“How can land use planning and the built environment be managed more effectively to lower reliance on high emission patterns of transport behaviour”

“What are the key barriers to cost-effective low emission opportunities in the building sector”

Overview
This response asserts that the major reason for Australian cities’ reliance on high emission patterns of transport behaviour is directly related to the size of cities. This results from the ubiquitous pattern of low density residential settlement. A car is required for most trips and as a consequence a culture of car dependency has resulted.

An alternative to continuing outer urban development is proposed which relocates development into higher density urban hubs which are serviced by a new and revamped rail network. The new hubs will reduce the need for transport considerably and the revamped public transport would provide an alternative to the car for most longer intra city trips. The hubs will also act as a transport interchange for residents of retained suburbs.

The new proposed 6-7 storey mixed use/residential buildings provide a significant challenge and opportunity for energy efficiency (and affordability).

The most important aspect of this response is that urban and transport reform are interrelated issues, one cannot exist without the other. The hub system will not work without an interlinking fixed rail system of public transport.
Action required and Key barriers

- Macro modeling of the suburban project is required to verify that a combination of higher densities precincts linked with public transport is the most energy effective urban solution.  
  *Main barrier is that it is not being undertaken, the CSIRO ‘Sustainable Cities’ is looking only at individual projects and there very little literature or data available. Hard data would help over come political and community concern.*

- Definition of hubs, professionals and public to define the denser urban precincts.  
  *Barrier: Needs a catalyst ie. some strong leadership and incentive*

- Plan the rail networks in conjunction with denser urban precinct and work out costing.  
  *Barrier: Needs expertise and a little funding, expertise may not be available locally.*

- Change planning laws to accommodate new and more sustainable development patterns and in particular to de-regulate the denser urban precincts.  
  *Barrier: Planning laws need a complete reassessment and new focus on environmental and social issues rather than the current emphasis on vehicle activity, protection of land owners privileges and the visual aspects of the urban environment*

- Establish the most appropriate body to manage and promote the development of the individual urban hubs and relationship with local and other governments.  
  *Barriers: Needs expertise a little funding, local government will see as a loss of power and control.*

- Provide disincentives for further low density urban expansion.  
  *Barrier: Outer suburban development has economic advantages. Ensure more significant component of infrastructure costs to be built into low density land costs and more appropriate pricing of energy/carbon. MOST IMPORTANTLY provide support for the establishment of sustainable (low energy), affordable alternative residential development particularly where integrated with public transport.*

- To allocate substantial sums from the sale of the emission permits especially those associated with oil and redirect funding from road infrastructure to the provision of rail networks and public transport.  
  *Barrier: Firstly carbon trading is not government policy yet. Secondly the concept of providing infrastructure that reduces emissions is not part of the offset structure.*

- To directly invest in the rail projects and to provide vehicles for superannuation funds to make similar investments.  
  *Barrier: Many steps need to be taken before we get to this stage especially the vision and the planning of the system needs to be advanced. But this is fundamental nation building investment and investment opportunities should be offered as widely as possible.*

- To widen the research into the economics and energy efficiency of residential buildings especially 6-7 storey mixed use buildings.  
  *Barrier: The work that is currently is being undertaken is aimed at traditional housing forms. Because there is not a wide acceptance of the need for this type of building work has not been undertaken.*
The problem

The single house on its own block is the single most identifiable component of our cities. It is the compounding effect of low density residential development which has caused the massive size of our suburban conurbations. Large distances have to be traveled for many regular activities which has resulted in people relying on the car for most trips. In response services and facilities have been designed so that a car is required for access. Expensive and intrusive road infrastructure, particularly urban freeways are needed but once built generate more low density residential development and car based facilities. The process is self fulfilling.

Continuing to expand in this way is totally unsustainable. Low density suburbs are not conducive to walking or cycling as a mode of transport because distances are too great and roads are dangerous. A car use expectation to has become embedded in our culture. The use of public transport is difficult, expensive and often inconvenient especially as many trips are outside the public transport routes.

