

## Submission To Melbourne Plan Revisited

This response has been prepared based on 42 years of experience as an environmental and water scientist dealing with natural resources, waterways, wetlands, Water Sensitive Urban Design, integrated water management and the development industry across wider Melbourne.

This response is triggered by my involvement in a recent project

which identified a raft of glaring issues with the lack of integrated management of water to attain liveability outcomes in both the established and Greenfield areas of the Western and Northern regions of Melbourne. (Please see the attached Executive Summary). One of the key issues identified is that the planning fraternity simply do not seem to understand the complexities and impacts arising from developments upon the water balance, soil moisture, the ability to green suburbs, flooding, plus impacts on waterway ecology and water quality. The lack of comprehension is not new as I have encountered this previously in a variety of growth corridor projects over the last 30 years.

I am deeply concerned that the current style of development undertaken in the last 15 years and that set out for the future, is totally contrary to that needed to create liveable suburbs. We have an extensive existing problem with low liveability in many new areas and with the impost of climate change, the situation will only get worse.

The Plan Melbourne Refresh document is very generalised in its dealing with water, soil and associated liveability matters and doesn't reflect the dire needs for existing Melbourne Suburbs and that of the Greenfield precincts. It is recognised that the document defers on water matters to the forthcoming State Water Plan. This is unfortunate as the Water Plan is likely to be at such a level that it won't necessarily deal the critical matters affecting the full array of Liveability issues and the Planning system recommendations that are needed

It is recognised that The Water Planning Framework is being updated to develop plans to manage all aspects of the water cycle to deliver:

- Affordable, efficient and reliable water and sanitation and stormwater management services – this will be limited in extent to existing practices
- Communities resilient to flood, drought and extreme heat events – again we are constrained to current practices and legacy of extensive areas that flood
- Communities able to experience the benefits of access to healthy catchments, waterways and bays. Unfortunately this statement is an aspirational goal that that is most unlikely to be attained successfully due to the impacts of a burgeoning metropolis

However, it is unlikely that the State Water Plan will include new approaches to support water retention in landscape, use of stormwater for passive irrigation and deep soil moisture management and protect flow regimes and water quality in waterways more than is currently required.

Further, there are significant impediments to the irrigation and infiltration with recycled treated sewage water (third pipe) due to significant and potentially limiting sodicity and salinity issues of the soils in the west and northern areas. Simply the treated effluent will exacerbate both salinity and sodicity issues and with time see water repelled from the soil and no plants able to grow.

The protection of waterway base flows and management of water quality and protection of current stream ecosystems will also not be able to be fully articulated, as there has been insufficient time to develop the necessary economically viable responses.

My concern is that our current approach to urban design will lead to significant health, social, environmental and economic impacts through the omission of consideration to the role of water and soils being critical to the provision of a liveable environment.

## Specific Comments on Sections of the Report

**Section 2.4 - Sustainable development goals - Sustainability** – current model/approach is unsustainable due to higher development densities vis a vis land capability and climate change. Simply we are developing unsustainable heat islands with huge energy requirements.

### Section 2.5 - Shaping the City

#### Table PP 19

**1 Strong Communities** – they won't be liveable as they can't be greened due to soil and lack of water constraints. Private Open Space is lost – street Open Space is lost, and local passive parks are brownscapes. We don't therefore provide usable fabric of open space for the community

**2. - Environmental resilience** - this is a joke from a sustainability point of view – Climate change will only make a glaring existing problem even worse!! The western suburbs and some of the Northern areas are already challenged for low rainfall, heat exposure, cold exposure, soil salinity and soil sodicity and a low soil moisture etc. Hence we won't have resilient community – but one reliant on huge energy inputs let alone transport issues

The projected lack of potable water resources out to 2050 cannot be met without another desalination plant – due to lower rainfall, lower yields etc. The third pipe reuse response does not totally answer the need, as due to WQ issues it can't be used outside on the predominantly sodic soils. We can't grow large canopy shading trees due to poor soils (sodic, saline, high pH, clay and lack of soil moisture etc.) in west and north. The Percentage impervious increase arising from the current mode of development, results in low soil moisture and massive export in Stormwater to the drainage system drain. We need to shift this disposal approach and shift to using this resource (particularly roof water) for potable and non-potable offsets.

