

Smarter Stay Smarter Go

Communication and Community Shelter Networks

RMIT DRI

**Design Challenge 09: Fire
Stage 2 Submission**

23.10.2009

A black silhouette of a landscape featuring several trees and a house, positioned on the right side of the slide.

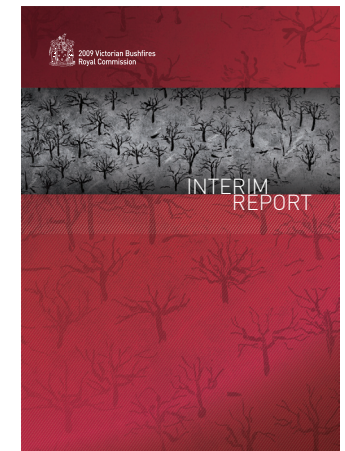
Team:
Stuart Harrison
Travis Dean
Jacqui Edge
Luke Adams
Matt Tonner
Rory Fort
Marcus White

Smarter Stay Smarter Go is a system of communication and community shelter networks that aims to provide survival options for rural residents and visitors in the times of bushfires.

To make a smarter 'Go' decision, we propose a new communication network to provide real-time data on current weather conditions to all stake holders provides real time fire risk communication for the public through a network of new fire danger index signs, replacements for the 'Fire Danger Today' signs that have been superseded by the new fire danger classification system. This would form part of a new data distribution system, open for all to access, forming an improved data collection network that would augment existing information gathering.

We aim to provide a secure 'Stay' option, by encouraging the use of community-based fire shelters that are located within housing clusters, in or around towns. This strategy recognises that much rural living is still neighbourhood-based. Isolated property owners would install their own fire shelters, and this is the focus of the current marketplace. Our research to date has developed a roadside community shelter that works a bus shelter in non-emergency times. We have a project-wide approach of 'dual-functioning' to increase investment efficiency and provide on-going maintenance and testing through local use.

We recognise the difficulty in assuming behavioural responses to emergency situations, and seek to provide options for all decisions, those who stay, those who go and those who continue to defer the decision until the last moment.



The 2009 Victorian Bushfires Royal Commission's hearings and Interim Report have provided our research backdrop from which we have developed our understanding of key issues. We have drawn from the report in this submission.



Our transdisciplinary team draws from the areas of architecture, urban design, sustainability fabrication, construction, art practice, electrics and community development. The team has also drawn on contributions by current and former CFA firefighters, public transport experts and discussions with social scientists.

Stuart Harrison (team leader)

Stuart is an Architect, researcher and architectural advocate in the media. A lecturer in the RMIT School of Architecture and Design he has taught across all discipline areas of design, communication, history and practice over the last 10 years. He is director of Harrison and White Architects, based in Brunswick and Melbourne Editor of Architecture Review Australia. In 2007 he completed a Research Masters by Project at RMIT investigating regional and suburban architectural typologies. He is host of 'The Architects' on 3RRR, Australia's only dedicated architecture and urban design radio show.

Travis Dean

Travis completed an apprenticeship in carpentry in Mornington Peninsula, moving to Melbourne in 1993 to become the Workshop Manager of a furniture manufacturing company in Moonee Ponds. He then started working from a home-workshop on private furniture commissions, moving into 3 Phase Design Studios in Brunswick in 1999. Consolidating Travis Dean Furniture Design + Production; he has continued to design and manufacture for private commissions and developed a product range for exhibition and retail distribution in Melbourne. Cantilever Interiors formed in 2006 with Peter Daly and Charlie Wilde with an emphasis on sustainable joinery, and has its workshop in Brunswick.

Matt Tonner

Having built a house in Kinglake and subsequently losing it in the recent fires, Matt provides input into the many issues relating to protection of property and lives, especially in the Kinglake region. Matt draws on his on personal experiences from living in the country both in Australia and California and his brush with fires on his own property in Kinglake, to being air lifted from the Kosciusko National Park in the 2001 fires. Matt is also very passionate about the environment and has a great deal of experience in building and construction industry, and runs Estella Design.

Jacqui Edge

Jacqui has a passion for community development and has facilitated projects with many groups and organizations. She has worked on projects including organizing sustainability festivals, fundraising for arts organizations, initiating art prize events, and coordinating functions at NGV Australia and NGV International as well as the University of Melbourne. She is currently establishing a



Jacqui Edge, Stuart Harrison, Marcus White, Rory Fort, Travis Dean, Luke Adams and Matt Tonner's house (top) before and after the fires.

business in the renewable energy sector while maintaining other community-based commitments. Jacqui brings to the group a range of organisational skills and helps to maintain cohesion and structure within the group.

Luke Adams

With a professional career in contemporary art and public sculpture, Luke Adams boasts significant experience in the development and implementation of cross discipline work - with creative solutions. As co-founder and former director of Artery Co-Operative, a professional artist hub in the heart of Northcote, Luke now steers his attention towards a solar powered vision. Luke Adams Electrical is the most recent venture this entrepreneur has embarked upon. His business specializes in solar energy, lighting and 'green' electrical works. Luke continues to develop cross-discipline relationships in business, and the arts.

Rory Fort

Rory is based in Kangaroo Ground in Melbourne's north east 'Green Wedge'. He has accomplished studies in Biological Sciences, Aquaculture, and his plumbing trade. Rory has been working as a plumber for the past 15 years, and prior to his position as Director of Enviro Friendly Plumbing, he worked on commercial, multi-storey buildings. He has also worked on the bio-filtration for Melbourne Aquarium, the Challicum Hills Wind Farm, and is regarded in the industry as one of the forbearers of the sustainable plumbing movement. Rory has a comprehensive knowledge of sustainable building and design practices including earth covered shelters, waste water treatment, solar thermal heating. He conducts talks at sustainability expos and is regularly consulted by local councils and industry professionals.

Dr. Marcus White

Marcus currently teaches design, technology and communications at RMIT University, is a director of Harrison and White and has recently completed his PhD thesis at RMIT SIAL which focuses on sustainable urban design solutions using custom digital design techniques. He has developed new techniques for digital agent-based pedestrian modelling, visibility graph analysis (Way-finding) and advanced solar amenity analysis. His work has been used to inform guidelines for various council urban design frameworks, including City of Whitehorse and City of Stonnington. He has received numerous design awards and his research has been published internationally.



The most extreme damage seemed to be in suburban style housing clusters. This became a focus for the research.

Findings of one of the most destructive natural disaster in Australia's history¹ have brought three issues to the fore: communication, behaviour, and refuge.

Since the 1990's state government has shifted its public message and policy from an 'agency-centered approach towards shared responsibility between emergency services and the community...a community safety approach.'² The associated message has long been overly simplified and ambiguous³: 'stay or go'. This slogan was joined in 2003 with the catch phrase 'houses protect people, people protect houses'⁴.

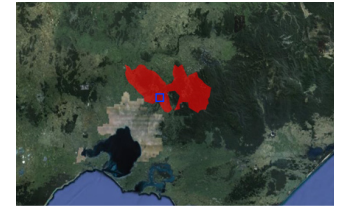
These public messages, coupled with few community members receiving adequate advice on how to prepare for the 2008-09 fire season⁵, may have contributed to some communities, families and individuals having unrealistic expectations, confusion, and poor preparations.

In a state of high stress and vulnerability most behaviour is primary; by men, to 'fight or flee', and by women, to 'tend or befriend'⁶. However some stuck to their fire plans, yet others had no plan; some left early, some stayed fought and left late, some stayed fought and survived, others didn't survive.

The Fire Fighters' Union declared the 'stay or go' policy as "stupid"⁷. The newly released policy, 'Flee or Fight' maintains the choice for individuals to stay and fight, or go early. There is emphasis on fleeing early, education, early decision making, and being prepared.

Whether the policy is 'stay or go' or 'fight or flee', the consideration of three factors for successful emergency public management include: communication, behaviour and refuge.

To stay or to go embodies the idea of fundamental choice, that is, some will stay, some will go, some will make up their mind when faced with imminent danger.



Area of fire damage from Feb7/Black Saturday is roughly the same area of, and very close to, metropolitan Melbourne.



