

‘NEIGHBOURWOODS’

A NATIONAL URBAN FORESTS PERSPECTIVE

URBAN FOREST SUSTAINABILITY - A MODEL FOR AUSTRALIA?

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Clark and Matheny published a model of urban forests sustainability in 1997¹ – I recall reading the article and thinking how far removed we were in Australia from such holistic tree management thinking – that was 1997 yet now 8 years on things look very different. Global warming is ringing alarm bells and sustainability has crept into the people’s dialogue from building to transport and planning. The NSW and SA Local Government Associations have both adopted urban forest policies, and Adelaide City has commenced an ambitious urban forest program whilst the City of Newcastle is drafting a comprehensive urban forest policy. A number of NSW local government Councils have adopted the term ‘urban forestry’ in lieu of ‘tree preservation’ and ‘tree management’. In March 2005 the Lord Mayor of Sydney hosted an Urban Forest Forum and a number of national conferences have focussed on issues in urban forestry.

Given this significant increase in attention to urban forestry in Australia I have set out here what I consider to be a potentially useful model for Australian authorities to take urban forestry into the application phase. I fear that in the absence of a practical model that helps us to understand and apply urban forestry, that our currently dysfunctional approach to urban tree management could become the defacto urban forestry - ie what we do now simply gets called ‘urban forestry’ - in my view, this would be a disastrous situation.

Broken down to its basics, Clark’s 1997 urban forest sustainability model becomes readily understandable for lay persons and therefore its ideas are transferable. I propose it as a basic model for Australian Local Government authorities seeking to gain from the potentially enormous benefits of their urban forest.

What follows is a summary of the Clark model which itself was adapted from a World Forest Sustainability model² Following that I present a sample of the Seattle Urban Forest Assessment: Sustainability Matrix³ which used the Clark sustainability model, with minor modifications, to identify directions for Seattle urban forest policy and programs.

A MODEL FOR SUSTAINABLE URBAN FORESTS

The **four principles** to which any model must adhere:

1. Sustainability is a broad, general goal
2. Urban forests primarily provide services rather than goods
3. Sustainable urban forests require human intervention
4. Trees growing on private land compose the majority of urban forests

Applying these four principles leads to this definition of sustainable urban forest:

“The naturally occurring and planted trees in cities which are managed to provide the inhabitants with a continuing level of economic, social, environmental and ecological benefits today and into the future”

Applying this definition in urban areas means accepting these three premises:

1. Communities must acknowledge that trees provide a wide range of net benefits – they are essential to the future health of cities and their inhabitants
2. Given the goal of maintaining net benefits over time, the regeneration of urban forests requires intervention and management by humans ie urban forests are sustained by people not by nature
3. Sustainable urban forests exist within defined geographic and political boundaries: those of cities – regardless of land ownership

Given these three premises, Clark & Matheny developed their model of urban forest sustainability which is founded on three components:

1. **Vegetation resource** (Table 1) the engine that drives urban forest. The composition, extent, distribution, and health define the limit of benefits provided and cost accrued.
2. **Community framework** (Table 2) a sustainable urban forest is one in which all parts...
3. **Resource management** (Table 3) Not simply management but a philosophy of management...

Achieving sustainable urban forests is founded on four assumptions:

1. **community cooperation** – with a shared vision and ever present focus on maximising benefits and minimising costs
2. **quality care** – redirecting the traditional orientation of urban tree management away from municipal trees to the mix of public and private trees
3. **continued funding**
4. **personal involvement**

The Clark urban forest sustainability model was based on the Santiago Agreement ² which suggested criteria and indicators for the conservation and sustainability of temperate and boreal forests. It recognised that both quantitative and qualitative indicators were needed because not all criteria could be accurately measured.

