Evacuation modelling: helping communities get to safety

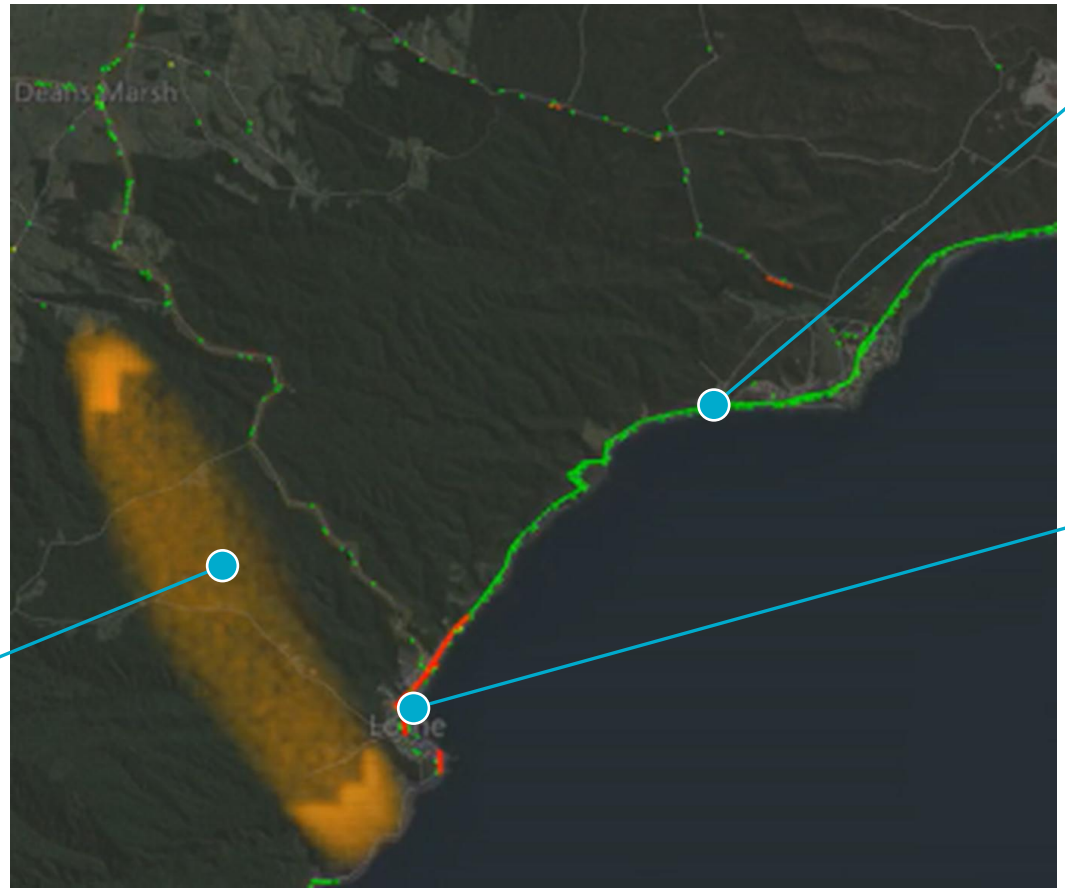
Vincent Lemiale | 23 October 2026

Evacuation modelling: why it matters

Planning ahead so communities can get to safety

Before an emergency, agencies need to know whether a community can get out in time.

Modelling lets agencies test scenarios and assess risk ahead of time, for planning, preparedness and training.



Places have limits

One coastal road out, and few alternatives

People are unpredictable

Not everyone leaves on time, so traffic builds in town

The hazard changes quickly

Fire can spread fast and cut off routes

SEEKER simulation, Great Ocean Road, Victoria. Vehicles coloured by speed.