The 20 minute neighbourhood concept has real issues as the quality of liveability assets such as well-developed and watered streetscapes and passive parks cannot be delivered. They are unirrigated and councils cannot afford to irrigate them with either Potable or recycle treated effluent.

**3. Living locally – a '20-minute' city** - This is fine in concept but does not work well with the natural constraints of a lot of PSP's and that of the land capability. It fails because most facilities take an inordinate amount of time to be delivered to create the neighbourhood – so socially the neighbourhood never gets the key elements that form a community. This includes shaded streets and open spaces that are usable. It also includes major transport issues as the lack of transport in neighbourhoods is appalling – leaving people isolated. Further with respect to **Place and Identity** - we can't make place and identity work on the basis of the current PSP's which totally ignore the impacts of high impervious cover, poor soils, lack of soil moisture to enable the creation of an identity of place with trees or WSUD. The streetscapes will be bare and lack shade as will the houses due to no space for trees, let alone shade. The streets and amorphous and have no distinguishing features.

**4. – Infrastructure Investment - Housing choice-** There is a gap in the style of housing /tenements being provided by the market. In particular there is a lack of an alternative to small lot code or lots <350m<sup>2</sup> – need 400-450m<sup>2</sup> to be the minimum for water infiltration needs and also for provision of individual semi attached tenements or aggregates – developers will not deliver other products in normal residential areas for moderate densification

### 2.6 - Housing –

The impact of intensification creates a high impervious coverage percentage, higher stormwater flows transported, lower soil moisture and lower evaporative loss for cooling. There are also extensive flooding problems in the existing established suburbs with many being almost unsolvable. Further intensification will only exacerbate existing major flooding problems – on SBO's LSIO's, OLFP's and waterways e.g. Chelsea, Croydon, Ringwood, Hawthorn, Camberwell etc.

### 2.7 Climate change

Absolutely right in the lack of any response to climate change. We need to be serious in understanding the existing climate constraints of low rainfall, exposure to hot winds, and exposure to cold winds, poor soil moisture, and poor land capability as these will only get worse under climate change scenarios.

The MPA has totally ignore some appalling land capability for a lot of areas, to the extent that vast areas will be unliveable now and worse with climate change.

Climate change factors have not been comprehensively included in the consideration of all the PSP's around Melbourne. The report

identified that Climate change will exacerbate an existing poor set of natural environmental characteristics that will make many areas distinctly unliveable.

### 3.2 - Designation of Activity Centres –

With respect to **Activity Centres e.g. Toolern and Lockerbie** – these exist in appalling climate and soils and it's only going to get worse with climate change. It will be impossible to get a worthwhile Liveable Activity Centre in these areas that have key components of vibrant open spaces – large canopy shading trees and wonderful settings that give these areas vibrancy. Inevitably they are characterised by large heat island buildings and hot unforgiving car parks. Similarly Truganina/ Tarneit and Greenvale will find the same constraints.

### Section 5.1 – The balance between established and Growth areas

The notions of attaining a 70/30 split between established and growth areas for extra housing needs to be tempered with a realistic view as to the consequences on existing infrastructure such as sewers and water mains to be able to supply service or the issue with increased impervious areas impacting dramatically on flooding. Many established areas have quite substantial flooding already and the increased in impervious areas from new tenements will only exacerbate these. Many existing flooding problems around Melbourne do not have a solution – either physically or economically. We should not allow development in areas that are already significantly flood constrained or where sewers are already overloaded above the 5x DWF criteria.

### Section 5.2 Population Growth and Housing

**Housing targets** – must have view to impacts on flooding etc. – plus climate change that will exacerbate existing flooding issues with higher intensities of rainfall. Setting absolute targets must reflect an area's overall capability and character and must not be the outcome of the application of a one size fits all approach adopted by MPA

### Section 5.4 – Housing Diversity. –

The market place for developing and selling land is geared to rapid turnover through the provision of small allotments. This is great for the developers and quick cash turnover, but does not necessarily meet the community needs.