TABLE 1**CLARK & MATHENY'S CRITERIA AND PERFORMANCE INDICATORS FOR VEGETATION RESOURCE**

Criteria	Performance indicators				Key objective
	Low	Moderate	Good	Optimal	
Canopy cover	No assessment	Visual assessment (ie photographic)	Sampling tree cover using aerial photos	Information on urban forest included in city wide GIS	Achieve climate appropriate degree of tree cover, community wide
Age-distribution of trees in community	No assessment	Street tree inventory, complete or partial	Public- private sampling	Included in city wide GIS	Provide for uneven age distribution
Species mix	No assessment	Street tree inventory	City wide assessment of species mix	Included in city wide GIS	Provide for species diversity
Native vegetation	No program of integration	Voluntary use on public projects	Requirements for use of native species on a project appropriate basis	Preservation of regional biodiversity	Preserve and manage regional biodiversity. Maintain the biological integrity of native remnant forests. Maintain wildlife corridors to and from the city

TABLE 2**CLARK & MATHENY'S CRITERIA AND PERFORMANCE INDICATORS FOR COMMUNITY FRAMEWORK**

Criteria	Performance indicators				Key objective
	Low	Moderate	Good	Optimal	
Public agency cooperation	Conflicting goals among departments	No cooperation)	Informal working teams	Formal working teams with staff coordination	All departments operate with common goals and objectives
Involvement of large private institutional landholders	Ignorance of issue	Education materials and advice available to landholders	Clear goals for tree resource by private landholders; incentives for preservation of private trees	Landholders develop comprehensive tree management plans and fund them	Large private landholders embrace city-wide goals and objectives through specific resource management plans
Green industry cooperation	No cooperation between segments of industry. (nursery, contractor, arborists) No adherence to industry standards	General cooperation between nursery, contractor, arborists	Specific cooperative arrangements eg purchase certificates for right tree right place	Shared vision & goals including use of professional standards	The green industry operates with high professional standards & commits to city-wide goals & objectives
Neighbourhood action	No action	Isolated and or limited number of active groups	City-wide coverage and interaction	All neighbourhoods organised and cooperating	At the neighbourhood level, citizens understand & participate in urban forest management
Citizen-government-business interaction	Conflicting goals amongst constituencies	No interaction amongst constituencies	Informal and or general cooperation	Formal interaction eg tree board with staff coordination	All constituencies in the community interact for the benefit of the urban forest
General awareness of trees as a community resource	Low - trees as problems and drain on budgets	Moderate – trees as important to community	High – trees acknowledged to provide environmental services	Very high – trees as vital components of economy and environment	The general public understands the value of trees to the community
Regional cooperation	Communities operate independently	Communities share similar policy vehicles	Regional planning	Regional planning coordination and or management plans	Provide for cooperation and interaction among neighbouring communities and regional groups

TABLE 3 CLARK & MATHENY'S CRITERIA AND PERFORMANCE INDICATORS FOR RESOURCE MANAGEMENT

Criteria	Performance indicators				Key objective
	Low	Moderate	Good	Optimal	
City-wide management plan	No plan	Existing plan limited in scope and implementation	Government-wide plan accepted and implemented	Citizen-government – business resources management plan accepted and implemented	Develop and implement a management plan for trees and forests on public and private property
City-wide funding	Funding by crisis management	Funding to optimize existing population	Adequate funding to provide for net increases in population and care	Adequate funding , private and public to sustain maximum potential benefits	Develop and maintain adequate funding to implement a city-wide management plan
City staffing	No staff	No training	Certified arborists on staff	Professional tree care staff	Employ and train adequate staff to implement city-wide management plan
Assessment tools	No ongoing program of assessment	Partial inventory	Complete inventory	Information on urban forest included in city-wide GIS	Develop methods to collect information about the urban forest on a routine basis
Protection of existing trees	No policy or policy not enforced	TPO present and enforced	Tree preservation plan required for all projects, public, private, commercial	Integrated planning program for conservation and development	Conserve existing resources, planted and natural, to ensure maximum function
Species and site selection	Arbitrary species prohibitions	No consideration of undesirable species	Identification/prohibition of undesirable species	Ongoing of adapted high performance species with good site species match	Provide guidelines and specifications for species use, including a mechanism for evaluating the site.
Standards for tree care	None	Standards for public tree care	Standards for stock, pruning etc, for all trees	Standards part of community wide vision	Adopt and adhere to professional standards for tree care
Citizen safety	Crisis management	Informal inspections	Comprehensive hazard program (failure, tripping)	Safety part of cost benefit program	Maximise public safety with respect to trees
Recycling	Simple disposal by land filling of green waste	Green waste recycling	Green and wood waste recycling and reuse	Closed system, no outside disposal	Create a closed system for tree waste

