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Submission to the House of Representatives, Standing Committee on Environment and Heritage, Inquiry into Sustainable Cities.
(www.aph.gov.au/house/committee/environ/cities)

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The EcoDemocrats is a network formed by members of the Australian Democrats to promote debate and to campaign on environmental issues.

Disclaimer: The views expressed below are for the purposes of discussion and are not meant to represent the official views of the Australian Democrats or any of its component bodies.

Contents

1. Introduction

This submission offers a (non-exhaustive) definition of sustainable cities, and proposes a range of measures to achieve them.

2. Sustainable Cities

Sustainable cities:

- Use only renewable resources.
- Live in balance with nature.
- Ensure that all people have a good quality of life.

Goals:

- Minimise the energy consumption of buildings, industry and transport. To stay within the capacity of renewable, safe energy sources.
- Minimise demand for materials. Recycle and reuse materials as much as possible.
- Minimise demand for water and land. To maximise the land and water set aside for natural habitats and biodiversity maintenance.
- Minimise greenhouse gas emissions and other pollution. So that climate and other environmental changes are gradual enough to allow for natural biodiversity maintenance (through species migration and evolution).
- Provide a high quality of life despite for all despite limited supply of material resources. Eg through small but attractive houses, good public spaces, supportive families and communities, interesting jobs, a rich and diverse local culture, and good access to nature.

Benefits:

- By creating a good quality of life through better communities (as a public good) rather than resource consumption (as a private good), wealth can be shared more equally, with more willingness to do so by those already well off.
- By recreating Australian cities as models of best-practice for natural resource conservation and community supportive features, we can encourage other cities to follow, with consequent global environmental benefits (eg slower climate change) and social benefits (less inward-migration pressure).
- By demonstrating that it is taking world environmental problems seriously, and contributing to the solving of global problems, Australia will generate goodwill among other nations and peoples, who will be more likely to cooperate with us on joint projects, or at least not be hostile and work against our interests.
- Less need for fossil fuels, especially oil, will allow Australia to be independent of imported fuel. This will help disengage us from conflicts of interest in our dealings with the Middle East and other oil supplying regions.

3. Neighborhoods

Goals:

- A good quality of life for all without need for high material consumption.
- Good public spaces that are pleasant to be in and encourage social contacts.
- A diverse range of goods and services, job opportunities, community facilities within walking distance of homes and public transport stops.

Walkable Neighborhoods

- Provide pathways and other public spaces (eg green streets and outdoor lounge-rooms) that are pleasant, safe and attractive for pedestrians, to encourage walking. Benefits: promotes community identity; encourages social contact and supportive relationships between neighbours, and between residents and visitors; encourages physical exercise.
- Provide a variety of destinations walk to, especially daily destinations, to encourage residents to stay within their neighbourhood and so reduce the need for motorised transport. Benefits: encourages walking as part of other activities.
- Cluster many destinations around public transport stops. Put destinations that attract visitors to the neighbourhood within easy walk of the stop. To encourage people to use local facilities on the way to and from the stop.
- Traffic speed on local and main roads should be kept low, to remove barriers to pedestrian (and cycle) movement. The need for pleasant, safe and well connected neighborhoods should not take second place to the ability of motorised traffic to move about quickly.

Green Streets

- Green streets, which are intensely vegetated with trees, bushes, grasses, etc, with minimal or permeable paving and low vehicle speeds, encourage pedestrian use and children’s play and provide urban habitat for birds and other wildlife. The vehicle

pathway should only be one lane wide with provision on roadway shoulders for vehicles to pass each other and to share the road with pedestrians.

Outdoor Lounge-Rooms

- Provide small, public or semi-public places which allow for a range of activities by neighbours and visitors, and which encourage people to stop and chat. With barbecues, abundant seating and table space, some sheltered seats and tables, outdoor electricity and modem connections, for computers and other electrical equipment, separate smoking areas, public toilets, and other community facilities.
- Should be car free or allow only limited access to vehicles at very low speeds.

