support. Changes in government were not generally accompanied by wholesale withdrawal from positions and programs introduced by previous governments. The continuing commitment to public housing, the continuing evolution of housing and urban development planning and regulations, while not even in the support they gained, has recently given way to increasing polarisation over issues and dramatic shifts in policy.

I do not suggest here that there has been some kind of inevitability to our recent history. There clearly has not been. We have experienced great periods of change - of progress and regression. The energies and visions of the 1940s were followed by the complacency and somnolence of the 1950s and 1960s. The revitalisation of interest in urban and environmental issues of the 1970s, especially of the Whitlam era was followed by a rapid decline in interest due to the dominance of the economic rationalism of the 1980s and 1990s.

The increasing but erratic engagement by the Commonwealth government in urban and environmental matters from 1945 to 1996 could be seen as one example of an area in which it had little formal constitutional authority but in which the public expected it progressively to play a central role. The sudden withdrawal by the Commonwealth from most of these areas has left urban and environmental issues in limbo.

This is particularly important in the approach to sustainability. It has taken two centuries for some of the environmental issues to become critical and it is fanciful to imagine that we can quickly solve the problems. Salination, for example, has been with us for some time but it is only recently that its full magnitude has been accepted and the need for an imaginative large scale, continuing effort over a long period to reduce or eliminate it has been recognised. Even here, however, for a variety of reasons, the significance of salination and waterlogging in urban areas remains unrecognised.

If their actions can be taken as a measure, recent Federal governments, but especially the present one, seem to think that sustainability concerns do not arise in the cities or that they are none of their concern. They are remarkably selective in their response to sustainability issues, smugly confident that the three-card trick played in Kyoto absolves them from doing anything serious about greenhouse gases.

Urban Planning

For half a century we have employed land use planning as a way of pursuing social, environmental and economic goals in the development and operation of urban and regional areas. That is, land use planning has always been concerned with the triple bottom line.

It has always been difficult to say with certainty that particular intensities or arrangements of uses would lead to specific outcomes. The identification of land uses were, at best, only ever crude approximations of the nature of activities, the connections between them and the externalities associated with them. That is, land use planning relied to a very large extent on the precautionary principle in pursuit of these goals.

Planners were for a time able to convey confidence that their prescriptions and recommendations about the uses to which specific pieces of land should be put, based on this precautionary principle, would produce the felicitous social, environmental and economic outcomes we collectively sought.

A great deal of regulation was justified and built on this expression of trust - this belief in the efficacy the decisions made by planners - and there is no doubt that it frequently produced congenial results. But there were also many instances where the lack of specificity or where the relationship between the activities proposed for a particular piece of land and the social, economic or environmental outcomes of those activities were vague or contested which led to courts becoming involved in providing the precision or determining the relationship. A great deal of case law evolved to buttress this, which might have been a comfortable outcome for many lawyers but it thrust courts and judges into playing the role of planners - a role for which they were not necessarily well suited.

For a variety of reasons, not all of them due to the fallibility of planners, the land use planning practices we followed were not able to cope with changing demands to accommodate growth or with the simultaneous increasing concern over environmental issues.

Part of the failure of town planning was due to the destructive preoccupation with post modernism, which accompanied the rise of individualism and the failure of collectivist solutions to communal problems. Part of its failure was due to the contradictions inherent in trying to develop land use plans in situations where land was privately owned. The planning process had to be secretive and confidential to avoid individuals gaining advantage from premature or advanced knowledge of proposed changes, yet it also required a high degree of community consultation under which plans were exhibited and reviewed.

More recently we saw an even greater focus on environmental issues when we introduced environmental impact statements. This latter approach, while well intentioned, had the effect of undermining town planning and setting those concerned about the human condition and its relation to the natural world at odds with one another. The two world views - the one of the town planners and civic designers and the other of the scientists and ecologists – collided.

The current expression of concern over sustainability can, to some extent, be seen as a reaction to the outcome of the individualism we have pursued and to the limitations of narrowly conceived consideration of environmental impacts. It is also recognition of the global impact of many of the environmental stresses we develop.

How should we respond to this situation? How should we pull together the threads of the frayed town and regional planning system and weave a stronger web which takes fuller account of environmental issues in the pursuit of social, environmental and economic goals?

Path dependency

Over the next twenty years the inherited form and structure of the cities will largely affect the provision of urban services in our cities.

The provision of urban services will also, of course, be affected by the characteristics of the present investment in them.