We need a different product compared with small single tenements or Medium density <4 storey type tenements. We need to aggregate the bits of space around the houses/units together, so that we have semi attached cluster housing with common open space where we can have trees etc. The concentration on small single tenements or attached dwellings/ units satisfies the developer market, but not the need of the buying public and provision of greened areas

## 6.0 A Resilient and more Environmentally Sustainable Melbourne prepared for Climate Change

This is an area that has been seriously overlooked in the zeal to plan many PSP's as fast as possible. The lack of a full environmental and land capability input is a great worry as it will produce unliveable suburbs with major internal and external problems.

Our current approach is flawed as the increase in density and impervious areas has devastating impacts on the water balance. The areas in the Greenfields and also a lot of the existing western and northern suburbs are going to become increasingly uncomfortable to live in. A lot of the statements in Box 3 (pp70) are expressed without any real knowledge of what the current situation is and what will happen under Climate change. The statements are mere spin and put a gloss on the guiding principles that we simply will be unable to attain – merely motherhood statements.

The use of the existing planning controls will not add value to protecting the environment or the dwellers from high risks associated with Climate change.

- Better protect and enhance the health and wellbeing of Victorians, particularly vulnerable Victorians.
  - Poor soils and lack of water for trees – simply we dry the landscape through development – losing soil moisture
  - Heat island impacts, high energy needs for heating/cooling
  - High Mortality rates due to lack of shade and heat island effects
  - High transport costs- reliance on cars – 2.7 cars per household – with small lots and narrow streets results in parking on streets/nature strips – kills trees

- No private rec space no backyard no shade
- No room for large canopy trees – shading
- Better protect our natural environment
  - Increased land usage for subdivision with higher impervious areas and development density– higher runoff – impacts on streams and receiving environments – peak flows, periodicity, pollutant loads etc.
  - Our soils will be drier
  - Using our floodplains for single use – many are not a natural ecosystem – they can be used for Open space and biodiversity areas
  - Very little worthwhile **natural capital** exists in the majority of Melbourne’s Greenfields – some grasslands – nothing substantial – even waterways already severely degraded
  - More demands on a reducing resource under climate change – potable water – where is it coming from??
  - Building in high energy costs – High Albedo – hot as hades in summer – cold as charity in Winter – huge heating and cooling costs to many who can’t afford it – plus its adds to the overall greenhouse gas issue.
- **Ensure our communities, cities and towns remain great places to live as our climate changes.**

Can’t do – poor soils, very low soil moisture – no trees – hot dry – no evapotranspiration – no cooling. No attractive green landscapes – they will be brownscapes - refer Box 3 pp 70 retain water in the landscape - ***Cooling Melbourne by creating more green spaces, ‘greening our buildings’, roads and open space, and planting urban forests.*** – Unachievable without a wholesale change in approach to development and use of land – some parts of Melbourne will verge on semi-Arid climates with Climate Change – not enough water and third pipe is not the answer!

  - Heatwaves – more often – cant mitigate
  - Passive OS – undeveloped no shade, no water – not useable
  - No room for shaded private space in allotment sizes down to 300-350m2
  - Streetscapes barren – not an Open Space really, so severe loss of overall recreation capacity. Streets too narrow – competition with cars on nature strips – resulting in loss of trees
  - Lack of large canopy trees being planted – no root space, competition with services, poor soils no watering – doomed for failure
  - Urban forests are a concept and is not a reality without the footprints being provided.
  - WSUD – is not being utilised and distributed across the landscape as developers and Councils do not support the of WSUD inclusion at the local scale due to footprint and cost issues
  - Huge heat islands being built – high albedo being built both in the roads and in the private space - exposed to the elements cold and heat – more extreme days
  - Flooding exacerbated – LSIO and SBO’s have to be larger due to the massive increase in run off
  - The Engineering Guidelines require that all stormwater is piped away – a very small amount of the original component that went to deeper soil moisture will be lost – hence no ability to grow trees

*Land use planning processes should already adopt a best practice environmental management and risk management approach which aims to **avoid or minimise environmental degradation and hazards**. Planning should identify and manage the potential for the environment, and environmental changes to impact our economic, environmental or social wellbeing. **It does not do this – the PSP process is an abject failure – major issues with poor soils, very low soil moisture, lack of shade trees able to grow, leading to heat island suburbs wit high mortality in heat waves.***

