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1 OVERVIEW

1.1 Purpose

This is the second volume in a two-part series on fauna sensitive road design. The aim of this manual is to provide guidelines for preferred practices to reduce or eliminate the impact of road infrastructure on fauna. Specifically, this manual outlines preferred practices and provides recommendations to achieve fauna sensitive road design. The manual addresses four crucial questions:

1. How well do certain practices/mitigation measures work?
2. In what circumstances do certain structures function best?
3. For which species are the mitigation measures appropriate?
4. How can overall performance of these mitigation measures be maintained and improved?

Practices outlined in this manual are applicable across Australia. However, local knowledge, data and experience should always be used to enhance, modify or even replace the recommendations provided within this manual. The aim of fauna sensitive road design is to produce the best overall, locally relevant, outcome.

1.2 Importance of this document

Over recent years, the Department of Transport and Main Roads (TMR) has increasingly recognised the importance of ameliorating the effects of road infrastructure on fauna and the environments they inhabit. This is evidenced by the release of *Fauna Sensitive Road Design Volume 1: Past and Existing Practices* manual in 2001, and now the production of this volume, *Fauna Sensitive Road Design Volume 2: Preferred Practices*.

1.3 Sources of information

This volume provides guidance on how to achieve fauna sensitive road design. It is based on research that has specifically investigated the effectiveness of fauna impact mitigation measures. The research was conducted by the TMR, other state and international road agencies, and national and international research institutes. Information was collected from multiple resources including desktop research, conversations with knowledgeable people and agencies, and field research.

1.4 Future Directions

The desktop research revealed there is a significant lack of scientific rigour when designing and monitoring fauna impact mitigation measures. This can be addressed through more involved surveying, monitoring and maintenance of fauna impact mitigation measures. Furthermore, investment towards good surveying and monitoring is more cost-effective than a series of minimal monitoring attempts. A standard method of monitoring through preconstruction, construction and post-construction should be performed. The implementation of the SMART technique (Specific, Measurable, Achievable, Realistic, Timeframed) is recommended.

Secondly, the communication of road studies and learnings could be improved. Reliable research on the success of mitigation measures is not readily available. Findings from future road projects could be documented for inclusion in peer-reviewed literature. The availability of these findings would allow for informed decisions on fauna sensitive road design to be made in the future.

1.5 How to use this manual

This manual provides an overall introduction to the principles underlying habitat connectivity and recommends solutions to retain connectivity. The structure of this manual enables the user to find information within distinct sections. The majority of fauna sensitive road design measures are outlined in Sections 6 and 7.

The following information provides a summary of the sections and their content:

Section 1: Overview: explains the need for fauna sensitive road design and how to use the manual.

Section 2: Introduction: provides objectives and basic concepts.

Section 3: Preferred Planning for Mitigation Measures: outlines the principles of effective fauna sensitive road design.

Section 4: Site Assessment and Monitoring: gives a brief introduction to site assessment, monitoring techniques and principles.

Section 5: Maintenance Requirements: highlights the need for ongoing maintenance of fauna sensitive road designs.

Section 6: Measures to Achieve Fauna Sensitive Roads: introduces the various structures and techniques that can be used to achieve fauna sensitive road designs, as well as providing advantages and disadvantages for a number of fauna groups.

Section 7: Target Species Design Considerations: provides some background information for a number of fauna groups to assist with the implementation of fauna sensitive road design.

Section 8: Non-native Species Design Considerations: provides information on road design for non-native fauna.

Section 9: Case Studies: provides examples of fauna sensitive road design and associated learnings.

It should be noted that the existence of this manual does not indicate fauna mitigation structures should automatically be implemented in all instances, but rather TMR should undertake appropriate consideration of fauna mitigation measures within the context of each project and the region within which it occurs. Furthermore, structures should always be designed in accordance with other relevant design standards and guidelines.

1.6 Who should use this manual

This manual should be used as a reference document by TMR staff involved in the implementation of fauna sensitive road design and general environmental management for road projects and road corridor management.

To encourage the adoption of these processes, it is necessary to strive for their integration within the overarching Road System Manager (RSM) Framework. Table 1.6.1 specifically indicates the points of integration into the RSM Framework.

Table 1.6.1 Overview of linkages between TMR Processes and Fauna Sensitive Road Design

RSM Framework							
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Products and Services		Road System	Road Corridor	Road Operation Road Project			
OnQ Project Management Phases				Concept	Development and Implementation	Finalisation	
TMR Environmental Policy / Practices	Main Roads Environment and Heritage Policy and Strategy	Input of environmental considerations as required	RCEA data as part of Corridor Development Plans	Project Environmental Assessment Project Environmental Management	Project Environmental Management Project Environmental Certification Project Works Environmental Management Plans	Project Environmental Auditing and Reporting	
Fauna Sensitive Road Design Manual: Volume 2			Section 1 Section 2 Section 3	Section 3 Section 4 Section 6 Section 7 Section 8	Section 5 Section 6 Section 7 Section 8	Section 5 Section 9	

1.7 Acknowledgements

Fauna Sensitive Road Design Manual Volume 2: Preferred Practice was written based on information from Fauna Sensitive Road Design Manual Volume 1: Past and Existing Practices. This volume provides a practical guideline following on from recommendations in Volume 1, as well as providing updates from more

recent road impact and mitigation research and studies. The authors of the earlier document summarised research undertaken in the field of road ecology and also included a review of research from Australia and around the world. The authors wish to acknowledge the contributions of the authors of the previous document.

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