Chapter Overview Presentations

Twelve Chapter Overview presentations supplement the Guidelines document. Chapters 1-11 each have a Chapter Overview and an additional one summarizes appendices A-O.

These self-paced presentations are designed for individual use or for small group presentations where discussion can be accommodated. It is helpful to have the Guidelines document as a reference when viewing the presentations.

The Chapter Overview presentations are available on the ADOT Roadside Development Section website.

Navigate the Chapter Overview by scrolling through the pages.
Chapter 3: Habitat Connectivity
Acknowledgments:

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Guidelines Contents

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8 Storm Water and Pollution Control
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Appendices A - O
After reviewing the Chapter 3 Tutorial you should…

• Understand habitat fragmentation and the potential impact of highway corridors on wildlife.

• Know how to make highways safer for both motorists and wildlife and more permeable to wildlife movement.

• Be familiar with design techniques to mitigate conflict between highways and the natural environment:
  – Wildlife Overpasses
  – Wildlife Underpasses
  – Fences & Walls
  – Roadside Vegetation

• Understand the importance of monitoring devices.

• Locate additional sources of information on habitat connection and wildlife crossing design.
Chapter 3 Contents

3.1 Chapter Goals
3.2 Scoping and NEPA Processes
3.3 Design Process
3.4 Environmental Mitigation
3.5 Monitoring
3.6 Additional Resources

Arizona's Wildlife Linkages
3.1 Chapter Goals

- Review means by which highways can be made more permeable to wildlife movement and to render them safer for both motorists and wildlife.
3.2 Scoping and NEPA Processes

- The Guidelines adopts the strategy that prevention is better than the cure regarding the negative effects of habitat fragmentation.
  - When possible, designers should avoid alignments that lead to habitat fragmentation and thus require site mitigation.
  - During the Scoping Process the project team should first evaluate the natural heritage of the project area and identify sensitive areas.
  - Time and funding required for information gathering should be included in the Scoping Process.
3.2 Scoping and NEPA Processes

- Information gathered should include:
  - Habitat types and sizes
  - Existing wildlife corridors
  - Type of anticipated conflicts between wildlife and the highway corridor
  - Potential for effective mitigation of highway impacts
  - Mapping of wildlife corridors in relation to the proposed highway corridor

- Wildlife and conservation biologists, landscape ecologists, planners, landscape architects and road engineers all play a valuable role throughout the scoping and design process.

Refer to pages 23-25 of the Guidelines for additional wildlife planning considerations during the Scoping Process.
The first strategy for minimizing habitat fragmentation is to avoid sensitive habitats.

General infrastructure planning should occur early in the planning process.

Mitigation techniques should be viewed as part of an integrated solution.
- Different species require different mitigation measures and design criteria.
- Mitigation measures should be cost-effective, properly located, and sensitive to anticipated future land use changes adjacent to the highway.

There is rarely only one measure that will effectively mitigate habitat fragmentation.
3.3 Design Process

- Design Considerations

Wildlife Overpass

Wildlife Underpass

High Bridges to preserve riparian ecosystems

Box Culverts

Small Culverts
3.3 Design Process

- Design Considerations

- Fish Passages

- Amphibian and Reptile Tunnels

- Roadside Vegetation

- Fences and Walls

Spanaway Creek, Washington
When negative impacts from highway construction are determined to be excessive, environmental mitigation may be necessary.

Mitigation in this context is defined as creating, restoring or enhancing natural areas in order to offset ecological damages caused by the construction of a highway corridor.

Mitigation should be considered a ‘last resort’ solution employed only when the design techniques discussed previously in this chapter are determined to be insufficient.

Environmental mitigation may be constructed within the highway corridor and possibly outside the easement.
3.4 Environmental Mitigation

- Environmental Mitigation Measures:
  - Restoration of degraded habitat (i.e. from overgrazing).
  - Restoration of damaged wildlife corridor (i.e. riparian area).
  - Combination of techniques to improve connectivity of isolated habitat areas.
• The purpose of monitoring is to measure the efficacy of the designs used to benefit wildlife in both biological and economic terms.

• Monitoring devices should be addressed during the NEPA and design processes.

• Monitoring must be tailored to the types of designs and species involved.
3.6 Additional Resources

- Eco-logical: An Ecosystem Approach to Developing Infrastructure Projects
- Keeping It Simple: Easy Ways to Help Wildlife Along Roads
- Safe Passages
- Arizona’s Wildlife Linkages Assessment
- Second Nature: Improving Transportation Without Putting Nature Second
- Center for Environmental Excellence by AASHTO
  [http://environment.transportation.org/](http://environment.transportation.org/)
Read Chapter 3

- To understand habitat connectivity and potential habitat fragmentation from highway corridors.
- To review design techniques used to mitigate habitat fragmentation.
- To understand the importance of monitoring current and future projects.
- For links to additional resources on wildlife crossing design and habitat connection.
Knowledge Check: Do you……

✓ Understand habitat fragmentation and the potential impact of highway corridors on wildlife?
✓ Know how to make highways safer for both motorists and wildlife, and more permeable to wildlife movement?
✓ Know specific design techniques to mitigate conflict between highways and the natural environment:
  ✓ Wildlife Overpasses
  ✓ Wildlife Underpasses
  ✓ Fences & Walls
  ✓ Roadside Vegetation
✓ Understand the importance of monitoring devices?
✓ Know how to locate additional sources of information on habitat connection and wildlife crossing design?
Guidelines Appendices

- Acronyms and Abbreviations
- Glossary of Terms
- ADOT-FHWA-USFS MOU
- ADOT-FHWA-BLM MOU
- Slope Design Details
- Easement Development
- Section 106 Process on Forest Service Lands
- Typical Blasting Plan Content
- Comparison of Permit Processes for Material Sites
- Signing
- Project Reference Fact Sheet
- Native Plant Salvage & Replanting Evaluation Guidelines
- References and Photography Credits
- Additional Photos (online appendix)
- Document Revision History
Document Availability

Purchase from:
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Phoenix, Arizona 85007-3217
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Fax: 602-712-3235

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