Bushfires, Transport and Technology on the NSW South Coast

A Personal Experience and suggestions for actions

### By Peter Thornton[1]

1.   Summary

- The South Coast of NSW was subjected to widespread extreme fire event with many major bush fire fronts moving quickly in a NW to SE direction from very large tracts of forested land towards many coastal settlements;

- The Thornton family were at Broulee Beach and, as a of result of communications from the RFS *Fire near Me* app, decided to evacuate to Moruya which was considered a place of safety; Advice from the TfNSW *Live Traffic* app showed that it was not possible to exit the region for Sydney; As soon as that App showed it was possible, we did so;

- Of all the transport infrastructure in the region, the road system is the most critical for evacuation in times of emergency and for inward access by emergency services;

- The other forms of transport infrastructure have contributions to make but none so great as the road system;

- Fire behaviour is such that under catastrophic conditions, fire fronts starting in the huge tracts of forested land to the west advance on the Princes Highway, initially down a roughly NW to SE line, which can be cut in several places;

- Most settlements on the coast are accessed along roads running from the highway east to the coast – egress under bushfire conditions is toward danger, not away from it;

- Over very long sectors of the Princes Highway, there is no alternative route of any standard which would allow egress for evacuation purposes or ingress for emergency services from these coastal settlements; this lack of an alternative path to safety contrasts poorly with what, under fire engineering regulations, is required in buildings;

- Such alternative routes should be planned and implemented and can be done so in a manner which preserves the human and nature assets of the region;

- Access to communications and technology such as *Fires near Me* and *Live Traffic* apps is absolutely vital for people to make the right decisions in regard to their safety plan and to be able to act on advice to leave the region; Interoperability of communications networks in emergencies is needed.

- As has bedevilled Australia for 200 years, States seem to deliberately use different systems, technologies and terminologies – bushfires have no regard for the man drawn state boundaries and fully compatible system are required.

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[1] Peter Thornton has more than 40 years' experience as consultant and adviser to the NSW and other Australasian Governments on matters of Transport and Infrastructure. In February 1987, he lead a study entitled *"Bushfire Protection Advantages Study"* for Blue Mountains City which made more than 16 recommendations on what might be done to facilitate protection of life and property while respecting the environmental assets of the Blue Mountains and was in response to the 1983 Ash Wednesday fires which claimed 76 lives, 359,000 hectares of land 2463 houses 290,000 head of stock and 20,000 kms of fencing.

2.   Introduction

On 31 December 2019, major fire fronts - termed the Currowan, Araluen Road, and Clyde Mountain fires[2] - burnt out of control, from the huge expanses of bushland, State Forests and National Parks tracts to the northwest of Moruya and as far north as Nowra, down a northwest to south east fire line to the coast. These fires burnt through interalia i) Nelligen, Batemans Bay, the townships on the south bank of the Clyde River and on down to Malua Bay and Rosedale and ii) from Araluen Road through Mogo and on to Tomakin and Broulee.
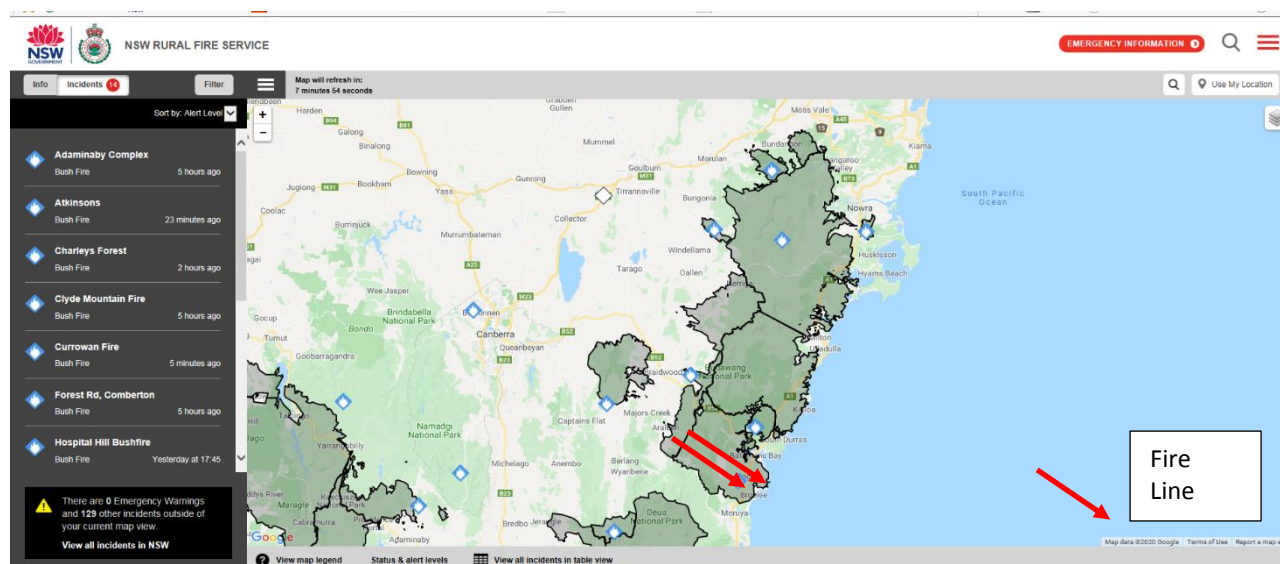
3.   Thornton Family Involvement and Personal Transport Experience

On 30 December 2019, our immediate family (six adults and two children) was assembled at our newly renovated beach house at Broulee when advice from the Rural Fire Service was upgraded regarding about the *"severe"* fire conditions[3] and the recommendation to evacuate to an evacuation centre in either Batemans Bay or Moruya - if it was our plan to leave - before 8am on 31 December 2019.

Initially, we thought that some adults would stay to defend the house and, if need, be evacuate to the relative safety of Broulee Beach. In part this was because of a belief that by comparison to many other locations, Broulee, and our house in particular, was relatively protected and advantaged by the Princes Highway, more open country, George Bass Drive, cleared land and two residential streets in between us and the approaching fire front and all being places from which the RFS could mount defensive operations. This belief was in part informed by the experience noted in footnote 1.[4]

However, we ultimately took the collective family decision that we would all evacuate to Moruya prior to 8am on 31 December, as recommended, and prepared to do so by packing essentials in our cars on the evening of 30 December. We elected Moruya over Batemans Bay due to our perception that Moruya would be more defendable in a bushfire, due to surrounding grazing lands, river to the north and golf course to the south.