Evacuation modelling: how it works

Hazard, people and places, brought together in one simulation

INPUTS

Hazard
How fire, floodwater or smoke spreads over time

People
Where people are, and how they decide when and where to go

Places
Roads, footpaths, refuges and high ground

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EVACUATION MODEL

Simulate the evacuation

Hazard, people and places interact as the event unfolds, across many what-if scenarios

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OUTPUTS

- Time to get everyone to safety
- Bottlenecks on roads and paths
- Who is most at risk, and where
- Which routes, timing and warnings work best

HAZARDS MODELLED TO DATE

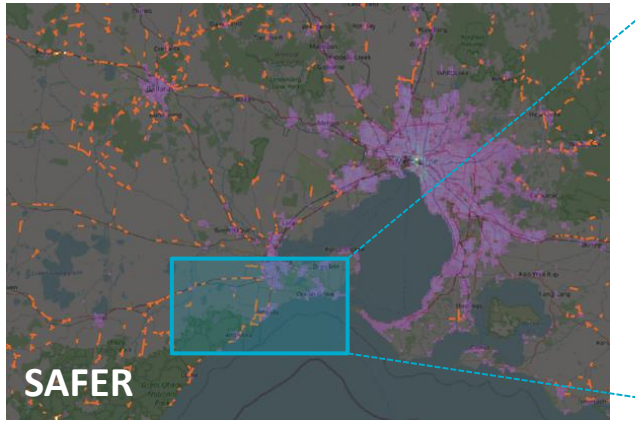
Bushfire | **Flood** | **Tsunami** | **Tropical cyclone** | **Bushfire smoke**

Hazard scenarios come from specialist models and change over time as people evacuate.

Evacuation modelling: capability across scales

State-wide screening down to individual pedestrian behaviour

STATEWIDE



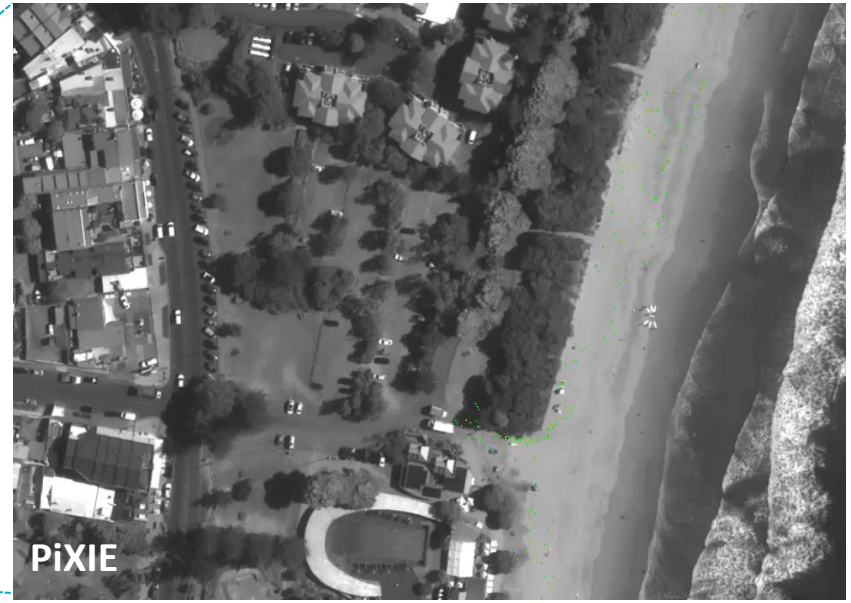
Critical link capacity x fires impacting it

REGIONAL



Vehicles coloured by speed

LOCAL



Pedestrians (green) moving towards their vehicles

Where would evacuation be hardest?
Screens many fire scenarios across a whole state

