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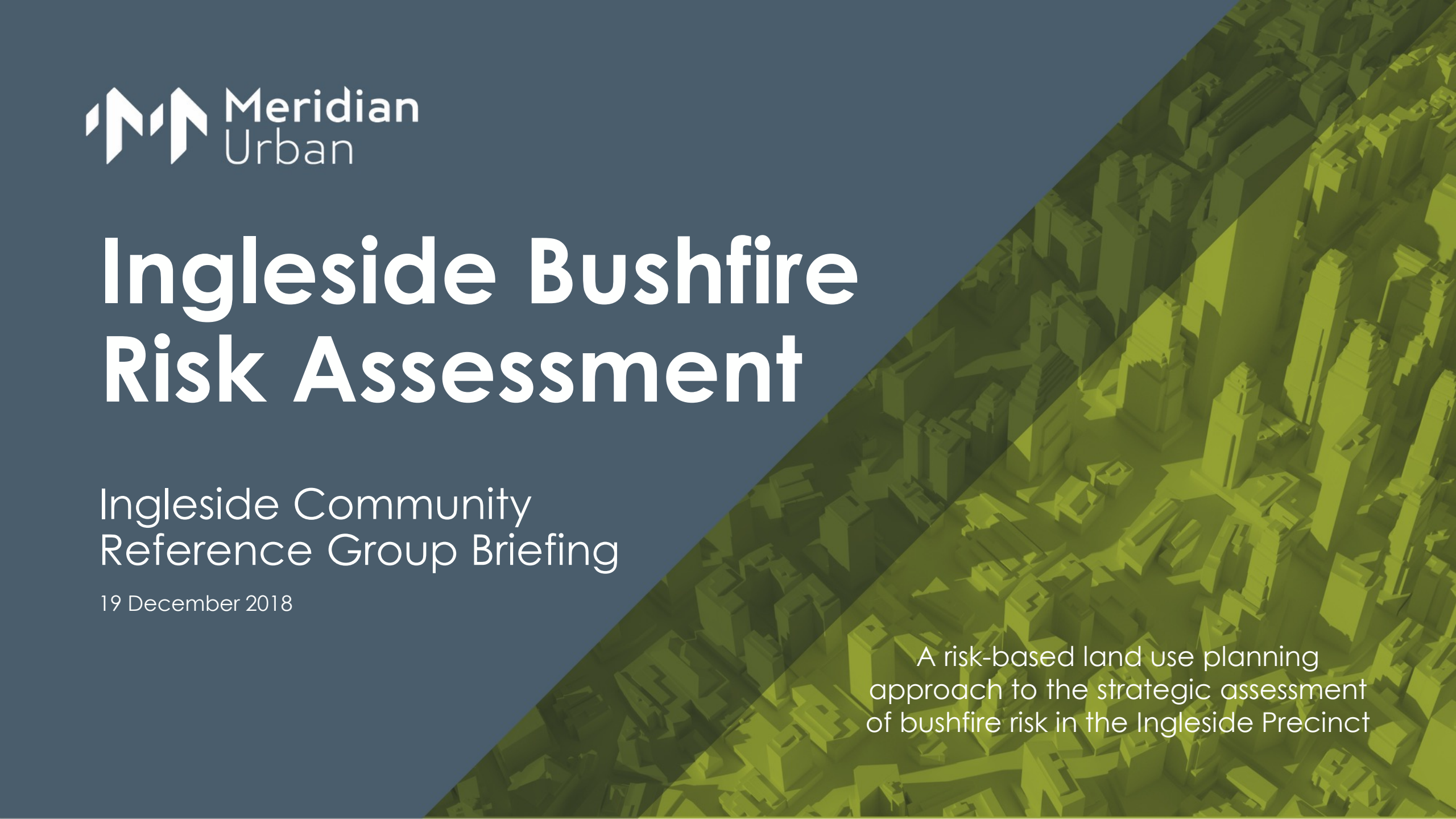
Ingleside Bushfire Risk Assessment