The individual lot also supports car use expectation by providing convenient storage and access and often there are several cars associated with each household. In recent times the urban design of new estates has become so bad that pods of development are physically separated by major road infrastructure meaning that even to get from one pod to another requires a car.

There has been some work done to improve greenfield low density subdivisions using purportedly sustainable design techniques and there has been considerable advances in the energy efficiency of low density dwellings. This does not address the problem of the reliance on the car and is in essence a smoke screens to market continuing unsustainable low density, car dependent, suburban development.

The general solution

There is a simple logic, if enough people live closer together and if services, retail, schools, recreation, employment and public transport are close by, then there is significant chance that people will use their cars less, particularly if car parking and its access is disassociated from housing and services. In this case it would be more convenient to walk or cycle, or take a short trip by public transport.

This is the basis for European cities and it would appear to be the fundamental reason for the difference in energy use. Newman and Kenworthy have proposed a system which comprises a series of dense urban hubs, across the existing conurbation, which are interlinked with public transport networks. This is a logical solution, as it takes the best parts of the European model and integrates those principles into our large sprawling cities; it is in fact state government policy for Melbourne (M2030). However, this is not resolved policy, it is not based on proper modeling, there is no scale, no implementation or management strategy and there is considerable public ambivalence to the proposal.

Base decisions on facts

There needs to be a substantial program to model these assumptions so that planning can be based on proper facts and that major urban reforms can be made with a much more scientific footing. But the modeling must be done with the clear understanding that energy costs are going to rise significantly.
Reduce the need to use the car

Reducing the need for transport is the most positive way to reduce emissions. Reducing the need to use a car for most activities will also ameliorate our congestion problems, the need for additional expensive road infrastructure and it will have significant social benefits. But the system needs to be implemented properly and comprehensively.

The high density model should also be applied to provincial centres and especially coastal resort town. The thrust to reduce car usage will be undermined if people move to country areas and commute or rearrange their life styles, and for part of the week, migrate to low density second homes.

Urban Consolidation

In order to achieve reduced car usage the focus must be on substituting low density suburban growth on the perimeter of the city with more sustainable and affordable dense urban housing. All single lot housing development must be discouraged.

Densification across the whole the conurbation will not produce sufficient intensity of activity to break the nexus between external activity and car usage. It does not provide an adequate population base to support new services and facilities and it dilutes the efficacy of a highly developed network of fixed rail.

Not supporting general densification does not negate the need for new and significant measures to make the remaining low density suburbs more sustainable. New town houses, units and small lot housing all provides for alternative needs and take the pressure from low density suburban growth. Substantial benefits will flow to these areas from the establishment of the hubs, particularly the provision and upgrading of the rail networks.

It is vital, however that the hubs do not become parking centres for commuters or shoppers. Access to the hubs except for the delivery of goods and possibly the disabled generally must not be by car.

Urban Cities (hubs, activity centres or go go areas)

Urban cities will be completely different to existing suburbs, life styles will be different and people’s expectations will also need to be different. Shops for example will not require parking because local population densities will generate adequate demand. To provide a real and meaningful alternative to the single house, urban cities must be beautiful, safe and affordable, places where there is a sense of community, characteristics which many urban Australians are seeking.

This rebuilding process could have a very valuable social impact, it could lead to changing peoples values from embracing the status of the family home to an acceptance of more moderate apartment style living where there is much greater emphasis on participation in the community and involvement in cultural, sporting and recreational activity.

Location

The sighting of the urban cities need to be carefully considered and amongst other issues, must be on existing main rail links and in locations which facilitate
circumferential or cross rail lines. The location should be relatively evenly spaced around the existing urban fabric. There are many complex considerations.