- **Optimise water and energy efficiency, and waste minimisation and recovery through the planning system to help achieve a more sustainable city –**
  - The matter of water efficiency is something that is not well articulated or resolved. The mandating of third pipe for use of recycled water has been adopted at the expense of schemes that ruse roof run off for potable water replacement

- Recycled treated effluent is not of suitable quality for broad scale reuse on the sodic and saline high pH soils of the majority of the western and northern growth corridors
- Stormwater retention and reuse in the landscape for deep soil moisture is entirely overlooked with the design guideline that ensures export of the vast majority of stormwater away from the landscape
- The urban design with high % imperviousness and close proximity of buildings results in high energy use
- **Use the planning system to better recognise and support healthy catchments, waterways and bays -** Apply approaches, including improved design standards for urban development to retain water in landscapes and protect waterway flow regimes and water quality by reducing stormwater volume, peak flows and contaminated run-off into our bay, rivers and streams. Use recycled stormwater and wastewater to support improved waterway base flows through irrigation, infiltration and the greening of Melbourne, helping every suburb become a leafy suburb.
  - We have a major gap between the practices articulated in the MPA's Engineering Guidelines and the above statement – simply the Precinct Structure Plans and the Engineering Guidelines work totally against these outcomes – an unmitigated disaster happening now and only likely to get worse in the future! There is no infiltration of stormwater to the soils, no stormwater recycling or reuse, no flow regime mitigation and only tacit support for WSUD

Problems with Table 4 as well – Avoidance will involve in not developing the high risk areas such as Tarneit, Rockbank, Toolern and Lockerbie – as the issues of lack of rainfall and poor soils cannot be overcome or can't be mitigated. Third pipe water is not suitable and most of the soils are sodic and saline.

#### 6.4 MELBOURNE A RESILIENT CITY PREPARED FOR CLIMATE CHANGE

Save for the City of Melbourne, which has a large budget and is able to commit to climate change preparations, the majority of metropolitan municipalities are almost incapable of undertaking any programs for lack of funds and skills capability.

The report

identified that the majority of Municipalities are really challenged to make any substantial headway to improve the existing poor state of liveability in their areas, let alone take on the increased challenge that Climate change will bring.

#### 6.6 Cooling a Hot City

This is a major issue with liveability for the suburbs, is the high albedo arising from the development style and the high percentage of impervious areas and predominance of grey roofs. Given that there is no room for shading trees on the lots and building separations are down to bare minimum – there is trapped heat between the buildings. This arrangement is not open to wind shear and is exacerbated by hot air from the air conditioning units. This is further exacerbated by the lack of large shading trees in the streetscapes and high albedo of the pavements.

The dry basaltic terrain in the western and northern greenfield areas also adds to the retained heat as there is already low soil moisture and this will be exceedingly so under climate change. It is all well to talk about more trees and canopy cover, plus more WSUD. Again the delivered developments are anything but and the MPA's approach falls long ways short of achieving anywhere near the desired outcomes. Simply we are building massive heat islands. The inability to improve soil moisture renders the majority of these areas without the benefit of the evaporative potential of a moist soil.

Similarly, the ability to plant more vegetation is limited by a lack soil moisture, soil types, structural design and lack of footprint area. It is all well to discuss the notional provision of "urban forests" but the lack of

available areas and the lack of soil moisture severely limits the ability to attain very high canopy cover percentages. The city of Melbourne is a poor example to use and most municipalities struggle to get above 2-3% of canopy cover. There needs to be a total rethink as to how this can be achieved. The Greening the West initiative has struggled to achieve any significant gains in canopy cover increases over the last 5 years and will continue to do so unless there is a significant change in the way we reuse stormwater or change the quality and price of recycled treated effluent. The limited distribution, quality and price of recycled water prevents Municipalities using this for improved Greening outcomes

### **Role of MPA**

The MPA has contributed to a significant log of issues that does not provide for a Liveable Melbourne. The single minded and myopic approach to one size fits all for the Greenfield areas is resulting in the production of unliveable suburbs. The lack of recognition of the unique climate and land capability constraints and almost total disregard for stormwater reuse and soil moisture will result in barren brownfield estates with narrow unshaded streets, choked with cars and private developments crammed cheek by jowl with no private open space or shade.