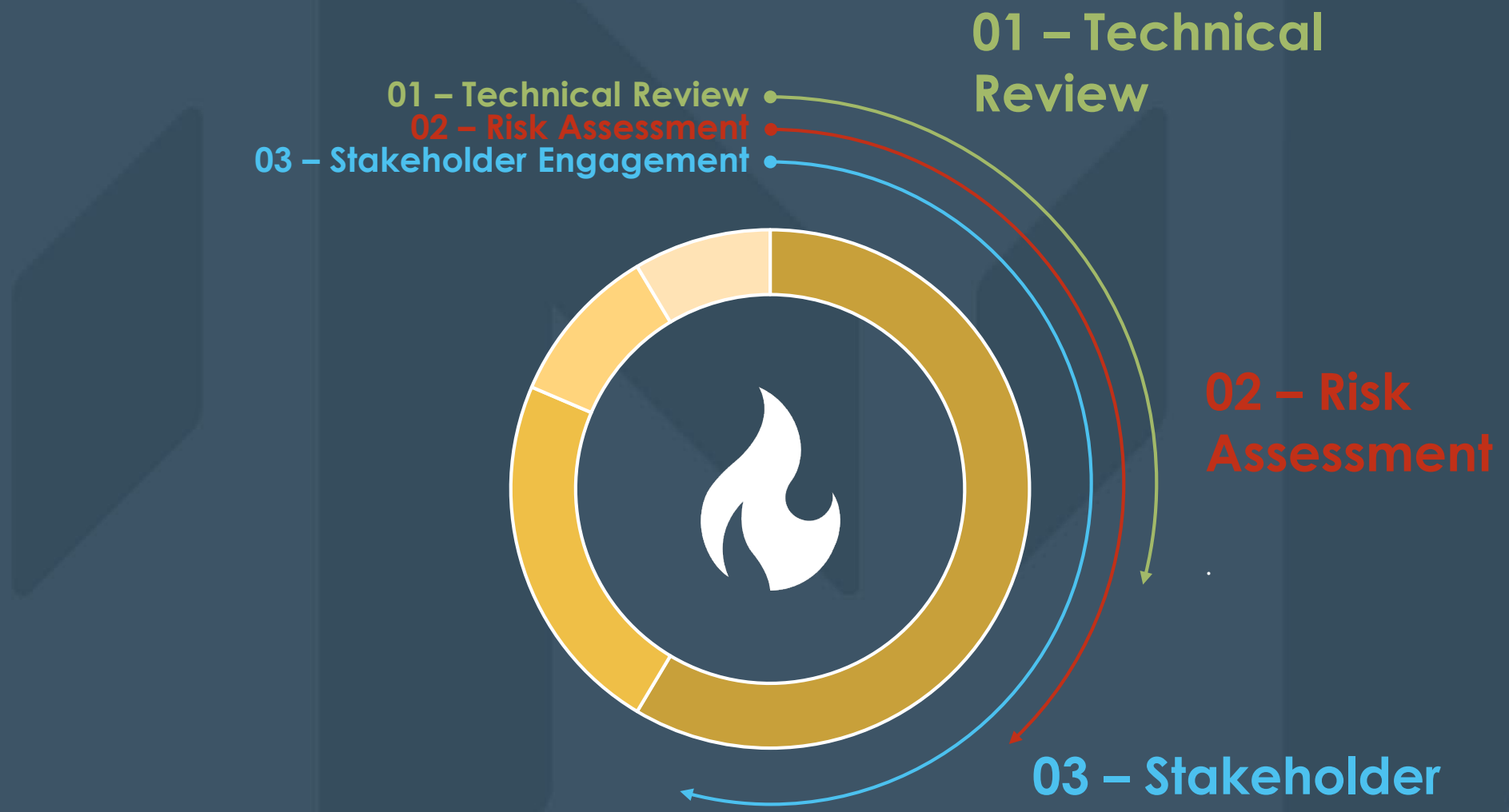
Ingleside Community Reference Group Briefing

19 December 2018

A risk-based land use planning approach to the strategic assessment of bushfire risk in the Ingleside Precinct