Scale
It is important to understand the scale of this proposal. If in the case of Melbourne all of the envisaged population increase over the next 22 years was be accommodated, without the need for further low density expansion, 50 hubs capable of housing between 30,000-50,000 people at densities of around 100 people per hectare would be required. That means each hub will need to occupy around 10 square kilometers or around 7% of the existing city. (Projections are for 1,000,000 more people but it is more likely to be 2,000,000 and the higher number will be achieved over time)

Urban Planning
Urban planning is regarded as an integral part of local democracy, it adjusts and shapes the urban environment to reflect community values. It is however not a vehicle for creative reform and there are strong pressures from a wide variety of interest groups who target planning to resist urban change. There are also many forces which relate to urban outcomes which are not represented by planning, for example there is an understanding in the community about the problems of climate change, there is substantial good will and an acceptance of the need for change to meet these challenges yet planning has not been able to produce adequate responses.

The problem with urban planning is that it supports the retention of the existing suburban form and despite the rhetoric to the contrary promotes car usage and is one of the fundamental drivers of outward, low density, urban growth. This occurs because the rules are designed to facilitate vehicle access and movement and strict parking requirements ensure convenient accessibility for car usage. Stringent height controls, setbacks, private open space and often unnecessary landscaping ensures low rise, extremely low density development. There is an expectation that new development reflects the surrounding suburban form which reinforces relatively low density solutions and car use. In addition the separation of uses especially retail from residential makes car use almost obligatory for every activity.

The effect of these standards tends to distort the form of housing from meeting demographic, social, even market needs, to ingratiating the status quo. These restrictions in addition to planning’s cumbersome administration and, illogical complexity and generally negative sentiment towards urban re-development results in lengthy delays and severely impedes the free market operation for the provision of economical medium density urban housing.

Protection of heritage buildings and places is an aspect of urban planning which is handled reasonably well and must be supported but in many precincts without heritage value this control is morphed into restricting change. However, urban hubs will often be proposed in very sensitive areas. Often it was the railway station that was the focus of early development and many may wish to preserve this heritage. A more positive approach will be necessary where change and the value of preservation are embraced and integrated. Often compromise will be essential.

During the 1960’s and 1970’s much of the built heritage of cities was lost. The Builders Labourer’s Federation’s Jack Munday’s fight with developers and governments paid off handsomely and preserved much of inner Sydney’s colonial heritage. We must learn from these experiences and not repeat the same mistakes, however we don’t have the luxury of doing nothing.
Where urban hubs are proposed the current urban planning concepts, rules and processes must be abandoned because, even though stated in the objectives, planning has demonstrated that it cannot deliver these sorts of changes. A new system is needed that gives the public even greater say and ownership but in the general concept rather than the individual buildings. The present zoning system, and all of the detailed planning requirements such as parking, setbacks, visual privacy, private open space etc. planning permits and advertising should all be eliminated. A freer market based system is called for, which supports and encourages development, but where much broader community and environmental considerations are the focus.

The view that our planning system protects the community from aggressive developers who may cause detrimental impact on third parties, identifies the fundamental focus of current urban planning practice, it is, however, this aspect that overwhelms everything else, especially environmental issues, social concerns and particularly housing affordability. Within the hub precinct the philosophy needs to change from preventing new buildings from impacting on others to ensure the sustainable aspects of a proposed building are not dependent on limiting the development potential of adjacent or near by land.

There will of course need to be some simple, unambiguous rules, the focus being to enhance the public space. A good starting point when considering the form of the dense hubs is to draw on European examples particularly the historic hearts of cities such as Paris and Berlin. Building heights in these precincts relate to the streets and open spaces and provide very comfortable public environments. Conversely the building heights seen in Manhattan, Surfers Paradise and Southbank (Melbourne) tend to be overwhelming and are not conducive to pleasant street activity. To achieve densities of 100 units per hectare (approx 1/3 of central Paris including parks and river) buildings of 20-25m should be adequate. That is 6-7 stories.

Issues of pedestrian permeability and front setbacks for streetscape landscaping in non commercial precincts will also need to be addressed.

