

Bonville Upgrade Fauna Overpass

Overpasses

The use of vegetated overpasses in Australia has had relatively little investigation in Australia due to the high costs of building and maintaining bridge like structures or tunnelling roads. Generally for an overpass to allow successful movement of arboreal species, an upper canopy is considered necessary to provide gliding ability. This would require a substantial amount of ground surface on the fauna overpass to allow tree growth. [2]

For this reason, the depth of the soil used for the fauna overpass is greater than previous examples along the Pacific Highway. Please refer to the handouts provided with the CIG meeting #2 notes for soil depths.

Adjacent vegetation

Hunt et al. (1987), referenced in 'Fauna Sensitive Road Design' also established that the presence of vegetation adjacent to culverts was found to significantly increase fauna activity near the culvert entrances in case studies in Western Australia. [2]

The vegetation to be planted on the Bonville Upgrade fauna overpass will include sufficient vegetation to encourage fauna activity and use of the overpass.

The speed limit along the service road

Trials of Koala Zone Speed Limits have been undertaken in Redlands Shire, south-eastern Queensland. The speed zones require that drivers lower speeds between the months of August and December and between 7pm and 5am when koalas are most likely to be moving on the ground. This has met with limited success in terms of reducing car speed (de Villiers, 1999). [1]

However, Redlands Shire did find that a reduction in speed from 100km/hr to 80km/hr did reduce the number of koalas killed on the roads. [2]

The speed limit along the service road will be 80km/hr.

Road design

The use of speed humps and additional lighting on urban roads also slows traffic and increases the chance that koalas on roads can be seen and avoided. Detailed discussions are also provided in Wellwood (1995). [1]

Painted sections across roads and rumble strips have also been proposed in the draft Greater Taree Plan and draft Campbelltown Plan as a way of further alerting drivers to koala 'black spot' areas (J. Callaghan, AKF, pers. comm.). [1]

Several options to assist with decreasing traffic speed are currently being discussed for the Bonville Upgrade service road to reduce the possibility of fauna casualties.

Fauna exclusion fencing

In Australia, fencing is most commonly used for the conservation of koalas and to exclude macropods from the roads. Guide fences are mainly associated with underpasses and culverts, leaving large sections of road unfenced. This is necessary in areas where culverts are impractical, but also prevents animal deaths from fire, where the ability of an animal to escape may be impeded by extensive lengths of fence without suitably spaced and sized underpasses. [2]

It is necessary to ensure that all koala proof fencing is located or maintained so that trees do not grow within approximately 3m of the fence.

Temporary fauna fencing (4km in length) is currently being installed and will be complete prior to any clearing. The location of the permanent fauna fence will be available at the Community Information Centre.

Overpasses locations

The following examples of overpasses were researched in the design phase of the Bonville Upgrade fauna overpass.

Australia

- Crompton Road, Brisbane, constructed in 2004, passing through Karawatha Forest – 1.3km of divided dual carriageway with a fauna overpass. Also includes several culvert style underpasses to provide multiple crossing locations
- Pacific Highway, Yelgun to Chinderah – The Bonville Upgrade Overpass is modelled on the fauna overpasses on the Yelgun to Chinderah Upgrade for consistency of appearance.

Overseas

- United States of America
 - 2 overpasses in Utah primarily targeting deer passage, 1 in Hawaii, 1 in New Jersey, 1 in Montana and 1 in Florida as a combined recreation and fauna overpass.
- Canada
 - 2 overpasses to allow fauna passage across the Highway through Banff National Park. This is used by deer and Black Bears.
- France
 - 125 fauna overpasses. Widths vary between 15m to 800m. France was the first country to introduce 'hour glass' shaped bridges to reduce costs.
- Germany
 - 32 fauna overpasses, as well as 8 under construction and 20 more planned (as of 2003). The widths of overpasses vary from 8.5m to

870m and include forest or agricultural tracks on approximately half of the structures.

- Slovenia
 - 5 Overpasses constructed for the passage of Brown Bears
- Switzerland
 - 24 Overpasses have been constructed for a range of species. A Swiss study of 12 overpasses has been examining the links between width and wildlife usage. The study indicated that for between 20m and 50m in width, the frequency of use increases significantly and then flattens off. Small passages under 20m width were not readily used. Overpasses with a width of 50m or greater are used by the greatest variety of species. [6]
- Netherlands
 - 4 Fauna Overpasses, 17 to 50m in width. These structures have been considered to be successful, as within a 1 year period 4000 various deer and wild boar crossed a fauna overpass near Terlet.

Overpass Images



Pacific Highway, Yelgun to Chinderah



Crompton Road Land Bridge, Brisbane



An Example from Switzerland



A French 'hour glass' example with solid screens for fencing, as viewed from the fauna approach side



An example from Germany



An example from the Netherlands



An example from the Netherlands of an overpass with solid screens.



