



**XXIV<sup>th</sup> World  
Road Congress  
Mexico 2011**

Mexico City 2011.

# Protecting Natural Habitats in Road Development: A Multi-level Approach

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# Overview

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To introduce a multi-level approach to address the impacts of road development on natural habitats

- ❑ Impacts of road development
- ❑ The mitigation hierarchy
- ❑ The multi-level approach:
  - ✓ *national policy*
  - ✓ *sectoral planning*
  - ✓ *project engineering*



# Impacts from Road Development on Natural Habitats



1. Habitat Loss



2. Mortality from Poaching and Traffic



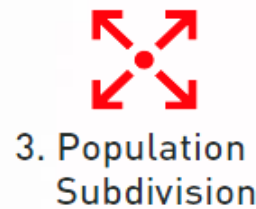
4. Barrier to Movement



Less habitat available

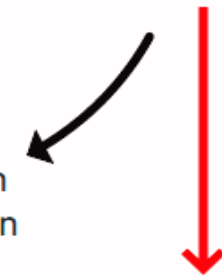


Increased mortality



3. Population Subdivision

Decreased immigration; increased vulnerability to stochasticity



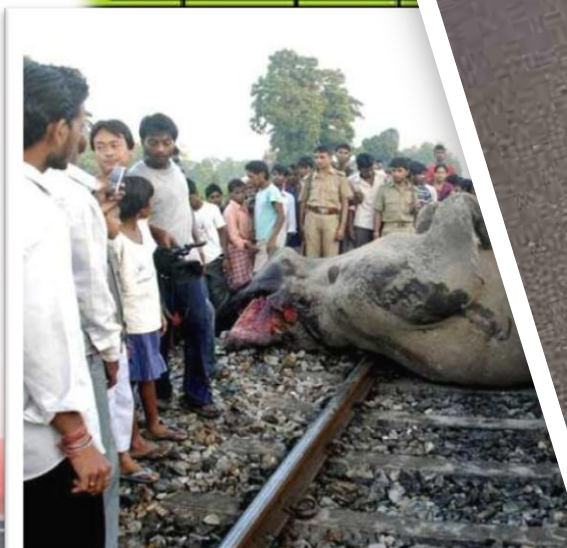
Less accessibility to mates, habitat, food, etc.