The other principle requirement is that the new buildings will need to achieve a high level of sustainability, that is use very little electricity, gas or water. A six star rating would be a good balance between efficiency, cost and embedded energy. It is the diverse architectural responses to this demanding requirement that will produce interesting buildings and streetscapes. This would be far more effective than all the prescribed urban design rules having this objective.

The desirability and marketing emphasis of an apartment will need to change from promoting the views to offering affordability, the urban setting and proximity of the unit to services and public transport.

Management and implementation
Negative sentiment towards redevelopment generated in the current planning system will need to be replaced by co-operation and support. A paradigm shift in local political power will be needed. To develop an urban city will be a complex and ambitious project, local government alone does not have the political authority, resources or expertise. Each centre will require a competent, professional management team preferably under the banner of an independent authority with a clear mandate agreed to by all contributing parties.

It will be the responsibility of the independent authority in conjunction with local and state governments to educate the community about the need for change and to
ensure general involvement in defining the area to be transformed. Without public support change will not happen. The authority will need to be properly funded so it can co-ordinate the provision of facilities, services, open space and infrastructure and proactively engage, support and promote small to medium sized mixed use development.

Vested Interests and pressures against reform
There are many organisations and individuals who will fight to retain the status quo and the business as usual form of development. These range from outer suburban local government who need development to sustain economic activity, there are the individual and corporate land holders expecting to develop urban fringe land to the speculators with parcels waiting for rezoning. The are also the operators of the stand alone shopping centres, the car lobby and the community groups wanting to save the suburbs from any substantial change.

Many people dislike medium density housing and simply do not believe that this is an appropriate form of housing for their suburb. There is also extensive list of community groups that believe that the single house is the best and only form of accommodation for families. These groups need to be identified and their causes clearly assessed. Many of their expectations are legitimate but others are simply self interest or ill-informed.

Parking and vehicle storage
If new buildings within the hubs were not permitted to accommodate car parking, buildings would considerably cheaper and if on-street residents parking permits were eliminated that is convenient parking was not available for residents and commercial patrons this could act as a significant disincentive to live in the hub. But such a provision would also reduce the traffic on streets enabling more passive uses, transforming streets in the urban clusters into a highly desirable public spaces especially if integrated with retail/commercial activity.

By making the designation of an overnight vehicle storage space a road traffic authority obligation of the vehicle owner, vehicle storage could become a market oriented service, located adjacent to major roads on the edge of the dense urban area it would shift cost impost from housing development directly to the vehicle owner.

Until the public transport was fully established transitional arrangements would be necessary.

Impacts on existing property owners
There will be households especially those with homes within the areas designated for redevelopment that will be effected by the change. Even though business as usual is not an option we must proceed with care. The redevelopment of parts of run down inner cities after the Second World War caused significant social problems and decimated many fragile communities. (Jane Jacobs The Death and Life of Great American Cities) This havoc was often caused by public authorities undertaking unrestrained slum clearance and urban renewal (Housing Commission of Victoria in Carlton, North Melbourne).

It is important to consider a real case (even if hypothetical) a family has purchased a beautiful old house at considerable cost and spent a lot on money customizing it to their own needs. It falls within the designated area. Soon it is proposed to build 6 storey buildings on either side. The question we have to ask ourselves should this be
able to happen and is it fair and what will be the impact on the resilience on planning law in the future?

Should the privileges bestowed on this family by way of the planning system prevent this most important urban reform aimed at cutting GHG emissions (and rationalizing the functioning of the city). These are difficult issues but would probably be better addressed with economic solution rather an emotional argument based on perceived rights.

**Building Form**

Much of the area deregulated for redevelopment will consist of existing, conventional house lots and street layout. There is no intention to change this configuration, existing courts and winding streets will provide a unique urban framework for much higher and dense development.

Retaining the integrity of the 650m2 suburban lot would enable use of much of the existing infrastructure and simplify redevelopment. This size lot if buildings are limited to 6-7 storeys without current suburban planning and parking requirements, could accommodate 10-15 units, of varying forms and sizes. This innovative residential form is demonstrated by buildings in Albert Road South Melbourne and is the basis for urban housing in many traditional European cities.

