



**Submission to the House of Representatives Standing Committee on
Environment and Heritage**

Inquiry into Sustainable Cities 2025

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DENSITY - PEOPLE AND BUILDINGS

City densities. Buildings generally are becoming more densely clustered but the number of occupants per dwelling is reducing while the size of individual dwellings is increasing. City liveability is being threatened by this move towards lower occupancy and larger dwellings combined with an increasing population and as a result the current positive move towards higher building density is being undermined.

City form and its influence. Current city form does not encourage the development of community although the provision of inner city sporting facilities helps and local schools and churches can assist. It has been suggested that the use of the private car tends to isolate individuals and conversely that having facilities within walking distance creates a casual interaction that can promote community development. To foster the sense of community re-planning our cities should therefore treat the question of public transport as a priority. Similarly in order to develop small densely populated vibrant centres it will be necessary to support local shopping strips, office space, cafes etc. by safeguarding the supply of low cost real estate and reasonable rentals.

I. BUSHLAND, HERITAGE AND GREEN ZONES

A. Green zones and urban sprawl

1. Pressures. Under the present planning system and demonstrated purchaser preferences for larger houses with fewer occupants maintaining green zones while restricting urban sprawl will be a major problem. The expected increase in urban populations will put pressure on all open spaces both in and adjacent to urban areas. Some price or other incentive is required to reverse the trend to lower occupancy and/or to promote co-housing and ecovillage concepts which have demonstrated lower environmental impacts. Exploring the concept of earth sheltered dwellings and rooftop gardens could be another way of reducing pressure on open spaces. There may be a need for government to develop a programme to raise awareness and send the appropriate signals.

2. Dwelling size. As noted above the demand for larger houses with fewer occupants is a major threat to the control of urban sprawl. As an example a formula could be developed that relates building areas to number of bedrooms and penalises excessively large houses via development costs such as the open space contribution, so that they become more expensive per sq metre for the developer to build. Currently the reverse is true.

B. Impacts of green zones and bushland

- 1. Bushland and bio-diversity.** Bushland is essential for maintaining bio-diversity. Some work on coral reefs has indicated that bio-diversity is a source of resilience for the system generally. At this time it seems probable that native amphibians have been (or are being) decimated by a fungal infection, this in turn will have a ripple effect which could threaten the whole web of native fauna from brown snakes to kookaburras and the least we can do is to maintain the habitat while the various species adjust to this shock and the coming shock of climate change. As we are all basically dependent on the environment it is important that bio-diversity is encouraged and protected.
- 2. Bushland/City interactions** The downside of increasing the proximity of bushland and city structures is the increased interaction between people and wildlife and the likelihood of fire, including arson. It will be important to educate the public about local poisonous snakes, plants and insects and to develop an understanding of ways to protect property in the event of fire. Perhaps areas close to bushland could require potential residents to attend an orientation course before finalising a move into the area.
- 3. The need for green.** Green zones and parkland have been described as the lungs of the city and it has been demonstrated that they are effective in removing pollutants¹ so it is important to maintain and develop them. Toronto has a series of natural gorges that run into the city and are very much prized by the community. Cities need to make use of natural features such as riparian corridors and remnant wetlands or grasslands that can bring the bushland into the city. Careful selection of indigenous vegetation can gradually supplant the introduced species however we should not ignore or downgrade the heritage elements that form some of our older parks and gardens. Indigenous planting needs to be carefully assessed for use in the urban environment.

C. Multi purpose green zones

- 1. Habitat areas.** While some habitat areas could include recreation zones for people jointly with wild life, areas that are aimed at protecting particular threatened species or habitat will need to be set aside and isolated from feral predators with only limited or controlled human intrusion if they are to be successful.
- 2. Other Green zones.** Green spaces can be developed as garden allotments, sports facilities and passive recreation areas and these can also provide habitat for indigenous insect and bird life.

¹ German study reported in Skyrise Greening Handbook, Singapore government internet publication

D. Maintaining Urban Heritage

- 1. Streetscapes and heritage areas.** As with the green zones the demand for large houses with low occupancy rates also threatens our streetscapes and heritage areas. It is the maintenance of these heritage areas and streetscapes rather than the large iconic building that gives a city its soul and its identity. The single iconic building is also less likely to be threatened as it can be used to motivate large protest groups. The estimated rate of population growth is the main danger as there is still a tendency to ignore the value of heritage buildings and allow free rein to the developer.
- 2. Parks and Gardens** In our haste to move towards a sustainable indigenous environment we should be careful to recognise the heritage value of existing parks and gardens and protect and maintain these remnants of earlier years as they speak to us of our past and contribute to the soul of the city.