Our scope


01 – Technical Review
02 – Risk Assessment
03 – Stakeholder Engagement
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02 – Risk Assessment
03 – Stakeholder Engagement

Strategic v statutory processes

- ‘Should’ v ‘how’
- Line of sight international and national frameworks
- Global and national increases in bushfire losses
- Planning for Bushfire Protection 2018

Land use planning is perhaps the most potent policy lever in addressing future natural hazard risk

NSDR

- Office of Emergency Management
- Productivity Commission Report to Commonwealth Government

Process snapshot

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A 'tapestry' of contextual data and evidence

An evidence-based analysis of existing vs proposed risk

Risk context

Risk analysis

Options and risk treatments

Integrated approach

A risk-based land use planning approach to the strategic assessment of bushfire risk in the Ingleside Precinct, adopting an integrated resilience-based lens

Key contextual narratives

Informing detailed risk identification, analysis and evaluation

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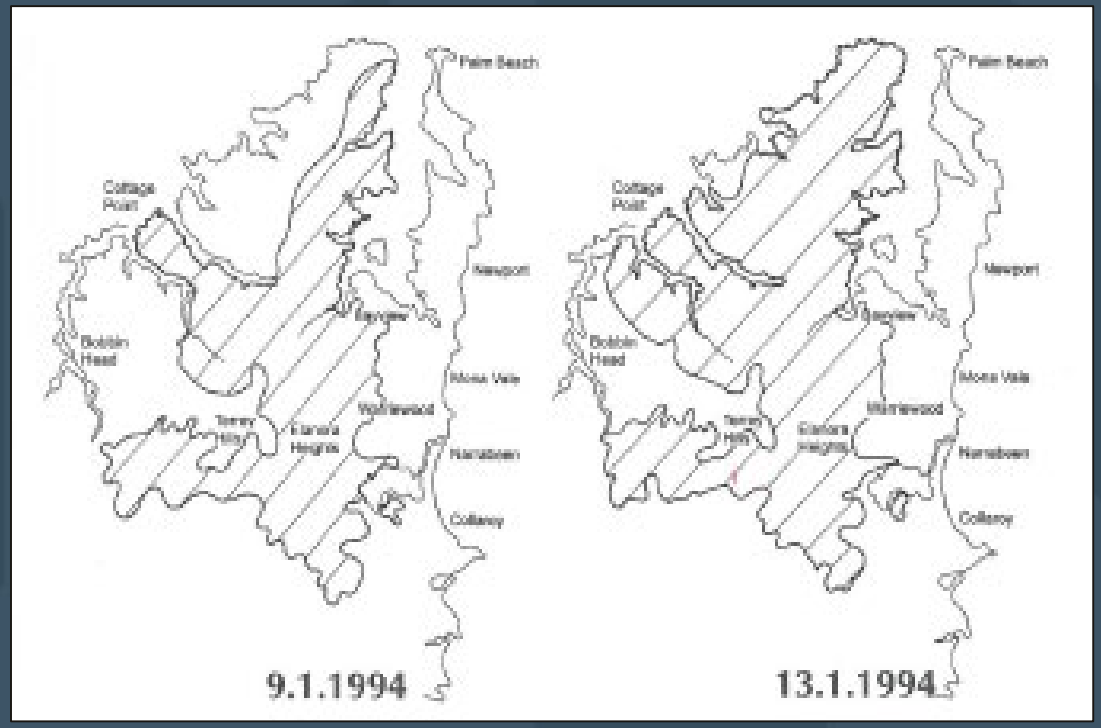
Cottage Point Fire Extent 7-13 January 1994



Source: Macleod, 1996)

Risk identification

Likelihood of fire

Daily FFDI records back to 1972

- Highest recorded FFDI – 116 at Richmond on 26 November 2015
  - FFDI 111 on 13 October 2013
  - FFDI 94 on 17 October 2014
  - FFDI 91 on 10 September 2014
  - FFDI 95 on 23 December 1990
- House loss escalates from FFDI 50
- 1994 Cottage Point fire – FFDI circa 62 causing over $12m in damage and loss in Ingleside
- Warringah Pittwater BFRMP – average of 48 bushfires per year
- Events every 5-7 years on average considered major events

