

Maintenance



PRIORITIES

- Has equal weighting to all other aspects – need, design, construction, operation (sustains other uses, eg. drainage)
- Funding incorporated with project cost – ear marked funding
- Documentation and information transfer downstream of design process (time effects)
- Ensuring ongoing effectiveness

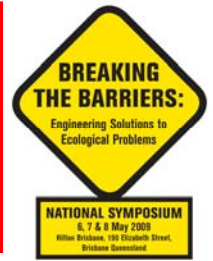
ISSUES/CHALLENGES

- Guarantee of funding for the lifetime of structure
- Clear understanding of maintenance requirements and ability to adapt over time/experience gained
- Over maintaining risk
- Conflicting maintenance priorities (fire cf reg height)
- Capabilities and awareness of needs of client and maintenance contractors (do they wish to do this!) Communicate...
- Inclusion and acceptance
- Failure to implement

POTENTIAL SOLUTIONS

- Prioritisation of maintenance issues and actions
- Good documentation, including feedback with designers and communication (though staff changes, handovers with contractors, with engineers etc)
- Integration, communication, funding throughout infrastructure lifespan
- Maintenance 'Bond'/trust fund
- Independent auditing

Research, Monitoring & Evaluation



PRIORITIES

- Collaboration
- Broader scale/view
- Research that is able to guide policy
- Best practice manual
- Develop tool for evaluation
- Research – prior and post
- Aware of dynamic ecosystems and changing world
- Reference sites
- Determination of effectiveness using benchmarks
- What are we trying to achieve?
- Ways to study/evaluate population viability under different scenarios

ISSUES/CHALLENGES

- Loss of data/information
- Not enough collation
- Research
- Public awareness – research best ways to change human attitude
- Linear barriers not just roads
- Barriers not only linear
- Multiple linear infrastructure in same area
- Funding
- Attitude
- Collaboration
- Policy
- Scope
- Education
- Community
- Scale and repetition
- Choosing indicators of effectiveness
- Researching higher order effects
- Guidelines that allow mitigation evolution
- Duration of monitoring
- Reliability of data
- Data synthesis – who is doing what
- Distinguishing road/traffic effects from other effects
- Rigorous science
- Lack of quality/peer review/reliability of data

Research, Monitoring & Evaluation



POTENTIAL SOLUTIONS

- National database
- Independent hub for determining mitigation effectiveness
- Infrastructure sharing between organisations eg. gaslines (pipes), railways
- Collaboration – inter/national database
- Research public awareness
- Leadership
- Education – roads as a key threatening process
- Involve the community
- Data/information clearing house – who would drive it?
- Central funding sources
- Central database of resources
- Peer review system of proposals (before research commences)

Design



PRIORITIES

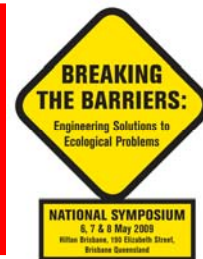
- Effectively meeting the objectives of the biodiversity conservation issues
- Design the structures to work effectively
- Respond to and understanding the need
- Fit for purpose design response
- Greater appreciation by designers/engineers of environmental outcomes
- Understanding difference between national/local level – not same fit for all
- Species relevant design
- Funding

ISSUES/CHALLENGES

- Understanding values and the specific threats
- Site specific constraints and opportunities eg. grade separation (bridge, tunnel)
- Completing design criteria – what is the design purpose
- Future land use changes/development
- Standards/specifications
- Integrating
- Timeframe
- Long lead time
- Place at the table – keeping environmental issues on the table
- Communications between disciplines
- Definition of objectives and measurable outcomes
- Level of education awareness
- Timeline and engagement of engineers occurs often prior to enviro. consultation
- Species catered for in proposed design (target/non target)
- Lack of knowledge/research knowledge
- Feedback mechanism to ecologists/design (modification)
- Cost/time restraints

POTENTIAL SOLUTIONS

- Appropriate analysis of ecological function of the affected area
- Understanding of the interaction of proposed works and ecological function
- Selection of appropriate design solutions
- Research including review/feedback
- Ongoing evaluation of design including collaborative approach
- Right people/right skills
- Understanding aims, integrating disciplines, informing solutions
- National design standards/guidelines



- Information sharing/national database
 - Legislation specific to linear infrastructure
- # Construction

PRIORITIES

- Change culture
- Deliver objectives

ISSUES/CHALLENGES

- Getting consistency in communication during entire construction process
- Interpretation by contractors/sub contractors
- Lack of ownership
- Troubleshooting design flaws

POTENTIAL SOLUTIONS

- Raising awareness with other peak bodies (APIA, ACEA, AIE)
- Outcomes
- Onsite supervision
- Education
- Design meetings with construction group to ensure what's in EA is then in plan and is the delivered onsite
- An Env Officer/manager to assist with communication
- Checklists
- Involvement of client/agencies in regular visits
- Instill ownership with site staff

Planning



PRIORITY

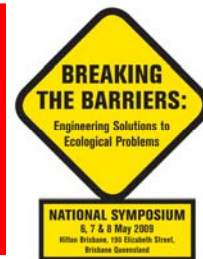
- Collaboration from start with all parties
- Funding
- 'Whole of life' view of project
- Structure suitability for individual cases – guide
- Maintain and enhance viable populations and biodiversity through strategic planning
- Ecosystem viability
- Information sharing/presenting