E. Protecting and creating public spaces

- 1. Preventing urban sprawl.** Urban sprawl is the least attractive response to urban growth. It usually occupies productive land and does so in an inefficient and isolating manner often without adequate infrastructure to support the increased population. It is recognised that moves towards increased density in the inner and middle suburbs is an important element in preventing urban sprawl but this trend also must be tightly controlled if we are to avoid the loss of significant urban heritage. It should also be recognised that the city will change and that change is important to the city and not all change is bad.
- 2. Protecting parkland.** The title of all parkland should be inviolate and it should not be subject to the whims of government or other authorities. If the sale or other use of parkland is being considered it should require the agreement of both houses of parliament and the approval of an independent body that assesses community impacts.
- 3. Streets and footpaths.** If we can facilitate a reduction in car ownership and use, it should be possible to reclaim some streets as public space. Some suburbs already have a network of barriers that prevent the "rat runs" of commuter traffic through residential areas and the logical extension to this would be the creation of small pockets of greenery or even communal gardens in the streets. Developments of this nature could be considered at the request of the local residents and then encouraged and supported by local councils. Co-operative or communal title could be granted to residents developing suitable projects.

F. Ensuring green zones are integrated into new development

- 1. Integrating green zones.** The best way to ensure that new developments include integrated green spaces is to allow developers some form of rebate on other taxes and charges for example the existing open space contributions (which are calculated on a % of the improved value) could be reduced based on the public open space provided in relation to total density in terms of households.

II. ENERGY EFFICIENCY AND RENEWABLE RESOURCES

A. Shift to diversified energy sources & small scale distribution

- 1. Ideas from overseas.** The Rocky Mountains Institute has suggested that small diversified power sources offer more security of supply and less risk of major disruption by terrorist action or accidents. They also envisage small scale fuel cell power sources and hydrogen supply for transport. Details of the proposed method of developing the distribution networks applies mainly to the United States however a similar detailed plan could be developed for Australian conditions
- 2. Small scale distribution.** Roof top grid interactive solar power could help to handle peak summer loads however these will probably not be economic unless there is a realistic attempt to charge the coal fired power stations for the pollution that they cause and a carbon tax on the CO₂ emissions. New renewable energy sources cannot be viable and cannot reduce our greenhouse impacts unless government ceases to use distorting subsidies and starts to seriously look at demand management.
- 3. Increased demand for air conditioning.** As global warming and climate change proceed there will be an increase in the frequency of extreme weather conditions including high temperatures over the land mass². This will lead to an increased demand for air conditioning, a trend that is already apparent. Support for an interlinked A/C and solar panel system similar to solar hot water should be developed to offset this rise in demand.

B. Impediments to utilisation

- 1. Psychological impediments.** There is a commitment to privatisation and freedom from government interference that fails dismally in that it refuses to address the question of supply side control and reducing consumption. The Rocky Mountains Institute and also a report by the now defunct SEC in Victoria have demonstrated there are huge savings to be made through

² Intergovernmental Panel on Climate Change - Summary for Policy Makers 2001

demand management. Unfortunately the continuous growth paradigm that is a feature of Economic Rationalist thinking will not allow these savings to be implemented.

- 2. Fiscal impediments** Fiscal impediments are largely the result of government choices and subsidies that distort the market and which do not allow accurate analysis of the hidden costs of pollution and greenhouse gas emissions. Witness the subsidies on four wheel drive vehicles and the failure to endorse hybrid electric cars, which then translates into the need to drill for oil in sensitive areas.

C. How local is local (eg house or region)

- 1. A possible strategy.** The most advantageous strategy would probably be a mixture of promotion at the district level combined with the single house level in terms of air conditioning and hot water. These matters need to be examined in detail but the take up of solar HWS suggests that the single house level would be effective initially and could be followed by concentration on regional levels.