2% AEP (1 in 50 year) fire weather has occurred multiple times between 1972 and today

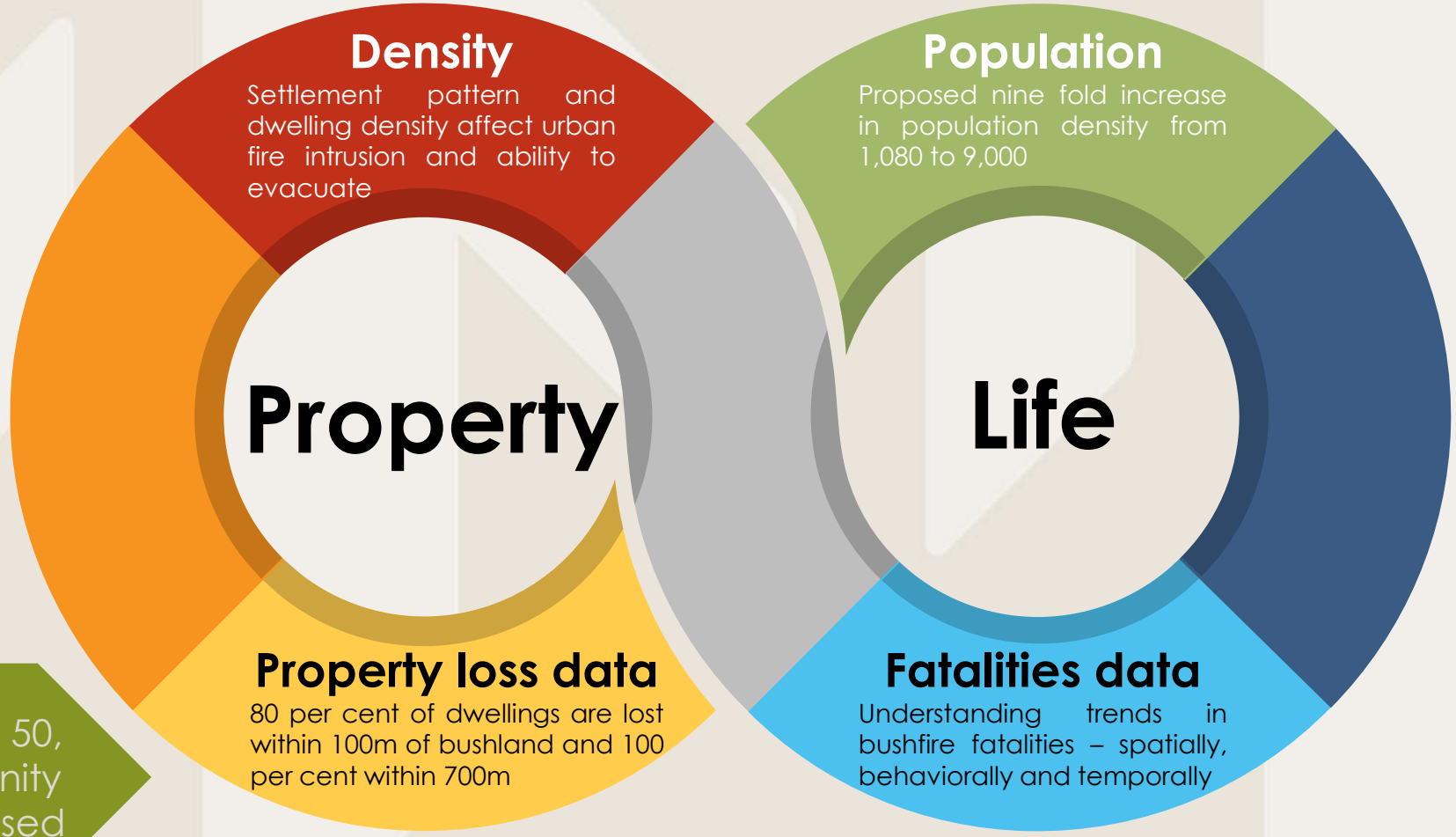
26% probability of a 1% AEP (1:100 year) event occurring over life of a 30 year mortgage