Kinglake after the 7 Feb 2009 Fires. Image: Australian Defence Force

1 31 bushfires raging in Victoria as death toll continues to grow; 09/02/09 - Sydney Morning Herald

2 2009 Victorian Bushfires Royal Commission – Interim Report - Chapter 7, page 193

3 2009 Victorian Bushfires Royal Commission – Interim Report - Chapter 7, page 193

4 History backs 'stay or go early' policy - John Handmer & Rebecca Monson, 13/02/09 – The Age

5 2009 Victorian Bushfires Royal Commission – Interim Report - Chapter 7, page 195

6 'Panic' and Human Behaviour in Fire - Rita F Fahy et al., 13/07/09 – institute for Research in Constuction, Canada

7 Where to now? Rebuilding the system after Black Saturday – Jane Cowan, 16/06/09 - www.abc.net.au



The current 'Fire Danger Today' sign as used in Victoria.

The public message communicated broadly, whether 'people save houses, houses save people', 'stay or go', or, 'flight or flee', is mostly concerned with public behaviour. Communication at high risk times and at the time of an emergency is concerned with local conditions. Effective, clear and timely communication can spur smarter decisions, thus smarter behaviour.

The Royal Commission Interim Report details how the public used a range of sources to better understand the fire danger prior to, and on, February 7th 2009. These sources included television, radio, newspaper, CFA and BOM websites¹. However the nature and behaviour of the fires on this day made it impossible for emergency services to update the warnings, and distribute information quickly². Public messages proved untimely and communications muddled³.

With power outages rife and real time communications non-existent, a successful and broadly used method of communication and warning proved door to door knocking. The Royal Commission interim report lists a number of recommendations which support the need for improved public communication (refer to appendix 1).

The Royal Commission findings have charged a review of public policy, which includes public messages. Based on the new Fire Rating Index, the BOM and fire agencies will determine a fire rating each day, expected to be published daily in the media⁴. Coupled with a mobile phone alert system, and a code red warning incorporated into existing road signs, this is the extent, confirmed to date, of proposed public communication⁵.

As John Handmer from the Bushfire CRC states: 'warnings to me operate in a competitive environment often with everything else people are doing or listening to, and there is often, not always, but often needs to be some way of cutting through all that haze...'⁶. This suggests not only home electronic visual queues are required, but more intrusive, aural and visual aides too.

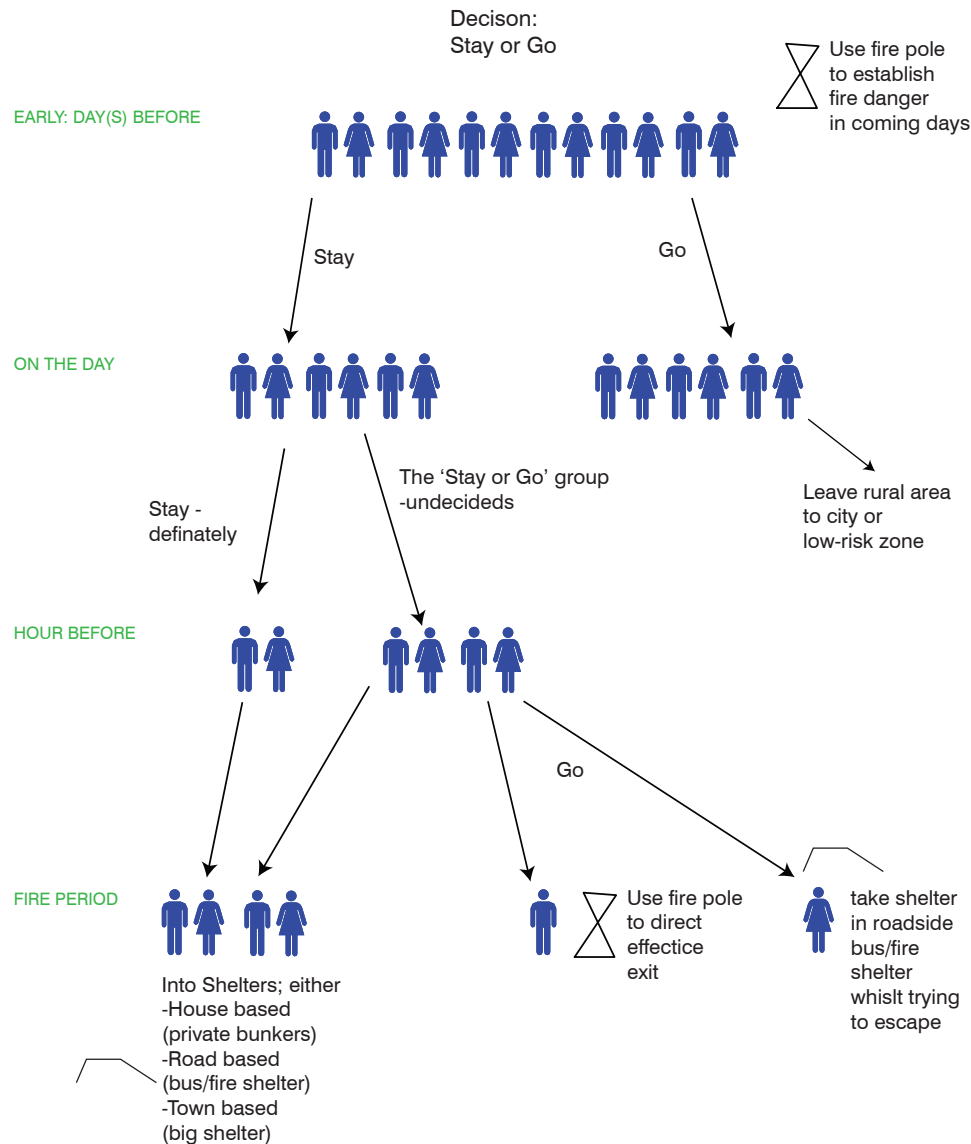
For the State's third significant fire in 100 years, and current fire predications for the Dandenong Ranges and most of peripheral Melbourne, there is a real call for public, real time data communication⁷. This would better equip communities and individuals in their preparations, decision making and consideration of the State message: 'fight or flee'.



The existing 'Fire Danger Today' does not respond quickly.

- 1 2009 Victorian Bushfires Royal Commission - Interim Report - Chapter 4
- 2 Black Saturday fires had power of 1500 A-bombs, The Australian 22/05/09 - Gary Hughes
- 3 2009 Victorian Bushfires Royal Commission - Interim Report - Chapter 4, page 138
- 4 New fire policy: flee don't fight, The Age 11/10/09 - Melissa Fyfe
- 5 Bushfire warning system unveiled, The Age 10/09/10 - Mex Cooper
- 6 2009 Victorian Bushfires Royal Commission - Interim Report - Chapter 4, page 147
- 7 Fire Note, Issue 39, September 2009 - Bushfire CRC

Bushfire Stay or Go - a decision chart



This diagram of behaviour sets out the key decisions in a stay or go process, and how the work of our proposal relates to this. Refer 'Proposal' section for descriptions of fire-poles and bush/fire shelters.

The purpose of a public campaign is to educate and prompt planning. The purpose of the revised policy is 'to save lives'¹. 'The purpose of a warning is to provide a signal for some action', says Professor Handmer². However John Gledhill of the Tasmanian Fire Service emphasizes, "(that) we assume rational behaviour and people's behaviour isn't rational."³

Mr Gledhill continues to say, "even if a property has been fully prepared and the householder decides to stay and defend, just what they will do when the fire front comes their way is something that can't be predicted by anyone." As Allan Rhodes, CFA Manager Community Safety Research said, 'It is unrealistic to expect people to respond to disasters in a uniform manner, or in a rational manner...it is highly likely that in the future there will be people who 'wait and see', or 'do as much as possible' and then leave, in future wildfire events.'⁴

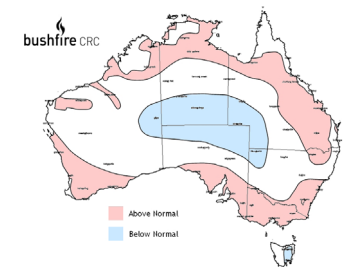
Studies of the Black Tuesday and Ash Wednesday fires, and preliminary findings of Black Saturday, all draw the same conclusion: that those attempting to reach a location when a fire hits are at greatest risk.

This February, amongst the dead, approximately 35% were in transit. Those trying to reach another destination are often those who are the most vulnerable. As Rhodes said in his cross examination at the Victorian Courts earlier this year, 'it looks as if the people killed would have had no intention to stay, this is because they were elderly, disabled, children or women with children, or visitors to houses.'⁵

Whatever action is recommended, message is communicated, plan in place - in an emergency, we need a 'Plan B'. The Royal Commission interim report lists a number of recommendations which support the need for improved communication and facilities in light of a revised public policy (refer to appendix 2).