Members of our group upgraded their *Fires near Me* app watch zones to extend them as far as the southern reaches of the Clyde Mountain Fire (at the time this was a distance of around 25-30km away). Phones were also checked to make sure that the emergency notification function (to override a phone's do not disturb function) was turned on.

At 3:57am we received a notification from the *Fires near Me* app that the Clyde Mountain Fire had been upgraded to *"Watch and Act"* status and was heading our way. We decided to bring forward our plan to leave Broulee to 6am. While readying the house to leave, continuous monitoring of the *Fires Near Me* app meant that, at around 5.30am we were able to see that a fire to the south of Moruya had spread quickly (in the space of half an hour), with a two-pronged fire front shown heading towards Bermagui. This prompted us to bring forward our leave time again to

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[2] https://www.rfs.nsw.gov.au/fire-information/fires-near-me and amongst several other major fires that day.

[3] In point of fact the RFS were warning that the 31st was shaping up as a *"catastrophic"* day on the day before but without us appreciating specific indications of just what might happen and where – since then we have found the fire spread map on the *"Fires near me"* App.

[4] This assessment might have been right except for i) the speed at which the fire front was moving and ii) the fact that overall regional RFS resources were stretched so thinly to address even more pressing situations than at Broulee.

around 5:45am lest a similar fire leap occurred near us, cutting off our evacuation route from Broulee to Moruya, which is through an expanse of coastal forest, connected to bushland to the northwest.

An automated emergency advice text to leave Mogo, a village on the Princes Highway 7.6kms directly NNW of Broulee*, "immediately"*, came at 6:01am. Mogo, which suffered very substantial damage, lay on the wind line between Broulee and the fire front.

We were able to exit Broulee without difficulty via George Bass Drive, an alternative route to the Princes Highway, to a place of safety on the southern riverbank of the Moruya River, where we were quickly joined by many others[5] and from where we watched the fires progress towards Broulee, as the following photos show. Immediately we arrived in Moruya, and before heading to Riverside Park, we ensured that all three of our vehicles were filled with petrol. Fortunately, the service station on the Princes Highway, to the north of the Moruya River was open at that time of the morning.

[5] Who by now were evacuating all their animals as well as people.
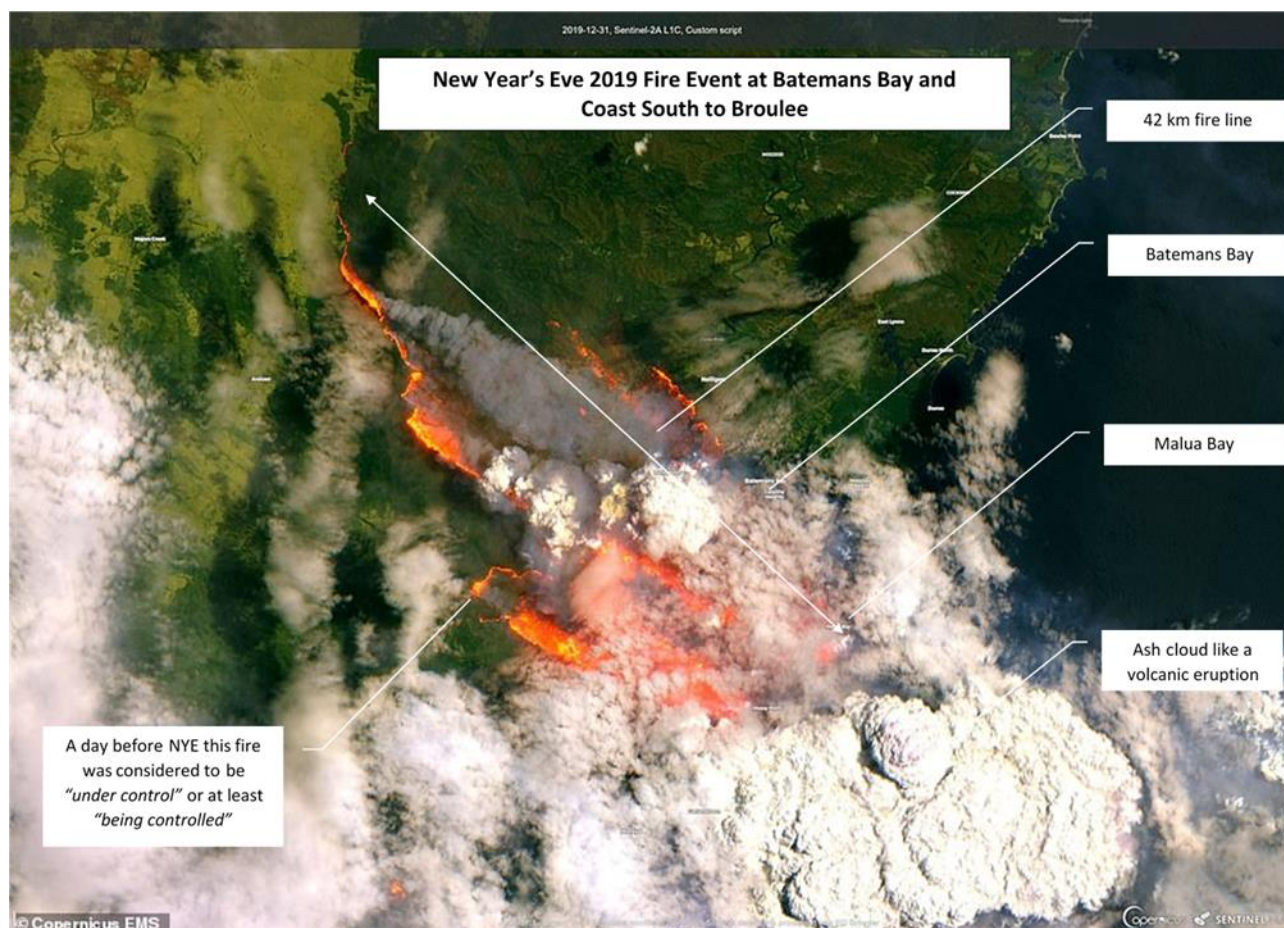
The key issues for us then on were:

- Constant checking of the relative safety of our current location as the fire to the north burned southwards towards Moruya, and knowing that the forecast southerly may push the fire to the south of Moruya northwards in the afternoon. After the fact, and once we had a better understanding of the scale of the impact in other areas, it became clear that we were in the safest possible location in the Far South Coast.
- Information about the progress of the fire and the likelihood of loss of life in Mogo and Broulee, or that our property was damaged or lost – our principal source was the RFS *Fires Near Me* App – the question was whether we could go back to the house that night or needed to find emergency accommodation such as at the evacuation centre or some other alternative; We were most fortunate to secure two motel rooms as a result of a cancellation of people who could not get into the region; This was because we still had an internet connection and phone coverage for those in our group who had phones on the Telstra network;
- Information about what roads were open to enable us to depart the region as quickly and safely as possible – our principal source was the *Live Traffic* App;
- The loss of all power in Moruya – this led to a situation where most retail outlets closed especially the large supermarkets; fuel could not be dispensed; cash could not be obtained for ATM's; and phones could not be charged except by driving around wasting fuel;
- Loss of ABC radio – which was a vital source of information especially for those who did not have access to the two Apps - in some places; and loss of communications channels other than Telstra, which remained operational in Moruya, though not in Broulee.

