Sustainable Cities 2025

Comments to the discussion paper.

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1. Summary.

1.1 Thankyou for your discussion paper and the opportunity for input to such an important national discussion.

1.2 While meaning to make a comprehensive submission for this paper, unfortunately other commitments, especially with City of Yarra, have meant that I am reduced to submitting by way of example, a few discussion papers that I have written for Yarra Greens members and councillors, to promote discussion and consider initiatives.

1.3 I was particularly enthused by elements of your paper on seeing the paragraph on page 5, … *rather than a frontier approach.. to provide settlements which can be co-habitated by people, flora and fauna*…..… The articles following have been articles attempting to address this very notion in the city, and in the inner city at that.

1.4 In the big picture, I believe Planning and regulation are the keys. Planning that we may have cities that work for people and not just for cars, and regulations to ensure that development necessarily is on a sustainable basis. On both these counts, we are doing woefully, as we pour more money into freeways and out-urban "1/4 acre blocks" with huge thin-walled houses..

1.5 Another of the vital aspects for us to be dealing with is our finite resources, in particular, water. Water is a finite and diminishing resource, which we continue to talk about in "per capita" terms. We must always be talking in absolute terms, and then reviewing the consequences for us. I note that the Victorian Government paper, "*Our Water, Our Future*", talks in these terms, and expresses reductions on a per capita basis, which is not even half the story.

1.6 It is vital that we tell it exactly how it is in regard to these resources. Only in this way, can we begin to take on the task ahead, and know that we only know how to achieve a small part of the solution – eg. with water, 15% of the 50+% that we need to change – and that it remains a huge and exciting task ahead to actually identify and address this need for change. At present, whether it be logging and biodiversity, water and salinity, or energy and greenhouse gases, not to mention non-renewable resources, we haven't even come to terms with acknowledging the extent of our profligacy, which might be the first step to *really* mending our ways.

I would very much like to be including in further releases, and, if late submissions will continue to be accepted, to enhance on this "scrapbook" of local initiatives included.

James Kilby

2. Linear (Corridor) Parks.

2.1 What is meant by Linear (Corridor) Parks?

Linear corridors of native vegetation, along road lines/ easements, either on nature strips or boulevard centre strips, or through winning back under-utilised road space in residential areas, to achieve habitat/wildlife corridors through the city.

2.2 Aim.

To identify and convert road margins, and under-utilised road space, to corridors of native vegetation.

2.3 Overview.

With traffic calming measures, many of our roads in actual residential blocks are under-utilised, have become unnecessary expanses of asphalt. In many cases, these road zones could be transformed with linear habitat corridors of native vegetation. This is consistent with *City of Yarra: Our Sustainable Future, ch13: Biodiversity,* which indicates that "*This strategy will cover: - habitat restoration works including the development of wildlife corridors;…*".

Establishing such linear parks has the potential of achieving many current aims in one:

- providing green corridors for both native wildlife and ourselves, for passive enjoyment and to soften walking streets; and
- aiding traffic calming, with minimum traffic lanes;
- providing porous easements for absorption of stormwater runoff;
- saving freshwater usage by ensuring good groundwater with absorption of runoff.

There are also many wide nature strips, on avenue streets like Canning Street and Michael St, which could be greened with a partial understorey of native plants, to provide habitat, food, and cover for native birds and animals.

Example streets that are ideally suited to this treatment, and would serve as a feature project for the city, are the triplet of Napier, Gore, and George streets, Fitzroy. These corridors could also be continued up through Edinburgh gardens and Falconer/Rowe Sts to Merri Creek corridor! Another triplet of wide inner-block streets for consideration would be Kent, Buckingham and Lincoln Sts in Richmond.

With traffic calming, Napier, Gore and George streets carry very little traffic, just local residential traffic, as should be the case. By making these streets one-way, with same parking as at present, at least one lane of road would be available for greenery. These are full-width, 1-chain roads, some 20m wide. With footpaths on each side, plus minimum through lanes of 1x 2.7m car lane, and 1x 1.8m bike lane, 2 lanes of parallel parking, up to 5metres would be available for vegetation! The sealed road surface would be removed in this zone, including drain, and replaced with permeable surface, such as in outer urban park car-parks, bluestone edging where desired on porous base, allowing bushes, grasses and trees in an appropriate mix for shade from western sun, and access paths. Stormwater drains would be raised to just below footpath and road grade, to allow runoff in more extreme downpours, but to allow normal rain to soak in locally, with little wetlands and ponds where possible.