This is not to say that planning for transition to sustainability is governed by the path dependency created by a city's past pattern of investment in fixed capital in buildings and structures - the physical fabric of the city - or in the fixed rail rolling stock, vehicle, or ferry fleets. It is simply that recognising the significance of the past helps us identify the difficulties which must be anticipated and planned for in proposing how urban services may change or, if we are to take control of our own destiny, may be changed. It also helps us assess what environmental benefits may be expected to flow from such changes.

Current land use planning approaches cannot provide an appropriate estimate that will allow us to forecast the nature or magnitude of the changes or whether they are more or less sustainable. Moreover, the market notions of 'highest and best use' embedded in current land use plans restrict the ability of planners to propose alternative dispositions of activities which are more sustainable. That is, narrow conceptions of one of the bottom line considerations - the economic - tends to have a disproportionate impact on the consideration of development options.

We need a new approach which integrates the concerns of the scientist/ecologist and the measures they can provide of the environmental effects of exploitation of resources with those of the town planner who can introduce the social, economic and aesthetic considerations.

Standard of living assumptions

In making the transition to sustainability, in order to develop and maintain public support, we must assume that the standard of living for Australians will be maintained or increased.

This will be reflected in:

a) *maintenance or improvement of the standard of residential accommodation.* That is, we assume that the historically confirmed trajectory of households demanding more residential space of higher quality as their wealth and income has increased will continue - although in this transition period significant innovations may be introduced to make the existing housing stock more energy efficient and ensure that new housing contains less embodied energy and is also more energy efficient in its operation.

b) *maintenance or improvement of the standard of workplace accommodation and of working conditions.*

c) *improved accessibility to the full range of cultural life and economic and social opportunities in the cities for all residents.*

The transition to sustainability has as objectives:

i) reduced consumption of energy from non-renewable sources;

ii) increased energy efficiency of all residential and non-residential buildings and structures and of the activities carried out in them;

iii) reduction in the extraction of water for urban use from distant water sources;

iv) increased capture of rainfall within cities for domestic and other uses;

v) increased recycling of water for domestic, commercial and industrial uses;

vi) reduced storm water runoff;

vii) maintenance of biodiversity;

vii) reduction in use of natural resources; and

ix) reduction of waste.

Transport services are derived demands that are mediated by the form and structure of a city. Provision of transport services also has the capacity to shape the structure of a city. In the transition to sustainability we do not assume any reduction in the historically confirmed demand for individual travel.

Freight transport is a major component of the development, operation and management of the city. At present the low cost of transport encourages centralisation of manufacturing, warehousing and distribution which tends to increase freight travel. That is, the road system functions to some extent as part of the warehousing system. Decentralised/recentralised manufacture and warehousing would reduce total freight travel.

The reduction in consumption of non-renewable energy to meet the transport task is a necessary condition in the transition to sustainability that may lead to significant redirection in the development and operation of transport services.

Energy and water profiles

The components of a sustainable future for our cities can only be achieved by deliberate transitions from current practices to different ways of acting. One way of facilitating the transition would be to develop a different approach to the planning for and accommodation of the activities carried out in the city. This implies a departure from the present approaches to land use planning.

One approach would be to develop energy and water profiles for the city which would allow planners to assess alternative development strategies for the physical fabric of the city, for investment options in urban services and in the structure and operation of manufacturing, warehousing and retailing.

An energy profile would be based on a representation of the embodied energy of the buildings and structures which make up the physical fabric of the city, the operational energy required for the buildings and structures, the operational energy of the activities carried out in those buildings and structures and the energy required to transport the people and goods between

the various activities. That is, we could develop a set of energy profiles to represent the full range of invested and operational energy consumption aspects of the city.

Such a set of energy profiles could be progressively built up, be based on empirical evidence about the inherited physical fabric, be capable of being represented spatially and disaggregated for various activities or intensities of activity. They could be built on data sets collected for a variety of purposes such as the periodic census, the energy authorities, property records, vehicle registries and supplemented by sample surveys. The emphasis would be on building the model using existing data streams which are regularly updated and maintained. The total energy profile would then be used to estimate the greenhouse gas production of different forms and structures of urban development.

A water profile for the city could be constructed as a set of models of the consumption of water, the flows of sewage and stormwater runoff. The profile could then be used to assess the opportunities for rainfall capture, recycling and reduction in stormwater runoff for different forms and structures of urban development.