Masonry construction elements survived the enormous radiant heat and fire



Australia's relative bushfire risk level across the country for 2010 Image: Bushfire CRC

- 1 Fire Update, Issue 33, August 2009 - Bushfire CRC
- 2 2009 Victorian Bushfires Royal Commission - Interim Report - Chapter 4, page 125
- 3 TAS fire policy of prepare and stay needs defending, <http://www.abc.net.au/local/stories/2009/07/02/2614944.htm>, 2009
- 4 2009 Victorian Bushfires Royal Commission - Interim Report - Chapter 4, page 193
- 5 Today at the Commission - AFAC, <http://knowledgeweb.afac.com.au> - 18/06/09

Creek beds, dams and purpose built private shelters were the few places which saw survival success stories. Media reports also covered stories of communities which had devised and implemented fire plans utilizing registered and unregistered public refuges. Some of these refuges have existed since 1939, others are a result of recommendations stemming from the Ash Wednesday Fires inquiry back in the 80's, and other refuges, which still exist, were maintained and available due to local community dedication and drive¹.

Not since the 1939 fires have there been a significant, active, and lasting approach to the way Victorians prepare for, and behave in wild fire. The 1946 Royal Commission Enquiry bore a change in public and private attitude towards fire prompting the construction of the Country Fire Authority (CFA) and the ruling of a 'total fire ban day'².

Recommendations in response to community behaviour and expectation were also made firm and active as an outcome of the Ash Wednesday Fires Royal Commission Enquiry of 1983: that the 'stay or go' policy be promoted, and that community refuges should be designated³. Although the 'Stay or Go' message remained until 2009, of the public refuges which were built or registered, few survived to serve the public of today. Maintenance and liability proved contentious issues between local council and state departments⁴.

Although much contention over who is the responsible body for siting and maintaining refuges, the Royal Commission findings recommend for tourists, campers, school children and those whose planning went wrong, facilities need to be provided and available. Chapter 8 of the Royal Commission details how the public sought shelter in a range of places as a last resort and how many were confused about locations of refuges or "safer places". Evidence supports "that many community members regard public buildings, ovals and emergency services facilities as safe places of refuge during a bushfire." and "non-government school authorities, are urged to ensure that schools in bushfire prone areas have either a certified refuge or a neighbourhood safer place for the students to shelter from the fire."⁵

The Royal Commission interim report lists a number of recommendations which support the need for refuges and neighbourhood safer places, or what could be otherwise put as 'Plan B' (refer to Appendix 3).



*Some earth-covered bunkers built after previous fires remained in use and saved lives.
Image: The Age 14/04/09.*

1 Call for fire refuges in wake of Black Saturday, The Age 14/06/09 – Michael Bachelard

2 Jeph Neale, ex-CFA member, Kangaroo Ground Precinct

3 Call for fire refuges in wake of Black Saturday, The Age 14/06/09 – Michael Bachelard

2 Australia: Royal Commission inquiry forced to investigate "stay or go" bushfire policy, World Socialist Website 16/05/09 - Maragel Rees,,

4 Fire refuges expose councils: commission, The Age 25/06/09 – Edwina Scott

5 2009 Victorian Bushfires Royal Commission – Interim Report

The Aftermath, The Scientists, Kevin Tolhurst, www.abc.net.au/blackfriday/aftermath/ktolhurst.htm#top 2009 – ABC Film Victoria & Moira Fahy

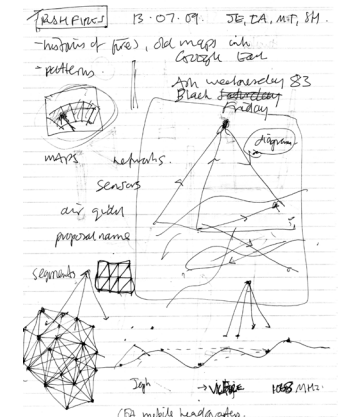
Proposal

Above-mentioned evidence from the Royal Commission supports the need for improved public awareness of fire risk and real time communication and the need for providing safe refuges as a last option in times of emergency.

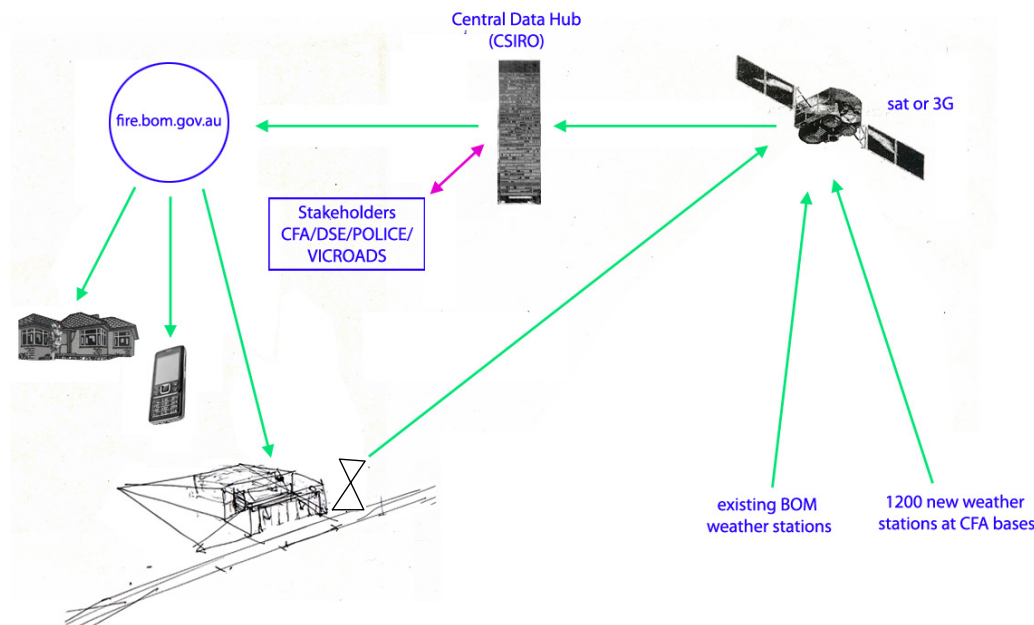
Currently the Bureau of Meteorology (BOM) collects a range of data, which CFA staff in each region access to predict daily respective fire danger index. This fire danger index is then displayed on manually operated signs in the township. The "catastrophic / code red" category has recently been added to categorise the most extreme fire risk days. We seek to make this information updatable instantly and not just in terms of days, so upgrades can be made across the network as required.

Central to our proposal is the distribution of information to foster pathways to stay or go. The connections of the objects we have designed to this wider system is shown opposite. The following pages outline the fire-pole and bus/fire shelter systems.

The project demonstrates innovation in the areas of assembly or existing technologies in new ways. The integration of communication and shelter systems allows for a state-wide system. The design of the objects outlined over the next pages using new technologies in construction - such structural edge frame/cladding (fire-pole) and existing technologies such earth-roof and prefabrication for a new type (road-based communal hybrid shelter).