D. Economic & social implications of self sufficient energy generation

- 1. Implications of self sufficiency.** There appears to be a clear relationship between control over ones immediate environment and a sense of well being and I would therefore suggest that at an individual level there would be social benefits while at a neighbourhood level it could increase the sense of community.

E. Higher efficiency standards

- 1. Energy rating - domestic buildings.** This is already coming into the picture and is of importance in the domestic market. Energy rating of most appliances and windows is in existence or coming into play in the near future. They have been well accepted generally but there is now a need to move towards excluding products that do not meet a minimum standard and to follow that with a gradual increase in that minimum. Victoria is to introduce 5 star energy rating for all new houses in July 2004.
- 2. Energy rating - commercial buildings** The problem is that currently energy rating is only relevant to the domestic market while the commercial buildings which are a major problem are not affected. There is a need for mandatory conditions to be in place with regard to commercial buildings as these are usually built by developers and sold on prior to being leased. This means that there is no incentive for the developer to increase the standard of efficiency if it increases the capital cost in any way.

F. Public transport & renewables

- 1. Public transport** Public transport should be run entirely on new renewables and non polluting fuels if we wish to have a sustainable city. This concept should also be applied to all forms of commercial and personal transport operating in areas of high population density. How this is to be achieved is a matter for discussion.

III. WATER AND STORM WATER

A. Water management

- 1. Small scale local management** Successful conservation generally starts with small scale local commitment³. This could mean subsidising or otherwise supporting the installation of water saving devices in the home and rain water tanks. It could also include on site sewage treatment and reclamation of grey and black water.
- 2. Industrial water use.** Presumably the sustainable city will need to accommodate industries of various types and water use in industry will need to be carefully controlled. All industry both new and existing should be required to demonstrate an ecologically sound plan for water conservation and for the reclamation, purification and reuse of waste water.
- 3. Efficient sustainable management.** The best way of dealing with the question of water supply is to have carefully managed government controlled catchment areas supplemented by local tank water and locally reclaimed grey & black water recycled through toilet systems and for irrigating gardens, street trees etc. Logging water catchments is not acceptable particularly when they are short rotation plantations which are fertilised with products containing heavy metals and other poisons. A privatised water market has not demonstrated any propensity to reduce or control water usage.

IV. DOMESTIC AND INDUSTRIAL WASTE

This is a complex and very important area and it has not been covered in this submission however policies based on the need to move to a zero waste strategy must be developed in order for the city to become a sustainable ecosystem. This will require responsible waste management and minimisation, resource reuse, product stewardship and the acceptance that environmental outcomes are of paramount importance (beyond even the profit motive) because they are about survival.

³ For example the Land Care movement and most environmental organisation

V. TRANSPORT NETWORKS AND NODAL COMPLIMENTARITY

A. Reducing dependence on the car

1. **Access dictates development** “Infrastructure especially transportation shapes cities and thus is critical to urban sustainability” Peter Newman, Director, Sustainable Policy Unit, Western Australian Government ⁴. This is clearly evident in the current city form in advanced countries which have developed a pattern of outlying suburbs along car friendly routes regardless of the impact on market gardens or other productive land use.
2. **The impact of roads.** Road transport particularly freeways are built along the easiest cheapest route taking up hectares of level fertile land instead of using difficult rocky or less productive land. This is quintessentially stupid sacrificing reliable food sources for non-productive tarmac. Additionally road transport is not fully costed as greenhouse emissions and road costs are not included in accounting figures so the true cost of road transport is hidden.
3. **Providing integrated transport networks.** If we accept that high densities and the control of urban sprawl are required for the development of sustainable cities then the development of carefully integrated low impact transport networks are a priority. One of the possible scenarios would include a city which has a series of transport hubs with pulsed timetables so that all services connect ensuring minimum waiting times and quick and easy transport across the city. This could also link to a ten minute regular service for public transport limited to the local neighbourhood.
4. **Interim actions.** Offer immediate reduction in car dependence by
 - a) Providing safe, cheap park and ride facilities (linking the parking cost to the public transport ticket so that the one includes the other)
 - b) Providing manned, safe, clean, cheap public transport
 - c) Recognising that road transport is not really fully costed (due to greenhouse and road costs not being included) and that public transport is less damaging and acting accordingly.
 - d) Increasing casual parking costs and reducing parking availability so that a car is not used for most short trips
 - e) Provision of delivery services instead of car parking at major shopping centres (with the exception of disabled parking)
 - f) Progressively closing congested areas to cars other than for

⁴ Keynote paper ISOS Internet Conference.

local resident and disabled owners.