ISSUES/CHALLENGES

- Data – lack of or irrelevance as well as access
- Breadth of potential collaborators/stakeholders
- Lead in time not often adequate
- Lack of funds for stakeholders to be involved
- Responsibilities and roles
- Competing values
- Multiple level of legislation to meet
- Maintain and enhance habitat
- Feasibility
- Landscape and local scale ecological viability
- Mitigate impact of linear networks
- Improve connectivity/communication
- Getting 'green' infrastructure on infrastructure agenda/on the map
- Disconnection between disciplines
- Better techniques for valuing
- Human and financial resources

POTENTIAL SOLUTIONS

- Policy changes
- Champions
- Early collaboration
- Collaborative forward planning at appropriate scales
- Improve knowledge base and baseline information/sharing information
- Specify benchmarks and target
- Collaborative partnerships
- Head of power
- Integrated decisions
- Statutory green infrastructure



- Integrated frameworks
- Risk management structures

Legislation

PRIORITIES

- Essential legislation to protect biodiversity Esse
- Must define base line standards – must be met or exceeded Mus
- Level of government (all levels) Who
- Must be prescriptive about no net loss of biodiversity/ecosystem/vulnerable species Mus
- Allow for discretion Less
- National legislative base Nati

ISSUES/CHALLENGES

- Community backlash
- System backlash
- Level of prescription
- Political agendas/political will
- How to package it attractively – politically and socially
- Bureaucracy and time
- Reality
- More prescriptive regulation
- No wish list democracy
- No capitalism

POTENTIAL SOLUTIONS

- Federal government
- Education
- Funding
- Politically/socially attractively packaged
- Prescriptive regulation

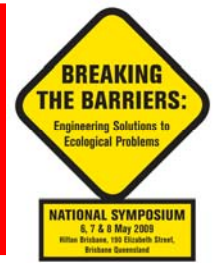
Amelia's slides

Research, Monitoring and Evaluation

- Need controls, replication and peer review
- Long studies to enable meaningful results
- What species are not using the structures?
- Aquatic environment considerations
- Studying use is not the same as determining effectiveness
- Scientific rigour/quantifiable
- Researchers be engaged throughout the process
- Importance of combining data, models etc. with expert panel review
- Population viability studies are essential as they determine the effectiveness of mitigation measures
- Undertake monitoring and evaluation before, during and after

Key Lessons from Speakers

- We need a collective vision for the future
- Long-term commitment to work together
- Persistence when the going gets tough
- Communication, communication, communication
- Tolerance to different view points
- Agreed approach
- Innovation
- If it's not in the contract, it won't happen



- If it's not in the design, it won't happen
- Need to start at strategic planning level
- Importance of maintenance
- Existing structures are often neglected (retrofitting issue and accidental mitigation structures)
- No one size fits all
- Need for legislation referring to mitigation measures/ guidelines/ decision-making tools
- The ESD framework provides the impetus
- The issue of multi-use needs examining
- Setting priorities and having an objective
- Political support
- Community awareness, involvement and support
- Importance of connectivity in the context of climate change, fire, stochastic events etc.
- May not need to monitor every structure – concentrate efforts on particular projects and do them well
- Roadkill is a threatening process
- Connectivity from biological, social etc. multiple perspectives
- Animal welfare issue
- Driver safety and property damage further drivers
- Vehicle speed/signage/traffic calming
- Education



Principles

1. Avoid
2. Minimise
3. Mitigate
4. Offset

- S Specific
M Measurable
A Achievable
R Realistic
T Time Frame

Mary Maher's Evaluation Session Results

Research, Monitoring and Evaluation

- Population persistence
- Effects effecting infrastructure and mitigation
- Hub
- Attitude, Collaboration, Policy, Scope, Education, Community
- Inter/national database
- Research public awareness
- Independent determination

Design

- Understanding aims
- Integrating disciplines
- Informing solutions
- Meet objectives
- Knowledge integration
- Collaborative approach
- Clear objectives
- Understand values
- Effective solutions
- Specifications
- Species requirements
- Information sharing

Construction

- Change culture via awareness consistency and communication
- Deliver objectives
- Communication
- Supervision
- Education

Planning

- Collaborative forward planning at appropriate scales
- Collaborative knowledge/information shared early for decisions



- Statutory green infrastructure

- Integrated frameworks
- Reconnecting
- Traffic reduction
- Values
- Solutions – collaborative partnerships
- Ecosystem viability

Legislation

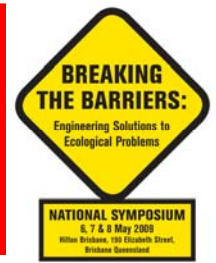
- Less discretion
- Bureaucracy and timing
- Prescriptive legislation
- National and consistent
- Backlash and agendas
- Will and Education

Collaboration

- Facilitate communication through federal funded web based hub

Maintenance

- Ongoing effectiveness – keeps working
- Factored in from the start
- Funding
- Acceptance



- Failure to implement

- Project trust fund
- Auditing
- Integration – in the design process
- Funding throughout the infrastructure lifespan \$\$
- Communication

Outcomes

- Communication
- Intent to work in a collaborative way
- **All** Values based approach
- National consistency for frameworks
- Networking/awareness/education
- The “Hub” idea – website, database/knowledgebase, forum, blog
- Elevate issues/awareness in the political arena – funding to follow
- Local Government can implement now – biodiversity codes