**Reduced Population Size**

**Reduced Population Persistence**



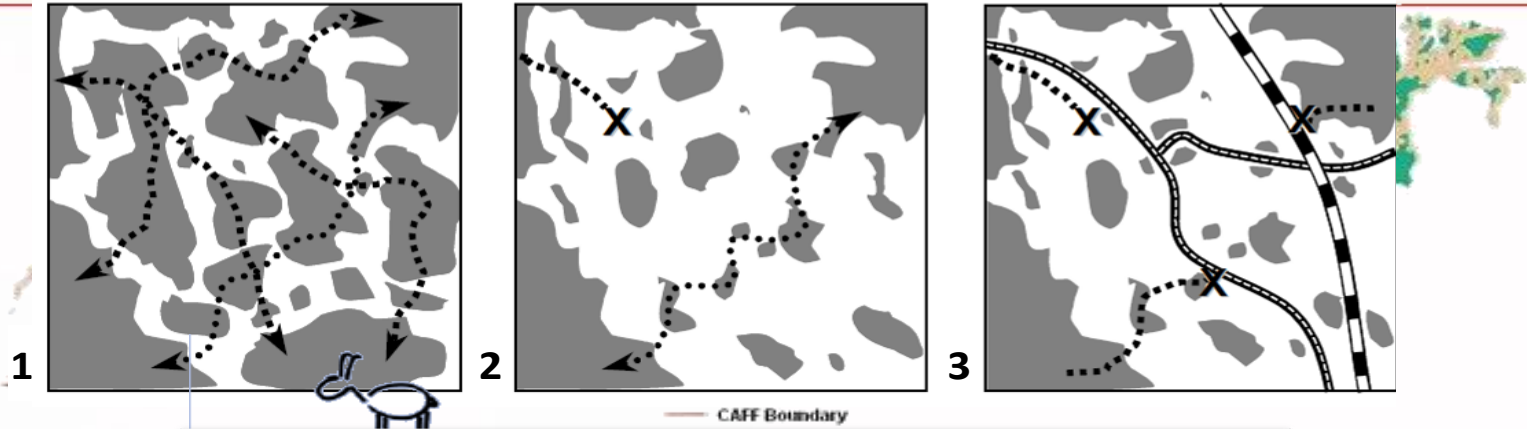
# Direct Impacts



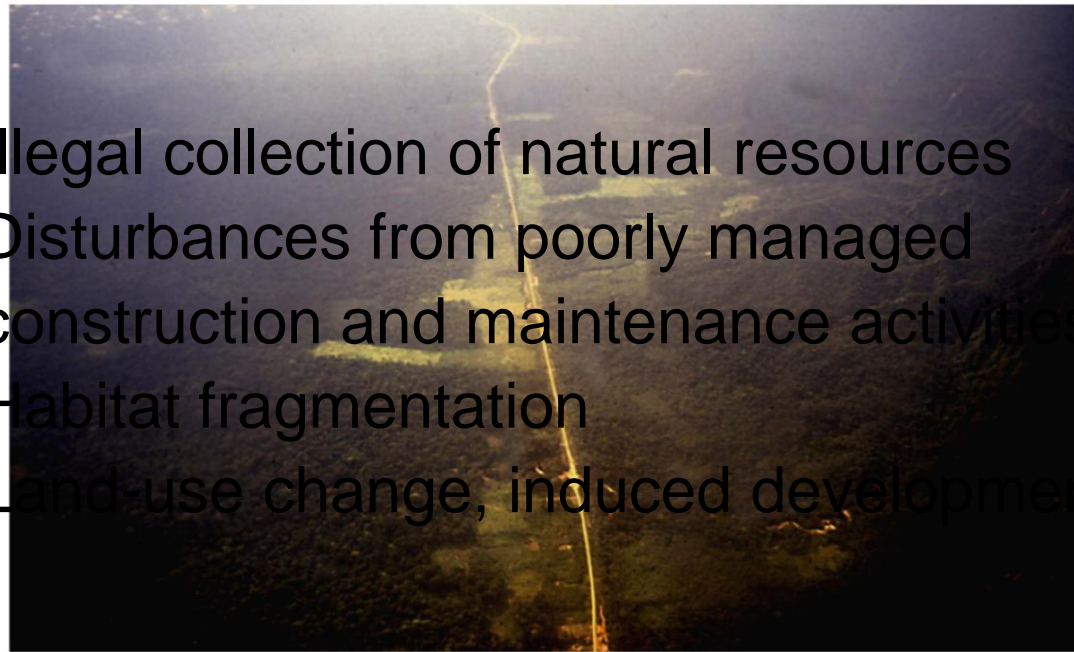
*Effect*



# Indirect and Induced Impacts



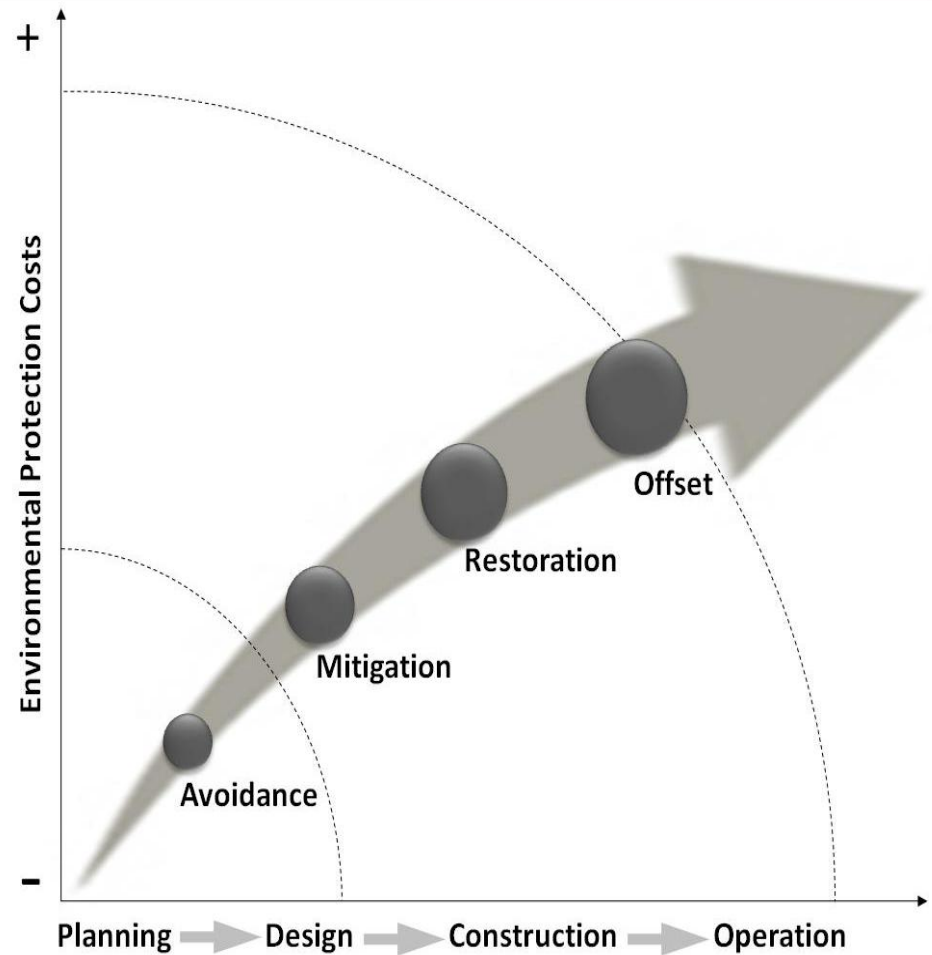