B. Promotion of new technologies for cars

- 1. New technology.** We must use subsidies and incentives wisely and government purchases based on ecologically sound technology to quietly promote the technology without promoting increased use of the car or undermining the use of public transport.
- 2. Mandating the uptake of new technology.** This could be implemented in a way similar to the introduction of seat belts and unleaded petrol by announcing a deadline for the introduction of hybrid technology in the first instance (say 2008) and completely non-petrol non-polluting engines in the longer term once the technology reaches a suitable standard.

C. Transport infrastructure for new settlement areas

- 1. Preferred city models.** The final model of the Sustainable City will probably incorporate a variety of design concepts. I would suggest that the most suitable model to aim for is one which does not result in excessive inner city growth at the expense of outer and regional areas but is not so dispersed that it foregoes the benefits of close settlement. This would probably lead to a compact inner city model with some urban hubs and "ultra city" development in surrounding regional areas.
- 2. Transport infrastructure.** If cities are to be sustainable they will need good cheap public transport. This transport infrastructure will have to embrace a pulsed interconnection at the transport hubs and frequent (say 10 minute) services in the local district if it is to provide safe, affordable, frequent transport that is easy to use and responsive to the public's requirements.

VI. ECO-EFFICIENCY IN COMMERCIAL AND DOMESTIC BUILDINGS

A. Integrating green construction and refurbishment techniques into standard building practice

- 1. The need for Mandatory Requirements.** There is a need for mandatory requirements because so many houses are built as "spec" or builders' project homes and are so price sensitive that green construction will only be achieved by incorporating the requirements into the Building Code.
- 2. Commercial Buildings.** A similar situation exists with commercial buildings which are usually built by developers and sold on. Some of the costs can be offset if the building is looked at as a whole and if dispensations are given that allow the reduction

of costs by eliminating basement car parking for example.

B. Promoting eco-efficiency in commercial and domestic buildings

- 1. Demand Reduction** . A demand reduction strategy needs to be urgently developed for use in both commercial and domestic electricity markets. Prior to privatisation of the Victorian SEC a study was commissioned that identified ways of achieving this demand reduction. The report was never seriously considered due to the impending sale of the assets. This report should be revisited urgently.

- 2. Controlling internal temperatures - vegetated roof cover.** In the anticipated future scenario of rising summer temperatures the control of heat gain in both residential and commercial buildings and hence control of the demand for air conditioning will prove vital in the effort to reduce demand for power. There is evidence that greening the city by including vegetated roof cover could have remarkable spin off effects namely:
 - a) Reducing the internal temperature by 3^o - 4^o ⁵
 - b) Reducing peak run off during rain storms ⁶
 - c) Reducing air pollution ⁷
 - d) Allowing home grown vegetable production etc which in turn cuts greenhouse emissions by eliminating cartage and consequently reducing the embodied energy component. ⁸
 - e) There is evidence that suggests that a 20cm substrate with 20cm to 40cms of dense grass vegetation on the roof offers the equivalent of 15cms of mineral wool insulation ⁹

C. Impediments to eco-efficiency in commercial and domestic buildings

- 1. Design requirements in commercial buildings.** The main impediment to eco-efficiency in commercial buildings is the lack of any mandated design standards and/or financial incentives. The "efficient" building has deep floors with no daylight access and fixed glazing requiring artificial lighting and full air conditioning at all times, eco-efficiency is quite different. Improving this scenario would require high rise buildings to move away from the current form and develop a different concept or maybe abandon the high rise office building completely.

- 2. Simple improvements.** Some simple changes eg the inclusion of remote sensing for services operation in existing commercial

⁵ Skyrise Greening Handbook, Singapore government internet publication

⁶ Skyrise Greening Handbook, Singapore government internet publication

⁷ German study reported in Skyrise Greening Handbook, Singapore government internet publication

⁸ Vale & Vale "The New Autonomous House: Design and Planning for Sustainability"

⁹ Kuhn 1996

buildings and the installation of devices that reduce power consumption and heat output in computers during times of inactivity would help as would effective external shading devices.