Another example from Europe



An example from Switzerland

REFERENCES:

- [1] NPWS (2003). *Draft Recovery Plan for the Koala*. New South Wales National Parks and Wildlife Service, Hurstville, NSW.
- [2] Department of Main Roads, 2000, *Section 6 – Existing Practices, Fauna Sensitive Road Design. Volume 1 – Past and Existing Practices*. Department of Main Roads, Brisbane, Australia
- [3] Hogg, D.McC. (November 2002), *GUNGAHLIN DRIVE EXTENSION ENVIRONMENTAL ASSESSMENT OF ECOLOGICAL AND NATURAL RESOURCE MANAGEMENT ISSUES*, Report to Roads ACT Department of Urban Services.
- [4] *Ecoducts: effective for connectivity!* Posters from the publication "Connectivity in Process: Examples from the Field". Presented during the European Nature Conference 2005: "Our Landscapes: Space for Nature, Opportunities for People" 21st-25th September 2005, Apeldoorn, the Netherlands. http://www.eurosite-nature.org/IMG/pdf/051_ecoducts_natuurmonumenten.pdf
- [5] Bank, F., Irwin, C.L., Evink, G., Gray, M., Hagood, S., Kinar, J., Levy, A., Paulson, D., Ruediger, W., Sauvajot, R., Scott, D. and White, P. (2002). *Wildlife habitat connectivity across European highways*. Publication No FHWA-PL-02-011 Office of International Programs, Federal Highway Administration, US Department of Transportation. 64pp.
- [6] Trocmé, Marguerite, (March 2006), *Habitat Fragmentation due to Linear Transportation Infrastructure: An overview of mitigation measures in Switzerland*, Conference paper STRC 2006, Swiss Transport Research Conference – March 15 – 17, 2006,
- [7] Keith K. Knapp, Xin Yi, Tanveer Oakasa, Wesley Thimm, Eric Hudson, and Chad Rathmann, *Deer-Vehicle Crash Countermeasure Toolbox: A Decision and Choice Resource*, Midwest Regional University Transportation Center Deer-Vehicle Crash Information Clearinghouse, University of Wisconsin. www.deercrash.com/toolbox

OTHER RELEVANT REFERENCES FOR FAUNA OVERPASSES:

AMBS Consulting. *An investigation of the use of road overpass structures by arboreal marsupials*. Final Report, Prepared for NSW Roads and Traffic Authority, January 2001.

AMBS Consulting, *Fauna usage of three underpasses beneath the F3 Freeway between Sydney and Newcastle*. Prepared for NSW Roads and Traffic Authority, August 1997.

Bank, F. (2002). *The scan of the wild*. Public Roads 66 (3). <http://www.tfhrc.gov/pubrds/02nov/01.htm>

Callaghan, J., Curran, T., Thompson., Mitchell, D. and Floyd, R. 2002a. *Draft Greater Taree City Council Comprehensive Koala Plan of Management*. Prepared by the Australian Koala Foundation for Greater Taree City Council.

de Villiers, D. 1999. *Koala Management in SE Queensland – How do we know it works?* In *Proceedings of the Conference on the Status of the Koala in 1999*. Australian Koala Foundation, Brisbane.

Ecologia Environmental Consultants. (1995) *Kwinana Freeway wildlife underpass study – fauna monitoring program*. Prepared for Main Roads, Western Australia.

Evink, Gary L. (2002). Chapter 7 and chapter 10, *Interaction Between Roadways and Wildlife Ecology, A Synthesis of Highway Practice*, NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM, Transportation Research Board, Washington, D.C

Hunt, A., Dickens, H.J. and Whelan, R.J. (1987) *Movement of mammals through tunnels under railway lines*, Australian Zoologist 24: 89-93.

Interstates make history, The Transporter, Special Edition, May 2006, New Jersey Department of Transportation, Vol. 40 No. 4

Ishta Consultants (1999) *Report on the observed limitations on the implementation of koala underpasses and barrier fence systems*.

Jackson, S.D. 2000. *Overview of Transportation Impacts on Wildlife Movement and Populations*. Pp. 7-20 In Messmer, T.A. and B. West, (eds) *Wildlife and Highways: Seeking Solutions to an Ecological and Socio-economic Dilemma*. The Wildlife Society. <http://www.wildlifecrossings.info/beta2.htm>

Kistler, R. 1998. *Wissenschaftliche Begleitung der Wildwarnanlagen Calstrom WWA-12-S: Juli 1995 - November 1997*, Schlussbericht. Infodienst Wildbiologie & Oekologie. Strickhofstrasse 39, 8057, Zurich, Switzerland.

Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016, (01 Jul 2006), Queensland Government - Environmental Protection Agency, www.epa.qld.gov.au

Port Stephens Council (2002). *Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) – June 2002*. Prepared by Port Stephens Council with the Australian Koala Foundation.

Ryan, B. 2001. *An Investigation of the use of road overpass structures by arboreal marsupials*, Mammals Society conference, Brisbane, Australia.

Wellwood, N. 1995. *Koala Friendly Development – a Developer's Perspective*. In *Proceedings of A Conference on the Status of the Koala in 1995*. Australian Koala Foundation, Brisbane.