PARLIAMENTARY INQUIRY INTO WILDLIFE ROAD STRIKE

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-NATIONAL TECHNICAL EXECUTIVE ECOLOGY – WSP AUSTRALIA PTY LTD

Relevant experience

1995 – 2000: PhD Deakin Uni, wildlife living in roadside habitats, northern Victoria

2000 – 2016: Assoc Professor and Deputy Director of Australian Research Centre for Urban Ecology, Melb Uni. Research and consulting to quantify and mitigate negative impacts of road and rail on wildlife.

2013: Established the Australasian Network for Ecology and Transportation (ANET)

2015: Published the international award-winning 'Handbook of Road Ecology'

2016 – 2025: Adjunct Assoc Profess Melb Uni, and Ecological Consultant. Worked on major road and rail projects across eastern Australia and internationally

2020: Founded and lead editor at www.TransportEcology.info

2024: Produced the Queensland 'Fauna Sensitive Transport Infrastructure Delivery Manual'

2025: Using technological solutions to reduce WVC – Transport for NSW

Five main points for today

1. Three main priorities or goals when addressing WVC
2. Need better WVC data to inform planning and mitigation
3. Consider the existing road network, not just new road and rail projects
4. Best WVC solution will vary by location, species, road type, traffic volume etc. Make evidence-based decisions when implementing mitigation
5. Technological solutions are likely critical, but significant investment in R&D is critical!

Three goals for mitigating WVC

1. **Animal welfare: Reduce wildlife injury, death and suffering**
2. **Human health, wellbeing and costs: Reduce human injury, death and costs, including for property damage and wildlife rehabilitation**
3. **Conservation outcomes: Improve biodiversity and conservation outcomes**

Need better WVC data in Victoria (and Australia)

- **WVC: Need to know where, when, what, why, who (which species)**
- **Good data leads to better decision-making – where to mitigate, for what species, when etc**
- **Dozens of road-kill data collection Apps and systems around the world**
- **None in Australia - we need one, now!**
- **Building an app is simple, but careful design needed to maximise value for systematic surveys and incidental observations, improve wildlife carer responses, insurance claim, etc**

New roads are a small fraction of the problem

- **Need systematic landscape-scale planning to identify WVC hotspots, barrier to movement, opportunities to improve, regional ecological corridors, etc**
- **Funding and programs for fixing or ‘defragmenting’ the impacts on the existing road and rail network**
- **Focus not just on ‘threatened’ species, but common species, declining species, and also non-native large-bodied species, such as deer.**