D. Incentives and standards for sustainable residential buildings

- 1. 5-star rating for domestic buildings.** This initiative which is currently being implemented in Victoria will be a mandated requirement for all new domestic construction and will also incorporate water saving measures ¹⁰. This should be extended to cover all new Australian domestic construction and all renovations.

E. Are existing standards adequate to maximise eco-efficient design?

- 1. Eco-efficient design.** There is a large body of knowledge now available and if used effectively it could have a dramatic impact on eco-efficiency in building design, but there still needs to be work done on identifying and rating "green" products and there is a need to make the assessment tools a bit more user friendly.

VII. PLANNING TO ACCOMMODATE LIFESTYLE AND BUSINESS OPPORTUNITIES

A. Planning models and zoning

- 1. The City as an ecosystem.** There is some consensus that the city must be regarded as an ecosystem if it is ever to be sustainable and so planning models are closely linked with the other sections of the discussion paper. If a sustainable ecosystem is a system in which all wastes become resources and all inputs are benign it is probable the the City can never be called sustainable. However if it can become waste free in terms of a global perspective (ie the food sources and other supply chains are fully sustainable) it could then be termed "sustainable"
- 2. Inclusion of communities.** Planning models need to originate with and through the community and including social perspectives if they are to be successful.
- 3. High rise residential dwellings.** Even though there may be shared facilities in modern high rise developments the experience generally is that they reduce the opportunities for community interaction unless there is long term occupancy and some form of regular meeting or communal activity available. This can be equally applied to outer suburban developments.

¹⁰ Victorian Building Commission "5 Star Standard for New Homes" "Inform" Sept 2003

- 4. Eco-villages & co-housing and mixed zoning.** If some of the concepts that are embodied in co-housing and eco-villages were incorporated into main stream planning there could be some improvement in the linkages within communities. Zoning that allows the mixture of residential and commercial areas would encourage home based enterprises. Local business seems to be important in developing a sense of community.

B. Urban hubs and transport nodes

- 1. Transport nodes and urban hubs.** This would seem to be a logical direction for the Australian city as such a structure could allow a mixture of close and not-so-close development without the down side of urban sprawl.

C. Transforming existing developments

- 1. Changes to zoning and localities and controlling urban expansion.** The establishment of multiple small localities which are involved with and have a vision for the future development of their area is perhaps the best way to develop sustainable outcomes for existing developments. These groups should be sponsored and mentored by local councils and any necessary specialist consultants and can have a real responsibility within a framework that allows them some autonomy while recognising the broader context. The City of Port Phillip is using a consultative approach to the development of South Melbourne Central and particularly South Melbourne Market and although still in the early stages this seems to have community support.

D. Dangers in decentralised cities with multiple hubs

- 1. The tendency to encourage car based transport.** The obvious danger with decentralised cities is the tendency for such a structure to degenerate into just another car based society. There may also be a tendency for the average length of travel to increase when compared with a more concentrated density. In terms of greenhouse emissions this could be offset by an increase in the amount of home grown food, (in terms of fruit trees, vegetable gardens or keeping chickens for egg production) that seems to occur in lower density settlements.

E. Community, commercial and biodiversity in new urban centres.

- 1. Encouraging community** There have been suggestions that a sense of being connected within the community has a generally

beneficial effect on the individuals concerned. However the question of developing and maintaining an active community is a difficult one. The art of supporting community interaction is not fostered by our use of car based transport, the mobile nature of our society and work, or our apparent need for security. Locally based shopping strips, parks and schools can help to foster interaction and so can free local newspapers that list local clubs, and events that are sponsored by council. Being within walking distance of public libraries, shops, cafes etc also encourages the development of a sense of community.

- 2. Encouraging commercial enterprises** A community can work best if there are local jobs or businesses. There may need to be some form of support for local traders, particularly small traders and home based businesses if we are to develop truly functional and sustainable cities. This support, whatever form it takes, would need to address the excessive real estate pricing that is currently distorting the makeup of our cities.
- 3. Encouraging biodiversity** Biodiversity is probably one of the most important aspects of sustainability and one of the most undervalued. As previously noted work on coral reefs has indicated that biodiversity is probably a source of resilience for the system as a whole and we are all dependent on that system.