Our initial strategy discussions centred around networking and communication

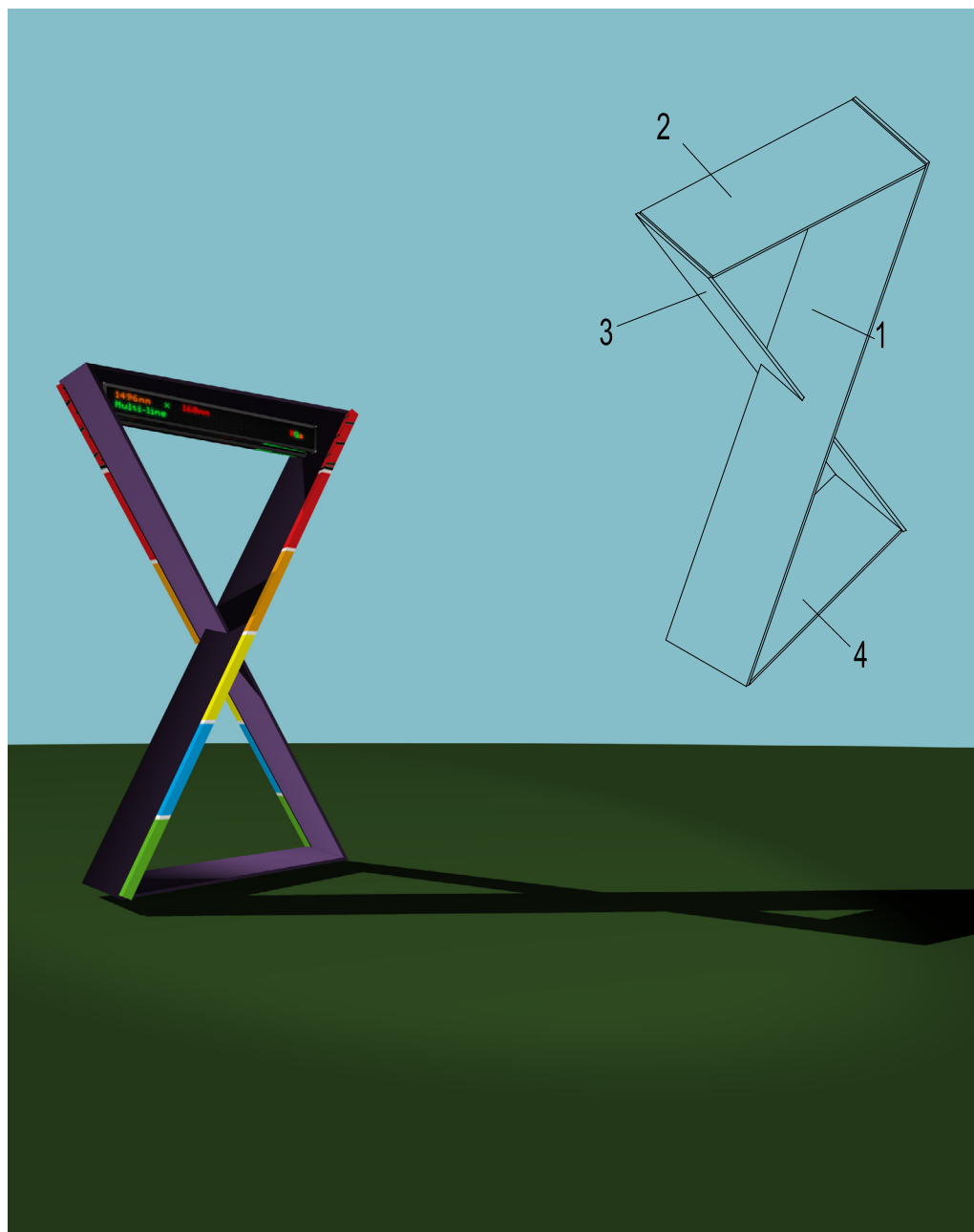


A system of networked connections: Fire data is collected and sent to a satellite from new and existing weather stations. This data is then collected centrally and then open to access by key stakeholders; it is also made as open-access real time data across various media.



Our team undertook several visits to bushfire areas; here to the pilot Regrowth Pod designed by 1:1 Architects and installed on a destroyed property on Coombes Road, Kinglake West.





The proposed concept for the fire sign (3.1m h x 1.6m w) can be read from both sides and can display text on the top scroll bar. Solar panels mounted on the top of the sign, batteries mounted in the frame.

Fire Pole

In order to improve the communication of the fire danger index we propose to design and develop a fire danger index sign, the 'Fire-Pole'. It features the following:

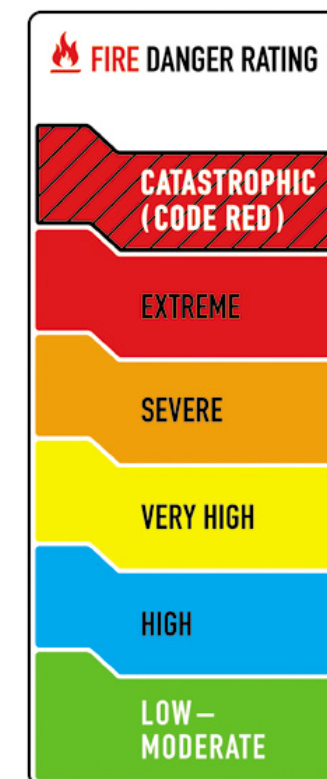
- Off-grid solar powered with battery backup.
- Horizontal LED text scroll, readable to a road user, information is editable, and could include general information / warnings / directions for other emergencies and events.
- Text is remotely programmed and readable from both sides.
- Real time data and predictions.
- Real time Fire Danger Index readable from both sides
- Illustrate fire danger index, in colour and gradient, using low voltage LED lights.
- Flashing and a siren warning if the community is under direct threat and action by residents is required.
- Local radio 'over' broadcasting to relay audio warnings and information on all frequencies when close to poll (as per road tunnels).
- Acts as simple sensor by sending relay back to satellite. When fire destroys signs, it is registered on the system.

This sign replaces the 'Fire Danger Today' which has recently been made obsolete by the new warning scale. The new sign is a 'Fire Danger Now' sign as it gives real-time updates.

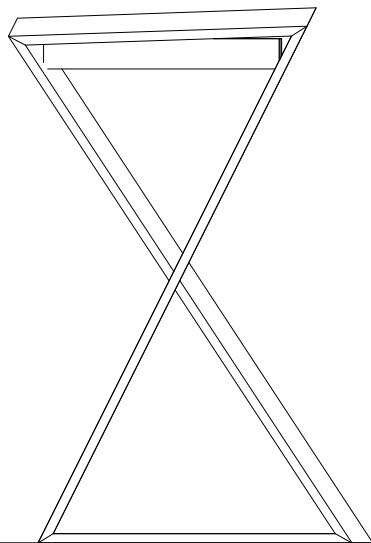
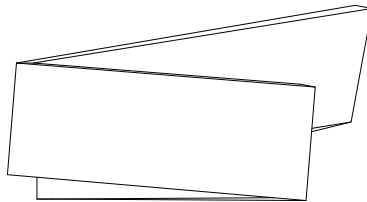
In a emergency evacuation situation, the Fire-Pole can direct movement and give ongoing information. The sign would be made off steel plate with a vivid factory paint finish. Its self supporting design provide both vertical and horizontal edges, as well as a clear recognisable marker to symbolise the network.



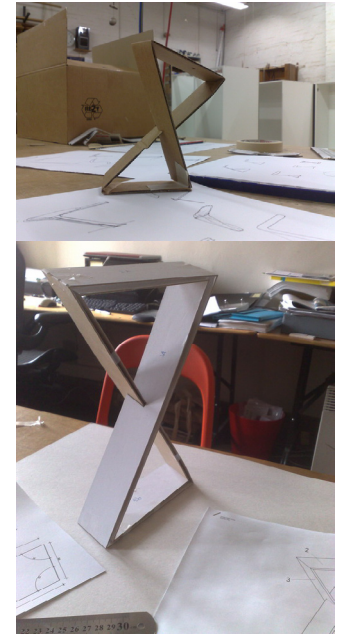
The Flood Gauge is a vertically-based and real-time indication of risk



The new fire danger classification scale.
Image: ABC



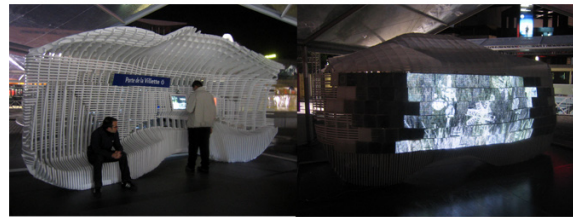
Fire-Pole: Plan and Elevation, 1:40



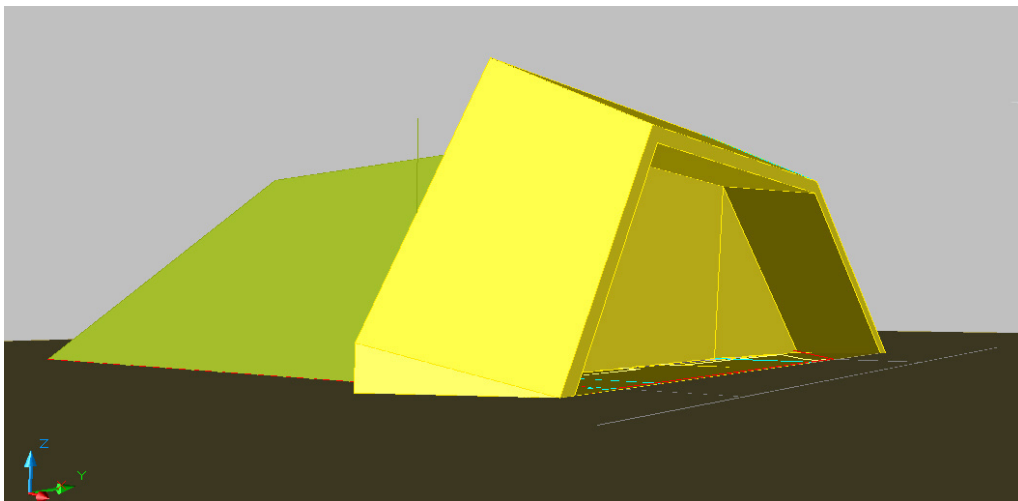
Development models for the fire sign; a bent ribbon informed by the loop and the egg-timer form: something that can be read from either direction (one pole on the road, rather than one each side)



LED strip lighting - cheap and long-lasting



Bus Shelters: a study of existing bus shelters that incorporate earth roofing, digital information, current and historical design trends, and the idea of a sealed interior.