On the morning of 1 January, we were able to travel back to Broulee – the Princes Highway was closed on 31 December[6] between Moruya and Batemans Bay but George Bass Drive remained open to Tomakin though closed further on. We found our house had not been damaged although the fires had come very close and, in fact, ember attack had gone over our house and set alight the fore dune of Broulee Beach. The change in wind direction to a

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[6] And remained closed for at least a week

Southerly at about 11:30am on 31st December 2019 was no doubt a big factor in the relative lack of damage to Broulee, especially compared to the villages of Rosedale and Malua Bay further north.
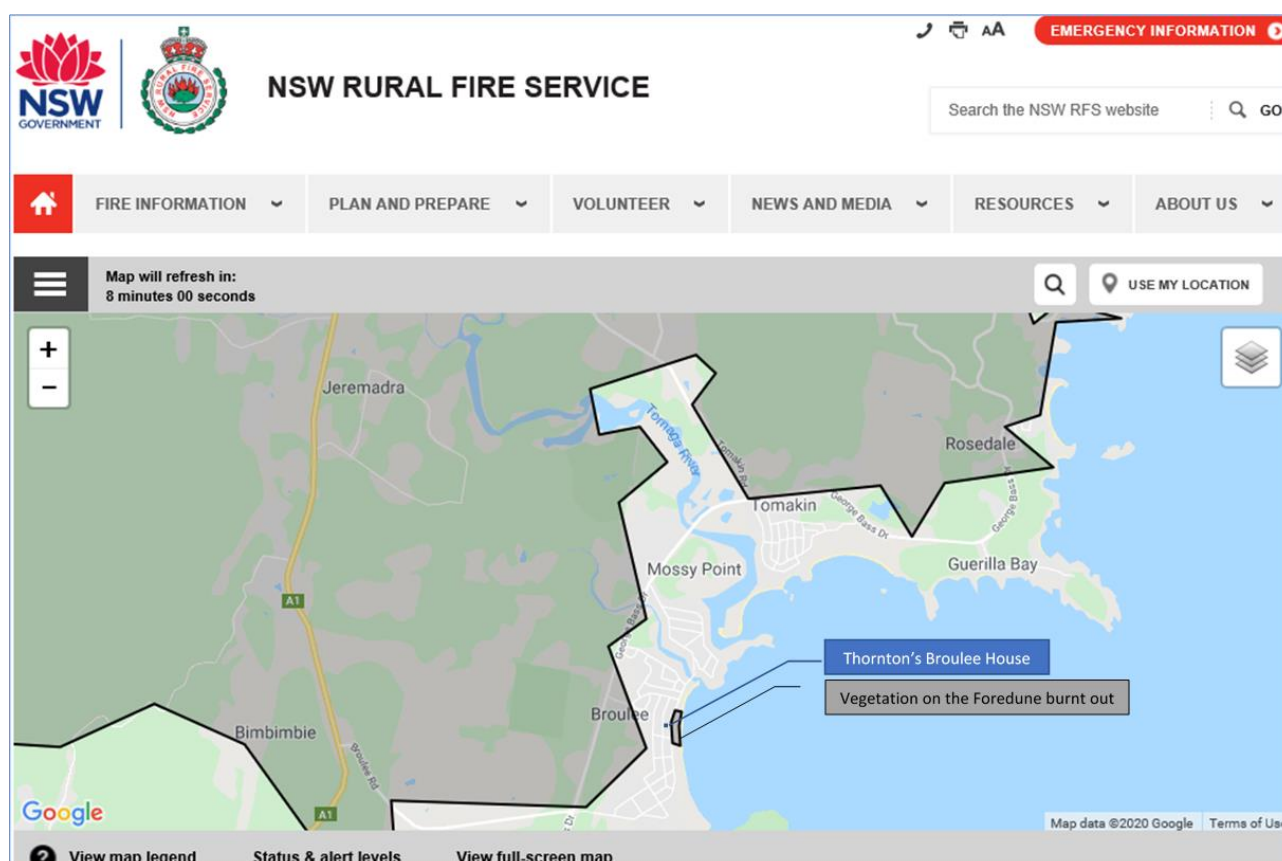
At this point, we were still not able to evacuate the region via the Princes Highway as it had now been cut south of Nowra, nor via the Kings Highway which had been closed earlier in December nor, at that point with any certainty of safety ,via Bega.[7]

We could have elected to move back into the house – as did some others, including some who had stayed through the whole event but decided that, given the advice was that there remained a lot of fire sources in the local environment, we should stay in place of safety in Moruya – one fewer family for the RFS to worry about, should the fire flare again. Also, while at Broulee, we had no communications or ability to access *Fires near me* or *Live Traffic apps*, we did in Moruya, due to outages of both the Telstra and Optus networks in that area.

The main issue at that point was how to act on the RFS advice that *"if you don't need to be in the south coast then please leave before Friday"*.

We decided that, due to our place of relative safety in the landscape and the two-day window of forecasted calm weather, we would prefer not to attempt to leave the region until the RFS and local police had had an opportunity to properly assess the road network along evacuation routes.

For most of 1 January 2020 the *Live Traffic* App showed:

- To the north, Princes Highway closed between Moruya and Batemans Bay;
- To the north, Princes Highway closed between Bateman Bay and Ulladulla;
- To the north, Princes Highway closed between Milton and Nowra;
- To the north, George Bass Drive open to Tomakin and later to Batemans Bay, thereby providing a bypass to the Princes Highway in that sector – which remained closed for many days after; George Bass Drive did intermittently close according to conditions but Princes Highway did not intermittently open.
- To the west, Kings Highway closed, as it was prior to the event and has been ever since;
- To the west, Araluen Road closed, as it has been ever since;

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[7]   We later found out, from other hotel guests who elected to drive out via Bega on 1 January that the route south and over Brown Mountain to Cooma was open and safe to drive, providing you had more than 300km worth of fuel**.**

- To the north and west, Nerriga Road
- To the south, Princes Highway closed south of Tilba Tilba but with a diversion on local roads via Bermagui and Tathra to Bega[8];
- To the south and west Snowy Mountains Highway intermittently closed depending on conditions.