In 2000, the city of Seattle (pop 540,000) USA undertook an assessment of the Seattle urban forest in response to concerns about the impacts of population growth and higher development densities on Seattle’s trees³. The Seattle assessment used an adapted form of the Clark & Matheny model of urban forest sustainability and may be a useful model for application by Australian cities.

A sample of two criteria (Table 4) from the Seattle matrix illustrates this point. It uses similar criteria to the Clark & Matheny model, which are presented as a matrix to summarise data collected by survey. The matrix included comparisons with several other US and Canadian cities to ‘*explore lessons from them & their possible application to Seattle*’

TABLE 4 SEATTLE URBAN FORESTS ASSESSMENT MATRIX – RESOURCE MANAGEMENT

Criteria	Objective	Current Seattle conditions	Challenges & opportunities	Other Cities	Lessons learned
City-wide management plan	<i>Develop objectives & implement a management plan for trees on public and private property</i>	No city-wide management plan in place	Require strategic vision and resources to develop UF management plan, review process and update	Servals cities have management plans that are periodically reviewed and updated	Adequate support fro tree maintenance is concern of most tree mangers I most US cities
Urban Forest Policy	<i>Conserve/ restore, enhance resources; develop guidelines and standards; ensure citizen safety and benefit</i>	Urban Forest Coalition now in process of developing guidelines and approaches; requires political and budgetary support as well as program to educate voters	Integrate tree conservation into land use and growth management planning. Develop tools to increase tree cover in new development Enforcement of existing ordinances remains a problem as well as development of enforceable new laws	CA cities major challenges are planting/maintenance responsibilities and ownership. Policy has both UF practices component (internal standards) and city quality component (external audiences) Some cities policies re: tree stewardship (protection and preservation in development), emergency & storm management, tree valuation, or root protection –ay or may not have code	Tree policy is integrated with other city-wide goals in Boston 400 & The Metropolis Plan

The Clark urban forest sustainability model and the Seattle urban forest assessment matrix could be very easily adapted for application in Australia.

To reiterate, the model has three important components, all three must be present:

1. **Vegetation resource**
2. **Community framework**
3. **Resource management**

We do not need to invent new models – the hard work has been done. The results of such studies conducted in Australia would expose the urban tree management situation for policy makers, politicians, Councillors and administrators in such a way as to reveal the true state of play with each city's urban trees. This would create the starting point for urban forest action.

Now is as good a time as ever arboriculturists to throw the urban tree management 'ball' back to the players who have such significant influence on the design and management of our cities and suburbs, and because of this, exert enormous influence on the structure, extent and future of urban forests. Arboriculturists (and committed associates) must take the role of advocates and activists, prodding for progress and steering it instead of running alone as now and virtually haemorrhaging as a profession in the process. After all, sustainable living is everyone's goal and therefore it is everyone's concern.

The urban forest sustainability model is a valid, proven approach that Australian cities could employ as a practical measure to achieving the social and economic health and well being of all who visit, live in and love this country now and in the future.

REFERENCES

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3. Cascade Consulting Group University of Washington. 2000. *Seattle Urban Forest Assessment: Sustainability Matrix* Urban Forest Coalition, City of Seattle.
(<http://www.cityofseattle.net/environment/documents/sustainability%20matrix.pdf>)