The Bus/Fire Shelter: diagrammatic view

Bus/Fire Shelter

For property owners living in remote areas seeking shelter from a bush fire attack on their property we propose the use of a fire shelter (bunker) which they would install at their cost. A number of proprietary bunkers built to an upcoming Australian Standard will soon be available on the market.

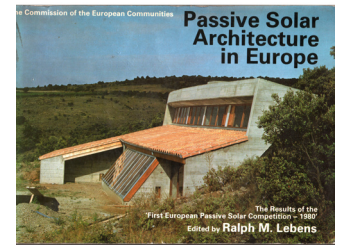
In areas outside of town where there is a cluster of houses and areas along bus routes we propose the installation of a network of bus shelters which act as a bus stop on a day-to-day basis and become fire shelters in emergencies - access to a fire-proof room is within the bus shelter.

These bus shelters would be made from five pre-cast concrete units, earth-covered to the rear and sides making them accessible only by the front which would be orientated away from typical fire approach. The covered porch area would provide sheltered entry and exit from the bunker. This porch area becomes to a waiting and seating area in times of normal use. A large protected LCD screen in this porch displays either transport or fire information, and could be used for other information display. Another monitor exists in the fire-proof interior space, which can handle 20 or more people comfortably.

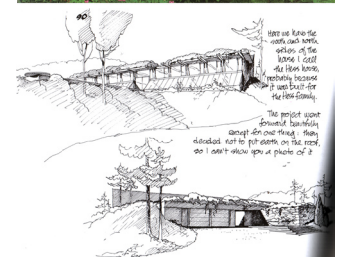
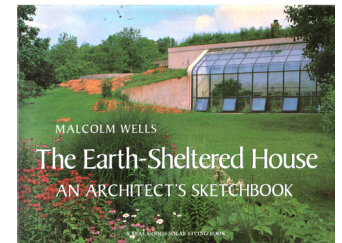
The bus shelters would be installed by council with guidance from fire authorities on road easements where most bus stops are currently situated. A percentage of the costs would be offset by local residents by being charged to their rates over a number of years and managed and maintained by the local residents. This shared ownership would reduce the number of residents having to install their own private shelter or bunker on their own property. The shared ownership principle would foster a sense of ownership by the neighbourhood.

The shelters are designed to have on-grade access to comply with existing and future disability access requirements. A visible front entry helps identify where the shelter is, as does its roadside location.

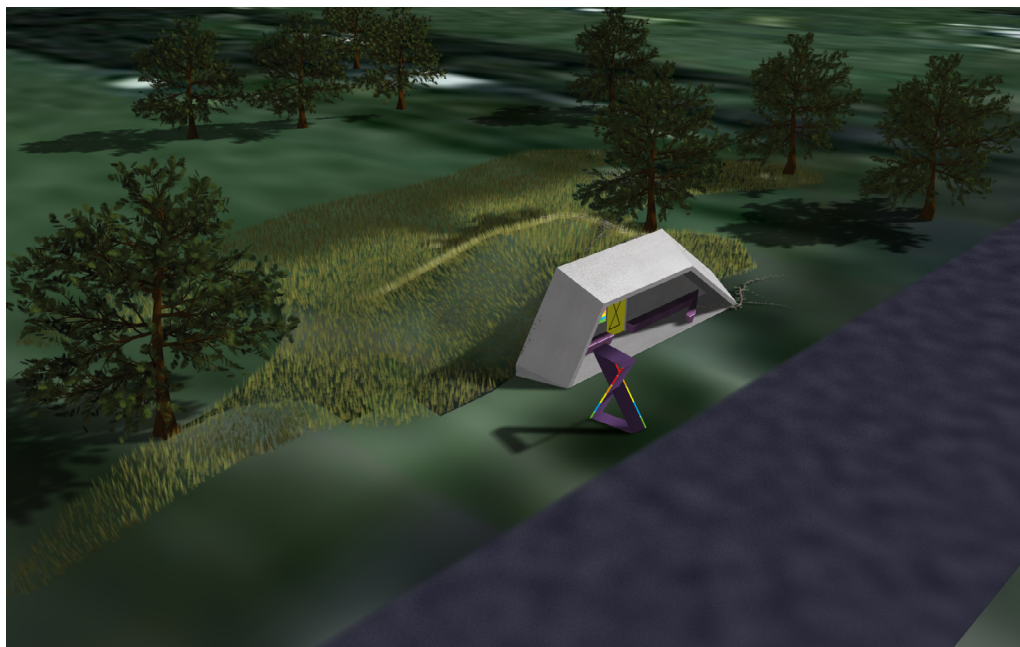
Four interlocking pre-cast concrete shells would form the main part of the building. The first two would be 1m deep footing blocks that would displace soil for use in earth-covering and allow water storage from the roof under the building (refer section).



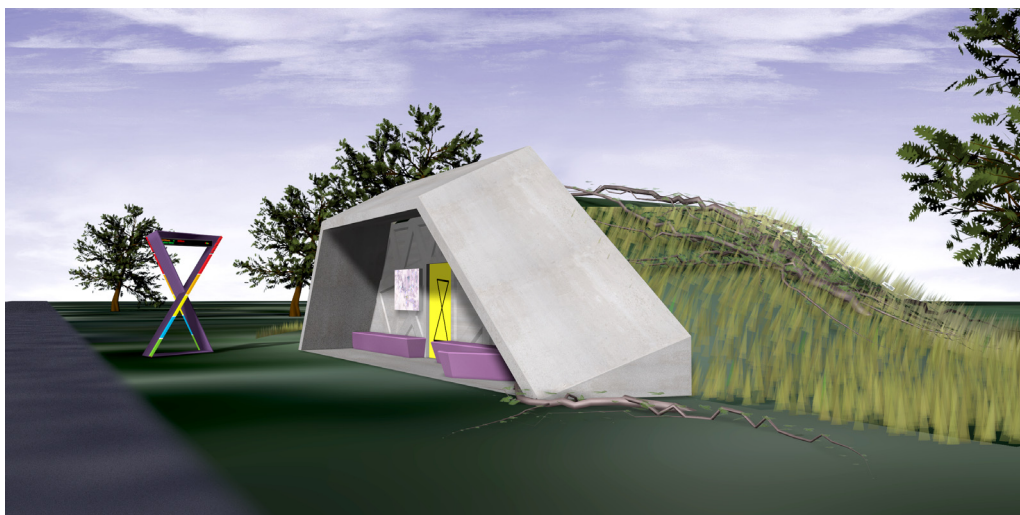
Earth roof construction, pioneered in the 1970s has made a critical return to construction with its sustainability. It is a very good way of achieving fire-proofing and low cost.



Lyons, Queenscliff Marine Discovery Centre, 2004



The Bus/Fire Shelter: aerial view



The Bus/Fire Shelter: road view

This water can then be drawn from for fire-truck refilling during fire-fighting.

Given the increase in bus usage and the planned development of the bus network throughout regional Victoria¹, the bus shelters could be fitted with "tram tracker" type technology to monitor bus traffic and give passengers waiting at bus stops accurate information of bus arrivals and departures.

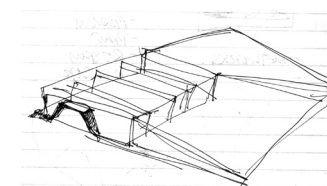
The findings of the Royal Commission identified that in emergency situations the public generally will flee to the safest location they can get to. In the case of the Kinglake complex fire the public fled to the safety of neighbours, schools, church, CFA sheds and even broke into the local Pub to hide in the cool room.

Given this human behaviour, and the inadequate shelter these buildings often provide, we propose that in towns surrounded by bush like Kinglake, Healesville, Marysville, Macedon. etc., a 'big' fire shelter and community building should be constructed to provide a safe place for the public to shelter as a last resort for those unprepared or caught out. This would also dual-function to provide on-going use and make the most of the infrastructural investment.