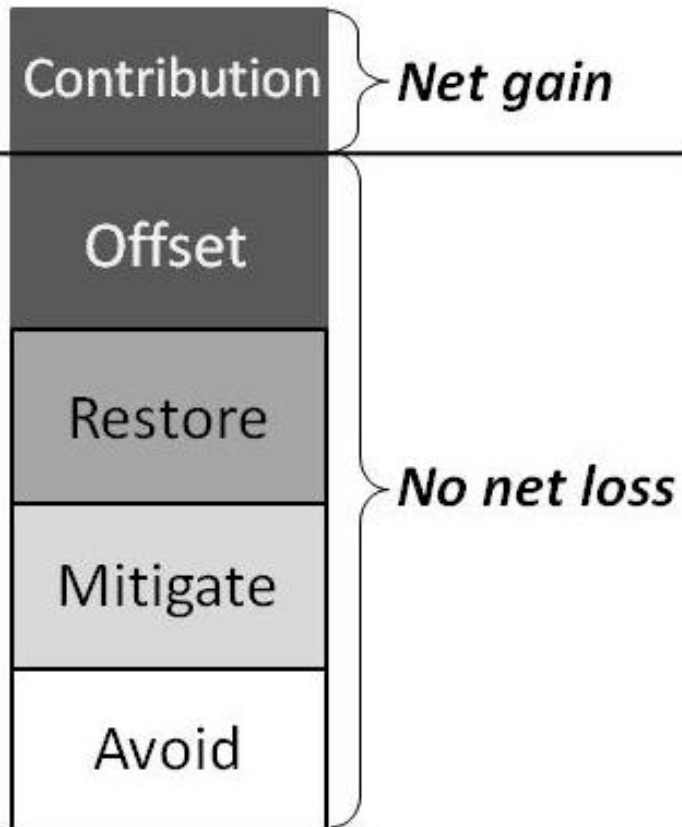
- Illegal collection of natural resources
  - Disturbances from poorly managed construction and maintenance activities
  - Habitat fragmentation
  - Land-use change, induced development
- Probability of population persistence