Communal Gardens

- Communal gardens allow residents to work on private plots or common projects.
- They should incorporate toolsheds, children's play areas, and other features commonly found in private backyards. To encourage social contact and to give residents access to greater range of facilities.
- They should include back areas where people can seclude themselves either alone so as not to be disturbed or in noisy groups, so as not to disturb others.
- They provide a local repository for food waste, vegetation cuttings and for plant nutrients from local sewage treatment plants
- Can incorporate wetlands, nature reserves, fuelwood plantations and other local greenspace.

Mixed-Use Neighbourhoods

- Houses should be close to shops, workplaces, public transport, schools and other learning facilities, health and recreation facilities, other community facilities. To encourage shorter journeys and give the suburb a more diverse and interesting character.
- Workplaces and houses should share streets, indeed buildings (eg with workplaces below and housing above) – to provide passive surveillance day and night.
- Functional segregation – with dormitory suburbs, large house-free and shop-free workplace complexes, and large, house-free shopping centres surrounded by extensive car parks – should be phased out.
- Car parking should be small and scattered, not gathered in large paved fields. Or multi-story, to save space for other uses. Or green – filled with vegetation, so doubling as a public garden. Or not required at all due to an abundance of good public transport and walking and cycling paths, which allow car-free mobility.
- Local industries should be located along or near main roads or railways to allow for easy access to freight vehicles, and to minimise truck movements down local streets. But should otherwise be adjacent to other land uses, eg housing. Conflicts between housing and industry should be minimised through residence-friendly industrial practices. Narrow buffer zones should be used if necessary, but large swathes of vacant, poorly vegetated industrial land (eg for dumping of toxic chemicals) should be avoided.

Compact Neighbourhoods

- Residential densities should be not be low – 100 people or more per hectare across built up areas (compare the 20 people per hectare density of a typical Adelaide suburb). To build up numbers in public spaces, support local shops, and use public transport and other infrastructure more effectively.
- Residential density should be greatest at neighbourhood centres and near public transport stops, and grade off toward the edges.
- Functions that require more extensive land use such as urban farming, fuelwood plantations, wetlands or nature reserves, are located at the edges, so as not to disrupt compactness at the centre.

Urban Centres

- Urban centre should have outdoor loungerooms, as a convivial public spaces that allow people to enjoy each others company, bump into friends, form acquaintances.
- There should be a down-shifting of the functions currently found at urban centres. Local centres should take on more of the functions of regional centres, that is, a wider range of goods and services and community facilities (eg libraries), albeit on a smaller scale. Regional centres should take on more of the functions of metropolitan centres (eg office space). To encourage shorter journeys, strengthen local centres, and open up space in larger centre for more housing and for more specialist and diverse businesses and other activities.
- Centres should be well defined, with well-marked borders, and focused upon well-used, distinctive public spaces.
- They should provide low rent spaces for community shop fronts, work facilities and meeting places, marginal businesses, and creative or experimental projects.
- They should provide a range of activities for young people that allow them to take risks, prove themselves to their peers, and to create, engage in or observe unexpected things. To provide alternatives to anti-social behaviour.

Local economies

- Neighborhoods should provide a range of job-opportunities for local residents. To allow people to walk to work. People should not be expected to travel large distances to find jobs that could just as well be done nearer to home.
- Specialised industry clusters should be reserved for those industries that benefit from proximity, eg high technology and innovation intensive industries which benefit from daily face-to-face contact between workers across a number for firms, or industries which use each others waste products as feed stock.
- Small government offices should be established in neighbourhood centres so government employees can walk to work part of the time, and work in offices at the metropolitan on other days, eg alongside others working in their specialisation. Benefit: In small, local offices, workers from different departments could meet and share ideas, thus breaking down “government silos".

Local electricity generation

- Local electricity generation allows for co-generation - the waste heat from electricity generation reused for industrial or domestic purposes.
- Electricity generated close to its use point cuts down on transmission losses.

Local sewage treatment

- Small sewage treatment plants, scattered through the city, are surrounded by nearby destinations for the water, materials and methane they would generate. If using wetlands, they would create local wildlife habitats.

Stormwater capture

- Water runoff from streets and other surfaces from flowing into natural open water bodies (sea, lakes, streams) should be captured, by ground cover, wetlands, small dams and holding tanks, and reused for local irrigation and for aquifer regeneration.
- Water run-off from roofs should be used to flush toilets and for irrigation.