### **Climate change and water**

Please see previous comments

The organisation and its approaches need an urgent restructure and redefinition. Can we undo a lot of the appalling PSP's and development guidelines that deliver such appalling outcomes? I hope so!!

## Appendix

### Executive Summary

This study looks at just one component of the multi-dimensional concept of liveability. It has sought to examine how improvements to the vegetated urban landscape can deliver better liveability outcomes for communities in metropolitan Melbourne. Water is seen as a key tool that can assist improvements to liveability. The study therefore draws particular attention to infiltration and evapotranspiration as key points in the water cycle where liveability has a clear association and intersection.

There are numerous definitions of 'liveability' used in practice. The Victorian Competition and Efficiency Commission (VCEC, 2008) suggests that the term '*reflects the wellbeing of a community and represents the many characteristics that make a location a place where people want to live now and in the future.*' This report adopts the principles of the VCEC definition with specific focus on the level of community wellbeing that is supported by the urban form, open space and vegetation.

The study area matches that of the three integrated water management (IWM) investigations for the west, north and central areas of Melbourne being undertaken by the Department of Environment, Land, Water and Planning. This report will assist and advise each of those three studies about how liveability services might be improved. The three IWM investigations will also add value to the findings of this report through identification of alternative water sources and opportunities where IWM could assist in making Melbourne's suburbs more liveable.

The geographical area of primary interest is the growth areas on Melbourne's western and northern fringes. Here, there has been an emphasis on examining a range of recent developments – from areas where the Metropolitan Planning Authority's Precinct Structure Plans have started to be implemented in new estates, through to a range of recently completed developments where the products of new urban planning approaches have been realised.

Observations from this cross-section of recent developments have informed the consultant team's views about the extent to which liveability is being successfully delivered for these new communities. The consultant team approached its assessment of these new developments keen to observe the following three items particularly:

- **urban form** – layout and density of settlement, housing design, estate presentation/greenness, urban heat potential or heat mitigation evident via design; solar orientation and layout/design to optimise solar access; the role of waterway corridors in urban design; the role of streetscapes and boulevards in estate presentation;
  - **streetscapes** – road pavement width and on-street car parking, incidence of crossovers, nature strip width and capacity to support large tree growth, nature strip condition and surfacing, local soils, tree species selection, health of street trees and innovation in vegetation used on nature strips;
  - **open space** – location within estate, design and use of vegetation especially extent of tree cover and deliberate design for shading, design for shelter from prevailing winds, usability of the space and extent of enclosure at a human scale, the extent of open space along waterway corridors, the design of stormwater treatment wetlands and the extent to which they added value to open space, the extent to which minor drainage lines had been rehabilitated to become part of the
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liveability design of estates, condition of open space plantings and facilities, use of irrigation and the contribution of open space to urban form, local character and estate presentation.

These observations were made on the basis that water management is a key tool through which liveability improvements are sought.

A secondary geographical area of interest for the report has been a selected sample of suburbs from within more established areas. Eighteen suburbs from across the study area were chosen on the basis of their high heat vulnerability. They represent a variety of suburbs from older inner suburbs such as Prahran, Carlton and Footscray to suburbs developed mainly after the Second World War such as Altona Meadows, St. Albans, Fawkner and Thomastown.

In this instance, the extent of analysis was less intensive than that for the growth areas, but still focussed on improvements that might be made to streetscapes and open space to address improvements to the liveability services they provide, thereby helping reduce heat vulnerability.

This report makes 64 recommendations to a range of organisations including water retailers, councils and State government agencies. The recommendations cover several topics related to water and the vegetated urban landscape such as soils, open space planning, irrigation, street trees, water sensitive urban design and urban heat. Key findings include the following:

**(i) The declining private open space contribution to the vegetated urban landscape** - since 1990 across Australia, private open space, particularly backyards, have diminished in size. They have almost entirely ceased to provide a space that provides for large tree canopies to be established. A range of biodiversity, environmental, social and recreational values have declined along with the size of the suburban backyard.