The profiles would then provide a tool for planners to advise government and the community of the energy, greenhouse gas, water consumption and drainage consequences of alternative growth and operational options for pursuing the transition to sustainability.

Transition to sustainability

The sustainability transition is therefore a complex set of processes that require exacting integrative initiatives. We cannot simply attack the supply side of the problem of energy consumption; for example, we must begin to reshape the demand as well. This would lead us into exploring the areas in which we can expect to make significant savings by reducing the embodied energy in the buildings and structures in our cities and towns without reducing their quality. This would require us to reconsider many of the local planning and building regulations. A focus on reducing embodied energy would tend to favour use of materials which 'lock up' greenhouse gases over those which lead to their permanent release. This would tend to favour use of timber over, say steel, aluminium or concrete.

Focussing on reshaping demand would lead us to seek reductions in the operational energy used to make our buildings and structures function, the energy used in the various activities we carry out in those buildings and structures and the energy used in transporting ourselves and our goods around the cities and regions. It would tend to lead us in the direction of constructing and operating buildings and structures which exploited opportunities to integrate renewable energy sources in their operation.

A focus on reduction in embodied energy and on improved efficiency in operational energy of buildings and structures together with policies designed to make residences, commercial and industrial undertakings more self sufficient in water consumption will lead to changes in their form of development to make them more sustainable.

Timeframes

In responding to the challenge to develop a strategy for the transition to sustainability it is necessary to operate with two time frames in mind, simultaneously.

The first is to provide advice on how the inherited form and structure can be made less unsustainable and the second is to provide advice on what should be done in the development of the physical fabric of the city.

In the first phase the task is to advise on how we can progressively make the present city, including its transport services less unsustainable. In the earliest stage of this phase minor design improvements to the present physical fabric of the city which improve traffic flow or lead to better interchanges between transport modes can also be expected to lead to improved efficiencies but these are expected to be modest.

The second phase is focused on the medium to longer term and is more complex because the difficulties of pursuing the transition from the present form and structure of the city to a more sustainable form and structure are brought into high relief and may require changes in approach and behaviour.

Innovations in the transformation and distribution of energy create new opportunities for decentralisation/recentralisation in the city. Similarly, changes in the capture, storage, use and recycling of water provide new opportunities for the development of more independent forms of dwellings, commercial and industrial structures.

Better planning of the location of new growth and better development control to produce improved accessibility can be expected to lead to increasing gains to efficiency in the transport services but the risk will be that short term considerations will mitigate against the adoption of policies and administrative practices to pursue the medium to longer term objectives.

It will be necessary to provide advice on the possibility of introducing new forms of vehicles and their motive power which are more sustainable, provision will need to be made in the physical arrangement of activities and in the progressive development of the network of energy supply and support services to introduce or take up the new technology. That is, assuming, for example, that it would be feasible and desirable to introduce new technology (say fuel cells for motor vehicles) we would need to plan for the disposition of service centres for that technology to facilitate the transition. We would also need to plan for the mix of regulations and incentives needed to be introduced to facilitate the transition. The city would need to run two transport services in parallel. The design and layout of existing and future roads for example would need to be able to cope with vehicles operating with different kinds of motive power.

At this distance this does not seem to pose major problems for the road based transport services. It is possible that differences in motive power for rail based transport services will necessitate different kinds of investment although we note that the present rail systems have been able to accommodate different kinds of rail based transport technology.

Development strategy

Assuming that population will continue to increase and that only a small proportion of this growth can be directed to regional centres the strategy will be to direct the city's growth to reduce the high degree of centralisation of its structure and therefore increase its accessibility.

These will not simply be land use decisions. Whether and how decentralisation/recentralisation within metropolitan area can be achieved will depend on the nature of the institutional and governance structure of the city. In particular it will depend on advice on how the administration and service delivery - especially for those provided by government may be reformed to facilitate or encourage the appropriate degree of decentralisation/recentralisation.

It is assumed that the numbers of people working in the central area will slowly increase in the short run but that the proportion of the workforce with central city destination will decline. That is, as the decentralisation/recentralisation strategy takes effect the numbers working in the central area may well stabilise leading to a significant reduction in the proportion of the workforce with a central Sydney work destination.

Increasing use of IT and various e-services will also lead to an increase in home based work which will also reduce demand for transport services for the journey to or from work from the present one quarter of all trips. The modal split for central city work trips is already heavily public transport oriented and it is unlikely that we will be able to increase it without also increasing the inefficiency in the transport system. Increase in e-services such as banking is likely to reduce travel.