4. Housing

Goals:

- Provide a good quality of life without need for high material consumption.
- Provide a secure and private place as a complement to community involvement.
- Accommodate people with a range of needs.
- Accommodate a range of community and business enterprises.

Energy Sufficient Housing

- Houses should not need (net) imports of energy to maintain a comfortable temperature range, eg between 15 and 25 degrees. They can do so by using thermal sinks (to store and release heat or coolness), natural ventilation (outside breezes and internal air convection), trees and other vegetation (to provide shade and a buffer from warm breezes in summer, and a buffer from cold breezes in winter), insulation (walls, double-glazed windows, air-locks), to control internal temperatures.
- Thermal sinks. Thick walls and floors, and air-pockets, which store and release heat and coolness, for temperature stability and to make best use of available heat and coolness. (eg storing heat from sunlight in winter for night-time release, or storing coolness from cooler night breezes in summer for daytime release).
- Natural ventilation. Cool air drawn from near floor level to replace warm air released near ceiling level. Windows on opposite sides of the house which can be opened to let outside breezes pass through. “Wind cows” – rooftop ventilation units which steer into breezes to draw in and release air, and are equipped with passive heat exchangers - to provide ventilation in otherwise air-tight buildings, which lose less heat or coolness and let in less outside noise than open windows.
- Solar hotwater. With hot or warm water stored in roof tanks, for boosting in ceiling tank or at smaller tanks down stream nearer the use-point (eg using instant hotwater heaters).
- Gravity-fed hotwater for low-flow showers (better than low-flow shower heads). (Can you use instant hotwater heaters with low-pressure water?)
- Hotwater heated with waste heat from local electricity generators, or with slow-combustion heaters (in cold climates).

Affordable Housing

- There should be good provision of low rental accommodation with secure tenure, for residential, community or commercial use. Need for interiors which add value to small floor areas, in order to include more households (eg one person households) with the same building volume.

Adaptable Housing

- The size of houses should be variable so that people do not end up living in houses that are too large for their needs, or can expand their houses to accommodate household growth. Benefit: allows people to stay in place despite changes in household size or other needs.
- Houses should be accessible to wheelchairs and other means of personal mobility. Ground floors should bathrooms or provision to add them later. Windows, switches, handles, etc should be designed to be usable to people in wheelchairs. Multi-floor houses or buildings should have lifts or stairlifts, or provision to add them later. Allows people to stay in play despite changes in physical ability, and gives disabled people a wider choice.

Housing Clusters

- Cooperative housing clusters consist of several households sharing buildings, gardens and other facilities such as laundries, workshops, large entertainment rooms, storage rooms.
- The buildings should be arranged around a small, landscaped “outdoor loungeroom” through which residents regularly pass.
- Disposition of buildings around a semi-private space, distinct but accessible from surrounding streets helps identify the cluster to residents and others and so strengthens community feeling. To provide layer of community in between the individual household and the neighborhood.
- Housing clusters allow for domestic facilities at a larger than household scale. Eg re-use of heat from local electricity generators, and water recovery from sewage and greywater, underground, timed irrigation.

- Good noise insulation for the houses promotes neighborliness. Buildings should buffer the outdoor lounge room from busy streets. The communal greenspace should include quiet backspaces for outdoor solitude when needed.
- Car parking for the cluster should be constrained to small carparks at the edges, not allowed to dominate the shared space at the centre.
- The shared space should be well landscaped with ornamental, habitat, food plants as well as plants for temperature and humidity control.
- Cluster entry points should be well-marked although open for outsiders to walk through. Houses on both sides of a street can form a cluster if the street is converted into a "green street" - a garden through which cars and trucks pass only occasionally and at walking speed.
- Housing clusters should consist of multi-story buildings. To contribute to residential density without displacing greenspace.
- Housing clusters should host shops and workplaces, or at least make provision for their establishment. To encourage functional diversity and walking to work within the cluster and its neighbourhood.
- Cooperative housing clusters allow buildings and activities to complement each other by giving all those affected some control over developments.