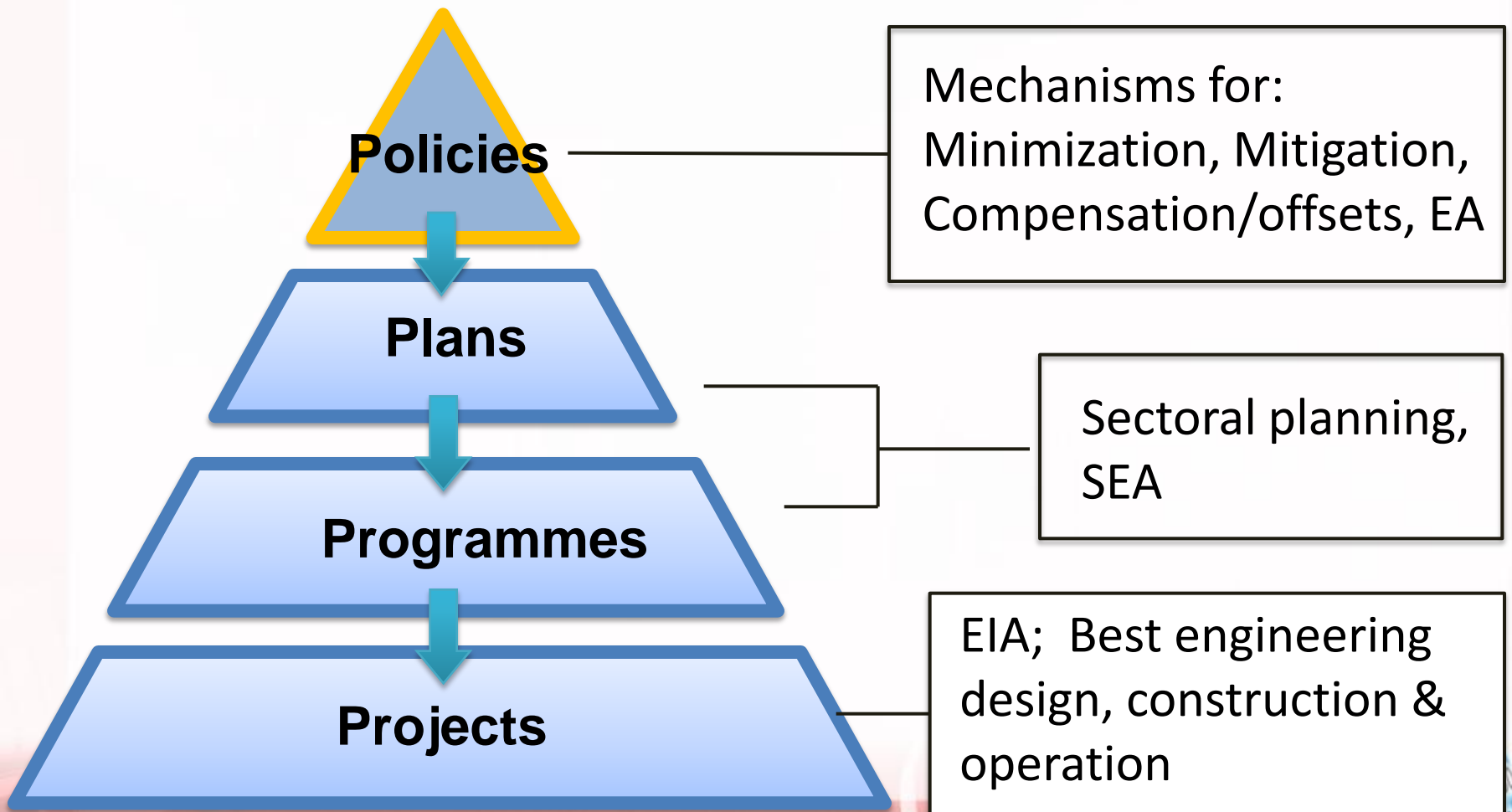
# The Mitigation Hierachy

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# The Multi-level Approach



# The Multi-level Approach

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*Traditional project-based approach* shows limitations in:

- ◆ addressing long-term impacts of road projects
- ◆ restoring habitat connectivity
- ◆ lowering human and monetary costs of habitat conservation activities