Developments in retailing over the last four decades suggest that the proportion of central city retailing in metropolitan areas will continue to decline. This is likely to increase the demand for car based shopping trips. Retailing is likely to continue to require the continuation of extensive road based distribution of merchandise from freight terminals and from manufacturing plants to retail outlets.

Freight movements of raw materials for manufacturing, of waste from manufacturing and of semi processed items from one plant to another will continue to be large demands on the road system. The transport of materials of construction for the physical fabric of the city will continue to be major demands on the road system as will the transport and distribution of food.

The increasing serviced based nature of the urban economy will increase the demand for road space as will the increasing demand for waste disposal and security services such as fire.

The increasing complexity in the range of interests residents have, and the spatial dispersion of their communities of interest, mean we may not be able to assume a reduction in the demand travel for non-work activities. Increasing life expectancy with longer periods in retirement is likely to increase the demand for non-work activities. By their very nature, including the dispersion in the times of day in which such activities are pursued, it is likely that the demand for non-work travel will rely increasingly on car based travel. This is unlikely to change with changes in technology.

The demand for these transport services can be modeled and estimates made from the transport task performed by the road based transport services (cars, buses, light and heavy trucks and commercial vehicles) as well as the fixed rail services, of the greenhouse gas produced under various development and growth strategies

Sustainability and the notion of seeing the future of cities in terms of the social, environmental and economic outcomes is being presented as something new.

It is not.

What is new is that there is a renewed commitment to the need to do so.

Impediments

We know something of the impediments we encountered when we tried to focus on the triple bottom line in the town planning we adopted fifty years ago. Have these impediments changed? Is there a social demand to pursue these goals under the rubric of sustainability?

As I have suggested, the earlier town planning initiatives foundered on the rock of private property. That rock remains but increasingly we are seeing changes in the notion of property rights. We see them most dramatically in relation to water. There is not only a change in the view of who owns the water which falls as rain and how much property owners may capture and store but what obligations property owners have in relation to the pollution loads of water which drains from their property, either as surface runoff or as sewage. The responsibilities of property owners to ensure that they do not pollute aquifers are other changes to property rights.

Yet another relates to the discharge of air borne pollution. We are seeing major changes to the rights of individuals in the production of pollutants and greenhouse gases that can be attached with little difficulty to the uses to which individual parcels of private property may be put.

The increasing concerns over a variety of environmental stresses and the realisation that we can only reduce or eliminate them to make our cities more sustainable by collective action is changing the way we perceive rights in property. We cannot be sanguine but must be encouraged by this development.

The second major rock on which town planning initiatives foundered was the place town planning had in the institutional structures and system of governance. Opposition from traditional centres of bureaucratic power accompanied strong antipathy by those committed to classical economic theory to anything that sounded like 'planning'. The traditional arms of government saw town planning and its tool, land use planning, as a threat to or limitation of their powers. It was never central in governmental decision making. Planning Ministers were traditionally low down in the pecking order.

The negative and passive nature of the planning system itself meant that, compared with the big spending government agencies or those that had significant largesse to dispense, town

planning departments did not rank highly. All departments of government, but especially Treasury, were opposed to town planning departments being central in the identification of priorities in government budgets. Statements by political leaders committing themselves and their governments to the pursuit of the triple bottom line of social, environmental and economic goals were rarely translated into effective programs. Cities grew more unequal with increasing degrees of segregation and polarisation.

The focus on international obligations in the pursuit of environmental issues and the use of national legislation to protect natural resources is inexorably, if unevenly, forcing the realisation that we must embark on the transition to sustainability. This, in a sense, is forcing governments at all levels to return to discover the strengths of scientific planning built on notions of stability, consistency, predictability and continuity in pursuit of social, environmental and economic goals.

The attraction of the transition to sustainability is the attraction of a system of decision-making which ensures that the ends of social and environmental goals are at least given equal weight to the means we employ to achieve them.

This means that to pursue the transition to sustainability, planning must become more central in the institutional structure and system of governance.

The pressures of globalisation which are referred to often as an argument against Australia 'going it alone' are not inevitable. Indeed, one way for us to protect ourselves from such pressures is to commit to the pursuit of sustainability - to the bottom line of social, environmental and economic goals.

Unless we do so our social and ecological systems will be unsustainable. That is, to be sustainable we need to reach consensus on the social and environmental ends we want to pursue then determine the economic means we wish to employ in achieving them.

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