Urban Ecotechnology and Infrastructure Workshop Report

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Lincoln University, New Zealand

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Purpose

The overall aim of this workshop was to explore how we could "provide an urban environment that meets the physical, social and cultural needs of the community in a manner that is cost effective and compatible with past, present and future ecosystems".

Workshop Process

Each workshop session had a separate theme as shown in the attached workshop outline. In the first session was intended to set the scene with a stocktake of the impacts and challenges that our urban infrastructure has imposed on ecological values. The underlying questions were: Where are we at? What have we learned? What are the drivers for change? The second focussed on how to include community values and aspirations into our professional planning. The final session provided participants the opportunity to get technological and share their many success stories, new ideas and lessons learned, and to identify research and development needs.

Each session comprised a short talk by a person with appropriate expertise to set the scene relating to the session's theme. This presentation was followed by general discussion and information sharing facilitated by Lyn Torgerson.

Session 1: Stocktake – Urban Communities

Jan Gregor (Drinking Water Treatment and Quality Scientist, ESR NZ) introduced the topic by encouraging the questioning the taken-for granted, on the basis that responding to underlying causes is far more effective than responding to resulting symptoms that would otherwise continue to resurface. Questions raised included

1) What are the meanings of: sustainability, benefit, consultation, ecotechnology and natural environment?
2) What is the purpose/goal?
3) Whose interests and values are served?
4) What is beneficial, and from whose perspective?

The following discussion centred on how ecological objectives could be satisfied in and urban environment, with an emphasis on how it could be applied to a planned wastewater strategy for Christchurch. By the end of the workshop it was concluded that the target objective related to infrastructural planning and ecotechnology was:

To establish and maintain an urban environment in a cost effective manner that is compatible with past, present and future ecosystems, that will accommodate desirable human activities and provide;

1) an acceptable living environment
2) systems to effect consequent movements of goods and people
3) effective services for solid and liquid wastes
4) water of sufficient quantity and quality.

The following issues relating to how this objective could be achieved were raised:

1) The need for public involvement in decision making, carrying a responsibility for public education
2) Considering the large investment in existing infrastructure, improvements may be more readily implemented by focussing on smaller zones, particularly those requiring major capital works
3) Notwithstanding a high investment in existing infrastructure, a recent investigation in Sydney indicates that small scale decentralised sewerage schemes are comparatively very cost effective, which may justify complete reconstruction
4) Useful to consider natural stormwater paths and ways of restoring these
5) To achieve objective there is a need to improve efficiency, reduce demand and integrate services where appropriate
6) Population growth is the key dynamic factor in considering long term sustainability of urban infrastructure
7) It is necessary to consider a 30 year plus time frame, while recognising that infrastructure is expected to last much longer than this.
8) Changing values need to be anticipated

Session 2: the Social Dimension

Gay Pavelka (Mediator, Facilitator and Trainer, Christchurch, NZ) introduced the session on community involvement with a case study of how years of conflict between a developer and the community were resolved, resulting in a development proposal supported by both groups.

The subsequent discussion covered the participation process and how to involve the community.

Issues concerning the participation process include:

- A well planned framework is required and professional advice should be sought
- It is important to involve both the public and decision makers early in the project
- Levels of service and key performance indicators must be established and agreed
- The process is deliberative, with community groups making a decision based on expert views
- Linkages and information pathways need to be established
- Even extreme views should be sought and listened to
- The process is often iterative.

Trust should be developed to the point where the Council, experts and professionals are a part of the community exploring the options rather than “us versus them”. The community needs to be part of the process, for example through workshops where information is presented, discussed and the solutions worked through.

The ability of the public to define the boundaries within which the ecologist and engineer must work should not be underestimated. Interested community members and groups are often idealists, but are generally willing to accept reality and resolve differences. They tend to focus on the higher level like levels of service and objectives rather than technical detail. Technologists should avoid assuming an obvious infrastructural requirements and instead focus on the basic needs; for example, the apparent need for a road should involve consultation that considers

other options for enabling people to move freely. The community should create the direction leading to an agreed pathway, with technology providing the means.

A lot of valid knowledge sits in local communities that would not otherwise be accessible (nevertheless it must be critically evaluated). There are also local "experts" whose knowledge should be used where possible; for example local surfers could provide useful information on a particular coastal area.

Community acceptance can be a slow process. Conflicts need to be worked through; e.g. a community may want the benefits of growth, yet not the developments and changes that accompany it. Where possible, small steps should be taken to test the technology and its acceptability. An example is the move to decentralised sewerage in Scandanavia. Working examples and trial plants are important to develop community confidence.

The following constraints on the public consultation process were noted:

- Economic ecological options sometimes lose to expensive options that are pushed by business interests
- Time is an important constraint, particularly where there is wide community interest e.g. the air quality in Christchurch
- There is a risk of active community groups swaying opinion without needing to provide technical justification
- A commitment by the decision makers to use the results of the consultation is important to retain the credibility of the process.

Options for involving the community include open days, mail drops and one-to-one discussion. Options and details are available from the International Association of Public Participation (www.iap2.org)

Session 3: Technology – Themes and Development

Rainer Hoffman (Wastewater Engineer, Montgomery Watson Ltd, NZ) introduced this theme using wastewater management as an example, noting that sustainable development involved balancing not only environmental factors, but also social and economic factors. The challenge in applying technology involved

- innovation
- effective management of facilities while being mindful of sustainable concepts
- conservation of natural resources (in the case of wastewater by reusing effluent and biosolids)
- using appropriate and sustainable technology.

In the following discussion, the merits of separation at source were outlined (i.e. separation of black water and urine separation) in conjunction with minimal flushing requirements.

Methods should consider ways of avoiding or changing the problem rather than necessarily solving it particularly if the social, ecological or monetary costs are too great. For example alternatives to a treatment plant upgrade could include separation at source, reduced dilution and decentralisation. Similar advantages applied to storm-water separation at source rather than attempting to manage after dilution. For transportation instead of transporting goods or people from A to B, shifting B to A might be more effective. It was pointed out that ecological solutions are often less expensive than technical solutions and that cost can provide some indication of spent resources.

It may be possible to remove barriers to an otherwise appropriate ecotechnological solution by bringing about a change of public attitude or by changing a regulation.

The new technology must be culturally acceptable. For example people may not accept the use of faecal matter around edible plants even if guaranteed pathogen free. It is also necessary to be wary of innovative processes that may not be within the available skills to operate and maintain. The roles of creative thinking and risk assessment were also discussed.

A brainstorming session of options to consider for four main infrastructural areas followed, with results as tabled below.

Water supply • rainwater capture • efficiency - fixtures, demand management, education • reclamation/reuse - on site, centralised • irrigation measures • regulatory issues • traditional methods • groundwater protection • charging • dual water supply - potable and non-potable	Sanitation • separate at source • agricultural waste - land use and riparian management • sewer systems • phosphate-free detergent • toilet options - separating, composting • decrease in water use • biogas • aquaculture/wetlands/pond systems/land application • garbage grinding
Transportation • cycle/footpath • cluster housing • increased population density • removing carparking • city bikes - green bike scheme • park n ride schemes • bus lanes • light rail • tolls	Stormwater • kerbs and swale • hot spot identification • filters • rain garden • green (planted) rooves • terracing • permeable surfaces • 1st flush separation • storage and reuse • use for public amenity • groundwater recharge