Effectively this meant the entire Eurobodalla Shire was cut off from the rest of the country, other than via one highway route which could be closed at any moment.

Based on this information from *Live Traffic*, we determined we would exit the region via Princes Highway south to Tilba Tilba then via local roads via Bermagui and Tathra to Bega and then via Snowy Mountains Highway to Canberra and Sydney a distance of 719kms and 8 hours travel time compared to a normal time of 4.25 hour and 320 kms. While the route was possible, it had a number of issues that concerned us:

- The route was more remote and with fewer obvious places of safety;
- There were likely to fewer emergency services personnel in the region than compared to the Princes Highway;
- We knew that there was fire in the vicinity of the Snowy Mountains Highway;
- We knew the road closure was as a result of the fires in Cobargo and that the fire front was advancing towards the coast – this later lead to closure of the coastal road.
- We were advised that police would not let you take this route unless they were satisfied you had sufficient fuel to complete the journey to at least Cooma; In our case, we had full tanks of fuel before the event commenced, Many others did not ;
- We heard that Bega's water supply and power systems were damaged which would make it even more uncomfortable than in Moruya, should we be forced to stop there – power was restored in Moruya at about 9:00pm on 1st January 2020.

Nevertheless, our plan was to depart Moruya at 4:00am on 2nd January 2020 to try to take advantage of calm conditions and to encounter as little traffic as possible and travel out of the region via the Snowy Mountains Highway. At 3:15am, we used *Live Traffic* to reassess the situation and found that the Princes Highway had opened from Batemans Bay to Nowra, albeit that it showed an incident north of Milton. We also noted that the little traffic that was passing the hotel had changed direction and was now heading north. We felt we needed local confirmation that what *Live Traffic* was showing was, in fact, correct before setting out and rang both Nowra and Batemans Bay Police to check – both stated that if *Live Traffic* said the road was open, then it was. Nowra Police did say the route was about to close for a short time to remove a fallen power pole but would open again once dealt with. *Live Traffic* immediately showed this and this evidence of real time updates gave us the confidence in *Live Traffic's* information that we needed and, accordingly, we then changed our plan to travelling north not south via:

- George Bass Drive to Batemans Bay;
- Princes Highway to Nowra.

This journey proved remarkable because of:

- The impeccable behaviour of the traffic – no one attempted speed or to overtake even where there were passing lanes - that is not until we reached Nowra when the local traffic came in whereupon it was "business as usual";
- Seeing the extent of damage to trees and power poles and other roadside equipment and the realisation that all that infrastructure had to inspected, problems dealt with and approval given for the route to be reopened – it was easy to be frustrated that it was closed but seeing why made us appreciate what the relevant authorities had to do to ensure traffic safety;
- The strong visibility of police, RFS, emergency services, council and other utility personnel all along the route maintaining road blocks on side roads and fixing infrastructure; This gave great confidence that situation along the route was being carefully monitored and that we had made the right decision to travel that way.
- The evidence of the action to restore service – new power poles had already been dropped on the roadside for installation.

Once past Nowra, our journey to Sydney was normal and unremarkable.

Key points

- As advised to do, we took early action to both evacuate in face of danger and to depart the region;
- The RFS *Fires Near Me* and TfNSW *Live Traffic* apps proved invaluable to informing us as to the appropriate actions to take – provided, of course, that you had such a phone, the phones were able to be charged and a signal

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[8] This route later closed as fires moved from the Princes Highway towards the coast.

could be obtained – we came across people who did not have such access to information and who were disadvantaged by that; We came to trust and rely on both Apps;

- The fire spread prediction needs to much more visible on the *Fires near Me* app, perhaps added to the mapping in a different colour - we were not aware of this fire spread prediction mapping until one of us saw it on social media. Even then it was a struggle to find it (and re find it) on the RFS website. Such important information should not be hidden away on a .pdf on the website, it should be very clearly upfront and part of the app. More than anything else, this prediction lead to our decision in respect of initiating our Safety Plan.
- The information content between the two Apps appeared otherwise to be well coordinated;
- While the RFS *Fires Near Me* app provided pings to advise of danger, the *Live Traffic* app did not provide pings to say whether an escape route was open[9] – had we been so advised, we would have left at any time, day or night; Perhaps this could be investigated to see if it would be possible[10];
- Access to mobile phone communications is essential to provide the public with the best information upon which they can take their decisions – there appeared to be a lack of coordination whereby if one network infrastructure was damaged its traffic could be carried by a competitor – in this instance Optus users did not have access to the real time information that Telstra users did. And one overseas couple did not have any form of access to real time information.
- The ability of people to escape the region by road is hampered by the long stretches where there is no alternative route.
- As a family we were able to make the right decisions – for us - by having early warning and up to date information; as a result we were safe at all times, at worst in a heightened state of anxiety and at best, just somewhat inconvenienced;

4.   NSW South Coast Transport Infrastructure

This personal experience prompted a review of the transport infrastructure that exists with the NSW South Coast and its relevance in such an emergency. This is shown in the following figure.

As can be seen the region is characterised by many settlements of varying scale generally to the east of the Princes Highway and to the west of the Highway huge tracts of National Park, State Forest and other heavily timbered country in steep and inaccessible terrain leading up to the coastal escarpment, beyond which is the more open county of the Monaro Plateau.

Roads

The region is effectively served by four highway sectors – the major north and south Princes Highway and the east – west Kings Highway and the Snowy Mountains Highway – plus one minor sealed route through Nerriga and several unsealed routes.

At various times since 1 January 2020 these have either been totally or intermittently closed. In regard to the Princes Highway over the 258 kms between Nowra and Bega, the following sectors which comprise 67 % of the route have no effective alternative route which could be used to move either north or south under emergency situations

- Moruya to Tilba Tilba - 62kms;
- Bateman Bay to Ulladulla - 55kms;
- Milton to Nowra - 58 kms

Ports

As has been seen at Mallacoota Inlet, some coastal communities can be so completely cut off by land transport that evacuation by sea is necessary.