45% probability of a 2% AEP (1:50 year or FFDI 100) event occurring over life of a 30 year mortgage

Likelihood of fire generally = almost certain

Likelihood of a catastrophic fire = likely

Consequence



Urban intrusion

Property loss extending beyond 100m is typically a result of settlement pattern, density and surrounding vegetation (corridors and landscaping)

Evacuation

Five existing network routes in/out of Ingleside, which is not proposed to increase. Four of the routes traverse bushland

Where FFDI exceeds 50, suppression opportunity becomes compromised

Proximity to hazard

The difference between Ingleside and other areas across metropolitan Sydney?

The likelihood of catastrophic fire AND proximity to hazard source

Risk analysis

Landscape hazard assessment + Fatality, dwelling loss & attack mechanism data = Risk exposure mapping

Risk exposure mapping
- Landscape risk
- Localised risk

Existing

Proposed

Data analysed across existing and proposed land use zones, strategic evacuation network, key infrastructure locations, by sub-precinct and across multiple fire weather scenarios using GIS data query processing

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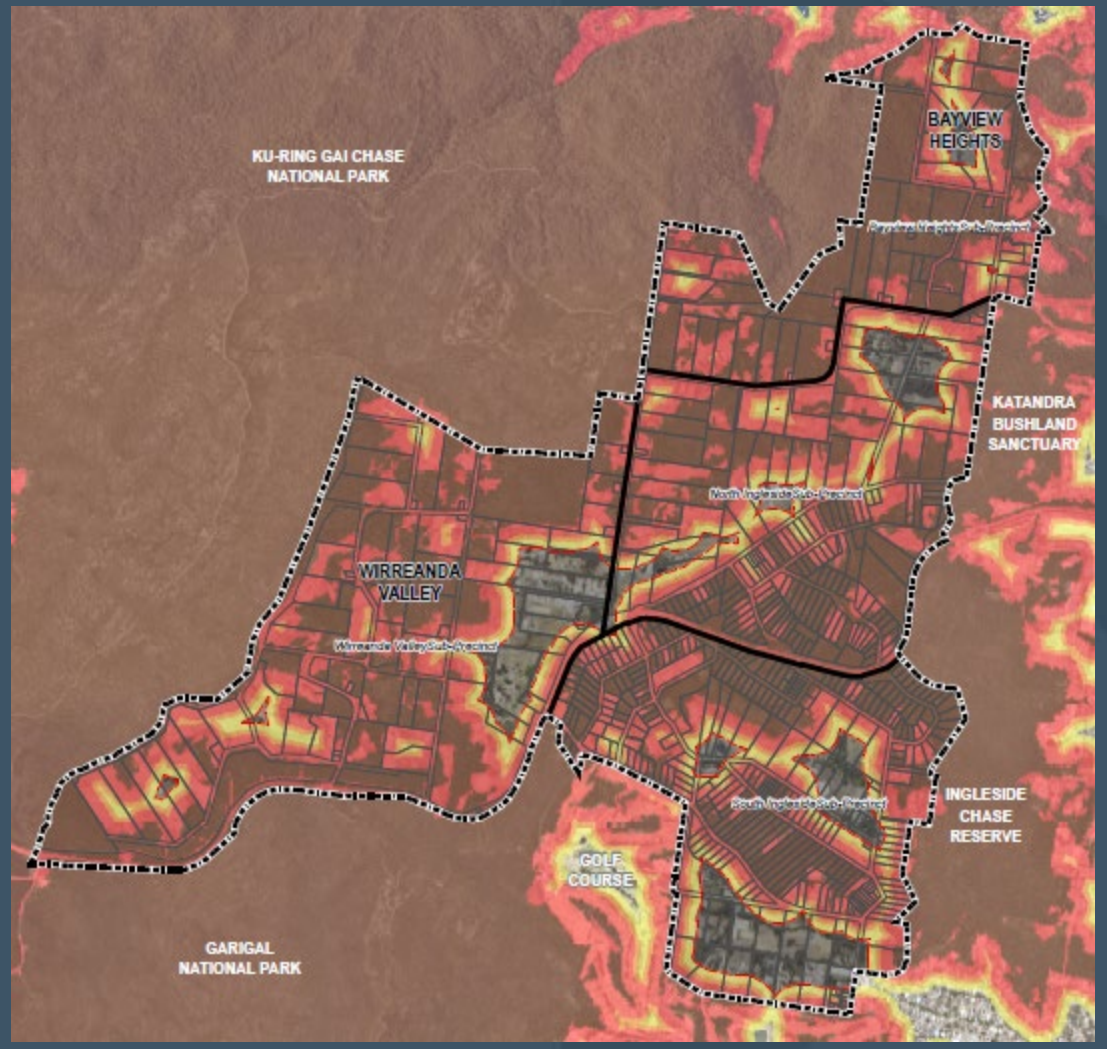
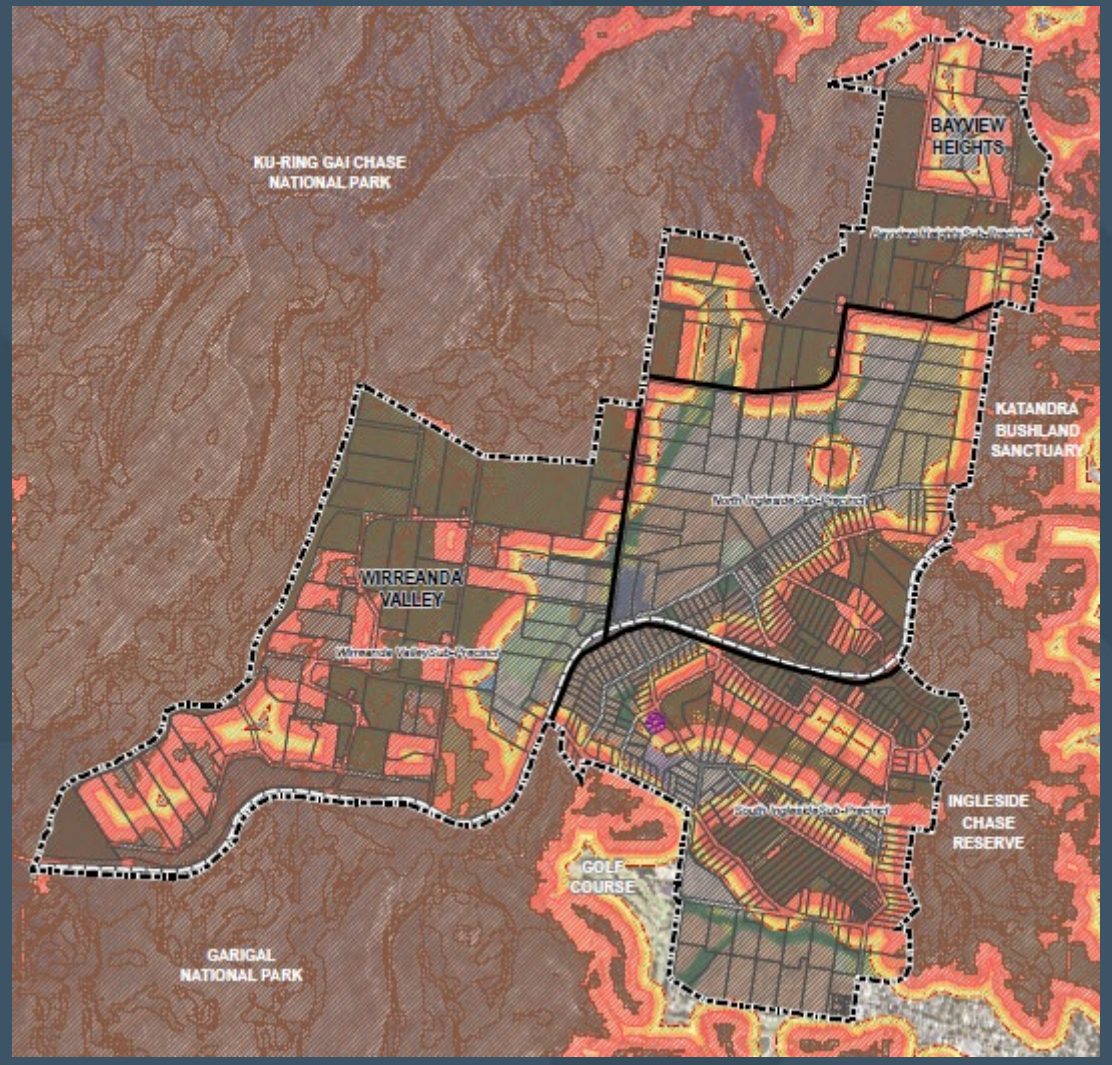
Risk mapping