Other streets with wide central strips, such as Canning St and Michael St, Victoria Pde, would also be ideally suited to converting part, or all, of the grassy strips into native grassland understorey, with bushes wherever possible. This would be particularly good for Canning St, to connect Curtain Square up to Park St and beyond, which would allow an appropriate corridor for the problem possums of Curtain Square, contained as they are at present in the island of the square.

2.4 What are the key requirements for the project?

2.4.1 Identify Streets suitable for makeover.

2.4.2 Develop general engineering design for roads with permiable edge surfaces and drains.

2.4.3 Develop particular engineering design for each individual road.

2.4.4 Canvass street neighbours for agreement and support for overall project.

2.4.5 Identify costing, and include in Yarra budget, as an on-going program, as a key part of “Greening Yarra”.

2.4.6 Community involvement , Publicity / Community Knowledge

2.5 Outcomes of Scheme.

2.5.1 Full range of native birdlife through the city, eg. Finches and Wrens all through our city.

2.5.2 Free roaming for possums through the city, to avoid overpopulation issues in “island parks” such as Curtain Square..

2.5.3 Softer streetscape, with greater appreciation of native flora, and fauna.

2.5.4 Local retention of rainwater and runoff, for improved river quality, better groundwater and tree health.

2.5.5 Further traffic calming, and shading for eastern properties from western sun,

3. Wetlands.

3.1 Aim.

To create wetlands around the city wherever it is possible or convenient to interrupt runoff and stormwater, adding interest and mini eco-systems, greenery, to the city, while filtering stormwater before reaching our streams and rivers.

3.2 Overview.

3.2.1 With the growing emphasis on water use and stormwater/ runoff quality, quantity and velocity, and an interest in greening our city, we should better utilise our stormwater, rather than ensuring that all runoff finds its way through ever more efficient channels and pipes as quickly as possible to our rivers and streams.

3.2.2 Almost as thoroughly and quickly as we cleared the land for our cities, marshes and streams were drained, channeled, and generally sanitised. Now, with current wisdom, wetlands are being constructed in various locations to acknowledge the importance of these systems, such as along the Yarra behind View St Fairfield. There is also the possibility of constructing smaller “marshes” as features in our parks and river environs, wherever the stormwater drains are accessible at park grade, which also serve as a filtering system, and haven for waterbirds.

Possible examples of this are:

3.2.2.1 Along the lower reaches of the Darebin, between Alphington College and the Golf course. Here a 400-500mm pipe crosses a sloping green area before reaching the Darebin. It would appear that this could come out close to the residence line, and have an interesting marsh, little ponds, path/bridge through it all, before reaching the Darebin, some 100metres or more.

3.2.2.2 At the western end of Coate Park, there is a deep and very large drain next to a riparian woodland/wetland area. This appears to have a small continuous flow, and would appear to carry very large volumes in storm conditions. Driving the full force and volume of storm flows through a wetland etc would lead to erosion, as it has been adversely channeled. However, a low damn of some 400mm height could be constructed very simply a little up the channel, higher than the top edge of the park area (with inundations) and a 400mm pipe layed in this damn and brought down to exit into the woodland/wetland area. This would provide a constant stream, with reasonable flood flow, while allowing larger volumes of water to spill over the damn and flood directly into the Yarra, as is currently the case.

3.2.2.3 Along the eastern edge of Darling gardens, there is an outlet for stormwater at a relatively high (garden) elevation near North Terrace. The road design for this section of Hoddle St is defined by this stormwater requirement, in a most bike-unfriendly way. Here, a series of small banks (600-900mm) could be built for a cascade of shallow ponds between the rows of elms (?), before excess water (I’m told this pipe can carry a lot of water) drained at the lower corner of the park (S-E corner). Near this S-E corner, Sth Tce & Hoddle St, a further wetland, or at least piping to distribute water further into the park, could easily be included.

3.2.2.4 Along the Merri, more or less under the Westgarth rail bridge, there is somewhat of a creek coming down from the playing field above. With a little work here, this could cascade down this slope with ponding.