*The multi-level approach:*

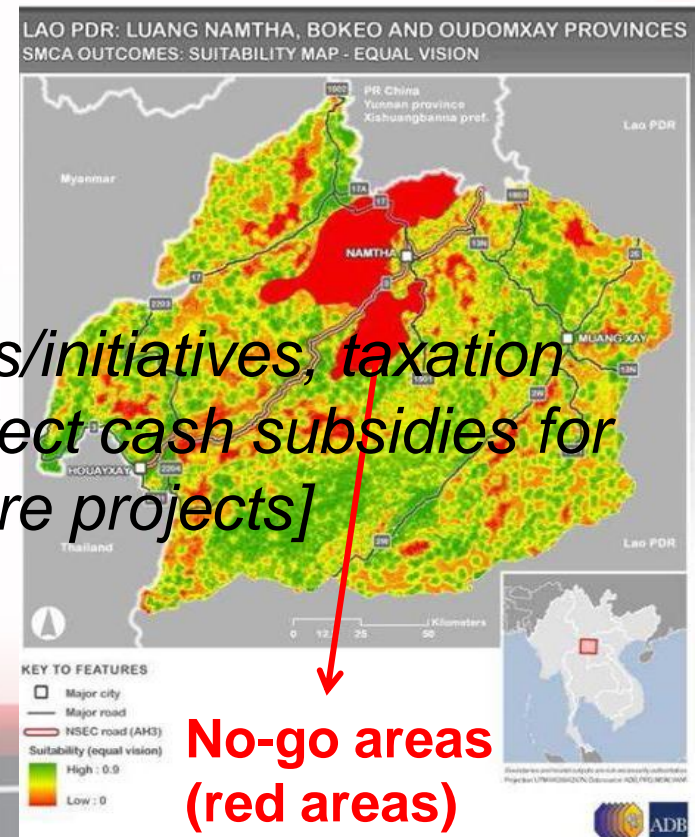
- ◆ ensures implementation of “avoidance”
- ◆ identify priorities of habitat that should be conserved/restored in a systematic manner
- ◆ more cost effective





# The Multi-level Approach: Options for National Policies

1. **Flag “no go” areas:** critical habitats, connecting corridors [*Biodiversity laws; Land-use policies; ecological zoning framework*]
2. **Provide financial incentives** [*national conservation programs/initiatives, taxation benefits, funding sources, or direct cash subsidies for habitat protection in infrastructure projects*]



# The Multi-level Approach: Options for National Policies

3. **Setting up direct/indirect offset mechanisms**  
[e.g., establishing channels to transfer part of project profits to support habitat conservation]

## *Brazilian Ecological Compensation Law*

- ❑ Acquisition of goods/services
- ❑ Land tenure regularization/demarcation

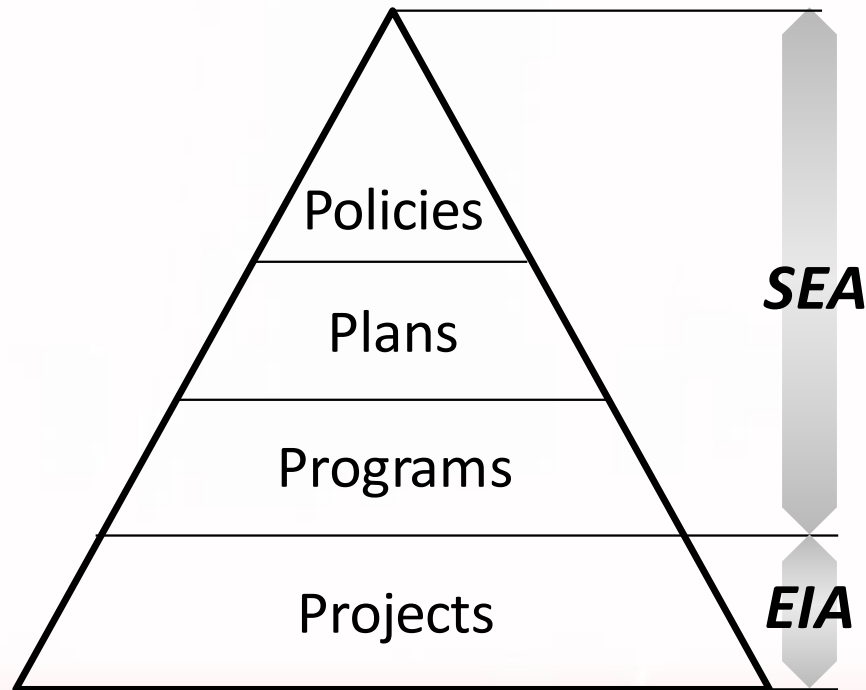
**Compensation  
Money**



- ❑ Research on creation and management of conservation unit and its buffer zone
- ❑ Elaboration/revision/implementation of management plans