Over the 320 kms of coast line between Wollongong and Eden there are only:

- Three ports of the scale that could accommodate a major naval vessel such as HMAS Adelaide – Port Kembla; Jervis Bay and Eden;
- Several ports that could accommodate large commercial fishing vessels – Ulladulla, Bateman Bay, Narooma and Bermagui.

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[9] Although research today does indicate that personalised alerts can be provided, this was not easily apparent in the time of crisis on a very small IPhone screen

[10] Recognising that causing "stampede" of evacuees might be even more dangerous.

- Possibly a few embayments of the scale of Broulee with sufficient flat beaches which could accommodate a large vessel and support landing craft operations; These might also be able to operate through the river mouth bars such as at the Moruya River;
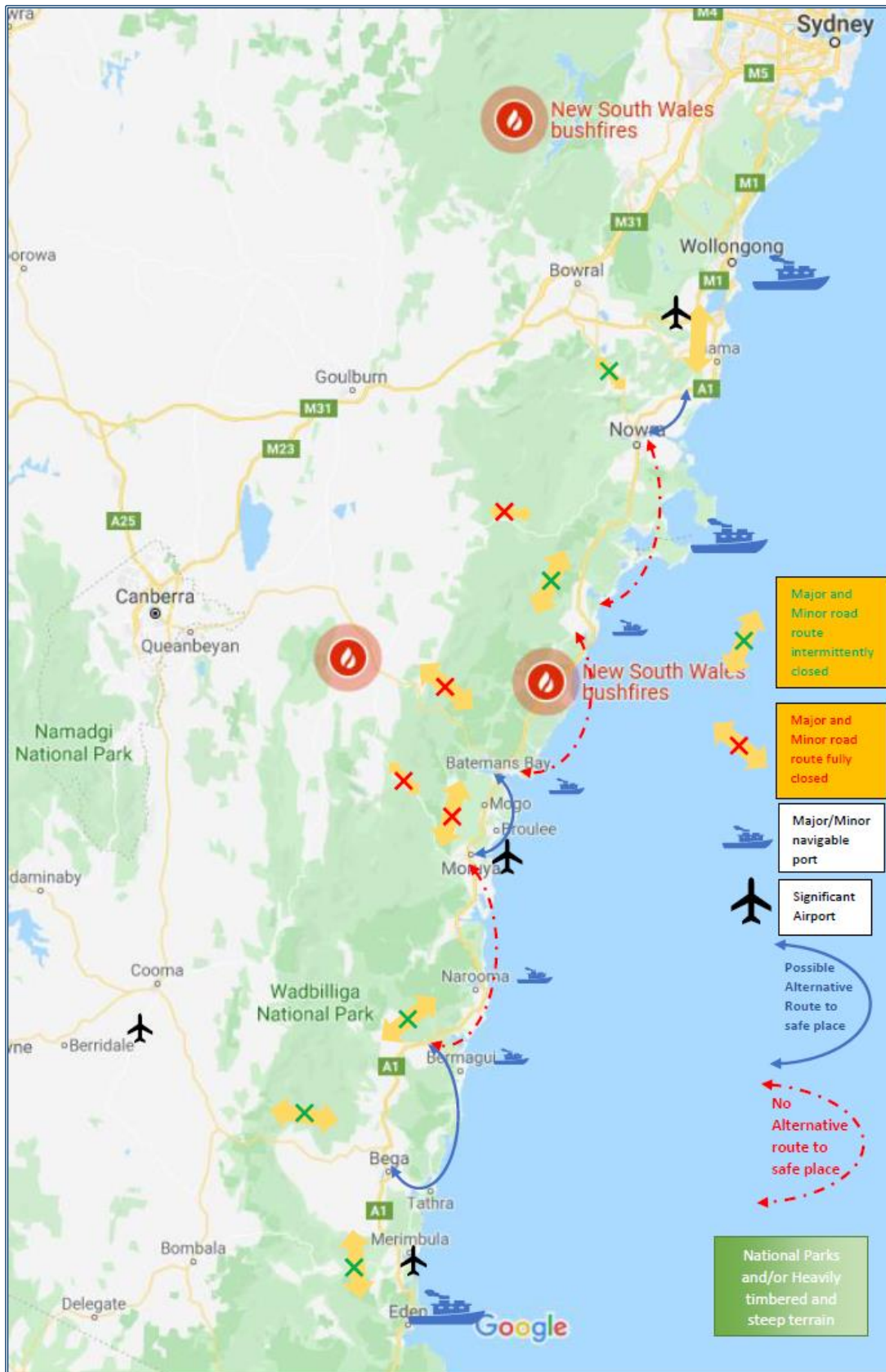
Operations to bring in heavy resources to the region, as has now happened through Eden, are realistically limited to Eden which has wharfage of adequate scale and Port Kembla, both of which lie at the extremities of the region and both of which were cut off by road closures. Elsewhere, fishing boat scale operations only would be possible.

Rail

There is no rail south of Bomaderry on the northern side of the Shoalhaven River from Nowra. Hence any use of this mode in an emergency is wholly dependent on access by the road system.

Airports

Over the 320 kms of coast line between Wollongong and Eden, there are only the following significant airports from which major emergency evacuation services could be operated:

- Three commercial airports – Illawarra; Moruya and Merimbula able to operate aircraft up to about 70 seater scale i.e. Bombardier Q400, ATR72, or Saab 340 aircraft operated by Qantas Virgin and Rex respectively; These airports would probably be suitable for RAAF C-130J-30 Hercules and C-27J Spartan Freight aircraft[11];
- One major defence airport at HMAS Albatross Nowra with two runways of over 2000m, probably able to accommodate passenger aircraft of up to Short Haul International Code E aircraft (B787) and Domestic RPT to Code 4C (B737/A320)[12] in an emergency; This airports would suitable for RAAF C-130J-30 Hercules and C-27J Spartan Freight aircraft ;
- RAN's Jervis Bay Airfield with two runaways 1524 m x 46 m and 1463 m x 46 m, probably able to operate Intrastate propeller domestic RPT and small executive aircraft; It may be suitable for RAAF C-27J Spartan Freight aircraft

All of these require road access, power (unless solar in already in place or backup generators are installed or can be fitted quickly) and, in the case of recent events, all would have been inaccessible to some of the population on the region at various times. All, however, would be able to accommodate helicopter operations for evacuation, emergency resources and firefighting.

In terms of evacuation, however, the numbers would be relatively small compared to road.