3.2.2.5 Further upstream, just north and north-west of Rushall station, there is a very large stormwater outlet (1200mm) below the infilled grassy area enclosed by the rail line. The piping should be investigated here to see if any piping is above the level of the area, to bring it out over a part of this grassy area. This would originally have been a marshy flood area, I suspect. There is an existing constructed stony creek bed with riparian woodland scrub to the side of this area which is well done. (And the filtering cage that had been at the end of this outlet has been removed.)

3.2.3 Given that a considerable section of Richmond was river flats, it is to be hoped that there are a few straightforward opportunities to create small wetlands in the parks of Richmond, over and above any current constructed ones.

3.2.4 Other opportunities where stormwater pipes or channels, or runoff, is able to be accessed at grade, or tapped, to create further wetlands, eg. Along the lower reaches of Merri, in or around the old quarry site.

3.3 What are the key elements of the project?

3.4 Community involvement , Publicity / Community Knowledge

3.5 Outcomes of Scheme.

3.5.1 A greener city with interesting wetlands, reedbeds, and the like, with frogs and waterfoul etc through the city.

3.5.2 Better river and stream quality, with reduced flooding.

4. Water Friendly Road Designs.

4.1 Aim.

To review road design for neighborhood roads to include as much permeable surface as possible, retain as much surface water/ runoff as possible, have nature strips and other vegetation areas with best possible natural watering.

4.2 Overview.

With the growing emphasis on water use and stormwater/ runoff quality, quantity and velocity, it is noted that our current road engineering aggravates all these issues. Tree health, on nature strips, is of continuing concern, with sick and dying trees a common occurrence in Yarra. While the look of bluestone curbing has been valued, and given high priority for heritage reasons, the original benefit of bluestone has been lost with our obsession with neatness and longevity, maintenance of assets. Originally, bluestone was laid on sand (and probably rubble), without concrete, and offering some permeability to water flows in gutters, assisting with groundwater for remaining trees. Bluestone laid this way lasted some 80 years or more. Then there are nature strips and the newer beds laid as a part of traffic calming measures, and incidentally for greenery. These beds are raised from the roadways, and have no other groundwater than the rain that falls on them – unless we use fresh water with in-ground watering. While we are now replanting these beds with neat rows of more drought-sensitive native plants, it's a tough life for plants in these beds. Centre-strips in roads are also raised, which is compromising the health of the trees in these strips in current dry conditions, such as the brush boxes along Michael St, Nth Fitzroy, etc. Meantime, we are concerned with stormwater volumes.

When we consider old roads, road construction through a swamp for example, the road is elevated to ensure dry conditions and local runoff, allowing the swamp conditions around while ensuring a firm road surface. This would seem a better model for our road design. The trick for us in our city will be to be shifting to construction that is permeable and conducive to local runoff retention in an upgrade of the existing road surfaces and grades.

Before the City embarks on a considerable expansion of its street trees, our road designs should be reviewed to maximise groundwater absorption, while maintaining good roads. It would seem logical for water reasons to have beds lower than the surrounding road surface. With a simple design, say low piping, that constrains traffic to the confined laneway etc, while allowing water onto beds, this would better suit the needs of plants, make a considerable difference in runoff water, and consequential required watering regimes. A version of this has been tried with some centre bed tree planting, though it is clear that these designs not always stood the test of time with our driving habits. If stormwater gully-traps were raised above the bed grade, but still below footpath and road grade, this would allow as much runoff to soak in as possible without compromising safety and convenience.

4.3 What are the key elements of the project?

4.3.1 Develop general engineering design for roads with permeable edge surfaces and drains.

4.3.2 Incorporate new water-considerate design in all road reworks, especially any extra beds cut for traffic calming and additional street trees.

4.3.3 Develop particular engineering design for each individual road.

4.3.4 Ensure that any relaying of bluestone guttering uses tradition semi-permeable laying techniques.

4.3.5 Identify costing, and include in Yarra budget, as an on-going program, as a key part of “Greening Yarra”.

4.4 Community involvement , Publicity / Community Knowledge

4.5 Outcomes of Scheme.

4.5.1 A greener city using less fresh water for watering, healthier street trees, lusher nature strip plantings, reduced flow and velocity of stormwater runoff to the Yarra and tributaries.

5. Tree Policy, Open Space, and Greening the City. (a local response)

ED NOTE: This is a edited version of a submission made to a Draft Tree Plan, which preceded the actual Tree Policy on which it was to be based, and the Open Space Policy – thus the intermingling of concept and execution. I have tried to glean down to sections that have some relevance to Urban Greening and biodiversity, living with and in the land!