Water recovery from sewage and greywater

- Water recovered from sewage can be reused to flush toilets, if sufficiently purified to meet health regulations, and so used again and again.

5. Transport

Goals:

- Eliminate car dependency – allow people not to use or even to own cars.
- Encourage modes that minimise fuel use – public transport over cars; non-motorised transport over motorised transport.
- Encourage modes that introduce physical exercise into daily routines.
- Encourage modes that make less demand on public spaces, eg cycling over private cars.
- Minimise cars use and ownership in general. To reduce energy use and pollution. To reduce demands on public spaces – land use, noise levels, pollution levels, risk and obstacles for pedestrians - from moving and stationary vehicles. To save money for other more valuable or more necessary investments.

Public Transport

- A substitute for cars where motorised transport is required – longer distances, spontaneous journeys, small freight carriage, journeys beyond the city.
- Often used in conjunction with cycling.
- Well integrated with the urban fabric.
- As a means of connecting urban centres within a dense network of cross connections (not just radial routes to and from the metropolitan centre).

Public Transport Network

- The urban public transport network should have frequent services, fairly direct routes, good connections between routes. To allow passengers to go anywhere within the metropolitan area without long waits and without needing a timetable. To approximate the convenience of the car for spontaneous journeys.
- Frequencies should be 10 minutes or better through the busier 12 hours on weekdays - to shorten waits at stops, especially when connecting between routes, and to avoid the need to consult a timetable. After hours and at weekends, when people are in less of a hurry, frequencies could go out to 15 minutes. Frequencies should avoid going beyond this except where demand for motorised transport is very low, eg late at night or between country towns.

- Frequencies of 15 minutes or more should be in 15 minute, 30 minute, hourly or multi-hourly units, so that the schedule for a given stop is easy to state and to remember.
- Routes should be easy to understand. Bus routes should run down main roads and avoid meandering detours along local roads. Routes active at quiet periods should be active at busy periods. To minimise route proliferation and avoid confusing, spaghetti like public transport maps (eg the current one for Adelaide).
- Public transport stops should be located within or adjacent to an urban centre, however small. Railway stations and bus interchanges should be staffed during hours of operation. Where possible, they should be integrated with neighbourhood centres (eg created for existing stations). Stops should away have good shelter, information, active and passive surveillance, and other features that make people feel confident and comfortable.
- Access paths to stops should be direct, safe, easy to use and well-signed with directions to the stop.

Public Transport Vehicles

- Existing vehicles should be retrofitted for greater energy efficiency. Eg by replacing large engines with smaller engines combined with flywheels in the drive chain.
- New vehicles should have electric motors and be able to obtain power from a variety of sources, eg electricity from overhead wires, hydrogen fuel cells, or internal combustion engines combined with flywheels or other batteries.
- Small vehicles should be used for local, lower-passenger-occupancy routes that extend the reach of trunk routes, as “feeder” and/or “cross-suburban” links. For trunk routes at non-peak times. For special peak-hour-only routes in parallel with trunk routes, to ensure that no small vehicles are idle. For “para-transit” - variable route, door-to-door services that wind through narrow streets between houses and trunk route stations.
- Large vehicles should be used to replace small vehicles at time of busier demand. To reduce traffic congestion and demand for drivers, and create more variety.
- Vehicles should allow roll-on-roll off access (and internal provision) for wheelchairs, gophers, shopping and freight trolleys and users of walking-frames. From outside platforms at the level of the vehicle floor. Buses should use O-Bahn style guideways to bring the vehicles up against the platform.
- Buses should travel as smoothly as trains and trams, eg through computer mediated acceleration and braking, and smooth traction (eg electric motors).
- The vehicle fleet should be upgraded regularly to incorporate new technologies. The public transport fleet, having smaller vehicle numbers than the private car fleet allows for this without great expense, despite the much smaller unit cost of cars that are produced in greater numbers. (A bus can substitute for several cars which together cost more to purchase. But this benefit is lost unless public transport allows enough people to avoid buying cars.)