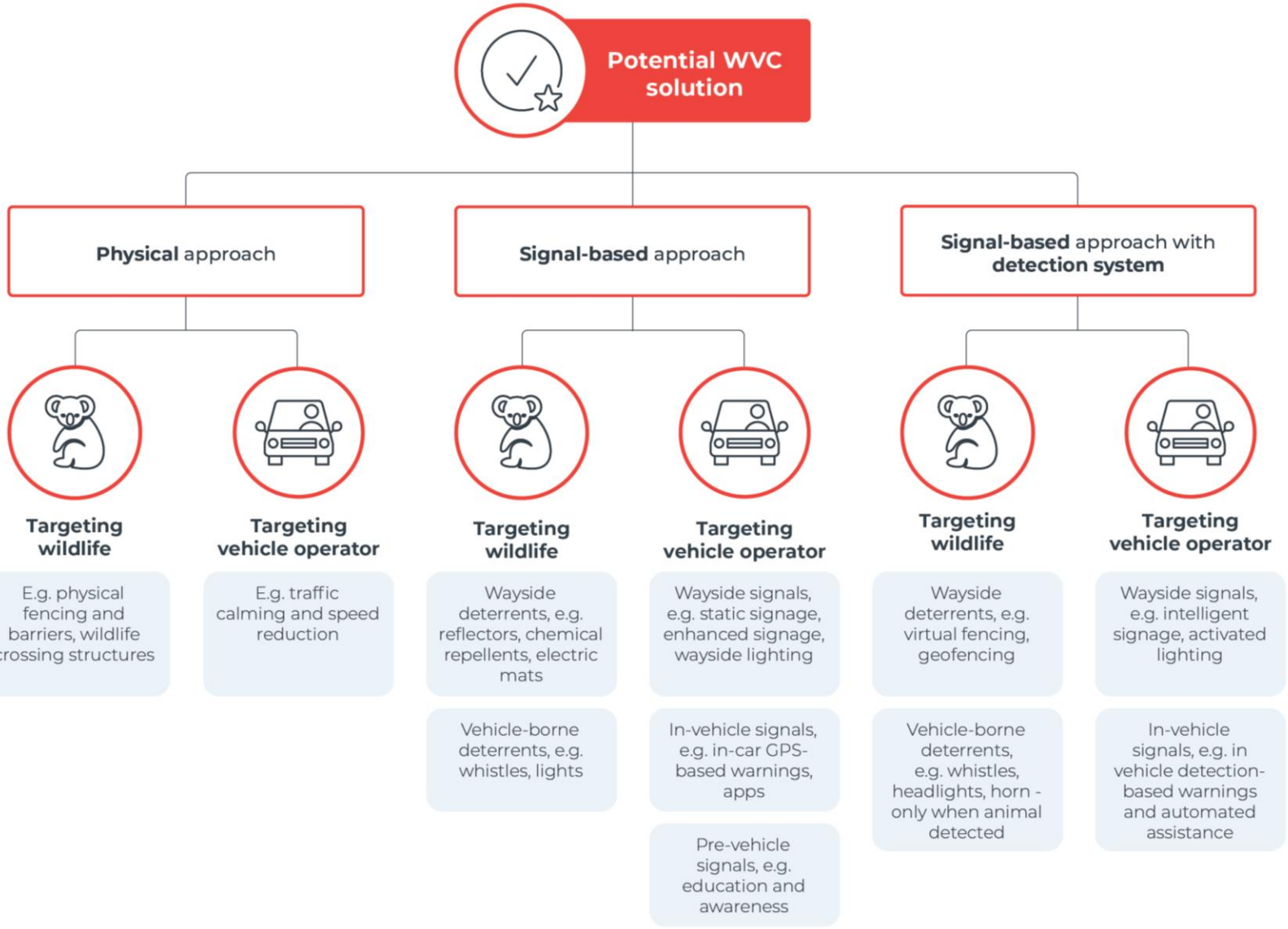
Netherlands: >75 land-bridges (1/6th the area of Victoria)

WVC mitigation measures schema

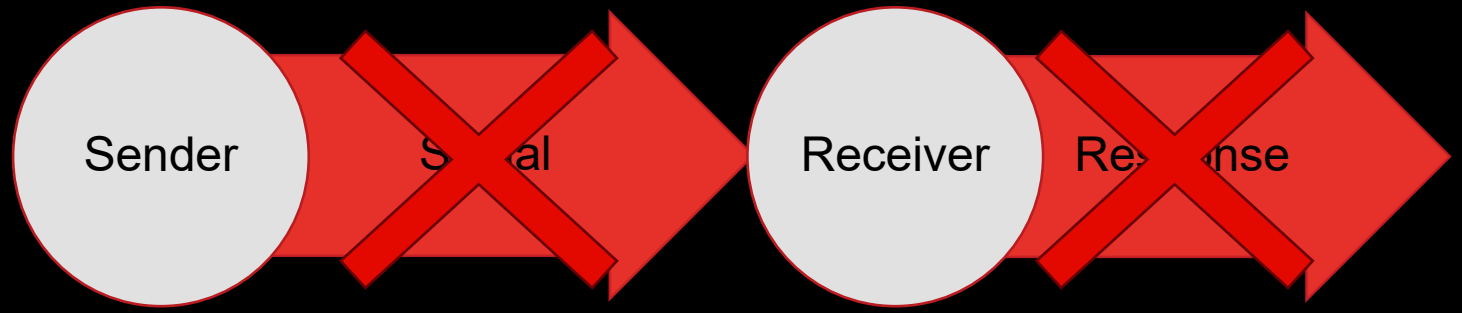
1. **Approach type** (physical, signal-based, signal-based with detection)