5.1 Any Vision should highlight:

5.1.1 Street plantings as a part of an overall "Urban Woodland"

5.1.2 Retrieving habitat vegetation into the fabric of the city

5.1.3 Nurturing native wildlife into all corners of our city, providing habitat and home for birds, bats, marsupials, even frogs and lizards, for balance and beauty.

5.1.4 The clean, cool air benefits of miximizing trees and plants for absorbing carbon and pollutants and providing shade, softening wind.

5.1.5 Safety measures in choice of tree size and root invasion, as well as wired limbs for large trees where concerns are expressed.

5.1.6 Maintaining mature exotic tree lines to reflect the past sensibilities.

5.1.7 Ensuring minimum water usage and maximising runoff water takeup to maintain groundwater, to improve tree, soil and stream health.

5.1.8 The long-term possibility of occasional harvesting of mature street-trees for timber.

5.2 Consistent with the Yarra Environment policy (biodiversity), plans for reverting as much as possible of under-utilised roadway within the road easements to vegetation, including trees, should be included in the Street Tree Plan. Within the overall capital works programs for implementing the plans, several iconic road transformations should be included in early budget plans, along with minor "good value" works. Works should be so geared to concentrate on areas that are low in greenery relative to other parts of the city, as indicated in the plan.

5.3 As a part of the "Urban Woodland" program, conservation projects for specific threatened species should be undertaken by the City. These projects would aim at cultivating large numbers of "accredited seedlings" to be planted throughout the city, and available to Yarra citizens for planting in private gardens. Specific suggestions here are: the listed hybrid eucalypt *Eucalyptus X studleyensis*, Studley Park Gum, which is found in Studley Park, and named from this park adjunct to, or in, the city of Yarra; *Eucalyptus leucoxylon ssp. connata*, Melbourne Yellow-gum; and a small herbacious plant, *Nicotiana maritina,* Coast tobacco, which was long thought extinct, but is now listed as endangered with specimens in Studley Park/ Yarra Bend, and would be suitable for garden planting. These projects would provide another avenue for community participation and consciousness, as a part of school projects and plantings. This program could be extended to other indigenous species where there are almost unique examples in our remnant vegetation areas such as Yarra Bend, especially for those mature trees that predate european settlement. This might include *E. viminalis* (Manna Gum), *E. camaldulensis* (River

Red Gum),*& E. psuedoglobulus (*a local Blue Gum), Yellow Box (E. malliodora), the unusual base for our "Box-Ironbark" woodlands, and further shrubs.

5.4 Work with the Engineering dept to detail generic water-friendly alternative solutions for new street bedding, and detail up some road make-overs which create oneway streets and widest possible vegetation strips, accounting for runoff water into the strips, swampy sections, etc. to include in Greening Yarra's Streets.

6. The Issues.

6.1 The Brief and Questionnaire.

Yarra has a number of policies which provide a background for a Tree Plan. We should foster our native flora and fauna, and maintain our unique biodiversity. Water and Stormwater policies, and attitudes, determine that it is imperative to minimize the supplementary water requirements for our city as a whole and parks and gardens in particular, and improve(minimize) stormwater flows and velocities. This background should provide the vision and stimulation for a Tree Plan. Even the term "Tree Plan" would seem inappropriate as a part of any such vision. Rather, this should be a "Vegetation Plan", or "A Plan for Greening Yarra's Streets". With such a vision as a starting point, community involvement, and questioning would be from a different perspective. More the line:

> *The City of Yarra intends to undergo an ongoing greening program for our streets. As a basis for this plan, we have our environment and water policies, quality of life, and understanding of our custodial relationship to the land. Wherever possible, native vegetation, somewhat representational of our original woodlands and grasslands, will be the norm for plantings. This shall be balanced with other needs for our streets, including parking, roadways sufficient for the actual road needs, picnicking and recreation on select plots in medians etc, proper access for all citizens, and also maintaining mature lines of the exotic trees, with infill for consistency, that are also a part of our city's roadscape.*

Thus a case is put to the city, with latitude for individual preferences, while being quite clear about the overall principled direction. Those who have strong preferences will express these, and most will be very pleased with the greening plan, assured that the like of root issues are taken care of.