How will a community evacuate?
Individual drivers making their own decisions

How will people move on foot?
Schools, town centres, refuges, beaches

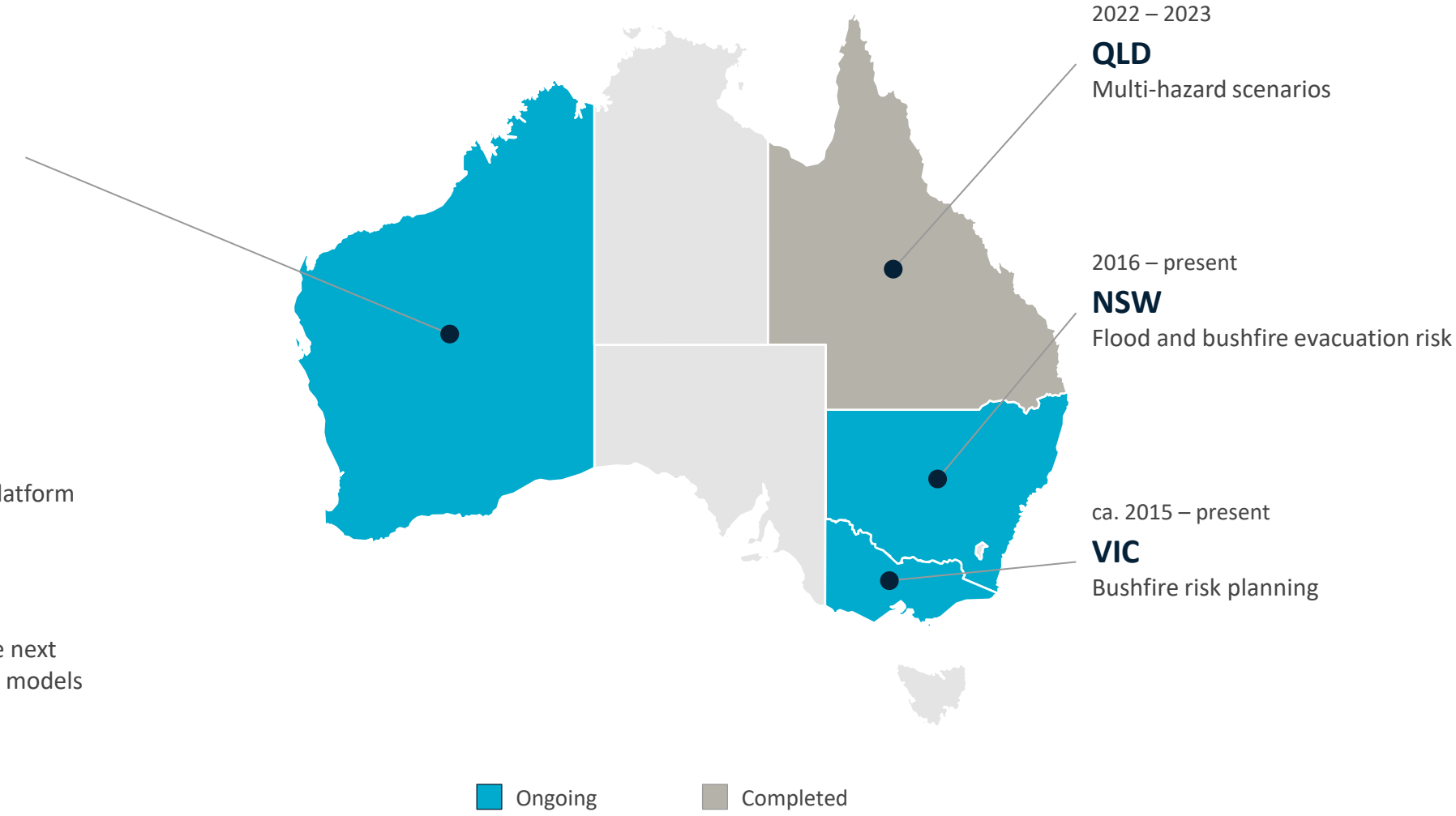
Evacuation modelling: engagement with Australian agencies

From state-based risk tools to a national roadmap for next-generation evacuation modelling

2021 – present

WA

Bushfire assessment



2022 – 2023

QLD

Multi-hazard scenarios

2016 – present

NSW

Flood and bushfire evacuation risk

ca. 2015 – present

VIC

Bushfire risk planning

NATIONAL PROGRAMS

2022 – present

NEMA

National unified online platform

2026 – 2027

NHRA

National roadmap for the next generation of evacuation models

Thank you

Technology
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