Key Points

- The highway system provides the major means to evacuate the region;
- The highway system is very *"skinny"* and lacks alternative routes over very substantial sections in the event – as has just occurred - of it not being available for significant periods of time;
- Airports could contribute in the case of some degree of injection of specialised support, evacuation, resupply, equipment, medical evacuations - though such medical operations probably might be best done by the long range helicopters of the NSW Ambulance Service or military equivalents; Airports, by virtue of their degree of open space may also be suitable as places of safety – though obviously not if remaining fully operational;
- The region is principally resupplied by road transport but both ports and airports could play useful logistics roles in emergencies by delivery of specialised cargoes e.g. medical, rations; water. These could also be delivered by helicopter.

5. Issues related to the Highway system's evacuation capabilities

As noted above, the Highway and road system is the major means to evacuate and resupply the region. The following diagram outlines the type of conditions that apply over most of the length Princes Highway through the south coast region.

- Highway paralleling the coast but very often several kilometres inland from it;
- Settlements of various scale east of the Highway on the coast and accessible by a single road, mostly with few or no alternative routes back the Highway;
- Massive fire sources west of the Highway in inaccessible terrain and also some major sources east of the Highway out towards coastal settlements;
- Relatively few large population centres able to provide places of safety for large numbers of people;

As has been seen in recent events, under catastrophic conditions the fire fronts, driven by wind, advance down an essentially north-west to south east fire line toward the Highway. West of the Highway, there are few roads which provide access for RFS crews to attempt to stem the advances and roads to the west quickly get cut. Once the fire front reaches the Highway, the Highway itself gets cut preventing egress from those settlement whose access roads connect in that sector of the Highway. If those populations have chosen not to evacuate then they are entirely cut off,

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11 Subject to further checking on matters such as aircraft performance runway length and width, and pavement strength
12 https://www.westernsydneyairport.gov.au/sites/default/files/Technical_Papers_Volume_1-Joint_Study_on_Aviation_Capacity_in_the_Sydney_Region.pdf

no additional resources can be mobilised into the area and they have their backs to the sea. This is what occurred at Lake Conjola, where 89 homes were lost and some people were forced to take refuge in the lake.
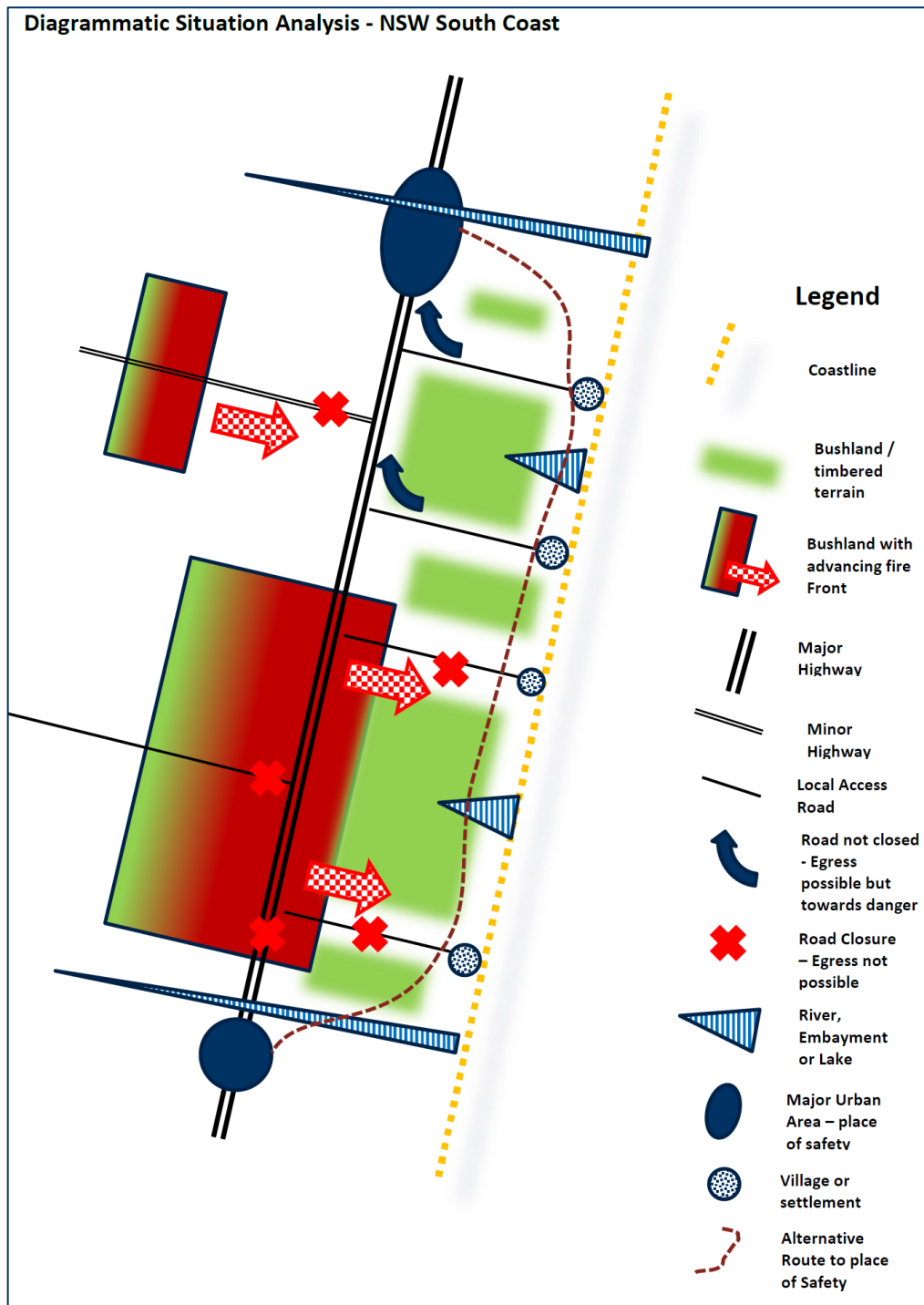
If the fire front has not crossed the Highway and it is still operational, it may still be possible to safely evacuate via the minor settlement's access road to the Highway and thence to a place of safety in major urban area. However as shown the evacuation route is **towards** the advancing fire front, not away from it – hence its usefulness is diminished by the speed of the oncoming fire and, of course, the Princes Highway itself cannot be considered a place of safety. Furthermore, fire fronts do not advance in nice tidy straight lines.

What is clear though is that, unlike the situation between Moruya and Batemans Bay where a major trafficable alternative route in the form of George Bass Drive existed, a great many of settlements along the coast have no alternative means of egress. A good example are villages and settlement between Ulladulla and Batemans Bay.[13]

This is in complete contrast to what is required in a modern building where alternative paths to purpose designed and engineered fire exits are mandated. Of course, the charm of the many small beach side places on the south coast lies in their isolation and their settings, often in deep forest and by them not being a repetition of the bleak suburbia that now surrounds our major cities. However, the road networks of such modern planned and engineered suburbs are generally sufficiently complex as to provide more than one connection to major road systems thereby providing alternative ways to escape a major incident.