2. **Targeted receiver** (wildlife or vehicle-operator)

3. **Signal origin** (on/from the wayside or in/from the vehicle)



New solutions will rely on signal theory



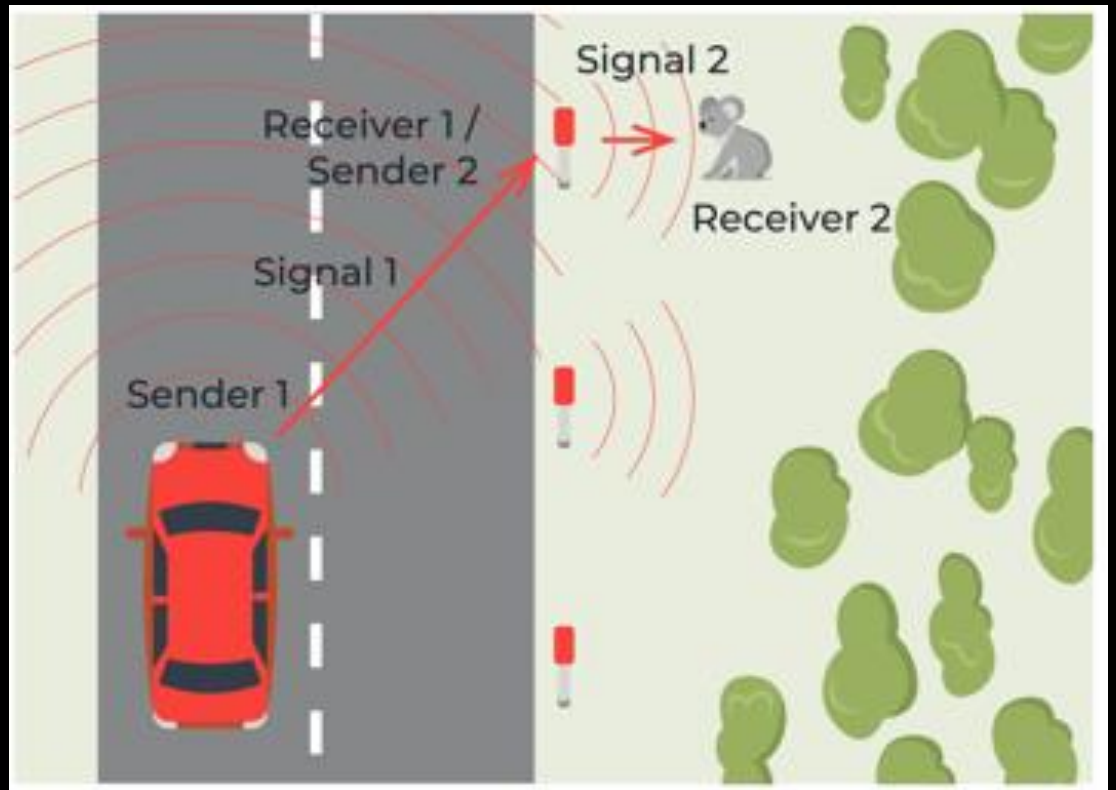
An effective signal should:

- Be ‘heard’ by the intended receiver
- Elicit the intended response

Signal theory in WVC mitigation

- **The receiver is either**
  - The animal
  - The vehicle-operator

  - Systems can get complicated with multiple steps of signalling



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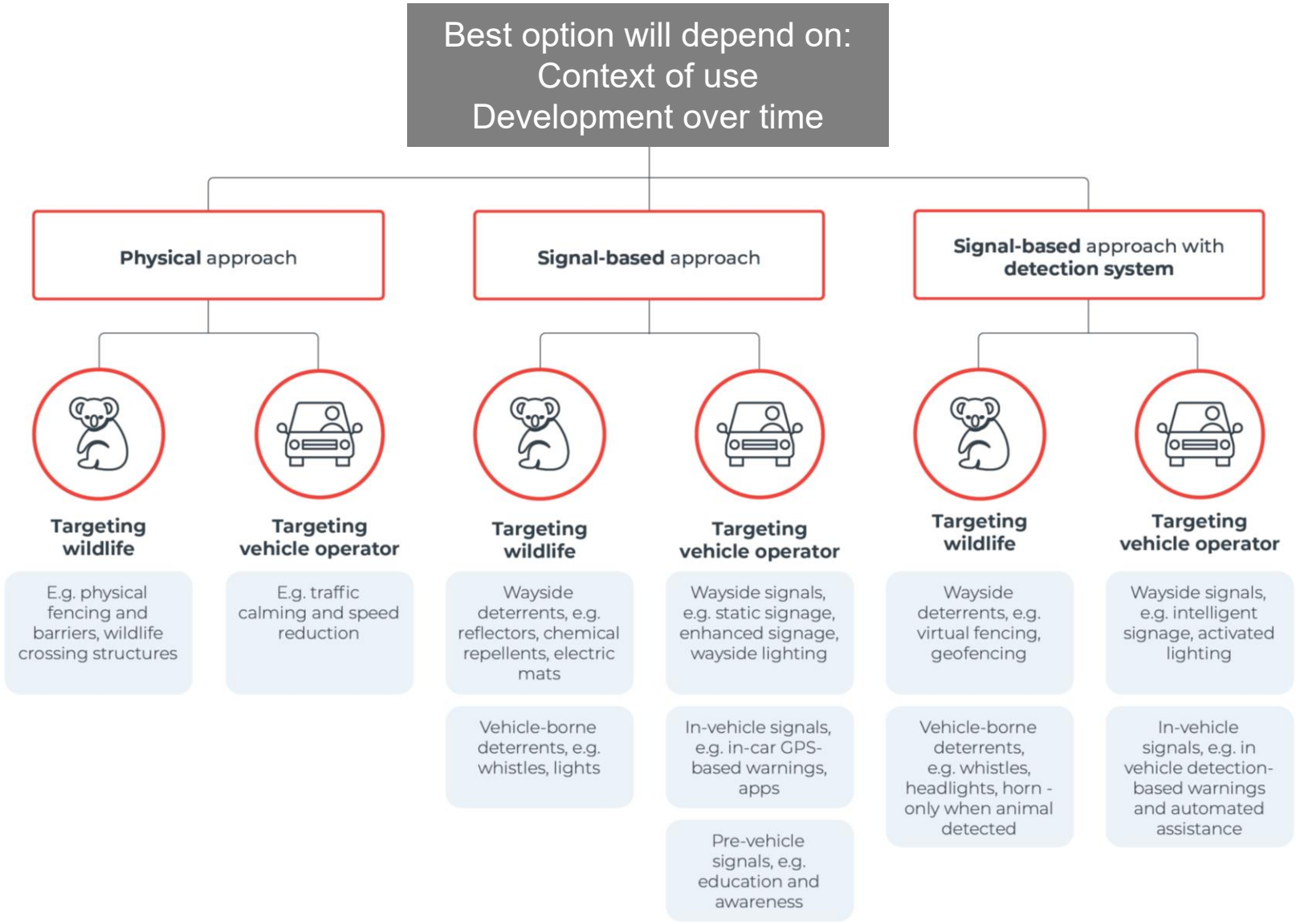
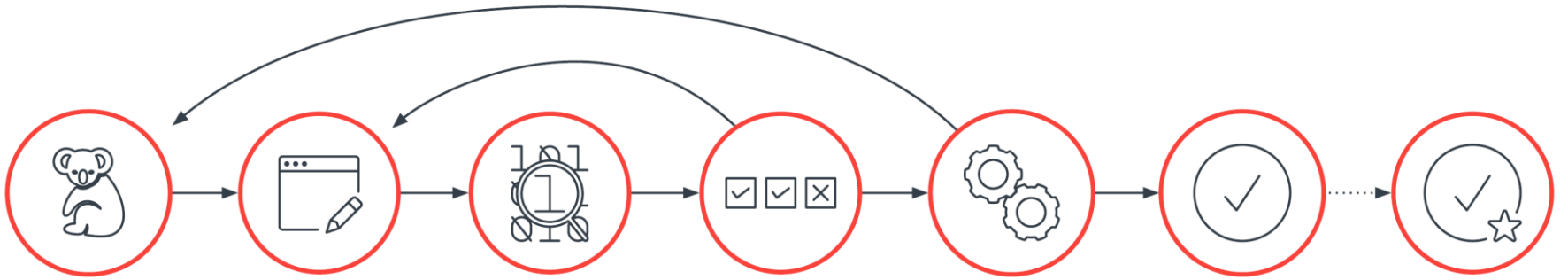