6.2 Custodianship and intrinsic value.

Before every meeting and gathering, we acknowledge the "Wurundjeri community as the first owners of this country", but this seems little more than lip-service. Firstly, our concept of "ownership" was and is foreign to aboriginal culture. Were we to note their "custodianship" of the land, we might consider the distinction, and take on this custodial role in the contemporary context.

Open Space as Habitat.

The natural environment is to be treated and celebrated as a priceless resource for its beauty, inspiration, wisdom, and intrinsic worth. It is vital to redress the decline in the quality and area of native vegetation, and the fauna for which this is habitat, across the state. In rural areas, salinity and land degradation have shown that we are over-farming the land. There is an acceptance that a proportion of the land must be left as natural vegetation. While figures and understanding varies on how much will need to be reserved for nurturing natural systems, figures of between 15% and 30% are quoted in this context. We need to fold this understanding back into the city context, as the validity of the requirement to maintain the natural background remains, both intrinsically, and as an important common understanding with our rural communities. This would allow us to recognise dwellings and buildings as just another form of land utilisation, to be overlayed on a natural background in a sustainable way.

It is important that we recognise our city as a part of the land and nurture habitat vegetation for its own sake and for the sake of our land, water and air, and as a part of our empathy with the state overall, and acknowledge that there are many non-human residents in our city as well. Remnant vegetation should be recognised as priceless, for its natural biodiversity. It is also an important as a genetic source for seeds of local provenance.

To suggest a percentage habitat for the city would be a very valuable exercise if all parties were in agreement on revegetation and land usage. Unfortunately, intrinsic value to land and habitat vegetation is not necessarily acknowledged, and has yet to be enshrined in the law as an unqualified requirement within sustainable development. Without this, there will always be a strong push from developers, and often the governments, to sell off or use every available square of land for development and profit. In simple terms, we know that this compromises our quality of life, the more so for the resultant increased population that has no recreation and breathing space, in both the literal and figurative senses. Any percentage would need to be applied down to the block level. Large areas such as Yarra Bend should not be seen as balancing overuse of land in the rest of the city. As habitat areas will always be a lesser constructed analog – though hopefully at least indicative - of the EVC's of the area, asserting a percentage for having self-maintaining vegetation is not realistic. Instead, more useful measures will be the live indicators of the smaller and more sensitive fauna, especially birds which more freely migrate and populate areas when sufficient food and cover is provided, along with measures for clean air, and subjective measures of being in a native woodland.

It is our responsibility to protect natural ecological diversity, and to foster natural eco-systems. This should include providing background native vegetation through the city - as an analog example of our eco-systems – for itself, and as habitat for local fauna, the remnant bird, animal, lizard, etc populations – to allow these to thrive as best possible, and with some constructed balance. The fauna will become our indicators of success. We can but provide the flora, to allow the fauna to thrive.

Linking Habitats.

In recent years, we have seen the re-emergence of many native species, especially birds, in the city. Kingfishers, Herons and Night Herons, Ibis, and Yellow-tailed black cockatoos can be found along the Merri, and Yarra, along with pardalotes, thornbills, and the red-browed firetail of the grasslands. Ducks and hens abound. The presence of the larger carnivorous birds in our city, such as Tawny Frogmouths, Kookaburras, and Peregrine Falcons, indicate healthy numbers of smaller birds, such as the white-plumed honeyeater. Fish are occasionally to be seen even in the Merri. All this has its roots in the revegetation of our watercourses, and the upsurge of native vegetation planting in urban gardens, both of which must be supported and encouraged. Less than ten years ago, rainbow lorikeets were not to be seen in the inner city. Now they are in profusion. We can be very grateful for the work of the Friends of Merri Creek for their work over the last 25 years in revegetating the Merri habitat corridor, the fruits of which we are now seeing in the returning fauna populations. This, and the critically important remnant vegetation areas along the Yarra and through Yarra Bend Park, and across the river in Studley Park, provide the basis for expanding this vegetation through the city.