The importance of this approach is that the scale and complexity of development is well within the capabilities of small sized developers. It has been demonstrated that small operators working in a competitive, de-regulated environment can produce innovative, environmentally responsive and more cost effective housing solutions. This is the basis for the production of suburban housing where building costs are minimal.

Multi-level housing, however, brings many new challenges especially higher construction cost. This can be balanced to some extent by an acceptance of smaller dwellings and much more efficient use of land and infrastructure. There is also substantial potential for the rationalisation of structural systems, procedures and logistics to achieve economies. There are difficulties such as fire rating and access issues which can be complex and expensive especially when lifts are used.

In many countries lifts are not used in this scale of building illustrating the need to question our traditional residential expectations. It is this aspect that can fill market niches and aid with affordability.

New higher density building forms also bring exciting opportunities for energy saving and water re-cycling systems, demonstrated by the new Melbourne City Council head quarters building CH2 and the Ministry of Housing buildings in Raleigh Street Windsor (Vic). This is where the research and development for energy efficiency measures should be directed. Embedded energy, the longevity and robustness of the building systems also need to be carefully considered to achieve a high level of overall sustainability.
Transport Systems

Any discussion of urban transport must include the features of the various modes. Melbourne and Sydney for example have reasonably good radial systems, but as the price of petrol is increases these 19th Century systems are not handling the stress of additional patronage, they need to be up graded and expanded. Some discussion about the current best technology is necessary both the infrastructure, the rolling stock the management and scheduling of the system. Freight transport must also be capable of being incorporated into the radial rail systems especially for the distribution food into the hubs in the event of a complete collapse of the road system.

With the development of hubs there will be a need for interlinking and cross town public transport. The proposal in Melbourne is to use buses, a great but expedient solution. With a proposed 30-50,000 people in each hub much more effective access through out the whole conurbation is necessary. A series of circumferential rail lines would interlink the nodes. Fixed rail is the only way to handle this volume of people over the long distances across our vast conurbations fast and efficiently. Where there are no existing corridors lines should be underground so as not to divide or damage existing communities.

Once the hubs and the primary rail networks have been established a series of feeder light rail and or bus links need to be planned which also link into the retained low density suburbs.

Methods of financing the construction of these new networks need to be explored. Processes should be investigated which re-direct expenditure from road, freeway and outer urban development and which assesses the possibility of utilizing the bounty resulting from new macro-economic reforms to ameliorate carbon emissions. Financial modeling must be undertaken where car travel generally is significantly less convenient and more expensive.

Alternative, renewable energy sources to power the transit systems should be investigated but this is beyond the scope of this response.

Conclusion

To achieve real reduction in green house gas emissions from both urban transport and building form we need to adopt a new vision for our cities. Changes will be necessary to traditional suburban values and expectations and many more people will need to live in much denser living configurations. Small but significant parts of the city will need to accommodate most of the increase in population as the traditional form of low density single lot suburban expansion is phased out.

As the single and two storey house on a single lot is an unsustainable goal, realistic, affordable alternatives must be available. Mid level (6-7 storey), small scale, housing and mixed use development brings many new challenges but also provides the setting for innovation, lifestyle benefits, energy conservation and above all, less car dependence and greater housing affordability.

Those who administer the current suburban centric planning system, particularly the politicians and the pressure groups, must be made aware that its fundamental impact is to cement privileges to existing property owners, it also has significant adverse impact on the environment, on housing affordability and emissions.
Major investment in fixed rail public transport will need made so that people can access most parts of the conurbation by public transport. This work should be part funded from macro economic initiatives to reduce emissions, redirection of major road funding and superannuation funds as well as direct government and private investment.

All efforts to reform our emissions will be thwarted unless our overall patterns of consumption are reduced, the new housing is more affordable our systems generally are made more equitable.