The Royal Commission also highlighted the necessity to provide 'Plan B' refuges for school children. We propose the community building should be situated close to schools so it can be accessed by foot and could be used daily by school groups and the community at night; and for the public to shelter in emergencies. The community building would also be earth covered to the rear and side.

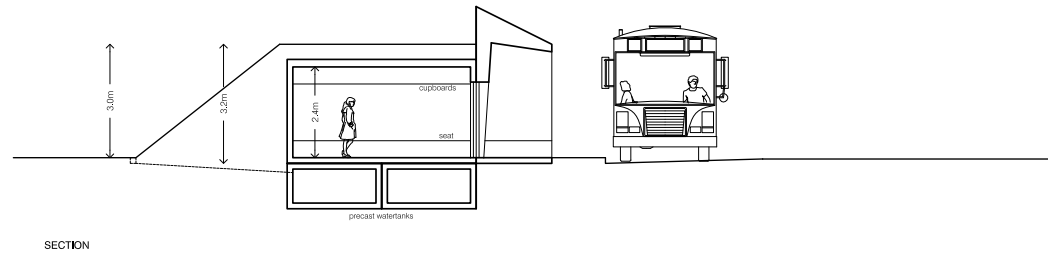
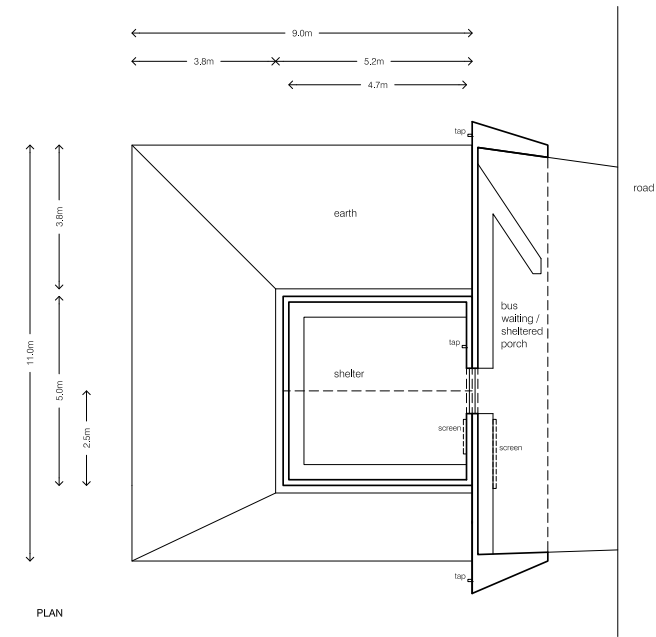
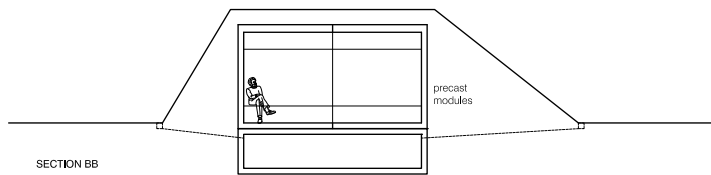
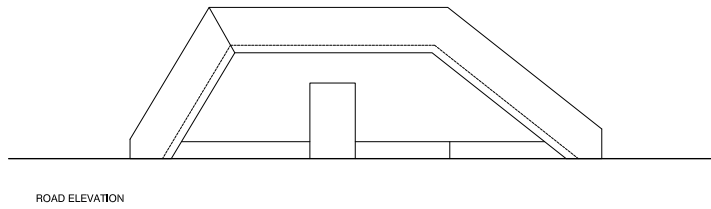
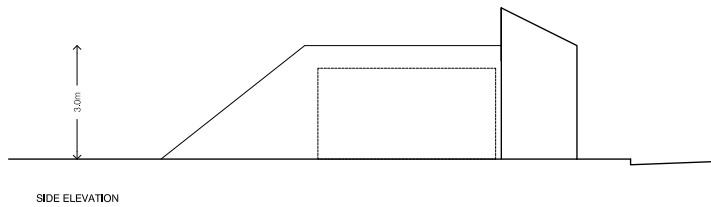


The bunker is a familiar type - and the 'porch' area provides an initial area of protection: Image: Return of the Jedi, 1983, George Lucas.

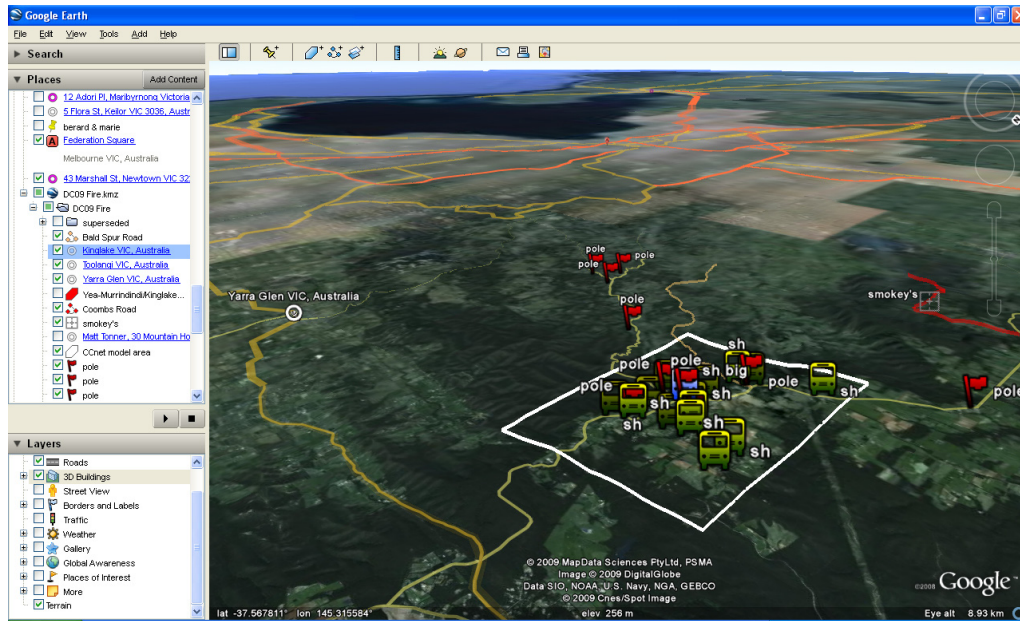


The 'big' community shelter located with the centre of towns would be an expanded version of the Bus/Fire shelter, but also maintain easy access with street address and presence.

¹ Victorian Department of Transport - Regional Transport Plan



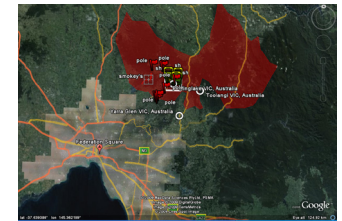
Kinglake Survey Area



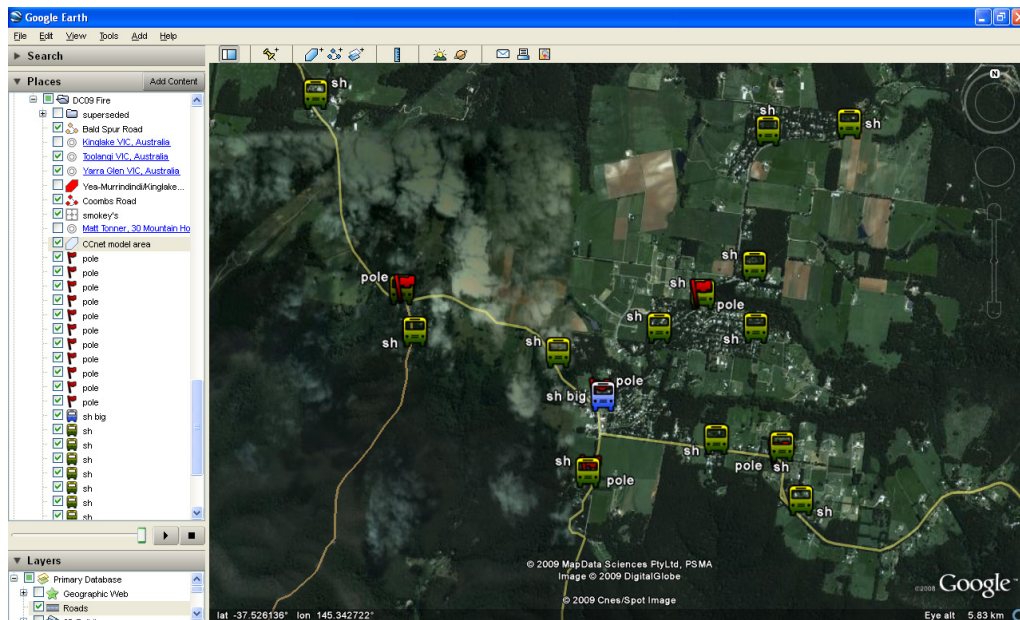
To develop the project a test survey area was selected in and around Kinglake, one of the towns extensively affected by the fires and in many ways typical of a country town - several roads in and out to other towns, several key residential areas clustered in a low-density manner around the town's core. Kinglake is surrounded by both high undulating National Park land, which is heavily forested, and flatter cleared land which is used for farming.