# The Multi-level Approach: Options for National Policies

## 4. Establishing Environmental Assessment (EA) system



# The Multi-level Approach: Options for Sectoral Planning

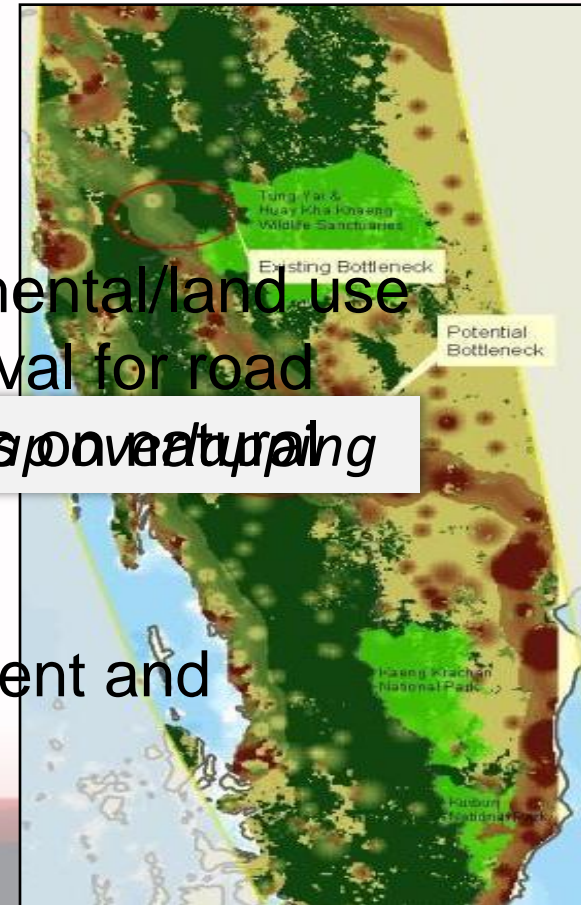
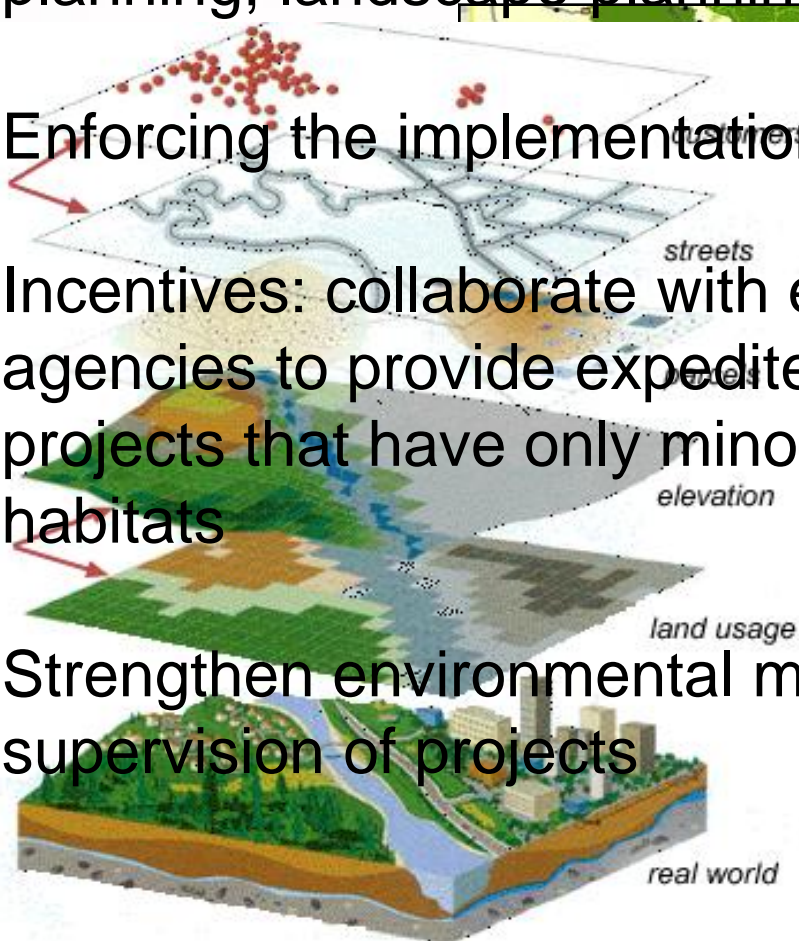
1. Using biodiversity-inclusive SEA in infrastructure planning; landscape planning