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[13] Where anecdotally people were stranded for four days and required a police escort out

Diagrammatic Situation Analysis - NSW South Coast

Legend

- Coastline
- Bushland / timbered terrain
- Bushland with advancing fire Front
- Major Highway
- Minor Highway
- Local Access Road
- Road not closed - Egress possible but towards danger
- Road Closure – Egress not possible
- River, Embayment or Lake
- Major Urban Area – place of safety
- Village or settlement
- Alternative Route to place of Safety

Obviously these settlements developed long before formal town planning occurred and their street layouts are not necessarily optimal for emergency services. Again, though, the disordered layouts of such settlements also leads to their charm and attractiveness compared to the sterility of engineered subdivision road layouts.

They also developed without consideration of alternative egress in times of emergency such as has just occurred.

Key Points

- Egress from many coastal settlements is towards fire danger not away from it;
- Over a significant portion of the south coast no alternative alignments of any road standard exist to provide emergency egress under extreme bushfire conditions; conversely, no alternative routes exist for emergencies service to get in.
- The absence of such alternative routes imposes addition burden on emergency services trying to save life and property;

6.   A suggestion to improve Fire and Life Safety in coastal settlements

As an example in one of the worst affected areas, the following figure shows a suggested alternative route, which had it been in place, would have allowed alternative egress for the residents of places as such Lake Conjola and Manyana whose only line of egress, other than by helicopter or lakes and the sea, was towards the advancing fire front. Such a route would permit egress by residents in such future emergencies toward the relative safety of Ulladulla and Nowra and would be away from the advancing fire front. This would also obviously provide an alternative route for emergency services to get into these areas.

What would the issues be?

- Many people might feel that such addition access would result in a loss of the charm and tranquillity of their settlements by permitting through traffic;
- People may also be concerned that such a road would lead to further subdivisions and increased populations and the loss of identity and exclusivity in these locations;
- There might be objections to building a road through the portions of the alignment that necessarily pass through lands designated for conservation purposes such as a State Conservation Areas or National Parks;
- There may be a need to gain approval from the Commonwealth in order to pass through the Jervis Bay territory.
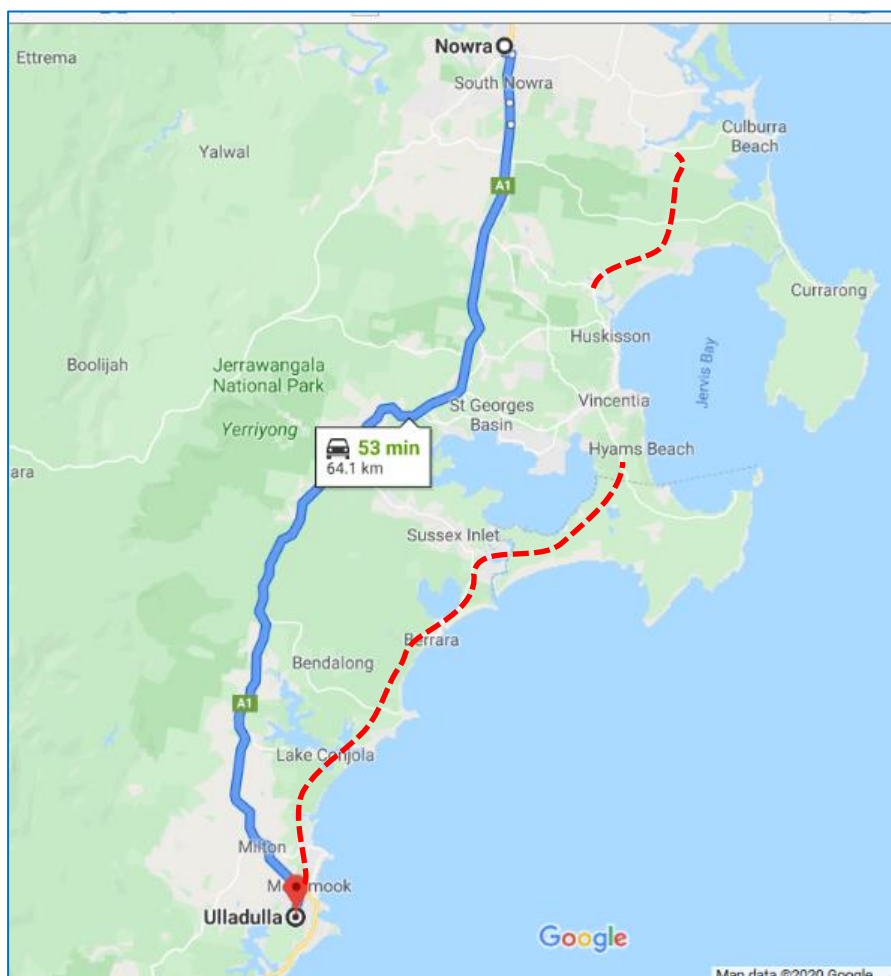
All of these issues can be overcome, by for example, building a road as a high quality, unsealed all weather tourist route; by imposing strict planning controls to preclude its use as a means for further subdivisions; by, if necessary, gating sections of the route to prevent its use except when opened by National Parks and/or Emergency Service personnel.[14]

As such, it could become a means to also open up to visitorship parts of the coast and forested areas that are now inaccessible. It would also provide tourists and visitors access to more of the assets of the region without adding to traffic on the Princes Highway. With careful environment design such a road could be implemented without damaging the environmental assets along the alignment. Being slower and longer, it would not be attractive as an alternative route to the Princes Highway under normal conditions.

Key Points

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[14] For example NPWS rangers used to drive from Thredbo and lock the gate at 5pm at Leather Barrel Creek on the Alpine Way during winter.