WVC mitigation measures evaluation framework

When any step is unsuccessful, including robustly field trials, repeat process using ecology and technology inputs updated with lessons learned and new information.
Funding and collaboration can provide new information.



Biology / behaviour

If any step, especially early in the process, is poorly implemented, the outcome is likely to fail, and the solution will not be ready for use. Lessons learned should be identified and applied in future attempts.

Concept design

Tech design

Technology stages should use lessons learned to improve designs between design and prototypes testings stages, e.g. machine learning.

Prototype testing

Field trialling

Outcome

1. Ready for use in context. Implement.

2. Not ready for use in context. Apply learnings and repeat process.

3. Not suitable for context. Investigate new solutions and/ or apply solution to better suited context.

When all steps, including robustly designed field trials, are complete, one of three possible outcomes and recommended actions is reached.

Future opportunities

Refined product ready for use in new context or new product builds on it.

Results from the process can feed into processes for other applications or solutions, providing increasingly improved knowledge, and faster and improved innovation processes each time.

Q&A

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Report

Assessment in Australian context

Includes:

- Principles
- Tools
- Detailed evaluation of all available mitigations
- Suitability outcomes
- Future directions and recommendations

Contacts

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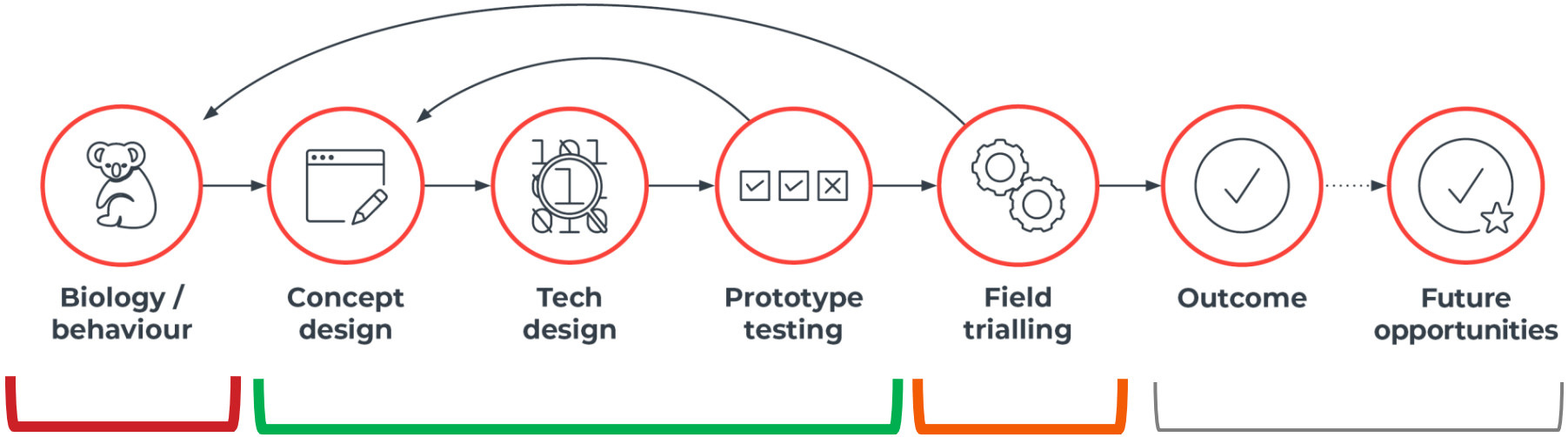
ANET
AUSTRALASIAN NETWORK FOR ECOLOGY & TRANSPORTATION