2. Enforcing the implementation of EIA

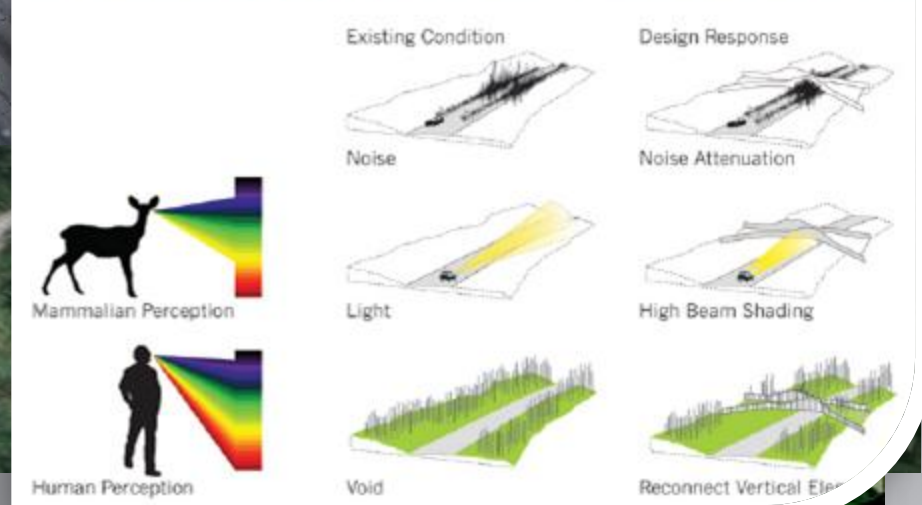
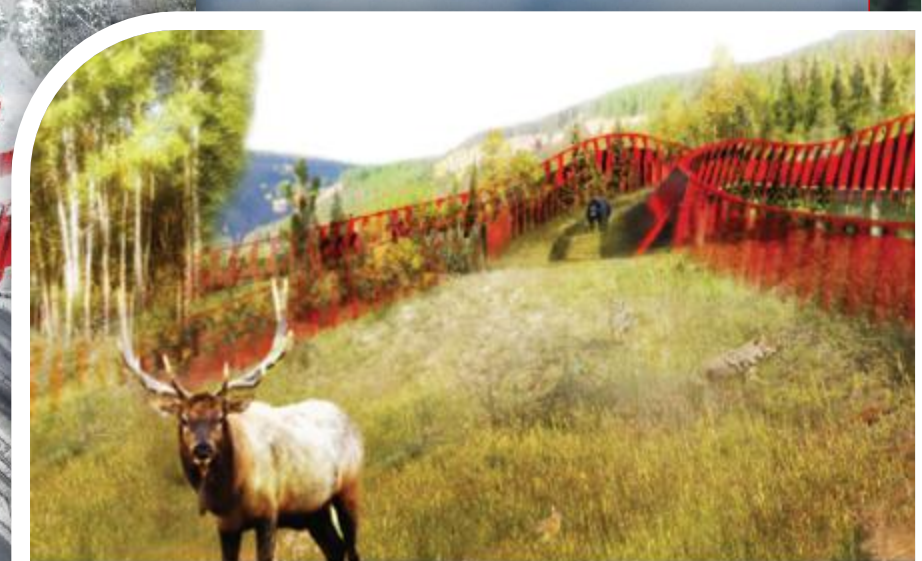
3. Incentives: collaborate with environmental/land use agencies to provide expedited approval for road projects that have only minor impacts on natural habitats

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4. Strengthen environmental management and supervision of projects



# The Multi-level Approach: Options for Engineering Design



# Conclusion