Bicycles

- Bicycles reduce the need for motorised transport, especially (single occupant) cars, and to extend the range of public transport.
- Bicycles should be available for use at public transport stations or carried aboard train, trams, buses, can be used to connect stations and destinations over greater distances or in shorter times.
- Bicycles used on routes parallel with public transport routes can reduce peak hour demand, and so reduce the size of the public transport fleet.
- An extensive, well-connected network of landscaped, off-road (or physically separate edge-of-road) cycle paths in each city will allow for pleasant and safe cycling between all parts of the city.

6. Industry

- There is a need for a well developed knowledge and innovation infrastructure that will will foster a change in industrial practices and the design of goods, to make industry less material, energy and water intensive.
- Industrial processes should minimise the need for material inputs, should source material inputs from recycled goods or other renewable or abundant supplies.
- Use all waste products should be used as feedstock for industry, agriculture, construction.
- Waste that cannot be reused, especially waste that takes up lots of room or is toxic or otherwise dangerous (eg nuclear waste), should not be produced.
- Complex products (manufactured goods, buildings and other constructions) should be designed for easy repair, remanufacture, or recycling of components and materials, and for durability and ongoing usefulness. And to minimise the energy, water and material needs of their users.
- Materials whose production and use require less energy and water and make less impact on the environment should be developed as alternatives to conventional materials with higher needs and impacts.

7. Government measures

Funding and resource-use levies

- The Commonwealth should play a strong role in providing finance for the rebuilding and replanting of Australia's cities for energy, water and materials conservation, and to create good public spaces and community facilities.
- Funding for energy conservation and greenhouse gas minimisation features such energy sufficient housing, good public transport and cycling facilities, compact cities, should come from a climate change levy, which will encourage a shift to lower energy use and to less greenhouse gas intensive energy sources.
- Funding for water conservation measures should come from a levy on water use.
- Funding patterns that encourage more resource intensive solutions over less resource use intensive solutions should be avoided. For example, public transport use should be subsidised to encourage a shift from private car use, but this should not inhibit a shift to bicycle use, walking, and the development of more self-sufficient, compact neighbourhoods. So these activities and developments should also receive subsidies, eg (roughly) proportionate to the fuel consumption they eliminate.
- Resource levies should reflect the environmental and resource depletion costs not accounted for by the costs of production. They should fund efforts to compensate for environmental damage and resource loss (eg immersed islands or depleted forests). But mostly they should fund efforts to avoid damage and loss. One effective use for such funds is in research and development, especially in demonstration projects that put environment and resource friendly measures into practice in a way that people throughout the world can learn from and be encouraged by

Variable versus fixed user fees

- Charges for car use as well as electricity, gas and water supply should substitute variable use costs for fixed access costs as much as possible. Benefit: encourages less use.
- The costs of road access for cars – road maintenance, first and third party personal and property insurance – should be proportionate to the distance travelled (and hence the road use and risks incurred). Such variable charging should take into account the multipliers on distance such as vehicle weight, and driver and vehicle risks (eg the risks generated by an experienced driver with a powerful car), thus should be more sensitive than a standard levy on fuel use, although that is very easy to administer.
- In the case of electricity, gas and water, users can be charged at different rates according to the expense of connection in their particular circumstances.

Regulations

- Should be used in conjunction with subsidies and levies to drive a transition to urban sustainability.
- Should prescribe outcomes rather than solutions. To make room for a variety of solutions, many unanticipated or with context-specific benefits.

Land Use Zoning

- Parts of the city that are near established centres and public transport trunk routes should be zoned for increasing density. Parts that are distant from centres and corridors for be zoned for reduction of buildings and roads and expansion of greenspace. Developers who want to build at the centres should balance any land that is paved or built on there, with a reduction in such land use in favour of greenspace at the fringes, eg by a ratio of 2 or more units of greenspace to 1 unit of built space.

8. Conclusion

Australia's heavy reliance on material consumption - of non-renewable energy and materials, land and water use - is causing environmental problems on a local and global scale. If other countries follow our current example, then things will get worse much more quickly. We should turn our talents and creative energies to developing cities that provide good quality of life with minimal material consumption, that restore natural habitats, and strengthen human communities. Luckily, these are goals that can be pursued simultaneously.