A survey area of 6 x 5km was formed around the town and surrounds. A process of locating both fire-poles and bush/fire shelters was undertaken within this area. This was performed using Google Earth, which allows placement of key points as well as defining and measuring areas, distances and altitudes.

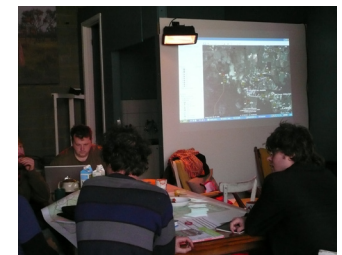
Within the survey area, and as potential general rule for a town, there were five fire-poles located. There were 13 Bus/Fire Shelters, and these followed a general rule of being no more than 500m from each house (for those houses located in a clustered manner). In this way, the shelters provide an index of regional housing and can expand with the increase in occupation.

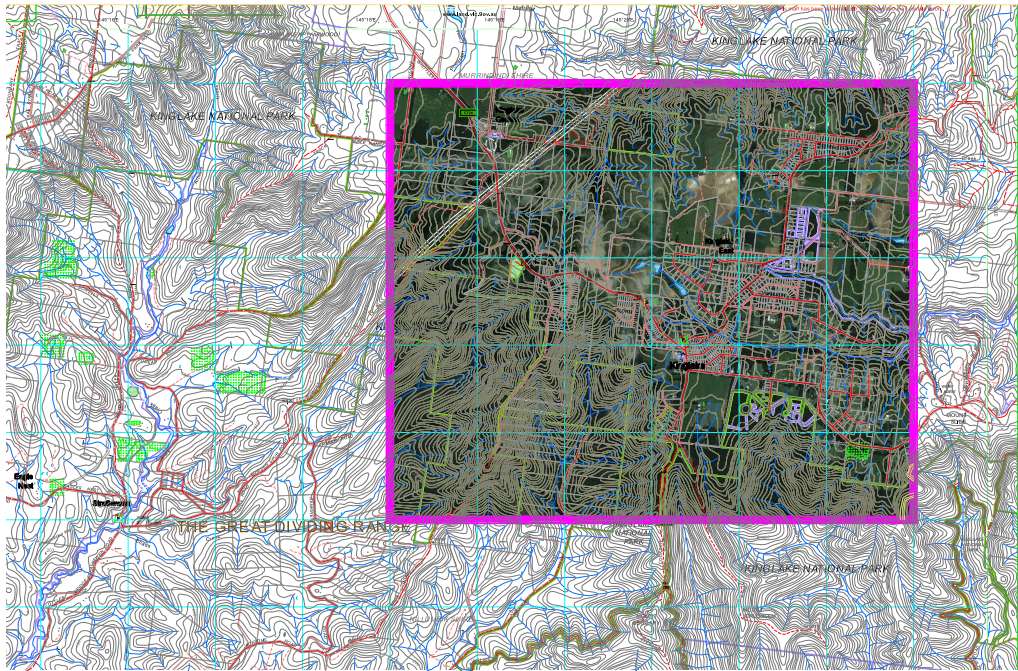


We mapped the full extent of the Yea-Murrindindi/Kinglake Complex (shown in red) into Google Earth, which had not yet occurred. It is clear that the whole area of our survey was burnt.

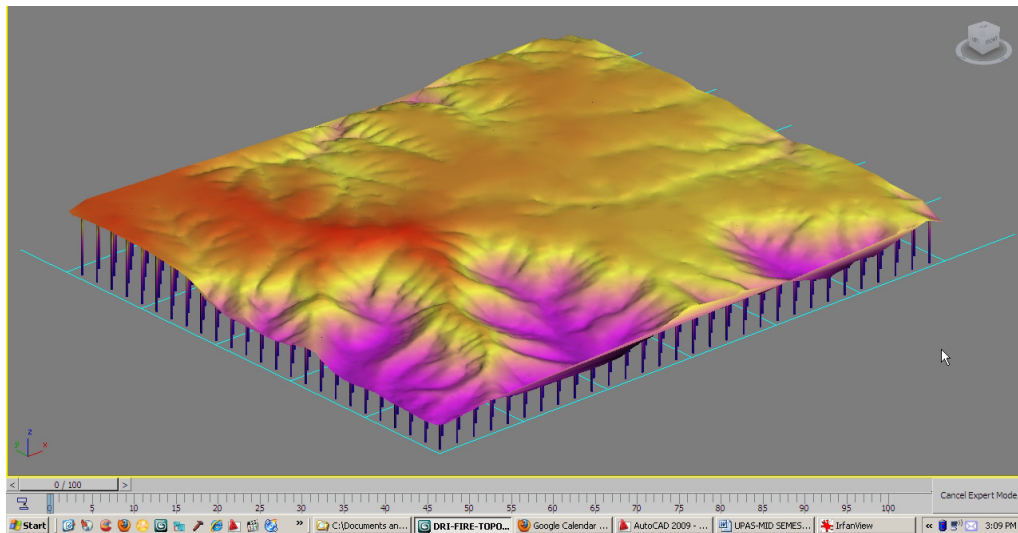


The process of mapping was both analogy and digital as we analysed the survey area.

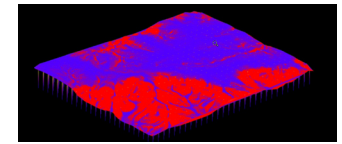




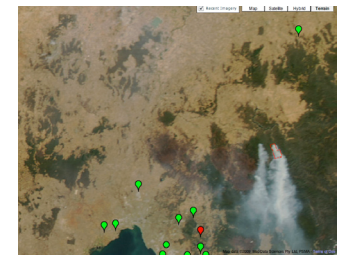
Extract from local natural feature map by VicMap merged with aerial photography information. Survey area shown, which is based on 1km survey grid.



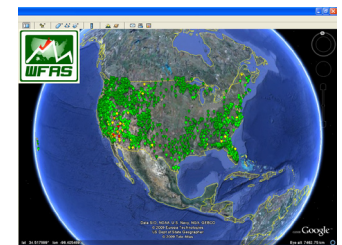
Topographical 3D model we constructed using contour information derived from VicMaps. Digital Elevation Analysis colour scale applied describes the plain, ridge and valley landscape. The future use of this analysis can be to identify likely areas of fire damage due to topography.



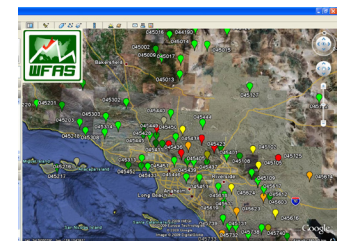
Gradient analysis of survey area: red shows area of greatest gradient change



Satellite aerial during fires. Preliminary use of placemarks to show danger level.



The US-based WEAS system gives auto-updating fire danger levels across the nation into Google Earth.



If the project was to develop into 2010 we would seek to expand the scope of team's expertise further into social behavioural study as outlined below, as well as into sustainable rural living. We would seek funding and resource support from the RMIT School of Architecture and Design, further funding from DRI and form a ARC application with DRI-affiliated ARC investigators. An initial funding EOI for ARC has been made by the team.

We would seek to involve Dr Paul Mees from RMIT in relation to public transport policy, who is aware of our research. We would seek to partner with State Government in terms of both DSE resourcing and possible direct funding. Initial queries with a engineering consultancy would be further explored to seek expert advice in risk and communication management.

Smarter Stay Smarter Go is contingent on delivering a clear message to the right people at the right time. It utilizes existing technology, but exists as a template for future technology, particularly real time data. Whilst new advances in communication and detection are expected, this proposal is not contingent on them. Our attitude to design, with this project, is to embed the meaning behind the object. We aim to clearly integrate and reinforce the danger of fire in the Australian bush.