WVC mitigation measures evaluation framework



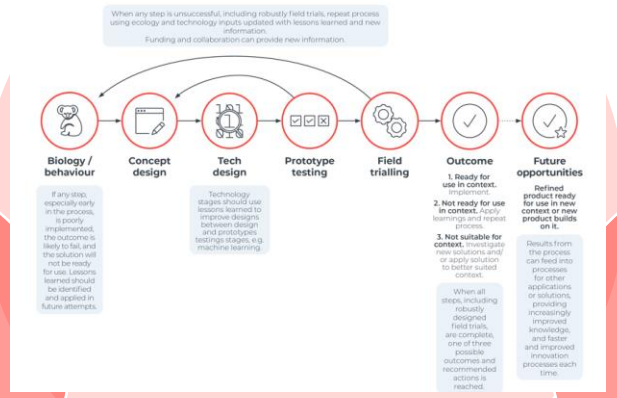
Assess success at each developmental stage

Determine an outcome

Implementation

Providing funding

Government
Industry



Requesting funding

Development

Collaboration

Research (biology or trialling)

Technology production (hardware or data)

Requesting funding

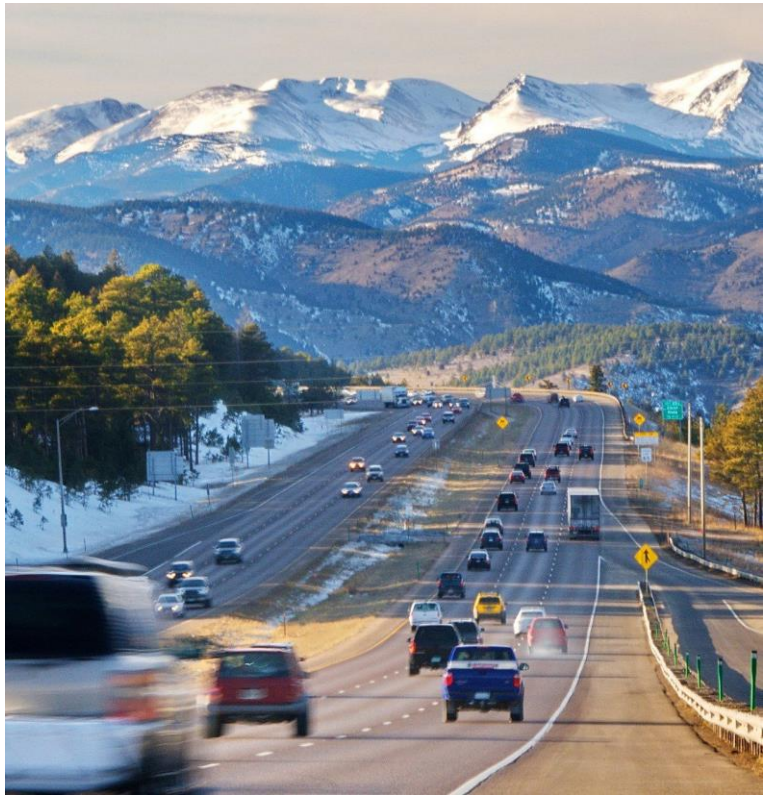
Development

Collaboration

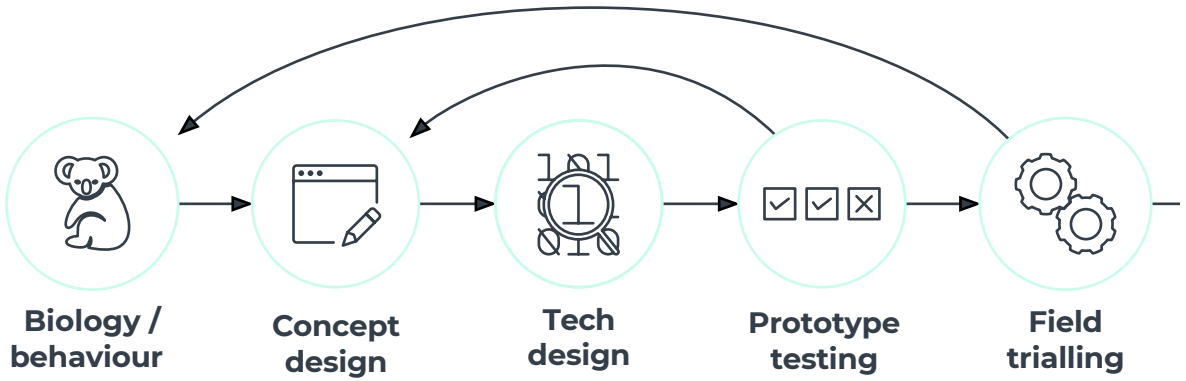
Benefits

- **Clear decision making**
- **Confidence in choice**
- **Reduced wastage** of time and funds
- **Reduced unintended impacts**
- **Increased collaboration** with direction
- **Improved efficiency** of development

Suitable mitigation implemented sooner



Enhanced signage



Existing technology functions as intended.

Confident that range and message of signal is suitable. Intended response is elicited. While margin of response is small, WVC risk reduction for small behaviour change is significant. Opportunity to develop signals that elicit larger margins of responses. Possibility of long-term habituation should be addressed by using signs reliably, e.g. only at high-risk and limited times and areas.

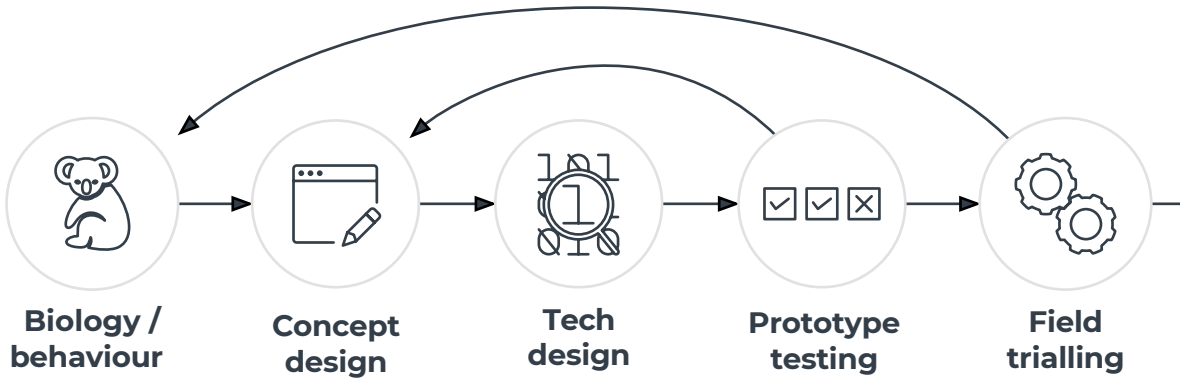
Well-designed field trials have shown success in reducing driver speed and WVC when solution is implemented suitably.

Key

— Sufficient research and investment, and appropriate approach based on principles (Section 2.3).

— Requires further research or investment based on principles (Section 2.3).

Wayside deterrents with detectors



Some success for target animals overseas. Suitable signal for Australian species unknown. Possibility of habituation and unintended responses a concern. Opportunity for research on effectiveness of different signal ranges and intensities on Australian species.

Signalling technology will require refinement once suitable signals are determined. This is likely relatively simple and unlikely a limiting factor.
. Reliable detection for small and erratic Australian species is a limitation. Opportunity for investment in detection systems.

Well-designed field trials have been successful overseas with large-bodied animals. Mixed results in Australian studies with flawed designs. Unsuccessful in well-designed field trials in Australia, likely due to inappropriate signals used. Opportunity for investment in robust field trials only after suitable signal types are determined.

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