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Ingleside risk profile

733%
increase from 1,080 to 9,000

EXPOSURE TO PRIMARY LOSS EXTENT (PROPOSED)
73%

EXPOSURE TO SECONDARY LOSS EXTENT (PROPOSED)
100%
NO CHANGE

25%
Mona Vale Rd corridor subject to flame contact (proposed)

18%
DECREASE IN LAND EXPOSED TO BUSHFIRE ATTACK MECHANISMS (EXISTING TO PROPOSED) WITHIN PRIMARY LOSS EXTENT

Flame contact
Radiant heat flux
Ember attack
+
Fire-driven wind
Smoke

Whilst property risk can be mitigated to an extent, the question of risk to life is increased by proposed development scenario

Damage/loss caused in 1994 Ingleside fire at FFDI 62
$12m

4 PROXIMATE 2% AEP (1 IN 50 YEAR or FFDI 100) FIRE WEATHER EVENTS HAVE OCCURRED IN PAST 5 YEARS

Key exposure issues

Evaluation process guided by:

- Landscape assessment
- Land use planning assessment

1. Density / settlement pattern and whole-of-Precinct evacuation (network vulnerability & no new road connections)
2. Appropriateness of density v exposure
3. Potential for isolation
4. Increase in landscape fuel connectivity (revegetation)
5. Potential vulnerabilities of the strategic evacuation network
6. Ability to achieve defendable space and APZs
7. Potential for inadvertent adverse impact on others' ability to evacuate

- Disaster and emergency management
- Cascading and compounding risks
- Infrastructure exposure, vulnerability and redundancy

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Compounding risk

Likelihood and history

Higher magnitude events and probability of ignition. Learned experience from the 1994 event with over $12m in loss and damage, and Coronial Inquiry

Proximity

Not only proximate but integrated with significant hazard and transition of key fire runs. North Ingleside is situated within a known fire path

Revegetation

Alteration of fuel composition across the Precinct coupled with conservation of important ecological values and desire for green character

Nature of consequential loss

Higher population giving rise to increased exposure, intersection of **settlement pattern** and **density** with **ability to evacuate** safely and likelihood of **urban fire intrusion**

Multiple issues acting in concert which inform risk magnitude

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Spectrum of risk treatment

Lower risk

Moderate risk

Higher risk

Avoid

Eliminate the cause of risk

Mitigate

Reduce likelihood or consequence of risk

Transfer

Defer risk to other (third) parties to take on responsibility of risk

Accept

Develop plans to deal with the risk

The extent of contextual data and evidence

Compounding nature of a range of risk

Residual risk

Benchmarking risk acceptability

Matters of strategic risk exist in relation to the draft Structure Plan:

- **the evacuation network and potential for entrapment**
- **the confluence of landscape-scale fire and urban fire intrusion**
- **the potential limited ability for shelter-in-place to be a tangible option in many locations throughout the Precinct.**

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Thank you

Questions?