The free migration and interaction of flora and fauna within and between remnants, and constructed linking habitat vegetation, is essential to an overall vision of vegetation plantings as a part of the background fabric of our land and city, and for encouraging and supporting wildlife populations in our city. At present, there are the recognised "open space" parks which are seen as parks with "natural" bushland, and then there is the "city". We are so fortunate to have Yarra Bend, the Yarra and the Merri (and thankful for the efforts of Friends of the Merri Creek etc for the revegetation works of the last 30 years), but what of the fabric of the rest of the city? Despite the further parks in the city, including the

former flood plains of lower Richmond/ Burnley, Edinburgh Gardens, Clifton Hill, Park Street linear park, are these seen as part of this vegetation fabric? Are the road easements seen as a greatly under-utilised opportunity analog woodlands, as opposed to nice rows of street trees? There is so much birdlife along the fringe of the city, but not as an integral part of the micro fabric of the city. This should be an enduring, and endearing, focus of plans to increase the street plantings and greenery, and clearly honoured as such. Our ongoing success in this endeavour may, and should, be measured by the presence or otherwise of the smaller birds - blue wrens, red-browed firetails, yellow-rumped thornbills, eastern spinebills – all through the city. Frogs and lizards will be further indicators. Getting kangaroos and wallabies into the city is probably a tall order at present, but these should definitely be in Yarra Bend (wallabies were in Yarra Bend in the 70's and may still be there in very small numbers), and possibly elsewhere along the city border…

6.3 Linear Parks and Plantings.

The term "Linear Park" here is used to conjure up a vision of continuous strips of woodland and the like along road easements etc, wide enough to have an understorey and significant, and continuous, enough to allow us the flavour of a woodland as a part of our city. These may even contain little swampy bits and mini-wetlands for diversity and to take up road and house runoff. *The* Linear Park along the old train line in North Fitzroy is a very wide example of this – clearly not possible on existing streets – which still has hardly reached its potential in that the woodland plantings are only occasional and more like large feature "native beds" rather than that the Linear Park *is* a woodland strip, perhaps with little wonderland picnic spots off the walking track.

In considering linear parks cum habitat vegetation, and overall with the street works for further plantings, where these require roadworks, a once-and-for-all approach should be taken. In 30 years in North Fitzroy, little beds here and there have often been repeatedly worked on and changed, and yet we still have vast areas of essentially unused asphalt in the wake of traffic calming measures in the residential blocks. With the current bike path markings, and with this street tree plan, an opportunity is being missed to mark out the minimum required lanes for cars (circa 2.7m), a bike lane, a uniform wheelchair friendly footpath, assign parking space to be no more than extant, and then delineate the rest as (potential) vegetation strips and beds. Within this scenario, where there are parallel low-use roads, these should be made one-way – when works are done – to allow significant linear parks through the city. The triplet Napier/ Gore/ George Sts in Fitzroy that link to the triplet Falconer/ McKean/ Rowe would lend themselves to this treatment. In Richmond, another example would be the set Somerset/ Kent/ Buckingham/ Lincoln, along with the set Palmer/ Murphy/ Blazey/ Crown/ North/ Appleton/ Doonside. The pairs of sets for Richmond and Fitzroy - North Fitzroy would effectively bring fingers of vegetation from the rivers right into the city. The background engineering for expanding street vegetation should be able to be done once only. With plans, these streets could be marked out fully ahead of the more major engineering works (and costs) of implementing the plans for beds and strips.

6.4 Value of Biodiversity.

Protecting indigenous biodiversity is crucial for present and future human wellbeing and physical and cultural quality of life, especially for providing wonderment, enjoyment, and intrigue in the limited context of city vegetation. With limited space available, every opportunity for supporting local gene populations of species should be taken, including the street trees and vegetation. There are exciting prospects here for community participation and pride in propagating threatened and endangered species through targeted programs. This allows community-building and a hands-on understanding of our local floral heritage, while using nature as the logical choice for selecting well-adapted species for our local climate.

Species Conservation Projects.

Three possible species conservation projects are listed below. These are species that are listed as either threatened or endangered in classifications. It is important that experts are involved in all stages of these species conservation projects. Seed collection from the correct specimens, seedlings sprouting true to type, site typing is important. For the eucalypt species listed below, Victoria's leading eucalypt taxonomist, Kevin Rule (rulelk@alphalink.com.au, 9878 4779) should be consulted, as he has studied the species concerned, and actually walked local Yarra areas for identifying specimens. For the herbacious shrub listed, Randall Robinson (randall.robinson@research.vu.edu.au, 0417 366 054, 9365 2711), who is a former park manager of Yarra Bend, should be contacted, as he has identified samples of the species in Yarra Bend or Studley Park, and is known to be cultivating this plant himself to safegaurd its existence.