Further research will be required to establish the behavioural models for our proposal. According to several CFA members (Jeph Neale, and Craig Lawless), there is concern regarding the use of community shelters. It is their belief that some form of regular use of the bunker will be required and that regular community involvement is required and that this involvement wont last. We believe that these concerns can be overcome with design. We believe that the right communication system can better serve the community in this case, and will better serve people from outside the community. Tourists are particularly vulnerable and will not benefit from community meetings.

Further research will need to establish the most clear and strict information required to penetrate the thought of individuals in an extreme panic and then lead them to safety. We will conduct workshops and surveys in bushfire communities. Set-up and road test some prototype designs. We will further consult with local authorities and seek examples of working systems in other countries. We will seek industry partners and cultivate relationships with academics, researchers and policy makers.

Considerations

Issues for consideration relating to research project include:

- >Realistic expectations of CFA involvement and leadership*
- >Realistic expectations of community involvement*
- >Resources required to fulfill successful fire drill*
- >Preliminary costing and funding models for delivery of resources and infrastructure.*
- >Strategy and funding model for ongoing maintenance*
- >Public acceptance / uptake / value*
- >Development in technology*
- >Dependence on road based communication*
- >Current & predicted social trends which will affect community psychology & behaviour*
- >Aging population, increased population and urban sprawl*



Church site and bus stop on the corner of Bald Spur Road and Kinglake-Wattlesea Road, potential site for a test site for the Bush-Fire shelter. Image: Meredith Fisher

Appendix 1 (COMMUNICATION)

Recommendation 4.1

WARNING CONFORMING TO POLICY

The State ensure that bushfire warnings issued in Victoria:

- are founded on the principle of maximising the potential to save human lives
- embody the principles encapsulated in Recommendation 8.5 of the Council of Australian
- Governments report the National Inquiry on Bushfire Mitigation and Management (2004)
- embody the principles endorsed in the Australasian Fire and Emergency Service Authorities Council
- Draft Discussion Paper, A National Systems Approach to Community Warning (May 2009)
- incorporate the use of the Common Alerting Protocol, as adapted for the Australian context

Recommendation 4.2

CONTENT: BUSHFIRE WARNING

The State ensure that the content of bushfire warnings issued in Victoria reflects the principles set out in the Commonwealth policy paper Emergency Warnings - Choosing Your Words (2008). In particular, all bushfire warnings issued in Victoria must use clear language, avoid euphemisms, and contain explicit information in relation to:

- the severity
- location
- predicted direction
- likely time of impact of bushfires on specific communities and locations
- the predicted severity of impact of the bushfire
- whether a specific fire poses a threat to human life

Recommendation 4.4

CONTENT: INFORMATION OR WARNING

The State ensure bushfire warnings in Vic-

toria are confined to two categories or stages:

Bushfire Information - a message providing information to the community on a bushfire that is 'going' and has the potential to threaten public safety; and
Bushfire Warning - a warning to the community about any dangerous or extremely dangerous bushfire, particularly one that is burning out of control and poses a threat to human life.

Recommendation 4.5

LIMITS TO COMMUNICATION EQUIPMENT MAXIMUM USE

The State ensure that the Standard Emergency Warning Signal (SEWS) be used in Victoria to precede each bushfire warning or group of warnings for bushfires that are dangerous or extremely dangerous, particularly for a fire that is burning out of control and poses a threat to human life, subject to appropriate limits on the maximum frequency of use.

Recommendation 4.7

USE OF SIRENS
The Office of the Emergency Services Commissioner and the CFA develop guidelines for the use of sirens in communities that decide to use a siren as part of their response to bushfires.

Recommendation 4.8

MOBILE PHONE WARNINGS

The Australian Government, Council of Australian Governments and the State determine whether it is technically possible to implement the second phase of the national telephony-based warning system (that is, the delivery of warning messages to mobile phones based on the physical location of a handset at the time of the emergency) with a view to implementation for the 2009-10 bushfire season.

Appendix 2 (BEHAVIOUR)

Recommendation 7.1

BEHAVIOUR POLICY & PUBLIC MESSAGE

The CFA revise the publications and programs by which it communicated with the community about preparing for bushfires and what to do in the event of a bushfire to:

- Reinforce existing advice that community members should prepare, and decide, well before a fire occurs, whether to leave early or stay and defend their homes; and
- clearly convey the following principles:
 - o The safest option is always to leave rather than to stay and defend,
 - o Not all houses are defendable in all circumstances and householders are advised to undertake an individual assessment of defendability,
 - o Unless a property is defendable the advice is to leave early,
 - o The impact of topography, fire weather and fire intensity on defendability should be factored into households assessments,
 - o The risks of staying to defend include the risk of physical injury and death,
 - o Contingencies are needed as the best-made plans fail,
 - o Even if a plan is to stay, preparations to enable leaving should also be made, including the preparation of a relocation kit specifying the location of designated community fire refuges,
 - o There could be psychological impacts of staying to defend a property,
 - o It is inadvisable for children to be present during the defense of properties
 - o Practical steps are needed to protect the vulnerable. Families with young children, older people, and disables people are advised to plan for early relocation,
 - o advice on triggers for when to leave to incorporate the need for flexibility, the dangers of leaving late and understanding that a warning may not be received, and
 - o advice in relation to the policy specifically targeted to urban communities on the urban/rural interface.

Recommendation 7.2

CFA ADVICE FOR INDIVIDUALS

The CFA consider the means of providing individual advice to residents in bushfire prone areas, as to the defendability of their homes.

Recommendation 7.3

TRAINED CFA MEMBERS

The CFA ensure its members are fully trained as to the changes to the advice to the community set out in Recommendation 7.1

Recommendations 7.4

TRAINED CFA EDUCATORS & MATERIALS

The CFA train facilitators and educators and ensure manuals, brochure and other materials are enhanced to incorporate changes to the advice to the community in relations to the 'stay or go' policy, and the changes recommended elsewhere in this report.

Recommendations 7.5

MESSAGE ADVERTISING CAMPAIGN

The State and its agencies implement as advertising and awareness campaign on the changes to policy and practices as set out in this report, such as the Standard Emergency Warning System, telephony-based warning system, use of sirens by local communities, refuges and relocation.

Appendix 3 (REFUGE)

Chapter 8 RISK AND REFUGE The Royal Commission Interim Report

Recommendation 8.5

CREATION OF SAFER PLACES IN COMMUNITY

The State promulgate criteria for the identification and operation of neighborhood safer places, and involve councils and local communities in their development and implementation as appropriate.

Recommendation 8.6

PROMOTE SAFER PLACES

The State to have commenced progressively identifying, establishing and advertising designated community refuges and neighborhood safer places, giving priority to areas where bushfire risk is identified as high.

Recommendation 8.7

EDUCATE THE PUBLIC ABOUT SAFER PLACES

Municipal councils record the location of designated community fire refuges and neighborhood safer places in Municipal Fire Prevention Plans and Municipal Emergency Management Plans, and inform residents and visitors about their use and location.

Recommendation 8.8

CREATE UNIFORM SIGNS

The State to have developed uniform signs for designated community fire refuges and neighborhood safer places in Victoria.

Recommendation 8.9

MAINTAIN A PUBLIC LISTING OF SAFER PLACE LOCATIONS

The CFA maintain an up to date, state-wide list showing the precise location of all designated community fire refuges and neighborhood safer places, and provide the list to DSE, Victoria Police, the State Emergency Service, the Municipal Association of Victoria, the Office of the Emergency Services Commissioner, and the Victorian Bushfire Information Line.

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INTERVIEWS, DISCUSSIONS & FEEDBACK

Jeeph Neale, ex-CFA member, Kangaroo Ground Precinct, June 2009
Craig Lawless, CFA Captain, Kinglake Fire Brigade, August 2009
Marc Bellette, Attorney General's Department, Victoria, August 2009
Smokey, resident, Kinglake, May 2009
Callum Donohue, CFA, resident, Strathewan, August 2009
John Thornton, Griffith University, resident, June 2009
John Marshall, RMIT, resident, Toolangi District, May 2009
Lisa Caren, Murrumbidgee Community Recovery Committee Member, September 2009
Sarah Canham, PPW/CMA Western Port and Dandenong Landcare Coordinator, August 2009
John Handmer, Innovation Professor in Risk and Sustainability at RMIT & head of the Centre for Risk and Community Safety, RMIT Design Institute, May 2009
Michael Reynolds – activist against climate change, BMW Edge, Federation Square, June 2009
Charlie, Bulk SMS, Maidstone, Victoria, August 2009

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