- South coastal settlement have never been designed, for situations such as recently experienced - indeed they were never designed at all but merely evolved;
- A system of alternative trafficable routes should be planned and implemented to enable alternative pathways for emergency egress and also to enable mobilisation of emergency service resources;

7.   Issues with Communications and Technology

ABC Radio and NSW Government apps *Live Traffic* and *Fires near Me* proved to be outstandingly valuable for managing personal safety in this emergency, providing, of course, they could always be accessed. This was not the case for ABC Radio and Optus users as it appears some Optus base stations became impacted and suffered loss of communications. Views were expressed by many people that in such an emergency one carrier's traffic should be able to be patched across to the alternate provider. This now applies to the "000" number. At the very least this should apply to access to such vital services that provide fire, road condition and life safety information. This should be mandatory albeit the technical feasibility of this is not clear. It should be examined as a matter of priority.
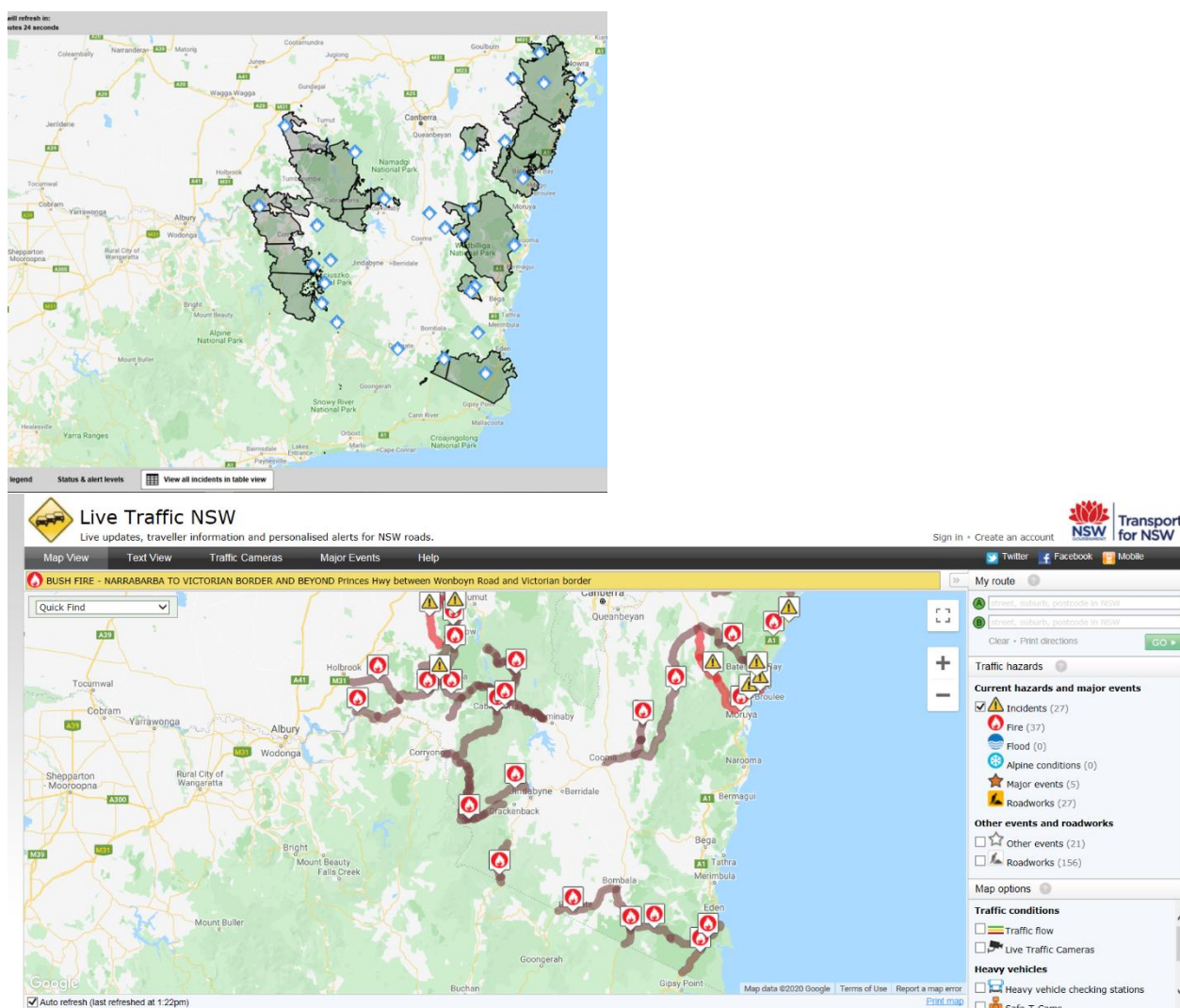
As noted previously, the loss of the power network[15] had a serious impact on continuing ability to access to mobile telecoms and there have been press reports[16] that it was only through the copper wire network that some locations and residents could access information. Redundancy in these systems needs to be considered in the same way as in transport system.

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[15] In regard to loss of power it was surprising that the designated evacuation centre in Moruya at its basketball hall in its show grounds did not have an emergency diesel power supply. This added to the discomfort of those who were forced to take shelter there and even prevented the Eurobodalla Fire Chief from being clearly heard when he attempted to brief those assembled there.
[16] https://www.abc.net.au/news/rural/2020-01-13/are-australias-telecommunication-up-to-the-new-kind-of-megafire/11860238

Finally, looking at both these screen shots from the NSW *Live Traffic* and *Fires near Me* App might lead to the conclusion that, quite remarkably, bushfires respect and do not cross state boundaries. That is, of course, absurd but what is equally absurd is that Victoria appears to use a different technology and has a different classification system and language for fire advice and there is no continuity between NSW and Victoria[17][18] – not even a link to the Victorian app is clearly shown on the NSW map or vice versa. Many people travel and visit southern NSW from Victoria and vice versa. Such people do not want to know only the part of the story – they need it all - for example, what their travel from Bega to Melbourne looks like. The two states even use different terminology with NSW declaring a *"State of Emergency"* and Victoria calling it a *"State of Disaster"*. These two designations may also have entirely different connotations in terms of powers and obligations – a national system of such designations is needed, not a state based one.

By now Australia should be far beyond the *"break of gauge"* problems that bedevilled the rail system and be using nationally consistent technology and terminology, even if locally its administration is expedited by one state or another. Both the Commonwealth and the States need to show leadership in such matters – the Commonwealth by providing overarching coordination and the States by stopping using different terminology and systems for the same matter[19].

Key Points

- Redundancy and interoperability in communications systems need to be considered;
- Backup diesel generator power is needed in key locations to power up the systems and places such as evacuation centres;
- Consistency of terminology and systems between States is needed;

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[17] And quite possibly this is the case between other states
[18] While the national fires app can be downloaded the issue of different classifications is not resolved on that app, it just adopts the state by state information and advice.
[19] So often, it seems, the States do this to try show their independent sovereign State status - that is, if State ABC does it this way then State XYZ chooses to do it a different way – this is no longer acceptable.