6.4.1 Studley Park Gum - *Eucalyptus X studleyensis*

Studley Park Gum is a naturally occurring hybrid of River Red Gum (*E. camaldulensis)*, and Swamp Gum (*E. ovata)*, which is also self-propagating. Mature trees (of pre-european age) of this hybrid may be found in Studley park, where it was first observed, further to the north-east in Rosanna (a nursing home has been built around a mature example), Watsonia Army Base (the most extensive stand, threatened by road-widening, saved by association with Pine Gap..), and further out in Greensborough in areas threatened by housing developments. This is one of the few listed hybrids, as it is both naturally occurring and self-propagating, and is from diverse parentage. The only colonies which could be extensive enough for survival are at Watsonia and Studley Park/ Yarra Bend. Both are threatened and would require propagation and expansion with buffering. This tree is ideal for street plantings, and could also be planted throughout the city, from local Yarra Bend/ Studley Park seed, and incorporated into Open Space Plans for Yarra Bend. The species is clearly associated with the area, and provides as ideal opportunity for engendering civic pride and community understanding of, and involvement in, local flora, provenance and biodiversity, in maintaining a species.

6.4.2 Melbourne Yellow-gum – *Eucalyptus leucoxylon ssp. connata*

This local sub-species of Yellow Gum is listed as either vulnerable or threatened. Populations in Yarra Bend should be enhanced to allow natural maintenance, while propagation from specimens true to type would ensure a good stock of this gracious smaller gum, ideally suited in size, and indigenous to the area. Nurseries are more likely to stock the more trendy cultivar, *E. leucoxylon var. megalocarpa*, with its registered name "Galwa Gum". The extensive planting of this cultivar, and its antecedent "Murray Bridge form" of *E. leucoxylon* var. *megalocarpa rosea* over the past 30 years has already lead to hybridisation with the local Melbourne Yellow-gum, so overall purity is no longer possible, but illustrates the need for such a project, and that expert opinion must be sought to ensure that the program is planting out specimens that are true to type, and that an extensive woodland in Yarra Bend is developed to ensure that a core of the species for propagation is maintained.

6.4.3 Coast Tobacco – *Nicotiniana maritina.*

This herbacious shrub grows to 1m, with large leaves and flowers almost year-round with 4cm tubular (cream?) flowers, and has been found in Yarra Bend. It would be ideal as an understorey plant in street plantings and beds, and for garden plantings, allowing involvement with private gardens as part of city program. It is noted as endangered, with the original siting from Studley Park in 1883, and few sitings since. As this is a plant suitable for gardens, this would allow general

involvement. It is a striking plant for its large leaves and extensive flowering season, and is something other than the usual “big ticket” eucalypts.

6.5 Runoff water and water consciousness.

Our understanding, and acknowledgment, of water, stormwater, and groundwater issues has changed over time. A past of streets as open sewers has determined an on-going sanitisation process of getting all water off streets and underground, in either sewerage or in stormwater drains. However, even within this drive, the bluestone guttering of the past was set in sand, allowing some permeability for seepage into the surrounding soil. This allowed sufficient moisture for street trees to survive. More recently, these bluestone gutters have been relaid in concrete, denying the soil of almost all water from runoff, with a consequential effect on tree health. If we are to relay bluestone for a heritage look, then this should be done in the heritage way that allows water to permeate to the soil. Bluestones so laid lasted some 100 years.

The change with bluestone is but one small example of how we have overdone the sanitisation process, and failed to take account of water needs, usage, and runoff volumes and velocities, which are now recognised as having an adverse effect on the health of our rivers, not to mention the health of the soil. The new street beds over the last 30 years are all raised beds with solid edging, usually in bluestone. While this can be understood in terms of keeping cars out of these beds, it doesn’t make any sense for the health of the plantings in these beds, and ensures all runoff goes down the drain, literally and figuratively, often requiring supplementary watering of plants in dry times, which are becoming the norm!

Within the plans for street greening and new beds and strips, there should be a clear aim of maximising the use of runoff water, and minimising the use of supplementary watering. This is an integral part of any plan for greening streets, and must be enshrined within these plans to ensure that all works are undertaken within these goals. Best would be bed designs that were at or below road level, surrounded by a strong permeable barrier - either a well-designed (low) pipe and rail type, or some concrete form that had frequent inlets for runoff water. Alternately, where beds are higher than road surface, or are best suited higher than the road surface, runoff water from the adjacent roads should be directed into permeable covered drains.