From a water perspective, this decline in size has caused the loss of important pervious areas for stormwater infiltration on private property. In some cases, today's small lots are delivering imperviousness rates of 90% - well in excess of the rates of 45-70% observed in older suburbs. Such high rates of imperviousness have serious implications for stream health, as in-stream ecosystems cannot sustain themselves in the face of this increased incidence of disruptive stormwater inflows. Ephemeral streams of peri-urban areas will be changed forever and their in-stream communities dramatically altered and simplified without stormwater volume reductions for newly urbanised areas.

**(ii) Increased stormwater infiltration on-lot** - the report recommends additional work be undertaken to further test the feasibility of infiltration at the lot level, not only for creating the conditions (via increased soil moisture) in which vegetation (especially trees) might become a significant component of backyards, but to also assist stormwater management. These include:

- further design work to refine the concept of on-lot infiltration trenches;
  - assessment of the minimum area and lot size required to accommodate infiltration trenches and have them operate without nuisance; and
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- modelling of the potential stormwater reduction resulting from on lot via infiltration trenches.

It should be noted that on-lot infiltration, allied with infiltration at other sites, will not fully address management of stormwater volumes. Instead it is only intended to assist in this regard. The primary driver of this proposal is for increasing soil moisture.

**(iii) Adding stormwater infiltration to the functions of nature strips** – nature strips have potential to become sites for infiltration, to help supplement other open spaces and retarding basins. Additional investigation as part of the above modelling work should assess the extent to which nature strips could be usefully and feasibly employed to reduce stormwater volumes, along with the key function of increasing soil moisture.

**(iv) Increasing tree canopy cover** – according to a national survey released last year, of the 34 municipalities surveyed across Victoria for tree canopy cover, councils in the study area occupied all of the bottom six places. In line with the City of Melbourne target of 40% canopy cover by 2040 and its proposed rate of annual increase, the report recommends that each council assess its capacity to lift their canopy cover by 0.75% per year. This has the capacity to help exceed the existing Greening the West target of doubling canopy cover by 2050.

**(v) Soil properties unhelpful to plant growth possibly exacerbated by recycled water** - investigations revealed that sub-soils in the west have high alkalinity, sodicity and salinity levels. Application of recycled water to soils in this area could further exacerbate such soil property issues because of the salt content in recycled water. The addition of gypsum to recycled water could help to address this issue.

**(vi) Making recycled and alternative water more attractive to users** –water retailers and councils are encouraged to hold discussions with a view to ensuring price is not an impediment to uptake of recycled water for irrigation of public landscapes and that similarly, domestic users are also encouraged via incentive programs to use recycled water for garden irrigation.

**(vii) Funding assistance for open space improvements** –investigation of funding sources that would assist water retention, infiltration and passive irrigation of vegetation, as well as revegetation, open space (particularly passive open space) and streetscape improvement works is recommended. The intent of such works would be to lift the liveability quality of open space and streetscapes across both growth area and established suburbs.

**(viii) Passive open space and contact with nature** - a lack of integration between passive and active components of open space and an initial under-resourcing of passive open space sites was found to be limiting the opportunities for users of these spaces to experience the genuine contact with nature and its associated benefits. It is recommended that strategic documents such as Open Space Strategies recognise the importance of the concept of contact with nature and investigate how this can be increasingly applied, especially for passive open space areas that tend to lack a diverse and strong vegetative cover.

**(ix) Urban heat mitigation including possible use of heat impact statements** – DELWP and councils are encouraged to investigate the inclusion of heat impact statements within the Victorian Planning Provisions and council Planning Schemes,

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especially seeking application to new large commercial and industrial developments. It is further recommended that councils investigate the preparation of such statements for all capital works over \$250,000.

This project has identified numerous opportunities for water-related interventions to drive improved liveability outcomes for metropolitan Melbourne. It is recognised that liveability is a highly complex issue, and that many more conversations and negotiations between stakeholders will be required to move towards implementing the recommendations. Nevertheless this comprehensive report provides a strong foundation for these conversations and offers a clear direction for stakeholders to work towards in providing water for liveability into the future.